

Arkansas Wildlife Action Plan







DESIGNING
A FUTURE for Arkansas Wildlife

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The Arkansas Wildlife Action Plan
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Purpose

The Arkansas Wildlife Action Plan (AWAP), formerly known as the comprehensive wildlife conservation strategy (CWCS), serves as a guiding document for the conservation community in identifying those species that are at risk of becoming further imperiled and the actions needed to conserve those species.

Acknowledgments

The preparation of Arkansas' original Plan involved the input and participation of a wide variety of individuals, including staff within multiple divisions of the Commission, as well as from other state and federal agencies, conservation organizations, private industry, and academia. The 2015 revision of the Plan involved many of those same partner organizations, a testament to the continued strength of conservation partnerships within Arkansas.

We extend our warmest thanks to everyone who has contributed their support, knowledge, time and energy in the development of the Plan.

We are also especially thankful for the following individuals for their efforts toward the revision of the plan: Dr. Bill Baltosser, Wes Cleland, Cindy Osbourne, Tony Davis, Tom Foti, Bill Holimon, Kelly Irwin, Scott Lane, Allan Mueller, Bill Posey, Jeff Quinn, Kory Roberts, Karen Rowe, Blake Sasse, Samantha Scheiman, Don Shepard, Jason Throneberry, Brian Wagner, and Doug Zollner.

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1915-2015 Arkansas 100
A Century of Conservation

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Mike Piccirilli
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Dear Mr. Piccirilli,

Nearly eight years have passed since the original Arkansas Wildlife Action Plan (AWAP) was approved. In that time, the state has received over $10 million dollars in state wildlife grant funding to implement the Plan. We have made many accomplishments as a result, including expanding our knowledge on the status and life history of many species and putting much needed habitat on the ground.

Over the past 3 years, we have worked diligently with our conservation partners to review and update the required elements within the Plan. The largest change is an update to the NatureServe state ranks for many species. The revised Plan includes 377 species of greatest conservation need (SGCN) for which all information has been updated.

We feel that the AWAP remains useful and relevant and is an important document, not only for our agency, but for all conservation agencies in the state. This is evidenced by the continued support and involvement of our conservation partners in updating the plan, serving on committees, and implementing the Plan.

Enclosed you will find a summary of the major changes to the Plan, two hard copies of the revised Plan for the regional review team, and a thumb drive with electronic copies of the Plan and the AWAP database. Should you have any questions, please contact Allison Fowler, Wildlife Diversity Program Coordinator, at 501-223-6366.

We look forward to your response.

Sincerely,

Mike Knoedl

Mike Knoedl, Director

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The Arkansas Game and Fish Commission's mission is to conserve and enhance Arkansas's fish and wildlife and their habitats while promoting sustainable use, public understanding and support.

Section 1. Arkansas Wildlife Action Plan

Eight Required Elements

Congress identified eight required elements to be addressed in these wildlife conservation plans. Further, the plan must identify and focus on the "species in greatest need of conservation," yet address the "full array of wildlife" and wildlife- related issues. They must provide and make use of:

(1) Information on the distribution and abundance of species of wildlife, including low and declining populations as the State fish and wildlife agency deems appropriate, that are indicative of the diversity and health of the State's wildlife; and,

(2) Descriptions of locations and relative condition of key habitats and community types essential to conservation of species identified in (1); and,

(3) Descriptions of problems which may adversely affect species identified in (1) or their habitats, and priority research and survey efforts needed to identify factors which may assist in restoration and improved conservation of these species and habitats; and,

(4) Descriptions of conservation actions proposed to conserve the identified species and habitats and priorities for implementing such actions; and,

(5) Proposed plans for monitoring species identified in (1) and their habitats, for monitoring the effectiveness of the conservation actions proposed in (4), and for adapting these conservation actions to respond appropriately to new information or changing conditions; and,

(6) Descriptions of procedures to review the plan at intervals not to exceed ten years; and,

(7) Plans for coordinating the development, implementation, review, and revision of the plan with Federal, State, and local agencies and Indian tribes that manage significant land and water areas within the State or administer programs that significantly affect the conservation of identified species and habitats.

(8) Congress also affirmed through this legislation, that broad public participation is an essential element of developing and implementing these plans, the projects that are carried out while these plans are developed, and the Species in Greatest Need of Conservation that Congress has indicated such programs and projects are intended to emphasize.

The following section is a guide to how Arkansas addressed the eight required elements.

Element 1. Information on the distribution and abundance of species of wildlife, including low and declining populations as the State fish and wildlife agency deems appropriate, that are indicative of the diversity and health of the State's wildlife;

Locations: The methodology of selecting, scoring and ranking **species that are indicative of the diversity and health of the State's wildlife** is provided in Section 2. Species of Greatest Conservation Need on pages 14-19.
Each SGCN has an individual Species Report located on pages 36-1131. Refer to this for Species Priority Score. Species Priority Scores reflect the abundance and population trend of the SGCN.
Refer to Species Reports on pages 36-1131 for ecoregions, ecobasins, terrestrial and aquatic habitats associated with SGCN. The ecoregions and habitats associated with SGCN represent **distribution**.
The entire list of SGCN is listed by Species Priority Score in Appendix 2.1 (pages1582-1591).
Lists of SGCN presented by taxa group is presented in Appendix 2.2. (pages 1592 – 1606).

Element 2: Descriptions of locations and relative condition of key habitats and community types essential to conservation of species identified in (1);

Locations: Refer to Section 3. The Ecoregions of Arkansas on pages 1132-1207. Within each ecoregion description is an **ecoregion map, description, associated SGCN and associated habitats**. Ecoregions are ranked by conservation priority based on overall importance to SGCN.
Section 4. Terrestrial Habitat, pages 1208-1517, has **descriptions, locations, key factors and indicators**, and, where available, **relative condition** of terrestrial habitats. Each terrestrial habitat is ranked according to its overall importance to SGCN associated with it.
Section 5. Aquatic Habitats, pages 1518-1558, has **descriptions, maps and indicators of aquatic condition**. Each aquatic habitat is ranked according to its overall importance to SGCN associated with it.

Element 3: Descriptions of problems which may adversely affect species identified in (1) or their habitats, and priority research and survey efforts needed to identify factors which may assist in restoration and improved conservation of these species and habitats;

Locations: Refer to Section 2. Species of Greatest Conservation Need in the Species Reports, pages 36-1131, for data gaps or research needs associated with each SGCN. This is **research needed to identify factors which may assist in restoration and improved conservation of these species and habitats.**
Refer to the Species Reports, pages 36-1131. Each Species Report lists **problems (threats and sources) which may adversely affect each SGCN.**
Refer to Section 3. The Ecoregions of Arkansas, pages 1132-1207, for tables that summarize and rank the **problems faced**. Problems faced by SGCN are presented in each ecoregion section.

Element 4: Descriptions of conservation actions proposed to conserve the identified species and habitats and priorities for implementing such actions;

Locations: Refer to the Species Reports, pages 36-1131. Each Species Report has a section which lists **conservation actions associated with each SGCN**.
Refer to Section 3. The Ecoregions of Arkansas, pages 1132-1207, **Conservation Actions** ranked to provide guidance for prioritizing the implementation of such actions. Each ecoregion has a list of Conservation Action categories associated with it.

Element 5: Proposed plans for monitoring species identified in (1) and their habitats, for monitoring the effectiveness of the conservation actions proposed in (4), and for adapting these conservation actions to respond appropriately to new information or changing conditions;

Locations: Refer to Section 1. Wildlife Action Plan on pages 9- 10.
Refer to Section 2. Species Reports, pages 36-1131, for a list of **species-specific monitoring** actions.
Refer to Section 4. Terrestrial Habitats, page 1211, for **monitoring associated with conservation actions.**
Refer to Section 5. Aquatic Habitat, page 1551, for **monitoring associated with conservation actions.**

Element 6: Descriptions of procedures to review the plan at intervals not to exceed ten years;

Location: Refer to Section 1. **Review Process and Schedule**, pages 10-13.

Element 7: Plans for coordinating the development, implementation, review, and revision of the plan with Federal, State, and local agencies and Indian tribes that manage significant land and water areas within the State or administer programs that significantly affect the conservation of identified species and habitats.

Location: Refer to Section 6. Informing and engaging the public on pages 1559-1565.

Refer to Section 6. Reaching out to the scientific community, pages 1559-1564.

Refer to Section 6. Native American contact, page 1565.

Element 8: Congress also affirmed through this legislation, that broad public participation is an essential element of developing and implementing these plans, the projects that are carried out while these plans are developed, and the Species in Greatest Need of Conservation that Congress has indicated such programs and projects are intended to emphasize.

Location: Section 6. Informing and engaging the public (pages 1564-1565) documents outreach and public participation.

Guiding Principles

From the outset, Arkansas' AWAP teams chose to focus on developing a living planning tool, rather than a static funding document, that could be useful to professional partners, citizen conservationists and land managers. At the core of Arkansas' plan are teams of scientists who have populated a database which stores and links information and makes possible the calculation of priorities. The result is a database that can be readily updated as data gaps are filled and conservation actions are accomplished. With every update, the status of species of greatest conservation need and the relationships between species, habitats and conservation actions can be reexamined in an efficient manner that will demonstrate progress over time.

Science-based decision making relies on making accurate information accessible and usable. In Arkansas, scientific teams, the general public, nonprofit groups, government agencies and land managers will rely on database-managed priorities communicated online at www.WildlifeArkansas.com.

Implementing Arkansas' Wildlife Action Plan

State Wildlife Grants support activities promoting the betterment of Arkansas' designated species of greatest conservation need (SGCN). Because there is much more to do to conserve SGCN than can be funded in a given year, Arkansas developed a science-based prioritization process to make the most efficient use of available funds. The process relies on a database framework for organizing, analyzing, storing and retrieving data. Each step in the process receives expert input from the plan's partners and stakeholders. Projects funded by State Wildlife Grants (SWG) will be chosen from a list of implementation needs that are generated from the database, coarse-filtered by Science Teams, then fine-filtered by the Steering Committee and the Implementation Team.

Given the current limits to available resources, doing our best for species of greatest conservation need means that funds must be targeted with an eye to optimizing results. The process will rely on a database framework for organizing, analyzing, storing and retrieving data, and it will rely on input from biologists, landowners, scientific teams, the general public, researchers, nonprofits, and the many partners whose involvement has contributed so much.

Monitoring and adaptive management are key elements of the conservation effort. Agencies and partners cannot afford to undertake large scale habitat protection, restoration or enhancement endeavors, only to discover after years of management that actions were ineffective or even counterproductive. Monitoring helps evaluate:

- assumptions made in species-habitat models and decision support tools;
- habitat responses to conservation actions;

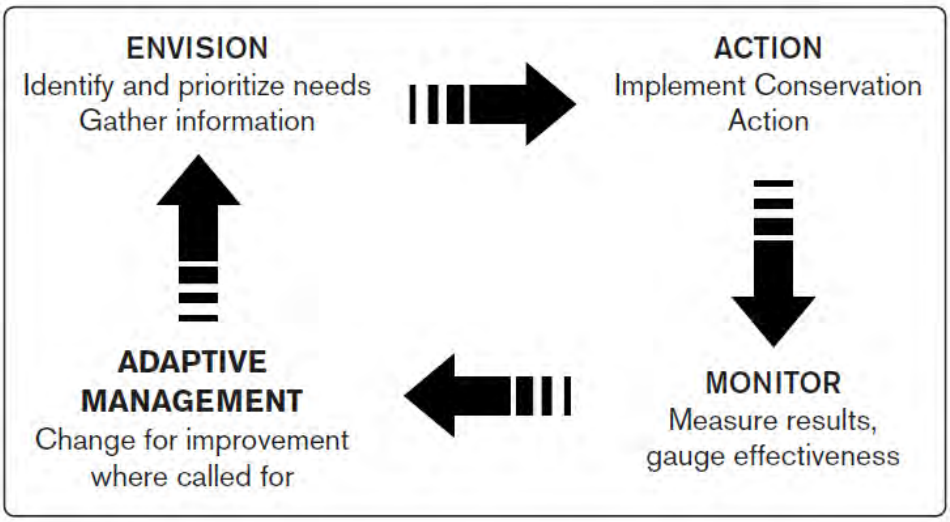
• population responses to conservation actions; and

• progress toward habitat and population objectives.

New information generated from research and monitoring only becomes useful if it influences future conservation decisions and actions. These benefits are most pronounced when the elements are iterative and ongoing, rather, than static or episodic. Thus, habitat conservation strategies are most appropriately viewed as living strategies that are continually developing in response to targeted research and monitoring results.

A continuous feedback loop is part of effective implementation. Successful application will depend upon sharing information and incorporating it into the overall body of knowledge held by the AWAP.

EFFECTIVE IMPLEMENTATION



A strategic approach for addressing and prioritizing multiple implementation needs

Assemble information

Implementation Step 1. As described in Sections 2, 3, 4 and 5, the Science Teams (Taxa Association Teams and Habitat Teams) populated the AWAP database with information on species of greatest conservation need ranked by species priority score. The teams linked species to ecoregion, ecobasin and habitats and weighted the relative importance of those relationships. The spatial relationships between ecobasins, habitats and ecoregions were mapped. For each species, Science Teams described problems faced, threats and sources, and data gaps, then

recommended conservation actions and monitoring strategies.

Generate implementation priorities

Implementation Step 2. The purpose of Step 2 is to use the information gathered and prioritized in Step 1 to promote efficient and scientific evaluation and to prioritize the allocation of resources, Arkansas uses a systematic approach to ranking implementation needs. Implementation needs are categorized into three groups:

> • **Data Gaps**: Survey or basic research needs identified during the planning process as requiring attention before further action can be taken. Examples are additional biological information needed for understanding of life history, population ecology, or distribution of SGCN prior to developing a conservation action.
>
> • **Conservation Actions:** the protection, management and restoration activities that directly affect SGCN, often at the habitat management level.
>
> • **Monitoring Needs:** Measuring how SGCN and habitats change over time. Of particular interest are those changes affected by the implementation of conservation actions. Monitoring drives the adaptive management process, guiding improvements in procedure, along with the identification and prioritization of additional data gaps and conservation actions.

On a 10-year cycle, a list of implementation needs is generated from the AWAP database using these data sets:

• a ranked list of all data gaps,

• a ranked list of all conservation actions, and

• a ranked list of all monitoring needs.

Prior to generating the list of implementation needs, the database will be updated with information gathered since the last revision, including information about previously implemented and ongoing research, conservation actions, and monitoring activities. Priority rankings associated with database-generated lists will be derived from an automated computation of the weights and rankings associated with SGCN, habitats, key factors, and indicator records. The information on this list is sorted and provided to teams representing these groupings: bird, mammal, fish, insect, crayfish, mussel, herpetofauna, other invertebrates, karst species, aquatic habitats, and terrestrial habitats.

Develop ten-year draft implementation schedule

Implementation Step 3. Each team will develop a ten-year implementation instrument to be used as a coarse-scale tool to help teams sort priorities and facilitate the creation of subsequent, finer-scale priority

action lists.

This step will be repeated biennially. Science Teams will convene to review and synthesize implementation needs. The result is a draft of implementation for the next ten years based on urgency, feasibility and scale, cost, capacity and funding availability, partnership/leverage opportunities, and other factors as circumstances warrant.

Science Teams prioritize implementation needs

Implementation Step 4. Every two years, the continuously updated AWAP database will provide Science Teams with updated ranked lists for data gaps, conservation actions, and monitoring needs.

After comparing the ranked lists with the existing ten-year implementation plan, and taking into account new information that warrants consideration, each team will identify top priorities in each category.

Each team's task is to then narrow the list to a "Hot List" of the highest priority needs that should be funded in the next two years if a proposal is submitted. The Hot Lists from each team include a mix of data gaps, conservation actions and monitoring needs that reflect their best judgment for that point in time. A Hot List from each team is provided to the Steering Committee for further consideration.

Steering Committee recommends annual action items

Implementation Step 5. Each year, the Steering Committee reviews the Hot Lists provided from each Science Team. At this time, the Steering Committee considers any new information or opportunities to develop a set of Annual Action Items.

Priorities the Steering Committee uses to evaluate implementation needs are determined through a combination of factors: relevance to species of greatest conservation concern and/or habitat priorities identified in the AWAP, project design, feasibility and cost, and the amount of currently available funding. Members of the Steering Committee will rank project proposals using the above set of defined criteria.

The final list of data gaps, conservation actions and monitoring needs captured will vary from year to year as biological, ecological, and programmatic circumstances warrant. So too will the mix of species and habitats vary from year to year.

Pre-proposals requested to meet annual action items

Implementation Step 6. With this list of needs selected, the State Wildlife Action Plan Coordinator will issue a Request for Pre-proposals, i.e. project descriptions including preliminary budgets, non-federal funding match opportunities and monitoring elements. Pre-proposals should

address the implementation priorities selected by the Steering Committee.

Implementation Team selects projects for funding

Implementation Step 7. The Implementation Team is composed of decision makers who have considerable vision and influence in deciding how SWG funds, agency budgets and partner budgets can be used most effectively. Each year, they will select from an array of pre-proposals that were solicited in Implementation Step 6. After the projects are selected, the budget will be presented to the Commission Budget Committee for review and approval. Those projects that are selected will be submitted to the U. S. Fish and Wildlife Service for approval.

Monitoring and Performance Measures

Methodologies

Implementation Step 8. Monitoring is essential to making effective management decisions and evaluating the outcomes of those decisions.

Short-term performance measures

Performance measures to ensure the effectiveness of projects will be a requirement of each project selected for SWG funding. Performance measures are quantifiable results that relate to implementation actions and make it possible to revise conservation actions by responding to new information or changing conditions for species-specific actions. Each state wildlife grant funded project will include performance measures that will be incorporated into the Tracking and Reporting Actions for the Conservation of Species (TRACS) database. Wildlife TRACS is the tracking and reporting system for conservation and related actions funded by the US Fish and Wildlife Services (USFWS) and Wildlife and Sport Fish Restoration (WSFR) Program. Project results and performance measures will be reported to the Science Teams, Steering Committee, AWAP partners, and stakeholders annually, and compiled and presented at the biennial Wildlife Action Plan Symposium.

Examples of short-term performance measures:

- 65 acres of Arkansas Valley Prairie and Woodland were burned in spring for 3 years. This is an obligate habitat for Greater Prairie Chicken (*Tympanuchus cupido*) and the Prairie Mole Cricket (G*ryllotalpa major*).

- 122 acres of stream habitat sheltering the Arkansas darter was protected with a conservation easement.

- 2000 yards of instream and streambank habitat in the Eleven Point River was stabilized and restored. This is important habitat for the Ozark hellbender.

Long term Performance Measures

While short term performance measures quantify effort expended, to be adaptive, we need to tie efforts back to the effects on the status of SGCN. A long term view is required because effects on target species may be difficult to measure or may not be noticeable for years after the conservation action was taken.

Long term effects will be reflected in the:

• Priority Scores of each SGCN, which are reviewed and updated by the Science Teams.

• Lists of priority data gaps, conservation actions, and monitoring needs recommended by the Teams. (See Implementation Step 4).

For example, burning projects in the Ozark-Ouachita Prairie and Woodland have had a generally beneficial effect on SGCN, therefore, we would expect to see a lowering of priority score for species associated with this habitat type as restoration improves and expands available habitats over time.

Revision Process and Schedule

Implementation Step 9. The steps of the implementation process incorporate consistency in managing changing priorities. AWAP teams and staff will continually update the AWAP database and communicate priorities with partners and stakeholders. A formal, comprehensive review of the Plan is required every ten years by the USFWS.

Revision Process

The first formal review and revision of the AWAP began in June 2012 when a letter of intent to review was submitted to the Service. At that time, a meeting with the implementation committee was held to discuss the needs for the review and update. The 2005 plan served as the starting point. Upon agreement that the underlying assumptions, processes, and prioritization mechanisms of the 2005 plan were still relevant and were working well, the objectives for the Plan review and revision were to address the eight required elements and specifically to: 1) update the SGCN list, 2) update SGCN status and information, 3) update habitat information, and 4) incorporate emerging threats.

Science Teams

The taxa expert teams and the habitat teams were instrumental in the updating of the Plan. These inter-agency teams began reviewing species and habitat information in September 2012 and continued to work on the revising of SGCN lists and updating of SGCN information (threats, research and monitoring needs, conservation actions, etc.) until summer of 2015. A list of taxa and habitat team members is provided in Section 6.

1. Changes to SGCN

To determine the list of species of greatest conservation need, the current list was chosen as a starting point. Each taxa team met to review species ranks. One of the largest undertakings involved many taxa teams reviewing the NatureServe state rankings. The NatureServe ranks are an important component of the species account, as the specie's priority score (degree of imperilment) is calculated using the global (G) rank and state (S) rank. State ranks were re-evaluated, and updated ranks were submitted to NatureServe for birds, fish, crayfish, amphibians, reptiles, and butterflies. Species with state ranks S1 and S2 were automatically added to the SGCN list. Species with a state rank S3 were reviewed to determine their need to add to the SGCN list. In general, species with an S4 or S5 rank were not included as SGCN. However, in some instances, an S4 species was included if it had a low global rank or severe impending threats.

Special attention was paid to pollinators and the insect taxa team added 22 new species of butterflies and dragonflies, based on review of species' status. Among the species added is the Monarch butterfly. This species was added due to the drastic decline of the migratory subspecies and based on the recommendation of the Association of Fish and Wildlife Agencies.

The re-evaluation of ranks resulted in the addition of several new species to the list of species of greatest conservation need, as well as the deletion of species. Newly discovered species and updated genetic analyses also resulted in the addition of new species. These additions and deletions are summarized in Appendix 2.3.

2. Updating SGCN Status and Information

Once the SGCN lists were finalized, the taxa team revised all species accounts with the latest information on species status, distribution, threats, research needs, monitoring needs, and conservation actions. Distribution maps were updated with the most current spatial data. These data were derived from occurrence data stored by the Arkansas Natural Heritage Commission, from AGFC staff databases, and from researcher databases. In addition, bird occurrences from eBird were used for bird SGCN. Habitat associations were also reviewed for each species and maps of potential habitat were updated.

3. Updating Habitat Lists and Information

The terrestrial and aquatic habitat teams met and reviewed the lists of habitats. After reviewing the list of terrestrial habitats, the habitat team decided to combine similar habitats to streamline the plan. In addition, a new habitat type, herbaceous wetland, was added. A summary of habitat changes is provided in Appendix 3.2. Indicators for all habitats were reviewed and updated where needed. Habitat team members met with representatives of each taxa team to review and update species-habitat relationships.

4. Addition of Emerging Threats

New threats have emerged or worsened since the completion of the original Plan. Added to the Plan are specific research needs, monitoring strategies, and/or conservation actions to address new threats: white-nose syndrome, feral hogs, wind energy impacts, and natural gas extraction. White-nose syndrome was confirmed in the state in 2013. Six bat SGCN are threatened by white-nose syndrome. The feral hog population has worsened in the state over the past 10 years. As a result, several ground nesting birds and amphibian species are at risk. Although not seen on a large scale, some wind energy development is present within the state. Bird and bat species may be impacted by colliding with towers or turbines. To address this, the threat "collision with man-made structures" was added to the Plan. Natural gas extraction in the Fayetteville Shale region began in 2006. The impacts of extraction and fracking on stream ecosystems were of particular concern and were added as an emerging threat to the Plan as a result. This activity would encompass several threats listed in the plan (toxins/contaminants, habitat destruction, sedimentation, etc.) with a source "resource extraction". New threats and sources along with research and monitoring needs and conservation actions were incorporated into associated species' accounts in Section 2.

Climate Change

Climate change impacts were not addressed in the original version of the Plan. A section was added to summarize potential changes in climate in Arkansas, to detail potential impacts to species and habitats, and to outline strategies to adapt to and lessen climate change impacts on species of greatest conservation need.

Cooperation with Other Agencies

All major partners were invited to participate in the review and revision of the Plan. Many partners participated by serving on specific taxa and habitat review teams. The draft plan was made available on the website. An email notification was sent to all partners with a link to the document and request for input/comments. A thirty-one day review period was given. All feedback was reviewed and suggested changes were incorporated into the Plan. Tables listing partner participants are provided in Section 6.

Public Participation

Public participation is an important component of any conservation plan. Public input was requested for the Plan following a similar procedure for the conservation partners. The draft revised plan was made available on the Arkansas Wildlife webpage and a 31 day public comment period was held between August 12th and September 11th. The notice for review was distributed with a statewide newspaper ad, in the Arkansas Game and Fish Commission's weekly newsletter, and via the Arkansas Game and Fish Commission's Facebook page. In addition, the

wildlife diversity program coordinator conducted a radio interview to discuss the plan revision and public comment period. The interview was broadcast once in northwest Arkansas and once in central Arkansas.

Comments received from the general public were few. Only one comment regarding actual plan content was received. This comment was in regards to the species account for the Rufous-crowned Sparrow. The comment was forwarded to the bird taxa team, who made changes accordingly to the account. Other comments were general in nature (better document accessibility, longer period of time for review desired, etc.). Responses were sent to all who provided input.

Plan Submission and Distribution

The revised plan was submitted to the Service on October 1, 2015. Upon plan approval, the AGFC will provide all conservation partners and the public at large with access to the updated Plan via the Arkansas wildlife action plan website. To ensure access to conservation partners, electronic copies of the Plan and the database will be distributed at the Arkansas Wildlife Action Plan Symposium, Fall 2016.

Commitment to Revision 2025

AGFC commits to completing a second comprehensive review and revision of the AWAP process and plan by October 1, 2025. At that time, not only will the functional process be evaluated, but the database, protocols and fundamental logic behind assumptions will be reassessed. We anticipate following a similar process in updating the SGCN list, SGCN status and information, habitat lists and indicator review, and the incorporation of emerging threats.

Section 2. Species of Greatest Conservation Need

Species of Greatest Conservation Need (SGCN)

Identification and Prioritization

The Arkansas Wildlife Action Plan Species Team created a list of species of greatest conservation need for Arkansas. Existing data from agencies and partners was cross-referenced with expert opinion.

Some species were chosen for inclusion on the list because they are rare, some because their populations are in decline or, in some cases, because not enough is known to determine their taxonomic, life history or conservation status.

Problems faced by Arkansas' wildlife are many and varied. They include the advance of exotic plant and animal species as well as the fragmenting and destruction of habitats. The aim of the list is to represent broadly the taxa of Arkansas so that the overall health of ecosystems at a landscape level can be addressed and effectively managed.

Inclusion on the list of Species of Greatest Conservation Need (SGCN) does not confer any special or regulatory status as federal listing as an endangered or threatened species does.

The identification of SGCN is part of a process to identify species and groups of species that will be the focus of programs and projects supported by federal funding under the State Wildlife Grant program. Federally-listed species that occur in Arkansas are included on the list of SGCN and addressed by this strategy. However, such species are eligible for funding by sources other than State Wildlife Grants.

How the SGCN list was created

The AWAP Species Team assembled a list of potential species from the existing lists of rare, declining or imperiled fauna kept by the Arkansas Game and Fish Commission and the Arkansas Natural Heritage Commission.

The team decided to consider all native amphibians, birds, fish, mammals and reptiles for inclusion on the list. Of the invertebrates, all native crayfish and mussels were considered for the list. Only representative insects and other invertebrates were considered because the team was concerned that the numbers of these species, many with poorly known conservation status, could overwhelm the list.

Standards used by NatureServe (see sidebar below) are used to rank the conservation status of species. NatureServe uses the following factors in assessing conservation status: total number

and condition of populations; population size; range extent and area of occupancy, short- and long-term trends, scope, severity and immediacy of threats, number of protected occurrences, intrinsic vulnerability and environmental specificity.

What is NatureServe?

Arkansas' species priority scores and list of SGCN were derived from information compiled by NatureServe.

NatureServe is a non-profit conservation organization that provides the scientific information and tools needed to help guide effective conservation action. NatureServe and its network of natural heritage programs are the leading source for information about rare and endangered species and threatened ecosystems.

NatureServe represents an international network of biological inventories—known as natural heritage programs or conservation data centers—operating in all 50 U.S. states, Canada, Latin America and the Caribbean. NatureServe collects and manages detailed local information on plants, animals, and ecosystems, and also develops information products, data management tools, and conservation services to help meet local, national, and global conservation needs. The objective scientific information about species and ecosystems developed by NatureServe is used by all sectors of society—conservation groups, government agencies, corporations, academia, and the public—to make informed decisions about managing our natural resources. Key activities include:

- Establishing scientific standards for biological inventory and biodiversity data management.
- Developing comprehensive and current data- bases on at-risk species and ecological communities.
- Designing advanced biodiversity data management systems in partnership with information technology leaders.
- Making biodiversity information available to the public through their websites, publications, and custom services to clients and partners.
- Providing information products and conservation services to guide natural resource decision- making.

Criteria for inclusion on the SGCN list

Generally, those species ranked G1, G2 and G3 are included on the draft list:

G1: Critically imperiled on a global scale — at highest risk of extinction due to extreme rarity or steep population declines.

G2: Imperiled — at high risk of extinction due to restricted range, few populations or steep population declines.

G3: Vulnerable — at moderate risk of extinction due to a restricted range, few populations, recent and widespread declines.

Similarly, species with S1, S2 and S3 ranks are included on the draft list:

S1: Critically imperiled in Arkansas — at highest risk of extinction due to extreme rarity or steep population declines.

S2: Imperiled in Arkansas — at high risk of extinction due to restricted range, few populations or steep population declines.

S3: Vulnerable in Arkansas — at moderate risk of extinction due to a restricted range, few populations, recent and widespread declines.

Taxa Association Team contribution and review

The draft planning list was divided into several faunal associations: birds, mammals, fish, reptiles, amphibians, insects, crayfish, mussels, invertebrates – other, and karst species. These lists were provided to teams of academic experts. Taxa Association Teams consisted of experts drawn from a coalition of public agencies, private nonprofit organizations and academic institutions. In committees, they contributed to populating the Arkansas WAP database.

Species removed from consideration were those that are extinct or those that are common elsewhere and rare in Arkansas because the state is on the periphery of their range.

Some species were added after the draft planning list was formed. Undescribed species and species with apparently more secure statuses (G4-G5 and S4-S5) were included on the list if their populations are thought to be in decline or if little is known about their conservation status.

Consulting additional information, Taxa Association Teams further refined the species list. The first version of the Plan listed 369 species of greatest conservation need. For the 2015 revision, taxa teams reviewed and updated state ranks for many taxa groups. The result was the addition of 66 species due to increased priority and deletion of 57 species due to increased information and lowering of priority score. The number of SGCN increased to 377.

Developing the Species Priority Score Protocol

To best prioritize the efforts directed by the AWAP, Arkansas developed a protocol to evaluate all species on the SGCN list and manage the information in a database. A “Species Priority Score” for SGCN makes it possible to prioritize projects to address the most pressing needs of species and groups of species included in the database.

Calculating the Species Priority Score

G Ranks are used to determine the range of vulnerability or security of a species worldwide. Several factors are considered in assessing conservation status: total number and condition of populations; population size; range extent and area of occupancy; short- and long-term trends; scope, severity and immediacy of threats; number of protected occurrences; and intrinsic vulnerability and environmental specificity (NatureServe 2005). For the AWAP, the global conservation condition of a species is weighted more heavily than is state condition.

In calculating the Species Priority Score, Arkansas assigned a numeric value to the G Rank from 1 to 16 which represents an exponential progression. This emphasizes scores of species that are imperiled across their entire range, and de-emphasizes species that are relatively more common but are rare or imperiled only in Arkansas. A higher number represents a more imperiled status. Generally:

G1=16
G2=8
G3=4
G4=2
G5=1

Combination G Ranks, for example, G3G5, that fell between the values assigned were given an average value. Subspecies were treated in the same manner as species. Where a determination needed to be made for a score value, the more conservative one was selected.

Similarly, the S Ranks were assigned a numeric value:

S1=5
S2=4
S3=3
S4=2
S5=1

Combination S Ranks, for example, S2S3, that fell between the values assigned were given an average value. Subspecies were treated in the same manner as species. Again, where a determination needed to be made for a score value, the more conservative one was selected.

Factoring in Population Trend

After the G score is added to the S score, the resulting raw score is multiplied by 0.75 if the species is increasing or multiplied by 1.25 if the species is declining so that the score will reflect trend data. The raw scores of stable populations or instances where trend data were not available were not manipulated. Population trend was determined by Taxa Association Teams using information derived from literature reviews, expert opinion or recent survey data.

The resulting number is divided by 0.2625 to scale it to a hundred point scale. The final score, the Species Priority Score, is presented on the first page of species reports. The entire list of SGCN, ranked by Species Priority Score, is provided in Appendix 2.1. Lists of SGCN ranked by taxa are provided in Appendix 2.2. Table 2.1 below shows the average of species priority scores for each taxa group.

Table 2.1. Evaluation of Species Priority Scores by taxa association. At right are averages of Species Priority Scores within each taxa association. A higher score implies the taxa association has a higher degree of conservation need.

Priority Score	Taxa
46	Invertebrate - other
44	Crayfish
40	Mussel
32	Insect
31	Mammal
30	Fish
28	Amphibian
23	Bird
20	Reptile

Distribution of Terrestrial Species*

The first spatial scale - occurrence

The first spatial scale for terrestrial habitats is depicted by maps of species occurrences. Occurrence data are derived from several sources. The most widely used source is element occurrence database (defined in sidebar below) generated by from data kept by the Arkansas Natural Heritage Commission (ANHC). ANHC provided site-specific records of occurrence for species that they track in Arkansas. Using a nationally standardized methodology, this database is populated by a variety of sources. Information is gathered from museums, scientific publications, research studies and field surveys. Information is also obtained from other governmental agencies such as the Arkansas Game and Fish Commission (AGFC), U.S. Forest Service (USFS) and U.S. Army Corps of Engineers. Where element occurrence records are not available, other data sources may be supplemented. For bird SGCN, eBird location data for the time period January 1966 to February 2015 were downloaded and mapped. For many butterfly species, county-level location data were provided by researchers. A point at county center was mapped to indicate species occurrence.

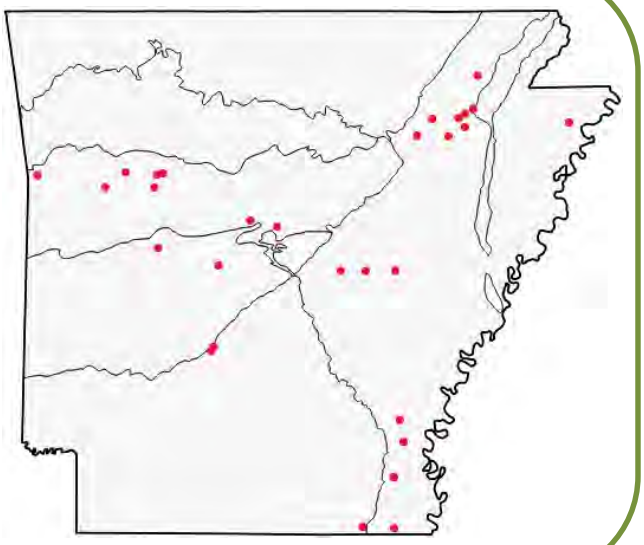
If data are available, the species occurence map is presented on the first page of a Species Report in the "Distribution" section. Known occurrences are represented by red dots (Figure 2.1). The lines within the state outline depict seven ecoregions (Figure 2.3; Woods and others 2004). Ecoregions are addressed in Section 3.

What is an Element Occurrence?

An Element Occurrence (EO) is an area of land and/or water in which a species or natural community is, or was, present. An EO should have practical conservation value for the Element as evidenced by potential continued (or historical) presence and/or regular recurrence at a given location. For Species Elements, the EO often corresponds with the local population, but when appropriate may be a portion of a population (*e.g.*, long distance dispersers) or a group of nearby populations (*e.g.*, metapopulation). Source: Arkansas Natural Heritage Commission (www.ArkansasHeritage.org)

*This section (and the ones following it) provides explanations of the origin and appearance of material presented in the Species Reports, pages 36-1131.

Figure 2.1. Example of element occurrence map. Red dots on a map refer to a known occurrence of a species. The lines within the state outline are seven Level III ecoregions (Woods and others 2004).



The second spatial scale - ecoregions

For the second spatial scale, Taxa Association Teams noted the presence or absence of each species in one or more ecoregions. Taxa Association Teams, using the best available data and professional judgement, chose to use the ecoregion delineations proposed by Woods and others (2004; Figure 2.3). Some discrepancies may occur between the distribution information provided by occurrence maps and the information provided here because Taxa Association Teams consulted different sets of distribution data.

Terrestrial species were assigned to one or more of these ecoregions: Ozark Highlands, Boston Mountains, Arkansas Valley, Ouachita Mountains, Mississippi Valley Loess Plains, Mississippi Alluvial Plain and South Central Plains. These correspond to level III ecoregions. They were selected for use because they are recognized by state and federal governmental agencies, academic institutions and private organizations in Arkansas and are consistent with habitat classification systems in adjacent states.

Ecoregions have general similarity to ecosystems in the type, quality, and quantity of environmental resources. These characteristics include geology, physiography, climate, soils, land use, wildlife, fish, hydrology and vegetation.

Roman numerals indicate different levels of ecological regions. Level I is the coarsest level, dividing North America into 15 ecological regions. Level II divides the continent into 52 regions (Commission for Environmental Cooperation Working Group, 1997). At Level III, the continental United States contains 120 ecoregions and the conterminous United States has 85 ecoregions (U.S. Environmental Protection Agency [USEPA], 2011). Level IV ecoregions are further subdivisions of level III ecoregions. Explanations of the methods used to define the USEPA's ecoregions are given in Omernik (1995) and Gallant and others (1989).

Figure 2.2. Example of Ecoregion occurrence checkoff for all SGCN. The ecoregion checkoff is presented for each SGCN on the first page of each Species Report.

Ecoregions where the species occurs:

- [x] Ozark Highlands
- [ ] Boston Mountains
- [x] Arkansas Valley
- [x] Ouachita Mountains
- [x] South Central Plains
- [ ] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains

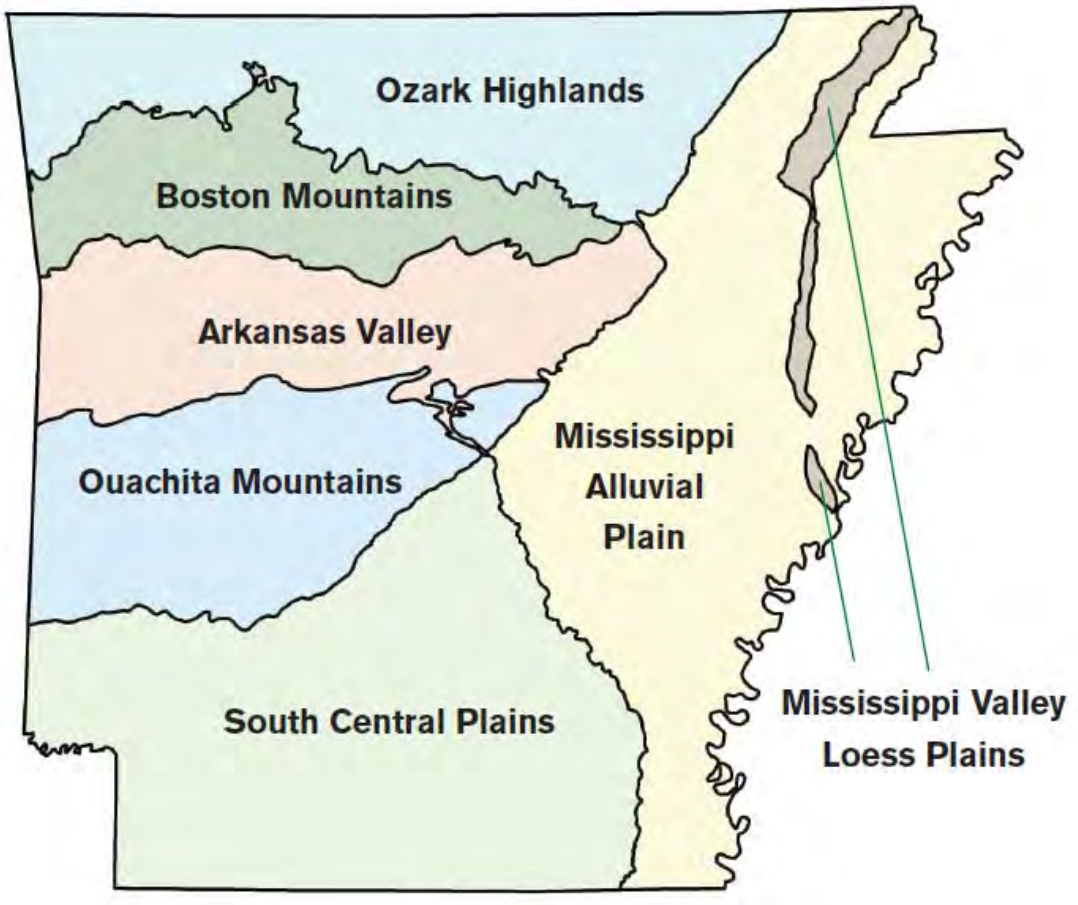


Figure 2.3. Locations and delineations of ecoregions used by the AWAP. The lines within the state are seven Level III ecoregions (Woods and others 2004). Discussion of ecoregions is in Section 3.

The third spatial scale - terrestrial habitat tables

The third spatial scale addresses the distribution of SGCN by associating each terrestrial species with one of more of 37 habitat types that occur in the state. Thirty habitat types (Table 2.2) are described by NatureServe National Vegetation Classification System: Ecological Communities and Systems (2005). An additional eight habitat classifications were included for habitat types used by SGCN in Arkansas that had not been previously described.

Arkansas chose to use this classification system because it is a standardized, systematic list of habitats from a third party and because it is being used by other states and agencies, specifically the U.S. Forest Service, whose planning database the AGFC built as part of a data-sharing effort. After determining which habitats the species may occur in, the Taxa Association Team weighted the value of the habitat to the species in question. The values are obligate, optimal, suitable or marginal.

In the case where habitat use and importance was unknown but predicted, “data gap” was assigned.

Figure 2.4. Example of terrestrial habitats as presented in Species Reports.

Habitats	Weight
Lower Mississippi River Bottomland Depression	Optimal
Lower Mississippi River Dune Woodland and Forest	Marginal
Lower Mississippi River High Bottomland Forest	Optimal
Lower Mississippi River Low Bottomland Forest	Optimal
Lower Mississippi River Riparian Forest	Optimal
Ozark-Ouachita Large Floodplain	Optimal

Table 2.2. AWAP Habitats described by NatureServe.

Crowley's Ridge Loess Slope Forest
Interior Highlands Calcareous Glade and Barrens
Interior Highlands Dry Acidic Glade and Barrens
Lower Mississippi Alluvial Plain Grand Prairie
Lower Mississippi Flatwoods Woodland and Forest
Lower Mississippi River Bottomland Depression
Lower Mississippi River Dune, Pond, Woodland and Forest
Lower Mississippi River High Bottomland Forest
Lower Mississippi River Low Bottomland Forest
Lower Mississippi River Riparian Forest
Ouachita Montane Oak Forest
Ozark-Ouachita Cliff and Talus
Ozark-Ouachita Dry Oak and Pine Woodland
Ozark-Ouachita Dry-Mesic Oak Forest
Ozark-Ouachita Forested Seep
Ozark-Ouachita Large Floodplain
Ozark-Ouachita Mesic Hardwood Forest
Ozark-Ouachita Pine/Bluestem Woodland
Ozark-Ouachita Pine-Oak Forest/ Woodland
Ozark-Ouachita Riparian
Ozark-Ouachita Prairie and Woodland
West Gulf Coastal Plain Calcareous Prairie and Woodland
West Gulf Coastal Plain Large River Floodplain Forest
West Gulf Coastal Plain Pine-Hardwood Flatwoods
West Gulf Coastal Plain Pine-Hardwood Forest/Woodland
West Gulf Coastal Plain Red River Floodplain Forest
West Gulf Coastal Plain Sandhill Oak and Shortleaf Pine Forest/Woodland
West Gulf Coastal Plain Seepage Swamp and Baygall
West Gulf Coastal Plain Small Stream/River Forest
West Gulf Coastal Plain Wet Hardwood Flatwoods

Additional Habitats added for AWAP

Caves, Mines, Sinkholes, and other Karst Features
Crop Land
Cultivated Forest
Herbaceous Wetland
Mud Flats
Pastureland
Ponds, Lakes and Waterholes
Urban/Suburban

The third spatial scale - terrestrial habitat maps

In addition to the terrestrial habitat tables, the third spatial scale is also depicted by "potential habitat maps" that were generated by TNC based on descriptors provided by the habitat teams. The information provides some descriptions of potential locations of key habitats and community types essential to conservation of SGCN. These maps use GAP Vegetation Map in combination with ancillary layers (polygons from Level III Omernik Ecoregions, STATSGO soils, 1:500,000 Arkansas Geology, Saucier Geomorphology).

"Potential habitat maps" show each habitat associated with the species in question, color-coded by importance (or weight) (Figure 2.5). Because many habitat definitions spanned multiple ecoregions while the known species occurrence did not, the habitats are only mapped within ecoregions in which the species is known to occur.

Of the 37 habitat types that SGCN were assigned to, 20 were mapped. Some unmapped habitats had insufficient data, while others were lumped with similar habitats because the differences are not distinguished by GAP. In addition, the Ozark Highlands, Boston Mountains, Arkansas Valley and Ouachita Mountains were combined as the Interior Highlands ecoregion. For additional information about this process, refer to Appendix 3.1. Arkansas continues to refine the use of GAP data to predict and define habitats.

If data are available, the map is presented on the second page of Species Reports in the "Habitats" section.

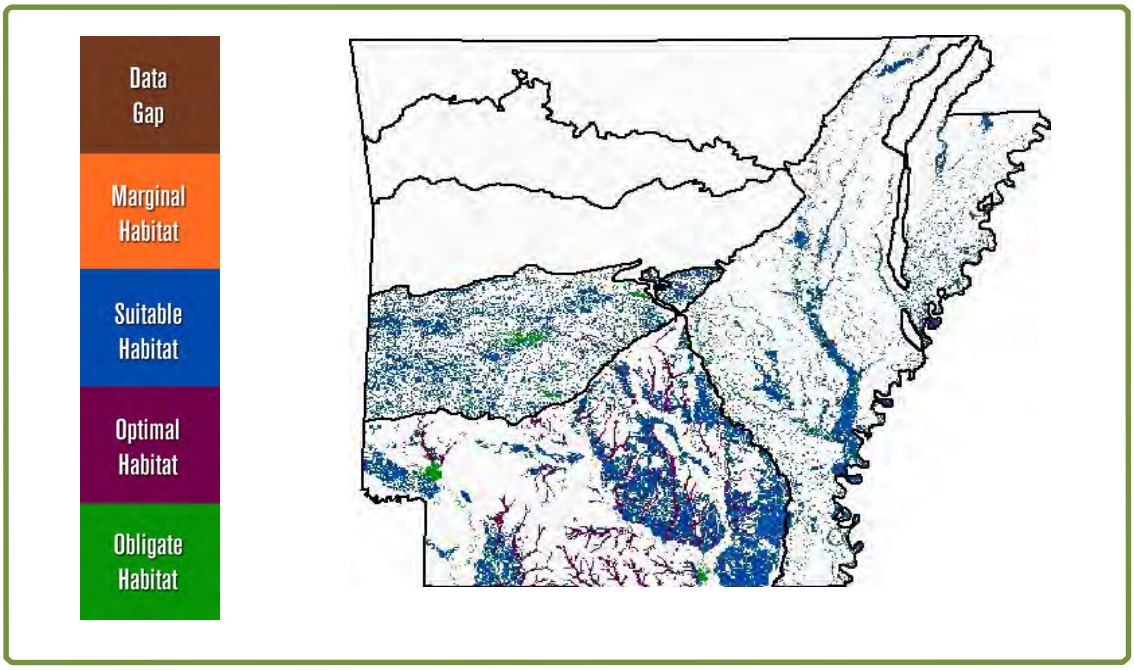


Figure 2.5. Example of Potential Habitat Map. Map shows where habitats, weighted by importance to each species, may occur.

Table 2.3. Habitat types mapped in "Potential Habitat Maps"

Caves, Mines, Sinkholes & other Karst Habitat
Crop Land
Crowley's Ridge Loess Slope Forest
Cultivated Forest
Lower Mississippi Flatwoods Woodland Forest
Lower Mississippi River Bottomland Depression
Lower Mississippi River Dune, Pond, Woodland, and Forest
Lower Mississippi River High Bottomland Forest
Lower Mississippi River Low Bottomland Forest
Lower Mississippi River Riparian Forest
Interior Highlands Calcareous Glade and Barrens
Interior Highlands Dry Acidic Glade and Barrens
Ozark-Ouachita Dry Oak and Pine Woodland
Ozark-Ouachita Dry-Mesic Oak Forest
Ozark-Ouachita Mesic Hardwood Forest
Ozark-Ouachita Pine/Bluestem Woodland
Ozark-Ouachita Pine-Oak Forest / Woodland
Ozark-Ouachita Riparian
Ozark-Ouachita Large Floodplain
Pasture Land
Ponds, Lakes, and Water Holes
Urban/Suburban
West Gulf Coastal Plain Calcareous Prairie
West Gulf Coastal Plain Dry Pine-Hardwood Flatwoods
West Gulf Coastal Plain Large River Floodplain Forest
West Gulf Coastal Plain Pine-Hardwood Forest
West Gulf Coastal Plain Red River Floodplain Forest
West Gulf Coastal Plain Sandhill Oak and Shortleaf Pine Forest and Woodland
West Gulf Coastal Plain Small Stream/River Forest

Table 2.4. Habitat types not mapped in "Potential Habitat Maps"

Herbaceous Wetlands
Mud Flats
Ouachita Montane Oak Forest
Ozark-Ouachita Cliff and Talus
Ozark-Ouachita Forested Seep
Ozark-Ouachita Prairie and Woodland
West Gulf Coastal Plain Mesic Hardwood Forest
West Gulf Coastal Plain Seepage Swamp and Baygall
West Gulf Coastal Plain Wet Hardwood Flatwoods

Distribution of Aquatic Species

The first spatial scale - element occurrence

The first spatial scale is depicted by maps of element occurrence generated by The Nature Conservancy (TNC) from data kept by the Arkansas Natural Heritage Commission (ANHC). ANHC provided site-specific records of occurrence for species in Arkansas. Using a nationally-standardized methodology this database is populated by a variety of sources. Information is gathered from museums, scientific publications, research studies and field surveys. Information is also obtained from other governmental agencies such as the Arkansas Game and Fish Commission (AGFC), U.S. Forest Service (USFS), Arkansas Department of Environmental Quality (ADEQ) and U.S. Army Corps of Engineers. Element occurrence maps are not generated for species that the ANHC does not track or for most migratory species.

If data are available, the map is presented on the first page of Species Reports in the Distribution section. Data for aquatic species are represented 2 ways. For amphibians and reptiles, point locations are provided, overlain on the ecoregions map (Figure 2.6). For fish, mussels, and crayfish, the distribution map portrays a spatial relation between the sample location of the species and the associated HUC12 watershed boundary. These maps were created by conducting a spatial join of the geographic latitude and longitude of an individual species in relation to the HUC12 watershed boundary and are overlain on the ecobasins layer and a streams layer (Figure 2.7).

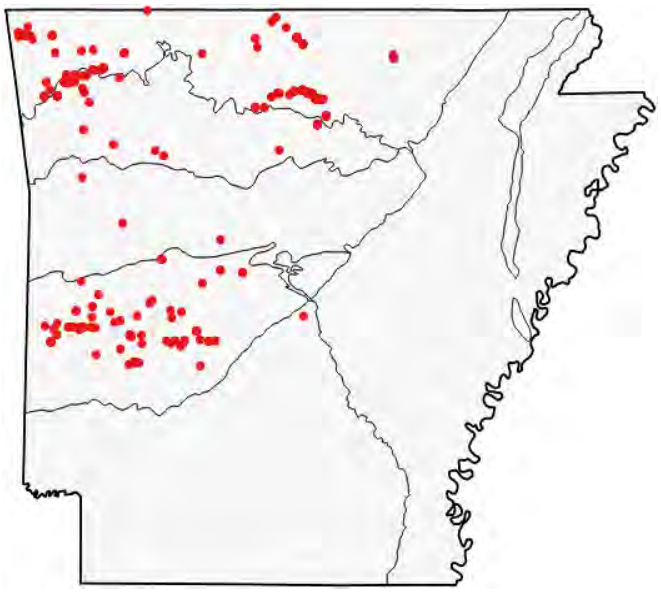


Figure 2.6. Example of element occurrence map for aquatic amphibians and reptiles. Red dots indicate known locations. Lines within the state outline depict ecoregions.

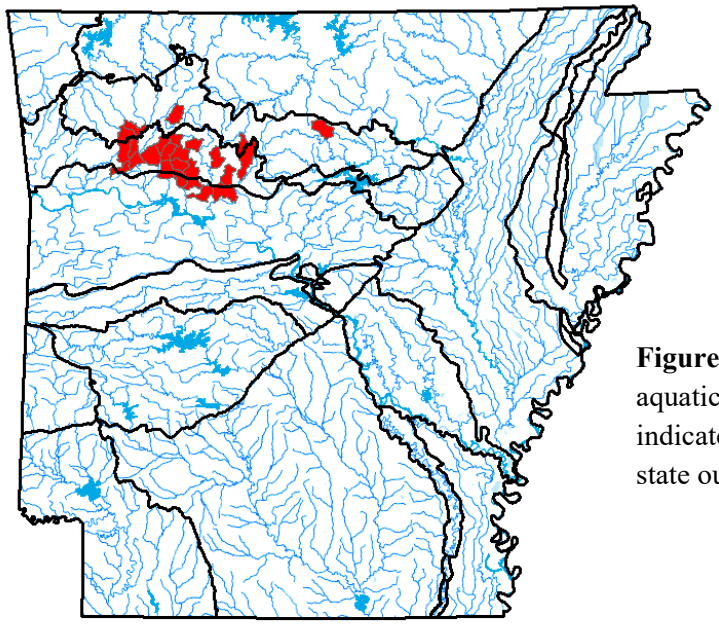


Figure 2.7. Example of element occurrence map for aquatic fish, mussels, and crayfish. Shaded polygons indicate HUCs with known locations. Lines within the state outline depict ecobasins.

The second spatial scale - ecoregions

For the second spatial scale, Taxa Association Teams noted the presence or absence of each species in one or more ecoregions. Taxa Association Teams, using the best available data and professional judgement, chose to use the ecoregion delineations proposed by Woods and others (2004) (Figure 2.3). Some discrepancies may occur between the distribution information provided by element occurrence maps and the information provided here because Taxa Association Teams consulted different sets of distribution data.

Aquatic species were assigned to one or more of these ecoregions: Ozark Highlands, Boston Mountains, Arkansas Valley, Ouachita Mountains, Mississippi Valley Loess Plains, Mississippi Alluvial Plain and South Central Plains. These correspond to level III ecoregions and were selected for use because they are recognized by state and federal governmental agencies, academic institutions and private organizations in Arkansas and are consistent with habitat classification systems in adjacent states.

Ecoregions have general similarity to ecosystems in the type, quality, and quantity of environmental resources. These characteristics include geology, physiography, climate, soils, land use, wildlife, fish, hydrology and vegetation.

The third spatial scale - ecobasins

For the third spatial scale, Taxa Association Teams noted the presence or absence of each aquatic and aquatic/terrestrial species in one or more ecobasins. This information is presented in tabular form (Figure 2.8) and depicted by ecobasin maps (Figure 2.9), both on the second page of the Species Reports. As used here, ecobasins are a version of the seven (level III) ecoregions (Woods and others 2004) further subdivided by six major river basins to form 18 ecobasins (Figure 2.10). Ecobasins are described and evaluated in Section 5.

Ecobasins
South Central Plains - Ouachita River
South Central Plains - Red River
Ozark Highlands - White River
Mississippi River - White River
Mississippi River - St. Francis River

Figure 2.8. Example of ecobasin table. Taxa Association Teams determined whether a SGCN occurred in an ecobasin. This information was presented as a table and also mapped (Figure 2.9).

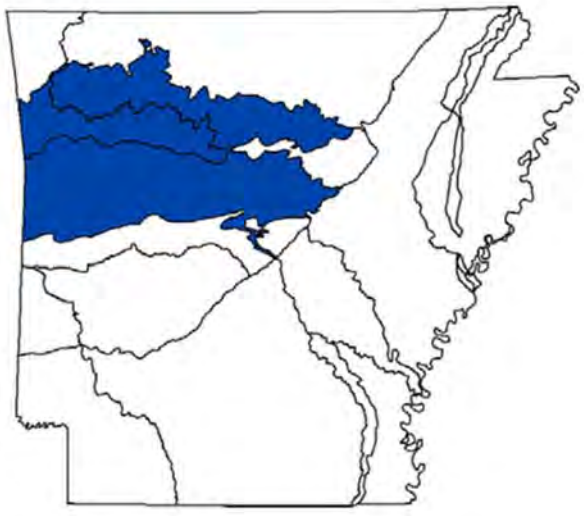


Figure 2.9. Example of ecobasin map. Blue depicts the presence of an aquatic species within an ecobasin.

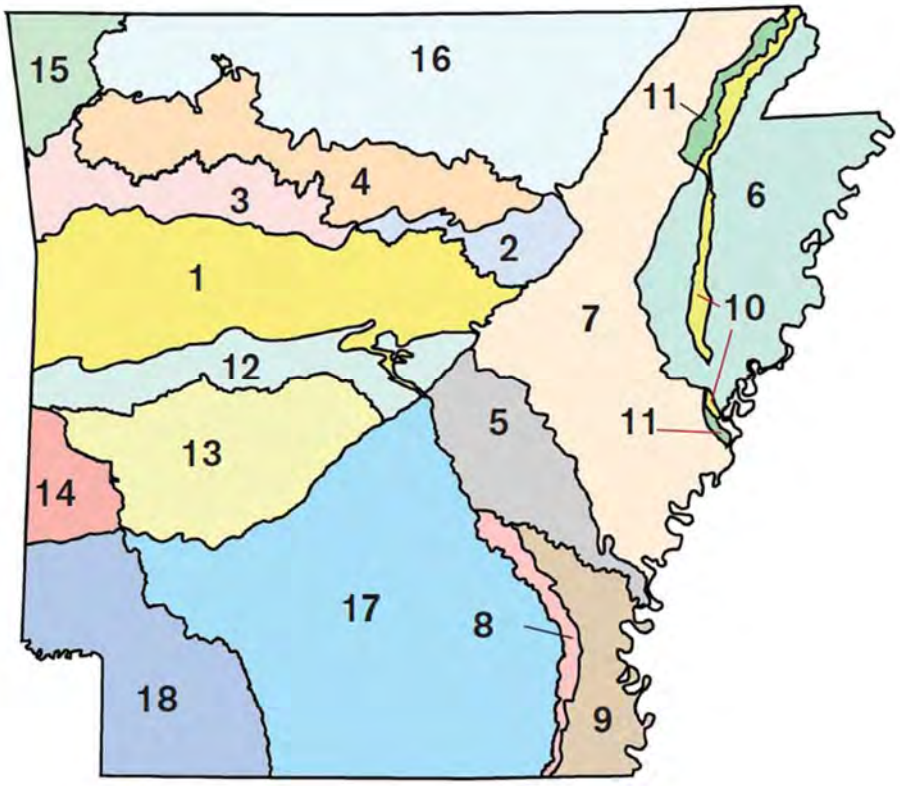


Figure 2.10. Ecobasin delineation for AWAP.

Key	EcoBasins
1	Arkansas Valley - Arkansas River
2	Arkansas Valley - White River
3	Boston Mountains - Arkansas River
4	Boston Mountains - White River
5	Mississippi River Alluvial Plain - Arkansas River
6	Mississippi River Alluvial Plain - St. Francis River
7	Mississippi River Alluvial Plain - White River
8	Mississippi River Alluvial Plain (Bayou Bartholomew) - Ouachita River
9	Mississippi River Alluvial Plain (Lake Chicot) - Mississippi River
10	Mississippi River Loess Plains - St. Francis River
11	Mississippi River Loess Plains - White River
12	Ouachita Mountains - Arkansas River
13	Ouachita Mountains - Ouachita River
14	Ouachita Mountains - Red River
15	Ozark Highlands - Arkansas River
16	Ozark Highlands - White River
17	South Central Plains - Ouachita River
18	South Central Plains - Red River

The fourth spatial scale - aquatic habitats

For the fourth spatial scale, Taxa Association Teams determined the aquatic habitat preferences of each species based on published evidence and scientific judgment and assigned one or more aquatic habitat types to each SGCN (Figure 2.11).

Seventeen habitat types were used to describe species' habitat preferences. These descriptors were further refined by size (small, medium, large and headwater).

After determining which habitats the species may prefer, the Taxa Association Team judged the importance (or weight) of the habitat to the species in question. The importance values were obligate, optimal, suitable or marginal. The teams also had the option to assign "data gap" to habitats where the preference or usage by the species was unknown but predicted.

Because of the ephemeral nature of aquatic habitats, they are not mapped. A list of habitats used by each aquatic SGCN is presented in a table on the second page of Species Reports.

Figure 2.11. Example of **aquatic habitats** showing size and importance as presented in Species Reports.

Habitats	Weight
Natural Pool: - Medium – Large	Suitable
Natural Run: - Medium – Large	Optimal
Natural Shoal: -Medium – Large	Optimal

Aquatic habitat subtypes

In addition to noting whether the aquatic habitat is natural or man-made, Taxa Association Teams defined the habitat with these characteristics:

Littoral Lentic – Shallow, near-shore area of a lake (<20' or 6m) where light can penetrate to the bottom and where rooted aquatic plants may colonize.

Pelagic Lentic – Deeper, open water areas of lakes and reservoirs away from the shoreline.

Pool Lotic – A deeper and generally wider portion of a stream with low velocity, low gradient, and variable substrates including finer silts and sands.

Side channel Lotic – A secondary channel off the main stem of a river that carries a portion of the flow of the primary channel. Can function as a high-water channel to relieve the pressure of flood flows.

Shoal Lotic – A shallow area of a river, can function like a flooded riffle in a large river, and usually composed of sand, gravel or a silt/sand/gravel conglomerate.

Slough Lotic – Side channels which are remnants of abandoned river channels, narrower than oxbows, yet connected to the river either during most river stages or only during high flow events.

Oxbow - connected Lotic – A lake occupying a former channel (meander) of the river isolated by movement of the stream channel. These lakes are connected to the main river by either broad or narrow chutes, allowing ingress and egress of water (and fish, invertebrates) from the river to the lake and back.

Other Lotic – Miscellaneous aquatic lotic habitat not listed or combination of aquatic lotic habitats.

Riffle Lotic - Shallow, swift sections of streams with turbulent flow where gradient can change significantly. Riffles are the hydraulic controls for upstream pools or glides. These habitats usually have coarser substrates such as gravel and cobble but can have boulder substrates if the gradient is high enough and the underlying geology appropriate.

Run Lotic – Swiftly flowing reaches with little surface turbulence and no major flow obstructions. Often considered as “flooded riffles”. Runs usually have gravel, cobble and boulder substratum.

Glide Lotic – Shallow stream reaches with low to moderate velocities, little or no turbulence, and uniform substrates of sand, gravel and sometimes cobble.

Cave Stream Subsurface – A subterranean stream that starts in a cave and flows underground for at least part of its length.

Spring Run Subsurface – Short, spring-fed streams with substrates of silt, sand and gravel that often contain thick growths of watercress.

Seep Subsurface – Small, groundwater discharge areas that slowly release water to the surface and/or to a stream. Flows are slow enough that noticeable flows may not be observed.

Groundwater Subsurface – Subsurface water standing in or passing through the soil and the underground strata. Groundwater is recharged via infiltration and enters streams through seepage and springs.

Swamp/Wetlands Swamp/Wetlands – Shrub or tree-dominated wetlands characterized by periodic flooding and nearly permanent subsurface flow through subsurface through sediments and organic material.

Oxbow - disconnected Lentic – An older channel scar lake, isolated from the river during some shift in the channel alignment. Only connected to the main stem river during relatively high river stages and flows.

Expert Assessment of SGCN

Problems facing SGCN

Taxa Association Teams recorded problems which adversely affect species or habitats of each species. Taxa Association Teams were provided standardized lists of threats (Table 2.5) and ascribed sources (Table 2.6) to each threat. Problems faced by each species of greatest conservation need are provided on the second page of a Species Report. Analysis and scope of problems faced by species within an ecoregion is discussed in Section 3. Ecoregions.

Table 2.5 Problems and Threats

Hydrological alteration
Nutrient loading
Habitat destruction
Sedimentation
Biological alteration
Chemical alteration
Alteration of natural fire regimes
Altered composition/structure
Excessive herbivory
Extraordinary competition for resources
Extraordinary predation/parasitism/disease
Groundwater depletion
Habitat destruction or conversion
Habitat disturbance
Habitat fragmentation
Resource depletion
Riparian habitat destruction
Toxins/contaminants
Collisions with man-made structures

Table 2.6 Source (of Problems and Threats)

Commercial/industrial development
Conversion of riparian forest
Agricultural practices
Excessive groundwater withdrawal
Excessive non-commercial harvest or collection
Fire suppression
Landfill construction or operation
Management of/for certain species
Parasites/pathogens
Channel alteration
Channel maintenance
Commercial harvest Confined animal operations Dam
Exotic species
Forestry activities
Grazing/Browsing
Municipal/Industrial point source
Predation Recreation
Resource extraction
Road construction
Urban development
Water diversion

Problems Faced

KNOWN PROBLEM: Loss of wooded wetlands on breeding grounds.	Threat: Habitat destruction Source: Conversion of Riparian Forest
KNOWN PROBLEM: Loss of wooded wetlands on breeding grounds.	Threat: Habitat destruction Source: Forestry activities
POTENTIAL PROBLEM: Vulernability to toxins and contaminants.	Threat: Toxins/contaminants Source: Non-point source pollution

Figure 2.12. Example of problems faced by SGCN as presented in Species Reports.

Research Needs

For many species, not enough is known about their status, distribution, taxonomic relationships, life history and ecological relationships to develop an approach to conservation. In some cases, basic research or status surveys are required before appropriate conservation actions or monitoring strategies can be prescribed.

Data Gaps/Research Needs

Determine habitat use in the winter.
Determine the effect of contaminants on health and survival.
Determine the effect of winter habitat selection on survival and carry-over effects to breeding season.
Information is needed on diet on the wintering grounds in Arkansas.

Figure 2.13. Example of Data Gaps or Research Needs suggested by Taxa Association Teams as presented in Species Reports.

Conservation Actions

These are voluntary conservation actions that are called for to maintain the viability of a species. For each SGCN, Taxa Association Teams provide Conservation Actions needed to maintain viable populations or restore the species or its habitat. Where possible, they ranked the importance of the Conservation Action to the species in question.

These are suggestions for voluntary actions and have no legal standing. Conservation Actions were placed into categories for further analysis (Table 2.7).

The categories are listed here and analyses are provided in Section 3. The Ecoregions of Arkansas.

Table 2.7. Conservation Action Categories.

Category	Description
Habitat Restoration/Improvement	Involves the improvement or restoration of habitat or habitat components
Habitat Protection	Involves the protection of existing habitat or habitat components
Fire Management	Management of fire regime
Land Acquisition	Purchase of land or conservation easements critical to species of concern
Population Management	Direct manipulation of populations of species of concern, including restocking, harvest management, and translocation efforts
Threat Abatement	Mitigation of an existing threat, such as predation, pollution, or competing species
Data Gap	Not enough information is known at this time to formulate Conservation Actions
Public Relations/Education	Public outreach and education involving species of concern or key habitats
Other	Other conservation actions not covered by these categories

Conservation Actions	Importance	Category
Manage water fluctuations for invertebrates in winter.	Low	Habitat Restoration/Improvement
Restore and protect wooded wetlands on breeding grounds.	Low	Habitat Protection

Figure 2.14. Example of Conservations Actions, Importance of Conservation Action and assignment to a Conservation Action category by Taxa Association Teams as presented in Species Reports.

Monitoring Strategies

Effectively addressing problems faced by species requires monitoring the response of the species over time. Some trend analysis will result (or continue to result) from species and habitat monitoring. Monitoring strategies provided on the Species Reports have been suggested by the Taxa Association Teams, using best available data and professional judgment, to address species-specific monitoring needs.

Monitoring will provide information to adapt conservation actions to respond appropriately to new information or changing conditions. These will be incorporated annually at AWAP information sharing symposia.

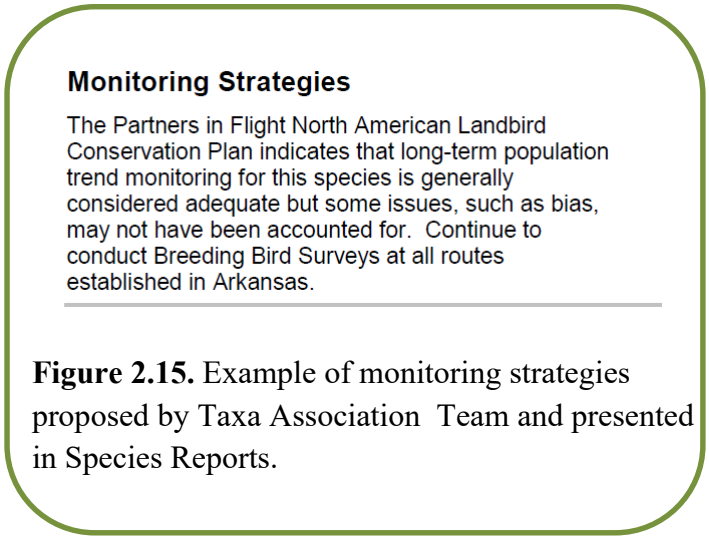


Figure 2.15. Example of monitoring strategies proposed by Taxa Association Team and presented in Species Reports.

Comments and Citations

At the end of each species reports, comments are included about the status of the species in Arkansas, life history notes and species description. Citations of publications used are referred to here. A list of individuals who compiled and reviewed the species information is provided in the Taxa Team Association and Peer Reviewers section at the end of each account.

Ambystoma annulatum

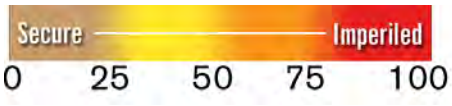
Ringed Salamander

Class: Amphibia

Order: Caudata

Family: Ambystomatidae

Priority Score: **19** out of 100





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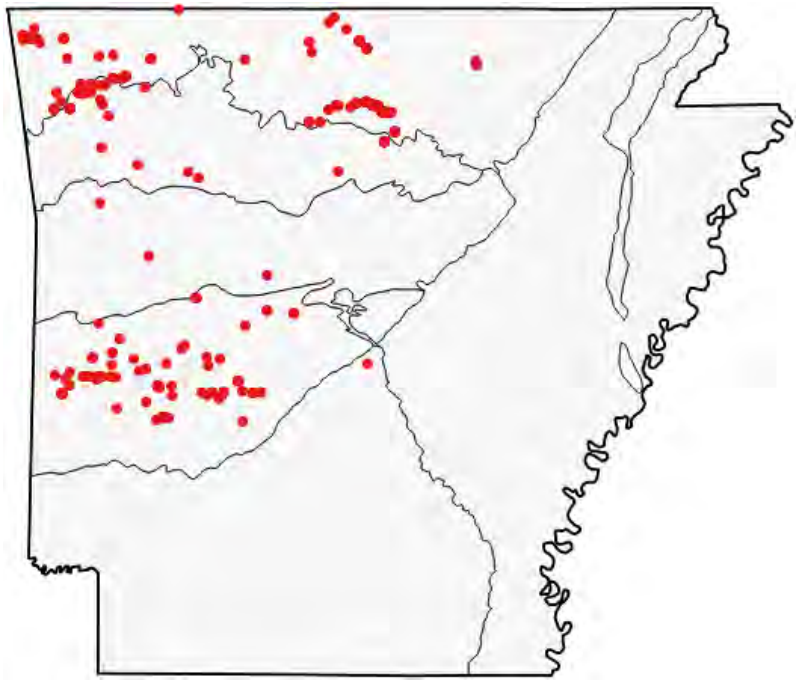
Population Trend: Unknown

Global Rank: G4 — Apparently secure species

State Rank: S3 — Vulnerable in Arkansas

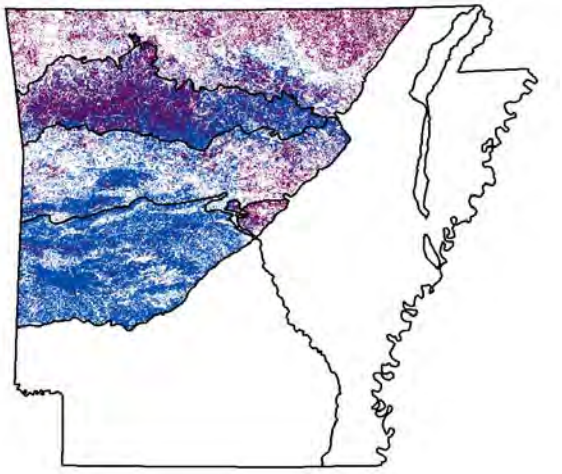
Distribution

Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☑
- Boston Mountains ☑
- Arkansas Valley ☑
- Ouachita Mountains ☑
- South Central Plains ☐
- Mississippi Alluvial Plain ☐
- Mississippi Valley Loess Plain ☐



Habitat Map



Habitats

	Weight
Caves, Mines, Sinkholes and other Karst Features	Optimal
Ozark-Ouachita Forested Seep	Suitable
Ozark-Ouachita Mesic Hardwood Forest	Optimal
Ozark-Ouachita Pine/Bluestem Woodland	Suitable
Ozark-Ouachita Pine-Oak Forest/Woodland	Suitable
Ozark-Ouachita Riparian	Suitable

Problems Faced

Forestry practices and associated negative impacts pose greatest problem.	Threat: Habitat destruction Source: Forestry activities

Data Gaps/Research Needs

Current distribution and abundance data are lacking.

Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.		

Monitoring Strategies

Conduct breeding site surveys.

Comments

Populations have responded well to the creation of wildlife ponds in the Ouachita-Ozark National Forests for use as breeding sites. Recent rangewide surveys for distribution and abundance are lacking. Populations within the national forests are considered stable. (ANHI 2003, Anderson, J.D. 1965, Anderson, P. 1965, Black and Dellinger 1938, Brussock and Brown 1982, Conant and Collins 1991, Cope 1886, Cope 1887, Crump 2003, Crump and others 2003A, 2003C, 2003D, 2003F, 2003P, Dowling 1956, Hurter and Strecker 1909, Hutcherson and others 1989, Johnson 1977, McAllister and others 1995d, McDaniel 1975, McDaniel and Saugey 1977, Noble and Marshall 1929, Nyman and others 1993, Peterson and others 1992, Petranka 1998, Reagan 1974a, Schmidt 1953, Spotila and Beumer 1970, Stejneger and Barbour 1917, Strecker 1924, Taylor 1935, Tihen 1958, Trapp 1956 (1957), Trapp 1959, Trauth and others 2004, Trauth 1980b, Trauth 2000, Trauth and others 1989b, Trauth and Cartwright 1989, Turnipseed and Gallagher 1991, USDA FS 1999, Wilson 1995).

Taxa Association Team and Peer Reviewers

AGFC Kelly Irwin, UCA Don Shepard, Kory Roberts

Ambystoma talpoideum

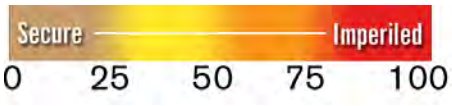
Mole Salamander

Class: Amphibia

Order: Caudata

Family: Ambystomatidae

Priority Score: **15** out of 100





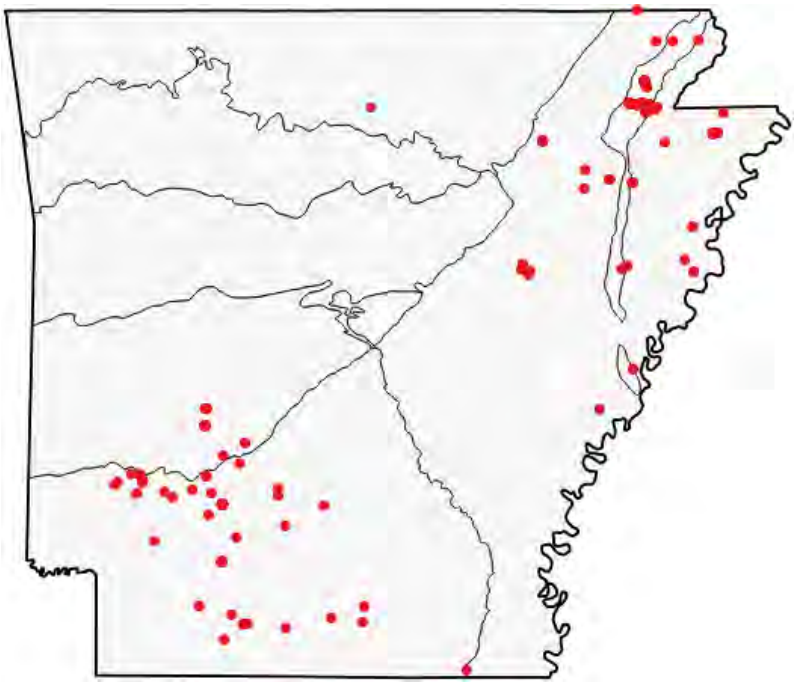
Population Trend: Unknown

Global Rank: G5 — Secure

State Rank: S3 — Vulnerable in Arkansas

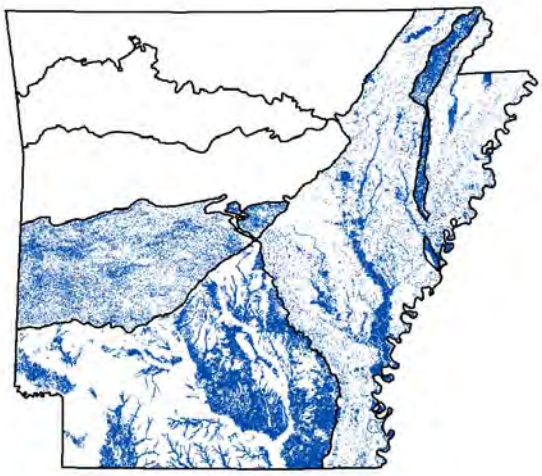
Distribution

Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☐
- Boston Mountains ☐
- Arkansas Valley ☐
- Ouachita Mountains ☑
- South Central Plains ☑
- Mississippi Alluvial Plain ☑
- Mississippi Valley Loess Plain ☑



Habitat Map



Habitats	Weight
Crowley's Ridge Loess Slope Forest	Suitable
Lower Mississippi River High Bottomland Forest	Suitable
Lower Mississippi River Low Bottomland Forest	Suitable
Lower Mississippi River Riparian Forest	Suitable
Ouachita Mountain Forested Seep	Suitable
Ozark-Ouachita Dry-Mesic Oak Forest/Woodland	Suitable
Ozark-Ouachita Mesic Hardwood Forest	Suitable
Ozark-Ouachita Pine-Oak Forest/Woodland	Suitable
Ozark-Ouachita Riparian	Suitable
West Gulf Coastal Plain Small Stream/River Forest	Suitable
West Gulf Coastal Plain Wet Hardwood Flatwoods	Suitable

Problems Faced

Local populations have been lost as forests with seasonal pools have been converted to agricultural and urban uses.	Threat: Habitat destruction or conversion Source: Urban development
Local populations have been lost as forests with seasonal pools have been converted to agricultural and urban uses.	Threat: Habitat destruction or conversion Source: Agricultural practices
Loss and degradation of forest habitat surrounding breeding ponds.	Threat: Habitat destruction Source: Forestry activities

Data Gaps/Research Needs

Additional distribution data are needed.

Conservation Actions

	Importance	Category
More information is needed to determine conservation actions.		

Monitoring Strategies

Conduct breeding site surveys at known localities.

Comments

Recent occurrence data suggest that this species may have a wider range in the state than was previously thought (Fulmer and Fulmer 2010, 2013). However, this species is not frequently encountered. (ANHI 2003, Bishop 1943, Boyd and Vickers 1963, Carr and Goin 1943, Conant and Collins 1991, Crump 2003, Crump and others 2003A, 2003C, 2003D, 2003F, 2003P, Dundee and Rossman 1989, Hardy and Raymond 1980, McAllister and Trauth 1996a, Meshaka and McLarty 1988, Mount 1975, Parker 1947, Patterson 1978, Plummer and Dye 1992, Raymond and Hardy 1990, Raymond and Hardy 1991, Reagan 1974a, Robison and Winters 1978, Semlitsch 1985, Semlitsch 1987a, Semlitsch 1987b, Shoop 1960, Shoop 1964, Smith 1961, Smith and others 1984, Sutton and Paige 1980, Trauth and others 1993a, Trauth and others 1995b, Trauth and others 2004, USDA FS 1999, Wilson 1995).

Taxa Association Team and Peer Reviewers

AGFC Kelly Irwin, UCA Don Shepard, Kory Roberts

Ambystoma tigrinum

Eastern Tiger Salamander

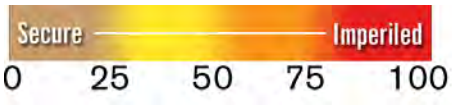


Class: Amphibia

Order: Caudata

Family: Ambystomatidae

Priority Score: **15** out of 100



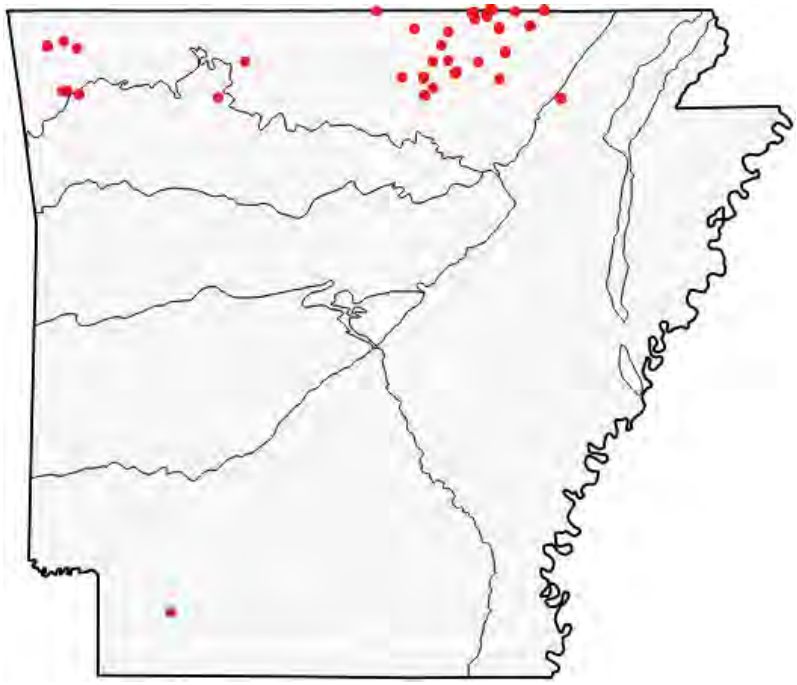
Population Trend: Unknown

Global Rank: G5 — Secure

State Rank: S3 — Vulnerable in Arkansas

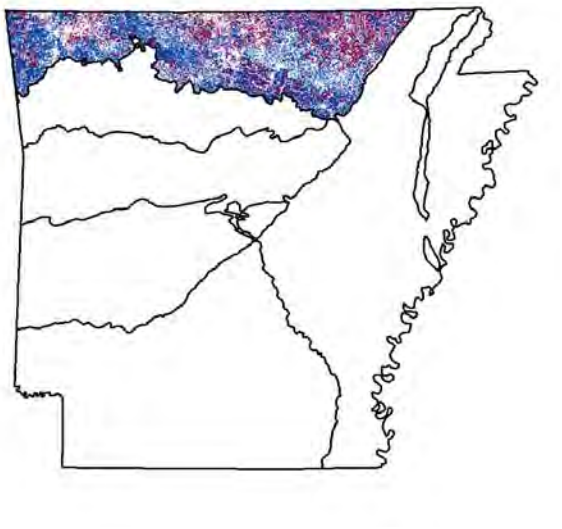
Distribution

Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☑
- Boston Mountains ☐
- Arkansas Valley ☐
- Ouachita Mountains ☐
- South Central Plains ☐
- Mississippi Alluvial Plain ☐
- Mississippi Valley Loess Plain ☐



Habitat Map



Habitats

	Weight
Caves, Mines, Sinkholes and other Karst Features	Optimal
Ozark-Ouachita Mesic Hardwood Forest	Suitable
Ozark-Ouachita Pine-Oak Forest/Woodland	Suitable
Ozark-Ouachita Prairie and Woodland	Optimal
Pasture Land	Suitable

Problems Faced

Loss and degradation of prairie and forest habitat surrounding breeding.	Threat: Habitat destruction Source: Forestry activities
Loss and degradation of prairie and forest habitat surrounding breeding.	Threat: Habitat destruction Source: Urban development

Data Gaps/Research Needs

Additional distribution and abundance survey data are needed.

Conservation Actions

	Importance	Category
Protect habitat.	High	Habitat Protection

Monitoring Strategies

Conduct surveys at known breeding sites.

Comments

Trauth and others (2004) summarized the literature and biology of this species. Local populations in northwest Arkansas have been lost to suburban development within the past 10 years.

Taxa Association Team and Peer Reviewers

AGFC Kelly Irwin, UCA Don Shepard, Kory Roberts

Cryptobranchus alleganiensis bishopi

Ozark Hellbender

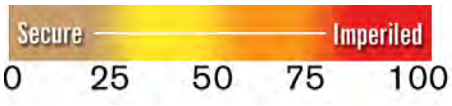


Class: Amphibia

Order: Caudata

Family: Cryptobranchidae

Priority Score: **71** **out of 100**



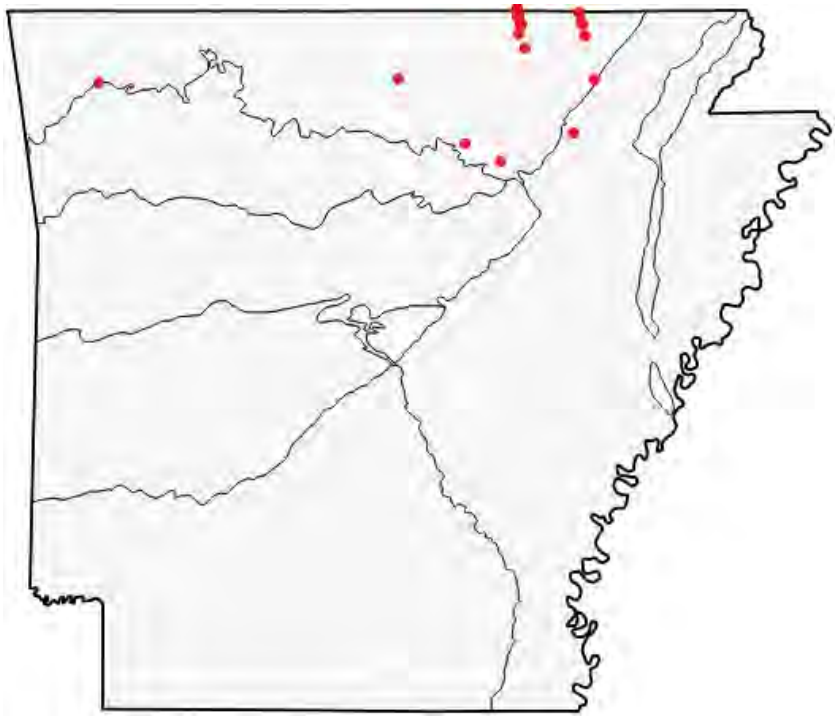
Population Trend: Decreasing

Gobal Rank: G3G4T2Q — Vulnerable (uncertain rank, imperiled subspecies) questionable taxonomy

State Rank: S1 — Critically imperiled in Arkansas

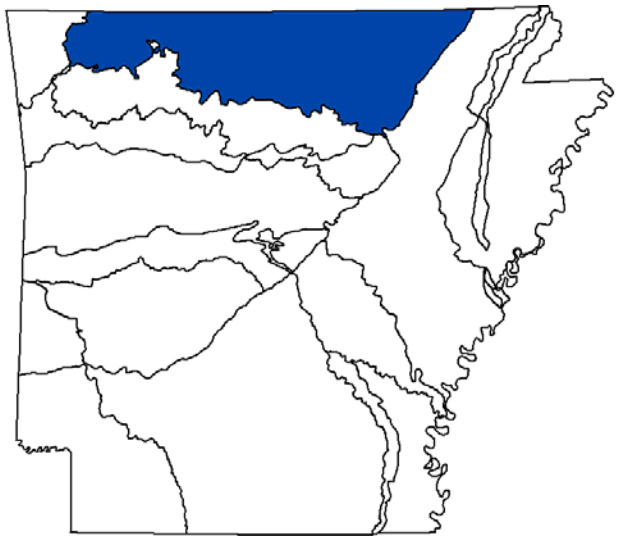
Distribution

Occurrence Records



Ecoregions where the species occurs:

- [x] Ozark Highlands
- [ ] Boston Mountains
- [ ] Ouachita Mountains
- [ ] Arkansas Valley
- [ ] South Central Plains
- [ ] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains



Ecobasins where the species occurs

Ecobasins

Ozark Highlands - White River

Habitats

	Weight
Natural Riffle: - Medium - Large	Optimal
Natural Run: - Medium - Large	Optimal

Problems Faced

Threat: Extraordinary predation/parasitism/disease
Source: Parasites/pathogens

Threat: Nutrient loading
Source: Confined animal operations

Threat: Nutrient loading
Source: Grazing/Browsing

Threat: Riparian habitat destruction
Source: Grazing/Browsing

Threat: Sedimentation
Source: Forestry activities

Threat: Sedimentation
Source: Grazing/Browsing

Threat: Sedimentation
Source: Road construction

Data Gaps/Research Needs

Assess survivorship of head-start releases.

Conservation Actions

Conservation Actions	Importance	Category
Develop and implement landscape level watershed protection program.	High	Habitat Restoration/Improvement
Develop public relations program to educate fishermen and women to release hellbenders caught on hook and line and not to gig hellbenders during sucker gigging season.	Medium	Public Relations/Education
Exclude livestock from rivers.	High	Habitat Restoration/Improvement
Propagation and restocking of head start animals.	High	Population Management
Restore riparian forests.	High	Habitat Restoration/Improvement

Monitoring Strategies

Continue established long-term population monitoring of Eleven Point River population by AGFC herpetologist.

Comments

Population Trend: Almost extinct in the Spring River, Fulton County. Unprecedented declines have occurred in this population in the last 20 years, likely due to combined effects of water quality degradation, habitat loss, and commercial collection. This is extremely difficult to determine without empirical data. The Spring River population is only known hellbender population in the U.S. with animals exhibiting cancerous tumors. Populations in the Eleven Point River may be stable but we lack long-term population monitoring data to accurately assess this at this time. Intensive habitat restoration work should be focused on the Eleven Point River basin to insure long term survival of this species in Arkansas. Two records from the White River have not led to discovery of identifiable populations.

Trauth and others (2004) summarized the literature and biology of this species. (Mayasich and others 2003, Nickerson and others 2002, Wheeler and others 2003, Wheeler and others 2005, Wheeler and Trauth 2002a, 2002b)

Taxa Association Team and Peer Reviewers

AGFC Kelly Irwin, UCA Don Shepard, Kory Roberts

Desmognathus conanti

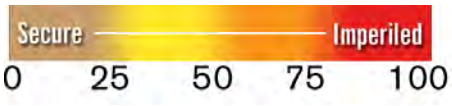
Spotted Dusky Salamander

Class: Amphibia

Order: Caudata

Family: Plethodontidae

Priority Score: **23** out of 100





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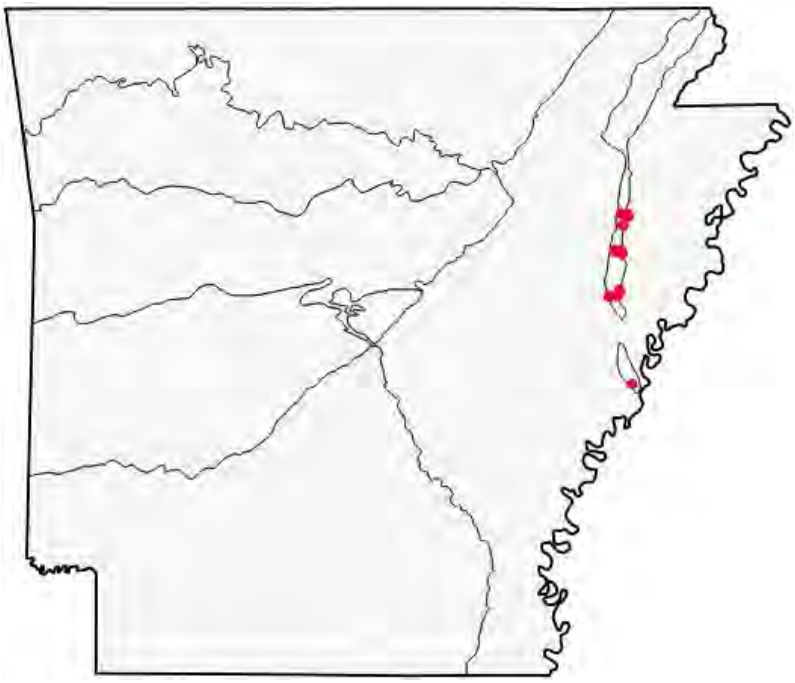
Population Trend: Unknown

Global Rank: G5 — Secure

State Rank: SH — Historic record. Possibly extirpated in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☐
- Boston Mountains ☐
- Arkansas Valley ☐
- Ouachita Mountains ☐
- South Central Plains ☑
- Mississippi Alluvial Plain ☐
- Mississippi Valley Loess Plain ☑



Habitat Map



Habitats

	Weight
Crowley's Ridge Loess Slope Forest	Optimal

Problems Faced

POTENTIAL PROBLEMS: Hydrologic alteration.	Threat: Hydrological alteration Source: Resource extraction
POTENTIAL PROBLEMS: Loss of habitat due to forestry practices.	Threat: Habitat destruction Source: Forestry activities
POTENTIAL PROBLEMS: Toxins due to agricultural water.	Threat: Toxins/contaminants Source: Agricultural practices
POTENTIAL PROBLEMS:Habitat destruction due to gravel mining.	Threat: Habitat destruction Source: Resource extraction

Data Gaps/Research Needs

Specimens are needed for genetic sequencing to determine: (1) species boundaries between the Spotted Dusky and Ouachita Dusky salamanders in the Coastal Plain and (2) the specific status of the Crowley's Ridge population.
Survey work is needed to determine if populations exist in the Coastal Plain and Crowley's Ridge.

Conservation Actions

	Importance	Category
Genetic assessments would direct conservation actions.	Medium	Data Gap

Monitoring Strategies

More information is needed to develop a monitoring strategy.

Comments

This species may be extirpated in Arkansas because no individuals have been observed on Crowley's Ridge in over 20 years. This species is restricted to springs and seepage habitats along the base of the eastern slope of Crowley's Ridge and at scattered locations in the Coastal Plain. Some localities assigned to this species in the Coastal Plain by Trauth and others (2004) are actually Desmognathus brimleyorum and not Desmognathus conanti (R. Bonnett, pers. com. 2005) as determined by molecular DNA tests. Additional specimens and data are needed from the Coastal Plain to resolve this situation. Trauth and others (2004) summarized the literature and biology of this species.

Taxa Association Team and Peer Reviewers

AGFC Kelly Irwin, UCA Don Shepard, Kory Roberts

Eurycea quadridigitata

Dwarf Salamander

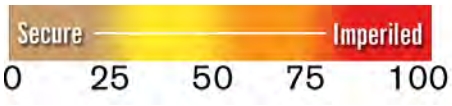


Class: Amphibia

Order: Caudata

Family: Plethodontidae

Priority Score: **15** out of 100



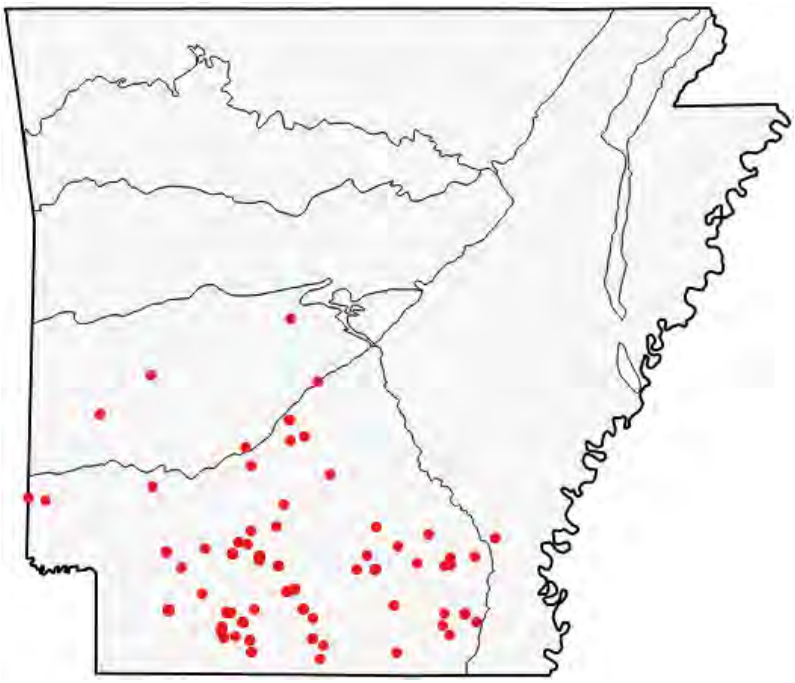
Population Trend: Unknown

Global Rank: G5 — Secure

State Rank: S3 — Vulnerable in Arkansas

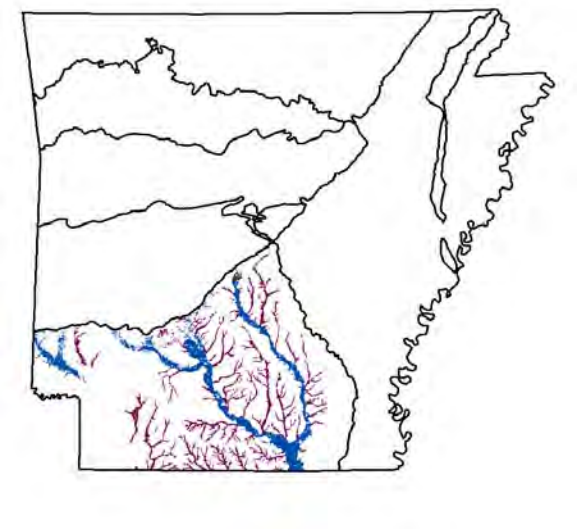
Distribution

Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☐
- Boston Mountains ☐
- Arkansas Valley ☐
- Ouachita Mountains ☐
- South Central Plains ☑
- Mississippi Alluvial Plain ☑
- Mississippi Valley Loess Plain ☐



Habitat Map



Habitats

	Weight
West Gulf Coastal Plain Large River Floodplain Forest	Suitable
West Gulf Coastal Plain Seepage Swamp and Baygall	Optimal
West Gulf Coastal Plain Small Stream/River Forest	Optimal

Problems Faced

POTENTIAL PROBLEMS: Habitat destruction due to forestry practices.	Threat: Habitat destruction Source: Forestry activities
POTENTIAL PROBLEMS: Habitat destruction due to forestry practices.	Threat: Habitat destruction or conversion Source: Conversion of riparian forest

Data Gaps/Research Needs

Genetic research is needed to assess the species status of Dwarf Salamanders by examining differences among populations in Arkansas and comparison with lineages from outside the state. Such work could reveal the presence of previously unrecognized species.

Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

More information is needed to develop a monitoring strategy.

Comments

Trauth and others (2004) summarized the known literature and biology of this salamander.

The Dwarf Salamander is part of a multiple species complex that occurs across the coastal plain of the southeastern U.S. and into the Edwards Plateau of central Texas (Lamb and Beamer, 2012). To date, very little genetic data are available for Dwarf Salamanders in Arkansas, and additional research is needed to test for genetic differences among populations in Arkansas and for comparison with lineages from outside the state. This will allow for the assessment of the species status of Dwarf Salamanders in Arkansas as well as test for the occurrence of other similar species within the state.

Taxa Association Team and Peer Reviewers

AGFC Kelly Irwin, UCA Don Shepard, Kory Roberts, U Tulsa Ron Bonett

Eurycea spelaea eastern

Grotto Salamander "eastern clade"

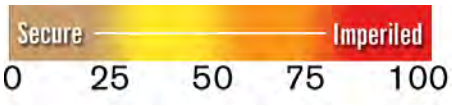


Class: Amphibia

Order: Caudata

Family: Plethodontidae

Priority Score: **15** out of 100



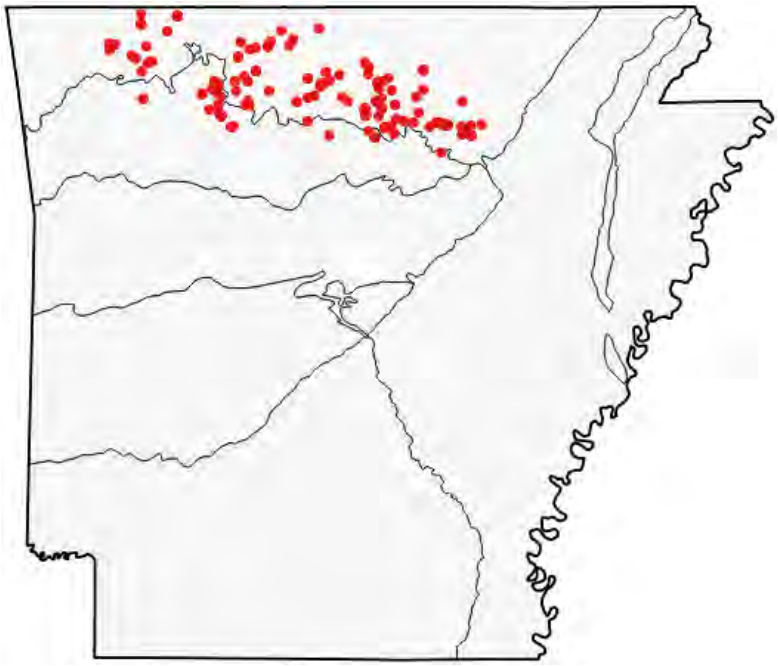
Population Trend: Unknown

Global Rank: GNR — Not yet ranked

State Rank: S3 — Vulnerable in Arkansas

Distribution

Element Occurrence Records



Ecoregions where the species occurs:

- [x] Ozark Highlands
- [ ] Boston Mountains
- [ ] Arkansas Valley
- [ ] Ouachita Mountains
- [ ] South Central Plains
- [ ] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains



Terrestrial Habitats





Ecobasins where this species occurs

Ecobasins

Ozark Highlands - Arkansas River
Ozark Highlands - White River

Terrestrial Habitats

Caves, Mines, Sinkholes and other Karst Features	Obligate

Aquatic Habitats

Natural Cave Stream: Headwater - Small	Obligate
Natural Groundwater: Headwater - Small	Obligate
Natural Spring Run: Headwater - Small	Obligate

Eurycea spelaea eastern
Grotto Salamander "eastern clade"

Problems Faced

Threat: Chemical alteration
Source: Confined animal operations

Threat: Chemical alteration
Source: Urban development

Threat: Groundwater depletion
Source: Excessive groundwater withdrawal

Threat: Hydrological alteration
Source: Urban development

Threat: Nutrient loading
Source: Confined animal operations

Threat: Nutrient loading
Source: Grazing/Browsing

Threat: Nutrient loading
Source: Urban development

Threat: Sedimentation
Source: Road construction

Data Gaps/Research Needs

Additional genetic research is needed to delineate boundaries between each of the Grotto Salamander clades. The "eastern clade" of Grotto Salamanders has presumed boundaries with the "western clade" in the vicinity of Madison, Benton, Carroll, and Washington Counties. The "eastern clade" of Grotto Salamanders has presumed boundaries with the "northern clade" in the vicinity of Baxter, Fulton, Izard, and Sharp Counties. The distribution of these boundaries is unclear. Further surveys and genetic analyses are needed in these regions to evaluate the distributions of these clades and test if these clades warrant species recognition.

Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

More information is needed to develop a monitoring strategy.

Comments

Trauth et al. (2004) summarized the literature and biology of the Grotto Salamander, referred to at the time as Typhlotriton spelaeus. Subsequent genetic research (Bonnett and Chippendale 2004) resulted in the taxonomic reassignment of Typhlotriton to the genus Eurycea, which also required changing the specific epithet to spelaea for proper gender agreement. Hence, the Grotto Salamander is currently referred to as Eurycea spelaea. Current phylogeographic research has identified several distinct clades within the “spelaea” group (Phillips et al., in prep) which may warrant taxonomic revision.

Taxa Team and Peer Reviewers

AGFC Kelly Irwin, UCA Don Shepard, Kory Roberts, U-Tulsa John Phillips, U-Tulsa Ron Bonett

Eurycea spelaea northern

Grotto Salamander "northern clade"

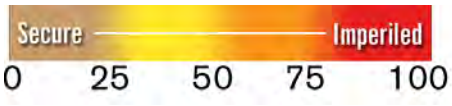


Class: Amphibia

Order: Caudata

Family: Plethodontidae

Priority Score: **19** out of 100



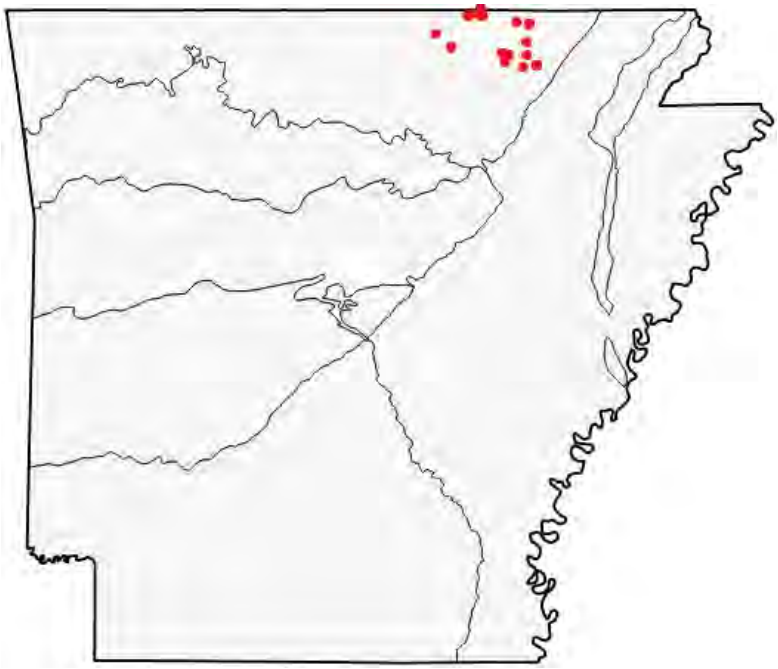
Population Trend: Unknown

Global Rank: GNR — Not yet ranked

State Rank: S2 — Imperiled in Arkansas

Distribution

Element Occurrence Records



Ecoregions where the species occurs:

- [x] Ozark Highlands
- [ ] Boston Mountains
- [ ] Arkansas Valley
- [ ] Ouachita Mountains
- [ ] South Central Plains
- [ ] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains



Terrestrial Habitats





Ecobasins where this species occurs

Ecobasins

Ozark Highlands - White River

Terrestrial Habitats

Caves, Mines, Sinkholes and other Karst Features	Obligate

Aquatic Habitats

Natural Cave Stream: Headwater - Small	Obligate
Natural Groundwater: Headwater - Small	Obligate
Natural Spring Run: Headwater - Small	Obligate

Eurycea spelaea northern
Grotto Salamander "northern clade"

Problems Faced

Threat:
Source: Urban development

Threat: Chemical alteration
Source: Confined animal operations

Threat: Chemical alteration
Source: Urban development

Threat: Groundwater depletion
Source: Excessive groundwater withdrawal

Threat: Nutrient loading
Source: Confined animal operations

Threat: Nutrient loading
Source: Grazing/Browsing

Threat: Nutrient loading
Source: Urban development

Threat: Sedimentation
Source: Road construction

Data Gaps/Research Needs

Additional genetic research is needed to delineate boundaries between each of the Grotto Salamander clades. The “western clade” of Grotto Salamanders is currently known only from the northwestern counties of Benton and Washington. The “western clade” has presumed boundaries with the “eastern clade” in the vicinity of Madison, Benton, Carroll, and Washington counties, yet the distribution of these boundaries is unclear. Further surveys and genetic analyses are needed in this region to evaluate the distributions of these clades and test if these clades warrant species recognition.

Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.	Medium	

Monitoring Strategies

More information is needed to develop a monitoring strategy.

Comments

Trauth et al. (2004) summarized the literature and biology of the Grotto Salamander, referred to at the time as Typhlotriton spelaeus. Subsequent genetic research (Bonnett and Chippendale 2004) resulted in the taxonomic reassignment of Typhlotriton to the genus Eurycea, which also required changing the specific epithet to spelaea for proper gender agreement. Hence, the Grotto Salamander is currently referred to as Eurycea spelaea. Current phylogeographic research has identified several distinct clades within the “spelaea” group (Phillips et al., in prep) which may warrant taxonomic revision.

Taxa Team and Peer Reviewers

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Eurycea spelaea western

Grotto Salamander "western clade"

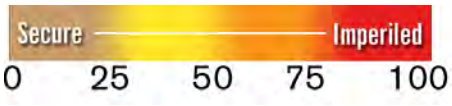


Class: Amphibia

Order: Caudata

Family: Plethodontidae

Priority Score: **19** **out of 100**



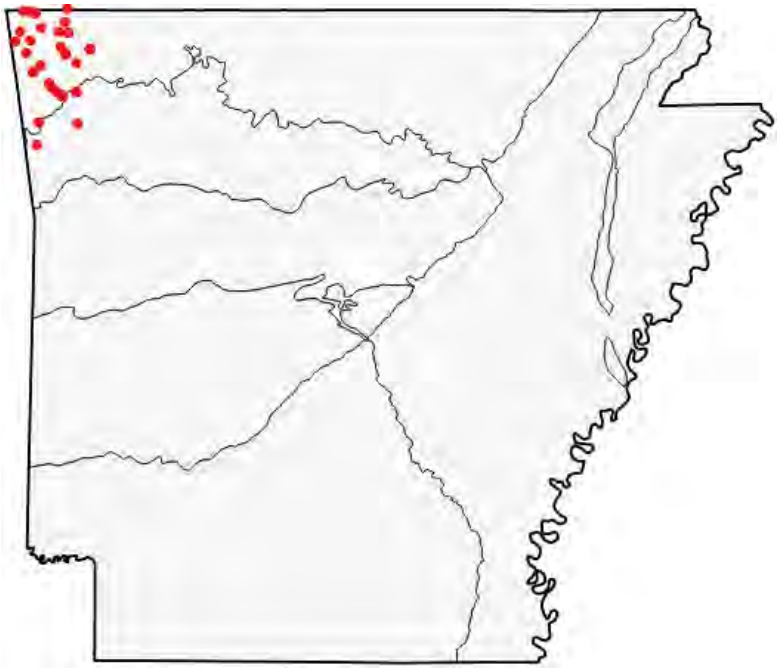
Population Trend: Unknown

Global Rank: G4 — Apparently secure species

State Rank: S3 — Vulnerable in Arkansas

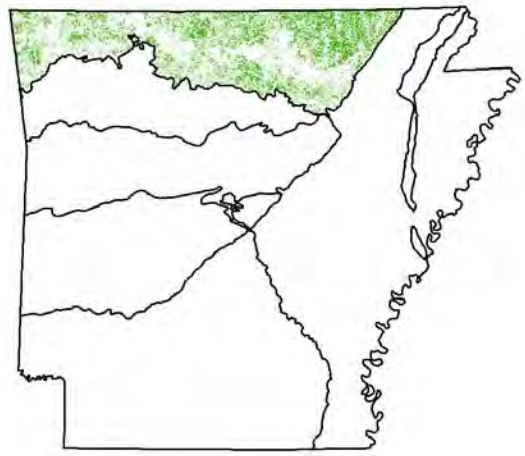
Distribution

Element Occurrence Records



Ecoregions where the species occurs:

- [x] Ozark Highlands
- [ ] Boston Mountains
- [ ] Arkansas Valley
- [ ] Ouachita Mountains
- [ ] South Central Plains
- [ ] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains



Terrestrial Habitats





Ecobasins where this species occurs

Ecobasins

Ozark Highlands - Arkansas River

Terrestrial Habitats

Caves, Mines, Sinkholes and other Karst Features	Obligate

Aquatic Habitats

Natural Cave Stream: Headwater - Small	Obligate
Natural Groundwater: Headwater - Small	Obligate
Natural Spring Run: Headwater - Small	Obligate

Eurycea spelaea western
Grotto Salamander "western clade"

Problems Faced

Threat:
Source: Urban development

Threat: Chemical alteration
Source: Confined animal operations

Threat: Chemical alteration
Source: Urban development

Threat: Groundwater depletion
Source: Excessive groundwater withdrawal

Threat: Nutrient loading
Source: Confined animal operations

Threat: Nutrient loading
Source: Grazing/Browsing

Threat: Nutrient loading
Source: Urban development

Threat: Sedimentation
Source: Road construction

Data Gaps/Research Needs

Additional genetic research is needed to delineate boundaries between each of the Grotto Salamander clades. The western clade of Grotto Salamanders is currently known only from the northwestern counties of Benton and Washington. The “western clade” has presumed boundaries with the “eastern clade” in the vicinity of Madison, Benton, Carroll, and Washington counties, yet the distribution of these boundaries is unclear. Further surveys and genetic analyses are needed in this region to evaluate the distributions of these clades and test if these clades warrant species recognition.

Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.	Medium	

Monitoring Strategies

More information is needed to develop a monitoring strategy.

Comments

Trauth et al. (2004) summarized the literature and biology of the Grotto Salamander, referred to at the time as Typhlotriton spelaeus. Subsequent genetic research (Bonnett and Chippendale 2004) resulted in the taxonomic reassignment of Typhlotriton to the genus Eurycea, which also required changing the specific epithet to spelaea for proper gender agreement. Hence, the Grotto Salamander is currently referred to as Eurycea spelaea. Current phylogeographic research has identified several distinct clades within the “spelaea” group (Phillips et al., in prep) which may warrant taxonomic revision.

Taxa Team and Peer Reviewers

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Eurycea subfluvicola

Ouachita Streambed Salamander

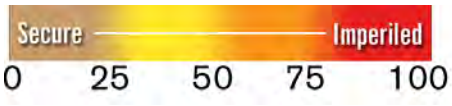


Class: Amphibia

Order: Caudata

Family: Plethodontidae

Priority Score: **23** **out of 100**



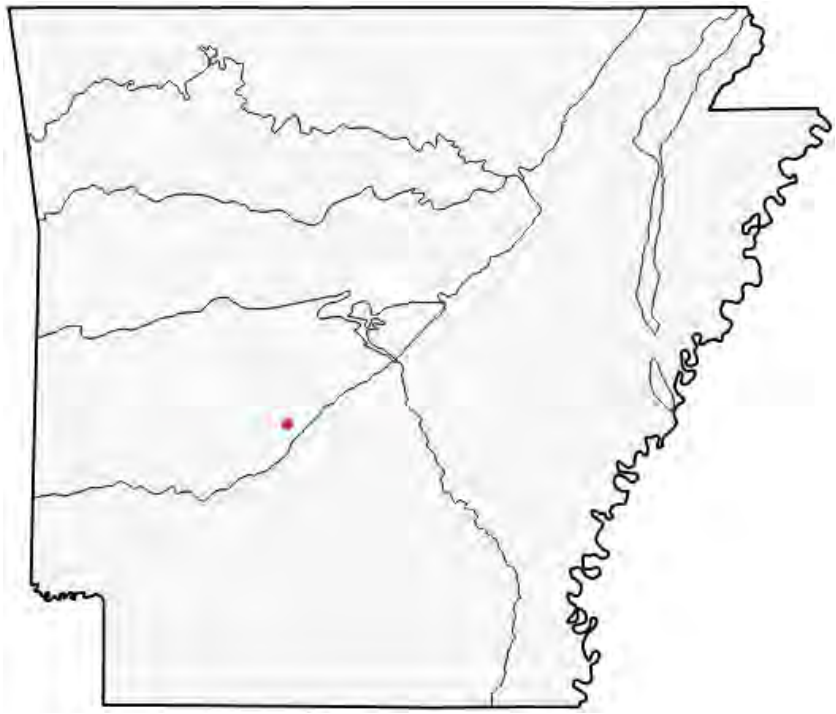
Population Trend: Unknown

Gobal Rank: GNR — Not yet ranked

State Rank: S1 — Critically imperiled in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- ☐ Ozark Highlands
- ☐ Boston Mountains
- ☑ Ouachita Mountains
- ☐ Arkansas Valley
- ☐ South Central Plains
- ☐ Mississippi Alluvial Plain
- ☐ Mississippi Valley Loess Plains

Ecobasins where the species occurs



Ecobasins

Ouachita Mountains - Ouachita River

Habitats	Weight
Natural Groundwater:	Obligate
Natural Riffle: Headwater - Small	Obligate

Problems Faced

Threat: Habitat destruction
Source: Forestry activities

Threat: Sedimentation
Source: Forestry activities

Threat: Sedimentation
Source: Road construction

Threat: Toxins/contaminants
Source: Non-point source pollution

Data Gaps/Research Needs

Assess genetic diversity of known populations.

Conduct life history and ecology study.

Conduct population estimate surveys at known and newly discovered sites.

Distribution and abundance survey work is needed throughout the Novaculite outcrops of the southern Ouachita Mountains.

Conservation Actions

	Importance	Category
Identify known populations and review land management practices that could pose potential threats to these populations.	High	Habitat Protection

Monitoring Strategies

More data are needed to determine monitoring strategies.

Comments

Steffen and others (2014) discovered and described this unique salamander, the only known paedomorphic plethodontid salamander from the Ouachita Mountains. It is currently restricted to the type locality making this the smallest known range of any North American vertebrate. More work is needed to expand the known range and elucidate the ecology and natural history of this species.

Taxa Association Team and Peer Reviewers

AGFC Kelly Irwin, UCA Don Shepard, U-Tulsa Ron Bonett, U-Tulsa Mike Steffen

Eurycea tynerensis

Oklahoma Salamander

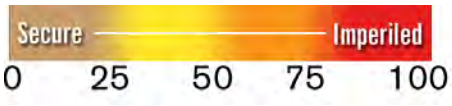


Class: Amphibia

Order: Caudata

Family: Plethodontidae

Priority Score: **23** **out of 100**



Population Trend: Unknown

Gobal Rank: G3 — Vulnerable species

State Rank: S4 — Apparently secure in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- [x] Ozark Highlands
- [x] Boston Mountains
- [ ] Ouachita Mountains
- [x] Arkansas Valley
- [ ] South Central Plains
- [ ] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains

Ecobasins where the species occurs



Ecobasins

Boston Mountains - Arkansas River
Ozark Highlands - Arkansas River
Ozark Highlands - White River

Habitats	Weight
Natural Cave Stream: Headwater - Small	Obligate
Natural Riffle: Headwater - Small	Obligate
Natural Spring Run: Headwater - Small	Obligate

Problems Faced

Threat: Groundwater depletion Source: Urban development
Threat: Hydrological alteration Source: Urban development
Threat: Nutrient loading Source: Confined animal operations
Threat: Nutrient loading Source: Grazing/Browsing
Threat: Nutrient loading Source: Urban development
Threat: Sedimentation Source: Grazing/Browsing
Threat: Sedimentation Source: Road construction
Threat: Sedimentation Source: Urban development
Threat: Toxins/contaminants Source: Resource extraction
Threat: Toxins/contaminants Source: Urban development

Data Gaps/Research Needs

Additional genetic research is needed to delineate boundaries between each of the three Oklahoma Salamander clades. The “eastern clade” of the Oklahoma Salamander has a presumed boundary with the “western clade” in Baxter, Marion, Pope, and Searcy, counties. The “western clade” has a presumed boundary with the “southwestern clade” close to Crawford and Washington counties. Further surveys and genetic analyses are needed in these regions to evaluate the distributions of these clades and to test if these clades warrant taxonomic revision.
The “eastern” clade contains only metamorphic populations, whereas the “western” and “southwestern” clades of the Oklahoma Salamander have both metamorphic (aquatic larvae and terrestrial adults) and paedomorphic (fully aquatic) populations. Therefore, further surveys and genetic analyses are needed to define the distribution of these two life history modes.

Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

Comments

Trauth and others (2004) summarized the literature and biology of this species.

Recent studies by Bonett and Chippindale (2004, 2006) and Emel and Bonett (2011) have identified several distinct divergent clades within the “tynerensis” group. Further genetic analysis and surveys are needed to better define clade boundaries, assess taxonomic status, and define distributions of populations with differing life history modes (metamorphic vs paedomorphic).

Taxa Association Team and Peer Reviewers

AGFC Kelly Irwin, UCA Don Shepard, Kory Roberts, U-Tulsa Ron Bonett

Gastrophryne olivacea

Great Plains Narrowmouth Toad

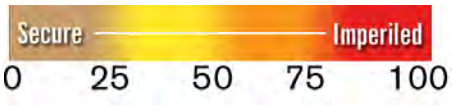


Class: Amphibia

Order: Anura

Family: Microhylidae

Priority Score: **19** **out of 100**



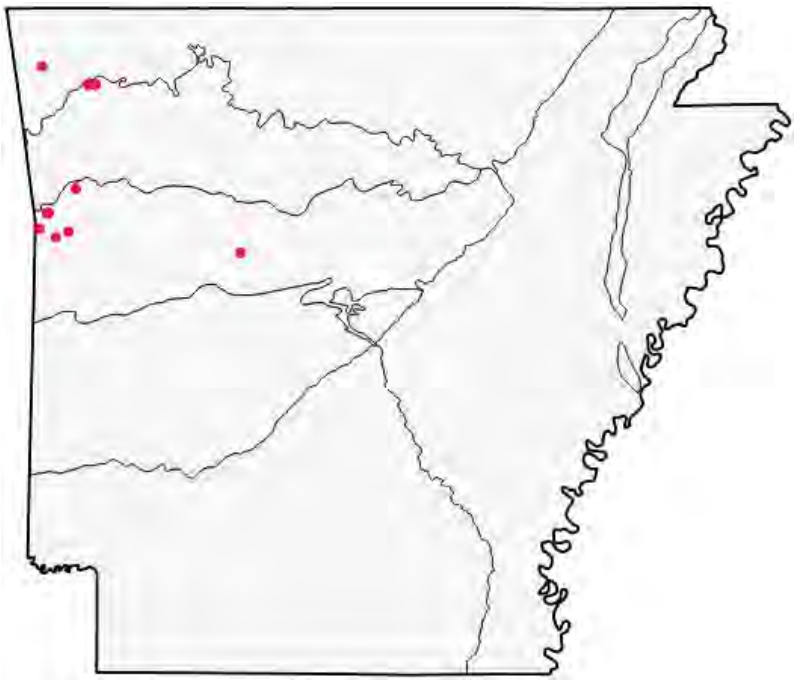
Population Trend: Unknown

Global Rank: G5 — Secure

State Rank: S2 — Imperiled in Arkansas

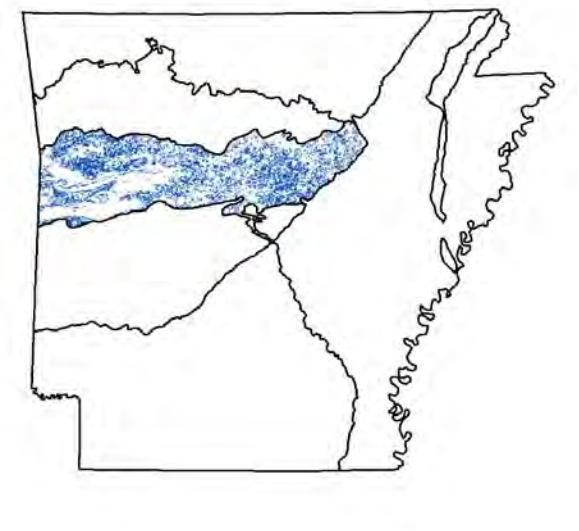
Distribution

Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☐
- Boston Mountains ☐
- Arkansas Valley ☑
- Ouachita Mountains ☐
- South Central Plains ☐
- Mississippi Alluvial Plain ☐
- Mississippi Valley Loess Plain ☐



Habitat Map



Habitats

	Weight
Ozark-Ouachita Prairie and Woodland	Optimal
Pasture Land	Suitable

Problems Faced

POTENTIAL PROBLEMS: Agricultural practices, habitat destruction/alteration.	Threat: Habitat destruction Source: Agricultural practices

Data Gaps/Research Needs

Distribution and abundance surveys are needed.

Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

More information is needed to develop a monitoring strategy.

Comments

Trauth and others (2004) state that there are no published records for this species in Arkansas and map seven localities in the Arkansas Valley and Coastal Plain. These authors also summarized the biology of this frog based on information from outside Arkansas.

To date (March 2015) no records of this species have been published. However, K. Roberts (pers. comm. 2015) has found this species in Sebastian County in recent years and will be publishing that record in the near future. Records plotted for museum vouchered specimens within the Arkansas Valley ecoregion should be considered valid. The localities as plotted in Trauth et al. (2004) for Columbia, Montgomery, and Ouachita counties are spurious at best, and are likely the result of misidentification of the similar Eastern Narrowmouth Toad Gastrophryne carolinensis or some other museum curation error, if indeed specimens do exist in museum collections. The only potential range for G. olivacea in southern Arkansas would be the Red River floodplain in Little River, Hempstead, Miller, and Lafayette counties. This is supported by records of this species in northeast Texas for those counties bordering the Red River and the southwest corner of Arkansas.

Taxa Association Team and Peer Reviewers

AGFC Kelly Irwin, UCA Don Shepard, Kory Roberts

Hemidactylium scutatum

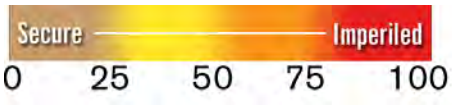
Four-toed Salamander

Class: Amphibia

Order: Caudata

Family: Plethodontidae

Priority Score: **19** out of 100



Population Trend: Unknown



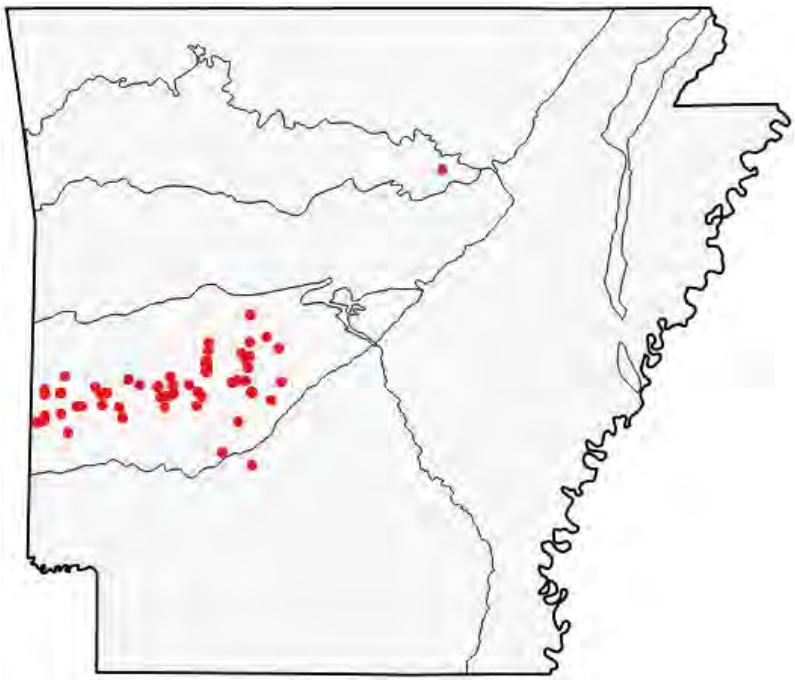
©Suzanne L. Collins

Global Rank: G5 — Secure

State Rank: S2 — Imperiled in Arkansas

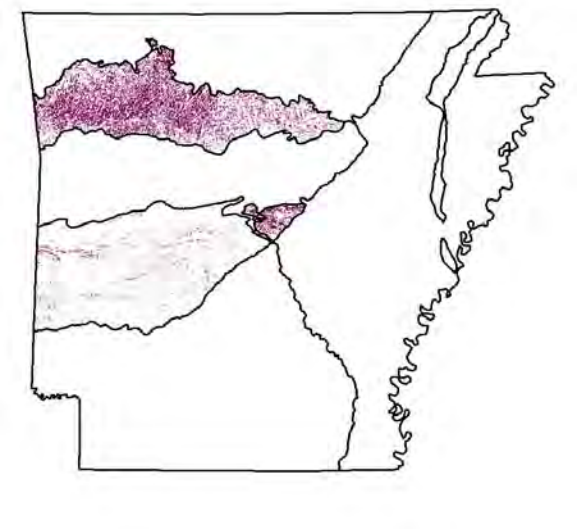
Distribution

Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☐
- Boston Mountains ☑
- Arkansas Valley ☐
- Ouachita Mountains ☑
- South Central Plains ☐
- Mississippi Alluvial Plain ☐
- Mississippi Valley Loess Plain ☐



Habitat Map



Habitats

	Weight
Caves, Mines, Sinkholes and other Karst Features	Optimal
Ozark-Ouachita Forested Seep	Obligate

Problems Faced

POTENTIAL PROBLEMS: Habitat destruction due to forestry practices.	Threat: Habitat destruction Source: Forestry activities

Data Gaps/Research Needs

Distribution and abundance surveys are needed.

Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

More information is needed to develop a monitoring strategy.

Comments

Populations are spottily distributed, likely due to habitat preference. Curiously, only one population has been recorded from the Ozark Highlands of Arkansas, yet the Missouri Ozarks has many known populations. Two genetic lineages have been identified in the state, one each in the Ouachita Mountains and the Ozark Highlands (Herman 2009).

(ANHI 2003, Bishop 1943, Bleakney and Cook 1957, Carter 1968, Conant and Collins 1998, Crump 2003, Crump et al. 2003A, 2003C, 2003D, 2003F, 2003P, Dellinger and Black 1938, Dowling 1957, Dundee 1968, Dunn 1926, Harris and Gill 1980, Hurter and Strecker 1909, Martof 1955, Neill 1963, ONHI 2003, Reagan 1974a, Saugey and Trauth 1991, Smith et al. 1984, Strecker 1924, Trauth and Caldwell 1986, Trauth and Cochran 1991, Trauth et al. 2004, USDA FS 1999, Wilson 1995, Wood 1955)

Taxa Association Team and Peer Reviewers

AGFC Kelly Irwin, UCA Don Shepard, Kory Roberts

Hyla avivoca

Bird-voiced Treefrog

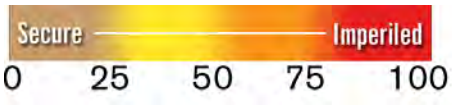


Class: Amphibia

Order: Anura

Family: Hylidae

Priority Score: **15** out of 100



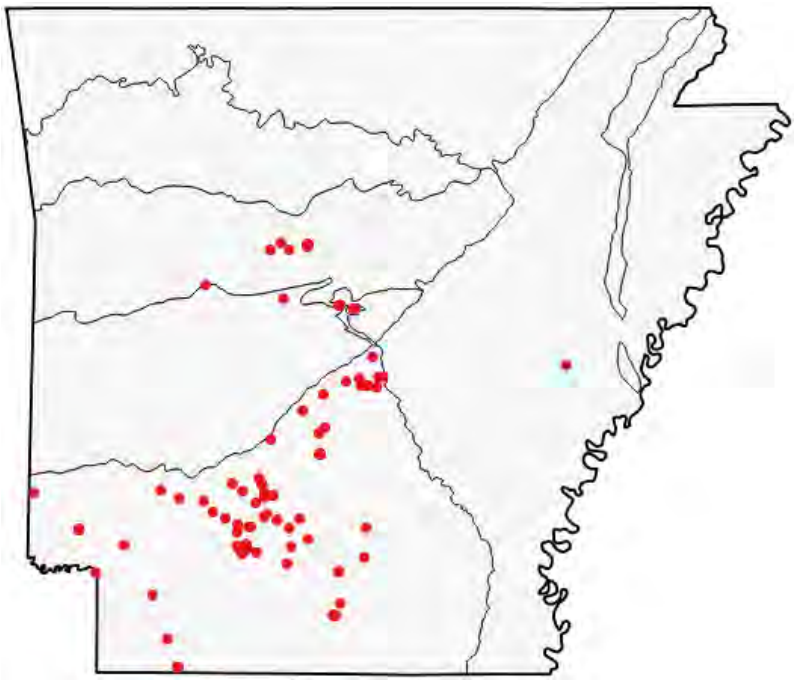
Population Trend: Unknown

Global Rank: G5 — Secure

State Rank: S3 — Vulnerable in Arkansas

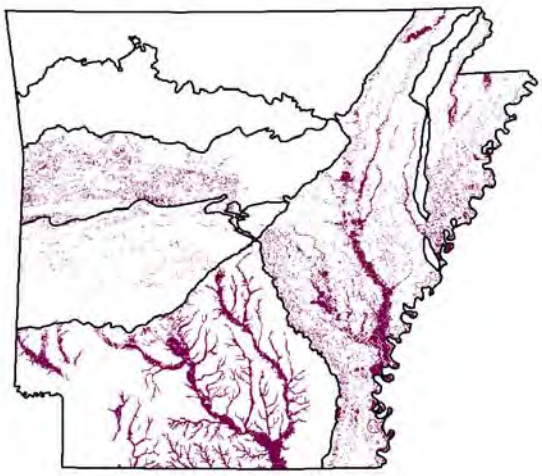
Distribution

Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☐
- Boston Mountains ☐
- Arkansas Valley ☑
- Ouachita Mountains ☑
- South Central Plains ☑
- Mississippi Alluvial Plain ☑
- Mississippi Valley Loess Plain ☐



Habitat Map



Habitats	Weight
Lower Mississippi River Low Bottomland Forest	Optimal
Ozark-Ouachita Large Floodplain	Optimal
West Gulf Coastal Plain Large River Floodplain Forest	Optimal
West Gulf Coastal Plain Seepage Swamp and Baygall	Optimal
West Gulf Coastal Plain Small Stream/River Forest	Optimal

Problems Faced

POTENTIAL PROBLEMS: Loss of wetland and swamp habitat.	Threat: Habitat destruction Source: Forestry activities

Data Gaps/Research Needs

Conduct distribution and abundance surveys.

Conservation Actions	Importance	Category
Restore wetlands.	High	Habitat Restoration/Improvement

Monitoring Strategies

More information is needed to develop a monitoring strategy.

Hyla avivoca
Bird-voiced Treefrog

Comments

(ANHI 2003, Conant and Collins 1998, Crump 2003, Crump and others 2003A, 2003C, 2003D, 2003F, 2003P, Davis and Hollenback 1978, Fulmer and Tumlison 2002, Jamieson and others 1993, McAllister and others 1993b, Mount 1975, ONHI 2003, Secor 1988, Smith 1966b, Trauth 1992b, Trauth and others 2004, Trauth and Robinette 1990a, Trauth and Robinette 1990b, Turnipseed 1976, Turnipseed 1980b, USDA FS 1999, Volpe and others 1961, Wilson 1995).

Trauth and others (2004) summarized the literature and biology of this species.

Taxa Association Team and Peer Reviewers

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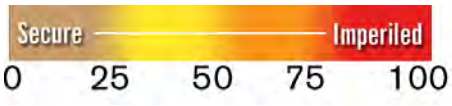
Hyla squirella

Squirrel Treefrog

Class: Amphibia
Order: Anura
Family: Hylidae



Priority Score: **23** **out of 100**



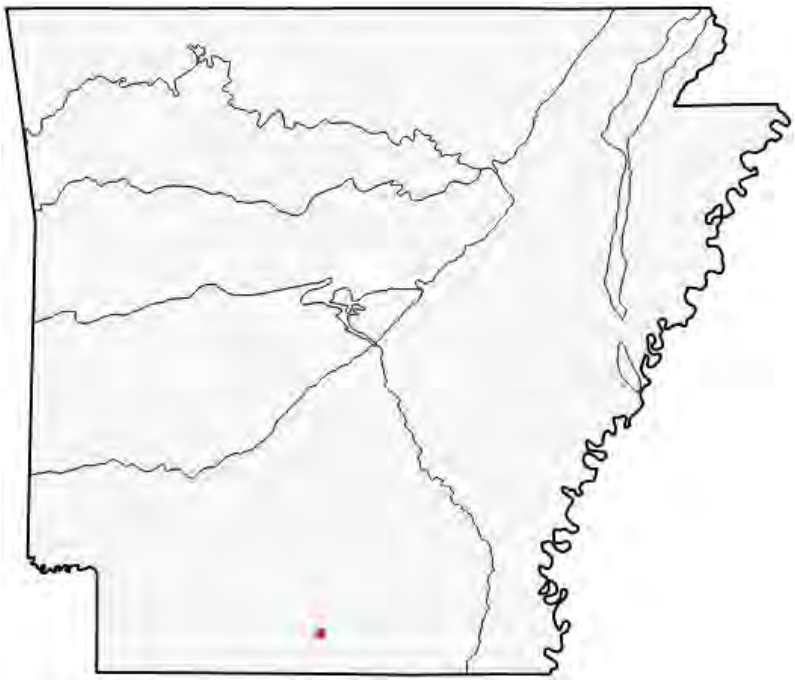
Population Trend: Unknown

Global Rank: G5 — Secure

State Rank: S1 — Critically imperiled in Arkansas

Distribution

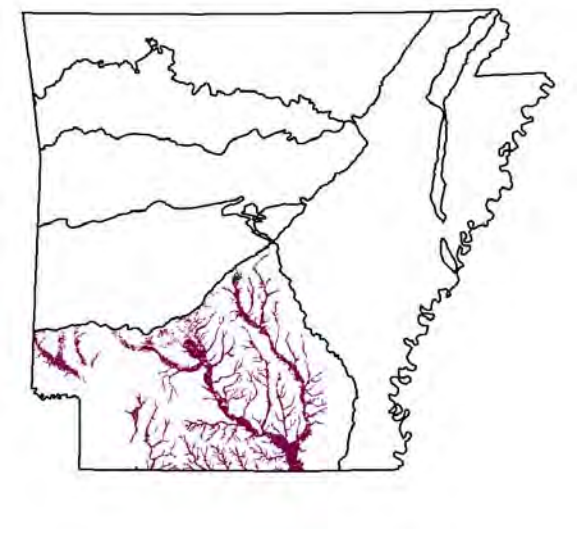
Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☐
- Boston Mountains ☐
- Arkansas Valley ☐
- Ouachita Mountains ☐
- South Central Plains ☑
- Mississippi Alluvial Plain ☐
- Mississippi Valley Loess Plain ☐

Habitat Map





Habitats

	Weight
Lower Mississippi River Low Bottomland Forest	Optimal
Ozark-Ouachita Large Floodplain	Optimal
West Gulf Coastal Plain Large River Floodplain Forest	Optimal
West Gulf Coastal Plain Seepage Swamp and Baygall	Optimal
West Gulf Coastal Plain Small Stream/River Forest	Optimal

Problems Faced

POTENTIAL PROBLEM: Loss of wetland and swamp habitat.	Threat: Habitat destruction Source: Forestry activities

Data Gaps/Research Needs

Conduct distribution and abundance surveys.

Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.	Medium	

Monitoring Strategies

More information is needed to develop a monitoring strategy.

Hyla squirella
Squirrel Treefrog

Comments

The Squirrel Treefrog is a common, wide-ranging species of the Gulf and Atlantic coastal plains, from Texas to Virginia. Apparently viable populations of this species were recently discovered in Union County (Fulmer 2013).

(ANHI 2003, Conant and Collins 1998, Crump 2003, Crump et al. 2003A, 2003C, 2003D, 2003F, 2003P, Davis and Hollenback 1978, Fulmer and Tumlison 2002, Jamieson et al. 1993, McAllister et al. 1993b, Mount 1975, ONHI 2003, Secor 1988, Smith 1966b, Trauth 1992b, Trauth et al. 2004, Trauth and Robinette 1990a, Trauth and Robinette 1990b, Turnipseed 1976, Turnipseed 1980b, USDA FS 1999, Volpe et al. 1961, Wilson 1995).

Taxa Association Team and Peer Reviewers

AGFC Kelly Irwin, UCA Don Shepard, Kory Roberts

Lithobates areolatus

Crawfish Frog

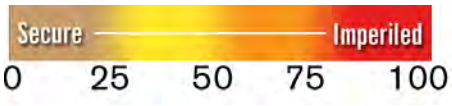


Class: Amphibia

Order: Anura

Family: Ranidae

Priority Score: **23** **out of 100**



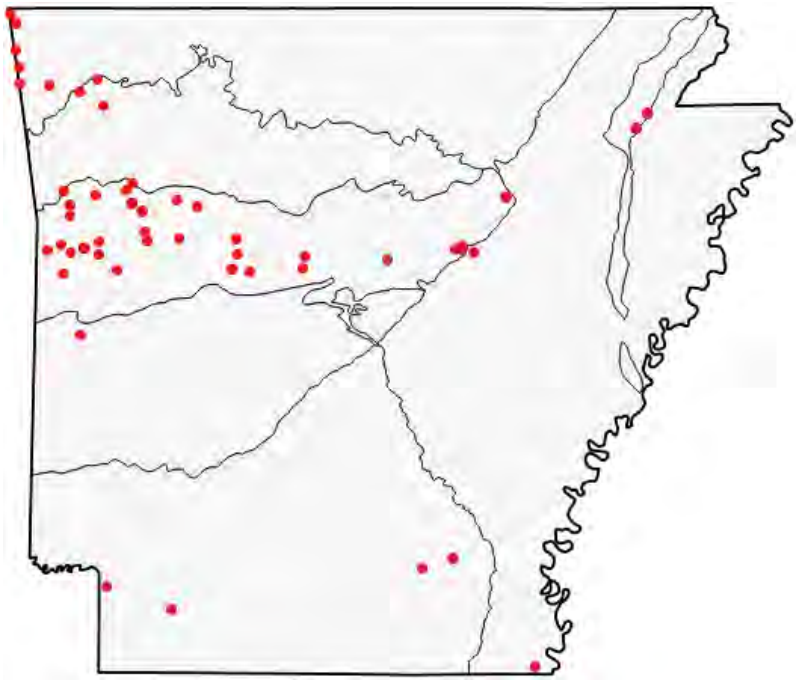
Population Trend: Unknown

Global Rank: G4 — Apparently secure species

State Rank: S2 — Imperiled in Arkansas

Distribution

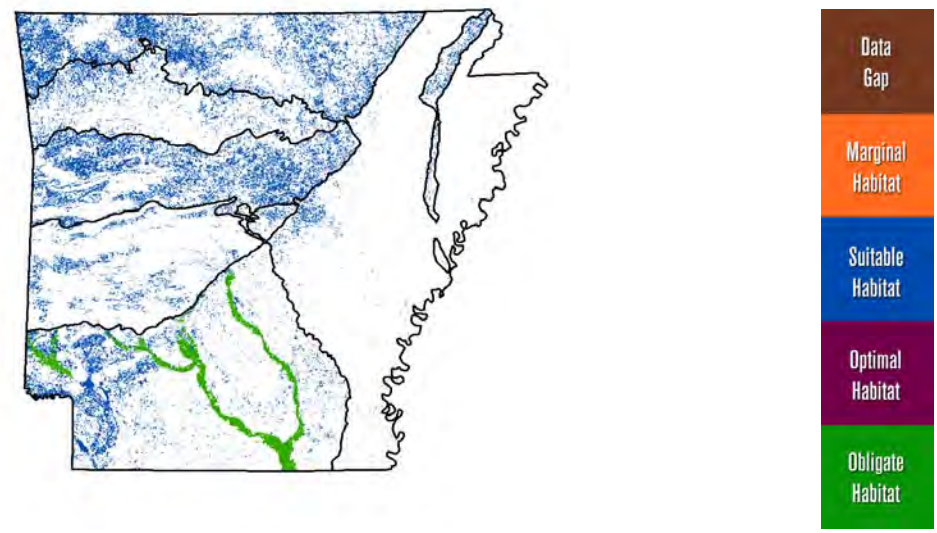
Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☑
- Boston Mountains ☑
- Arkansas Valley ☑
- Ouachita Mountains ☑
- South Central Plains ☑
- Mississippi Alluvial Plain ☑
- Mississippi Valley Loess Plain ☑

Habitat Map



Habitats

	Weight
Ozark-Ouachita Prairie and Woodland	Optimal
Pasture Land	Suitable
West Gulf Coastal Plain Large River Floodplain Forest	Obligate
West Gulf Coastal Plain Red River Floodplain Forest	Suitable

Problems Faced

POTENTIAL PROBLEMS: Habitat destruction.	Threat: Habitat destruction Source: Forestry activities
POTENTIAL PROBLEMS: Habitat destruction.	Threat: Habitat destruction Source: Agricultural practices

Data Gaps/Research Needs

Further distribution and abundance surveys are needed.
Genetic assessment of the currently recognized subspecies is needed to determine if divergent lineages are present and to what degree, and if so, is subspecific recognition warranted.

Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

More information is needed to develop a monitoring strategy.

Comments

Two subspecies are currently recognized, Lithobates areolatus areolatus (Southern Crawfish Frog) and L. a. circulosus (Northern Crawfish Frog). The previous AWAP contained separate accounts for each subspecies; however, these were combined for the 2015 revision. When assessed separately, the Southern Crawfish Frog has a rank of S1, critically imperiled, as only two historic records are known (Trauth and others 2004). The combined subspecies assessment produced the same S2 rank as independently established for the Northern Crawfish Frog. A phylogeographic analysis is needed to ascertain whether a species complex exists within L. areolatus. Such an analysis could reveal that formal recognition of subspecies is no longer warranted.

This species was historically associated with floodplain prairie systems and open uplands throughout its range. Trauth and others (2004) summarized the literature and biology of this species.

(ANHI 2003, Bacon and Anderson 1976, Black and Dellinger 1938, Byrd and Hanebrink 1974, Collins 1974, Conant and Collins 1991, Conant and Collins 1998, Crump 2003, Crump et al. 2003a, 2003c, 2003d, 2003f, 2003p, Dowling 1957, Johnson 1977, Plummer 1977f, Plummer and White 1992, Taylor 1935, Trauth et al. 1990, Trauth et al. 2004, USDA FS 1999, Wilson 1995).

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Lithobates sylvaticus

Wood Frog

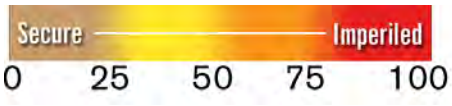


Class: Amphibia

Order: Anura

Family: Ranidae

Priority Score: **15** out of 100



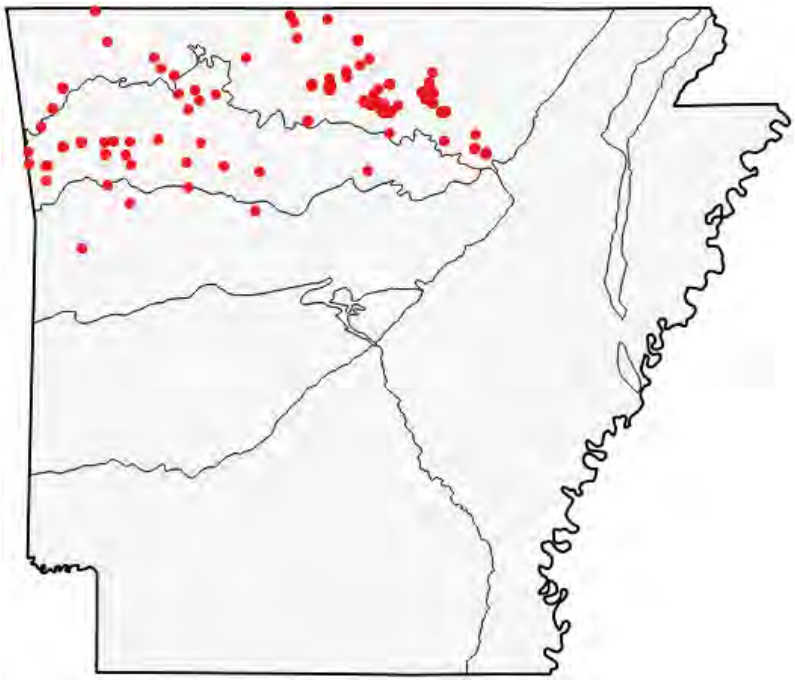
Population Trend: Unknown

Global Rank: G5 — Secure

State Rank: S3 — Vulnerable in Arkansas

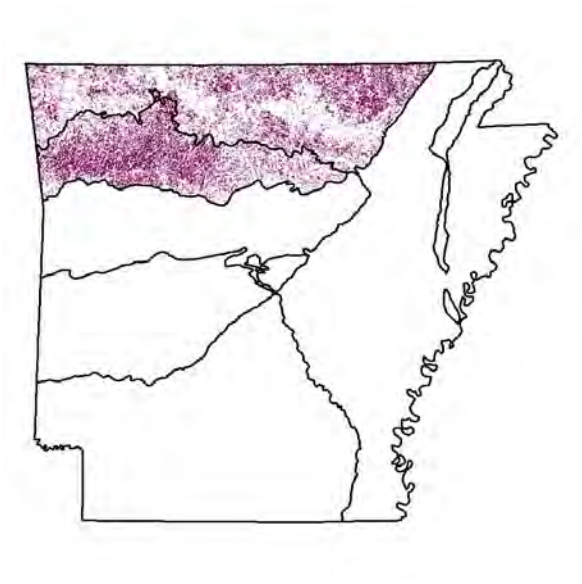
Distribution

Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☑
- Boston Mountains ☑
- Arkansas Valley ☐
- Ouachita Mountains ☐
- South Central Plains ☐
- Mississippi Alluvial Plain ☐
- Mississippi Valley Loess Plain ☐



Habitat Map



Habitats

	Weight
Caves, Mines, Sinkholes and other Karst Features	Optimal
Ozark-Ouachita Mesic Hardwood Forest	Optimal

Problems Faced

KNOWN PROBLEM: Mass mortality events at breeding sites (possibly due to ranavirus pathogen).	Threat: Extraordinary predation/parasitism/disease Source: Parasites/pathogens
POTENTIAL PROBLEMS: Loss of habitat.	Threat: Habitat destruction Source: Forestry activities

Data Gaps/Research Needs

Determine cause(s) of breeding site mass mortality.

Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

Monitor breeding sites for mass mortality events and changes in local population dynamics.

Comments

Trauth and others (2004) summarized the literature and biology of this frog. Mass mortality events were reported at breeding sites in relatively undisturbed areas within the Ozark National Forest over a decade ago. However, no cause for these events has been unequivocally determined to date (March 2015). It has been suggested that an emerging disease (Ranavirus) may be the culprit, based on the external appearance (petechial hemorrhaging of venter and thighs) of dead or dying frogs (Kelly J. Irwin, pers. obs.).

(McCallum and others 2003a)

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Plethodon caddoensis

Caddo Mountain Salamander

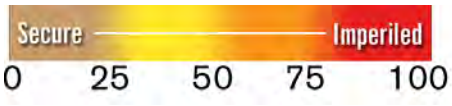


Class: Amphibia

Order: Caudata

Family: Plethodontidae

Priority Score: **46** out of 100



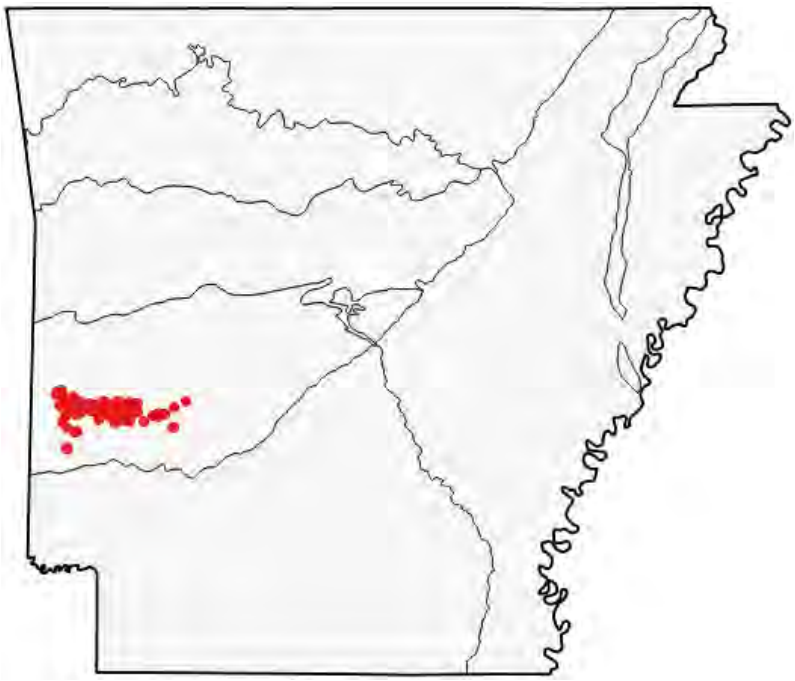
Population Trend: Unknown

Global Rank: G2 — Imperiled species

State Rank: S2 — Imperiled in Arkansas

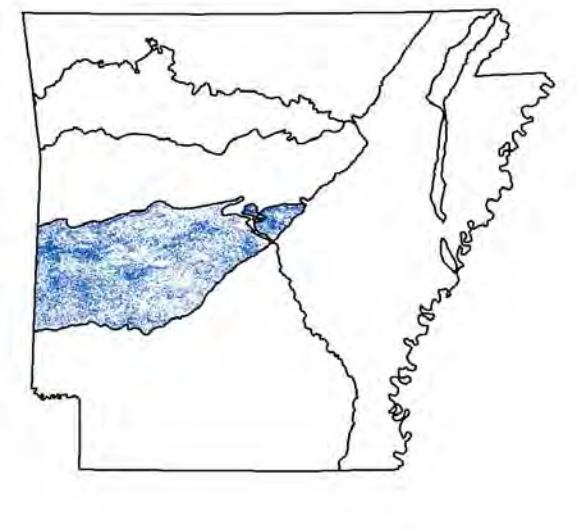
Distribution

Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☐
- Boston Mountains ☐
- Arkansas Valley ☐
- Ouachita Mountains ☑
- South Central Plains ☐
- Mississippi Alluvial Plain ☐
- Mississippi Valley Loess Plain ☐



Habitat Map



Habitats

	Weight
Caves, Mines, Sinkholes and other Karst Features	Suitable
Ozark-Ouachita Dry-Mesic Oak Forest/Woodland	Suitable
Ozark-Ouachita Mesic Hardwood Forest	Optimal
Ozark-Ouachita Pine-Oak Forest/Woodland	Suitable
Ozark-Ouachita Riparian	Suitable

Problems Faced

POTENTIAL PROBLEMS: Habitat destruction, forestry practices.

Threat: Habitat destruction or conversion
Source: Forestry activities

Data Gaps/Research Needs

Determination of species status, based on nuclear genetic testing, and gene flow between the various lineages identified by Shepard and Burbrink (2011) is needed.

Conservation Actions

Conservation Actions	Importance	Category
Conduct controlled burns.	Medium	Fire Management
Eliminate timber harvest within range.	High	Habitat Restoration/Improvement
Eliminate timber harvest within range.	High	Habitat Protection
Reduce/eliminate all-terrain vehicle use in areas where the species occurs.	High	Habitat Protection
Set aside wilderness areas where species occurs to insure long term survival.	High	Habitat Protection

Monitoring Strategies

Establish long-term monitoring plots to assess population trends.

Comments

This species is locally common, with most known localities occurring within the Ouachita National Forest. Forest management activities via conversion of land to pine plantations have likely reduced the amount of historically suitable habitat for this species. Shepard and Burbrink (2011) identified four highly divergent and geographically distinct clades.

(ANHI 2003, Anthony 1993, Anthony et al. 1994, Atwill and Trauth 1988, Blair and Lindsay 1965, Blair 1957, Conant and Collins 1991, Crump 2003, Crump et al. 2003a, 2003c, 2003d, 2003f, 2003p, Dowling 1956, Duncan and Highton 1979, Highton 1962a, McAllister et al. 2002, Palmer 1924, Plummer 1982, Pope 1964, Pope and Pope 1951, Reagan 1974a, Saugey et al. 1985, Spotila 1972, Taylor et al. 1990, Trauth et al. 2004, Trauth et al. 2000a, Trauth and Wilhide 1999, USDA FS 1999, Wilson 1995, Winter et al. 1986).

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Plethodon fourchensis

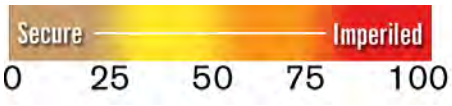
Fourche Mountain Salamander

Class: Amphibia

Order: Caudata

Family: Plethodontidae

Priority Score: **46** out of 100





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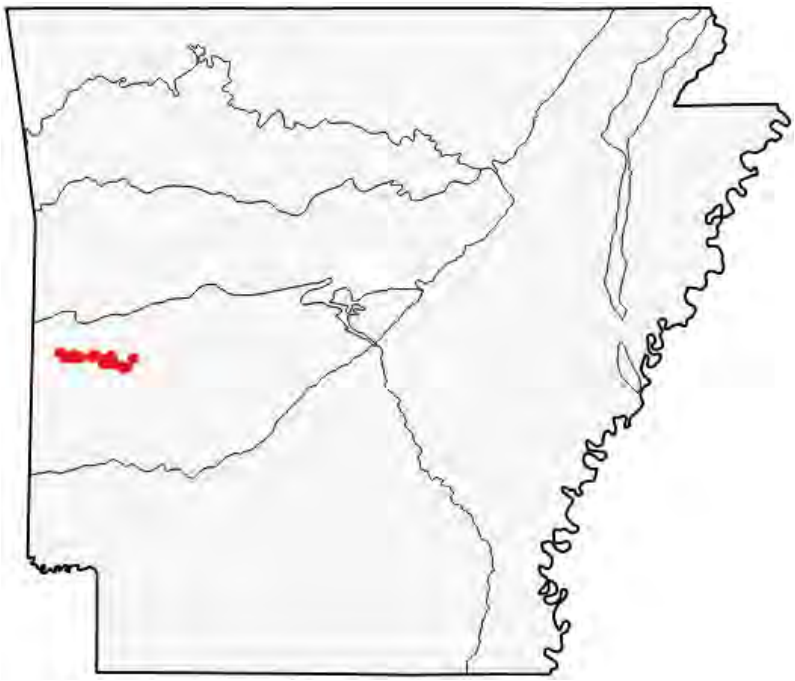
Population Trend: Unknown

Global Rank: G2Q — Imperiled (questionable taxonomy)

State Rank: S2 — Imperiled in Arkansas

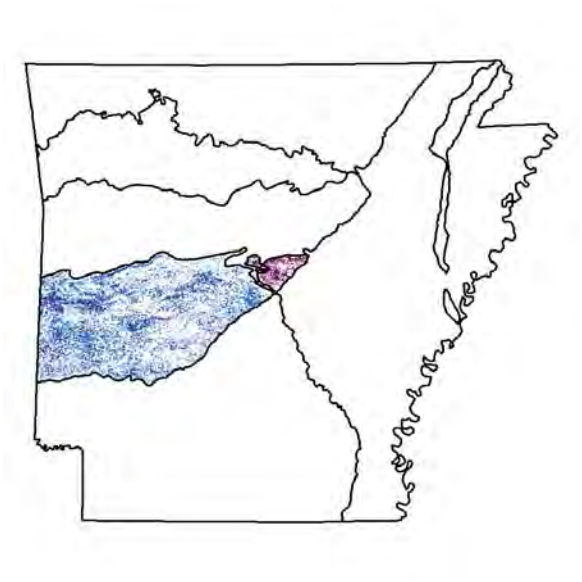
Distribution

Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☐
- Boston Mountains ☐
- Arkansas Valley ☐
- Ouachita Mountains ☑
- South Central Plains ☐
- Mississippi Alluvial Plain ☐
- Mississippi Valley Loess Plain ☐



Habitat Map



Habitats

Habitats	Weight
Ouachita Montane Oak Forest	Optimal
Ozark-Ouachita Dry Oak and Pine Woodland	Suitable
Ozark-Ouachita Dry-Mesic Oak Forest	Suitable
Ozark-Ouachita Mesic Hardwood Forest	Optimal
Ozark-Ouachita Pine-Oak Forest/Woodland	Suitable

Problems Faced

POTENTIAL PROBLEMS: Habitat destruction, forestry practices.	Threat: Habitat destruction or conversion Source: Forestry activities

Data Gaps/Research Needs

No research needs are identified at this time.

Conservation Actions

Conservation Actions	Importance	Category
Conduct controlled burns.	Medium	Fire Management
Eliminate timber harvest within known range.	High	Habitat Restoration/Improvement
Reduce/eliminate all-terrain vehicle use in areas where this species occurs.	High	Habitat Protection
Set aside wilderness areas where species occurs to insure long term survival.	High	Habitat Protection

Plethodon fourchensis
Fourche Mountain Salamander

Monitoring Strategies

Establish long-term monitoring plots to assess population trends.

Comments

This salamander is endemic to the Fourche/Irons Fork Mountain chain, including Shut-In Mountain on the northwestern end of the range, to the high ridge east of Grapevine Mountain on the eastern end. This species' range is entirely within the ownership of the Ouachita National Forest. Based on mtDNA sequence analysis, Shepard and Burbrink (2009) identified four distinct lineages within this species. Shepard et al. (2011) showed that significant morphological differences existed between the two sister species, Plethodon fourchensis and P. ouachitae, further supporting the genetic evidence between these divergent species. These two species have a narrow zone of hybridization on West Fourche Mountain, phenotypically fourchensis, genotypically ouachitae.

(ANHI 2003, Blair and Lindsay 1965, Conant and Collins 1998, Crump 2003, Crump et al. 2003a, 2003c, 2003d, 2003f, 2003p, Duncan and Highton 1979, Lohoefener and Jones 1991, ONHI 2003, Plummer 1982, Robison and Allen 1995, Taylor et al. 1990, Trauth et al. 2004, Trauth and Wilhide 1999, USDA FS 1999, Wilson 1995).

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Plethodon kiamichi

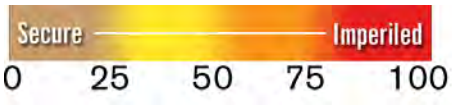
Kiamichi Slimy Salamander

Class: Amphibia

Order: Caudata

Family: Plethodontidae

Priority Score: **50** out of 100





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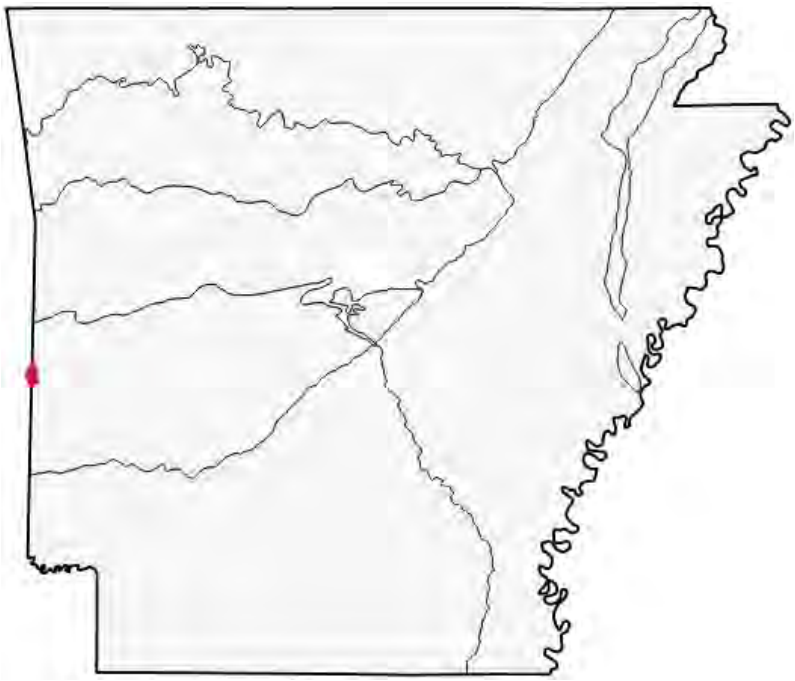
Population Trend: Unknown

Global Rank: G2 — Imperiled species

State Rank: S1 — Critically imperiled in Arkansas

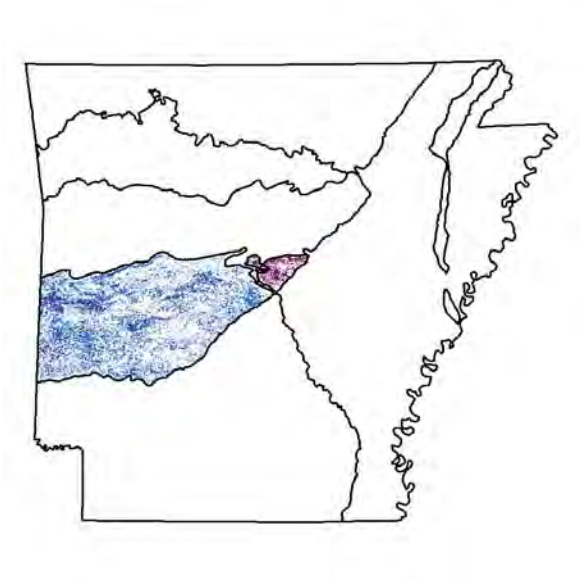
Distribution

Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☐
- Boston Mountains ☐
- Arkansas Valley ☐
- Ouachita Mountains ☑
- South Central Plains ☐
- Mississippi Alluvial Plain ☐
- Mississippi Valley Loess Plain ☐



Habitat Map



Habitats

	Weight
Ouachita Montane Oak Forest	Optimal
Ozark-Ouachita Dry Oak and Pine Woodland	Optimal
Ozark-Ouachita Dry-Mesic Oak Forest/Woodland	Suitable
Ozark-Ouachita Mesic Hardwood Forest	Optimal
Ozark-Ouachita Pine-Oak Forest/Woodland	Suitable

Problems Faced

POTENTIAL PROBLEMS: Habitat destruction, forestry practices.

Threat: Habitat destruction or conversion
Source: Forestry activities

Data Gaps/Research Needs

Conduct distribution surveys using genetic analysis, due to similarity of appearance to other members of the species complex.

Genetic assessment of species boundaries in the Plethodon albagula-kiamichi-kisatchie complex.

Conservation Actions

	Importance	Category
Acquire habitat.	Medium	Land Acquisition
Conduct controlled burns.	Medium	Fire Management
Eliminate timber harvest within known range.	High	Habitat Restoration/Improvement

Monitoring Strategies

More information is needed to develop a monitoring strategy.

Comments

This species is currently recognized as endemic to the Kiamichi Mountains within the greater Ouachita Mountain ecoregion.

(ANHI 2003, Blair and Lindsay 1965, Crump 2003, Crump et al. 2003a, 2003c, 2003d, 2003f, 2003p, Duncan and Highton 1979, Highton 1989, McAllister et al. 2002, ONHI 2003, Trauth et al. 2004, USDA FS 1999, Wilson 1995).

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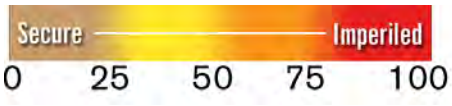
AGFC Kelly Irwin, UCA Don Shepard, Kory Roberts

Plethodon kisatchie

Louisiana Slimy Salamander

Class: Amphibia
Order: Caudata
Family: Plethodontidae

Priority Score: **27** out of 100




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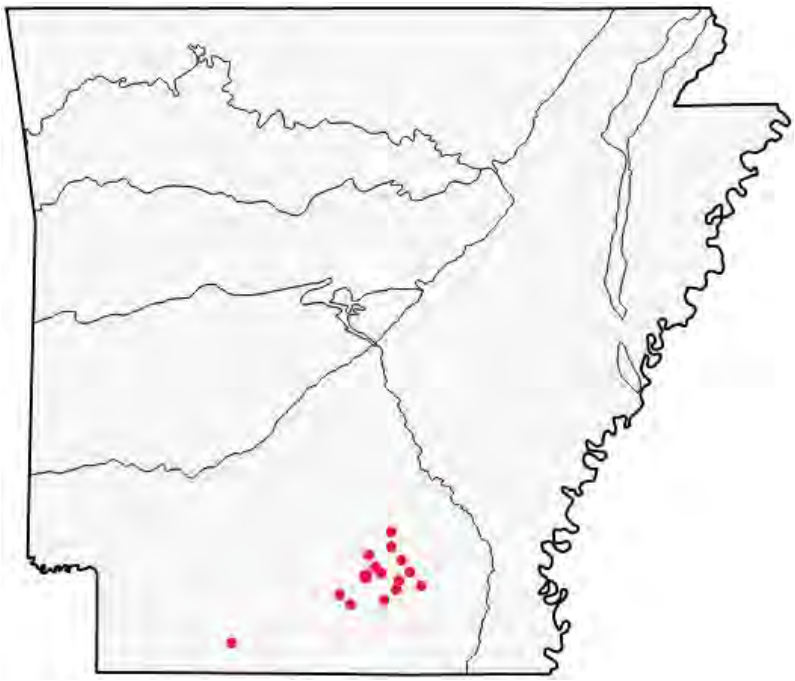
Population Trend: Unknown

Global Rank: G3G4 — Vulnerable (uncertain rank)

State Rank: S2 — Imperiled in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☐
- Boston Mountains ☐
- Arkansas Valley ☐
- Ouachita Mountains ☐
- South Central Plains ☑
- Mississippi Alluvial Plain ☐
- Mississippi Valley Loess Plain ☐



Habitat Map



Habitats

	Weight
West Gulf Coastal Plain Pine-Hardwood Forest	Optimal

Problems Faced

POTENTIAL PROBLEMS: Habitat destruction, forestry practices.	Threat: Habitat destruction Source: Forestry activities

Data Gaps/Research Needs

Conduct distribution surveys using genetic analysis, due to similarity of appearance to other members of the species complex.

Genetic assessment of species boundaries in the Plethodon albagula-kiamichi-kisatchie complex.

Conservation Actions

	Importance	Category
Acquire habitat.	High	Land Acquisition
Conduct controlled burns.	Medium	Fire Management
Eliminate timber harvest within known range.	High	Habitat Restoration/Improvement

Monitoring Strategies

More information is needed to develop a monitoring strategy.

Comments

The range is limited to the South Central Coastal Plain where recent specimens have been associated with remnant old growth beech-hardwood/ pine forest stands. The bulk of historically favorable habitat has likely been converted to pine plantation monocultures.

Taxa Association Team and Peer Reviewers

AGFC Kelly Irwin, UCA Don Shepard, Kory Roberts

Plethodon ouachitae

Rich Mountain Salamander

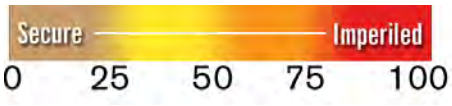


Class: Amphibia

Order: Caudata

Family: Plethodontidae

Priority Score: **38** out of 100



Population Trend: Unknown

Global Rank: G2G3 — Imperiled (uncertain rank)

State Rank: S2 — Imperiled in Arkansas

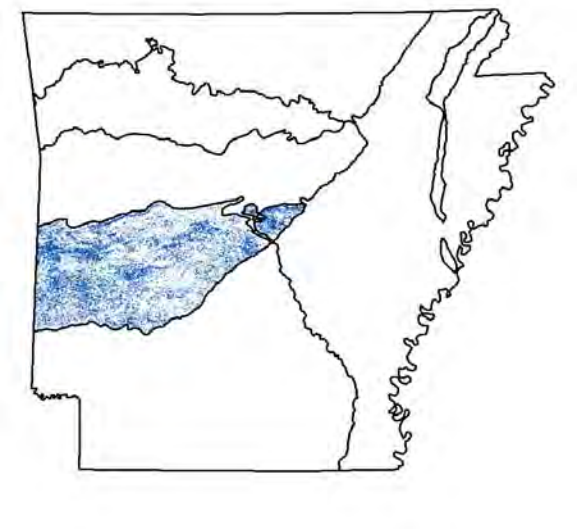
Distribution

Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☐
- Boston Mountains ☐
- Arkansas Valley ☐
- Ouachita Mountains ☑
- South Central Plains ☐
- Mississippi Alluvial Plain ☐
- Mississippi Valley Loess Plain ☐



Habitat Map



Habitats

Habitats	Weight
Ouachita Montane Oak Forest	Optimal
Ozark-Ouachita Dry Oak and Pine Woodland	Suitable
Ozark-Ouachita Dry-Mesic Oak Forest/Woodland	Suitable
Ozark-Ouachita Mesic Hardwood Forest	Optimal
Ozark-Ouachita Pine-Oak Forest/Woodland	Suitable

Problems Faced

POTENTIAL PROBLEMS: Habitat destruction, forestry practices.	Threat: Habitat destruction or conversion Source: Forestry activities

Data Gaps/Research Needs

No research needs are identified at this time.

Conservation Actions

Conservation Actions	Importance	Category
Conduct controlled burns.	Medium	Fire Management
Eliminate timber harvest within known range.	High	Habitat Restoration/Improvement
Reduce/ eliminate ATV use where this species occurs.	High	Habitat Protection

Monitoring Strategies

Establish long-term monitoring plots to assess population trends.

Comments

Shepard and Burbrink (2008) identified seven distinct lineages within the Plethodon ouachitae complex in Arkansas and Oklahoma. Three of these lineages occur in Arkansas on Rich, Black Fork, and West Fourche mountains, and the eastern end of the Kiamichi Mountain range on Cedar, Little Round, and Cow Creek mountains.

(ANHI 2003, Anthony 1993, Anthony 1995, Anthony et al. 2002, Anthony and Wicknick 1993, Atwill and Trauth 1988, Black and Dellinger 1938, Blair and Lindsay 1965, Burt 1935, Crump 2003, Crump et al. 2003a, 2003c, 2003d, 2003f, 2003p, Duncan and Highton 1979, Dunn and Heinze 1933, McAllister et al. 2002, ONHI 2003, Petranka 1998, Pope and Pope 1951, Reagan 1974a, Sievert 1986, Taylor et al. 1990, Thurow 1976, Trauth et al. 2004, Trauth and Wilhide 1999, USDA FS 1999, Wilson 1995)

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Plethodon sequoyah

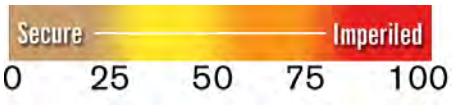
Sequoyah Slimy Salamander

Class: Amphibia

Order: Caudata

Family: Plethodontidae

Priority Score: **50** out of 100





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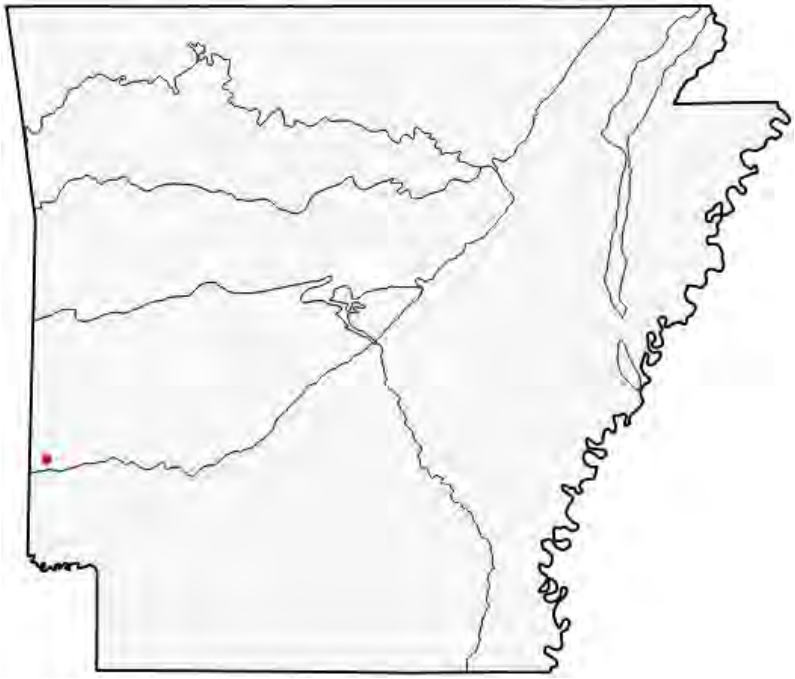
Population Trend: Unknown

Global Rank: G2 — Imperiled species

State Rank: S1 — Critically imperiled in Arkansas

Distribution

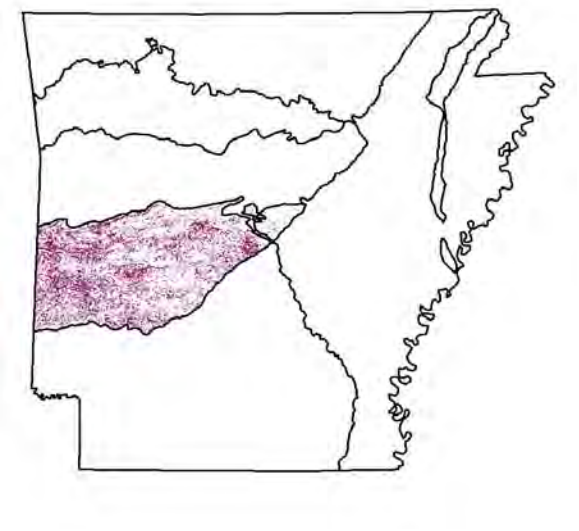
Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☐
- Boston Mountains ☐
- Arkansas Valley ☐
- Ouachita Mountains ☑
- South Central Plains ☐
- Mississippi Alluvial Plain ☐
- Mississippi Valley Loess Plain ☐

Habitat Map





Habitats

	Weight
Ozark-Ouachita Pine-Oak Forest/Woodland - Forest Condition	Suitable
West Gulf Coastal Plain Pine-Hardwood Forest/Woodland	Optimal

Problems Faced

POTENTIAL PROBLEMS: Habitat destruction, forestry practices.	Threat: Habitat destruction or conversion Source: Forestry activities

Data Gaps/Research Needs

Assess genetic composition of species boundaries in the Plethodon albagula-kiamichi-kisatchie complex.
Conduct distribution surveys using genetic analysis, due to similarity of appearance to other members of the species complex.

Conservation Actions

	Importance	Category
Acquire habitat.	High	Land Acquisition
Conduct controlled burns.	Medium	Fire Management
Eliminate timber harvest within known range.	High	Habitat Restoration/Improvement

Monitoring Strategies

More information is needed to develop a monitoring strategy.

Comments

The Sequoyah Slimy Salamander, as currently recognized, has a small range in southeastern Oklahoma and was reported from Sevier County, AR by Trauth and others (2004). Unpublished genetic data (D. Shepard, 2013) suggests that this may not be a valid taxon, and additional genetic sequence analysis is needed to resolve taxonomic status.

(ANHI 2003, Black and Sievert 1989, Highton 1989, Huntington and Stuhlman 1993, ONHI 2003, Trauth et al. 2004).

Taxa Association Team and Peer Reviewers

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Pseudacris illinoensis

Illinois Chorus Frog

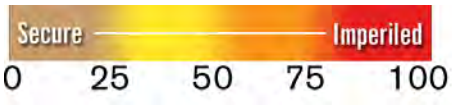


Class: Amphibia

Order: Anura

Family: Hylidae

Priority Score: **43** out of 100



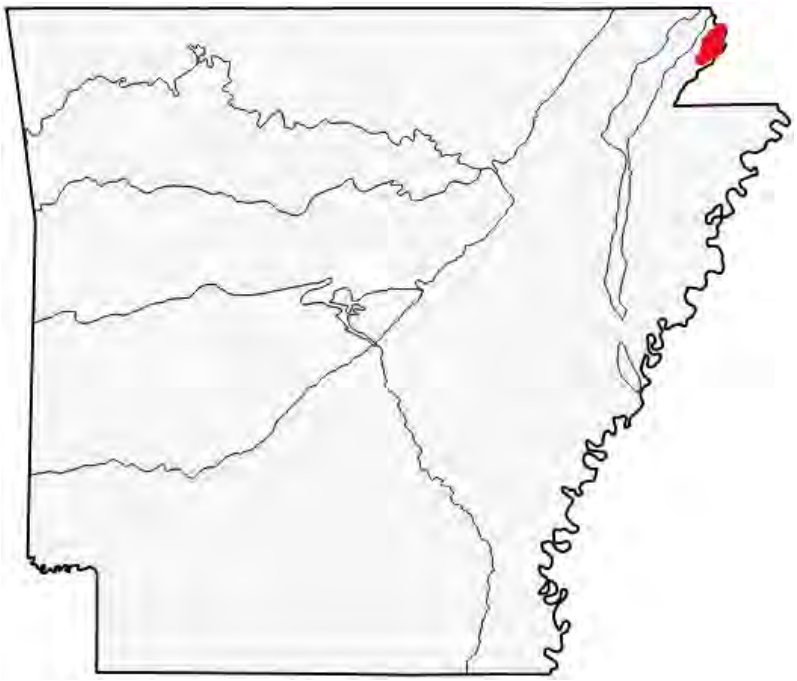
Population Trend: Decreasing

Global Rank: G3 — Vulnerable species

State Rank: S1 — Critically imperiled in Arkansas

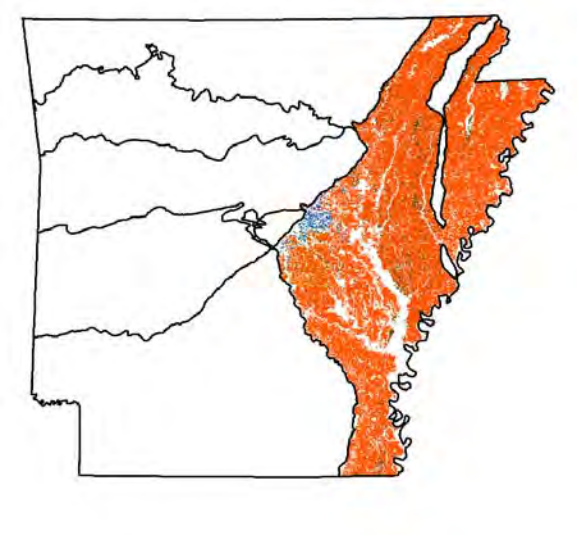
Distribution

Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☐
- Boston Mountains ☐
- Arkansas Valley ☐
- Ouachita Mountains ☐
- South Central Plains ☐
- Mississippi Alluvial Plain ☑
- Mississippi Valley Loess Plain ☐



Habitat Map



Habitats

Habitats	Weight
Crop Land	Marginal
Lower Mississippi Flatwoods Woodland and Forest	Data Gap
Pasture Land	Suitable

Problems Faced

KNOWN PROBLEMS: Habitat destruction, agricultural practices.	Threat: Habitat destruction Source: Agricultural practices
KNOWN PROBLEMS: Habitat destruction, agricultural practices.	Threat: Chemical alteration Source: Agricultural practices
Sustained laser leveling and well drilling accelerates habitat destruction and loss.	Threat: Habitat destruction Source:

Data Gaps/Research Needs

Reassess current population.

Conservation Actions

Conservation Actions	Importance	Category
Acquire land.	High	Habitat Restoration/Improvement
Restore ephemeral wetlands and sand prairie habitat.	High	Habitat Restoration/Improvement

Monitoring Strategies

Establish and implement long term monitoring protocol.

Pseudacris illinoensis
Illinois Chorus Frog

Comments

Trauth and others (2004) summarized the literature and biology of this species. The extremely limited range (found only in extreme eastern Clay County), coupled with extensive habitat loss (conversion of former alluvial sand prairie to intensive agricultural practices) threatens the continued existence of this frog in Arkansas.

(Johnson and others 2007, McCallum and Trauth 2001a, 2001b, McCallum and others 2001, McCallum and Trauth 2002, Moriarity and Cannatella 2004, Trauth and others 2004, Trauth and others 2007, Tucker 2000)

Taxa Association Team and Peer Reviewers

AGFC Kelly Irwin, UCA Don Shepard, Kory Roberts

Pseudacris maculata

Boreal Chorus Frog

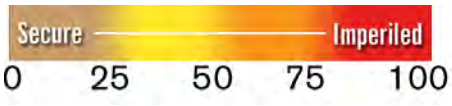


Class: Amphibia

Order: Anura

Family: Hylidae

Priority Score: **19** out of 100



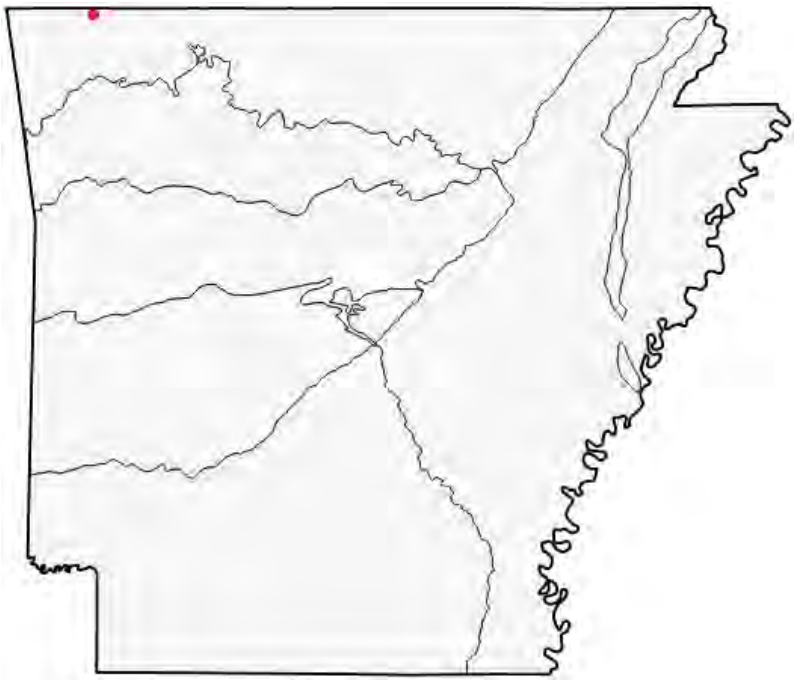
Population Trend: Unknown

Global Rank: G5 — Secure

State Rank: S2 — Imperiled in Arkansas

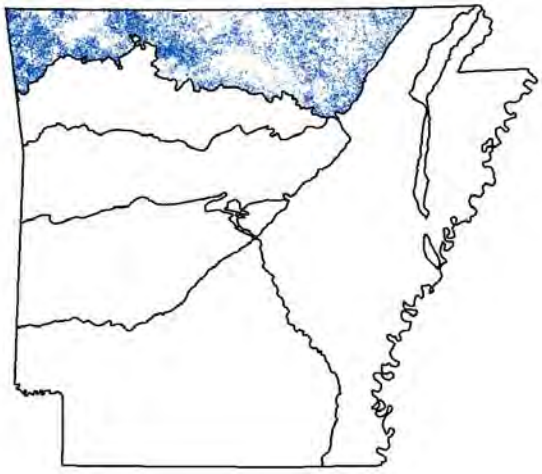
Distribution

Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☑
- Boston Mountains ☐
- Arkansas Valley ☐
- Ouachita Mountains ☐
- South Central Plains ☐
- Mississippi Alluvial Plain ☐
- Mississippi Valley Loess Plain ☐



Habitat Map



Habitats

	Weight
Ozark-Ouachita Prairie and Woodland	Optimal
Pasture Land	Suitable

Problems Faced

POTENTIAL PROBLEM: Habitat loss.	Threat: Habitat destruction or conversion Source: Urban development
POTENTIAL PROBLEM: Habitat loss.	Threat: Habitat destruction or conversion Source: Fire suppression

Data Gaps/Research Needs

Further distribution and abundance survey work needed.

Conservation Actions

	Importance	Category
Restore prairie habitat.	High	Habitat Restoration/Improvement
Use prescribed fire to improve prairie habitat.	High	Habitat Restoration/Improvement

Monitoring Strategies

More information is needed to develop a monitoring strategy.

Comments

This species was recently discovered in northwest Arkansas in Benton County.

(Collins 1993, Johnson 2000, Moriarity et al. 2007)

Taxa Association Team and Peer Reviewers

AGFC Kelly Irwin, UCA Don Shepard, Kory Roberts

Pseudacris streckeri

Strecker's Chorus Frog

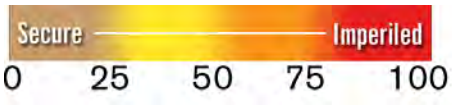


Class: Amphibia

Order: Anura

Family: Hylidae

Priority Score: **19** out of 100



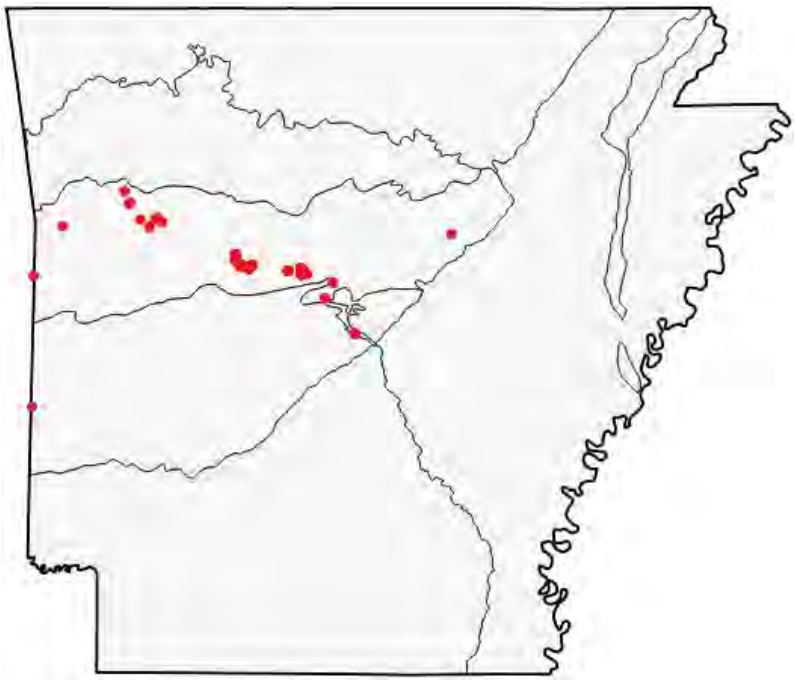
Population Trend: Unknown

Global Rank: G5 — Secure

State Rank: S2 — Imperiled in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☐
- Boston Mountains ☐
- Arkansas Valley ☑
- Ouachita Mountains ☐
- South Central Plains ☐
- Mississippi Alluvial Plain ☐
- Mississippi Valley Loess Plain ☐

Habitat Map





Habitats

Habitats	Weight
Crop Land	Marginal
Ozark-Ouachita Prairie and Woodland	Optimal
Pasture Land	Suitable

Problems Faced

KNOWN PROBLEMS: Habitat destruction, agricultural practices.	Threat: Habitat destruction Source: Agricultural practices

Data Gaps/Research Needs

Further distribution and abundance survey work is needed.

Conservation Actions

Conservation Actions	Importance	Category
Acquire habitat.	High	Land Acquisition
Restore ephemeral wetlands and sand prairies.	High	Habitat Restoration/Improvement

Monitoring Strategies

More information is needed to develop a monitoring strategy.

Comments

Inhabits sandy soil prairies of the Arkansas Valley and surrounding uplands. In spite of extensive loss of former alluvial valley prairie habitat, populations still persist along the Arkansas River Valley.

(ANHI 2003, Black and Dellinger 1938, Bragg 1942, Burt 1935, Butterfield et al. 1989, Conant and Collins 1998, Crump 2003, Crump et al. 2003a, 2003c, 2003d, 2003f, 2003p, Dowling 1957, Fesperman 1986, Hurter and Strecker 1909, Irwin and Irwin 2001, Parker 1947, Smith 1966a, Taylor 1935, Trauth et al. 1990, Trauth et al. 2004, Turnipseed and Shepherd 1985, USDA FS 1999, Wilson 1995)

Taxa Association Team and Peer Reviewers

AGFC Kelly Irwin, UCA Don Shepard, Kory Roberts

Scaphiopus holbrookii

Eastern Spadefoot

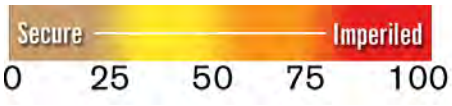


Class: Amphibia

Order: Anura

Family: Scaphiopodidae

Priority Score: **19** **out of 100**



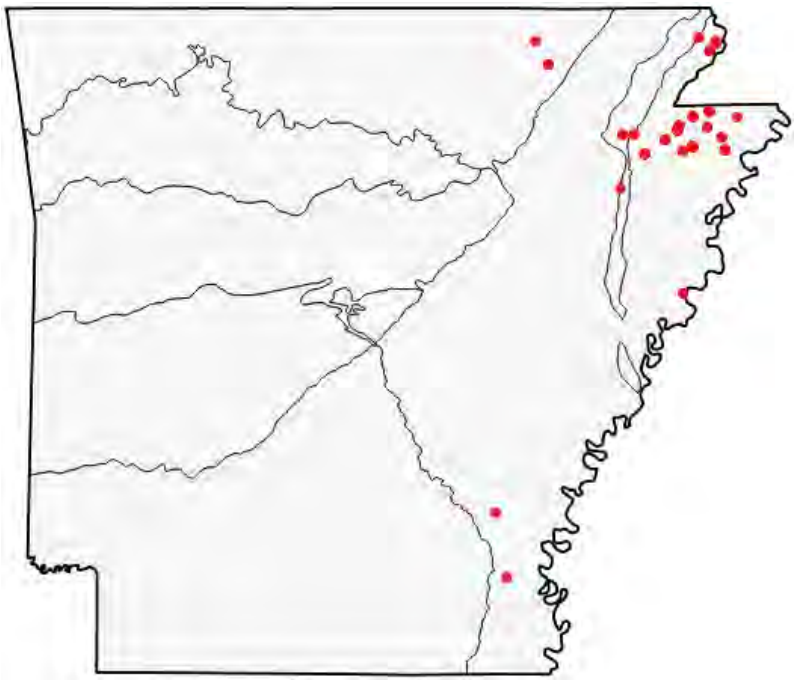
Population Trend: Unknown

Global Rank: G5 — Secure

State Rank: S2 — Imperiled in Arkansas

Distribution

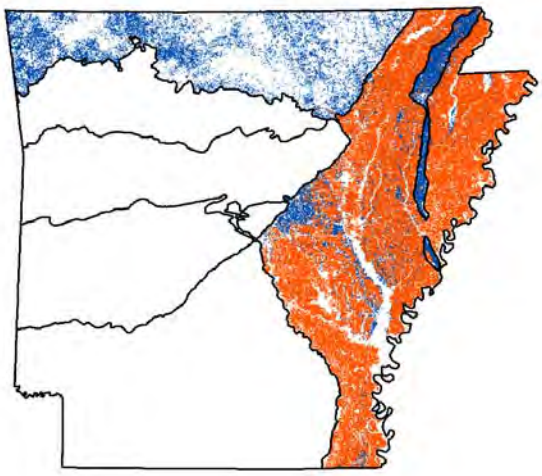
Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☑
- Boston Mountains ☐
- Arkansas Valley ☐
- Ouachita Mountains ☐
- South Central Plains ☐
- Mississippi Alluvial Plain ☑
- Mississippi Valley Loess Plain ☑

Habitat Map





Habitats

	Weight
Crop Land	Marginal
Crowley's Ridge Loess Slope Forest	Suitable
Lower Mississippi Alluvial Plain Grand Prairie	Suitable
Lower Mississippi Flatwoods Woodland and Forest	Suitable
Pasture Land	Suitable

Problems Faced

POTENTIAL PROBLEMS: Habitat destruction, agricultural practices.	Threat: Habitat destruction Source: Agricultural practices

Data Gaps/Research Needs

Further distribution and abundance survey work needed.

Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

More information is needed to develop a monitoring strategy.

Scaphiopus holbrookii
Eastern Spadefoot

Comments

Trauth and others (2004) summarized the literature and biology of this frog.

Taxa Association Team and Peer Reviewers

AGFC Kelly Irwin, UCA Don Shepard, Kory Roberts

Scaphiopus hurterii

Hurter's Spadefoot

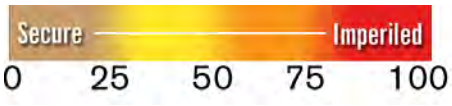


Class: Amphibia

Order: Anura

Family: Scaphiopodidae

Priority Score: **19** **out of 100**



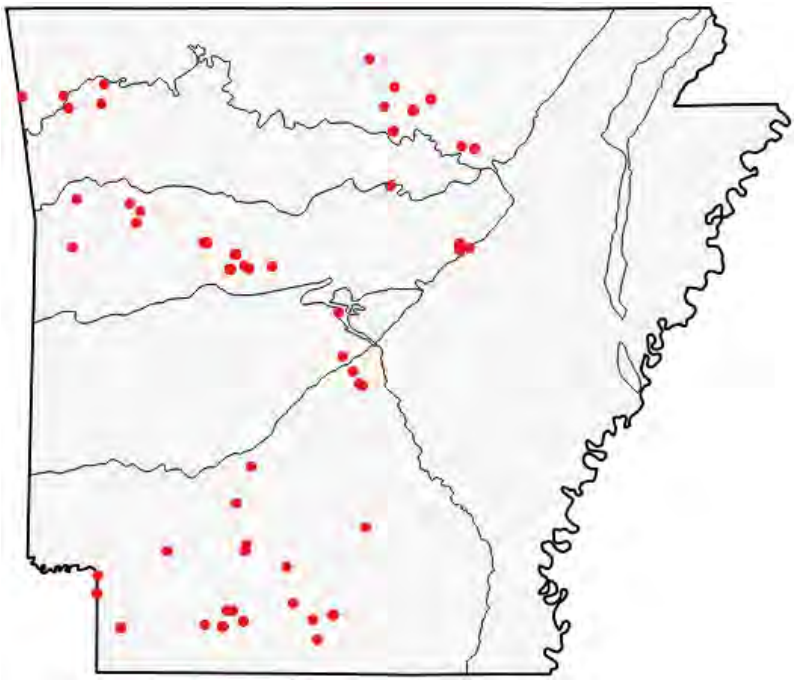
Population Trend: Unknown

Global Rank: G5 — Secure

State Rank: S2 — Imperiled in Arkansas

Distribution

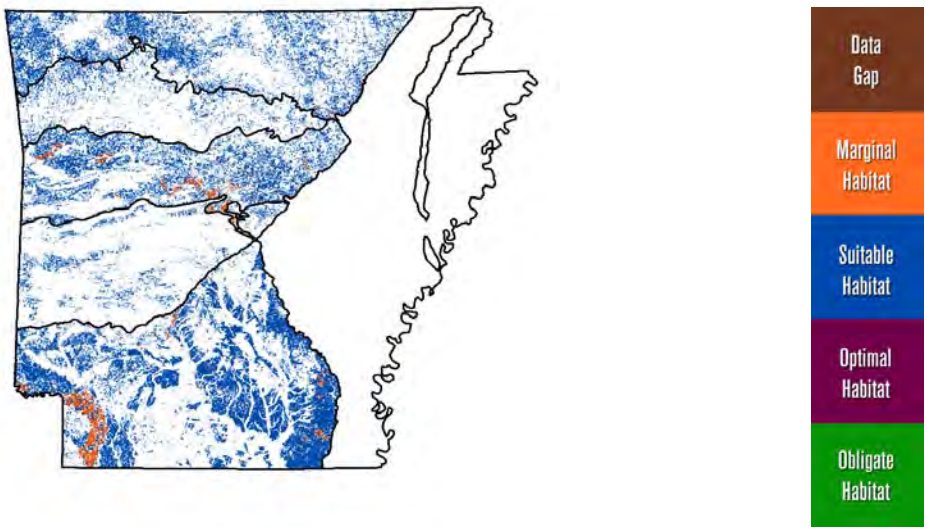
Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☑
- Boston Mountains ☑
- Arkansas Valley ☑
- Ouachita Mountains ☑
- South Central Plains ☑
- Mississippi Alluvial Plain ☐
- Mississippi Valley Loess Plain ☐

Habitat Map



Habitats	Weight
Crop Land	Marginal
Ozark-Ouachita Prairie and Woodland	Optimal
Pasture Land	Suitable
West Gulf Coastal Plain Pine-Hardwood Flatwoods	Suitable
West Gulf Coastal Plain Sandhill Oak and Shortleaf Pine Forest and Woodland	Suitable

Problems Faced

POTENTIAL PROBLEMS: Habitat destruction.	Threat: Habitat destruction Source: Agricultural practices
POTENTIAL PROBLEMS: Habitat destruction.	Threat: Habitat destruction Source: Forestry activities

Data Gaps/Research Needs

Further distribution and abundance survey work needed.

Conservation Actions	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

More information is needed to develop a monitoring strategy.

Comments

Trauth and others (2004) summarized the literature and biology of this frog.

Taxa Association Team and Peer Reviewers

AGFC Kelly Irwin, UCA Don Shepard, Kory Roberts

Spea bombifrons

Plains Spadefoot

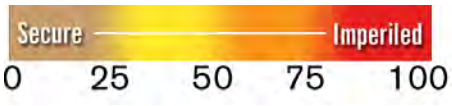


Class: Amphibia

Order: Anura

Family: Scaphiopodidae

Priority Score: **23** **out of 100**



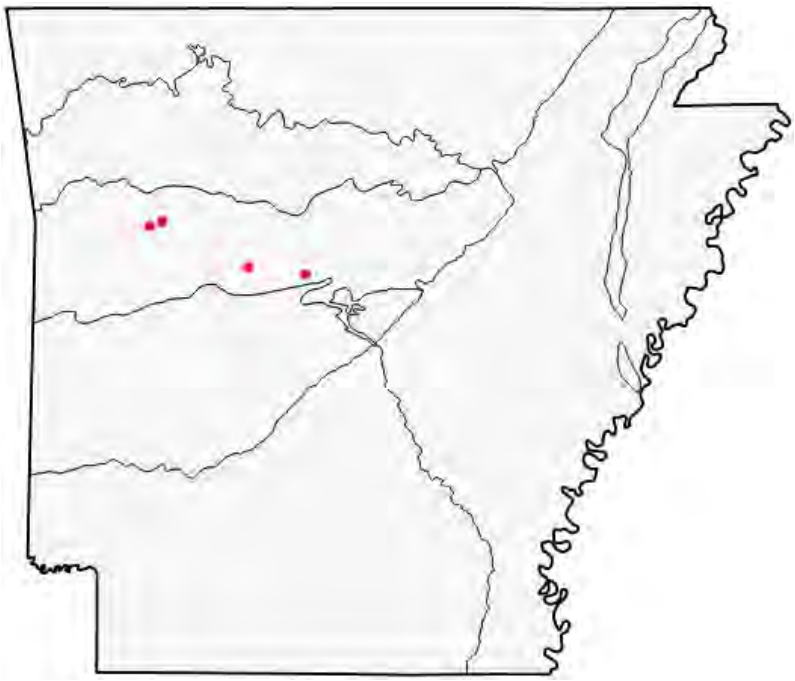
Population Trend: Unknown

Global Rank: G5 — Secure

State Rank: S1 — Critically imperiled in Arkansas

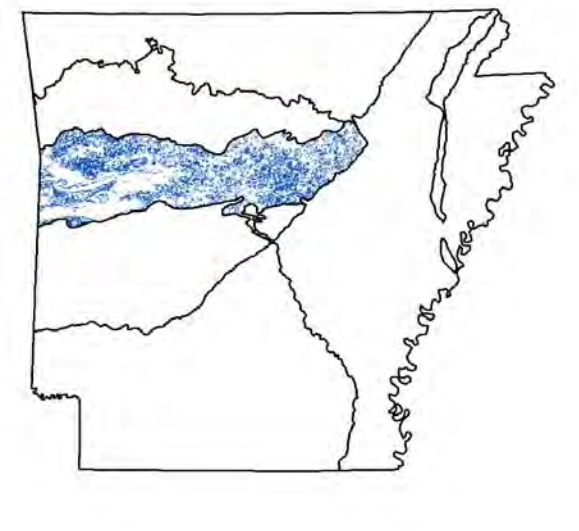
Distribution

Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☐
- Boston Mountains ☐
- Arkansas Valley ☑
- Ouachita Mountains ☐
- South Central Plains ☐
- Mississippi Alluvial Plain ☐
- Mississippi Valley Loess Plain ☐



Habitat Map



Habitats

	Weight
Ozark-Ouachita Prairie and Woodland	Optimal
Pasture Land	Suitable

Problems Faced

Threat: Habitat destruction
Source: Agricultural practices

Data Gaps/Research Needs

Further distribution and abundance survey work needed.

Conservation Actions

	Importance	Category
Acquire habitat.	Medium	Land Acquisition
Restore ephemeral wetlands.	Medium	Habitat Restoration/Improvement

Monitoring Strategies

More information is needed to develop a monitoring strategy.

Comments

Trauth and others (2004) summarized the literature and biology of this frog. An inhabitant of the former alluvial prairie of the Arkansas River floodplain, this species is restricted to a few known sites in an agriculturally dominated landscape.

Taxa Association Team and Peer Reviewers

AGFC Mr. Kelly Irwin, ASU Dr. Stan Trauth

Accipiter striatus

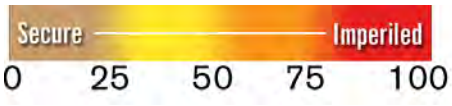
Sharp-shinned Hawk

Class: Aves

Order: Accipitriformes

Family: Accipitridae

Priority Score: **19** **out of 100**



Population Trend: Decreasing

Residence: Breeding

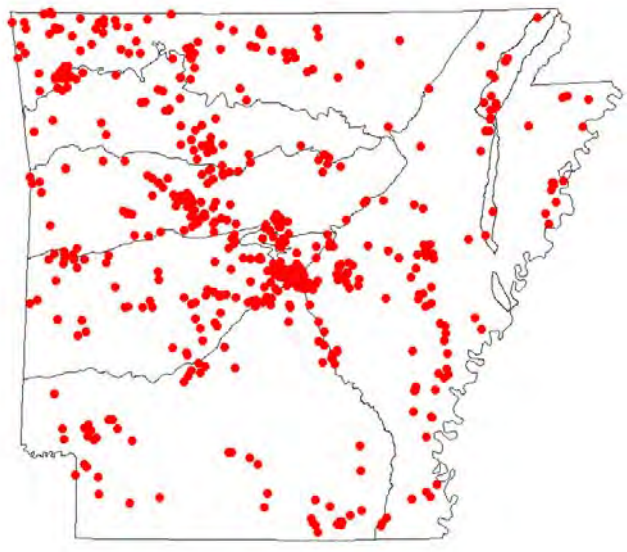
Global Rank: G5 — Secure

State Rank: S3 — Vulnerable in Arkansas



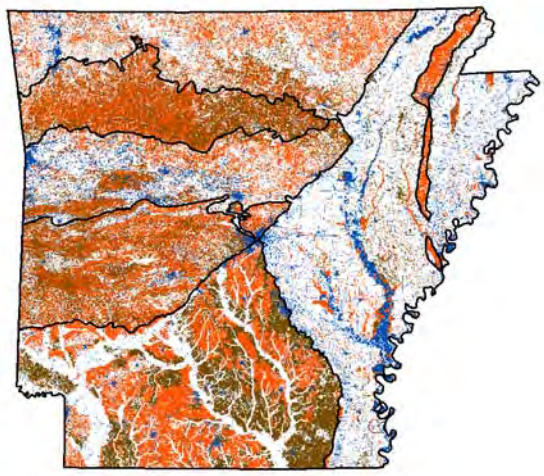
Distribution

Occurrence Records



Ecoregions where the species occurs:

- ☑ Ozark Highlands
- ☑ Boston Mountains
- ☑ Arkansas Valley
- ☑ Ouachita Mountains
- ☑ South Central Plains
- ☑ Mississippi Alluvial Plain
- ☑ Mississippi Valley Loess Plains



Habitat Map



Habitats	Weight
Crowley's Ridge Loess Slope Forest	Marginal
Cultivated Forest	Suitable
Lower Mississippi Flatwoods Woodland and Forest	Marginal
Lower Mississippi River Bottomland Depression	Marginal
Lower Mississippi River Dune Woodland, Pond, and Forest	Marginal
Lower Mississippi River High Bottomland Forest	Suitable
Lower Mississippi River Low Bottomland Forest	Marginal
Ozark-Ouachita Dry Oak and Pine Woodland	Marginal
Ozark-Ouachita Dry-Mesic Oak Forest/Woodland	Marginal
Ozark-Ouachita Forested Seep	Marginal
Ozark-Ouachita Mesic Hardwood Forest	Suitable
Ozark-Ouachita Pine-Bluestem Woodland	Marginal
Ozark-Ouachita Pine-Oak Forest/Woodland - Woodland Condition	Suitable
Ozark-Ouachita Prairie and Woodland	Marginal
Urban/Suburban	Suitable
West Gulf Coastal Plain Pine-Hardwood Flatwoods	Data Gap
West Gulf Coastal Plain Pine-Hardwood Forest/Woodland	Data Gap
West Gulf Coastal Plain Sandhill Oak and Shortleaf Pine Forest/Woodland	Data Gap

Accipiter striatus
Sharp-shinned Hawk

Problems Faced

KNOWN PROBLEM: Collisions with windows near bird feeders.	Threat: Collision with man-made structures Source: Recreation
POTENTIAL PROBLEM: Mortality and lowered reproductive success due to pesticides, toxins, and heavy metals.	Threat: Toxins/contaminants Source: Municipal/Industrial point source
POTENTIAL PROBLEM: Mortality and lowered reproductive success due to pesticides, toxins, and heavy metals.	Threat: Toxins/contaminants Source: Agricultural practices
POTENTIAL PROBLEM: Mortality and lowered reproductive success due to pesticides, toxins, and heavy metals.	Threat: Toxins/contaminants Source: Non-point source pollution

Data Gaps/Research Needs

Determine the effect of forest management practices and habitat degradation due to agriculutural and urban/suburban development on foraging, wintering, and breeding habitat.
Determine the effect of logging on nest locations and the use of buffers, including appropriate buffer diameter, around nest sites.
Determine the effects of prescribed fire on nesting habitat.
Information is needed on breeding distribution and abundance.

Conservation Actions

	Importance	Category
Reduce window collisions near bird feeding stations.	Medium	Threat Abatement
Reduce window collisions near bird feeding stations.	Medium	Public Relations/Education

Monitoring Strategies

This species is rarely seen during the breeding season outside of forest canopies, making it one of the most difficult raptors to census in Arkansas. Monitoring should include encouraging birders to search for nests in specific woodland habitats, especially mature dense pine stands and mixed pine-hardwood forests, and to report sightings and nests to the Arkansas Audubon Society Rare Bird Report and eBird.

Comments

Sharp-shinned Hawks are rarely-seen nesters that breed mainly in large stands of decidous, coniferous, and mixted pine-hardwood forests and pine plantations. Often referred to by Arkansans as the "Blue Darter," sharp-shinned hawks feed primarily on small birds. The size of a Blue Jay, these small accipiters are built for bursts of speed with a long narrow tail and short, round wings. They are often observed capturing prey at backyard bird feeders, often to the dismay of homeowners. Little is known about the distribution of and impacts of forest management on "sharpies" in Arkansas.

(Douglas and Neal 1986, Bildstein and Meyer 2000)

Taxa Association Team and Peer Reviewers

AGFC Ms. Karen Rowe, ANHC Mr. Bill Holimon, USFWS-retired Mr. Allan Mueller, Audubon Arkansas Dr. Dan Scheiman, AGFC Mr. Dick Baxter, USFS Mr. Leif Anderson, USGS Dr. David Krementz, ASU Dr. Than Boves, ATU Dr. Chris Kellner, UA Dr. Kim Smith, UAM Dr. Doug Osborne, AGFC Mr. Garrick Dugger, AGFC Mr. Bubba Groves, AGFC Ms. Allison Fowler, USFWS Mr. Mike Budd, USFWS Ms. Erin Knoll, USFS Mr. Steve Duzan

Aimophila ruficeps

Rufous-crowned Sparrow

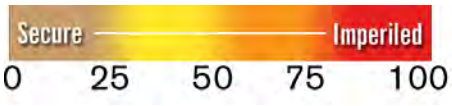


Class: Aves

Order: Passeriformes

Family: Emberizidae

Priority Score: **23** **out of 100**



Population Trend: Stable

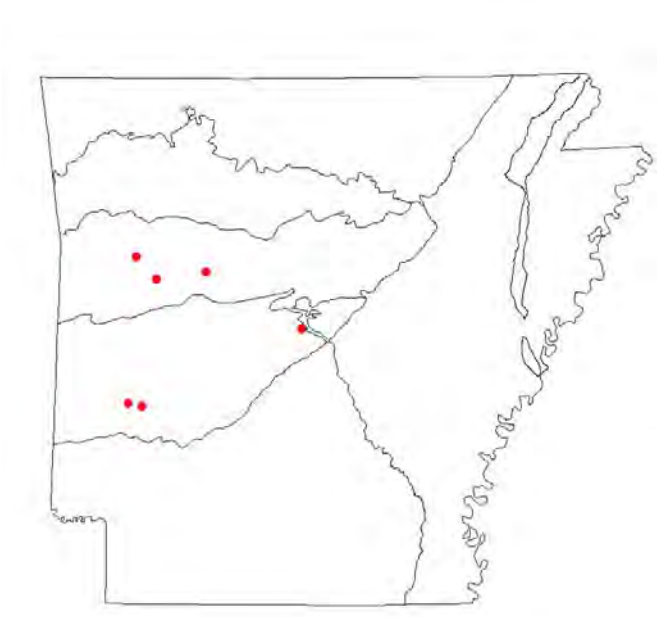
Residence: Breeding

Global Rank: G5 — Secure

State Rank: S1 — Critically imperiled in Arkansas

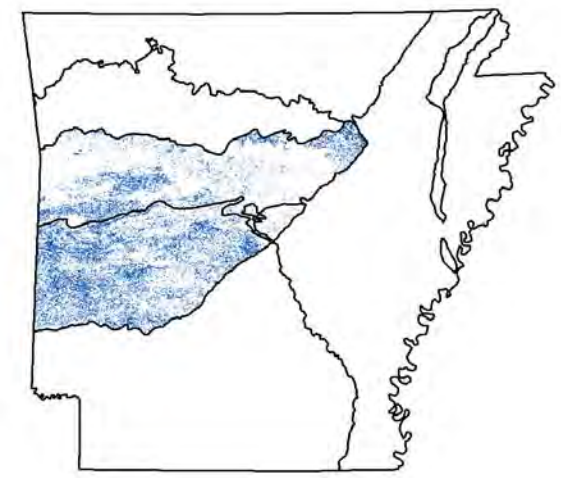
Distribution

Occurrence Records



Ecoregions where the species occurs:

- ☐ Ozark Highlands
- ☐ Boston Mountains
- ☑ Arkansas Valley
- ☑ Ouachita Mountains
- ☐ South Central Plains
- ☐ Mississippi Alluvial Plain
- ☐ Mississippi Valley Loess Plains



Habitat Map



Habitats

	Weight
Interior Highlands Dry Acidic Glade and Barrens	Suitable

Problems Faced

KNOWN PROBLEM: Loss of habitat due to fire suppression.	Threat: Alteration of natural fire regimes Source: Fire suppression

Data Gaps/Research Needs

Determine the effects of fire or mechanical thinning on populations.

Conservation Actions

	Importance	Category
Conduct prescribed burns.	Medium	Habitat Restoration/Improvement
Thin forests and maintain scrub habitat along blufflines.	Medium	Habitat Restoration/Improvement

Monitoring Strategies

The Partners in Flight North American Landbird Conservation Plan indicates that long-term population trend monitoring for this species is generally considered adequate, but some issues, such as bias, may not have been accounted for. However, because this species is so secretive and habitat-specific, targeted monitoring is required, e.g. use of playback to elecit a response. The single remaining populationin the state, located on Mount Magazine, should be monitored annually.Continue tracking of this species by the Arkansas Natural Heritage Commission.

Comments

Primarily a bird of the southwestern US and Mexico, this species has been found on a few mountaintops in central and western Arkansas, along south-facing bluff lines where open forest mixed with grass and rocky outcrops provides preferred habitat. Mount Magazine (Logan Co.) is currently the only occupied site in the state and is the species' eastern-most breeding population range wide. Previously occupied sites were: Pinnacle Mountain (Pulaski Co.), Mount Nebo (Yell Co.), Horseshoe Mountain (Franklin Co.), Redland Mountain (Pike Co.), and Paul Mountain (Montgomery Co.). Habitat restoration efforts should focus on these or similar sites. Isolated populations in Arkansas and elswhere in the species's range suggest it has good dispersal abilities and thus the potential to recolonize following restoration. However, the shy and secretive nature of this species makes it difficult to study. (Arkansas Audubon Society 2012, Collins 1999, eBird 2014, Hamel 1992, James and Neal 1986, Martin and Finch 1995, National Audubon Society 2002, Rich and others 2004, Sauer and others 2004)

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Ammodramus henslowii

Henslow's Sparrow

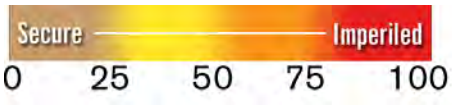


Class: Aves

Order: Passeriformes

Family: Emberizidae

Priority Score: **33** **out of 100**



Population Trend: Decreasing

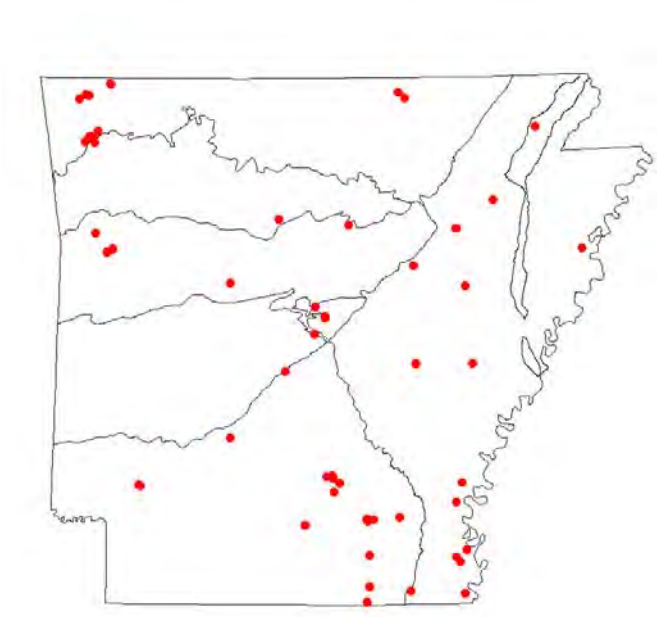
Residence: Permanent

Global Rank: G4 — Apparently secure species

State Rank: S1B,S2N — Critically imperiled breeding, imperiled nonbreeding species in Arkansas

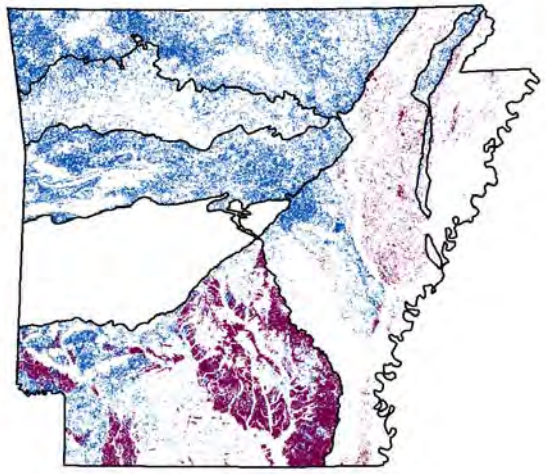
Distribution

Occurrence Records



Ecoregions where the species occurs:

- [x] Ozark Highlands
- [x] Boston Mountains
- [x] Arkansas Valley
- [ ] Ouachita Mountains
- [x] South Central Plains
- [x] Mississippi Alluvial Plain
- [x] Mississippi Valley Loess Plains



Habitat Map



Habitats

	Weight
Lower Mississippi Alluvial Plain Grand Prairie	Suitable
Ozark-Ouachita Prairie and Woodland	Optimal
Pasture Land	Suitable
West Gulf Coastal Plain Calcareous Prairie and Woodland	Suitable
West Gulf Coastal Plain Pine-Hardwood Flatwoods	Optimal

Problems Faced

KNOWN PROBLEM: Habitat loss due to conversion of pasture and hayfields to other uses.	Threat: Habitat destruction or conversion Source: Agricultural practices
KNOWN PROBLEM: Habitat loss due to natural succession related to fire suppression.	Threat: Habitat destruction or conversion Source: Fire suppression
KNOWN PROBLEMS: Nest failure from destruction of nests due to earlier and more frequent haying.	Threat: Biological alteration Source: Agricultural practices
POTENTIAL PROBLEM: Habitat loss due to urbanization.	Threat: Habitat destruction or conversion Source: Urban development

Data Gaps/Research Needs

Surveys for breeding Henslow's Sparrows need to be conducted in grasslands over a wider area in the Arkansas Valley and the Ozarks.

Conservation Actions

Conservation Actions	Importance	Category
Acquire important tracts to provide increased block size and connectivity of grassland habitat.	High	Land Acquisition
Disturb grasslands every 2-4 years.	High	Fire Management
Establish large blocks of grassland habitat.	High	Habitat Restoration/Improvement
Establish large blocks of grassland habitat.	High	Habitat Restoration/Improvement
Restore native grasslands.	Medium	Habitat Restoration/Improvement

Monitoring Strategies

Known populations should be monitored periodically to assess population trends. Surveys should be conducted in potential breeding and wintering habitat to search for additional populations. Continue tracking of this species by the Arkansas Natural Heritage Commission.

Comments

Small breeding season populations of Henslow's sparrows occur in tallgrass prairie remnants of northwest Arkansas. Protection, management, or restoration of privately owned tracts of tallgrass prairie through farm bill programs or other means would likely increase available breeding habitat. Larger populations occur in the winter in southern Arkansas, with the greatest number observed in saline glades within pine flatwoods of the Ouachita Terraces. Restoration of pine flatwoods structure to savanna and open woodlands may provide additional winter habitat, as would increased protection, management or restoration of calcareous prairie in southwestern portions of the state. (Arkansas Audubon Society 2012, Bechtoldt and Stouffer. 2005, Cooper 2007, Herkert and others 2002, Hamel 1992, Holimon and others 2004, Holimon and others 2008, James and Neal 1986, Martin and Finch 1995, National Audubon Society 2002, Rich and others 2004, Sauer and others 2004)

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Ammodramus leconteii

Le Conte's Sparrow

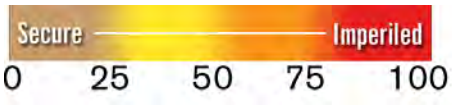


Class: Aves

Order: Passeriformes

Family: Emberizidae

Priority Score: 21 **out of 100**



Population Trend: Decreasing

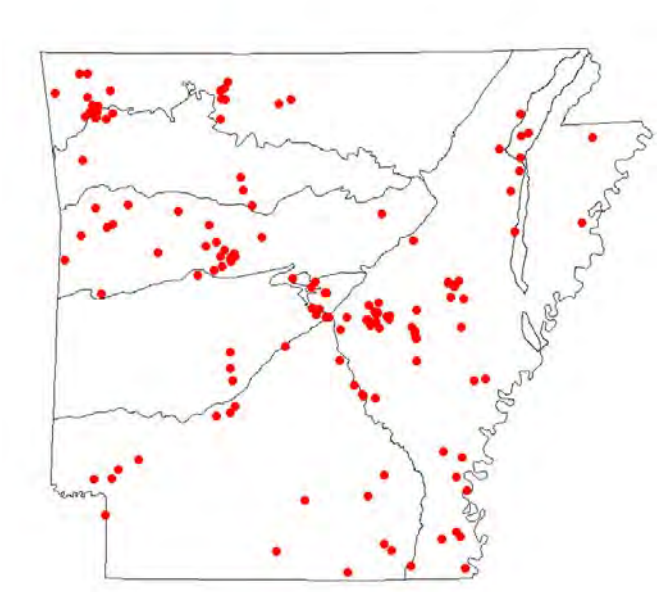
Residence: Winter

Global Rank: G4 — Apparently secure species

State Rank: S3S4N — Vulnerable nonbreeding species in Arkansas (uncertain rank)

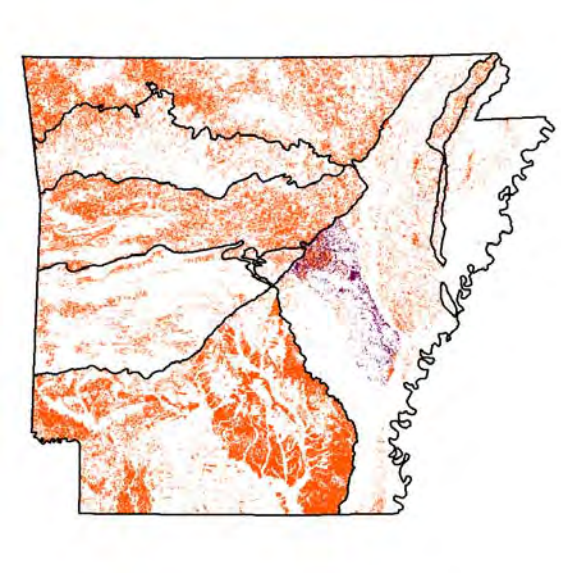
Distribution

Occurrence Records



Ecoregions where the species occurs:

- ☑ Ozark Highlands
- ☑ Boston Mountains
- ☑ Arkansas Valley
- ☑ Ouachita Mountains
- ☑ South Central Plains
- ☑ Mississippi Alluvial Plain
- ☑ Mississippi Valley Loess Plains



Habitat Map



Habitats	Weight
Lower Mississippi Alluvial Plain Grand Prairie	Optimal
Ozark-Ouachita Prairie and Woodland	Optimal
Pasture Land	Marginal
West Gulf Coastal Plain Calcareous Prairie and Woodland	Optimal
West Gulf Coastal Plain Pine-Hardwood Flatwoods	Marginal

Problems Faced

KNOWN PROBLEM: Loss and degradation of wetland habitats.	Threat: Habitat destruction Source: Agricultural practices
KNOWN PROBLEM: Loss and degradation of wetland habitats.	Threat: Habitat destruction Source: Urban development
KNOWN PROBLEM: Loss of habitat due to conversion to agriculture.	Threat: Habitat destruction or conversion Source: Agricultural practices
KNOWN PROBLEM: Loss of mesic grasslands, succession due to lack of periodic disturbance.	Threat: Habitat destruction or conversion Source: Fire suppression

Data Gaps/Research Needs

Survey grasslands in winter and during migration.

Conservation Actions

Conservation Actions	Importance	Category
Acquire important tracts to provide increased block size and connectivity of grassland habitat.	Medium	Land Acquisition
Burn grasslands every 2-4 years.	High	Fire Management
Establish large blocks of grassland habitat.	High	Habitat Restoration/Improvement
Mow or hay every 2-4 years; avoid annual disturbance regimes.	Medium	Habitat Restoration/Improvement
Restore native grasslands.	Medium	Habitat Restoration/Improvement

Monitoring Strategies

Expand efforts to locate and survey potential wintering habitat for this species.

Comments

Like other grassland specialists, populations are probably declining due to a lack of habitat. Its quiet and secretive nature make it difficult to study, especially on its winter range. Grassland habitat can be maintained or enhanced through treatments such as haying, grazing, and burning or combinations thereof, though annual disturbance management should be avoided because it reduces dense litter favored by this species. This species would benefit from farm bill program projects that protect, restore, and manage grasslands. (Arkansas Audubon Society 2012, Dechant and others 2003, Hamel 1992, James and Neal 1986, Lowther 2005, Martin and Finch 1995, National Audubon Society 2002, Rich and others 2004, Sauer and others 2004)

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Ammodramus savannarum

Grasshopper Sparrow

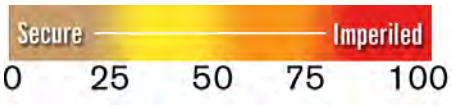


Class: Aves

Order: Passeriformes

Family: Emberizidae

Priority Score: **19** **out of 100**



Population Trend: Decreasing

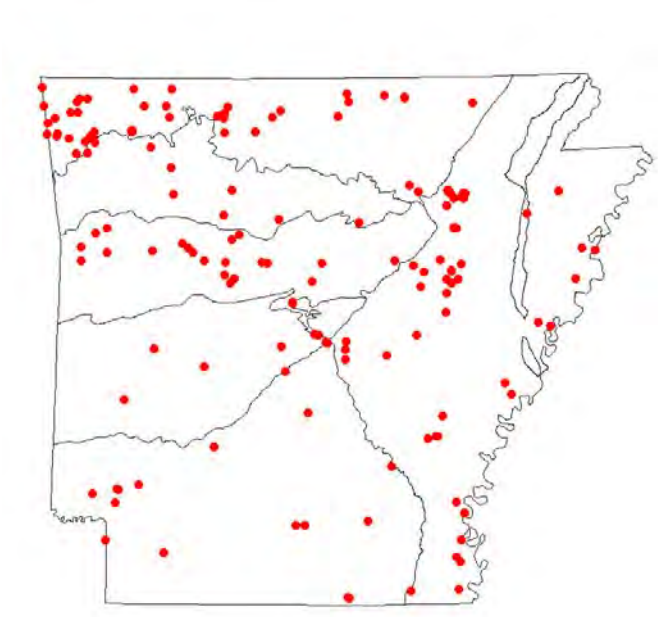
Residence: Breeding

Global Rank: G5 — Secure

State Rank: S3B — Vulnerable breeding species in Arkansas

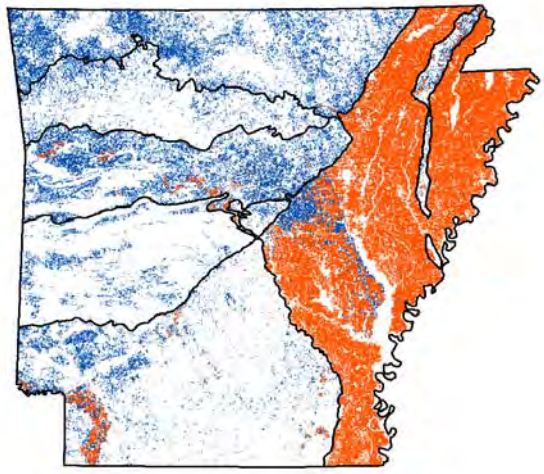
Distribution

Occurrence Records



Ecoregions where the species occurs:

- ☑ Ozark Highlands
- ☑ Boston Mountains
- ☑ Arkansas Valley
- ☑ Ouachita Mountains
- ☑ South Central Plains
- ☑ Mississippi Alluvial Plain
- ☑ Mississippi Valley Loess Plains



Habitat Map



Habitats	Weight
Crop Land	Marginal
Lower Mississippi Alluvial Plain Grand Prairie	Suitable
Ozark-Ouachita Prairie and Woodland	Optimal
Pasture Land	Suitable
West Gulf Coastal Plain Calcareous Prairie and Woodland	Suitable

Problems Faced

KNOWN PROBLEM: Habitat disturbance and nest failure from earlier and more frequent haying.	Threat: Habitat disturbance Source: Agricultural practices
KNOWN PROBLEM: Habitat disturbance from heavy grazing.	Threat: Habitat disturbance Source: Grazing/Browsing
KNOWN PROBLEM: Habitat loss from conversion of grassland to cropland.	Threat: Habitat destruction or conversion Source: Agricultural practices
KNOWN PROBLEM: Habitat loss from urbanization.	Threat: Habitat destruction or conversion Source: Urban development

Data Gaps/Research Needs

Additional grassland surveys.

Conservation Actions

Conservation Actions	Importance	Category
Acquire important tracts to increase block size and connectivity of grassland habitat.	Medium	Land Acquisition
Conduct prescribed burning.	High	Fire Management
Maintain habitat with light to moderate grazing or haying.	Medium	Habitat Restoration/Improvement
Protect and manage grassland habitat.	High	Habitat Protection
Restoration of native grasslands.	Medium	Habitat Restoration/Improvement

Monitoring Strategies

The Partners in Flight North American Landbird Conservation Plan indicates that long-term population trend monitoring for this species is generally considered adequate, but some issues, such as bias, may not have been accounted for. Continue to conduct Breeding Bird Surveys at all routes established in Arkansas. Expand efforts to locate and survey potential breeding habitat.

Comments

Grasshopper sparrows favor fairly open grasslands and prairies with bare or open ground for feeding and little shrub cover. Loss of native herbivores has resulted in less favorable habitat in prairie remnants than that which occurred historically. The largest known Arkansas population is on Fort Chaffee next to the Arrowhead Landing Strip, where open soil conditions within tallgrass prairie have been maintained, possibly through a combination of soil type and occasional mechanical disturbance. It also nests in open pasture land across the state that is not overgrazed. Promote farm bill projects that protect, restore, and manage grassland habitats. (Arkansas Audubon Society 2012, Hamel 1992, James and Neal 1986, Martin and Finch 1995, National Audubon Society 2002, Rich and others 2004, Sauer and others 2004, Vickery 1996)

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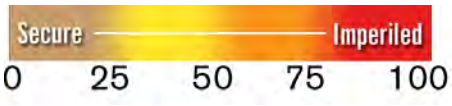
Anas rubripes

American Black Duck



Class: Aves
Order: Anseriformes
Family: Anatidae

Priority Score: **19** **out of 100**



Population Trend: Stable

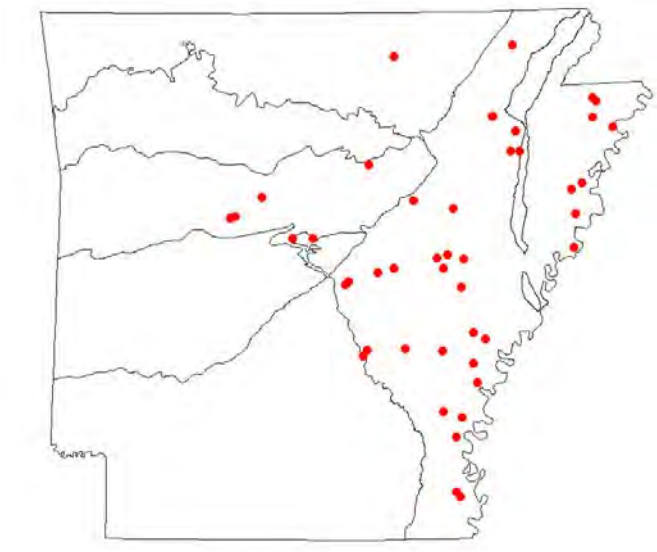
Residence: Winter

Global Rank: G5 — Secure

State Rank: S2N — Imperiled nonbreeding species in Arkansas

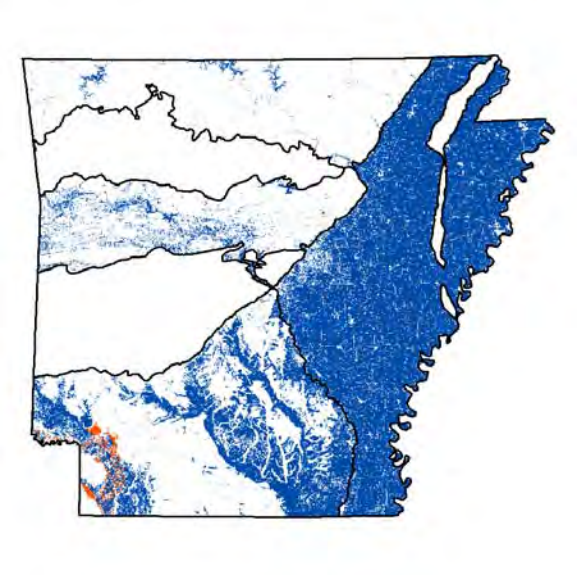
Distribution

Occurrence Records



Ecoregions where the species occurs:

- [x] Ozark Highlands
- [ ] Boston Mountains
- [x] Arkansas Valley
- [ ] Ouachita Mountains
- [x] South Central Plains
- [x] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains



Habitat Map



Habitats	Weight
Crop Land	Suitable
Lower Mississippi Alluvial Plain Grand Prairie	Suitable
Lower Mississippi Flatwoods Woodland and Forest	Suitable
Lower Mississippi River Bottomland Depression	Suitable
Lower Mississippi River High Bottomland Forest	Suitable
Lower Mississippi River Low Bottomland Forest	Suitable
Lower Mississippi River Riparian Forest	Suitable
Ponds, Lakes, and Water Holes	Suitable
West Gulf Coastal Plain Large River Floodplain Forest	Suitable
West Gulf Coastal Plain Red River Floodplain Forest	Marginal
West Gulf Coastal Plain Wet Hardwood Flatwoods	Suitable

Anas rubripes
American Black Duck

Problems Faced

KNOWN PROBLEM: Loss and degradation of wetlands and coastal salt marshes on wintering grounds.	Threat: Habitat destruction or conversion Source: Urban development
KNOWN PROBLEM: Loss and degradation of wetlands and coastal salt marshes on wintering grounds.	Threat: Habitat destruction or conversion Source: Municipal/Industrial point source
KNOWN PROBLEM: Loss and degradation of wetlands and coastal salt marshes on wintering grounds.	Threat: Habitat destruction or conversion Source: Recreation
KNOWN PROBLEM: Loss and degradation of wetlands on breeding grounds.	Threat: Habitat destruction or conversion Source: Resource extraction
KNOWN PROBLEM: Loss and degradation of wetlands on breeding grounds.	Threat: Habitat destruction or conversion Source: Commercial/industrial development
KNOWN PROBLEM: Loss and degradation of wetlands on breeding grounds.	Threat: Habitat destruction or conversion Source: Forestry activities
KNOWN PROBLEM: Loss and degradation of wetlands on breeding grounds.	Threat: Habitat destruction or conversion Source: Agricultural practices
POTENTIAL PROBLEM: Hybridization with mallards. Mallards have expanded in range and abundance.	Threat: Biological alteration Source: Interspecific competiton

Data Gaps/Research Needs

No data gaps or research needs were identified at the state level.

Conservation Actions

	Importance	Category
Protect wetlands.	High	Habitat Protection
Restore and/or enhance wetlands.	High	Habitat Restoration/Improvement

Monitoring Strategies

Record occasional observations during mid-winter waterfowl surveys and periodic aerial waterfowl surveys.

Comments

The American Black Duck was once the most abundant dabbling duck species in eastern North America but populations experienced a drastic decline (>50%) between the 1950s and 1990s. Winter inventories continue to indicate a stable or slightly declining population while breeding population estimates from 1990-2010 suggest a stable population. In contrast, demographic data suggest declining productivity between 1997 and 2007 (Devers and Collins 2011). Harvest restrictions were implemented in 1983 and 1984 in the U.S. and Canada, respectively, and harvest rates decreased (Francis et al. 1998). However, these data do not indicate that harvest was the only or primary cause of the black duck decline (Rusch et al. 1989). Currently, harvest is managed according to the Black Duck Adaptive Harvest Management framework, the goals of which are to: 1) maintain a black duck population that meets legal mandates and provides consumptive and non-consumptive use commensurate with habitat carrying capacity; 2) maintain societal values associated with the hunting tradition; and, 3) maintain equitable access to the black duck resources between and within the U.S. and Canada (USFWS 2014). American Black Ducks and Mallards are very similar genetically and ecologically thus setting the stage for competition, and field and laboratory studies provide circumstantial evidence of competition (Conroy et al. 2002). However, it is unclear if the increase in Mallards is the ultimate or proximate cause of the black duck decline or simply a concurrent event (Devers and Collins 2011). While research and monitoring projects to address key information needs are ongoing, habitat conservation efforts are focused on protection, restoration and enhancement of key lands on the breeding grounds, migration routes and wintering grounds (Devers and Collins 2011).

Taxa Association Team and Peer Reviewers

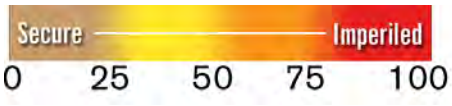
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Anhinga anhinga

Anhinga

Class: Aves
Order: Pelecaniformes
Family: Anhingidae

Priority Score: **19** **out of 100**

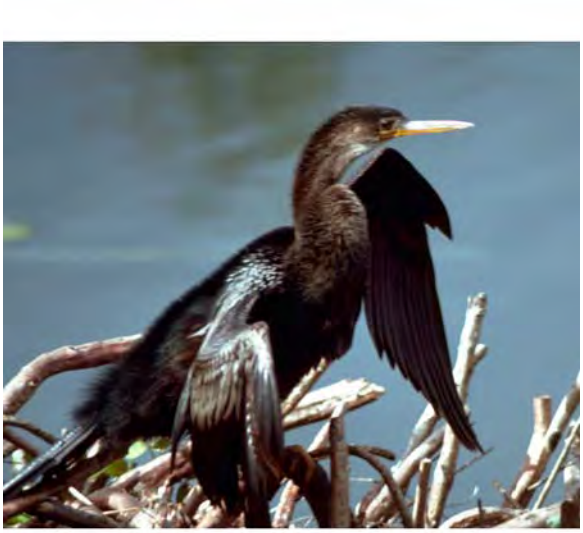


Population Trend: Stable

Residence: Breeding

Global Rank: G5 — Secure

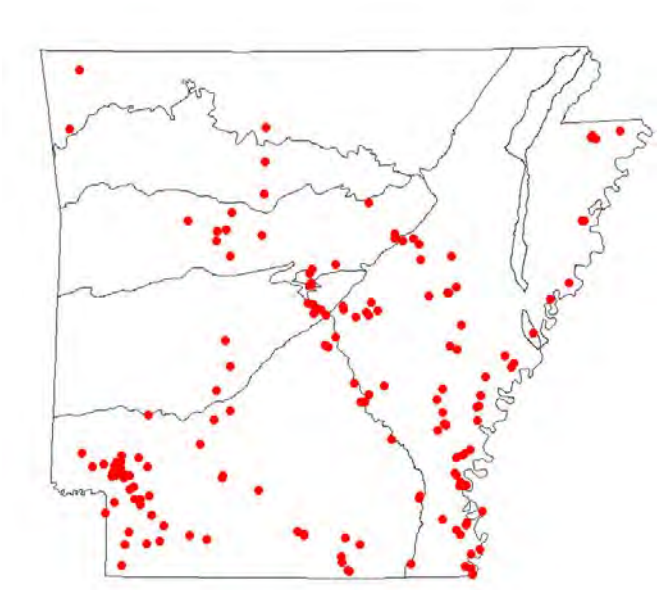
State Rank: S2 — Imperiled in Arkansas



©U.S. Fish and Wildlife Service

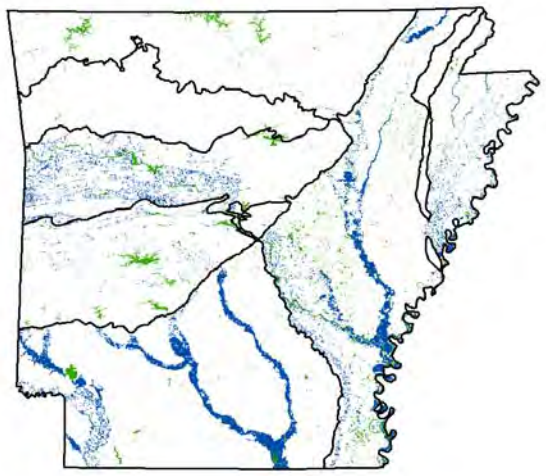
Distribution

Occurrence Records



Ecoregions where the species occurs:

- [x] Ozark Highlands
- [x] Boston Mountains
- [x] Arkansas Valley
- [x] Ouachita Mountains
- [x] South Central Plains
- [x] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains



Habitat Map



Habitats

	Weight
Lower Mississippi River Riparian Forest	Suitable
Ozark-Ouachita Large Floodplain	Suitable
Ponds, Lakes, and Water Holes	Obligate
West Gulf Coastal Plain Large River Floodplain Forest	Suitable
West Gulf Coastal Plain Red River Floodplain Forest	Suitable

Problems Faced

KNOWN PROBLEM: Loss of wetlands due to agriculture.	Threat: Habitat destruction Source: Agricultural practices
KNOWN PROBLEM: Loss of wetlands from hydrological alteration.	Threat: Hydrological alteration Source: Water diversion
POTENTIAL PROBLEM: Accidental shooting as a result of coromorant control.	Threat: Resource depletion Source: Confined animal operations
POTENTIAL PROBLEM: Poor water quality, contaminants.	Threat: Toxins/contaminants Source: Agricultural practices

Data Gaps/Research Needs

Determine survivorship.

Conservation Actions

	Importance	Category
Maintain or restore bottomland hardwood swamps with older growth tress adajcent to sloughs, rivers, bayous, and reservoir.	High	Habitat Restoration/Improvement

Anhinga anhinga
Anhinga

Monitoring Strategies

Conduct inventories for colonial waterbirds, particularly rookery counts, as a part of the North American Colonial Waterbird Monitoring Program coordinated by the Waterbird Conservation for the Americas Bird Initiative. Continue monitoring of this species by the Arkansas Natural Heritage Commission.

Comments

This species spends most of its life in or on the branches of tall trees, over slow moving rivers, sloughs, bayous and lakes and reservoirs. Even though it is highly aquatic, its feathers are not waterproof like most waterfowl feathers. Thus they need to spend a lot of time drying and warming in the sun, with their wings and tail spread. Their turkey-like tail spread gives them the nickname "Water Turkey". Their need to bask in the sun limits their range northward. They nest in colonies, often among herons and egrets. Young anhingas can swim before they can fly. They are sensitive to the presence of humans while nesting. Loss of wetlands through drainage and agricultural development has led to their decline in the state. (Arkansas Audubon Society 2012, Frederick and Siegel-Causey 2000, Hamel 1992, James and Neal 1986, Kushlan and others 2002, Martin and Finch 1995, National Audubon Society 2002, Rich and others 2004, Sauer and others 2004)

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Anthus spragueii

Sprague's Pipit

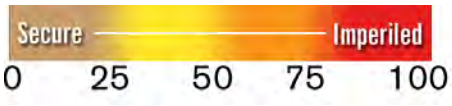


Class: Aves

Order: Passeriformes

Family: Motacillidae

Priority Score: **33** **out of 100**



Population Trend: Decreasing

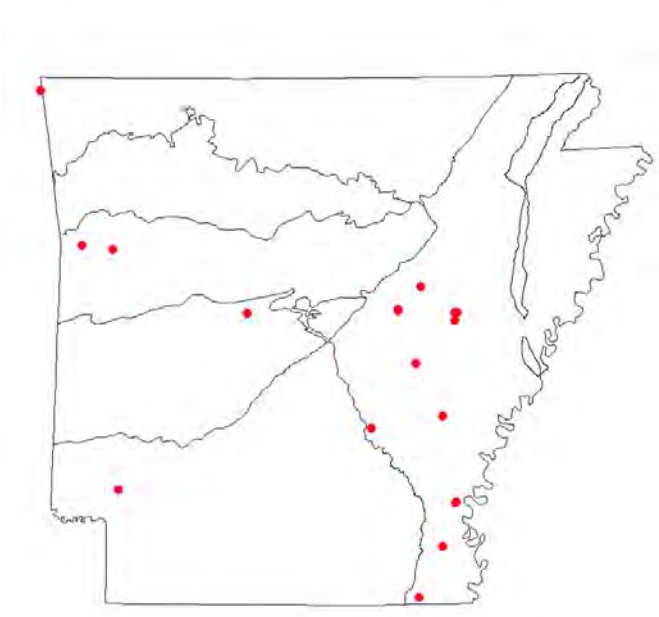
Residence: Winter

Global Rank: G4 — Apparently secure species

State Rank: S1N — Critically imperiled nonbreeding species in Arkansas

Distribution

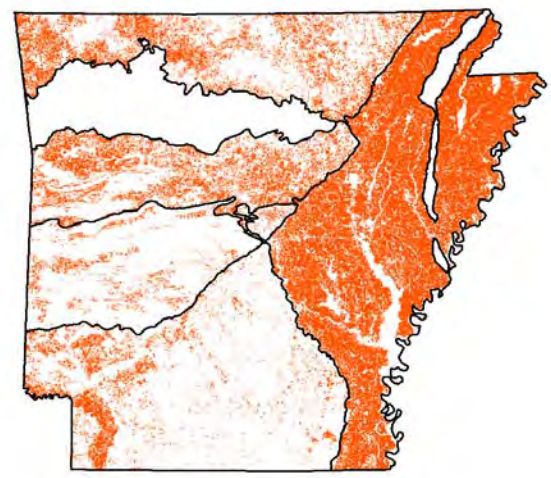
Occurrence Records



Ecoregions where the species occurs:

- [x] Ozark Highlands
- [ ] Boston Mountains
- [x] Arkansas Valley
- [x] Ouachita Mountains
- [x] South Central Plains
- [x] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains

Habitat Map





Habitats	Weight
Crop Land	Marginal
Lower Mississippi Alluvial Plain Grand Prairie	Marginal
Ozark-Ouachita Prairie and Woodland	Marginal
Pasture Land	Marginal
West Gulf Coastal Plain Calcareous Prairie and Woodland	Marginal

Problems Faced

KNOWN PROBLEM: Loss of grassland habitat.	Threat: Habitat destruction Source: Agricultural practices
KNOWN PROBLEM: Loss of grassland habitat.	Threat: Habitat destruction Source: Urban development
KNOWN PROBLEM: Loss of grassland habitat.	Threat: Alteration of natural fire regimes Source: Fire suppression
KNOWN PROBLEM: Loss of large herbivores.	Threat: Biological alteration Source: Management of/for certain species

Data Gaps/Research Needs

Determine best management practices.
Determine range of habitat associations.
Determine statewide distribution and abundance.

Conservation Actions

	Importance	Category
	Medium	
Conduct prescribed burning in grassland habitats.	High	Fire Management
Maintain habitat with light to moderate grazing or haying.	High	Habitat Restoration/Improvement
Restore native grasslands.	High	Habitat Restoration/Improvement

Monitoring Strategies

Continue to track this species using the Christmas Bird Count. Continue tracking of this species by the Arkansas Natural Heritage Commission.

Comments

Arkansas appears to be on the eastern periphery of the Sprague's Pipits wintering range. The species is a candidate for listing as Endangered or Threatened under the Endangered Species Act of 1973; the U.S. Fish and Wildlife Service is scheduled to make a decision on listing by the end of September 2015. Its conservation status includes Species of Special Concern/Watch List Species by Partner's in Flight and National Audubon Society. Range wide it winters in grasslands lacking shrubs. It winters in the adjacent state of Texas in heavily grazed grasslands dominated by little bluestem (Schizachyrium scoparium) and Andropogon spp, and in large, over-grazed pastures. Its winter habitat associations in Arkansas have not been quantified and are poorly understood, though they are reliably found in small numbers at the Stuttgart Airport in habitat dominated by old-field threeawn (Aristida oligantha) and have been observed in similar habitat at H.E. Flanagan Prairie Natural Area (Holimon, personal observation). Habitat descriptions from other observed locations in Arkansas are not known but in general consist of very open areas with short grass and few shrubs. (Arkansas Audubon Society 2012, Butcher and others 2007, Davis and others 2014, Grzybowski 1982, Jones 2010, Rich and others 2004)

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Antrostomus vociferus

Eastern Whip-poor-will

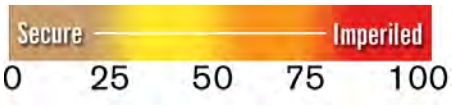


Class: Aves

Order: Caprimulgiformes

Family: Caprimulgidae

Priority Score: **19** **out of 100**



Population Trend: Decreasing

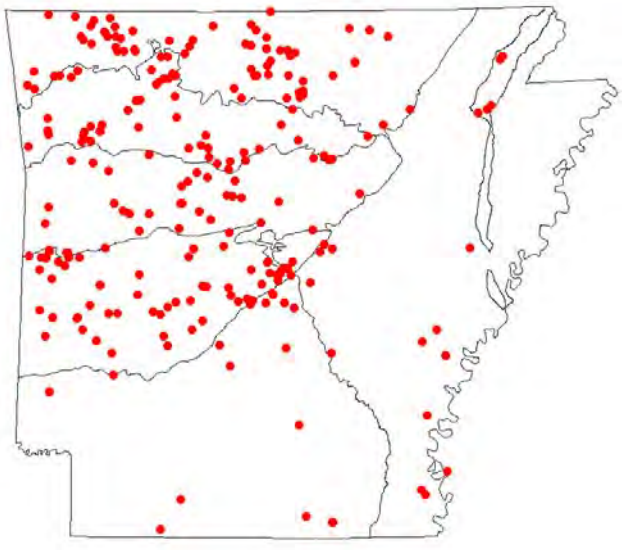
Residence: Breeding

Global Rank: G5 — Secure

State Rank: S3B — Vulnerable breeding species in Arkansas

Distribution

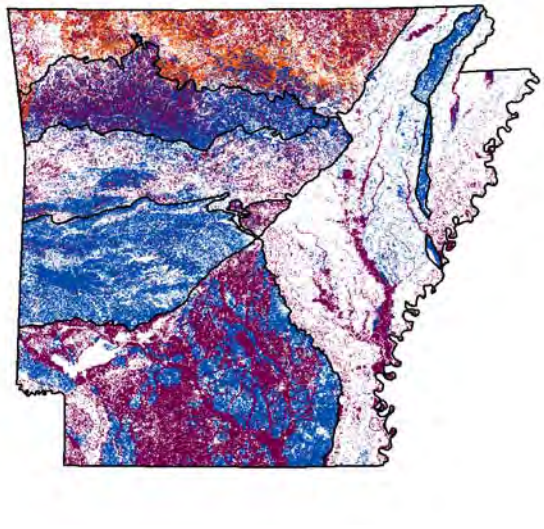
Occurrence Records



Ecoregions where the species occurs:

- ☑ Ozark Highlands
- ☑ Boston Mountains
- ☑ Arkansas Valley
- ☑ Ouachita Mountains
- ☑ South Central Plains
- ☑ Mississippi Alluvial Plain
- ☑ Mississippi Valley Loess Plains

Habitat Map





Antrostomus vociferus
Eastern Whip-poor-will

Habitats	Weight
Crowley's Ridge Loess Slope Forest	Suitable
Cultivated Forest	Suitable
Interior Highlands Calcareous Glade and Barrens	Marginal
Interior Highlands Dry Acidic Glade and Barrens	Marginal
Lower Mississippi Flatwoods Woodland and Forest	Suitable
Lower Mississippi River High Bottomland Forest	Suitable
Lower Mississippi River Low Bottomland Forest	Optimal
Lower Mississippi River Riparian Forest	Optimal
Ouachita Montane Oak Forest	Optimal
Ozark-Ouachita Dry Oak and Pine Woodland	Optimal
Ozark-Ouachita Dry-Mesic Oak Forest	Optimal
Ozark-Ouachita Dry-Mesic Oak Forest/Woodland	Optimal
Ozark-Ouachita Large Floodplain	Optimal
Ozark-Ouachita Mesic Hardwood Forest	Optimal
Ozark-Ouachita Pine-Bluestem Woodland	Suitable
Ozark-Ouachita Pine-Oak Forest/Woodland	Optimal
Ozark-Ouachita Prairie and Woodland	Suitable
Ozark-Ouachita Riparian	Suitable
West Gulf Coastal Plain Large River Floodplain Forest	Optimal
West Gulf Coastal Plain Pine-Hardwood Flatwoods	Suitable
West Gulf Coastal Plain Pine-Hardwood Forest/Woodland	Suitable
West Gulf Coastal Plain Red River Floodplain Forest	Optimal
West Gulf Coastal Plain Sandhill Oak and Shortleaf Pine Forest/Woodland	Suitable
West Gulf Coastal Plain Small Stream/River Forest	Optimal
West Gulf Coastal Plain Wet Hardwood Flatwoods	Optimal

Problems Faced

KNOWN PROBLEM: Loss of forest openings.	Threat: Altered composition/structure Source: Forestry activities
KNOWN PROBLEM: Loss of nesting habitat.	Threat: Habitat destruction or conversion Source: Agricultural practices
KNOWN PROBLEM: Loss of nesting habitat.	Threat: Habitat destruction or conversion Source: Urban development
KNOWN PROBLEM: Predation.	Threat: Extraordinary predation/parasitism/disease Source: Predation
POTENTIAL PROBLEM: Collisions with vehicles and man-made structures.	Threat: Collision with man-made structures Source: Urban development
POTENTIAL PROBLEM: Nest predation by feral hogs.	Threat: Extraordinary predation/parasitism/disease Source: Exotic species
POTENTIAL PROBLEM: Toxins, heavy metals, and pesticides negatively affect the species.	Threat: Toxins/contaminants Source: Municipal/Industrial point source
POTENTIAL PROBLEM: Toxins, heavy metals, and pesticides negatively affect the species.	Threat: Toxins/contaminants Source: Non-point source pollution

Data Gaps/Research Needs

Collect information on habitat selection and potential limiting factors on the breeding grounds.
Determine impacts of human activity.
Estimate population size and status.
Investigate interspecies competition between Chuck-will's-widows and Whip-poor-wills with and emphasis on the recent range expansion of Chuck-wills-widows.

Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

The Partners in Flight North American Landbird Conservation Plan indicates that long-term population trend monitoring for this species is generally considered adequate but some issues, such as bias, may not have been accounted for. This species may require implementation of night roadside counts to collect data on distribution and population trends specific to Arkansas. This effort should be coordinated with states doing similar monitoring. Nightjar Surveys in Arkansas should be expanded along current BBS routes with an emphasis on routes in the Ozark Highlands and norhtern portion of Crowley's Ridge.

Comments

This species is secretive, often heard but rarely seen. It feeds primarily on the wing, mostly at dawn and dusk. It is a ground nester which prefers nesting in open woods with little or no underbrush. These habitat patches are often found near suburbs and agricultural fields. However, habitat loss through succession or increased urbanization and agricultural development could be a problem. Common in the Ozark-St. Francis NF, Uncommon to locally common in the Ouachita NF (ANHC 2003, Bent 1989, Cink 2002, Duzan and others 2003, 2003A, Evans and Kirkman 1980, Fitzgerald 2000, Hamel 1992, Jacobs 2001, James and Neal 1986, Martin and Finch 1995, Robbins and Easterla 1992).

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Arenaria interpres

Ruddy Turnstone

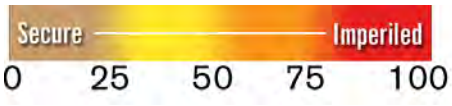


Class: Aves

Order: Charadriiformes

Family: Scolopacidae

Priority Score: **24** **out of 100**



Population Trend: Decreasing

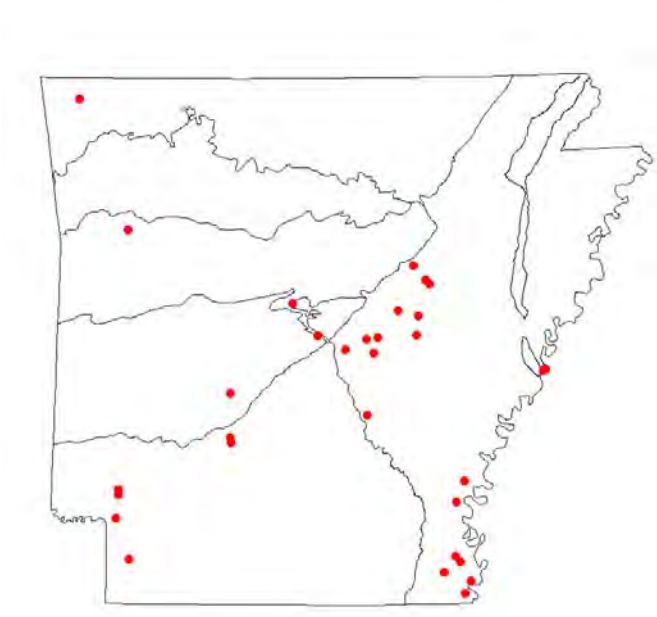
Residence: Transient

Global Rank: G5 — Secure

State Rank: S2N — Imperiled nonbreeding species in Arkansas

Distribution

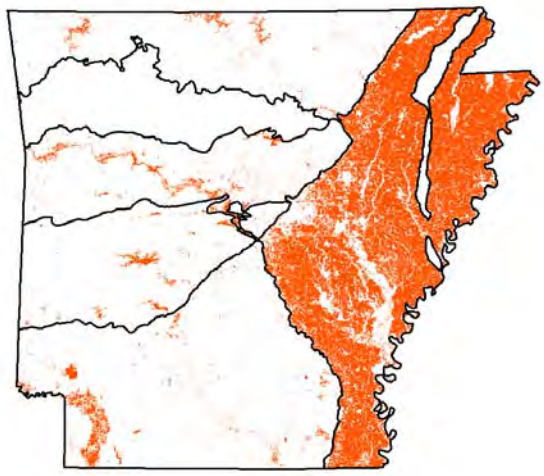
Occurrence Records



Ecoregions where the species occurs:

- [x] Ozark Highlands
- [ ] Boston Mountains
- [x] Arkansas Valley
- [x] Ouachita Mountains
- [x] South Central Plains
- [x] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains

Habitat Map





Habitats	Weight
Crop Land	Marginal
Mud Flats	Optimal
Ponds, Lakes, and Water Holes	Marginal

Problems Faced

KNOWN PROBLEM: Lack of mud flats during migration as a result of hydrological alteration.	Threat: Hydrological alteration Source: Water diversion
KNOWN PROBLEM: Lack of mud flats during migration.	Threat: Habitat destruction or conversion Source: Agricultural practices

Data Gaps/Research Needs

Determine habitat use during migration.

Conservation Actions	Importance	Category
Draw-down fish ponds to create mud flat habitat in July - November.	High	Habitat Restoration/Improvement
Flood crop land in summer and early fall after harvest.	High	Habitat Restoration/Improvement
Manipulate federal and state managed moist-soil units to provide mud flat habitat during March-early June migration and, if possible, during July - November migration.	Medium	Habitat Restoration/Improvement
Manipulate reservoirs (private and publicly owned) to provide mudflat habitat during July - Nov. migration, and, if possible, during March-early June migration.	Medium	Habitat Restoration/Improvement
Restore mud flats.	High	Habitat Restoration/Improvement

Arenaria interpres
Ruddy Turnstone

Monitoring Strategies

Initiate migration counts in the Mississippi Alluvial Valley and the West Gulf Coastal Plain, coordinated through Lower Mississippi Valley Joint Venture.

Comments

This species is seen in the state April-October, but this species is seen in the state very infrequently. They tend to forage on exposed mudflats, sandbars and rock dikes along rivers. Studies suggest that populations of this and other shorebird species are declining. The availability of habitat and food along their migratory route is critical. Birds need to stop and refuel as they go. Proper management of water levels on wetlands, artificial impoundments, and flooded agricultural fields can help. (Arkansas Audubon Society 2012, Hamel 1992, James and Neal 1986, Klima and Jehl 1998, Martin and Finch 1995, National Audubon Society 2002, Rich and others 2004, Sauer and others 2004).

Commercial aquaculture facilities are important stopover sites for this species and many other shorebirds (Lehnen and Krementz 2013). The decline of fish pond acreage in the state from 60,000 surface acres in 2002 to less than 30,000 acres in 2012 is alarming (personal communication Dr. Carole Engle, UAPB). Water management strategies have changed at many of the remaining facilities because of increased efficiency. Emphasis should be placed on programs that would encourage fish farmers to provide shallow-water habitat for extended periods of time.

Additionally, management plans for reservoirs (ex. Chicot, Millwood) and moist-soil impoundments (AGFC, USFWS, private) could be altered to provide additional benefit to many shorebirds that rely on mudflat habitat. Deeper water that is drawn down slowly typically provides more invertebrates than very recently flooded water.

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Botaurus lentiginosus

American Bittern

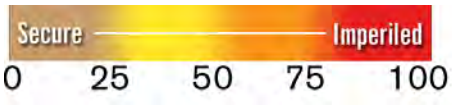


Class: Aves

Order: Ciconiiformes

Family: Ardeidae

Priority Score: **23** **out of 100**



Population Trend: Stable

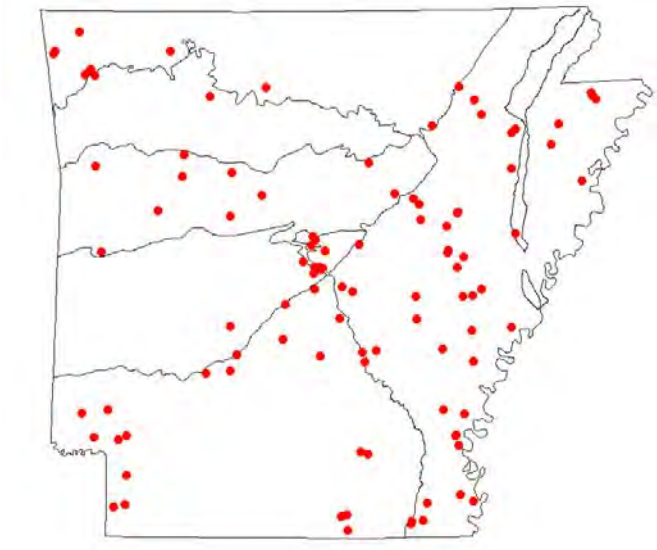
Residence: Permanent

Global Rank: G4 — Apparently secure species

State Rank: S2N — Imperiled nonbreeding species in Arkansas

Distribution

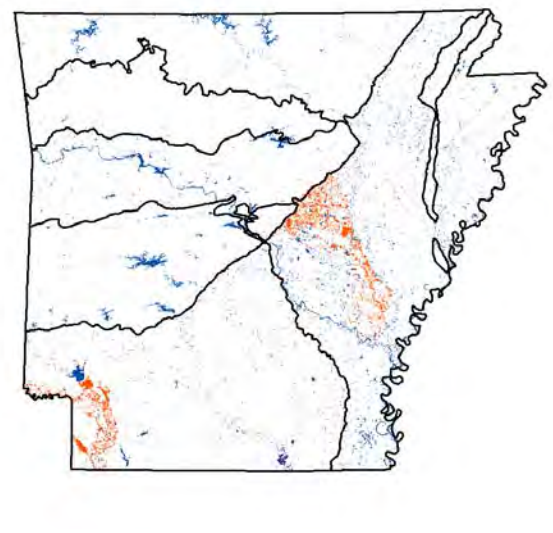
Occurrence Records



Ecoregions where the species occurs:

- ☑ Ozark Highlands
- ☑ Boston Mountains
- ☑ Arkansas Valley
- ☑ Ouachita Mountains
- ☑ South Central Plains
- ☑ Mississippi Alluvial Plain
- ☑ Mississippi Valley Loess Plains

Habitat Map





Habitats	Weight
Herbaceous Wetland	Optimal
Lower Mississippi Alluvial Plain Grand Prairie	Marginal
Ozark-Ouachita Prairie and Woodland	Marginal
Ponds, Lakes, and Water Holes	Suitable
West Gulf Coastal Plain Red River Floodplain Forest	Marginal

Problems Faced

KNOWN PROBLEM: Highly vulnerable to contaminants and pollutants.	Threat: Toxins/contaminants Source: Agricultural practices
KNOWN PROBLEM: Lack of emergent marsh, lack of wetlands.	Threat: Habitat destruction or conversion Source: Agricultural practices
KNOWN PROBLEM: Lack of emergent marsh, lack of wetlands.	Threat: Hydrological alteration Source: Water diversion
KNOWN PROBLEM: Lack of emergent marsh, lack of wetlands.	Threat: Habitat destruction or conversion Source: Forestry activities

Data Gaps/Research Needs

No data gaps or research needs were identified.

Conservation Actions	Importance	Category
Maintain wetlands.	High	Habitat Protection
Restore wetlands.	High	Habitat Restoration/Improvement

Monitoring Strategies

Participate in National Marshbird Monitoring Program coordinated by Waterbird Conservation for the Americas Bird Initiative.

Comments

Although little is known about this secretive species' natural history, its dependence on freshwater wetlands with tall, dense emergent vegetation is clear, as is its population decline associated with the decline in wetland habitat. Chemical contamination of their food supply may also be a factor in the decline. Although difficult to spot, its distinctive, loud, booming call can be heard from a long way off, and gives rise to nicknames like thunder-pumper. (Arkansas Audubon Society 2012, Hamel 1992, James and Neal 1986, Kushlan and others 2002, Martin and Finch 1995, National Audubon Society 2002, Rich and others 2004, Sauer and others 2004)

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Calcarius pictus

Smith's Longspur

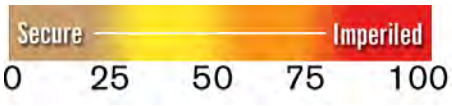


Class: Aves

Order: Passeriformes

Family: Emberizidae

Priority Score: **24** **out of 100**



Population Trend: Decreasing

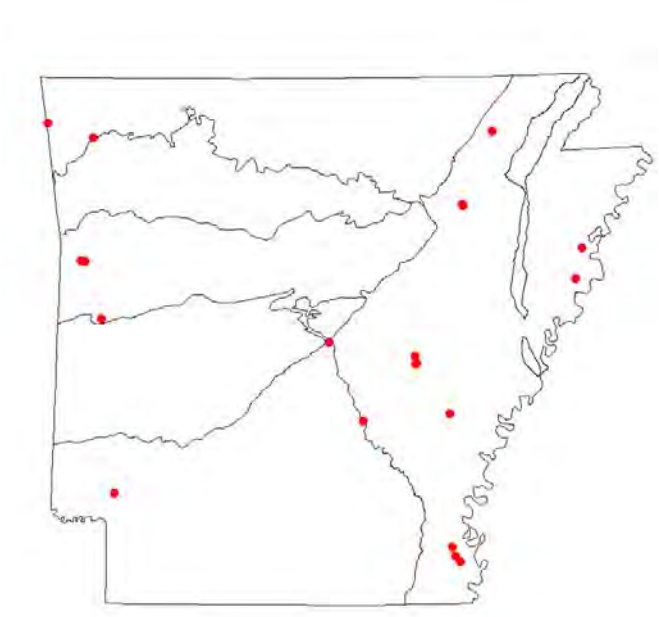
Residence: Winter

Global Rank: G5 — Secure

State Rank: S2N — Imperiled nonbreeding species in Arkansas

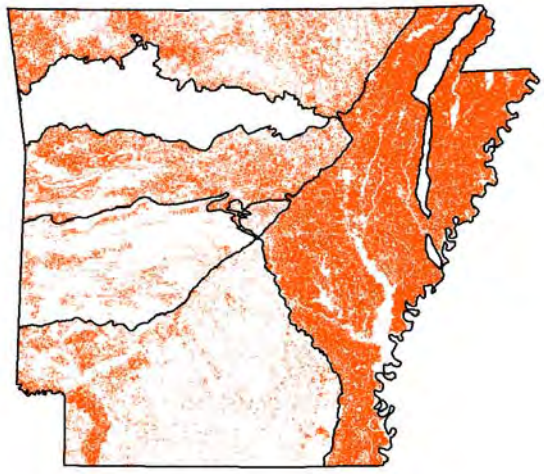
Distribution

Occurrence Records



Ecoregions where the species occurs:

- [x] Ozark Highlands
- [ ] Boston Mountains
- [x] Arkansas Valley
- [x] Ouachita Mountains
- [x] South Central Plains
- [x] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains



Habitat Map



Habitats	Weight
Crop Land	Marginal
Lower Mississippi Alluvial Plain Grand Prairie	Marginal
Ozark-Ouachita Prairie and Woodland	Marginal
Pasture Land	Marginal
West Gulf Coastal Plain Calcareous Prairie and Woodland	Marginal

Problems Faced

KNOWN PROBLEM: Loss of grassland habitat containing three-awn grass (Aristida spp.).	Threat: Habitat destruction Source: Agricultural practices
KNOWN PROBLEM: Loss of large herbivores.	Threat: Biological alteration Source: Management of/for certain species
POTENTIAL PROBLEM: Replacement of three-awn grass (Aristida spp.) with bermuda at airports.	Threat: Habitat destruction or conversion Source: Exotic species

Data Gaps/Research Needs

Determine population trends.
Further investigation of statewide distribution and abundance.
Investigate if there are alternative habitats to those dominated by three-awn grass (Aristida spp.).

Conservation Actions

	Importance	Category
Enocurage use of three-awn grass (Aristida spp.) along airport runways.	High	Habitat Restoration/Improvement
Stop mowing before end of growing season, providing cover, forage, and three-awn grass (an annual) seeds.	High	Habitat Restoration/Improvement

Monitoring Strategies

Continue efforts to locate and survey potential wintering habitat for this species.
Monitor known winter locations for abundance and presence of preferred habitat containing three-awn grass.

Comments

Smith's longspurs occur only in winter Arkansas, primarily along airport runways where prior soil disturbance favored the establishment of large stands of three-awn grass (Aristida spp). The number of known airport locations in the state supporting this bird has declined, likely due in part to this early successional grassland habitat type succeeding to a later seral grassland stage having different composition and structure. Without repeated disturbance favoring three-awn grass, succession to other grassland habitats resulting in loss of habitat suitable for wintering Smith's Longspurs is inevitable. In addition, airport managers now commonly replant disturbed areas associated with airport construction with non-native species such as Bermuda grass. Further, many airport managers have replaced three-awn grass and other native species with Bermuda grass for aesthetic purposes. Bermuda grass is not an important component of their winter habitat and deters their presence when it is dominant, perhaps because of deeper thatch. (Arkansas Audubon Society 2012, Briskie 2009, Grzybowski 1980, Hamel 1992, James and Neal 1986, Holimon and others 2012, Martin and Finch 1995, Monroe 2010, National Audubon Society 2002, Rich and others 2004, Sauer and others 2004)

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Calidris alba

Sanderling



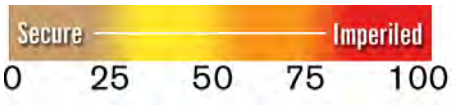
©Jeff R. Wilson

Class: Aves

Order: Charadriiformes

Family: Scolopacidae

Priority Score: **19** **out of 100**



Population Trend: Decreasing

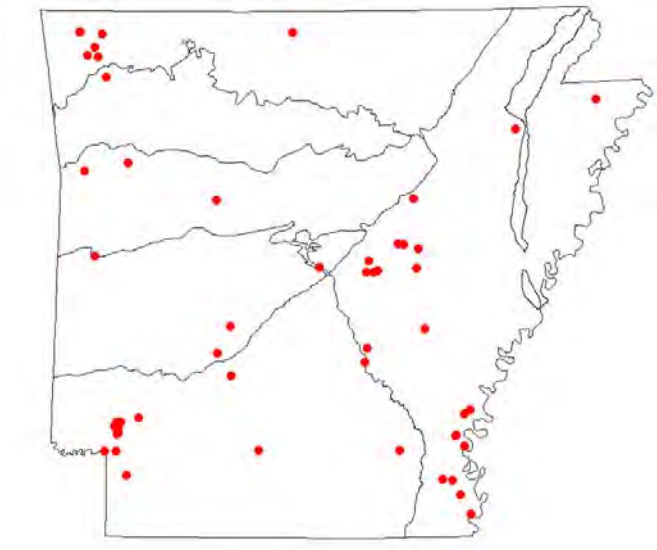
Residence: Transient

Global Rank: G5 — Secure

State Rank: S3N — Vulnerable nonbreeding species in Arkansas

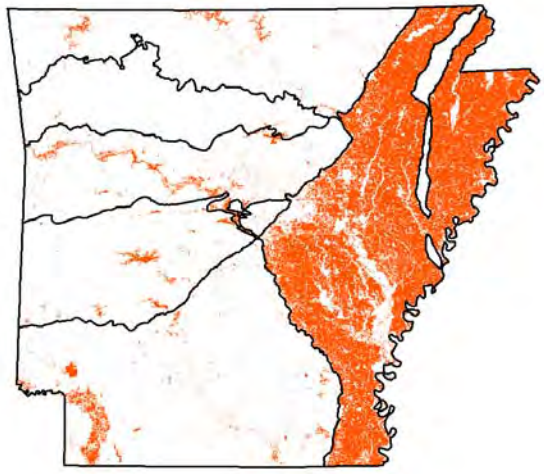
Distribution

Occurrence Records



Ecoregions where the species occurs:

- [x] Ozark Highlands
- [x] Boston Mountains
- [x] Arkansas Valley
- [x] Ouachita Mountains
- [x] South Central Plains
- [x] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains



Habitat Map



Habitats	Weight
Crop Land	Marginal
Mud Flats	Optimal
Ponds, Lakes, and Water Holes	Marginal

Problems Faced

KNOWN PROBLEM: Lack of mud flats during migration as a result of hydrological alteration.	Threat: Hydrological alteration Source: Water diversion
KNOWN PROBLEM: Lack of mud flats during migration as a result of hydrological alteration.	Threat: Hydrological alteration Source: Agricultural practices

Data Gaps/Research Needs

No data gaps or research needs were identified.

Conservation Actions	Importance	Category
Provide mud flat habitat by flooding harvested cropland in summer and early fall.	High	Habitat Restoration/Improvement
Provide mud flat habitat by manipulation moist-soil units during March to early June and, where possible, during July - November.	Medium	Habitat Restoration/Improvement
Provide mudflat habitat by drawing down fish ponds in July - November.	High	Habitat Restoration/Improvement

Monitoring Strategies

Initiate late summer - fall migration counts in the Mississippi Alluvial Valley and the West Gulf Coastal Plain, coordinated through Lower Mississippi Valley Joint Venture.

Calidris alba
Sanderling

Comments

This species is seen in the state April-October, but this species is seen in the state very infrequently. They tend to forage on exposed mud flats, sandbars and rock dikes along rivers. Studies suggest that populations of this and other shorebird species are declining. The availability of habitat and food along their migratory route is critical. Birds need to stop and refuel as they go. Proper management of water levels on wetlands, artificial impoundments, and flooded agricultural fields can help. (Arkansas Audubon Society 2012, Hamel 1992, James and Neal 1986, MacWhirter and others 2002, Martin and Finch 1995, National Audubon Society 2002, Rich and others 2004, Sauer and others 2004, U.S. Shorebird Conservation Plan 2004)

Commercial aquaculture facilities are important stopover sites for this species and many other shorebirds (Lehnen and Krementz 2013). The decline of fish pond acreage in the state from 60,000 surface acres in 2002 to less than 30,000 acres in 2012 is alarming (personal communication Dr. Carole Engle, UAPB). Water management strategies have changed at many of the remaining facilities because of increased efficiency. Emphasis should be placed on programs that would encourage fish farmers to provide shallow-water habitat for extended periods of time.

Additionally, management plans for reservoirs (ex. Chicot, Millwood) and moist-soil impoundments (AGFC, USFWS, private) could be altered to provide additional benefit to many shorebirds that rely on mudflat habitat. Deeper water that is drawn down slowly typically provides more invertebrates than very recently flooded water.

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Calidris alpina

Dunlin

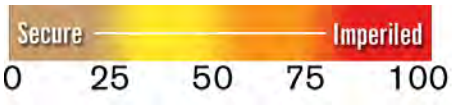


Class: Aves

Order: Charadriiformes

Family: Scolopacidae

Priority Score: **19** **out of 100**



Population Trend: Decreasing

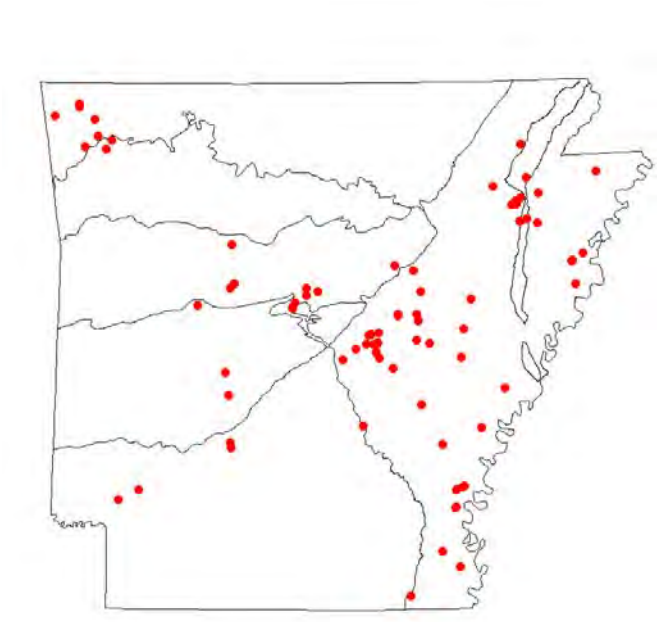
Residence: Transient

Global Rank: G5 — Secure

State Rank: S3N — Vulnerable nonbreeding species in Arkansas

Distribution

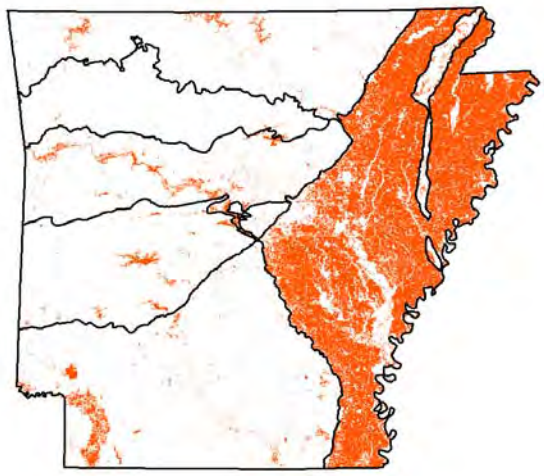
Occurrence Records



Ecoregions where the species occurs:

- ☑ Ozark Highlands
- ☑ Boston Mountains
- ☑ Arkansas Valley
- ☑ Ouachita Mountains
- ☑ South Central Plains
- ☑ Mississippi Alluvial Plain
- ☑ Mississippi Valley Loess Plains

Habitat Map





Habitats	Weight
Crop Land	Marginal
Mud Flats	Optimal
Ponds, Lakes, and Water Holes	Marginal

Problems Faced

KNOWN PROBLEM: Lack of mud flats during migration as a result of hydrological alteration.	Threat: Hydrological alteration Source: Channel alteration
KNOWN PROBLEM: Lack of mud flats.	Threat: Habitat destruction or conversion Source: Agricultural practices

Data Gaps/Research Needs

A reliable assessmnet of population status and trends is needed.

Conservation Actions	Importance	Category
Provide mud flat habitat by drawing down fish ponds in July - November.	High	Habitat Restoration/Improvement
Provide mud flat habitat by flooding harvested cropland in summer and early fall.	High	Habitat Restoration/Improvement
Provide mud flat habitat by manipulating moist-soil units during March to early June and, where possible, during July - November.	Medium	Habitat Restoration/Improvement

Calidris alpina
Dunlin

Monitoring Strategies

Initiate late summer - fall migration counts in the Mississippi Alluvial Valley and the West Gulf Coastal Plain, coordinated through Lower Mississippi Valley Joint Venture.

Comments

This species has been seen in the state every month, but is most common during the spring migration period March-June and the fall migration period October-December. They are often seen in association with other sandpipers. Studies suggest that populations of this and other shorebird species are declining. The availability of habitat and food along their migratory route is critical. Birds need to stop and refuel as they go. Proper management of water levels on wetlands, artificial impoundments, and flooded agricultural fields can help. (Arkansas Audubon Society 2012, Hamel 1992, James and Neal 1986, Klima and Jehl 1998, Martin and Finch 1995, National Audubon Society 2002, Rich and others 2004, Sauer and others 2004).

Commercial aquaculture facilities are important stopover sites for this species and many other shorebirds (Lehnen and Krementz 2013). The decline of fish pond acreage in the state from 60,000 surface acres in 2002 to less than 30,000 acres in 2012 is alarming (personal communication, Dr. Carole Engle, UAPB). Water management strategies have changed at many of the remaining facilities because of increased efficiency. Emphasis should be placed on programs that would encourage fish farmers to provide shallow-water habitat for extended periods of time.

Additionally, management plans for reservoirs (ex. Chicot, Millwood) and moist-soil impoundments (AGFC, USFWS, private) could be altered to provide additional benefit to many shorebirds that rely on mudflat habitat. Deeper water that is drawn down slowly typically provides more invertebrates than very recently flooded water.

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Calidris himantopus

Stilt Sandpiper

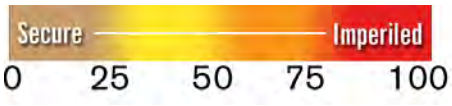


Class: Aves

Order: Charadriiformes

Family: Scolopacidae

Priority Score: **19** **out of 100**



Population Trend: Decreasing

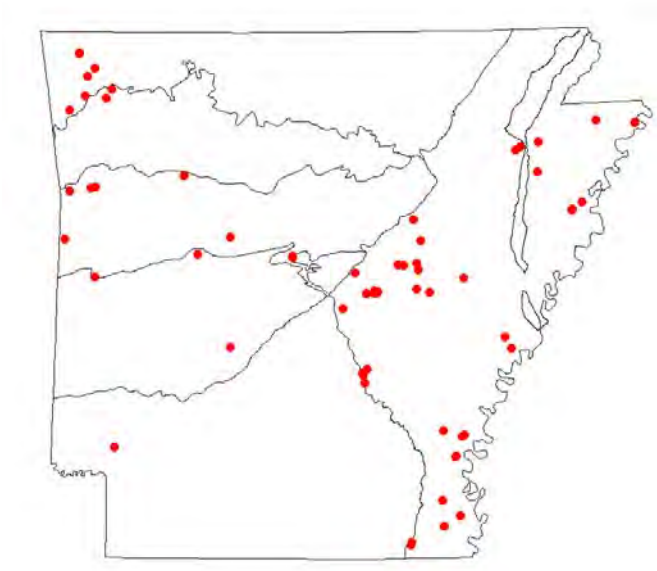
Residence: Transient

Global Rank: G5 — Secure

State Rank: S3N — Vulnerable nonbreeding species in Arkansas

Distribution

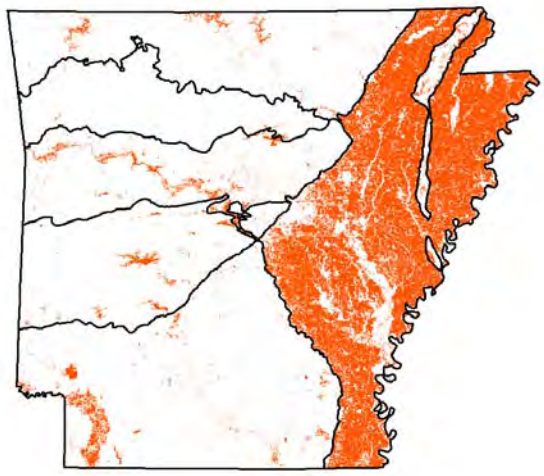
Occurrence Records



Ecoregions where the species occurs:

- ☑ Ozark Highlands
- ☑ Boston Mountains
- ☑ Arkansas Valley
- ☑ Ouachita Mountains
- ☑ South Central Plains
- ☑ Mississippi Alluvial Plain
- ☑ Mississippi Valley Loess Plains

Habitat Map





Habitats	Weight
Crop Land	Marginal
Mud Flats	Optimal
Ponds, Lakes, and Water Holes	Marginal

Problems Faced

KNOWN PROBLEM: Lack of mud flats during migration as a result of hydrological alteration.	Threat: Hydrological alteration Source: Water diversion
KNOWN PROBLEM: Loss of mud flat habitat.	Threat: Habitat destruction or conversion Source: Agricultural practices

Data Gaps/Research Needs

No data gaps or research needs were identified.

Conservation Actions	Importance	Category
Provide mud flat habitat by drawing down fish ponds in July - November.	High	Habitat Restoration/Improvement
Provide mud flat habitat by flooding harvested cropland in summer and early fall.	High	Habitat Restoration/Improvement
Provide mud flat habitat by manipulating moist soil units during March to early June and, where possible, during July to November.	Medium	Habitat Restoration/Improvement
Provide mud flat habitat by manipulating reservoirs (both private and public) during July through November migration, and where possible, during March to early June migration.	Medium	Habitat Restoration/Improvement

Calidris himantopus
Stilt Sandpiper

Monitoring Strategies

Initiate late summer - fall migration counts in the Mississippi Alluvial Valley and the West Gulf Coastal Plain, coordinated through Lower Mississippi Valley Joint Venture.

Comments

This species is seen in the state March-November, with March- June sightings believed to be spring northward migrants, while birds seen July through November are believed to be southbound migrants. They are often seen in association with Long-billed Dowitchers and tend to forage in very shallow water rather than exposed mud. Studies suggest that populations of this and other shorebird species are declining. The availability of habitat and food along their migratory route is critical. Birds need to stop and refuel as they go. Proper management of water levels on wetlands, artificial impoundments, and flooded agricultural fields can help. (Arkansas Audubon Society 2012, Hamel 1992, James and Neal 1986, Klima and Jehl 1998, Martin and Finch 1995, National Audubon Society 2002, Rich and others 2004, Sauer and others 2004)

Commercial aquaculture facilities are important stopover sites for this species and many other shorebirds (Lehnen and Krementz 2013). The decline of fish pond acreage in the state from 60,000 surface acres in 2002 to less than 30,000 acres in 2012 is alarming (personal communication Dr. Carole Engle, UAPB). Water management strategies have changed at many of the remaining facilities because of increased efficiency. Emphasis should be placed on programs that would encourage fish farmers to provide shallow-water habitat for extended periods of time.

Additionally, management plans for reservoirs (ex. Chicot, Millwood) and moist-soil impoundments (AGFC, USFWS, private) could be altered to provide additional benefit to many shorebirds that rely on mudflat habitat. Deeper water that is drawn down slowly typically provides more invertebrates than very recently flooded water.

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Calidris subruficollis

Buff-breasted Sandpiper

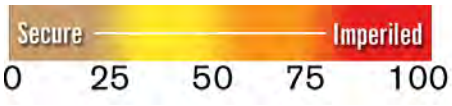


Class: Aves

Order: Charadriiformes

Family: Scolopacidae

Priority Score: **29** **out of 100**



Population Trend: Decreasing

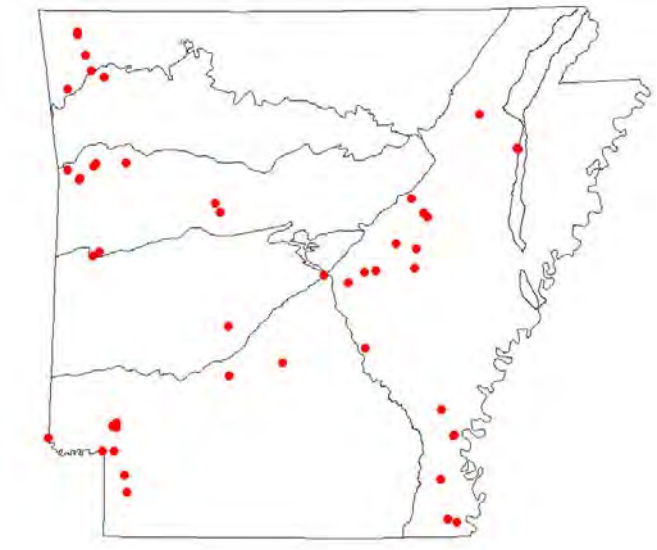
Residence: Transient

Global Rank: G4 — Apparently secure species

State Rank: S2N — Imperiled nonbreeding species in Arkansas

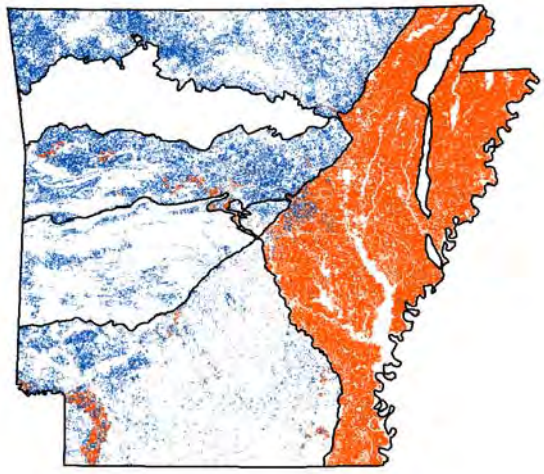
Distribution

Occurrence Records



Ecoregions where the species occurs:

- [x] Ozark Highlands
- [ ] Boston Mountains
- [x] Arkansas Valley
- [x] Ouachita Mountains
- [x] South Central Plains
- [x] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains



Habitat Map



Habitats	Weight
Crop Land	Marginal
Lower Mississippi Alluvial Plain Grand Prairie	Marginal
Mud Flats	Suitable
Ozark-Ouachita Prairie and Woodland	Marginal
Pasture Land	Suitable
West Gulf Coastal Plain Calcareous Prairie and Woodland	Marginal

Problems Faced

KNOWN PROBLEMS: Lack of open areas containing short grass.	Threat: Altered composition/structure Source: Grazing/Browsing
KNOWN PROBLEMS: Lack of open areas containing short grass.	Threat: Altered composition/structure Source: Fire suppression
KNOWN PROBLEMS: Lack of open areas containing short grass.	Threat: Altered composition/structure Source: Agricultural practices
KNOWN PROBLEMS: Lack of open areas containing short grass.	Threat: Altered composition/structure Source: Urban development

Data Gaps/Research Needs

Determine impacts of pesticides applied to golf courses and sod farms on prey availability and bird reproductive health.

Conservation Actions

	Importance	Category
Protect grasslands, short grass wetlands, and associated mud flats utilized during migration.	High	Habitat Protection
Restore grasslands and associated grassy mud flats utilized during migration.	High	Habitat Restoration/Improvement

Monitoring Strategies

Initiate fall migration counts in the Mississippi Alluvial Valley and the West Gulf Coastal Plain, coordinated through Lower Mississippi Valley Joint Venture. Continue tracking of this species by the Arkansas Natural Heritage Commission.

Comments

The only North American shorebird to have a lek mating system like grouse Listed as highly imperiled by the U.S. Shorebird Conservation Plan. Considered near threatened on the IUCN Red List; on the Yellow list of Watch List 2014. Specific management attention is needed for this shorebird. During migration, inhabits relatively dry, short-grass sites such as pastures, golf courses, and airports; also mudflats and rice fields. In Arkansas, rare spring migrant and uncommon fall migrant; highest numbers have been seen on sod farms. (Arkansas Audubon Society 2014, Hamel 1992, James and Neal 1986, Lanctot and Laredo1994, Martin and Finch 1995, National Audubon Society 2002, Rich and others 2004, Sauer and others 2004, U.S. Shorebird Conservation Plan 2004, Rosenberg and others 2014, U.S. Shorebird Conservation Plan Partnership. 2015)

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Chaetura pelagica

Chimney Swift

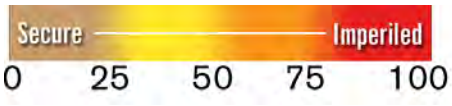


Class: Aves

Order: Apodiformes

Family: Apodidae

Priority Score: **19** **out of 100**



Population Trend: Decreasing

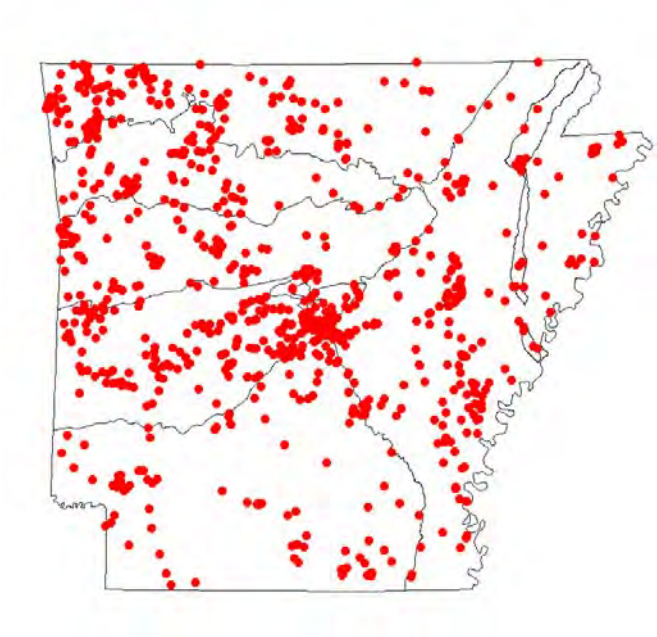
Residence: Breeding

Global Rank: G5 — Secure

State Rank: S3B — Vulnerable breeding species in Arkansas

Distribution

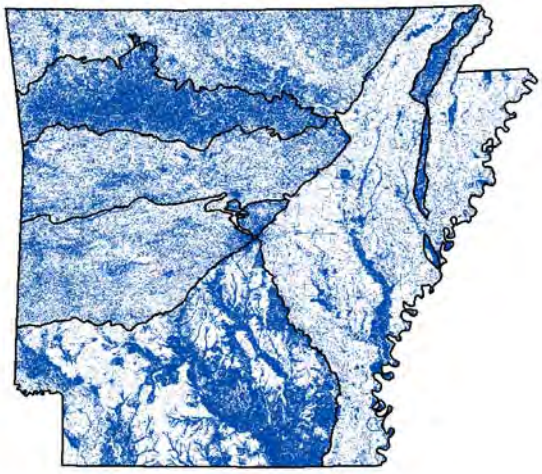
Occurrence Records



Ecoregions where the species occurs:

- ☑ Ozark Highlands
- ☑ Boston Mountains
- ☑ Arkansas Valley
- ☑ Ouachita Mountains
- ☑ South Central Plains
- ☑ Mississippi Alluvial Plain
- ☑ Mississippi Valley Loess Plains

Habitat Map





Chaetura pelagica
Chimney Swift

Habitats	Weight
Crowley's Ridge Loess Slope Forest	Suitable
Lower Mississippi Flatwoods Woodland and Forest	Suitable
Lower Mississippi River Bottomland Depression	Suitable
Lower Mississippi River Dune Woodland, Pond, and Forest	Suitable
Lower Mississippi River High Bottomland Forest	Suitable
Lower Mississippi River Low Bottomland Forest	Suitable
Lower Mississippi River Riparian Forest	Suitable
Lower Mississippi River Riparian Forest	Suitable
Ozark-Ouachita Dry-Mesic Oak Forest	Suitable
Ozark-Ouachita Large Floodplain	Suitable
Ozark-Ouachita Mesic Hardwood Forest	Suitable
Ozark-Ouachita Pine-Oak Forest/Woodland	Suitable
Ozark-Ouachita Riparian	Suitable
Urban/Suburban	Suitable
West Gulf Coastal Plain Large River Floodplain Forest	Suitable
West Gulf Coastal Plain Mesic Hardwood Forest	Suitable
West Gulf Coastal Plain Red River Floodplain Forest	Suitable
West Gulf Coastal Plain Sandhill Oak and Shortleaf Pine Forest and Woodland	Suitable
West Gulf Coastal Plain Small Stream/River Forest	Suitable

Problems Faced

KNOWN PROBLEM: Loss of old growth forests.	Threat: Habitat destruction Source: Forestry activities
KNOWN PROBLEM: Use of chimney caps prevents use of chimneys as nesting locations.	Threat: Habitat disturbance Source: Urban development
POTENTIAL PROBLEM: Temperature extremes and heavy rains affect food resources, survivorship, and nest success.	Threat: Biological alteration Source:
POTENTIAL PROBLEM: Widespread pesticide use reduces aerial insects.	Threat: Toxins/contaminants Source: Agricultural practices

Data Gaps/Research Needs

Determine the extent to which swifts are using natural sites (e.g. trees, caves) for roosting and nesting.

Quantify the availability and occupancy of man-made nesting and roosting sites (e.g. chimneys, swift towers, outbuildings, wells, silos) to determine if these sites are a limiting factor.

Conservation Actions

Conservation Actions	Importance	Category
Educate homeowners and chimney and pest control professionals about swift-friendly management practices.	High	Public Relations/Education
Identify and protect natural nest and roost sites.	High	Habitat Protection
Protect old growth forests.	Medium	Habitat Protection

Monitoring Strategies

The Partners in Flight North American Landbird Conservation Plan indicates that long-term population trend monitoring for this species is generally considered adequate, but some issues, such as bias, may not have been accounted for. Encourage documentation, reporting, and monitoring of natural nest/roost locations. Promote the citizen science monitoring program A Swift Night Out (chimneyswifts.org). Continue to conduct Breeding Bird Surveys at all routes established in Arkansas.

Comments

Historically, this species depended on scattered, large-diameter, hollow trees for nesting. Populations increased tremendously when Europeans settled the land and provided chimneys. Now populations are declining because people are capping old chimneys to keep animals out, and new chimneys are not as suitable. Uncapping chimneys and providing swift nesting towers may help stop the decline. (ANHC 2003, Cink and Collins 2002, Clawson 1982, Duzan and others 2003, 2003A, Evans and Kirkman 1980, Fitzgerald 2000, Hamel 1992, Hines et al. 2013, Jacobs 2001, James and Neal 1986, Martin and Finch 1995, Robbins and Easterla 1992, Steeves et al. 2014).

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Charadrius melodus

Piping Plover

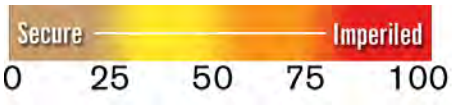


Class: Aves

Order: Charadriiformes

Family: Charadriidae

Priority Score: **43** **out of 100**



Population Trend: Decreasing

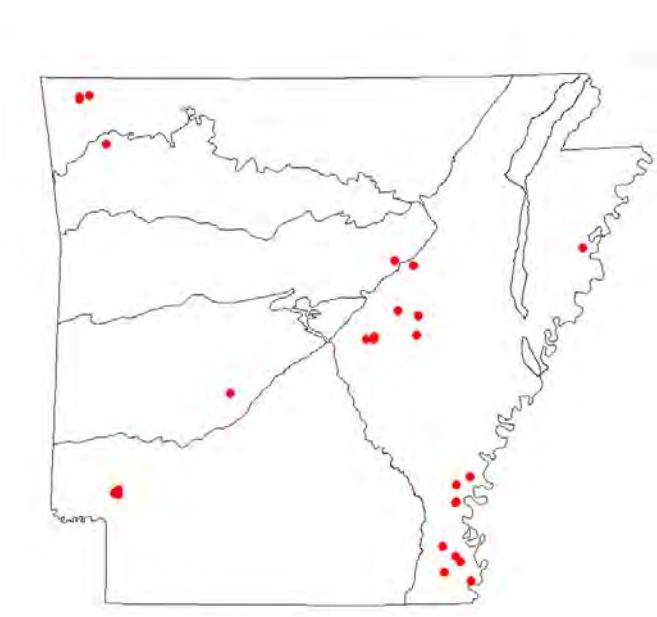
Residence: Transient

Global Rank: G3 — Vulnerable species

State Rank: S1N — Critically imperiled nonbreeding species in Arkansas

Distribution

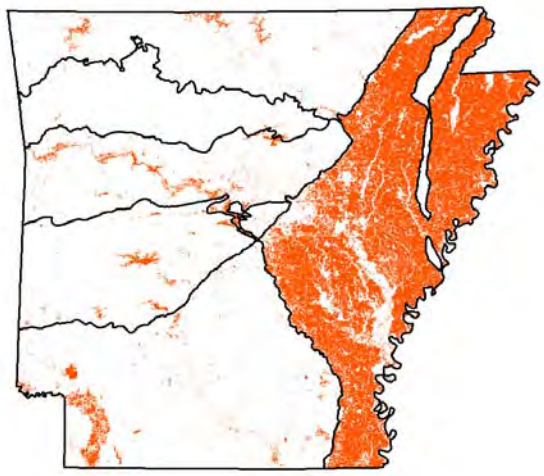
Occurrence Records



Ecoregions where the species occurs:

- [x] Ozark Highlands
- [x] Boston Mountains
- [x] Arkansas Valley
- [x] Ouachita Mountains
- [x] South Central Plains
- [x] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains

Habitat Map





Habitats	Weight
Crop Land	Marginal
Mud Flats	Optimal
Ponds, Lakes, and Water Holes	Marginal

Problems Faced

KNOWN PROBLEM: Lack of mud flats during migration as a result of hydrological alteration.	Threat: Hydrological alteration Source: Water diversion

Data Gaps/Research Needs

No data gaps or research needs were identified.

Conservation Actions

	Importance	Category
Maintain or restore mud flats.	High	Habitat Protection
Provide mud flat habitat by drawing down fish ponds in July - November.	High	Habitat Restoration/Improvement
Provide mud flat habitat by manipulation reservoirs (both public and private) during July - November migration, and where possible, during March to early June migration.	Medium	Habitat Restoration/Improvement

Monitoring Strategies

Initiate late summer - fall migration counts in the Mississippi Alluvial Valley and the West Gulf Coastal Plain, coordinated through Lower Mississippi Valley Joint Venture. Continue tracking of this species by the Arkansas Natural Heritage Commission.

Comments

This species is listed as a highly imperiled species by the U.S. Shorebird Conservation Plan. Although this species occurs in Arkansas only in small numbers during migration, it is a Federally Threatened species, and thus warrants attention. Reservoir shoreline was the most common habitat used on inland migration, but birds also stopped at natural lakes, rivers, marsh wetlands, industrial ponds and fish farms where the substrate type is predominantly mud flat. Wetlands, impoundments, and agricultural fields that are managed to provide mud flat habitat from July- November for other migratory shorebirds should provide foraging habitat for this species as well. (Duzan and others 2003, 2003A, Haig and Elliot-Smith 2004, U.S. Shorebird Conservation Plan 2004)

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Chordeiles minor

Common Nighthawk

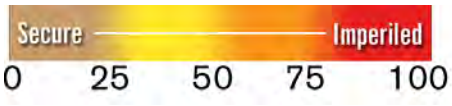


Class: Aves

Order: Caprimulgiformes

Family: Caprimulgidae

Priority Score: **24** **out of 100**



Population Trend: Decreasing

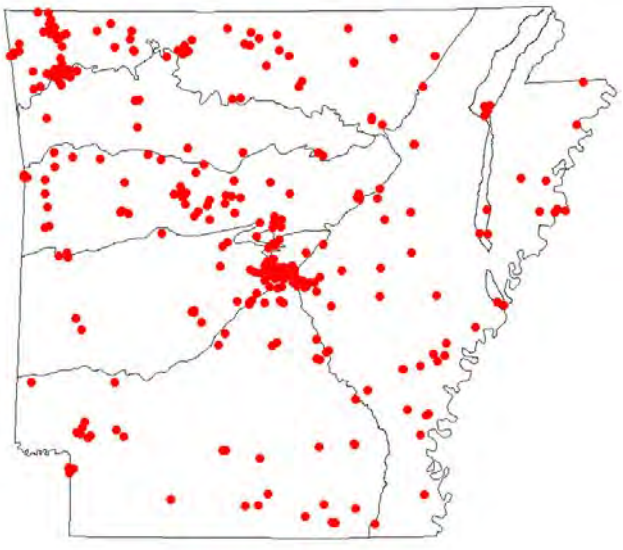
Residence:

Global Rank: G5 — Secure

State Rank: S2B — Imperiled breeding species in Arkansas

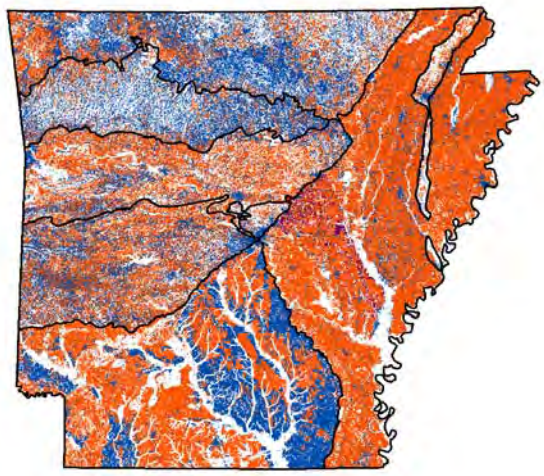
Distribution

Occurrence Records



Ecoregions where the species occurs:

- ☑ Ozark Highlands
- ☑ Boston Mountains
- ☑ Arkansas Valley
- ☑ Ouachita Mountains
- ☑ South Central Plains
- ☑ Mississippi Alluvial Plain
- ☑ Mississippi Valley Loess Plains



Habitat Map



Habitats	Weight
Crop Land	Marginal
Interior Highlands Calcareous Glade and Barrens	Suitable
Interior Highlands Dry Acidic Glade and Barrens	Suitable
Lower Mississippi Alluvial Plain Grand Prairie	Optimal
Lower Mississippi River Dune Woodland, Pond, and Forest	Marginal
Ozark-Ouachita Dry Oak and Pine Woodland	Marginal
Ozark-Ouachita Pine/Bluestem Woodland	Marginal
Ozark-Ouachita Prairie and Woodland	Optimal
Pasture Land	Marginal
Urban/Suburban	Suitable
West Gulf Coastal Plain Calcareous Prairie and Woodland	Optimal
West Gulf Coastal Plain Pine-Hardwood Flatwoods	Suitable

Problems Faced

KNOWN PROBLEM: Loss of insect prey due to increased use and effectiveness of insecticides.	Threat: Biological alteration Source: Agricultural practices
KNOWN PROBLEM: Loss of insect prey due to increased use and effectiveness of insecticides.	Threat: Biological alteration Source: Urban development
KNOWN PROBLEM: Loss of openland habitat due to succession.	Threat: Alteration of natural fire regimes Source: Fire suppression

Chordeiles minor
Common Nighthawk

Data Gaps/Research Needs

Determine breeding success.

Determine effects of insecticide use on prey availability.

Conservation Actions	Importance	Category
Implement prescribed fire to help create bare patches for nesting.	Medium	Fire Management
Restore and maintain native grasslands.	High	Habitat Restoration/Improvement

Monitoring Strategies

Continue to conduct Breeding Bird Surveys at all routes established in Arkansas. Conduct species specific routes, in urban/suburban environments, following Nightjar Survey Network protocols. www.nightjars.org

Comments

Data from the North American Breeding Bird Survey indicate that the species has declined roughly 2% per year between 1966-2010. A cause for decline includes the increased use of agricultural pesticides, including synthetic neonicotinoids, which has reduced the prey base of flying insects. This species commonly nests on gravel rooftops in urban and suburban areas. The increased use of rubber material for rooftops instead of gravel is a suspected cause of decline for urban populations.

(Brigham and others 2011, NABCI 2014)

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Cistothorus platensis

Sedge Wren

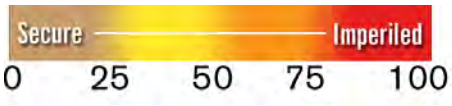


Class: Aves

Order: Passeriformes

Family: Troglodytidae

Priority Score: 21 **out of 100**



Population Trend: Stable

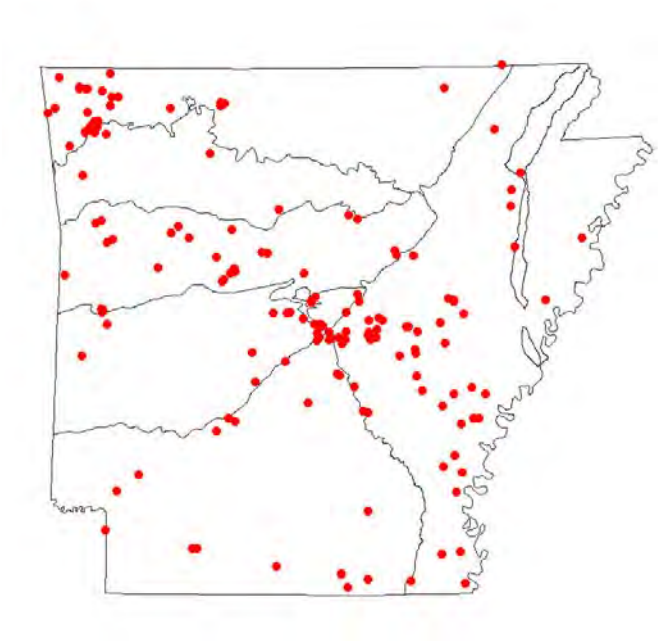
Residence: Permanent

Global Rank: G5 — Secure

State Rank: S1S2B,S4N — Critically imperiled breeding species in Arkansas (uncertain rank), apparently secure nonbreeding species in Arkansas

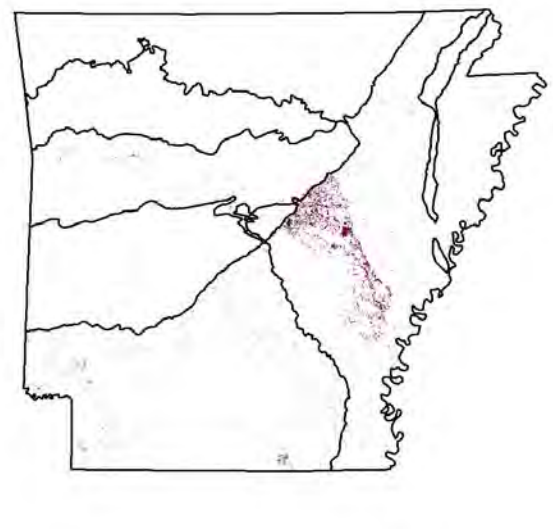
Distribution

Occurrence Records



Ecoregions where the species occurs:

- ☑ Ozark Highlands
- ☑ Boston Mountains
- ☑ Arkansas Valley
- ☑ Ouachita Mountains
- ☑ South Central Plains
- ☑ Mississippi Alluvial Plain
- ☑ Mississippi Valley Loess Plains



Habitat Map



Habitats

	Weight
Herbaceous Wetland	Optimal
Lower Mississippi Alluvial Plain Grand Prairie	Optimal
Ozark-Ouachita Prairie and Woodland	Suitable
West Gulf Coastal Plain Calcareous Prairie and Woodland	Suitable

Problems Faced

KNOWN PROBLEM: Loss and degradation of herbaceous wetlands.	Threat: Habitat destruction or conversion Source: Agricultural practices
KNOWN PROBLEM: Loss and degradation of herbaceous wetlands.	Threat: Habitat destruction or conversion Source: Forestry activities
KNOWN PROBLEM: Loss and degradation of seasonal wetland habitats.	Threat: Habitat disturbance Source: Excessive groundwater withdrawal
KNOWN PROBLEM: Loss and degradation of seasonal wetland habitats.	Threat: Habitat destruction or conversion Source: Agricultural practices
KNOWN PROBLEM: Loss and degradation of seasonal wetland habitats.	Threat: Habitat destruction or conversion Source: Urban development
KNOWN PROBLEM: Loss of native warm season grasslands.	Threat: Habitat destruction or conversion Source: Agricultural practices
KNOWN PROBLEM: Nest failure from destruction of nests due to earlier and more frequent haying.	Threat: Habitat disturbance Source: Agricultural practices

Data Gaps/Research Needs

Identify breeding sites.

Identify important wintering locations.

Conservation Actions

	Importance	Category
Conduct periodic disturbance to limit woody encroachment, timed to provide dense emergent wetland vegetation for nesting and/or wintering.	Medium	Habitat Restoration/Improvement
Conduct spring burns to provide optimal vegetation height and density and reduce litter.	Medium	Fire Management
Protect emergent wetlands and grasslands.	High	Habitat Protection
Restore emergent wetlands.	High	Habitat Restoration/Improvement
Restore native warm season grasses.	High	Habitat Restoration/Improvement

Monitoring Strategies

The Partners in Flight North American Landbird Conservation Plan indicates that long-term population trend monitoring for this species is generally considered adequate but some issues, such as bias, may not have been accounted for. Continue to conduct Breeding Bird Surveys at all routes established in Arkansas. Expand effort to locate breeding and important wintering locations. Continue tracking of this species by the Arkansas Natural Heritage Commission.

Comments

This species lives at the interface of grasslands and wetlands; they nest where the soil is saturated and sedges mix with grasses. Unfortunately, this habitat type has been frequently drained for farming. Frequent haying and over-grazing decrease habitat quality as well. Fortunately, providing habitat through the Conservation Reserve Program has boosted numbers in some areas.This species would benefit from farm bill program projects that protect, restore, and manage wetlands and grasslands. (Arkansas Audubon Society 2012, Dechant and others 2003, Hamel 1992, Herkert and others 2001, James and Neal 1986, Martin and Finch 1995, National Audubon Society 2002, Rich and others 2004, Sauer and others 2004)

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Coccyzus americanus

Yellow-billed Cuckoo

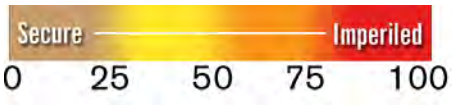


Class: Aves

Order: Cuculiformes

Family: Cuculidae

Priority Score: **19** **out of 100**



Population Trend: Decreasing

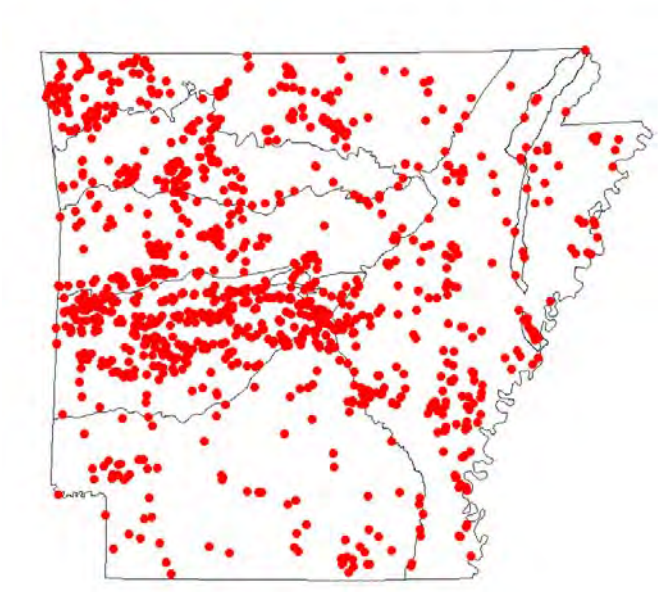
Residence: Breeding

Global Rank: G5 — Secure

State Rank: S3B — Vulnerable breeding species in Arkansas

Distribution

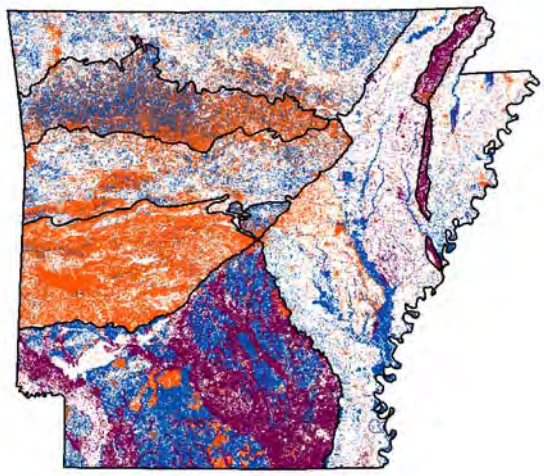
Occurrence Records



Ecoregions where the species occurs:

- ☑ Ozark Highlands
- ☑ Boston Mountains
- ☑ Arkansas Valley
- ☑ Ouachita Mountains
- ☑ South Central Plains
- ☑ Mississippi Alluvial Plain
- ☑ Mississippi Valley Loess Plains

Habitat Map





Coccyzus americanus
Yellow-billed Cuckoo

Habitats	Weight
Crowley's Ridge Loess Slope Forest	Optimal
Cultivated Forest	Marginal
Lower Mississippi Alluvial Plain Grand Prairie	Marginal
Lower Mississippi Flatwoods Woodland and Forest	Optimal
Lower Mississippi River Bottomland Depression	Marginal
Lower Mississippi River Dune Woodland, Pond, and Forest	Marginal
Lower Mississippi River High Bottomland Forest	Optimal
Lower Mississippi River Low Bottomland Forest	Suitable
Lower Mississippi River Riparian Forest	Suitable
Ouachita Montane Oak Forest	Suitable
Ozark-Ouachita Dry Oak Woodland	Suitable
Ozark-Ouachita Dry-Mesic Oak Forest	Suitable
Ozark-Ouachita Forested Seep	Suitable
Ozark-Ouachita Large Floodplain	Suitable
Ozark-Ouachita Mesic Hardwood Forest	Optimal
Ozark-Ouachita Pine/Bluestem Woodland	Marginal
Ozark-Ouachita Pine-Oak Forest	Marginal
Ozark-Ouachita Pine-Oak Forest	Marginal
Ozark-Ouachita Prairie and Woodland	Suitable
Ozark-Ouachita Riparian	Optimal
Urban/Suburban	Marginal
West Gulf Coastal Plain Calcareous Prairie and Woodland	Marginal
West Gulf Coastal Plain Dry Pine-Hardwood Flatwoods	Marginal
West Gulf Coastal Plain Large River Floodplain Forest	Optimal
West Gulf Coastal Plain Mesic Hardwood Forest	Optimal
West Gulf Coastal Plain Pine-Hardwood Forest	Marginal
West Gulf Coastal Plain Red River Floodplain Forest	Optimal
West Gulf Coastal Plain Sandhill Oak and Shortleaf Pine Forest and Woodland	Marginal

Habitats

Habitats	Weight
West Gulf Coastal Plain Seepage Swamp and Baygall	Suitable
West Gulf Coastal Plain Small Stream/River Forest	Optimal
West Gulf Coastal Plain Wet Hardwood Flatwoods	Suitable

Problems Faced

KNOWN PROBLEM: Loss of dense scrub cover near streams, marshes, and wetlands within otherwise open woodlands.	Threat: Riparian habitat destruction Source: Forestry activities
KNOWN PROBLEM: Loss of dense scrub cover near streams, marshes, and wetlands within otherwise open woodlands.	Threat: Riparian habitat destruction Source: Conversion of riparian forest
KNOWN PROBLEM: Loss of quality nesting habitat due to habitat fragmentation.	Threat: Habitat fragmentation Source: Urban development
KNOWN PROBLEM: Population declines thought to be linked to habitat loss.	Threat: Habitat fragmentation Source: Forestry activities
KNOWN PROBLEMS: Loss of forest stands containing well-developed midstories for nesting.	Threat: Altered composition/structure Source: Forestry activities
POTENTIAL PROBLEM: Loss of both hardwood and pine pole-stage timber plantations.	Threat: Altered composition/structure Source: Forestry activities
POTENTIAL PROBLEM: Loss of quality nesting habitat due to habitat fragmentation.	Threat: Habitat fragmentation Source: Resource extraction
POTENTIAL PROBLEM: Toxins and contaminants in agricultural areas may pose a threat.	Threat: Toxins/contaminants Source: Agricultural practices

Data Gaps/Research Needs

Additional information on life history on the breeding grounds is needed with a focus on breeding territory, site selection, site tenacity, fecundity, and mortality, and dispersal and survivorship of immature birds.
Determine causes of population decline.
Determine response to prescribed burning.
Evaluate effectiveness of management actions to provide breeding habitat for source populations.

Conservation Actions

Conservation Actions	Importance	Category
Create, restore, and maintain the shrubby component of riparian habitat.	High	Habitat Restoration/Improvement
Protect riparian forested habitat.	Medium	Habitat Protection
Reduce pesticide use near riparian and orchard areas.	Medium	Threat Abatement

Monitoring Strategies

The Partners in Flight North American Landbird Conservation Plan indicates that long-term population trend monitoring for this species is generally considered adequate, but some issues, such as bias, may not have been accounted for. If more accurate data are needed, a species specific census involving playback calls should be developed and conducted. Continue to conduct Breeding Bird Surveys at all routes established in Arkansas.

Comments

Although locally abundant in extensive mature forests, this species has undergone steep population declines and has disappeared from portions of its range. It is sensitive to habitat fragmentation. Breeding is often triggered by an abundant food supply of large orthoptera, especially caterpillars and cicadas. This species will occasionally lay eggs in the nests of other species. (Arkansas Audubon Society 2012, Hamel 1992, Hughes 1999, James and Neal 1986, Martin and Finch 1995, National Audubon Society 2002, Rich and others 2004, Sauer and others 2004)

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Colinus virginianus

Northern Bobwhite

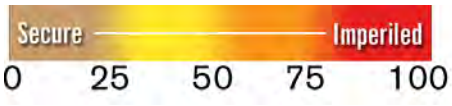


Class: Aves

Order: Galliformes

Family: Odontophoridae

Priority Score: **19** **out of 100**



Population Trend: Decreasing

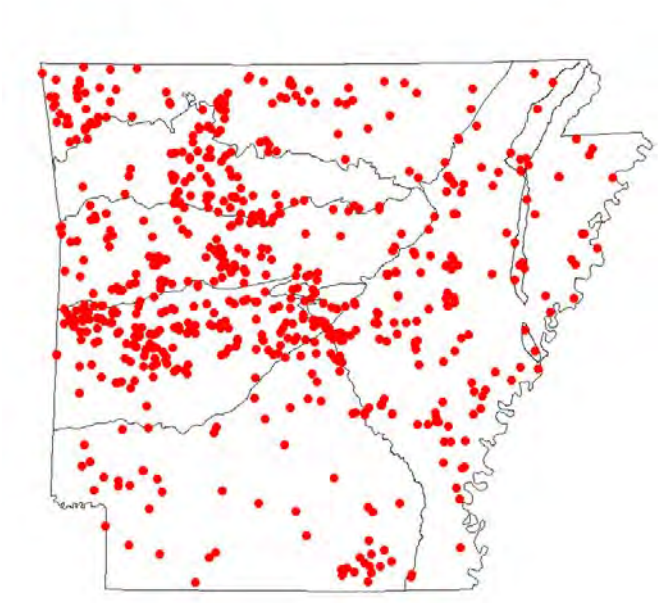
Residence: Permanent

Global Rank: G5 — Secure

State Rank: S3 — Vulnerable in Arkansas

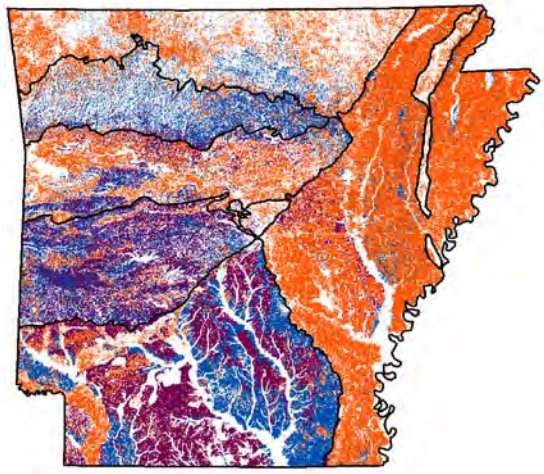
Distribution

Occurrence Records



Ecoregions where the species occurs:

- ☑ Ozark Highlands
- ☑ Boston Mountains
- ☑ Arkansas Valley
- ☑ Ouachita Mountains
- ☑ South Central Plains
- ☑ Mississippi Alluvial Plain
- ☑ Mississippi Valley Loess Plains



Habitat Map



Habitats	Weight
Crop Land	Marginal
Cultivated Forest	Marginal
Interior Highlands Dry Acidic Glade and Barrens	Suitable
Lower Mississippi Alluvial Plain Grand Prairie	Optimal
Lower Mississippi Flatwoods Woodland and Forest	Marginal
Lower Mississippi River Dune Woodland, Pond, and Forest	Marginal
Ozark-Ouachita Dry Oak and Pine Woodland	Optimal
Ozark-Ouachita Pine/Bluestem Woodland	Optimal
Ozark-Ouachita Pine-Oak Forest	Suitable
Ozark-Ouachita Pine-Oak Woodland	Suitable
Ozark-Ouachita Prairie and Woodland	Optimal
Pasture Land	Marginal
West Gulf Coastal Plain Calcareous Prairie and Woodland	Optimal
West Gulf Coastal Plain Pine-Hardwood Flatwoods	Marginal
West Gulf Coastal Plain Pine-Hardwood Flatwoods	Suitable
West Gulf Coastal Plain Saline Glade	Suitable

Problems Faced

KNOWN PROBLEM: Conversion to non-native, cool and warm season grasses (fescue, bermuda grass, bahiagrass).	Threat: Altered composition/structure Source: Exotic species
KNOWN PROBLEM: Fragmentation of early successional habitat and native warm season grasses.	Threat: Habitat fragmentation Source: Fire suppression
KNOWN PROBLEM: Habitat fragmentation.	Threat: Habitat fragmentation Source: Grazing/Browsing
KNOWN PROBLEM: Habitat fragmentation.	Threat: Habitat fragmentation Source: Agricultural practices
KNOWN PROBLEM: Lack of contiguous blocks of suitable habitat.	Threat: Habitat fragmentation Source: Urban development
KNOWN PROBLEM: Loss of early successional habitat and native warm season grasses.	Threat: Habitat destruction or conversion Source: Fire suppression
KNOWN PROBLEM: Loss of early successional habitat.	Threat: Habitat destruction or conversion Source: Agricultural practices
POTENTIAL PROBLEM: Decreased prey availability due to pesticide use.	Threat: Biological alteration Source: Agricultural practices
POTENTIAL PROBLEM: Fire ant predation on chicks.	Threat: Extraordinary predation/parasitism/disease Source: Predation
POTENTIAL PROBLEM: Loss of early successional habitat within pine plantation clearcut areas.	Threat: Habitat destruction or conversion Source: Forestry activities

Data Gaps/Research Needs

No data gaps or research needs were identified.

Conservation Actions

	Importance	Category
Increase connectivity of available habitat.	High	Habitat Restoration/Improvement
Restore early successional habitat.	High	Habitat Restoration/Improvement
Restore native warm season grasses and forbs.	High	Habitat Restoration/Improvement

Monitoring Strategies

The Partners in Flight North American Landbird Conservation Plan indicates that long-term population trend monitoring for this species is generally considered adequate, but some issues, such as bias, may not have been accounted for. Continue to conduct Breeding Bird Surveys at all routes established in Arkansas. Continue state agency brood surveys for this species.

Comments

This popular gamebird is in decline region-wide due to habitat degradation. Agricultural practices and forestry practices that remove weedy and shrubby vegetation also remove nesting and foraging habitat. Fire suppression also has led to habitat loss.

Farm Bill programs, particularly the applicable practices within the Conservation Reserve program (CP-33), that promote practices focusing on the establishment of early successional habitat may improve quail habitat. Private landowners should be encouraged to perform prescribed burns. (ANHC 2003, Baerg 1927, Brennan 1991, 1999, Clawson 1982, Dickson and others 1983, Dimmick and others 2002, Duzan and others 2003, 2003A, Evans and Kirkman 1980, Fitzgerald 2000, Hamel 1992, Jacobs 2001, James and Neal 1986, Landers and Mueller 1986, Martin and Finch 1995, Robbins and Easterla 1992, Rosene 1969, Stoddard 1931).

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Cygnus buccinator

Trumpeter Swan

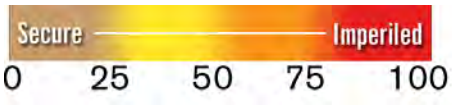


Class: Aves

Order: Anseriformes

Family: Anatidae

Priority Score: 17 **out of 100**



Population Trend: Increasing

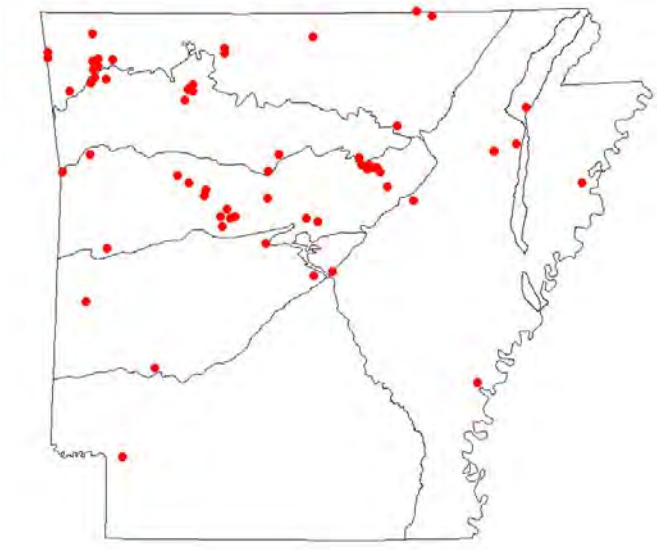
Residence: Winter

Global Rank: G4 — Apparently secure species

State Rank: S2N — Imperiled nonbreeding species in Arkansas

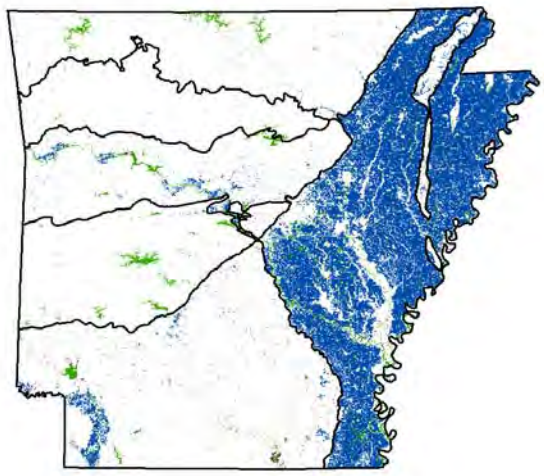
Distribution

Occurrence Records



Ecoregions where the species occurs:

- ☑ Ozark Highlands
- ☑ Boston Mountains
- ☑ Arkansas Valley
- ☑ Ouachita Mountains
- ☑ South Central Plains
- ☑ Mississippi Alluvial Plain
- ☑ Mississippi Valley Loess Plains



Habitat Map



Habitats	Weight
Crop Land	Suitable
Herbaceous Wetland	Optimal
Mud Flats	Marginal
Ponds, Lakes, and Water Holes	Obligate

Problems Faced

KNOWN PROBLEM: Collisions with power lines.	Threat: Collision with man-made structures Source: Commercial/industrial development
KNOWN PROBLEM: Collisions with power lines.	Threat: Collision with man-made structures Source: Urban development
KNOWN PROBLEM: Lead poisoning from ingestion of lead fishing tackle and lead shot.	Threat: Toxins/contaminants Source: Recreation
KNOWN PROBLEM: Dependency on supplemental feeding.	Threat: Biological alteration Source: Management of/for certain species
POTENTIAL PROBLEM: Competition with Mute Swans.	Threat: Extraordinary competition for resources Source: Exotic species

Data Gaps/Research Needs

As Mute Swans continue to expand into the current Trumpeter Swan breeding and wintering ranges, an understanding of the competitive interaction between these 2 species is needed to understand how the expansion of this exotic species may impact Trumpeter Swans.
Identify suitable foraging sites.
Information is needed on the differences in foraging ecology and nutritional needs between swans foraging on agricultural crops versus aquatic vegetation.
Specific data on the exact routes and sites used during migration and on the wintering grounds are needed to adequately protect and manage critical habitats.

Conservation Actions

	Importance	Category
Control breeding flighted and pinioned mute swans in Arkansas.	High	Public Relations/Education
Control breeding flighted and pinioned mute swans in Arkansas.	High	Threat Abatement
Install highly visible power line markers in on power lines around known wintering ponds and wetlands used by swans	High	Threat Abatement
Plant winter forage.	Medium	Habitat Restoration/Improvement
Protect quality emergent wetlands.	High	Habitat Restoration/Improvement
Restore and manage emergent wetlands.	High	Habitat Restoration/Improvement
Restore and manage for emergent and native aquatic vegetation in ponds, lakes and water holes.	High	Habitat Restoration/Improvement

Monitoring Strategies

Continue and expand winter and summer surveys for both Mute Swans and Trumpeter Swans.

Comments

In 1988, 1 collared Trumpeter Swan was observed on a pond adjacent to a nuclear power generating plant near Russelville AR. Banded near LaCreek NWR in Nebraska, this was the first Trumpeter Swan reported in Arkansas in over 80 years. In 1995, 9 Trumpeter Swans were observed on Magness Lake in Cleburne County. During the winter of 2001-2002, 45 swans was observed at Magness Lake and reliable reports of counts over 180 at Magness Lake were received in 2010 (K Rowe pers. Comm.) The construction of ponds as clean water sources for shale oil extraction in the vicinity of Magness Lake as well as the ponds' landowners feeding swans has increased estimates of swans wintering in Cleburne County to over 250 in 2014-5. In 2008-10 AGFC partnered with Iowa DNR and released 49 immature trumpeters raised in Iowa DNR's Trumpeter Swan Restoration Project. These swans were released in the Ozarks and Arkansas River Valley in a reverse migration experiment that proved successful as released collared swans returned to AR in subsequent years to winter. Several swans released in this experiment have been observed wintering in the Arkansas River Valley area as adults with un-collared mates and their cygnets (K. Rowe pers comm). Wintering Trumpeter Swan population estimates from a volunteer 2013-14 survey conducted by AGFC totaled about 525 swans. Trumpeter Swan mortality in Arkansas has been caused by lead poisoning, collision with power lines and illegal shooting (Rowe pers. Comm).

(Arkansas Audubon Society 2012, Hamel 1992, James and Neal 1986, Martin and Finch 1995, Mitchell 1994, Mitchell and Eichholz 2010, National Audubon Society 2002, Rich and others 2004, Sauer and others 2004)

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Egretta tricolor

Tricolored Heron

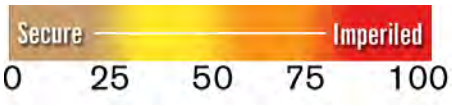


Class: Aves

Order: Pelecaniformes

Family: Ardeidae

Priority Score: **19** **out of 100**



Population Trend: Stable

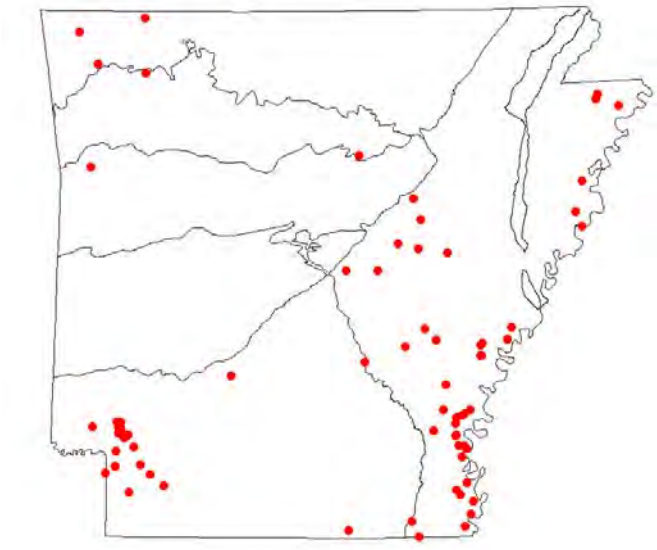
Residence: Breeding

Global Rank: G5 — Secure

State Rank: S2B — Imperiled breeding species in Arkansas

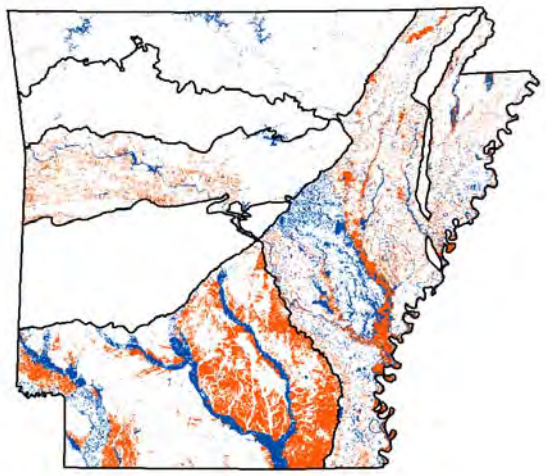
Distribution

Occurrence Records



Ecoregions where the species occurs:

- [x] Ozark Highlands
- [x] Boston Mountains
- [x] Arkansas Valley
- [ ] Ouachita Mountains
- [x] South Central Plains
- [x] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains



Habitat Map



Habitats	Weight
Herbaceous Wetland	Suitable
Lower Mississippi Alluvial Plain Grand Prairie	Suitable
Lower Mississippi Flatwoods Woodland and Forest	Marginal
Lower Mississippi River Bottomland Depression	Suitable
Lower Mississippi River High Bottomland Forest	Marginal
Lower Mississippi River Low Bottomland Forest	Suitable
Lower Mississippi River Riparian Forest	Marginal
Ozark-Ouachita Large Floodplain	Marginal
Ponds, Lakes, and Water Holes	Suitable
West Gulf Coastal Plain Large River Floodplain Forest	Suitable
West Gulf Coastal Plain Red River Floodplain Forest	Suitable

Problems Faced

KNOWN PROBLEM: Loss of emergent wetlands.	Threat: Altered composition/structure Source:
KNOWN PROBLEM: Conflicts with aquaculture.	Threat: Extraordinary competition for resources Source: Confined animal operations
KNOWN PROBLEM: Loss of wetlands from conversion.	Threat: Habitat destruction or conversion Source: Agricultural practices
POTENTIAL PROBLEM: Vulnerable to toxins and contaminants resulting from agricultural run-off.	Threat: Toxins/contaminants Source: Agricultural practices

Data Gaps/Research Needs

Determine the impacts of toxins, heavy metals, and pesticides.

Conservation Actions

	Importance	Category
Maintain wetlands.	High	Habitat Protection
Restore wetlands.	High	Habitat Restoration/Improvement

Monitoring Strategies

Initiate a Colonial Waterbird Survey as well as track species by www.ebird.com. Continue tracking of this species by the Arkansas Natural Heritage Commission.

Comments

This species is a rare and irregular summer resident that has bred a few times in Arkansas. It is more common in late summer when immatures wander north from breeding grounds nearer the coast. The tricolored heron favors coastal salt marshes. A decline in the availability of coastal marshes in Louisiana and the Gulf of Mexico has likely led to a decline in this species, which was previously known as the Louisiana Heron. Wetland restoration in Arkansas can improve breeding opportunities long term, especially if sea level rise forces the species to move northward from Louisiana. (Arkansas Audubon Society 2012, Hamel 1992, James and Neal 1986, Kushlan and others 2002, Martin and Finch 1995, National Audubon Society 2002, Rich and others 2004, Rodgers and Smith 1995, Sauer and others 2004).

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Elanoides forficatus

Swallow-tailed Kite

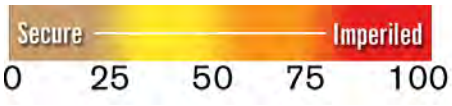


Class: Aves

Order: Accipitriformes

Family: Accipitridae

Priority Score: **29** **out of 100**



Population Trend: Decreasing

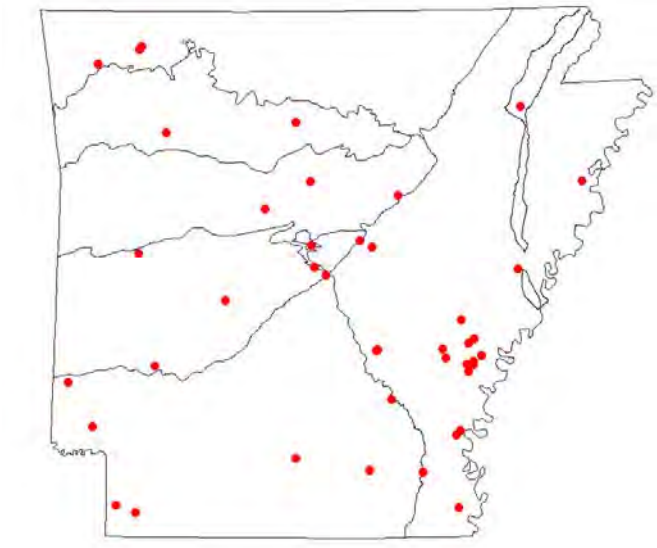
Residence: Breeding

Global Rank: G5 — Secure

State Rank: S1B — Critically imperiled breeding species in Arkansas

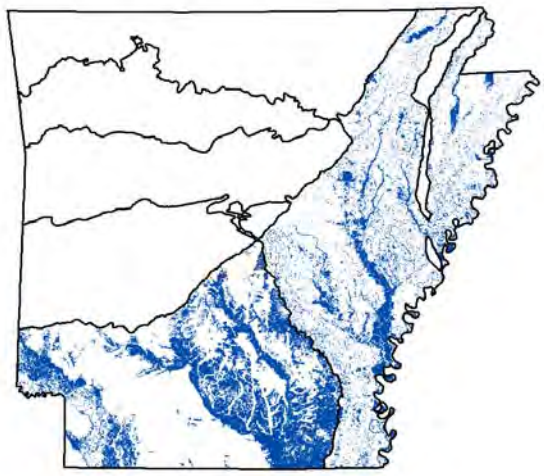
Distribution

Occurrence Records



Ecoregions where the species occurs:

- ☐ Ozark Highlands
- ☐ Boston Mountains
- ☐ Arkansas Valley
- ☐ Ouachita Mountains
- ☑ South Central Plains
- ☑ Mississippi Alluvial Plain
- ☐ Mississippi Valley Loess Plains



Habitat Map



Habitats	Weight
Lower Mississippi Flatwoods Woodland and Forest	Suitable
Lower Mississippi River High Bottomland Forest	Suitable
Lower Mississippi River Low Bottomland Forest	Suitable
Lower Mississippi River Riparian Forest	Suitable
West Gulf Coastal Plain Large River Floodplain Forest	Suitable
West Gulf Coastal Plain Red River Floodplain Forest	Suitable

Problems Faced

KNOWN PROBLEM: Loss of bottomland hardwood forests.	Threat: Habitat destruction or conversion Source: Conversion of riparian forest
KNOWN PROBLEM: Loss of bottomland hardwood forests.	Threat: Habitat destruction or conversion Source: Agricultural practices
KNOWN PROBLEM: Loss of bottomland hardwood forests.	Threat: Altered composition/structure Source: Forestry activities
KNOWN PROBLEM: Nest failure.	Threat: Extraordinary predation/parasitism/disease Source: Predation

Data Gaps/Research Needs

Determine if species is breeding on Dale Bumpers White River National Wildlilfe Refuge and adjoining private lands.
Determine if species is nesting and successfully fledging young on Sulphur River Wildlife Management Area.
Determine if species is present on Dale Bumpers White River National Wildlilfe Refuge during breeding season.
Determine if tree density and canopy connectivity increases rates of predation on nesting kites.

Conservation Actions

	Importance	Category
Manage forests for super dominant trees in canopy for nesting.	High	Habitat Restoration/Improvement
Reduce nestling predation.	High	Threat Abatement

Monitoring Strategies

The Partners in Flight North American Landbird Conservation Plan indicates that this species has imprecise trend data at the continental level. A specialized effort to determine if this species is nesting in Arkansas is needed. Nesting populations must be monitored in a manner which eliminates disturbance to the species. Continue tracking of this species by the Arkansas Natural Heritage Commission.

Comments

Once ranging from Florida to Minnesota, this species is now restricted to a few southeastern states, with most birds found in Florida. Formerly extirpated from Arkansas since the 1940s, a pair was observed routinely during the breeding season in 1998 and 1999 along the lower White River in the vicinity of the Dale Bumpers White River National Wildlife Refuge (DBWRNWR). This apparent re-colonization of Swallow-tailed Kites was significant because this species seems to have a high fidelity to breeding sites and tends to nest socially in loose colonies. Funded by AWAP funds and funds from the Arkansas Game and Fish Commission, a research project was initiated in 2002 to locate and monitor Swallow-tailed Kite nests on the DBWRNWR. Nests were located but failed prior egg hatching in 2002, 2004, 2005 and 2006. In 2007 and 2009. Swallow-tailed Kites were present on the refuge during the breeding season, but a nest was not located. In 2008 a nest with 3 nestlings was located and monitored but failed due to researcher disturbance. Swallow-tailed kites have been observed sporadically in spring and summer on the DBWRNWR since 2010. It is unknown if a pair is still attempting to nest on the refuge or adjoining property.

The most recent observation of this species occurred during spring/summer 2015, when a pair was repeatedly observed from April - August at Sulphur River Wildlife Management Area. The pair is assumed to have made a nesting attempt based on observed behavior (K. Rowe, pers. Comm.). Individual Swallow-tailed Kites, most likely from Louisiana, have been observed throughout Arkansas during the post-breeding season dispersal period.

(Arkansas Audubon Society 2012, Bader and Bednarz 2005, Chiavacchi and others 2011, Hamel 1992, James and Neal 1986, Martin and Finch 1995, Meyer 1995, National Audubon Society 2002, Rich and others 2004, Sauer and others 2004)

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Empidonax traillii

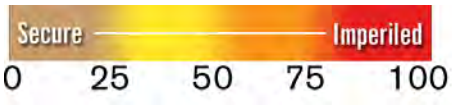
Willow Flycatcher

Class: Aves

Order: Passeriformes

Family: Tyrannidae

Priority Score: **23** **out of 100**



Population Trend: Stable

Residence: Breeding

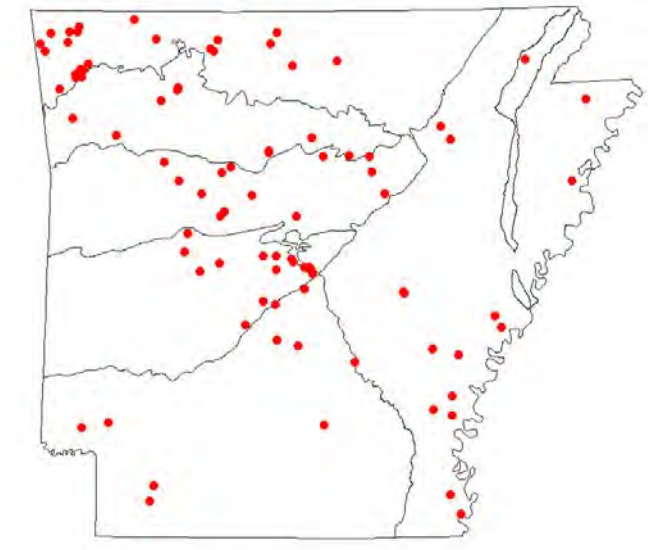


Global Rank: G5 — Secure

State Rank: S1B — Critically imperiled breeding species in Arkansas

Distribution

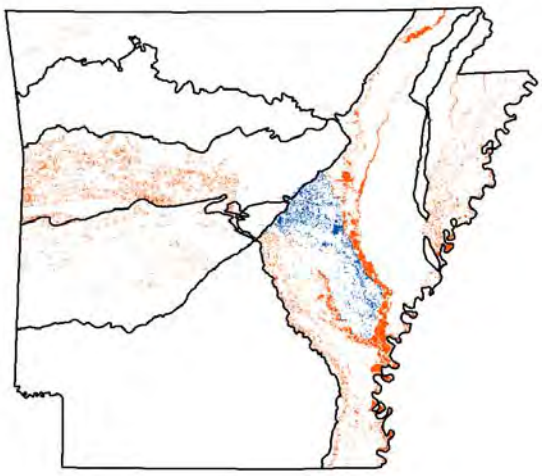
Occurrence Records



Ecoregions where the species occurs:

- ☑ Ozark Highlands
- ☑ Boston Mountains
- ☑ Arkansas Valley
- ☑ Ouachita Mountains
- ☑ South Central Plains
- ☑ Mississippi Alluvial Plain
- ☑ Mississippi Valley Loess Plains

Habitat Map





Habitats	Weight
Lower Mississippi Alluvial Plain Grand Prairie	Suitable
Lower Mississippi River Riparian Forest	Marginal
Ozark-Ouachita Large Floodplain	Marginal
Ozark-Ouachita Prairie and Woodland	Suitable
West Gulf Coastal Plain Calcareous Prairie and Woodland	Suitable

Empidonax traillii
Willow Flycatcher

Problems Faced

KNOWN PROBLEM: Loss of grassland with shrub component.	Threat: Altered composition/structure Source: Dam
KNOWN PROBLEM: Loss of grassland with shrub component.	Threat: Riparian Habitat Destruction Source: Conversion of riparian forest
KNOWN PROBLEM: Loss of grassland with shrub component.	Threat: Riparian Habitat Destruction Source: Agricultural practices
KNOWN PROBLEM: Loss of grassland with shrub component.	Threat: Habitat destruction or conversion Source: Urban development
KNOWN PROBLEM: Loss of grassland with shrub component.	Threat: Habitat destruction or conversion Source: Agricultural practices
POTENTIAL PROBLEM: Loss of quality, native grasslands.	Threat: Altered composition/structure Source: Grazing/Browsing
POTENTIAL PROBLEM: Loss of quality, native grasslands.	Threat: Altered composition/structure Source: Agricultural practices
POTENTIAL PROBLEM: Parasitism by Brown-headed Cowbirds.	Threat: Extraordinary predation/parasitism/disease Source: Parasites/pathogens

Data Gaps/Research Needs

Locate and survey potential breeding habitat.

Conservation Actions

	Importance	Category
Maintain grasslands with shrub component.	High	Habitat Protection
Restore grassland with shrub component.	High	Habitat Restoration/Improvement

Monitoring Strategies

The Partners in Flight North American Landbird Conservation Plan indicates that long-term population trend monitoring for this species is generally considered adequate, but some issues, such as bias, may not have been accounted for. Continue to conduct Breeding Bird Surveys at all routes established in Arkansas. Continue effort to locate breeding populations of this species. Continue tracking of this species by the Arkansas Natural Heritage Commission.

Comments

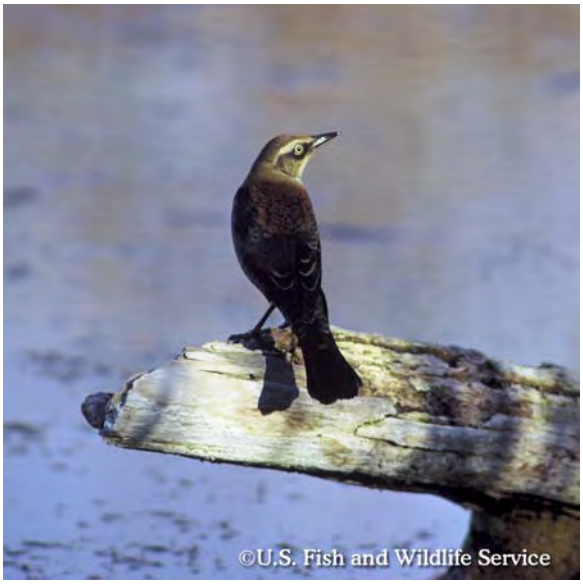
Population is below historical numbers in Arkansas and throughout the country. Disturbances to riparian habitat such as damming, dredging, channelization, urbanization, draining, and cattle are threats. (Arkansas Audubon Society 2012, Hamel 1992, James and Neal 1986, Martin and Finch 1995, National Audubon Society 2002, Rich and others 2004, Sauer and others 2004, Sedgwick 2000)

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Euphagus carolinus

Rusty Blackbird

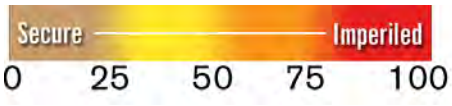


Class: Aves

Order: Passeriformes

Family: Icteridae

Priority Score: **29** **out of 100**



Population Trend: Decreasing

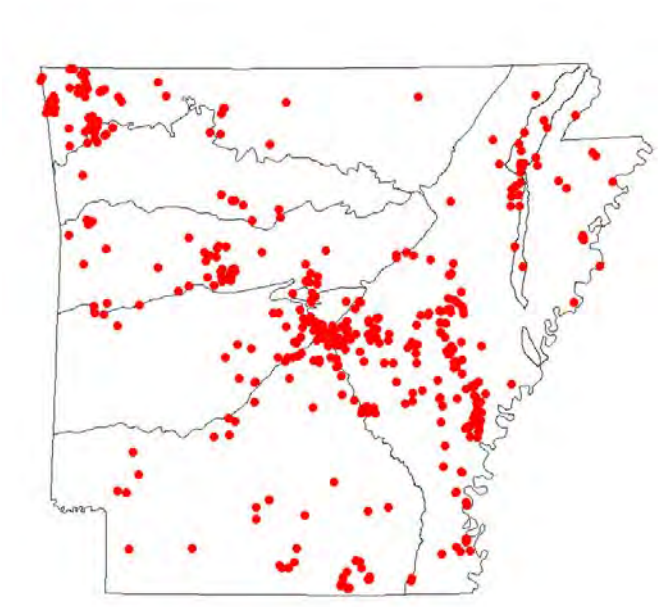
Residence: Winter

Global Rank: G4 — Apparently secure species

State Rank: S2N — Imperiled nonbreeding species in Arkansas

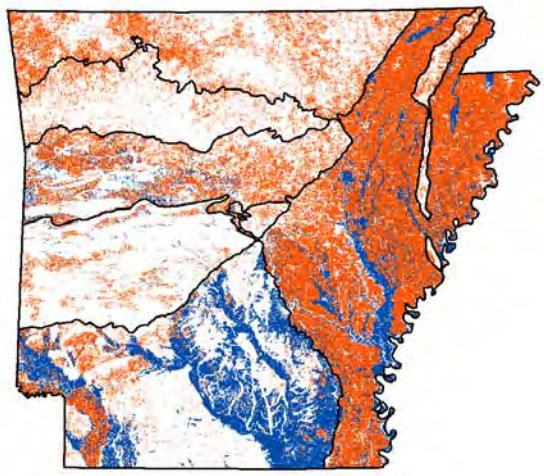
Distribution

Occurrence Records



Ecoregions where the species occurs:

- ☑ Ozark Highlands
- ☑ Boston Mountains
- ☑ Arkansas Valley
- ☑ Ouachita Mountains
- ☑ South Central Plains
- ☑ Mississippi Alluvial Plain
- ☑ Mississippi Valley Loess Plains



Habitat Map



Habitats	Weight
Crop Land	Marginal
Lower Mississippi Flatwoods Woodland and Forest	Suitable
Lower Mississippi River High Bottomland Forest	Suitable
Lower Mississippi River Low Bottomland Forest	Suitable
Lower Mississippi River Riparian Forest	Suitable
Ozark-Ouachita Large Floodplain	Suitable
Ozark-Ouachita Prairie and Woodland	Suitable
Pasture Land	Marginal
West Gulf Coastal Plain Large River Floodplain Forest	Suitable
West Gulf Coastal Plain Red River Floodplain Forest	Suitable

Problems Faced

KNOWN PROBLEM: Loss of wooded wetlands on breeding grounds.	Threat: Habitat destruction Source: Conversion of riparian forest
KNOWN PROBLEM: Loss of wooded wetlands on breeding grounds.	Threat: Habitat destruction Source: Forestry activities
POTENTIAL PROBLEM: Vulernability to toxins and contaminants.	Threat: Toxins/contaminants Source: Non-point source pollution

Data Gaps/Research Needs

Determine habitat use in the winter.
Determine the effect of contaminants on health and survival.
Determine the effect of winter habitat selection on survival and carry-over effects to breeding season.
Information is needed on diet on the wintering grounds in Arkansas.

Conservation Actions

	Importance	Category
Manage water fluctuations for invertebrates in winter.	Low	Habitat Restoration/Improvement
Restore and protect wooded wetlands on breeding grounds.	Low	Habitat Protection

Monitoring Strategies

The Partners in Flight North American Landbird Conservation Plan indicates that this species has imprecise trend data at the continental level. An effort is being made to expand the BBS program to better survey this species. Species specific citizen science-based monitoring efforts were iniitated in 2009 (Rusty Blackbird Blitz) and are aimed at winter and migratory periods. Continue tracking of this species by the Arkansas Natural Heritage Commission.

Comments

Unlike other blackbirds, this species has undergone significant population decline. Much more research is needed to understand the factors responsible for this decline, but it may be due in part to the destruction of wet woods these birds prefer on the breeding grounds. Clearing the land for agriculture and urbanization also has promoted other blackbirds that may out-compete Rusty Blackbirds. (Arkansas Audubon Society 2012, Avery 2013, Hamel 1992, James and Neal 1986, Martin and Finch 1995, Newell 2013, National Audubon Society 2002, Rich and others 2004, Sauer and others 2004)

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Falco sparverius

American Kestrel

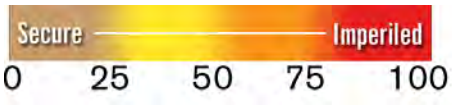


Class: Aves

Order: Falconiformes

Family: Falconidae

Priority Score: **19** **out of 100**



Population Trend: Stable

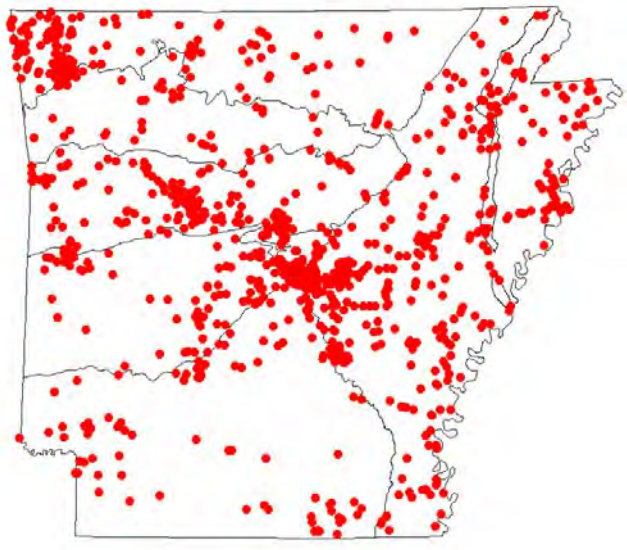
Residence: Winter

Global Rank: G5 — Secure

State Rank: S2B,S4N — Imperiled breeding, apparently secure nonbreeding species in Arkansas

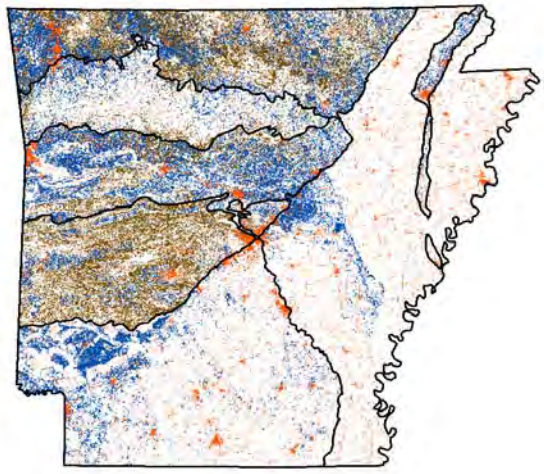
Distribution

Occurrence Records



Ecoregions where the species occurs:

- ☑ Ozark Highlands
- ☑ Boston Mountains
- ☑ Arkansas Valley
- ☑ Ouachita Mountains
- ☑ South Central Plains
- ☑ Mississippi Alluvial Plain
- ☑ Mississippi Valley Loess Plains



Habitat Map



Habitats	Weight
Central Interior Highlands Calcareous Glade and Barrens	Data Gap
Central Interior Highlands Dry Acidic Glade and Barrens	Data Gap
Lower Mississippi Alluvial Plain Grand Prairie	Suitable
Ozark-Ouachita Pine/Bluestem Woodland	Data Gap
Ozark-Ouachita Prairie and Woodland	Suitable
Pasture Land	Suitable
Urban/Suburban	Marginal
West Gulf Coastal Plain Calcareous Prairie	Suitable

Problems Faced

KNOWN PROBLEM: Lack of large trees within open areas for nesting.	Threat: Habitat destruction Source: Agricultural practices
KNOWN PROBLEM: Loss of available habitat due to succession from grassland and shrubland to forest.	Threat: Altered composition/structure Source: Forestry activities

Data Gaps/Research Needs

Determine causes of mortality.
Determine effects of pasture grass Kentucky 31 on prey species availability.
Determine factors that contribute to nest box use when nest structures are located in unoccupied habitat.
Determine impacts of pesticides.
Determine postfledging dispersal and subsequent recruitment into breeding populations.

Conservation Actions

	Importance	Category
Encourage farmers/ranchers to retain snags in pastures.	High	Habitat Restoration/Improvement
Encourage farmers/ranchers to retain widely spaced den trees in pastures.	High	Habitat Restoration/Improvement
Establish nest boxes in areas where kestrels occur during winter months.	High	Habitat Restoration/Improvement

Monitoring Strategies

Additional surveys need to be conducted in appropriate habitat to improve precision of BBS monitoring. Christmas Bird Count data are appropriate for monitoring overwintering kestrels.

Comments

American Kestrels inhabit open country across the United States where they hunt from perches and often while hovering (Smallwood and Bird 2002). They are commonly seen perched on utility lines along roadsides and thus are often censused from automobiles. Kestrels will not breed in habitat that is devoid of nesting cavities or dominated by tall grass or shrubs (Stys 1993). Fortunately, they will accept nesting boxes which can be used to increase breeding populations (Hamerstrum et al. 1973). Nest boxes placed with their openings facing south and east may be preferred (McComb and Nobel 1981). Kestrels have been documented nesting in man-made structures and buildings in Arkansas. Sites includes inside gutters, behind siding in insulation, and inside beams (K.Rowe pers. Obs). In Arkansas the overwintering population is larger than the breeding population (C. Kellner pers.obs.).

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Gallinula galeata

Common Gallinule

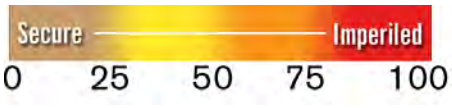


Class: Aves

Order: Gruiformes

Family: Rallidae

Priority Score: **19** **out of 100**



Population Trend: Unknown

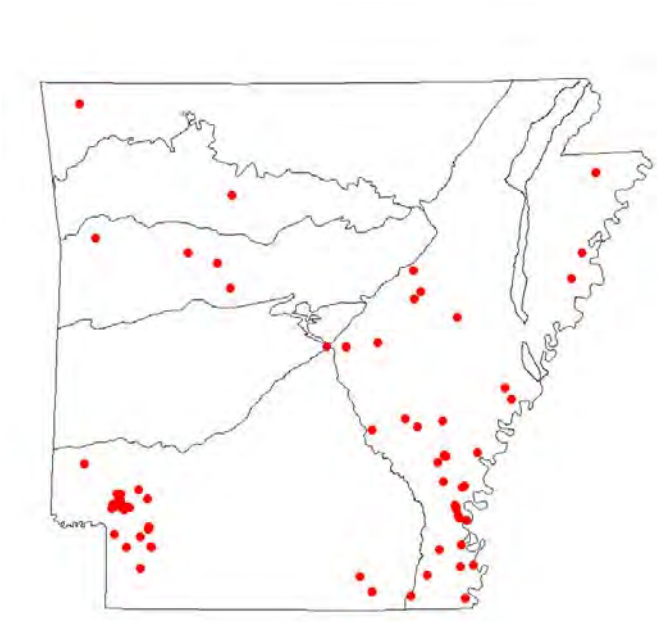
Residence: Breeding

Global Rank: G5 — Secure

State Rank: S2B — Imperiled breeding species in Arkansas

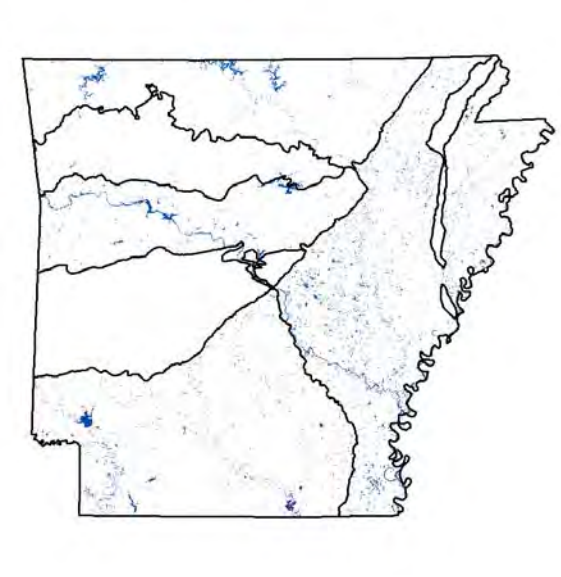
Distribution

Occurrence Records



Ecoregions where the species occurs:

- [x] Ozark Highlands
- [x] Boston Mountains
- [x] Arkansas Valley
- [ ] Ouachita Mountains
- [x] South Central Plains
- [x] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains



Habitat Map



Habitats

	Weight
Herbaceous Wetland	Optimal
Ponds, Lakes, and Water Holes	Suitable

Problems Faced

KNOWN PROBLEM: Loss of wetlands from conversion.	Threat: Habitat destruction or conversion Source: Agricultural practices
KNOWN PROBLEM: Loss of wetlands to invasive plant species.	Threat: Habitat destruction or conversion Source: Exotic species

Data Gaps/Research Needs

No data gaps or research needs were identified.

Conservation Actions

	Importance	Category
Protection of herbaceous wetlands.	High	Habitat Protection
Restoration of herbaceous wetlands.	High	Habitat Restoration/Improvement

Monitoring Strategies

Conduct secretive marshbird surveys using the North American Marsh Bird Survey Protocol outlined in the National Marsh Bird Survey Program.

Comments

This species has benefited by human-altered habitats such as flooded agricultural fields, reservoirs, and impoundments. However, for breeding they require permanently flooded marshes with robust emergent vegetation. They may be sensitive to wetland loss and invasive wetland plant species. Restoring or actively managing emergent wetlands will benefit this species. (Arkansas Audubon Society 2012, Bannor and Kiviat 2002, Hamel 1992, James and Neal 1986, Martin and Finch 1995, National Audubon Society 2002, Rich and others 2004, Sauer and others 2004)

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Haemorhous purpureus

Purple Finch

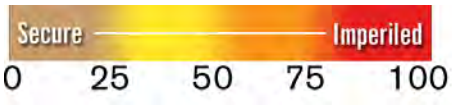


Class: Aves

Order: Passeriformes

Family: Fringillidae

Priority Score: **19** **out of 100**



Population Trend: Decreasing

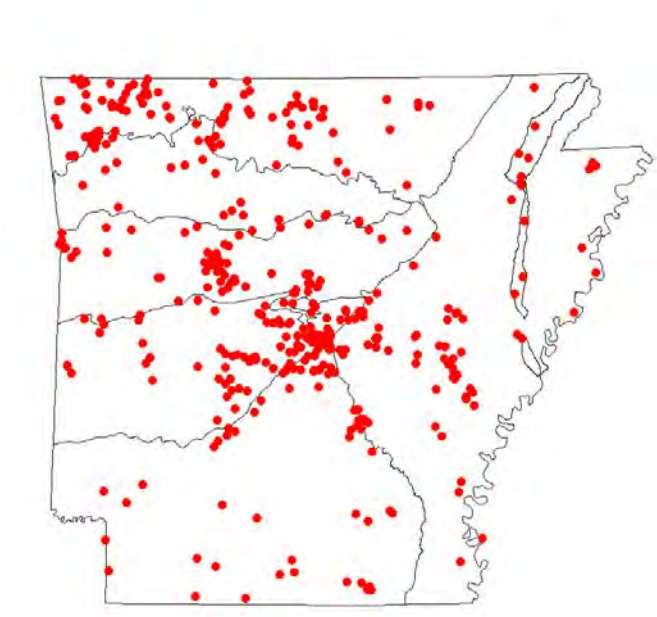
Residence: Winter

Global Rank: G5 — Secure

State Rank: S3N — Vulnerable nonbreeding species in Arkansas

Distribution

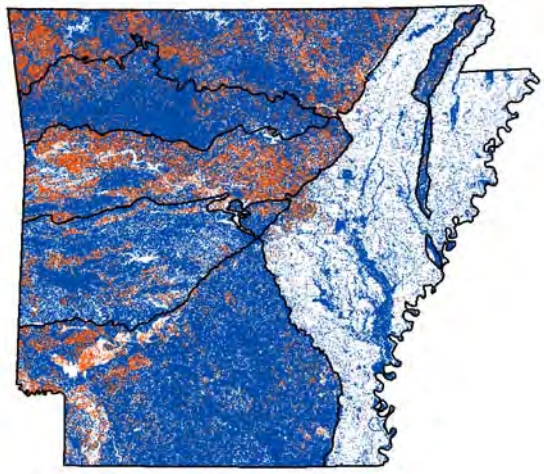
Occurrence Records



Ecoregions where the species occurs:

- ☑ Ozark Highlands
- ☑ Boston Mountains
- ☑ Arkansas Valley
- ☑ Ouachita Mountains
- ☑ South Central Plains
- ☑ Mississippi Alluvial Plain
- ☑ Mississippi Valley Loess Plains

Habitat Map





Haemorhous purpureus
Purple Finch

Habitats	Weight
Crowley's Ridge Loess Slope Forest	Suitable
Cultivated Forest	Suitable
Interior Highlands Calcareous Glade and Barrens	Suitable
Interior Highlands Dry Acidic Glade and Barrens	Suitable
Lower Mississippi Alluvial Plain Grand Prairie	Suitable
Lower Mississippi Flatwoods Woodland and Forest	Suitable
Lower Mississippi River Bottomland Depression	Suitable
Lower Mississippi River Dune Woodland, Pond, and Forest	Suitable
Lower Mississippi River High Bottomland Forest	Suitable
Lower Mississippi River Low Bottomland Forest	Suitable
Lower Mississippi River Riparian Forest	Suitable
Ouachita Montane Oak Forest	Suitable
Ozark-Ouachita Dry Oak and Pine Woodland	Suitable
Ozark-Ouachita Dry-Mesic Oak Forest	Suitable
Ozark-Ouachita Large Floodplain	Suitable
Ozark-Ouachita Mesic Hardwood Forest	Suitable
Ozark-Ouachita Pine/Bluestem Woodland	Suitable
Ozark-Ouachita Pine-Oak Forest/Woodland	Suitable
Ozark-Ouachita Prairie and Woodland	Suitable
Ozark-Ouachita Riparian	Suitable
Pasture Land	Marginal
Urban/Suburban	Suitable
West Gulf Coastal Plain Calcareous Prairie and Woodland	Suitable
West Gulf Coastal Plain Dry Pine-Hardwood Flatwoods	Suitable
West Gulf Coastal Plain Large River Floodplain Forest	Suitable
West Gulf Coastal Plain Mesic Hardwood Forest	Suitable
West Gulf Coastal Plain Pine-Hardwood Flatwoods	Suitable
West Gulf Coastal Plain Pine-Hardwood Forest	Suitable
West Gulf Coastal Plain Red River Floodplain Forest	Suitable

Haemorhous purpureus
Purple Finch

Habitats

	Weight
West Gulf Coastal Plain Sandhill Oak and Shortleaf Pine Forest and Woodland	Suitable
West Gulf Coastal Plain Small Stream/River Forest	Suitable
West Gulf Coastal Plain Wet Hardwood Flatwoods	Suitable

Problems Faced

KNOWN PROBLEM: Competition with House Finch.	Threat: Extraordinary competition for resources Source: Exotic species
POTENTIAL PROBLEM: Extensive clearcutting on breeding grounds.	Threat: Habitat destruction Source: Forestry activities

Data Gaps/Research Needs

Determine wintering habitat preferences.

Conservation Actions

	Importance	Category
Create open woodlands.	Low	Habitat Restoration/Improvement

Monitoring Strategies

Continue to conduct Christmas Bird Counts, Great Backyard Bird Count, and encourage the use of eBird.

Comments

Audubon's Christmas Bird Count data show this widespread winter resident has an irruptive yet declining trend in Arkansas. The decline is strongly associated with the spread of House Finches across eastern North America, indicating interspecific competition.

(Wooten 1996, National Audubon Society 2010)

Taxa Association Team and Peer Reviewers

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Hylocichla mustelina

Wood Thrush

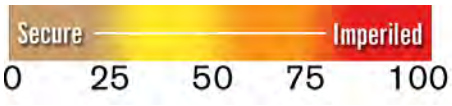


Class: Aves

Order: Passeriformes

Family: Turdidae

Priority Score: **19** **out of 100**



Population Trend: Decreasing

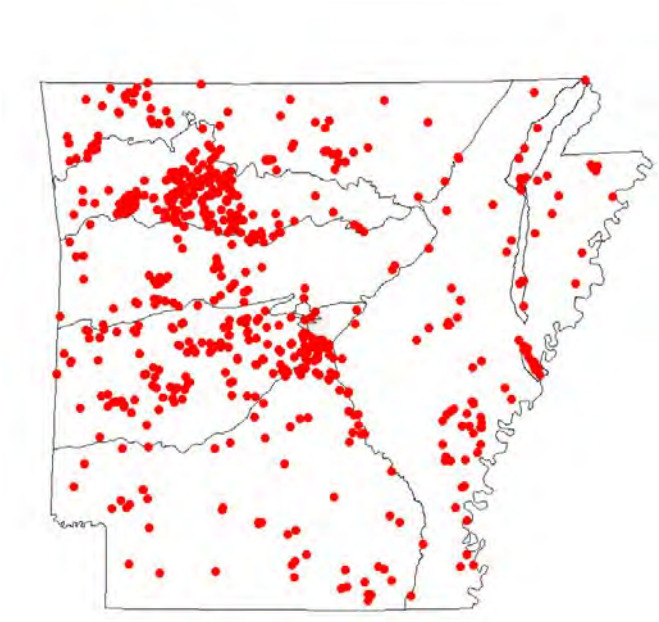
Residence: Breeding

Global Rank: G5 — Secure

State Rank: S3B — Vulnerable breeding species in Arkansas

Distribution

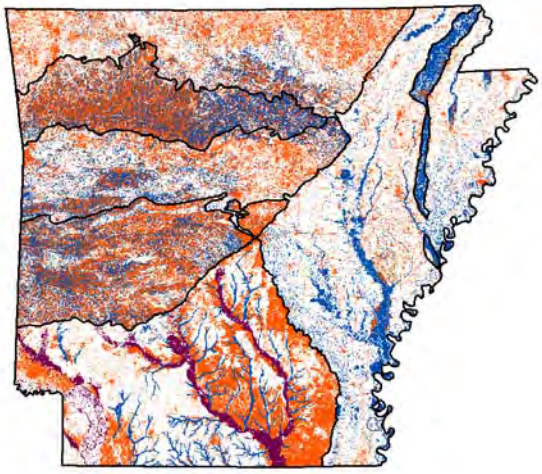
Occurrence Records



Ecoregions where the species occurs:

- ☑ Ozark Highlands
- ☑ Boston Mountains
- ☑ Arkansas Valley
- ☑ Ouachita Mountains
- ☑ South Central Plains
- ☑ Mississippi Alluvial Plain
- ☑ Mississippi Valley Loess Plains

Habitat Map





Hylocichla mustelina
Wood Thrush

Habitats	Weight
Crowley's Ridge Loess Slope Forest	Suitable
Cultivated Forest	Marginal
Lower Mississippi Flatwoods Woodland and Forest	Marginal
Lower Mississippi River High Bottomland Forest	Optimal
Lower Mississippi River Low Bottomland Forest	Suitable
Lower Mississippi River Riparian Forest	Suitable
Ouachita Montane Oak Forest	Marginal
Ozark-Ouachita Dry-Mesic Oak Forest	Marginal
Ozark-Ouachita Large Floodplain	Suitable
Ozark-Ouachita Mesic Hardwood Forest	Optimal
Ozark-Ouachita Pine-Oak Forest	Suitable
Ozark-Ouachita Riparian	Optimal
Urban/Suburban	Marginal
West Gulf Coastal Plain Dry Pine-Hardwood Flatwoods	Marginal
West Gulf Coastal Plain Large River Floodplain Forest	Optimal
West Gulf Coastal Plain Mesic Hardwood Forest	Optimal
West Gulf Coastal Plain Pine-Hardwood Forest	Suitable
West Gulf Coastal Plain Red River Floodplain Forest	Optimal
West Gulf Coastal Plain Small Stream/River Forest	Suitable
West Gulf Coastal Plain Wet Hardwood Flatwoods	Suitable

Problems Faced

KNOWN PROBLEM: Habitat fragmentation of extensive tracts of mature forest.	Threat: Habitat fragmentation Source: Urban development
KNOWN PROBLEM: Habitat fragmentation of extensive tracts of mature forest.	Threat: Habitat fragmentation Source: Agricultural practices
KNOWN PROBLEM: Habitat fragmentation of extensive tracts of mature forest.	Threat: Habitat fragmentation Source: Forestry activities
KNOWN PROBLEM: Habitat fragmentation of extensive tracts of mature forest.	Threat: Habitat fragmentation Source: Road construction
KNOWN PROBLEM: Habitat fragmentation of extensive tracts of mature forest.	Threat: Habitat fragmentation Source: Resource extraction
KNOWN PROBLEM: Increased nest predation by mesopredators as a result of habitat fragmentation.	Threat: Extraordinary predation/parasitism/disease Source: Predation
KNOWN PROBLEM: Increased parasitism by Brown-headed Cowbirds as a result of habitat fragmentation.	Threat: Extraordinary predation/parasitism/disease Source: Parasites/pathogens
PROTECTION PROBLEM: Lack of proper understory structure for nesting or post-fledging period.	Threat: Altered composition/structure Source: Forestry activities
PROTECTION PROBLEM: Lack of proper understory structure for nesting or post-fledgling period.	Threat: Alteration of natural fire regimes Source: Fire suppression

Data Gaps/Research Needs

Determine how fire and other forest management may affect suitability of forest patches for breeding (including predation and parasitism).
Determine how various habitats are used during various life stages.

Conservation Actions

	Importance	Category
Maintain forest cover across large landscapes.	High	Habitat Protection
Manage for species that produce high-lipid fruits during migration.	Low	Habitat Restoration/Improvement
Manage for understory development for nesting structure.	Medium	Habitat Restoration/Improvement
Provide matrix of forest conditions (early successional to mature) for various life stages.	Medium	Habitat Restoration/Improvement

Monitoring Strategies

The Partners in Flight North American Landbird Conservation Plan indicates that long-term population trend monitoring for this species is generally considered adequate, but some issues, such as bias, may not have been accounted for. Continue to conduct Breeding Bird Surveys at all routes established in Arkansas.

Comments

Its ethereal, flute-like voice is a trademark sound of the woods. Declining range wide. Typically requires extensive tracts of mature forest at the landscape scale, but this varies by location. At a more local scale, requires sites with hardwood understory and canopy overstory. Common to uncommon on the Ozark-St. Francis and Ouachita NF. Common in the Big Woods. Arkansas is on the western edge of its range. (Anders and others 1998, Annand and Thompson 1997, Artman and Downhower 2003, Baerg 1927, Clawson 1982, DeGraaf 1991, Dellinger et al. 2007, Duzan and others 2003, 2003A, Evans and Kirkman 1980, Evans and others 2011, Finch 1991, Finch and Stangel 1993, Fitzgerald 2000, Hamel 1992, Jacobs 2001, James 1971, James and Neal 1986, Kaisner and Lindell 2007, Kellner Unpublished, Martin and Finch 1995, Pingjun 1994, Probst and Thompson 1996, Robbins and Easterla 1992, Robinson and others 1995, Salveter 1994, Thompson 1995, Thompson and Fritzell 1990, Thompson and others 1995, 1996)

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Ixobrychus exilis

Least Bittern



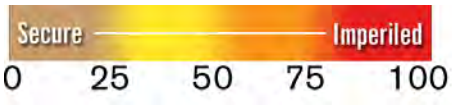
©Jeff R. Wilson

Class: Aves

Order: Ciconiiformes

Family: Ardeidae

Priority Score: 19 out of 100



Population Trend: Unknown

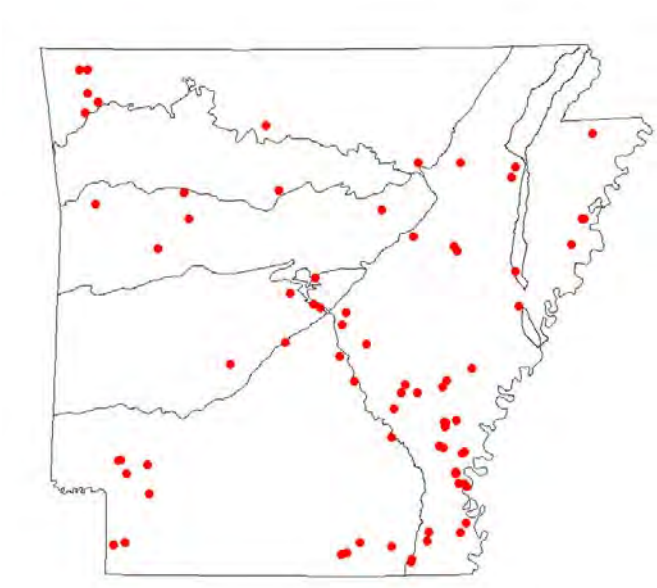
Residence: Breeding

Global Rank: G5 — Secure

State Rank: S2B — Imperiled breeding species in Arkansas

Distribution

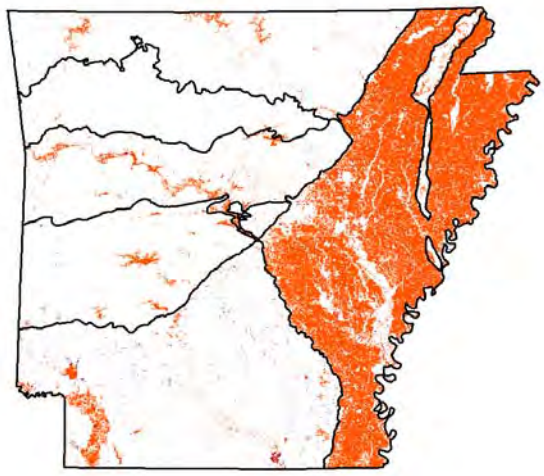
Occurrence Records



Ecoregions where the species occurs:

- ☑ Ozark Highlands
- ☑ Boston Mountains
- ☑ Arkansas Valley
- ☑ Ouachita Mountains
- ☑ South Central Plains
- ☑ Mississippi Alluvial Plain
- ☑ Mississippi Valley Loess Plains

Habitat Map





Habitats	Weight
Crop Land	Marginal
Herbaceous Wetland	Optimal
Ponds, Lakes, and Water Holes	Marginal

Problems Faced

KNOWN PROBLEM: Conversion of emergent and herbaceous wetlands to bottomland hardwoods.	Threat: Habitat destruction or conversion Source: Forestry activities
KNOWN PROBLEM: Loss of wetlands from conversion.	Threat: Habitat destruction or conversion Source: Agricultural practices
KNOWN PROBLEM: Loss of wetlands to invasive plant species.	Threat: Habitat destruction or conversion Source: Exotic species
KNOWN PROBLEM: Vulnerable to toxins and contaminants resulting from agricultural run-off.	Threat: Toxins/contaminants Source: Agricultural practices

Data Gaps/Research Needs

No data gaps or research needs were identified.

Conservation Actions	Importance	Category
Maintain herbaceous wetlands.	High	Habitat Protection
Restore herbaceous wetlands.	High	Habitat Restoration/Improvement

Monitoring Strategies

Conduct secretive marshbird surveys using the North American Marsh Bird Survey Protocol outlined in the National Marsh Bird Survey Program.

Comments

This secretive bird can be found in high densities in quality habitat. The availability of large, shallow wetlands with dense emergent vegetation is a limiting factor for this species in Arkansas. Loss of large, shallow wetlands with dense emergent vegetation and pollution are major threats. Minor modification to habitat management plans for waterfowl can increase available habitat. (Arkansas Audubon Society 2012, Gibbs and others 1992B, Hamel 1992, James and Neal 1986, Kushlan and others 2002, Martin and Finch 1995, National Audubon Society 2002, Rich and others 2004, Sauer and others 2004)

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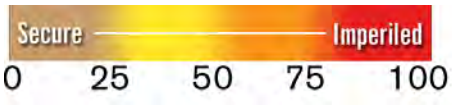
Lanius ludovicianus

Loggerhead Shrike



Class: Aves
Order: Passeriformes
Family: Laniidae

Priority Score: **24** **out of 100**



Population Trend: Decreasing

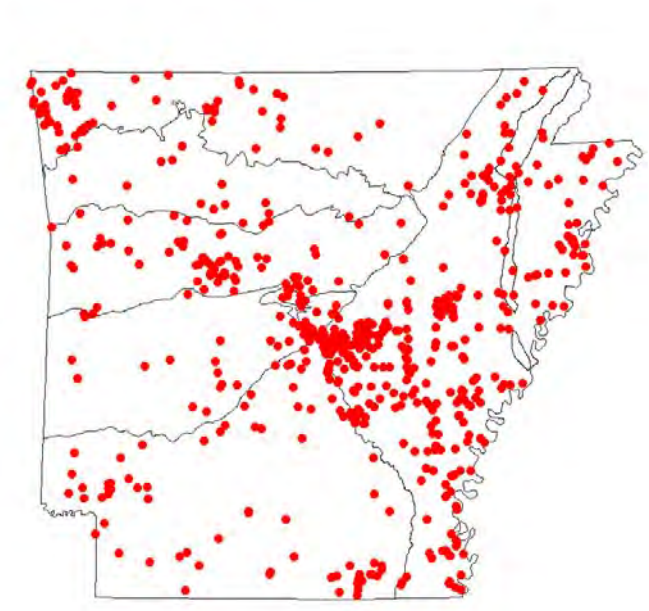
Residence: Permanent

Global Rank: G4 — Apparently secure species

State Rank: S3 — Vulnerable in Arkansas

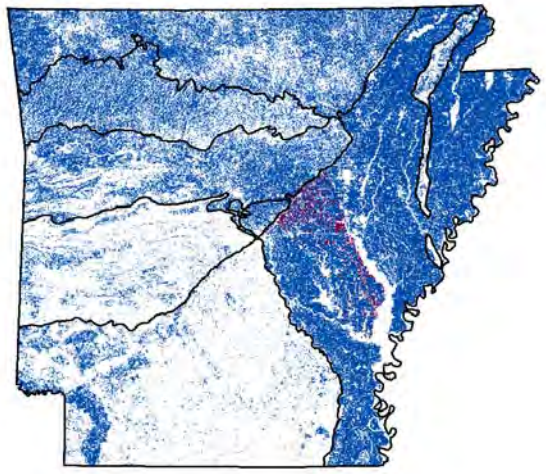
Distribution

Occurrence Records



Ecoregions where the species occurs:

- ☑ Ozark Highlands
- ☑ Boston Mountains
- ☑ Arkansas Valley
- ☑ Ouachita Mountains
- ☑ South Central Plains
- ☑ Mississippi Alluvial Plain
- ☑ Mississippi Valley Loess Plains



Habitat Map



Habitats

	Weight
	Optimal
Crop Land	Suitable
Lower Mississippi Alluvial Plain Grand Prairie	Optimal
Ozark-Ouachita Cliff and Talus	Suitable
Ozark-Ouachita Prairie and Woodland	Optimal
Pasture Land	Suitable

Problems Faced

KNOWN PROBLEM: Lack of grassland with shrub component.	Threat: Habitat destruction Source: Agricultural practices
KNOWN PROBLEM: Post-fledging mortality from car strikes.	Threat: Collision with man-made structures Source: Road construction
POTENTIAL PROBLEM: Pesticides.	Threat: Toxins/contaminants Source: Agricultural practices

Data Gaps/Research Needs

Conduct additional studies of pesticides, toxins, and heavy metals effects on Loggerhead Shrikes.
Determine causes of mortality in both resident and migrant populations.
Determine the role of shrike and automobile collisions in population declines of shrikes in Arkansas.
Study foraging success of resident versus migrant birds in the winter to determine if changes in the quality of winter habitat may affect migrant populations.

Conservation Actions

	Importance	Category
Maintain grassland with shrub component.	High	Habitat Protection
Plant or maintain low, thick shrubs and trees along fencerows and throughout otherwise open pastures and fields to improve nesting habitat.	Medium	Habitat Restoration/Improvement
Protect trees and shrubs used for nesting and perches from cattle grazing and rubbing.	Medium	Habitat Protection
Restore grassland with shrub component.	High	Habitat Restoration/Improvement
Restore native grasslands.	Medium	Habitat Restoration/Improvement

Monitoring Strategies

The Partners in Flight North American Landbird Conservation Plan indicates that long-term population trend monitoring for this species is generally considered adequate, but some issues, such as bias, may not have been accounted for. Continue to conduct Breeding Bird Surveys at all routes established in Arkansas. Continue tracking of this species by the Arkansas Natural Heritage Commission.

Comments

This predatory bird impales its prey (insects, rodents, birds) on sharp objects like thorns and barbed wire. This allows it to eat prey without the benefit of strong, taloned feet that raptors use for holding prey. It also serves to advertise its territory and attract mates. It inhabits open country that includes scattered trees and shrubs or fencerows. Populations are correlated with the amount of pasture land. Habitat is available, yet the species is declining. More study is needed to identify sources of the decline. (Arkansas Audubon Society 2012, Duzan and others 2003, Hamel 1992, James and Neal 1986, Martin and Finch 1995, National Audubon Society 2002, Rich and others 2004, Sauer and others 2004, Yosef 1996)

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Limnodromus griseus

Short-billed Dowitcher



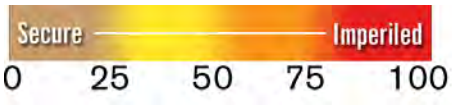
©U.S. Fish and Wildlife Service

Class: Aves

Order: Charadriiformes

Family: Scolopacidae

Priority Score: **19** **out of 100**



Population Trend: Decreasing

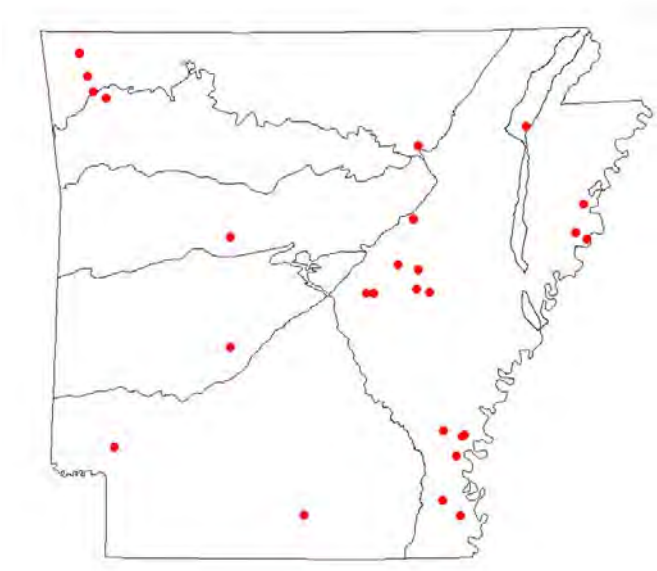
Residence: Transient

Global Rank: G5 — Secure

State Rank: S3N — Vulnerable nonbreeding species in Arkansas

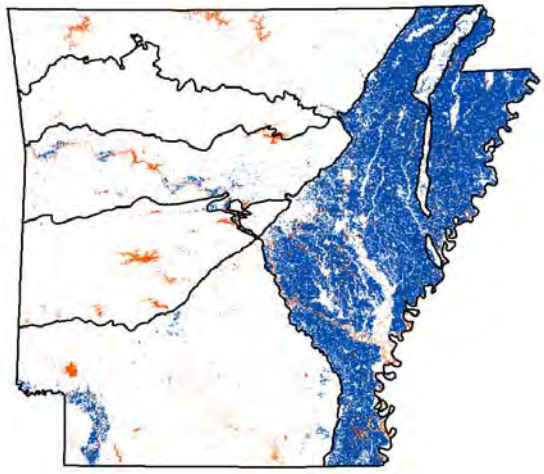
Distribution

Occurrence Records



Ecoregions where the species occurs:

- ☑ Ozark Highlands
- ☑ Boston Mountains
- ☑ Arkansas Valley
- ☑ Ouachita Mountains
- ☑ South Central Plains
- ☑ Mississippi Alluvial Plain
- ☑ Mississippi Valley Loess Plains



Habitat Map



Habitats	Weight
Crop Land	Suitable
Mud Flats	Optimal
Ponds, Lakes, and Water Holes	Marginal

Problems Faced

KNOWN PROBLEM: Lack of mud flat habitat.	Threat: Habitat destruction or conversion Source: Agricultural practices
KNOWN PROBLEM: Lack of mud flats during migration as a result of hydrological alteration.	Threat: Hydrological alteration Source: Water diversion

Data Gaps/Research Needs

Conservation Actions	Importance	Category
Draw down fish ponds to create mud flat habitat in July - November.	High	Habitat Restoration/Improvement
Flood cropland in summer and early fall after harvest.	High	Habitat Restoration/Improvement
Manipulate federal and state managed moist-soil units to provide mud flat habitat during March-early June and, if possible, during July - November.	Medium	Habitat Restoration/Improvement
Manipulate reservoirs (private and publicly owned) to provide mud flat habitat during July - November migration, and, if possible, during March-early June migration.	Medium	Habitat Restoration/Improvement
Restore mud flats.	High	Habitat Restoration/Improvement

Monitoring Strategies

Initiate late summer - fall migration counts in the Mississippi Alluvial Valley and the West Gulf Coastal Plain, coordinated through Lower Mississippi Valley Joint Venture.

Comments

This species is seen in the state April-October. They are often seen in association with the more numerous Long-billed Dowitchers and Stilt Sandpipers, and tend to forage in shallow water rather than exposed mud. This species is listed as a species of high concern by the U.S. Shorebird Conservation Plan. While population size is difficult to determine, it is thought to be relatively abundant. Proper management of water levels on wetlands, artificial impoundments, and flooded agricultural fields can provide critical stopover habitat during migration.

Commercial aquaculture facilities are important stopover sites for this species and many other shorebirds (Lehnen and Krementz 2013). The decline of fish pond acreage in the state from 60,000 surface acres in 2002 to less than 30,000 acres in 2012 is alarming (personal communication Dr. Carole Engle, UAPB). Water management strategies have changed at many of the remaining facilities because of increased efficiency. Emphasis should be placed on programs that would encourage fish farmers to provide shallow-water habitat for extended periods of time.

Additionally, management plans for reservoirs (ex. Chicot, Millwood) and moist-soil impoundments (AGFC, USFWS, private) could be altered to provide additional benefit to many shorebirds that rely on mud flat habitat. Deeper water that is drawn down slowly typically provides more invertebrates than very recently flooded water.

(Arkansas Audubon Society 2012, Hamel 1992, James and Neal 1986, Jehl and others 2001, Martin and Finch 1995, National Audubon Society 2002, Rich and others 2004, Sauer and others 2004, U.S. Shorebird Conservation Plan 2004)

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Limnothlypis swainsonii

Swainson's Warbler

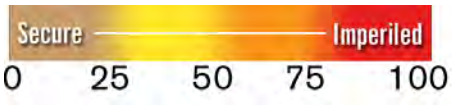


Class: Aves

Order: Passeriformes

Family: Parulidae

Priority Score: **19** **out of 100**



Population Trend: Unknown

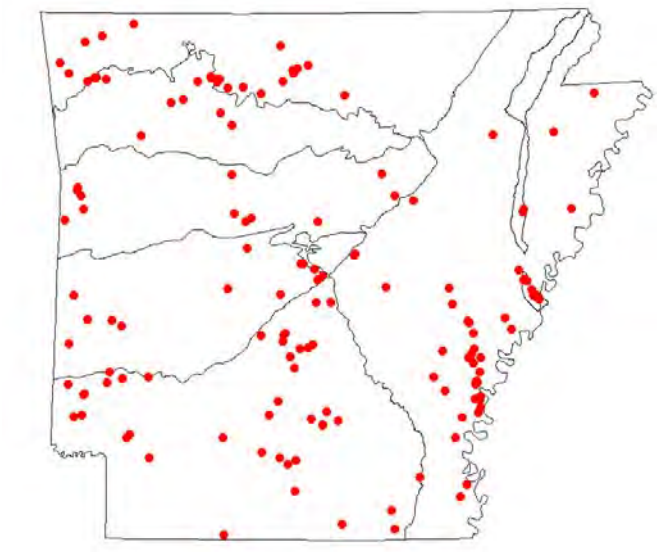
Residence: Breeding

Global Rank: G4 — Apparently secure species

State Rank: S3B — Vulnerable breeding species in Arkansas

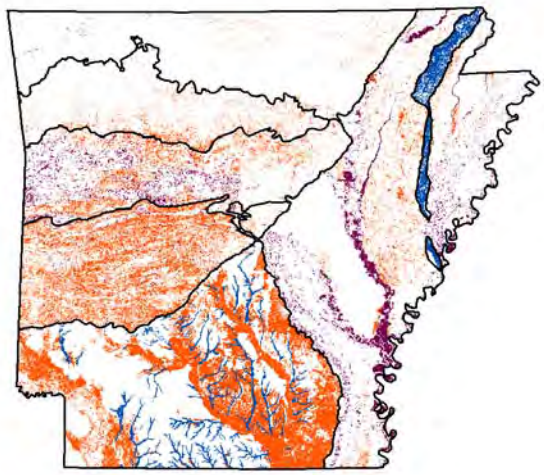
Distribution

Occurrence Records



Ecoregions where the species occurs:

- ☑ Ozark Highlands
- ☑ Boston Mountains
- ☑ Arkansas Valley
- ☑ Ouachita Mountains
- ☑ South Central Plains
- ☑ Mississippi Alluvial Plain
- ☑ Mississippi Valley Loess Plains



Habitat Map



Habitats	Weight
Crowley's Ridge Loess Slope Forest	Suitable
Cultivated Forest	Marginal
Lower Mississippi Flatwoods Woodland and Forest	Marginal
Lower Mississippi River High Bottomland Forest	Suitable
Lower Mississippi River Riparian Forest	Optimal
Ozark-Ouachita Large Floodplain	Data Gap
Ozark-Ouachita Riparian	Marginal
West Gulf Coastal Plain Large River Floodplain Forest	Marginal
West Gulf Coastal Plain Mesic Hardwood Forest	Marginal
West Gulf Coastal Plain Red River Floodplain Forest	Marginal
West Gulf Coastal Plain Small Stream/River Forest	Suitable
West Gulf Coastal Plain Wet Hardwood Flatwoods	Marginal

Problems Faced

KNOWN PROBLEM: Lack of understory and midstory and loss of midseral stages interspersed with more mature woodlands due to even-aged forest management.	Threat: Altered composition/structure Source: Forestry activities
KNOWN PROBLEM: Loss of dense understory component of riparian/floodplain forest.	Threat: Altered composition/structure Source: Dam
KNOWN PROBLEM: Loss of dense understory component of riparian/floodplain forest.	Threat: Alteration of natural fire regimes Source: Fire suppression
KNOWN PROBLEM: Loss of giant cane habitat.	Threat: Habitat destruction Source: Conversion of riparian forest
POTENTIAL PROBLEM: Nesting failure caused by flooding.	Threat: Hydrological alteration Source: Dam
POTENTIAL PROBLEM: Parasitism by Brown-headed Cowbirds.	Threat: Extraordinary predation/parasitism/disease Source: Parasites/pathogens

Data Gaps/Research Needs

Determine post- fledging survival.
Determine distribution and abundance.
Determine importance of regenerating forests.
Evaluate management practices to create breeding habitat.

Conservation Actions

	Importance	Category
Manage for dense understory and ground cover.	High	Habitat Restoration/Improvement
Manage for unevenaged forests using group selection harvest or evenaged management with small clearcuts.	High	Habitat Restoration/Improvement
Protect and restore tracts to increase bottomland forest block size and provide connectivity.	High	Habitat Protection
Restore canebrake habitats.	High	Habitat Restoration/Improvement

Monitoring Strategies

The Partners in Flight North American Landbird Conservation Plan indicates that long-term population trend monitoring for this species is generally considered adequate, but some issues, such as bias, may not have been accounted for. Continue to conduct Breeding Bird Surveys at all routes established in Arkansas. Expand effort to locate new breeding populations. Continue tracking of this species by the Arkansas Natural Heritage Commission.

Comments

The Swainson's Warbler is closely associated with canebrakes in bottomland hardwoods, but also utilizes regenerating clearcuts (hardwood or pine). It utilizes dense thickets within large contiguous forests of various age classes and composition that have occasional canopy gaps, high leaf litter, and a sparse herbaceous layer. Loss and fragmentation of bottomland hardwood forests and associated canebrakes is a source of decline. Cowbird nest parasitism is high in the Dale Bumpers White River NWR and Crowley's Ridge. The species distribution and abundance in regenerating forests of Arkansas is poorly understood. (Anich and others 2010, Brown and Dickson 1994, Carrie 1996, Clawson 1982, Duzan and others 2003, 2003A, Evans and Kirkman 1980, Fitzgerald 2000, Graves 2002, Graves 2014, Hamel 1992, Jacobs 2001, James and Neal 1986, Martin and Finch 1995, Robbins and Easterla 1992)

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Nyctanassa violacea

Yellow-crowned Night-Heron

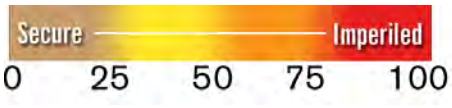


Class: Aves

Order: Pelicaniformes

Family: Ardeidae

Priority Score: **24** **out of 100**



Population Trend: Decreasing

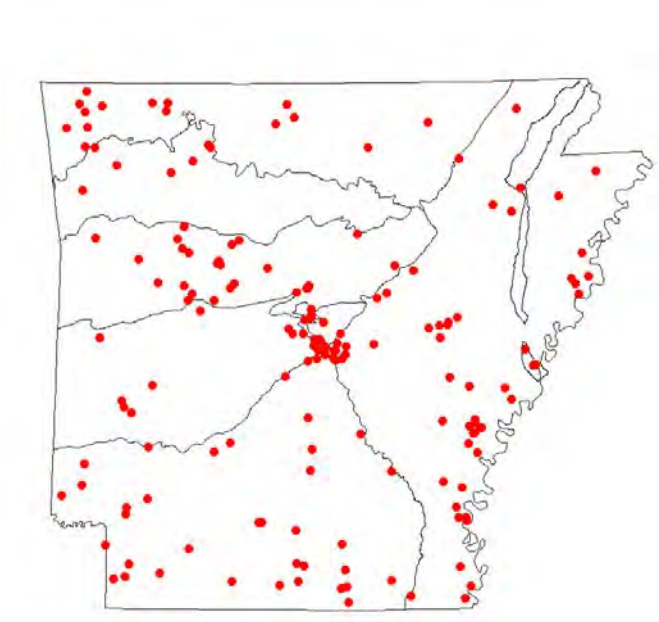
Residence: Breeding

Global Rank: G5 — Secure

State Rank: S2B — Imperiled breeding species in Arkansas

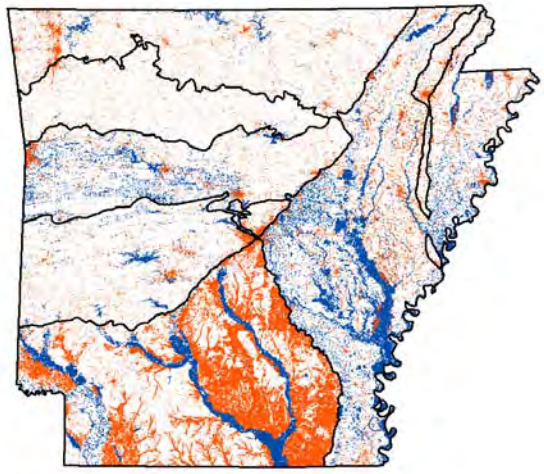
Distribution

Occurrence Records



Ecoregions where the species occurs:

- ☑ Ozark Highlands
- ☑ Boston Mountains
- ☑ Arkansas Valley
- ☑ Ouachita Mountains
- ☑ South Central Plains
- ☑ Mississippi Alluvial Plain
- ☑ Mississippi Valley Loess Plains



Habitat Map



Habitats	Weight
Lower Mississippi Alluvial Plain Grand Prairie	Suitable
Lower Mississippi Flatwoods Woodland and Forest	Marginal
Lower Mississippi River Bottomland Depression	Suitable
Lower Mississippi River High Bottomland Forest	Marginal
Lower Mississippi River Low Bottomland Forest	Suitable
Lower Mississippi River Riparian Forest	Suitable
Ozark-Ouachita Large Floodplain	Suitable
Ozark-Ouachita Prairie and Woodland	Data Gap
Ozark-Ouachita Riparian	Marginal
Ponds, Lakes, and Water Holes	Suitable
Urban/Suburban	Marginal
West Gulf Coastal Plain Large River Floodplain Forest	Suitable
West Gulf Coastal Plain Red River Floodplain Forest	Suitable
West Gulf Coastal Plain Small Stream/River Forest	Marginal

Problems Faced

KNOWN PROBLEM: Conflicts with aquaculture.	Threat: Extraordinary competition for resources Source: Confined animal operations
KNOWN PROBLEM: Degradation and loss of breeding and foraging habitat.	Threat: Habitat destruction or conversion Source: Agricultural practices
POTENTIAL PROBLEM: Vulnerability to toxins and contaminants from agricultural run-off.	Threat: Toxins/contaminants Source: Agricultural practices

Data Gaps/Research Needs

Home range estimates on wintering grounds are needed.

Conservation Actions

	Importance	Category
Improve breeding and foraging habitat.	High	Habitat Restoration/Improvement
Reduce depredation on aquaculture facilities.	High	Public Relations/Education
Reduce threats posed by toxins/contaminants.	Low	Threat Abatement

Monitoring Strategies

Initiate systematic ground surveys in high productive habitat during breeding season. Continue tracking of this species by the Arkansas Natural Heritage Commission.

Comments

This species forages from dusk to dawn. Because it specializes on crustaceans, it can conflict with aquaculture farmers. This species is generally abundant and widespread, though restricted to areas near water because of its food requirements. Protection of forested wetland habitat and reducing conflicts between birds and farmers and between nest colonies and the neighborhoods in which they nest are important conservation measures. (Arkansas Audubon Society 2012, Hamel 1992, James and Neal 1986, Kushlan and others 2002, Martin and Finch 1995, National Audubon Society 2002, Rich and others 2004, Sauer and others 2004, Watts 1995)

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Nycticorax nycticorax

Black-crowned Night-Heron

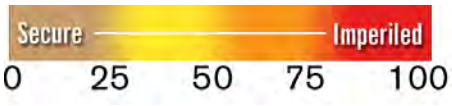


Class: Aves

Order: Pelicaniiformes

Family: Ardeidae

Priority Score: **19** **out of 100**



Population Trend: Stable

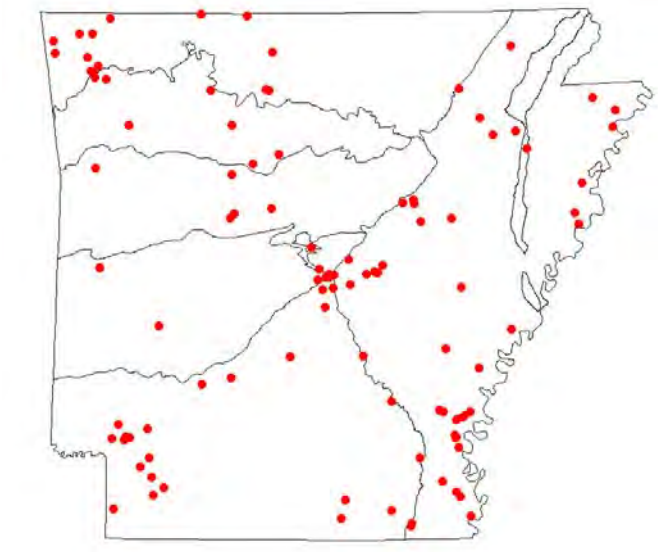
Residence: Permanent

Global Rank: G5 — Secure

State Rank: S2B — Imperiled breeding species in Arkansas

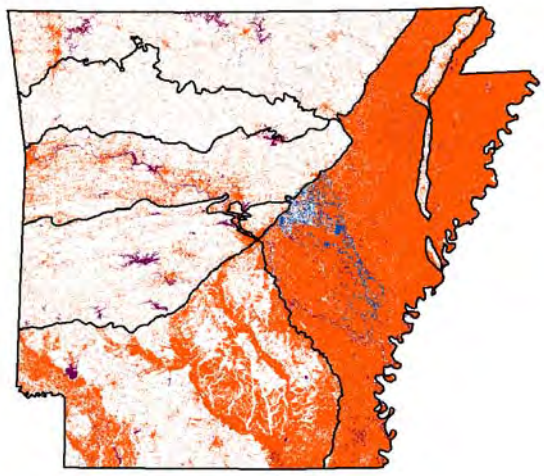
Distribution

Occurrence Records



Ecoregions where the species occurs:

- ☑ Ozark Highlands
- ☑ Boston Mountains
- ☑ Arkansas Valley
- ☑ Ouachita Mountains
- ☑ South Central Plains
- ☑ Mississippi Alluvial Plain
- ☑ Mississippi Valley Loess Plains



Habitat Map



Habitats	Weight
Crop Land	Marginal
Herbaceous Wetland	Optimal
Lower Mississippi Alluvial Plain Grand Prairie	Suitable
Lower Mississippi Flatwoods Woodland and Forest	Marginal
Lower Mississippi River Bottomland Depression	Suitable
Lower Mississippi River High Bottomland Forest	Marginal
Lower Mississippi River Low Bottomland Forest	Marginal
Lower Mississippi River Riparian Forest	Marginal
Mud Flats	Suitable
Ozark-Ouachita Large Floodplain	Marginal
Ozark-Ouachita Prairie and Woodland	Suitable
Ponds, Lakes, and Water Holes	Optimal
Urban/Suburban	Marginal
West Gulf Coastal Plain Large River Floodplain Forest	Marginal
West Gulf Coastal Plain Red River Floodplain Forest	Marginal

Problems Faced

KNOWN PROBLEM: Loss of emergent wetland habitat.	Threat: Habitat destruction or conversion Source: Agricultural practices
KNOWN PROBLEM: Loss of emergent wetland habitat.	Threat: Habitat destruction Source: Forestry activities
KNOWN PROBLEM: Nest failure resulting from mammalian predation.	Threat: Extraordinary predation/parasitism/disease Source: Predation
POTENTIAL PROBLEM: Conflicts with aquaculture.	Threat: Extraordinary competition for resources Source: Confined animal operations

Data Gaps/Research Needs

Determine impacts of contaminants, toxins, and heavy metals on reproduction.
Identify distribution of nesting colonies.
Identify non-lethal control strategies for aquaculture depredation.
Research effects of depredation on aquaculture.

Conservation Actions

	Importance	Category
Buffer nest sites to prevent human disturbance from causing nest abandonment and nestling mortality.	Medium	Habitat Protection
Buffer nest sites to prevent human disturbance from causing nest abandonment and nestling mortality.	Medium	Public Relations/Education
Reduce depredation on aquaculture.	Medium	Public Relations/Education
Reduce threats posed by toxins/contaminants.	Low	Threat Abatement
Restore emergent wetland habitat.	High	Habitat Restoration/Improvement

Monitoring Strategies

Conduct inventories for colonial waterbirds, particularly rookery counts, as a part of the North American Colonial Waterbird Monitoring Program coordinated by the Waterbird Conservation for the Americas Bird Initiative. Continue tracking of this species by the Arkansas Natural Heritage Commission.

Comments

A widespread, abundant, colonial nester which will nest in suburban areas in Arkansas. An excellent indicator of environmental quality, this species has recovered following the banning of DDT but may be impacted by other environmental contaminents. It is an opportunistic forager and eats a wide variety of prey, including fish and crawfish. This can put it in conflict with aquaculture farms. More study is needed to determine what effect this and other wading birds have on commercial harvest. (Arkansas Audubon Society 2012, Davis 1993, Hamel 1992, Hothem and others 2010, James and Neal 1986, Kushlan and others 2002, Martin and Finch 1995, National Audubon Society 2002, Rich and others 2004, Sauer and others 2004)

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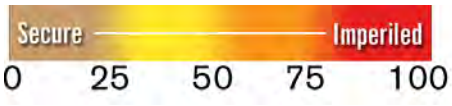
Peucaea aestivalis

Bachman's Sparrow



Class: Aves
Order: Passeriformes
Family: Emberizidae

Priority Score: **33** **out of 100**



Population Trend: Decreasing

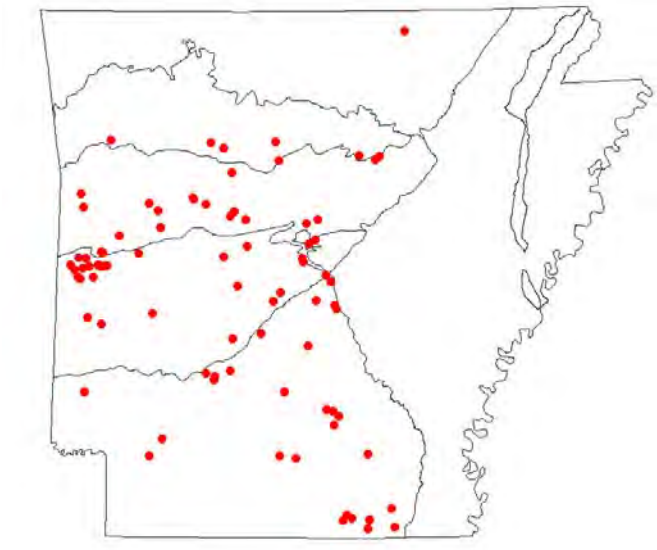
Residence: Breeding

Global Rank: G3 — Vulnerable species

State Rank: S3B — Vulnerable breeding species in Arkansas

Distribution

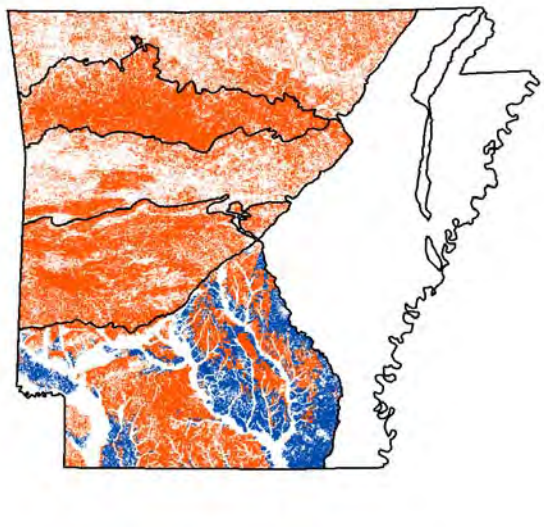
Occurrence Records



Ecoregions where the species occurs:

- [x] Ozark Highlands
- [x] Boston Mountains
- [x] Arkansas Valley
- [x] Ouachita Mountains
- [x] South Central Plains
- [ ] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains

Habitat Map





Habitats

	Weight
Cultivated Forest	Marginal
Ozark-Ouachita Dry Oak and Pine Woodland	Marginal
Ozark-Ouachita Dry-Mesic Oak Forest	Marginal
Ozark-Ouachita Pine/Bluestem Woodland	Optimal
Ozark-Ouachita Pine-Oak Forest	Marginal
Ozark-Ouachita Pine-Oak Woodland	Marginal
Ozark-Ouachita Prairie and Woodland	Marginal
West Gulf Coastal Plain Dry Pine-Hardwood Flatwoods	Suitable
West Gulf Coastal Plain Pine-Hardwood Forest	Marginal
West Gulf Coastal Plain Sandhill Oak and Shortleaf Pine Forest and Woodland	Marginal

Problems Faced

KNOWN PROBLEM: Loss of shortleaf pine/bluestem communities from fire suppression.	Threat: Habitat destruction or conversion Source: Forestry activities
KNOWN PROBLEM: Loss of shortleaf pine/bluestem communities from fire suppression.	Threat: Alteration of natural fire regimes Source: Fire suppression
KNOWN PROBLEM: Loss of shortleaf pine/bluestem communities from fire suppression.	Threat: Habitat fragmentation Source: Forestry activities

Data Gaps/Research Needs

Determine optimal amount of groundcover, especially grass cover, to maintain and increase sparrow populations.
Determine optimal growing season fire return interval for breeding habitats.
Determine the effects of habitat isolation and fragmentation.
Examine the relative importance of early successional versus older aged forest stands in maintaining local populations.

Conservation Actions

	Importance	Category
Develop or maintain early successional grass and forb layer with limited shrub and hardwood midstory.	High	Habitat Restoration/Improvement
Maintain open, mature pine forest habitat.	High	Habitat Protection
Maintain or restore historical fire regimes.	High	Fire Management
Maintain or restore shortleaf pine/bluestem communities.	High	Habitat Restoration/Improvement

Monitoring Strategies

The Partners in Flight North American Landbird Conservation Plan indicates that this species has imprecise trend data at the continental level. An effort is being made to expand the BBS program to better survey this species.

Comments

Bachman's Sparrows use both early and late successional pine and pine hardwood forests where the mid-story is sparse and a ground cover of grasses and forbs are present (Krementz and Christie 1999, Tucker et al. 2006, Jones and others 2013, Allen and Burt. 2014, Jones and others 2014). These pine systems require disturbance (usually growing season fire) on a regular basis (<4-year return intervals) to maintain their attractiveness. The scale at which the disturbance is implemented may affect local population dynamics, but this question requires further research (Seaman and Krementz 2000, Jones and others 2014). Early successional habitats, including clearcuts, can be attractive, and in certain situations, can be productive sites for Bachman's sparrows (Krementz and Christie 1999, Stober and Krementz 2000).

Taxa Association Team and Peer Reviewers

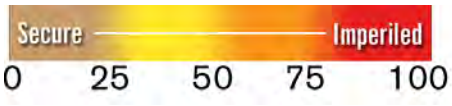
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Picoides borealis

Red-cockaded Woodpecker

Class: Aves
Order: Piciformes
Family: Picidae

Priority Score: **43** **out of 100**



Population Trend: Decreasing

Residence: Permanent

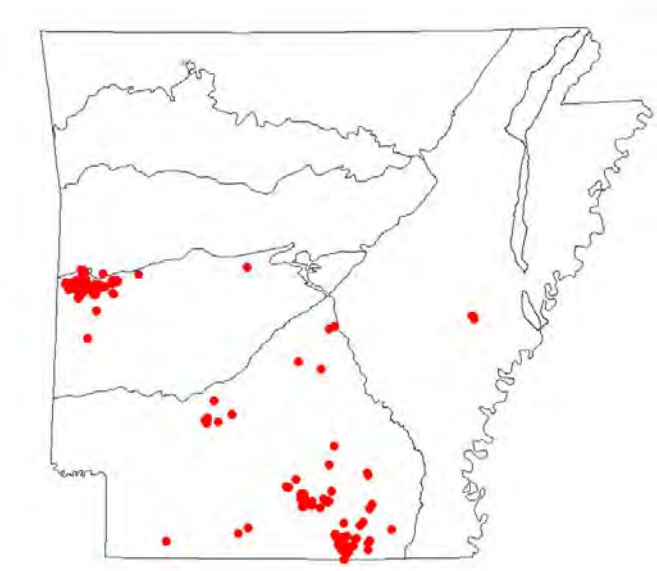
Global Rank: G3 — Vulnerable species

State Rank: S1 — Critically imperiled in Arkansas



Distribution

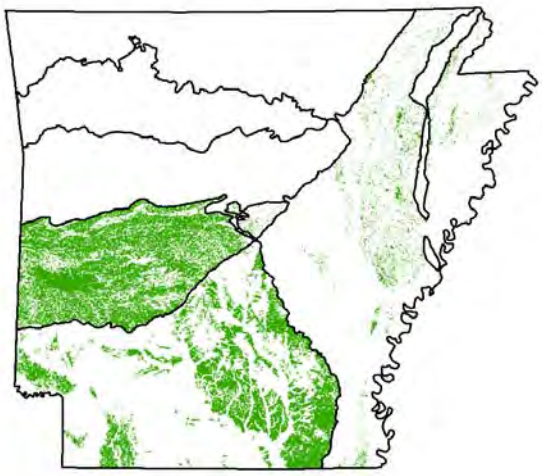
Occurrence Records



Ecoregions where the species occurs:

- ☐ Ozark Highlands
- ☐ Boston Mountains
- ☐ Arkansas Valley
- ☑ Ouachita Mountains
- ☑ South Central Plains
- ☑ Mississippi Alluvial Plain
- ☐ Mississippi Valley Loess Plains

Habitat Map





Habitats

	Weight
Ozark-Ouachita Pine-Bluestem Woodland	Obligate
Ozark-Ouachita Pine-Oak Forest/Woodland	Marginal
West Gulf Coastal Plain Pine-Hardwood Flatwoods	Obligate
West Gulf Coastal Plain Pine-Hardwood Forest/Woodland	Obligate

Problems Faced

KNOWN PROBLEM: Competition for nesting cavities.	Threat: Altered composition/structure Source: Forestry activities
KNOWN PROBLEM: Fire suppression.	Threat: Alteration of natural fire regimes Source: Fire suppression
KNOWN PROBLEM: Habitat fragmentation.	Threat: Habitat fragmentation Source: Forestry activities
KNOWN PROBLEM: Habitat loss and degradation.	Threat: Habitat destruction or conversion Source: Fire suppression
KNOWN PROBLEM: Loss of extensive, mature pine habitat that is open and park-like.	Threat: Habitat destruction Source: Forestry activities
KNOWN PROBLEM: Predation by snakes.	Threat: Extraordinary predation/parasitism/disease Source: Predation

Data Gaps/Research Needs

No data gaps or research needs were identified.

Conservation Actions

	Importance	Category
Manage clusters and translocate individuals to augment existing or establish new populations.	High	Population Management
Protect and restore additional sites and additional habitat adjacent to existing protected sites; develop connectivity between populations.	High	Habitat Protection
Reduce nest predation and cavity kleptoparasitism; important in small populations (i.e, < 100 breeding groups).	Medium	Threat Abatement
Restore canopy structure and composition; reduce mid-story encroachment; restore native groundcover.	High	Habitat Restoration/Improvement
Restore fire regimes through frequent (every 2-4 years) use of prescribed fire.	High	Fire Management

Monitoring Strategies

Annual property data reports submitted to the U.S. Fish and Wildlife Service provide population trends at the local, regional, and range-wide levels. Continue monitoring of clusters year-round that is being conducted by the ANHC, TNC, USFS, and the USFWS. Continue tracking of this species by the Arkansas Natural Heritage Commission.

Comments

This endangered species is a habitat specialist that occurs only in mature, open pine woodlands and savannas of the southeastern United States. Primary threats are loss of open pine habitat due to fire suppression and habitat conversion, loss of older pines needed for roost and nest cavities, and fragmentation of habitat causing isolation of populations which results in reduced genetic diversity and greater vulnerability to demographic and environmental chance events. A territorial, non-migratory species, it often occurs in family groups with a breeding pair and a male helper that is an offspring from a previous year; average group size is 2-3 birds. Until the mid-to-late twentieth century, largest populations were known from open pine flatwoods along the Ouachita terraces of southern Arkansas, and building on strong conservation efforts underway in that region represents one of the best opportunities for recovery of this species in this state. The Ouachita NF currently supports the largest population and has the potential for supporting a population 2-3 times its current size; additional habitat restoration in this region represents the other best recovery opportunity. Portions of the Ozark NF undergoing pine-hardwood woodland restoration may present additional opportunities, but the extent and likelihood need further exploration. A small population in eastern Arkansas, the only known one throughout the Mississippi Alluvial Plain, needs additional habitat protection and restoration to attain long-term viability. (Conner and others 2001, Costa and others 1996, Holimon and Montague 2003, Jackson 1994, James and Neal 1986, Masters and others 1995, McKellar and others 2014, Montague and others 1995, Neal 1992, Neal and others 1992, 1993a, 1993b, 1998, Robison and others 1999, Rudolph and others 1992, USDA FWS 2003, Walters and others 2002)

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Pluvialis dominica

American Golden-Plover

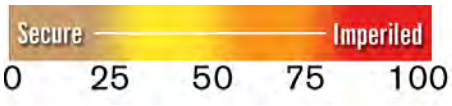


Class: Aves

Order: Charadriiformes

Family: Charadriidae

Priority Score: **15** **out of 100**



Population Trend: Unknown

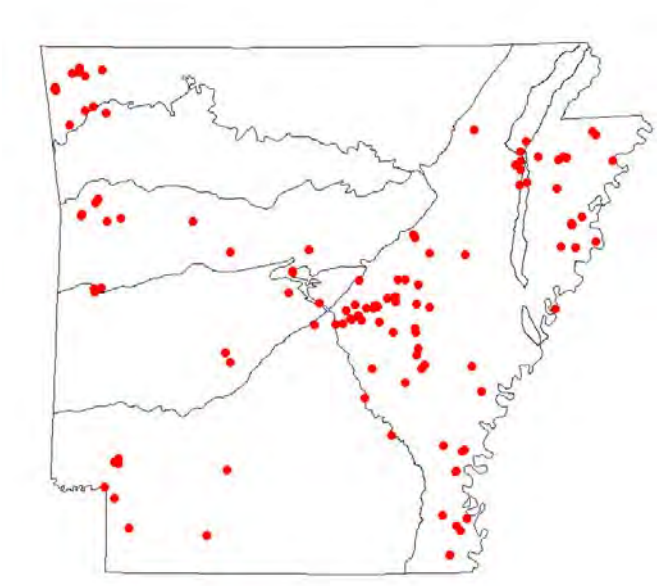
Residence:

Global Rank: G5 — Secure

State Rank: S3N — Vulnerable nonbreeding species in Arkansas

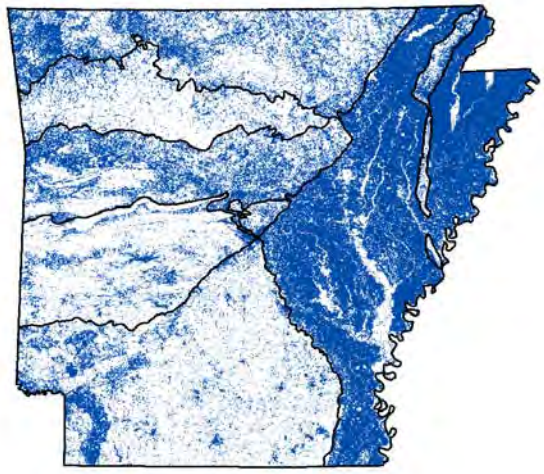
Distribution

Occurrence Records



Ecoregions where the species occurs:

- ☑ Ozark Highlands
- ☑ Boston Mountains
- ☑ Arkansas Valley
- ☑ Ouachita Mountains
- ☑ South Central Plains
- ☑ Mississippi Alluvial Plain
- ☑ Mississippi Valley Loess Plains



Habitat Map



Habitats	Weight
Crop Land	Suitable
Lower Mississippi Alluvial Plain Grand Prairie	Suitable
Mud Flats	Suitable
Pasture Land	Suitable
Ponds, Lakes, and Water Holes	Suitable
Urban/Suburban	Suitable

Problems Faced

KNOWN PROBLEM: Lack of wet prairie habitat.	Threat: Hydrological alteration Source: Agricultural practices
KNOWN PROBLEM: Lack of wet prairie habitat.	Threat: Groundwater depletion Source: Agricultural practices
KNOWN PROBLEM: Lack of wet prairie habitat.	Threat: Habitat destruction or conversion Source: Agricultural practices

Data Gaps/Research Needs

Determine habitat use during spring migration.

Determine stopover duration during spring migration.

Conservation Actions	Importance	Category
Manage for wet, open prairies and grasslands.	High	Habitat Restoration/Improvement

Monitoring Strategies

Develop spring migration counts in Arkansas through Lower Mississippi Valley/West Gulf Coast Joint Venture.

Comments

This shorebird has a long circular migration route that includes Arkansas during only spring migration. Spring migration records occur throughout the state. Some counts can be in the tens of thousands in Arkansas, but inter-annual variation in counts are high. Similar American Golden-Plover counts at some inland stopover sites in Indiana are thought to account for a significant portion of the entire known population (Johnson 2003). That comparable numbers of American Golden-Plovers use Arkansas stopover sites suggests that these sites may be important to the continental American Golden-Plover population. Usual habitats include short-grass prairies, flooded pastures, plowed fields and less often on mudflats and beaches where foraging for invertebrates occurs. Management for plover migration habitat may require the maintenance of complexes of potential habitat to assure alternatives when local conditions vary (Skagen and Knopf 1994). Very little is known about habitat use in Arkansas by this species.

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Pluvialis squatarola

Black-bellied Plover

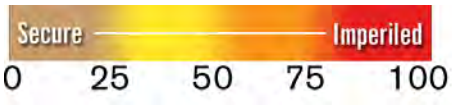


Class: Aves

Order: Charadriiformes

Family: Charadriidae

Priority Score: **24** **out of 100**



Population Trend: Decreasing

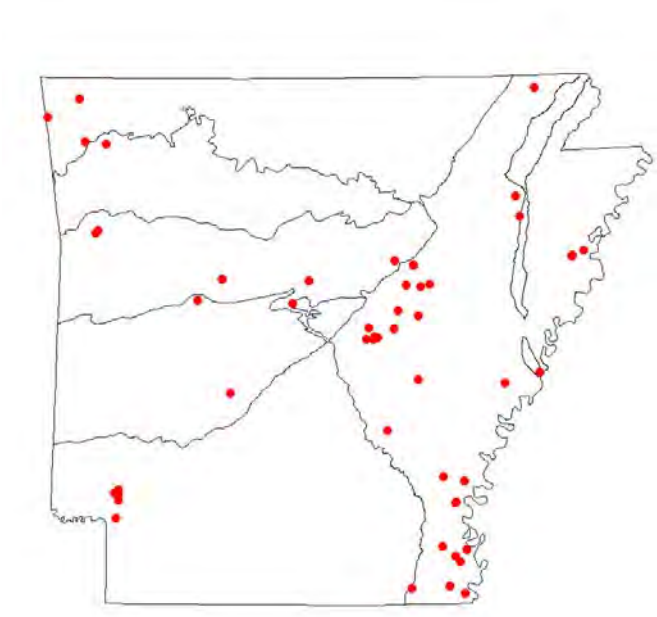
Residence: Transient

Global Rank: G5 — Secure

State Rank: S2N — Imperiled nonbreeding species in Arkansas

Distribution

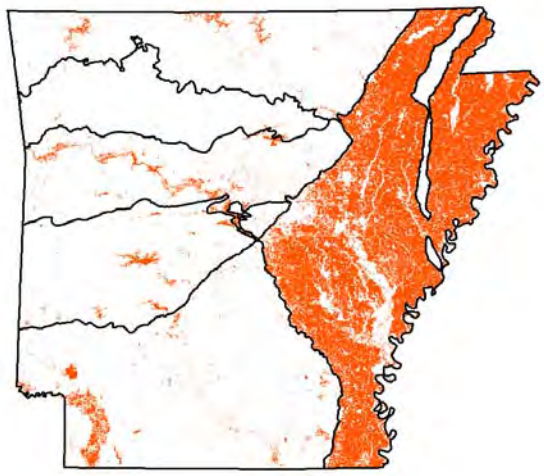
Occurrence Records



Ecoregions where the species occurs:

- [x] Ozark Highlands
- [x] Boston Mountains
- [x] Arkansas Valley
- [x] Ouachita Mountains
- [x] South Central Plains
- [x] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains

Habitat Map





Habitats	Weight
Crop Land	Marginal
Mud Flats	Optimal
Ponds, Lakes, and Water Holes	Marginal

Problems Faced

KNOWN PROBLEM: Lack of mud flat habitat.	Threat: Habitat destruction or conversion Source: Agricultural practices
KNOWN PROBLEM: Lack of mud flats during migration as a result of hydrological alteration.	Threat: Hydrological alteration Source: Water diversion

Data Gaps/Research Needs

No data gaps or research needs were identified.

Conservation Actions	Importance	Category
Draw down fish ponds to create mud flat habitat in July - November.	High	Habitat Restoration/Improvement
Flood cropland in summer and early fall after harvest.	High	Habitat Restoration/Improvement
Manipulate federal and state managed moist-soil units to provide mud flat habitat during March-early June and, if possible, during July - November.	Medium	Habitat Restoration/Improvement
Manipulate reservoirs (private and publicly owned) to provide mud flat habitat during July - November migration, and, if possible, during March-early June migration.	Medium	Habitat Restoration/Improvement
Restore mud flats.	High	Habitat Restoration/Improvement

Monitoring Strategies

Initiate late summer - fall migration counts in the Mississippi Alluvial Valley and the West Gulf Coastal Plain, coordinated through Lower Mississippi Valley Joint Venture.

Comments

This species is seen in the state March-November, with March- June sightings believed to be spring northward migrants, while birds seen July through November are believed to be southbound migrants. They are often seen in association with Long-billed Dowitchers, and tend to forage in very shallow water rather than exposed mud. Studies suggest that populations of this and other shorebird species are declining. The availability of habitat and food along their migratory route is critical. Birds need to stop and refuel as they go. Proper management of water levels on wetlands, artificial impoundments, and flooded agricultural fields can help. (Arkansas Audubon Society 2012, Carter and others 2000, CWCS 2004, CWCS 2005A, CWCS 2005B, Hamel 1992, James and Neal 1986, Klima and Jehl 1998, Martin and Finch 1995, National Audubon Society 2002, Rich and others 2004, Sauer and others 2004)

Commercial aquaculture facilities are important stopover sites for this species and many other shorebirds (Lehnen and Krementz 2013). The decline of fish pond acreage in the state from 60,000 surface acres in 2002 to less than 30,000 acres in 2012 is alarming (personal communication Dr. Carole Engle, UAPB). Water management strategies have changed at many of the remaining facilities because of increased efficiency. Emphasis should be placed on programs that would encourage fish farmers to provide shallow-water habitat for extended periods of time.

Additionally, management plans for reservoirs (ex. Chicot, Millwood) and moist-soil impoundments (AGFC, USFWS, private) could be altered to provide additional benefit to many shorebirds that rely on mudflat habitat. Deeper water that is drawn down slowly typically provides more invertebrates than very recently flooded water.

Taxa Association Team and Peer Reviewers

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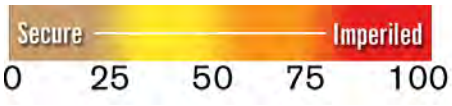
Porphyrio martinicus

Purple Gallinule



Class: Aves
Order: Gruiformes
Family: Rallidae

Priority Score: 23 **out of 100**



Population Trend: Stable

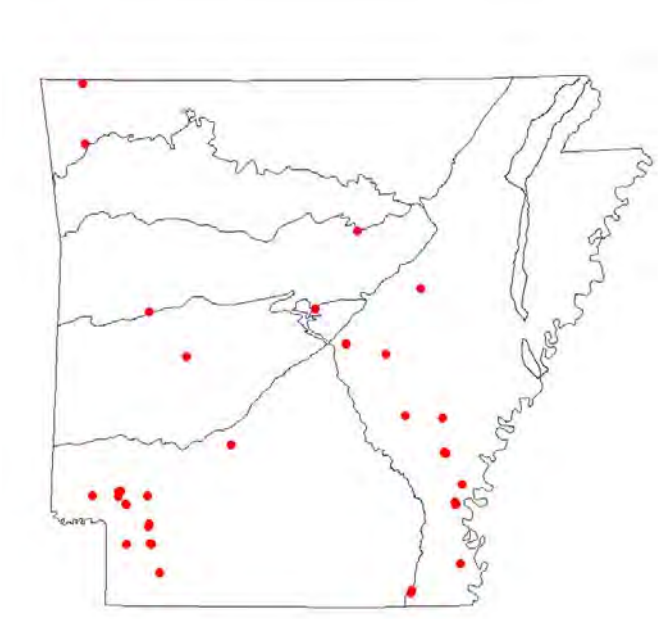
Residence: Breeding

Global Rank: G5 — Secure

State Rank: S1B — Critically imperiled breeding species in Arkansas

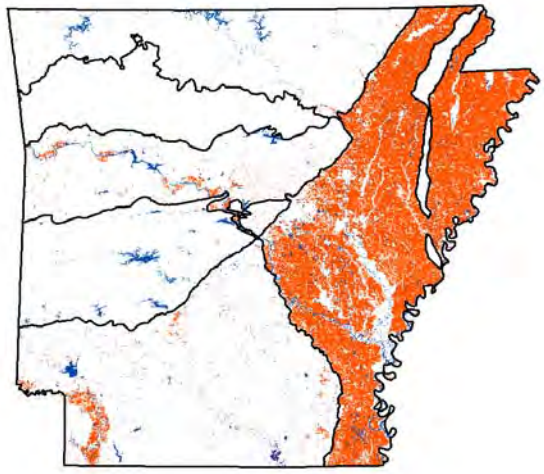
Distribution

Occurrence Records



Ecoregions where the species occurs:

- [x] Ozark Highlands
- [ ] Boston Mountains
- [x] Arkansas Valley
- [x] Ouachita Mountains
- [x] South Central Plains
- [x] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains



Habitat Map



Habitats	Weight
Crop Land	Marginal
Herbaceous Wetland	Optimal
Ponds, Lakes, and Water Holes	Suitable

Problems Faced

KNOWN PROBLEM: Loss of herbaceous wetlands.	Threat: Habitat destruction Source: Agricultural practices
KNOWN PROBLEM: Loss of herbaceous wetlands.	Threat: Habitat destruction Source: Urban development

Data Gaps/Research Needs

No data gaps or research needs were identified.

Conservation Actions	Importance	Category
Maintain herbaceous wetlands.	High	Habitat Protection
Restore herbaceous wetlands.	High	Habitat Restoration/Improvement

Monitoring Strategies

Conduct secretive marshbird surveys using the North American Marsh Bird Survey Protocol outlined in the National Marsh Bird Survey Program.

Comments

Purple Gallinules are not considered to be native to the state of Arkansas; rather they have expanded their range northward into Arkansas (Crow 1974). Their low population numbers in Arkansas is not an immediate concern, though climate change may shift their breeding range northward, increasing the importance of available habitat in Arkansas. The restoration of emergent wetlands could benefit this species and increase their population numbers overall. Extensive loss of wetland habitat may be offset by this adaptable species' use of rice fields, impoundments, and wildlife refuges. It readily accepts weedy conditions brought on by eutrophication and feeds on exotic weeds such as water hyacinth and hydrilla. Rapidly maturing rice varieties and subsequent early harvest together with removal of emergent vegetation from ponds could negatively affect this bird. (Arkansas Audubon Society 2012, Crow 1974, Hamel 1992, James and Neal 1986, Martin and Finch 1995, National Audubon Society 2002, Rich and others 2004, Sauer and others 2004, West and Hess 2002)

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Rallus elegans

King Rail

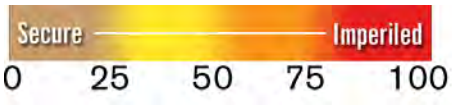


Class: Aves

Order: Gruiformes

Family: Rallidae

Priority Score: **33** **out of 100**



Population Trend: Decreasing

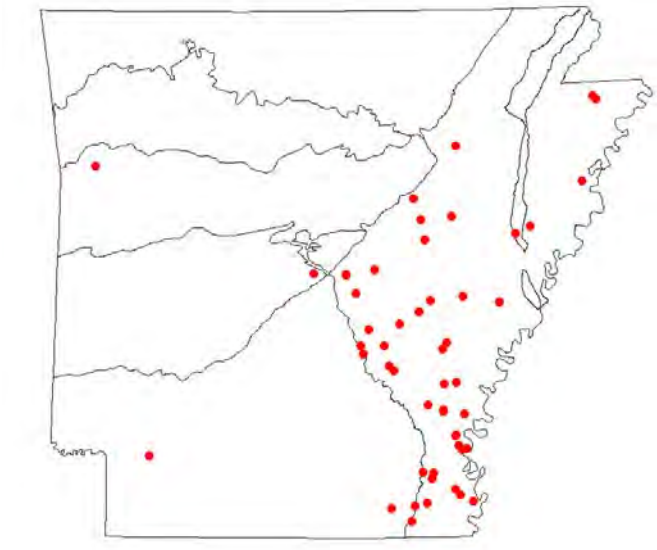
Residence: Permanent

Global Rank: G4 — Apparently secure species

State Rank: S1B — Critically imperiled breeding species in Arkansas

Distribution

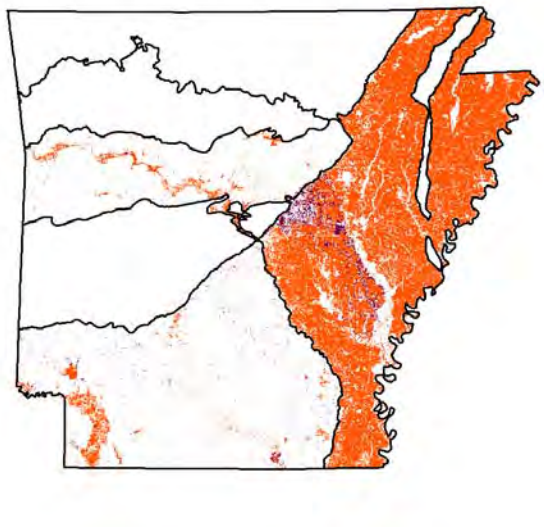
Occurrence Records



Ecoregions where the species occurs:

- ☐ Ozark Highlands
- ☐ Boston Mountains
- ☑ Arkansas Valley
- ☐ Ouachita Mountains
- ☑ South Central Plains
- ☑ Mississippi Alluvial Plain
- ☐ Mississippi Valley Loess Plains

Habitat Map





Habitats	Weight
Crop Land	Marginal
Herbaceous Wetland	Optimal
Lower Mississippi Alluvial Plain Grand Prairie	Optimal
Ponds, Lakes, and Water Holes	Marginal

Problems Faced

KNOWN PROBLEM: Conversion of emergent and herbaceous wetlands to bottomland hardwoods.	Threat: Habitat destruction or conversion Source: Forestry activities
KNOWN PROBLEM: Loss of herbaceous wetlands.	Threat: Habitat destruction Source: Agricultural practices
KNOWN PROBLEM: Loss of herbaceous wetlands.	Threat: Habitat destruction Source: Urban development
KNOWN PROBLEM: Loss of herbaceous wetlands.	Threat: Hydrological alteration Source: Water diversion

Data Gaps/Research Needs

Determine current distribution and abundance.

Conservation Actions	Importance	Category
Protect herbaceous wetlands.	High	Habitat Protection
Restore herbaceous wetlands.	High	Habitat Restoration/Improvement

Monitoring Strategies

Conduct secretive marshbird surveys using the North American Marsh Bird Survey Protocol outlined in the National Marsh Bird Survey Program.

Comments

The Grand Prairie region of Arkansas was historically important to King Rails, and they were common breeders in the rice fields and associated drainage ditches in the 1950s and 60s (Meanley 1969). Their abundance or occurrence throughout the rest of Arkansas was largely unknown outside of a few observations posted to the Arkansas Audubon Society's bird record database. In 2004, 2005 and 2012, marshbird surveys were conducted throughout the Mississippi Alluvial Valley of Arkansas to document the abundance and range of this species (Budd and Krementz 2011, Budd and Rowe 2013). In each of the three field seasons, very few (<25 individuals) King Rails were observed. The surveys also noted that King Rails were no longer common in the Grand Prairie Region, likely due to changes in agricultural practices. This species utilizes emergent wetlands that consist of cattails, sedges, rushes, etc and that have at least small pockets of water throughout the summer months. The King Rail also tends to use emergent wetlands that are more than 400 meters away from a forested block. These habitat conditions are rare in Arkansas. In order to improve their population status, more emergent wetlands need to be restored and maintained.

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Scolopax minor

American Woodcock



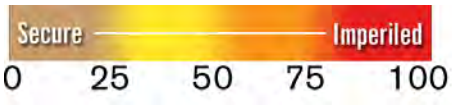
©U.S. Fish and Wildlife Service

Class: Aves

Order: Charadriiformes

Family: Scolopacidae

Priority Score: **24** **out of 100**



Population Trend: Decreasing

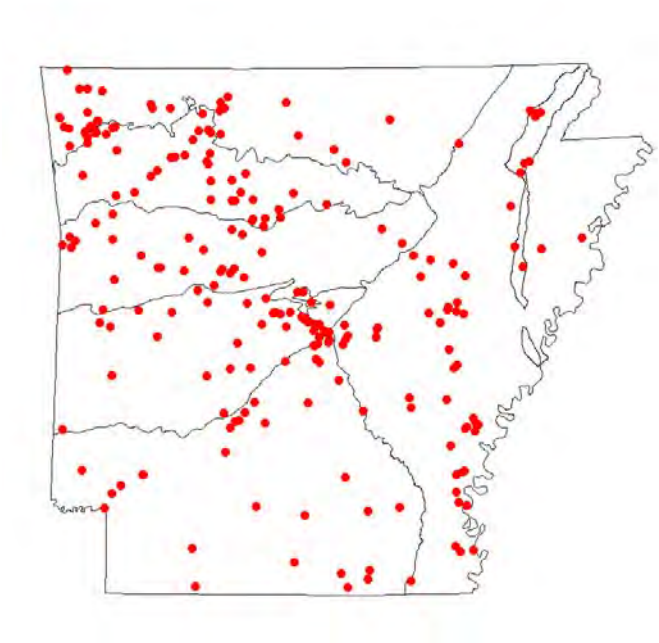
Residence: Permanent

Global Rank: G5 — Secure

State Rank: S2B,S3N — Imperiled breeding, vulnerable nonbreeding species in Arkansas

Distribution

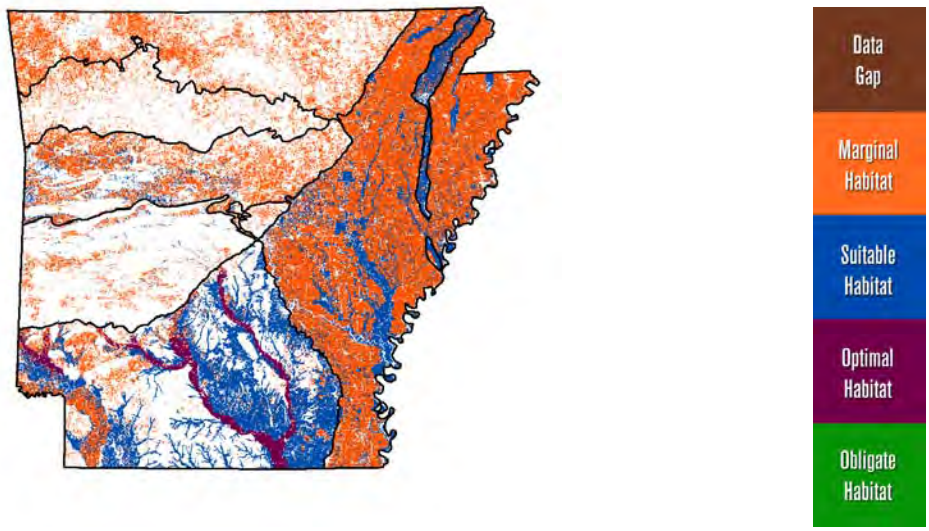
Occurrence Records



Ecoregions where the species occurs:

- ☑ Ozark Highlands
- ☑ Boston Mountains
- ☑ Arkansas Valley
- ☑ Ouachita Mountains
- ☑ South Central Plains
- ☑ Mississippi Alluvial Plain
- ☑ Mississippi Valley Loess Plains

Habitat Map



Scolopax minor
American Woodcock

Habitats	Weight
Crop Land	Marginal
Crowley's Ridge Loess Slope Forest	Suitable
Lower Mississippi Alluvial Plain Grand Prairie	Suitable
Lower Mississippi Flatwoods Woodland and Forest	Suitable
Lower Mississippi River Bottomland Depression	Marginal
Lower Mississippi River Dune Woodland, Pond, and Forest	Marginal
Lower Mississippi River High Bottomland Forest	Suitable
Lower Mississippi River Low Bottomland Forest	Suitable
Lower Mississippi River Riparian Forest	Suitable
Ozark-Ouachita Large Floodplain	Suitable
Ozark-Ouachita Mesic Hardwood Forest	Marginal
Ozark-Ouachita Prairie and Woodland	Suitable
Ozark-Ouachita Riparian	Suitable
Pasture Land	Marginal
West Gulf Coastal Plain Calcareous Prairie and Woodland	Marginal
West Gulf Coastal Plain Dry Pine-Hardwood Flatwoods	Suitable
West Gulf Coastal Plain Large River Floodplain Forest	Optimal
West Gulf Coastal Plain Mesic Hardwood Forest	Suitable
West Gulf Coastal Plain Red River Floodplain Forest	Suitable
West Gulf Coastal Plain Small Stream/River Forest	Suitable
West Gulf Coastal Plain Wet Hardwood Flatwoods	Optimal

Scolopax minor
American Woodcock

Problems Faced

KNOWN PROBLEM: Conversion of wet hardwood sites to commercial pine lands.	Threat: Habitat destruction or conversion Source: Forestry activities
KNOWN PROBLEM: Conversion of wet hardwood sites to commercial pine lands.	Threat: Habitat destruction or conversion Source: Conversion of riparian forest
KNOWN PROBLEM: Draining of swampy areas in bottomland hardwood and flatwood forests.	Threat: Hydrological alteration Source: Water diversion
KNOWN PROBLEM: Lack of early successional forests.	Threat: Altered composition/structure Source: Conversion of riparian forest
POTENTIAL PROBLEM: Loss of individuals to hunting.	Threat: Biological alteration Source: Recreation
POTENTIAL PROBLEM: Vulnerability to toxins and contaminants.	Threat: Toxins/contaminants Source: Agricultural practices

Data Gaps/Research Needs

Nocturnal habitat use during autumn migration in the Mississippi Alluvial Valley.
Stopover duration during autumn and spring migration.

Conservation Actions

	Importance	Category
Manage for successional bottomland and flatwood forests.	High	Habitat Restoration/Improvement

Monitoring Strategies

Initiate autumn migration counts in the Mississippi Alluvial Valley and the West Gulf Coastal Plain, coordinated through Lower Mississippi Valley West Gulf Coastal Plain Joint Venture.

Comments

This compact shorebird spends its time probing for food on forest floors rather than mud flats. Its long, flexible bill is sensitive to touch, and it uses it to find and extract earthworms. Forest management practices and hunting may influence population trends. Management for this species in Arkansas should prioritize providing migration habitat, as relatively little breeding occurs in Arkansas, and few woodcock overwinter here as compared to Texas and Louisiana. Woodcock use a wide variety of habitat types during both autumn and spring migration, but the use of open habitats like old fields and clearcuts can be quite important especially during spring migration. Diurnal habitat management should focus on high stem density of forbs/shrubs/trees (but not grass) at the ground layer with a sparse mid-story and an open canopy. Woodcock prefer loamy to sandy-loam soils where earthworm abundances, an important food source, are high. Disturbance (fire, thinning, grazing) of some habitat types is important component of management.

(Arkansas Audubon Society 2012, Hamel 1992, James and Neal 1986, Keppie and Whiting 1994, Martin and Finch 1995, National Audubon Society 2002, Rich and others 2004, Sauer and others 2004)

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Setophaga cerulea

Cerulean Warbler

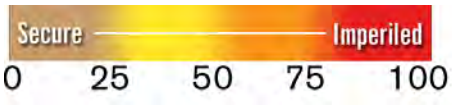


Class: Aves

Order: Passeriformes

Family: Parulidae

Priority Score: **24** **out of 100**



Population Trend: Decreasing

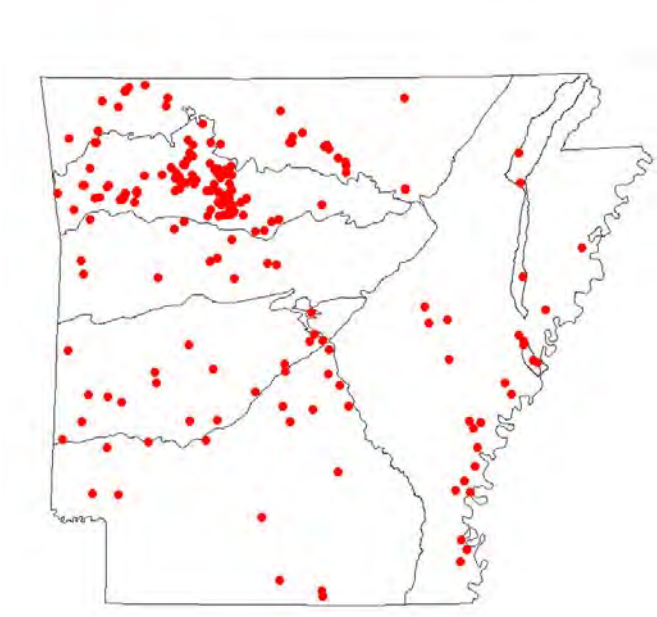
Residence: Breeding

Global Rank: G4 — Apparently secure species

State Rank: S3B — Vulnerable breeding species in Arkansas

Distribution

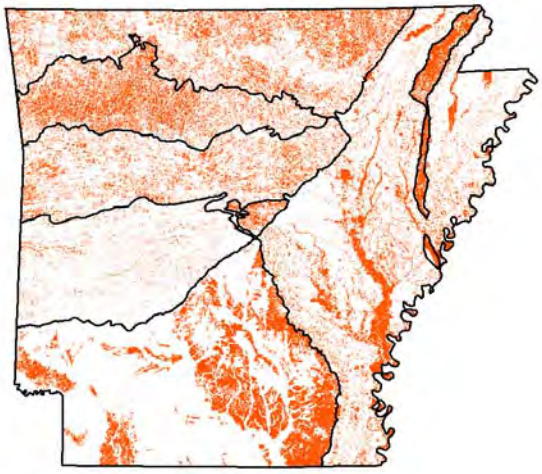
Occurrence Records



Ecoregions where the species occurs:

- ☑ Ozark Highlands
- ☑ Boston Mountains
- ☑ Arkansas Valley
- ☑ Ouachita Mountains
- ☑ South Central Plains
- ☑ Mississippi Alluvial Plain
- ☑ Mississippi Valley Loess Plains

Habitat Map





Habitats	Weight
Crowley's Ridge Loess Slope Forest	Marginal
Lower Mississippi Flatwoods Woodland and Forest	Marginal
Lower Mississippi River High Bottomland Forest	Marginal
Lower Mississippi River Low Bottomland Forest	Marginal
Lower Mississippi River Riparian Forest	Marginal
Ozark-Ouachita Dry-Mesic Oak Forest	Marginal
Ozark-Ouachita Mesic Hardwood Forest	Suitable
Ozark-Ouachita Riparian	Marginal

Problems Faced

KNOWN PROBLEM: Loss of large blocks of mature/old growth unevenaged forests.	Threat: Habitat fragmentation Source: Forestry activities
KNOWN PROBLEM: Lack of small openings/canopy gaps in large contiguous forests.	Threat: Altered composition/structure Source: Forestry activities
KNOWN PROBLEM: Loss of large blocks of mature/old growth unevenaged forests.	Threat: Habitat destruction Source: Forestry activities
KNOWN PROBLEM: Loss of unevenaged forest structure.	Threat: Alteration of natural fire regimes Source: Fire suppression
KNOWN PROBLEM: Loss of uneven-aged forest structure.	Threat: Altered composition/structure Source: Forestry activities
KNOWN PROBLEM: Nest parasitism from Brown-headed Cowbirds.	Threat: Extraordinary predation/parasitism/disease Source: Parasites/pathogens
KNOWN PROBLEM: Nest parasitism from Brown-headed Cowbirds.	Threat: Habitat fragmentation Source: Forestry activities
POTENTIAL PROBLEM: Loss of preferred tree species.	Threat: Altered composition/structure Source: Forestry activities
POTENTIAL PROBLEM: Red oak-borer problems resulting from fire suppression.	Threat: Alteration of natural fire regimes Source: Forestry activities

Data Gaps/Research Needs

Determine breeding status in the South Central Plains ecoregion.
Determine relationship between breeding habitat type, management practices, and post-fledgling survival.
Identify preferred vegetation structure within habitats.

Conservation Actions

	Importance	Category
Enlarge and connect forests to reduce the amount of non-forested edge.	High	Habitat Restoration/Improvement
Enlarge and connect forests to reduce the amount of non-forested edge.	High	Land Acquisition
Minimize forest fragmentation.	High	Habitat Restoration/Improvement
Promote unevenaged forest management.	High	Habitat Restoration/Improvement
Utilize prescribed fire to improve habitat suitablility.	Medium	Fire Management

Monitoring Strategies

The Partners in Flight North American Landbird Conservation Plan indicates that long-term population trend monitoring for this species is generally considered adequate, but some issues, such as bias, may not have been accounted for. Continue to conduct Breeding Bird Surveys at all routes established in Arkansas. Continue effort to locate new locations for breeding populations in Arkansas. Conduct area-specific surveys in order to capture territorial clusters that may be missed by Breeding Bird Surveys. Continue tracking of this species by the Arkansas Natural Heritage Commission.

Comments

The loss and fragmentation of extensive unfragmented tracts of mature forest, with natural disturbance regimes intact, is the primary threat to this species on the breeding grounds. Within these habitat patches, birds are affected (both positively and negatively) by local forest management practices. Small group- selection cuts can mimic the canopy gaps found in preferred habitat and may be attractive if occurring in regions with high overall forest cover (e.g., Ozark NF). However, these same artificial disturbances may lead to reduced densities in landscapes with low forest cover (Crowley's Ridge or LMAV). These efforts may also lead to a decrease in nesting success and a decline in densities over time (in regions of high forest cover as well). Thus, appropriate placement of these emulated disturbances in areas of highly forested regions with lower densities of birds (at a local scale) would be prudent.In any event, large trees (>40 cm DBH) are needed for nesting and foraging, and a complex layering of upper canopy, midstory, and understory vegetation is also preferred.

The species is locally common in appropriate habitat in the Ozark NF, but much less numerousin the Ouachita Mountain, Gulf Coastal Plain, and Mississippi Delta regions. (ANHC 2003, Boves and others 2013a and b, Buehler and others 2013, Clawson 1982, Duzan and others 2003, 2003A, Evans and Kirkman 1980, Fitzgerald 2000, Hamel 1992, 2000, Jacobs 2001, James 1971, James and Neal 1986, James and others 2001, Kellner In prep, Martin and Finch 1995, Probst and Thompson 1996, Robbins and Easterla 1992, Robbins and others 1989, 1995, Rodewald and Smith 1998, Rosenberg and others 2000, Wood and others 2013)

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Sternula antillarum athalassos

Interior Least Tern



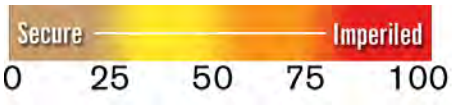
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Class: Aves

Order: Charadriiformes

Family: Laridae

Priority Score: 31 out of 100



Population Trend: Increasing

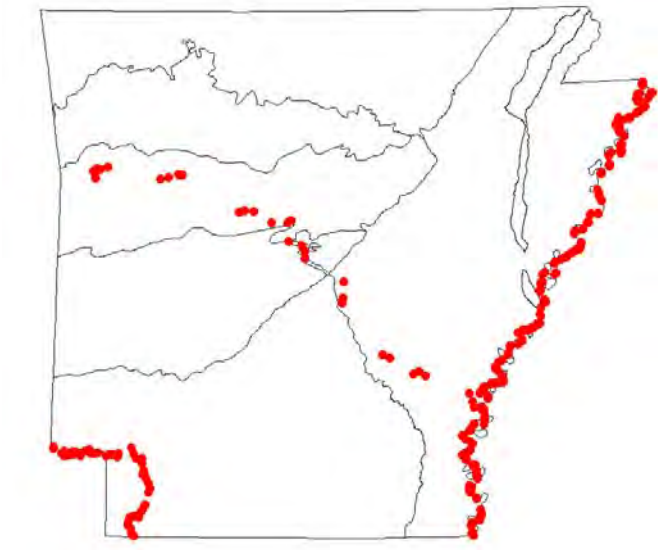
Residence: Breeding

Global Rank: G4T2Q — Apparently secure (imperiled subspecies) questionable taxonomy

State Rank: S3B — Vulnerable breeding species in Arkansas

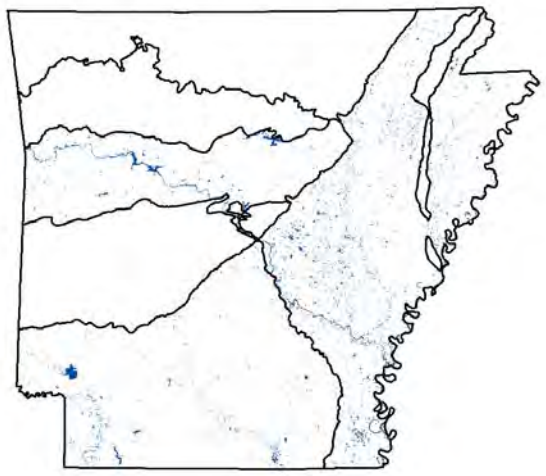
Distribution

Occurrence Records



Ecoregions where the species occurs:

- ☐ Ozark Highlands
- ☐ Boston Mountains
- ☑ Arkansas Valley
- ☐ Ouachita Mountains
- ☑ South Central Plains
- ☑ Mississippi Alluvial Plain
- ☐ Mississippi Valley Loess Plains



Habitat Map



Habitats

	Weight
Mud Flats	Obligate
Ponds, Lakes, and Water Holes	Suitable

Problems Faced

KNOWN PROBLEM: Disturbance by cattle.	Threat: Habitat disturbance Source: Grazing/Browsing
KNOWN PROBLEM: Disturbance by humans.	Threat: Habitat disturbance Source: Recreation
KNOWN PROBLEM: Loss of sandbars.	Threat: Hydrological alteration Source: Channel maintenance
KNOWN PROBLEM: Predation by mesopredators.	Threat: Extraordinary predation/parasitism/disease Source: Predation

Data Gaps/Research Needs

Monitor Red River population and determine reproductive success as well as causes of nest and nestling mortality.

Conservation Actions

	Importance	Category
Create sandbars.	Medium	Habitat Restoration/Improvement
Encourage predator control.	High	Threat Abatement
Protect sandbars.	High	Habitat Protection
Reduce human disturbance.	High	Public Relations/Education

Monitoring Strategies

Monitor nest success and population numbers on Arkansas and Red Rivers to assess disturbance from human related activities, including boaters, ATV use, and cattle intrusion. Continue monitoring breeding success. Continue tracking of this species by the Arkansas Natural Heritage Commission.

Comments

An endangered species in the interior portion of the country. Breeding habitat is limited to sand bars on large rivers - the Arkansas, Red and Mississippi Rivers. Numbers are increasing on the Mississippi. They also forage on open bodies of water, such as lakes and fish ponds in migration. (Arkansas Audubon Society 2012, Hamel 1992, James and Neal 1986, Martin and Finch 1995, National Audubon Society 2002, Rich and others 2004, Sauer and others 2004, Thompson and others 1997)

Numbers on the Arkansas, Red and Mississippi rivers have exceeded the delisting criteria since 2005 when annual surveys began (U.S. Fish and Wildlife Service 2013). In 2007 birds were discovered nesting on rooftops throughout the river valley; birds were discovered using at least five white gravel rooftops within 10 miles of the Arkansas River (Nupp and Watterson 2007).

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Thryomanes bewickii

Bewick's Wren

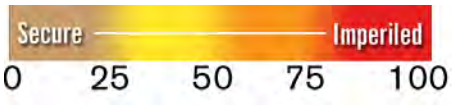


Class: Aves

Order: Passeriformes

Family: Troglodytidae

Priority Score: **29** **out of 100**



Population Trend: Decreasing

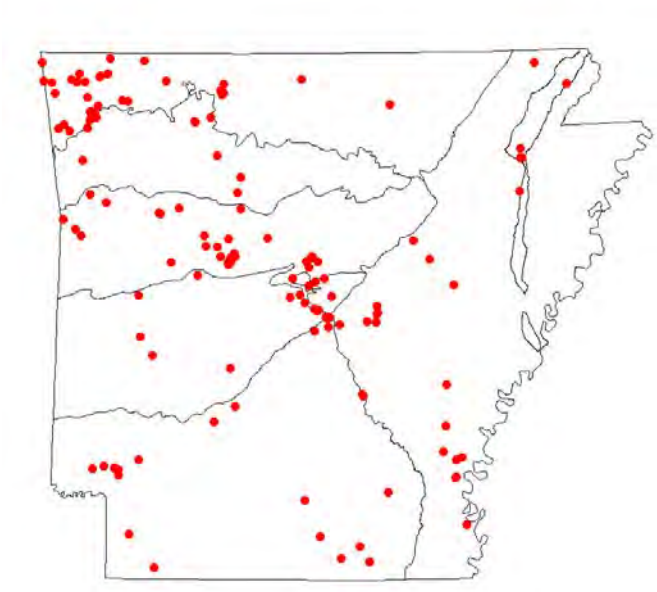
Residence: Permanent

Global Rank: G5 — Secure

State Rank: S1B,S1S2N — Critically imperiled breeding species, critically imperiled nonbreeding species (uncertain rank) in Arkansas

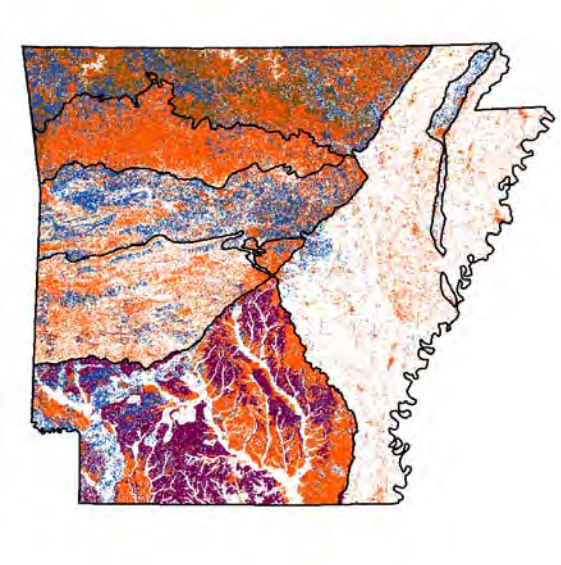
Distribution

Occurrence Records



Ecoregions where the species occurs:

- ☑ Ozark Highlands
- ☑ Boston Mountains
- ☑ Arkansas Valley
- ☑ Ouachita Mountains
- ☑ South Central Plains
- ☑ Mississippi Alluvial Plain
- ☑ Mississippi Valley Loess Plains



Habitat Map



Habitats	Weight
Interior Highlands Calcareous Glade and Barrens	Data Gap
Interior Highlands Dry Acidic Glade and Barrens	Marginal
Lower Mississippi Flatwoods Woodland and Forest	Marginal
Ozark-Ouachita Dry Oak and Pine Woodland	Optimal
Ozark-Ouachita Dry-Mesic Oak Forest	Marginal
Ozark-Ouachita Pine-Oak Forest/Woodland	Suitable
Ozark-Ouachita Prairie and Woodland	Suitable
Pasture Land	Suitable
Urban/Suburban	Marginal

Thryomanes bewickii
Bewick's Wren

Problems Faced

KNOWN PROBLEM: Breeding habitat loss from clean farming practices.	Threat: Habitat destruction Source: Agricultural practices
KNOWN PROBLEM: Collisions with towers.	Threat: Collision with man-made structures Source: Commercial/industrial development
KNOWN PROBLEM: Competition for nest sites with House Wrens.	Threat: Extraordinary competition for resources Source: Interspecific competiton
POTENTIAL PROBLEM: Breeding habitat loss from succession.	Threat: Habitat destruction or conversion Source: Forestry activities
POTENTIAL PROBLEM: Breeding habitat loss from sucession.	Threat: Alteration of natural fire regimes Source: Fire suppression

Data Gaps/Research Needs

Deterermine distribution and abundance.
Determine dispersal and survival of immatures from adjacent populations outside of Arkansas.
Determine habitat use and ecology.
Determine whether individuals in AR are eastern subspecies.
Study nest site limitations including competition with House Wren.

Conservation Actions

	Importance	Category
Manage for early successional and savanna habitat.	High	Fire Management

Monitoring Strategies

The Partners in Flight North American Landbird Conservation Plan indicates that long-term population trend monitoring for this species is generally considered adequate but some issues, such as bias, may not have been accounted for. Additional targeted surveys in Northwest Arkansas with concomittant population studies are recommended. Continue to conduct Breeding Bird Surveys at all routes established in Arkansas. Continue tracking of this species by the Arkansas Natural Heritage Commission.

Comments

Breeds in open country with a mix of shrubs and open woodland. Eastern populations are often around outbuildings of farms near brushy or wooded areas in cleared or fairly open country. The species has been nearly extirpated as a breeding bird across the entire eastern US, possibly due to habitat change (e.g. habitat succession of abandoned farms), and competition from the more aggressive House Wren for nest cavities. Targeted surveys by Thompson (2011) during 2008-2010 suggest the species has been essentially extirpated as a breeding bird, with occasional recolonizations possible in extreme northwest Arkansas from populations in southwest Missouri. (Arkansas Audubon Society 2012 Clawson 1982, Duzan and others 2003, 2003A, eBird 2014, Evans and Kirkman 1980, Fitzgerald 2000, Hamel 1992, Jacobs 2001, James and Neal 1986, Kennedy and White 2013, Martin and Finch 1995, Robbins and Easterla 1992, Robinson and others 1999, Thompson 2011)

Taxa Association Team and Peer Reviewers

AGFC Ms. Karen Rowe, ANHC Mr. Bill Holimon, USFWS-retired Mr. Allan Mueller, Audubon Arkansas Dr. Dan Scheiman, AGFC Mr. Dick Baxter, USFS Mr. Leif Anderson, USGS Dr. David Krementz, ASU Dr. Than Boves, ATU Dr. Chris Kellner, UA Dr. Kim Smith, UAM Dr. Doug Osborne, AGFC Mr. Garrick Dugger, AGFC Mr. Bubba Groves, AGFC Ms. Allison Fowler, USFWS Mr. Mike Budd, USFWS Ms. Erin Knoll, USFS Mr. Steve Duzan

Vireo bellii

Bell's Vireo

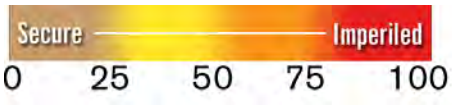


Class: Aves

Order: Passeriformes

Family: Vireonidae

Priority Score: **19** **out of 100**



Population Trend: Decreasing

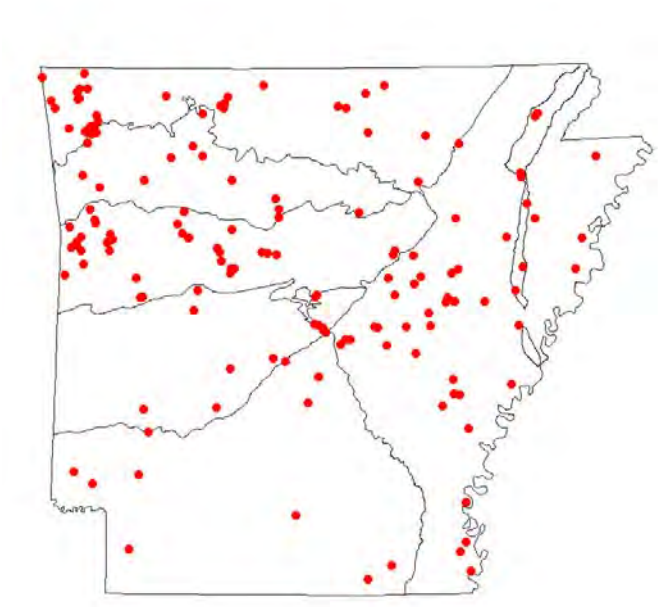
Residence: Breeding

Global Rank: G5 — Secure

State Rank: S3B — Vulnerable breeding species in Arkansas

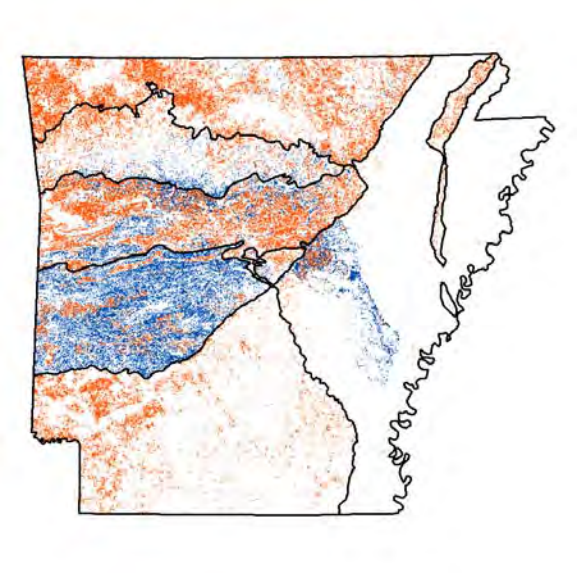
Distribution

Occurrence Records



Ecoregions where the species occurs:

- ☑ Ozark Highlands
- ☑ Boston Mountains
- ☑ Arkansas Valley
- ☑ Ouachita Mountains
- ☑ South Central Plains
- ☑ Mississippi Alluvial Plain
- ☑ Mississippi Valley Loess Plains



Habitat Map



Habitats

	Weight
Lower Mississippi Alluvial Plain Grand Prairie	Suitable
Ozark-Ouachita Pine-Bluestem Woodland	Suitable
Ozark-Ouachita Prairie and Woodland	Optimal
Pasture Land	Marginal
West Gulf Coastal Plain Calcareous Prairie and Woodland	Suitable

Problems Faced

KNOWN PROBLEM: Loss of extensive early successional habitat with shrub component.	Threat: Altered composition/structure Source: Fire suppression
KNOWN PROBLEM: Loss of extensive early successional habitat with shrub component.	Threat: Habitat destruction or conversion Source: Agricultural practices
KNOWN PROBLEM: Loss of extensive early successional habitat with shrub component.	Threat: Habitat destruction or conversion Source: Urban development
KNOWN PROBLEM: Parasitism by Brown-headed Cowbirds.	Threat: Extraordinary predation/parasitism/disease Source: Parasites/pathogens

Data Gaps/Research Needs

Conduct surveys to improve distribution and abundance information.
Determine if openings in bottomland hardwood restoration areas are utilized on migration or during the nesting season.
Determine the age class and extent of use of early to mid successional bottomland hardwood restoration areas both on migration and during the nesting season.
Determine whether breeding habitat type affects abundance and reproductive success to better focus effective conservation and restoration efforts.
Examine effects of the variability of the timing of arrival on breeding grounds and nest initiation on reproductive success and annual productivity and identify factors underlying this variability.
Identify source and sink populations.

Conservation Actions

	Importance	Category
Establish, restore, and manage shrubby fencerows and hedgerows in pasturelands and crop lands.	Medium	Habitat Restoration/Improvement
Reduce parasitism by Brown-headed Cowbird.	High	Threat Abatement
Restore habitat.	High	Habitat Restoration/Improvement
Restore native grasslands with a shrub component.	Low	Habitat Restoration/Improvement

Monitoring Strategies

The Partners in Flight North American Landbird Conservation Plan indicates that long-term population trend monitoring for this species is generally considered adequate, but some issues, such as bias, may not have been accounted for. Expand efforts to locate and survey potential breeding habitat for this species. Continue to conduct Breeding Bird Surveys at all routes established in Arkansas. Continue tracking of this species by the Arkansas Natural Heritage Commission.

Comments

This species is affiliated with shrubby components of prairies or grasslands where it nests in thickets. Where the habitat is patchy, many nests are parasitized by Brown-headed Cowbirds. (Arkansas Audubon Society 2012, Brown 1993, Hamel 1992, James and Neal 1986, Martin and Finch 1995, National Audubon Society 2002, Rich and others 2004, Sauer and others 2004)

Taxa Association Team and Peer Reviewers

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Bouchardina robisoni

Bayou Bodcau Crayfish

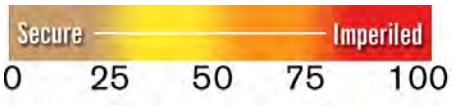


Class: Malacostraca

Order: Decapoda

Family: Cambaridae

Priority Score: **50** out of 100



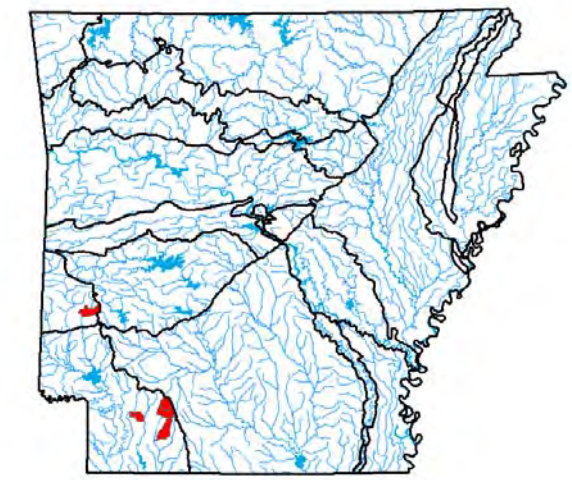
Population Trend: Unknown

Global Rank: G2 — Imperiled species

State Rank: S1 — Critically imperiled in Arkansas

Distribution

Element Occurrence Records



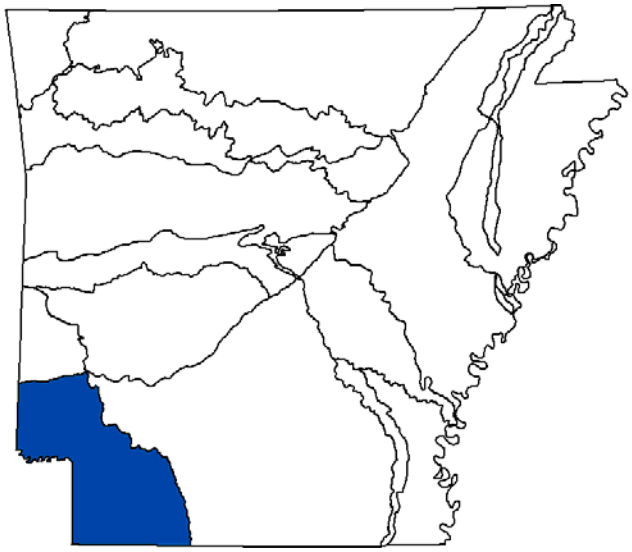
Ecoregions where the species occurs:

- ☐ Ozark Highlands
- ☐ Boston Mountains
- ☐ Arkansas Valley
- ☐ Ouachita Mountains
- ☑ South Central Plains
- ☐ Mississippi Alluvial Plain
- ☐ Mississippi Valley Loess Plains



Terrestrial Habitats





Ecobasins where this species occurs

Ecobasins

Ouachita Mountains - Red River

South Central Plains - Red River

Terrestrial Habitats

West Gulf Coastal Plain Seepage Swamp and Baygall	Data Gap

Aquatic Habitats

Natural Pool: Headwater	Data Gap
Natural Riffle: Headwater	Data Gap
Natural Seep: Headwater - Small	Data Gap
Natural Swamp/Wetlands: Headwater - Small	Data Gap

Problems Faced

Threat: Habitat disturbance
Source: Road construction

Threat: Hydrological alteration
Source: Forestry activities

Threat: Toxins/contaminants
Source: Road construction

Data Gaps/Research Needs

Identify habitat requirements and threats.

Survey for additional populations.

Conservation Actions

	Importance	Category
	Medium	Threat Abatement
Protect known occurrences from construction activities and herbicide applications.	Medium	Habitat Protection

Monitoring Strategies

Monitor known occurrences.

Comments

Description: a small (approximately 1/2 inch carapace length), grayish-tan crayfish with reddish-tan carapace with U-shaped rust markings on the sides (Hobbs 1977).

This species is an Arkansas endemic known from few sites. Robison (2006) found it to be localized, highly sporadic, and rarely abundant. He found it at 9 locations, but considered it to be more rare than previously thought.

Taxa Team and Peer Reviewers

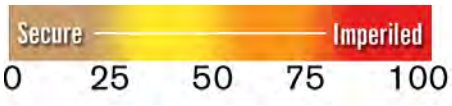
AGFC Mr. Brian Wagner, UA Dr. Daniel Magoulick

Cambarus aculabrum

Benton County Cave Crayfish

Class: Malacostraca
Order: Decapoda
Family: Cambaridae

Priority Score: **80** out of 100



Population Trend: Stable

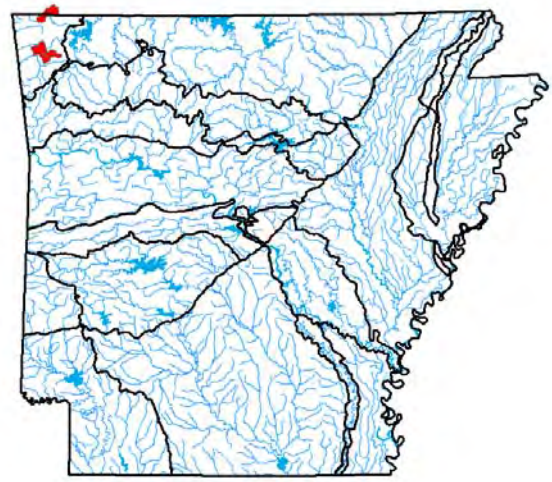


Global Rank: G1 — Critically imperiled species

State Rank: S1 — Critically imperiled in Arkansas

Distribution

Element Occurrence Records



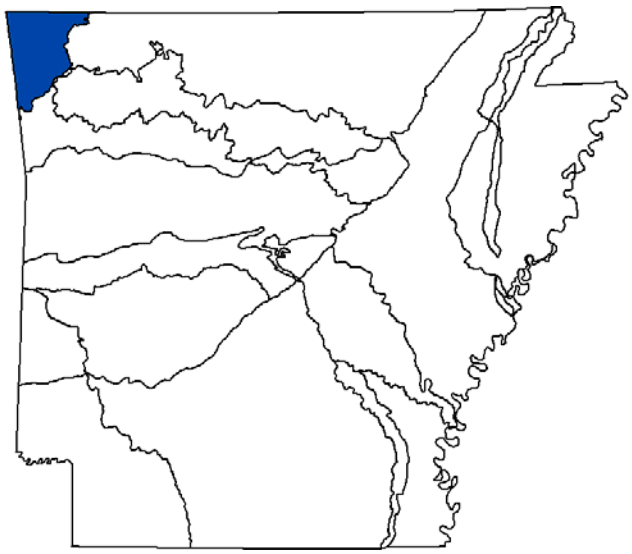
Ecoregions where the species occurs:

- [x] Ozark Highlands
- [ ] Boston Mountains
- [ ] Arkansas Valley
- [ ] Ouachita Mountains
- [ ] South Central Plains
- [ ] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains



Terrestrial Habitats





Ecobasins where this species occurs

Ecobasins

Ozark Highlands - Arkansas River

Terrestrial Habitats

Caves, Mines, Sinkholes and other Karst Features	Obligate

Aquatic Habitats

Natural Cave Stream: - Small - Medium	Obligate
Natural Groundwater:	Obligate
Natural Spring Run: Headwater	Marginal

Cambarus aculabrum
Benton County Cave Crayfish

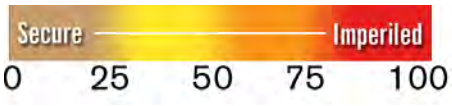
Cambarus hubbsi

Hubbs' Crayfish



Class: Malacostraca
Order: Decapoda
Family: Cambaridae

Priority Score: **27** **out of 100**



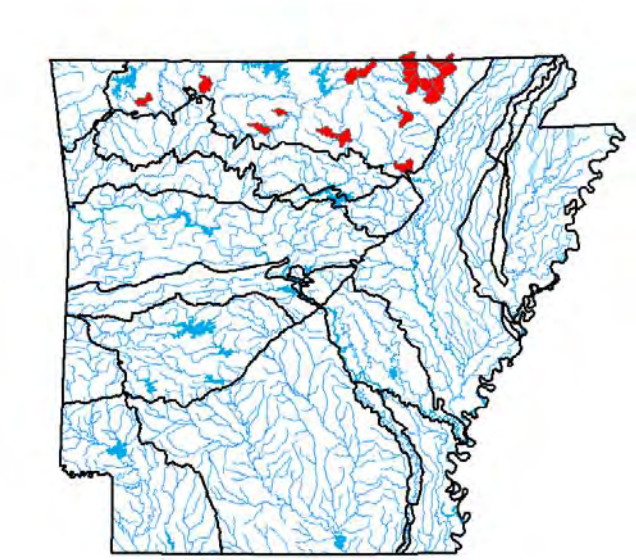
Population Trend: Unknown

Gobal Rank: G3? — Vulnerable (inexact numeric rank)

State Rank: S3 — Vulnerable in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- [x] Ozark Highlands
- [x] Boston Mountains
- [ ] Ouachita Mountains
- [ ] Arkansas Valley
- [ ] South Central Plains
- [ ] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains

Ecobasins

Boston Mountains - White River
Ozark Highlands - White River

Habitats

	Weight
Natural Cave Stream: - Medium - Large	Marginal
Natural Glide: - Medium - Large	Suitable
Natural Pool: - Medium - Large	Marginal
Natural Riffle: - Medium - Large	Optimal
Natural Run: - Medium - Large	Optimal
Natural Shoal: - Medium - Large	Optimal

Problems Faced

Threat: Biological alteration Source: Exotic species
Threat: Habitat destruction Source: Grazing/Browsing

Data Gaps/Research Needs

Determine impact of introduced crayfish.
Determine taxonomic and genetic status of subpopulations.
Survey for additional populations.

Conservation Actions

	Importance	Category
Maintain healthy, upland streams.	Medium	Habitat Protection
Prevent introduction of non-native crayfishes.	Medium	Threat Abatement

Monitoring Strategies

Monitor incidental to stream crayfish survey.

Comments

This crayfish is endemic to the Ozarks. It is fairly common in Ozark streams of the Black River basin, but it is much less common in the remainder of the White River basin. Coloration and habitat use differences between the two areas also are curious, and warrant future attention (Brian Wagner, personal communication).

Interspecific competition with the invasive crayfish Orconectes neglectus is thought to be causing a reduction in the range of this species, in addition to changes in land use causing a decline in stream habitat quality (Magoulick and DiStefano 2007). The causes of this decline, however, have yet to be confirmed.

Taxa Association Team and Peer Reviewers

AGFC Mr. Brian Wagner, UA Dr. Daniel Magoulick

Problems Faced

Threat: Hydrological alteration
Source: Urban development

Threat: Nutrient loading
Source: Confined animal operations

Threat: Nutrient loading
Source: Urban development

Threat: Sedimentation
Source: Road construction

Threat: Toxins/contaminants
Source: Confined animal operations

Data Gaps/Research Needs

Determine life history information.

Determine taxonomic relationships.

Survey and model for additional populations.

Conservation Actions

	Importance	Category
Maintain groundwater quality.	High	Threat Abatement
Protect cave habitat and recharge zone from development or disturbance.	High	Habitat Protection

Monitoring Strategies

Monitor known occurrences using protocols developed by monitoring team of The Nature Conservancy, ANHC, AGFC, and the US Fish and Wildlife Service.

Comments

Description: a small (maximum 28mm carapace length), unpigmented troglobitic crayfish with reduced eyes. (Hobbs and Brown 1987).

This crayfish is endemic to northwest Arkansas, known from very few caves, and has been listed as endangered (USFWS 1993). The species is threatened by water quality degradation, small population size, limited reproductive potential, and possible take by humans. (USFWS 1996). Recent discoveries have expanded the known distribution of this species to four sites. (Mike Slay, personal communication).

Taxa Team and Peer Reviewers

AGFC Mr. Brian Wagner, UA Dr. Daniel Magoulick

Cambarus causeyi

Boston Mountains Crayfish

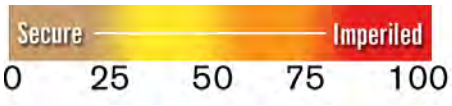


Class: Malacostraca

Order: Decapoda

Family: Cambaridae

Priority Score: **62** out of 100



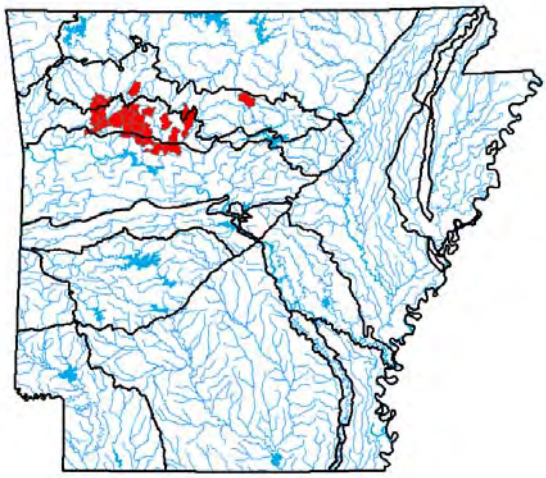
Population Trend: Decreasing

Global Rank: G2 — Imperiled species

State Rank: S1 — Critically imperiled in Arkansas

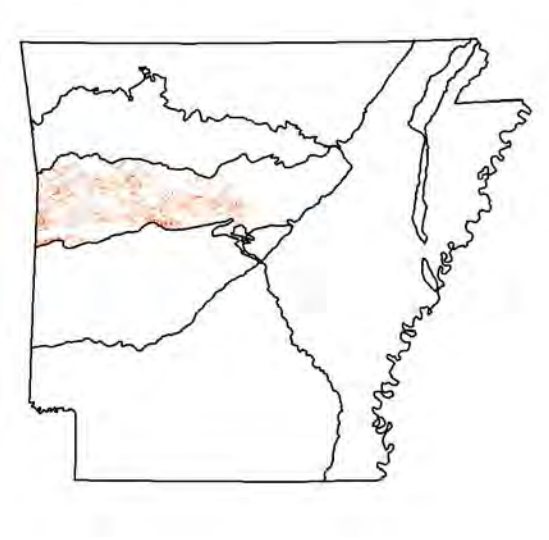
Distribution

Element Occurrence Records



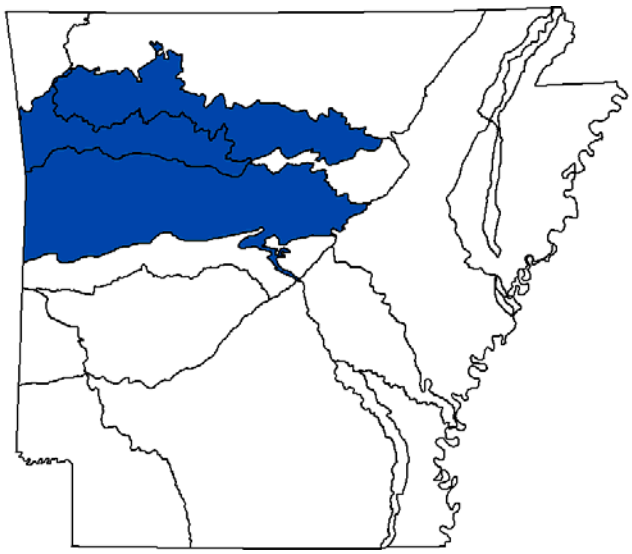
Ecoregions where the species occurs:

- ☐ Ozark Highlands
- ☑ Boston Mountains
- ☑ Arkansas Valley
- ☐ Ouachita Mountains
- ☐ South Central Plains
- ☐ Mississippi Alluvial Plain
- ☐ Mississippi Valley Loess Plains



Terrestrial Habitats





Ecobasins where this species occurs

Ecobasins

Arkansas Valley - Arkansas River
Boston Mountains - Arkansas River
Boston Mountains - White River

Terrestrial Habitats

Ozark-Ouachita Riparian	Marginal

Aquatic Habitats

Natural Seep: Headwater	Obligate
Natural Spring Run: Headwater	Suitable

Cambarus causeyi
Boston Mountains Crayfish

Problems Faced

Threat: Groundwater depletion
Source: Excessive groundwater withdrawal

Threat: Habitat disturbance
Source: Resource extraction

Threat: Riparian Habitat Destruction
Source: Forestry activities

Data Gaps/Research Needs

Determine status of known populations.

Identify habitat requirements and threats.

Survey for additional populations.

Conservation Actions

	Importance	Category
	Medium	Habitat Restoration/Improvement
Maintain or, where necessary, restore water quality and stream habitat.	Medium	Habitat Protection

Monitoring Strategies

Monitor known occurrences.

Comments

Description: a strongly compressed, olive-colored crayfish that is poorly known. (Robison and Allen 1995).

This Arkansas endemic crayfish inhabits complex burrows on hillsides near springs in the Boston Mountains. (Bouchard and Robison 1980). It is most closely related to three troglobitic species. (Reimer 1966). Robison et al. (2009) suspected that the species may be declining after only locating specimens at 4 out of 39 sites examined.

Taxa Team and Peer Reviewers

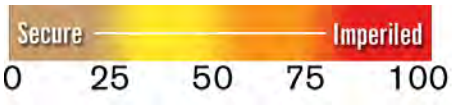
AGFC Mr. Brian Wagner, UA Dr. Daniel Magoulick

Cambarus setosus

Bristly Cave Crayfish

Class: Malacostraca
Order: Decapoda
Family: Cambaridae

Priority Score: **34** out of 100





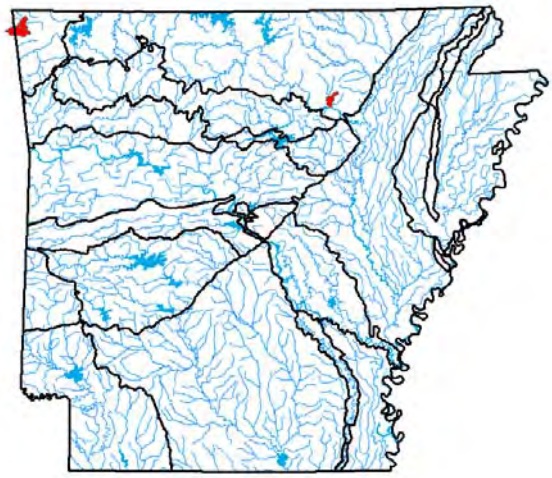
Population Trend: Unknown

Global Rank: G3 — Vulnerable species

State Rank: S1 — Critically imperiled in Arkansas

Distribution

Element Occurrence Records



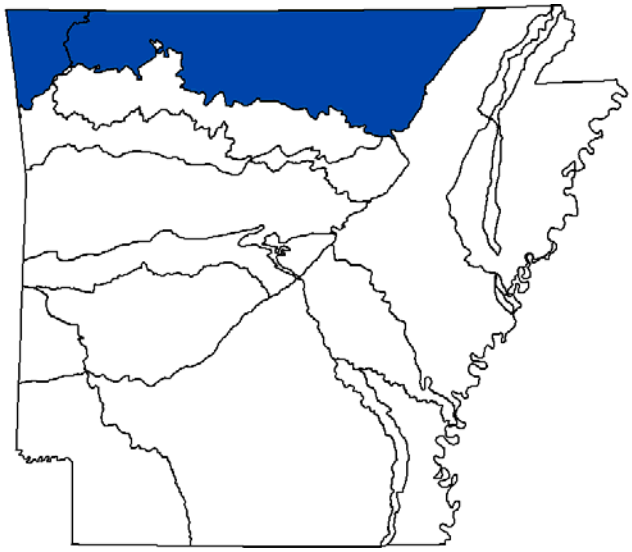
Ecoregions where the species occurs:

- [x] Ozark Highlands
- [ ] Boston Mountains
- [ ] Arkansas Valley
- [ ] Ouachita Mountains
- [ ] South Central Plains
- [ ] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains



Terrestrial Habitats





Ecobasins where this species occurs

Ecobasins

Ozark Highlands - Arkansas River
Ozark Highlands - White River

Terrestrial Habitats

Caves, Mines, Sinkholes and other Karst Features	Obligate

Aquatic Habitats

Natural Cave Stream: - Small	Obligate
Natural Groundwater:	Obligate

Cambarus setosus
Bristly Cave Crayfish

Problems Faced

Threat: Hydrological alteration
Source: Urban development

Threat: Nutrient loading
Source: Confined animal operations

Threat: Sedimentation
Source: Road construction

Threat: Toxins/contaminants
Source: Road construction

Data Gaps/Research Needs

Conduct taxonomic and genetic analyses.

Determine life history characteristics.

Survey and model for additional populations.

Conservation Actions

	Importance	Category
Maintain groundwater quality.	Medium	Threat Abatement
Protect cave habitat and recharge zone from development or disturbance.	Medium	Habitat Protection

Monitoring Strategies

Monitor known occurrences.

Comments

Description: a small (maximum 4.7 inches total length), unpigmented troglobitic crayfish with reduced eyes. (Pflieger 1996).

This crayfish is endemic to caves of the Ozarks in Missouri and Oklahoma. (Hobbs 1989). Recent unpublished discoveries have found this species in Arkansas as well. (Horton H. Hobbs III, personal communication). There is little known about the species in the state and based on the distribution of all cave crayfish populations in Arkansas, the identification of these populations is suspect and should be verified via genetic analyses.

Taxa Team and Peer Reviewers

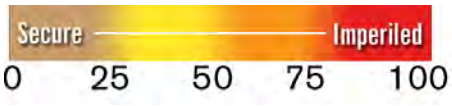
AGFC Mr. Brian Wagner, UA Dr. Daniel Magoulick

Cambarus zophonastes

Hell Creek Cave Crayfish

Class: Malacostraca
Order: Decapoda
Family: Cambaridae

Priority Score: **80** out of 100



Population Trend: Stable

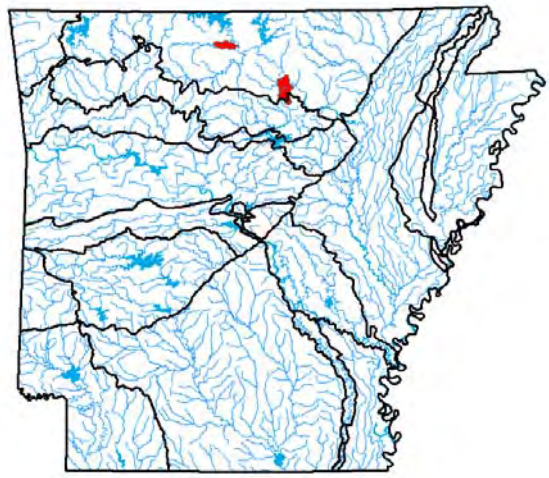


Global Rank: G1 — Critically imperiled species

State Rank: S1 — Critically imperiled in Arkansas

Distribution

Element Occurrence Records



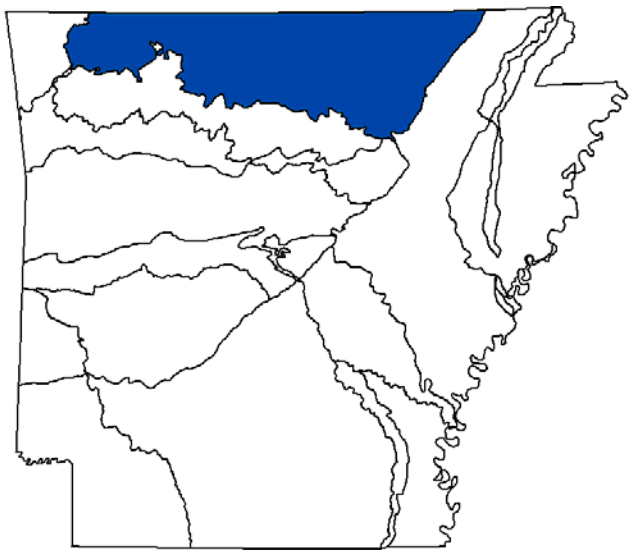
Ecoregions where the species occurs:

- [x] Ozark Highlands
- [ ] Boston Mountains
- [ ] Arkansas Valley
- [ ] Ouachita Mountains
- [ ] South Central Plains
- [ ] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains



Terrestrial Habitats





Ecobasins where this species occurs

Ecobasins

Ozark Highlands - White River

Terrestrial Habitats

Caves, Mines, Sinkholes and other Karst Features	Obligate

Aquatic Habitats

Natural Cave Stream: - Small - Medium	Obligate
Natural Groundwater:	Obligate
Natural Spring Run: - Small - Medium	Marginal

Cambarus zophonastes
Hell Creek Cave Crayfish

Problems Faced

Threat: Habitat disturbance
Source: Forestry activities

Threat: Habitat disturbance
Source: Urban development

Threat: Sedimentation
Source: Road construction

Threat: Toxins/contaminants
Source: Road construction

Data Gaps/Research Needs

Refine delineation of vulnerable portions of recharge area and identify threats therein.

Survey and model for additional populations.

Conservation Actions

	Importance	Category
Maintain groundwater quality.	High	Threat Abatement
Protect cave habitat and recharge zone from development or disturbance.	Medium	Habitat Protection

Monitoring Strategies

Monitor known occurences using protocols determined by monitoring team of The Nature Conservancy, ANHC, AGFC, and the US Fish and Wildlife Service.

Comments

Description: an obligate cave dweller lacking pigment, with long thin appendages and reduced eyes. (Robison and Allen 1995).

An Arkansas endemic originally known only from a single cave in Stone county which is owned by the Arkansas Natural Heritage Commission. This species is found in and has recently expanded to Nesbitt Spring Cave, Stone County, Arkansas, USA (Graening et al. 2006). Surveys have been initiated at 170 other caves; no additional populations have been located.

Protection of Hell Creek Cave's recharge area is the primary focus of recovery (USFWS 1988). While populations persist at what is likely historic levels its limited distribution makes it vulnerable to impacts (Graening and others, in progress). Individuals of this species have been washed out of groundwater feeding Town Branch in Yellville, and recharge delineation for this location has been completed through a Section 6 study (Slay 2014). Genetic identification of crayfish of other caves in the eastern Ozarks may reveal additional populations.

Taxa Team and Peer Reviewers

AGFC Mr. Brian Wagner, UA Dr. Daniel Magoulick

Fallicambarus dissitus

Pine Hills Digger

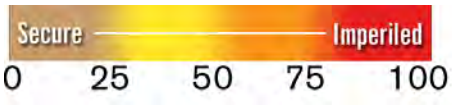


Class: Malacostraca

Order: Decapoda

Family: Cambaridae

Priority Score: **32** out of 100



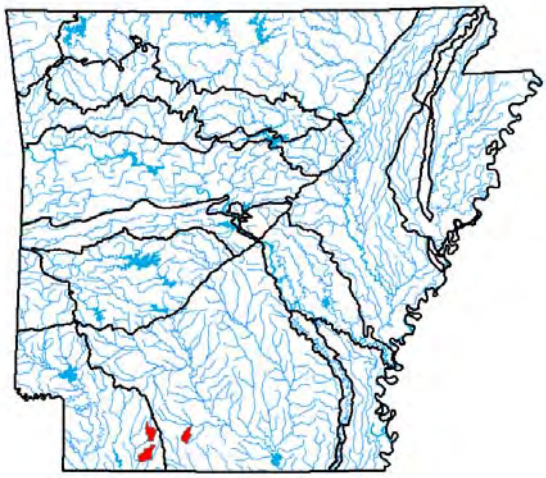
Population Trend: Unknown

Global Rank: G3 — Vulnerable species

State Rank: S1S2? — Critically imperiled species in Arkansas (uncertain rank) (inexact numeric rank)

Distribution

Element Occurrence Records



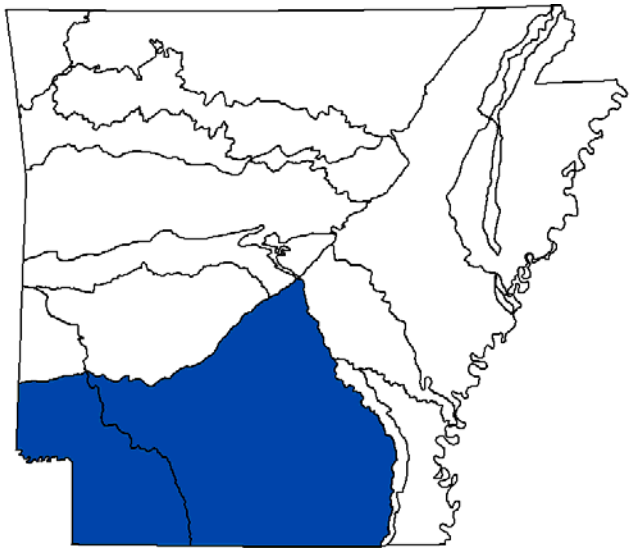
Ecoregions where the species occurs:

- ☐ Ozark Highlands
- ☐ Boston Mountains
- ☐ Arkansas Valley
- ☐ Ouachita Mountains
- ☑ South Central Plains
- ☐ Mississippi Alluvial Plain
- ☐ Mississippi Valley Loess Plains



Terrestrial Habitats





Ecobasins where this species occurs

Ecobasins

South Central Plains - Ouachita River
South Central Plains - Red River

Terrestrial Habitats

West Gulf Coastal Plain Seepage Swamp and Baygall	Suitable

Aquatic Habitats

Natural Groundwater:	Suitable
Natural Seep: - Small	Suitable

Fallicambarus dissitus
Pine Hills Digger

Problems Faced

Threat: Habitat disturbance
Source: Road construction

Threat: Toxins/contaminants
Source: Road construction

Data Gaps/Research Needs

Determine habitat requirements and threats.

Survey for additional populations.

Conservation Actions

	Importance	Category
Protect known occurrences from construction activities and herbicide applications.	Medium	Habitat Protection

Monitoring Strategies

Monitor known occurrences.

Comments

A primary burrowing crayfish endemic to Louisiana and Arkansas. It is of conservation concern in Louisiana and there are very few records from Arkansas.

Taxa Team and Peer Reviewers

AGFC Mr. Brian Wagner, UA Dr. Daniel Magoulick

Fallicambarus gilpini

Jefferson County Crayfish

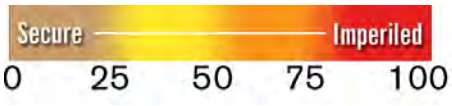


Class: Malacostraca

Order: Decapoda

Family: Cambaridae

Priority Score: **50** out of 100



Population Trend: Unknown

Global Rank: G2 — Imperiled species

State Rank: S1 — Critically imperiled in Arkansas

Distribution

Element Occurrence Records



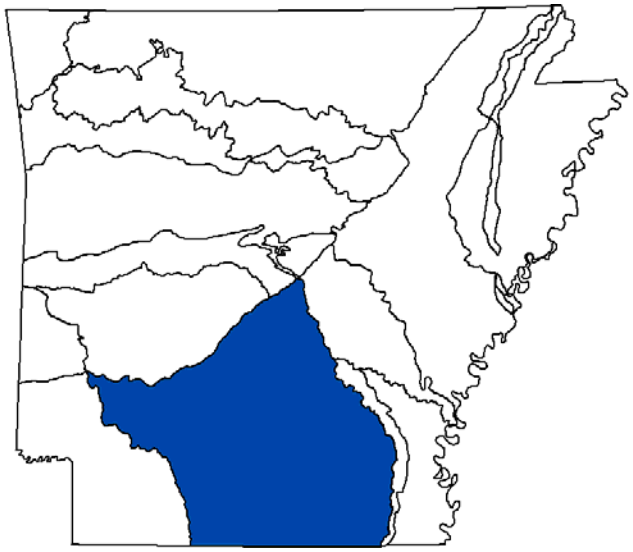
Ecoregions where the species occurs:

- ☐ Ozark Highlands
- ☐ Boston Mountains
- ☐ Arkansas Valley
- ☐ Ouachita Mountains
- ☑ South Central Plains
- ☐ Mississippi Alluvial Plain
- ☐ Mississippi Valley Loess Plains



Terrestrial Habitats





Ecobasins where this species occurs

Ecobasins

South Central Plains - Ouachita River

Terrestrial Habitats

West Gulf Coastal Plain Seepage Swamp and Baygall	Suitable

Aquatic Habitats

Natural Groundwater:	Data Gap
Natural Seep: - Small	Suitable

Problems Faced

Threat: Habitat disturbance
Source: Road construction

Threat: Toxins/contaminants
Source: Road construction

Data Gaps/Research Needs

Determine habitat requirements.

Survey for additional populations.

Conservation Actions

	Importance	Category
Protect known occurrences from construction activities and herbicide applications.	Medium	Habitat Protection
Protect known occurrences from construction activities and herbicide applications.	Medium	Threat Abatement

Monitoring Strategies

Monitor known occurrences.

Comments

Description: a burrowing crayfish often blueish in color. (Hobbs and Robison 1989)

This Arkansas endemic crayfish is restricted to a small area southwest of Pine Bluff, Arkansas. It has been documented from six sites in Jefferson County and one site in Cleveland County. (Robison and Wagner 2005). It prefers to burrow on seepage slopes away from standing water areas.

Taxa Team and Peer Reviewers

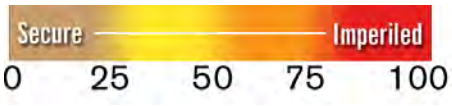
AGFC Mr. Brian Wagner, UA Dr. Daniel Magoulick

Fallicambarus harpi

Ouachita Burrowing Crayfish

Class: Malacostraca
Order: Decapoda
Family: Cambaridae

Priority Score: **46** out of 100




©Brian Wagner

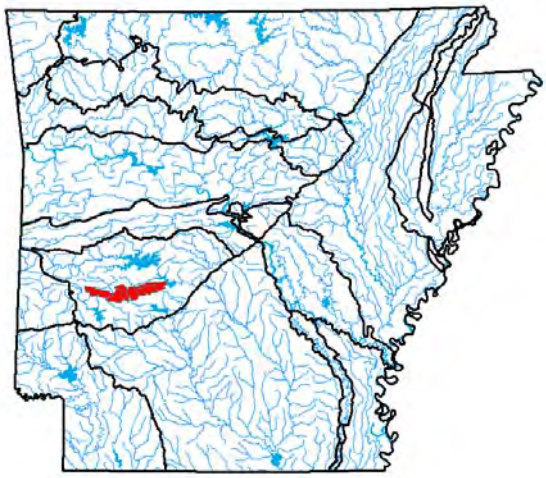
Population Trend: Stable

Global Rank: G2 — Imperiled species

State Rank: S2 — Imperiled in Arkansas

Distribution

Element Occurrence Records



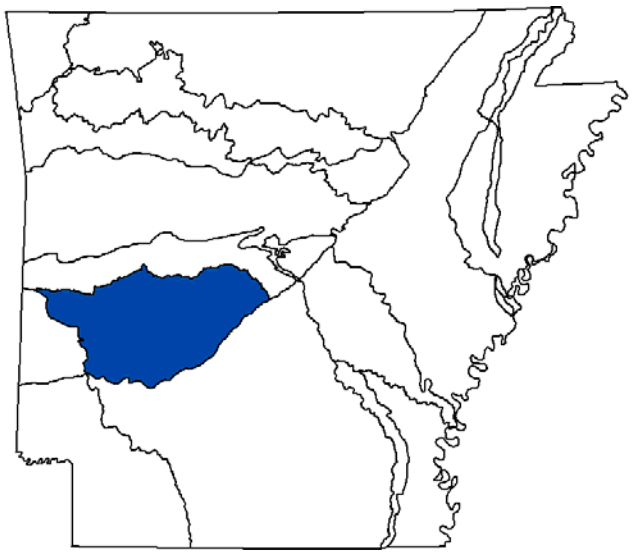
Ecoregions where the species occurs:

- ☐ Ozark Highlands
- ☐ Boston Mountains
- ☐ Arkansas Valley
- ☑ Ouachita Mountains
- ☐ South Central Plains
- ☐ Mississippi Alluvial Plain
- ☐ Mississippi Valley Loess Plains



Terrestrial Habitats





Ecobasins where this species occurs

Ecobasins

Ouachita Mountains - Ouachita River

Terrestrial Habitats

Ozark-Ouachita Forested Seep	Suitable
Pasture Land	Suitable

Aquatic Habitats

Natural Groundwater:	Data Gap
Natural Seep: - Small	Suitable

Fallicambarus harpi
Ouachita Burrowing Crayfish

Problems Faced

Threat: Habitat disturbance
Source: Road construction

Threat: Toxins/contaminants
Source: Road construction

Data Gaps/Research Needs

Identify habitat requirements and threats.

Conservation Actions

	Importance	Category
	Medium	Threat Abatement
Protect known occurrences from construction activities and herbicide applications.	Medium	Habitat Protection

Monitoring Strategies

Monitor known occurrences.

Comments

Description: a burrowing crayfish, tan in color with highly variable patterning (Hobbs and Robison 1985).

This crayfish is endemic to the southern Ouachitas and is known from 12 sites in Garland, Hot Spring, Montgomery, and Pike counties (Robison and Crump 2004). Rhoden et al. 2016 are currently studying this species in an attempt to model distribution based on habitat characteristics.

Taxa Team and Peer Reviewers

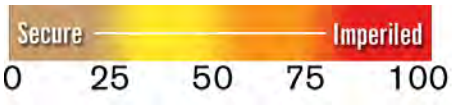
AGFC Mr. Brian Wagner, UA Dr. Daniel Magoulick

Fallicambarus jeanae

Daisy Burrowing Crayfish

Class: Malacostraca
Order: Decapoda
Family: Cambaridae

Priority Score: **46** out of 100





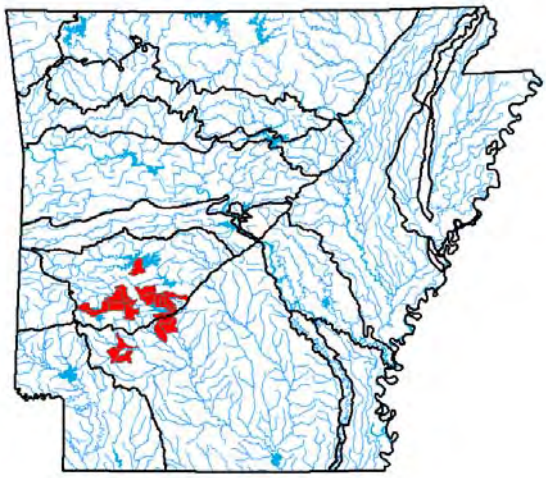
Population Trend: Unknown

Global Rank: G2 — Imperiled species

State Rank: S2 — Imperiled in Arkansas

Distribution

Element Occurrence Records



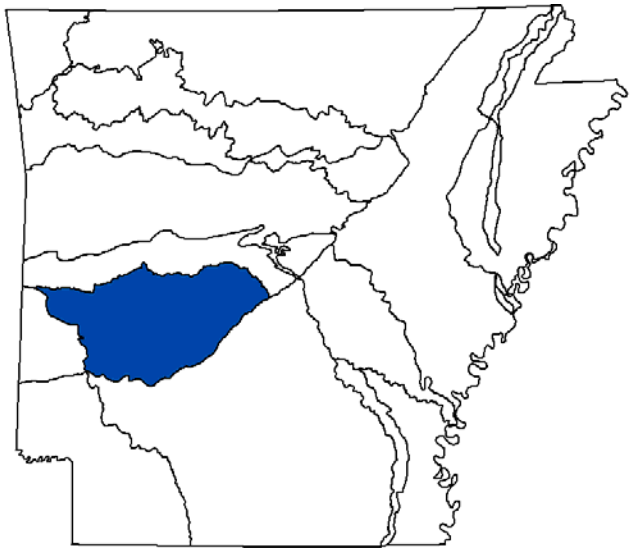
Ecoregions where the species occurs:

- ☐ Ozark Highlands
- ☐ Boston Mountains
- ☐ Arkansas Valley
- ☑ Ouachita Mountains
- ☐ South Central Plains
- ☐ Mississippi Alluvial Plain
- ☐ Mississippi Valley Loess Plains



Terrestrial Habitats





Ecobasins where this species occurs

Ecobasins

Ouachita Mountains - Ouachita River
South Central Plains - Ouachita River

Terrestrial Habitats

Ozark-Ouachita Forested Seep	Optimal

Aquatic Habitats

Natural Groundwater: - Small	Data Gap
Natural Seep: - Small	Optimal

Fallicambarus jeanae
Daisy Burrowing Crayfish

Problems Faced

Threat: Habitat disturbance
Source: Road construction

Threat: Toxins/contaminants
Source: Road construction

Data Gaps/Research Needs

Identify habitat requirements and threats.

Survey for additional populations.

Conservation Actions

	Importance	Category
Protect known occurrences from construction activities and herbicide applications.	Medium	Habitat Protection
Protect known occurrences from construction activities and herbicide applications.	Medium	Threat Abatement

Monitoring Strategies

Monitor known occurrences.

Comments

Description: a burrowing crayfish varying in color from tan to grey (Hobbs 1973, Robison and Allen 1995).

This endemic crayfish inhabits burrows in sandy clay soils in Hemptead, Pike, Clark and Hot Spring counties (Robison and Allen 1995).

Taxa Team and Peer Reviewers

AGFC Mr. Brian Wagner, UA Dr. Daniel Magoulick

Fallicambarus petilicarpus

Slenderwrist Burrowing Crayfish

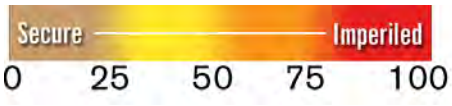


Class: Malacostraca

Order: Decapoda

Family: Cambaridae

Priority Score: **80** out of 100



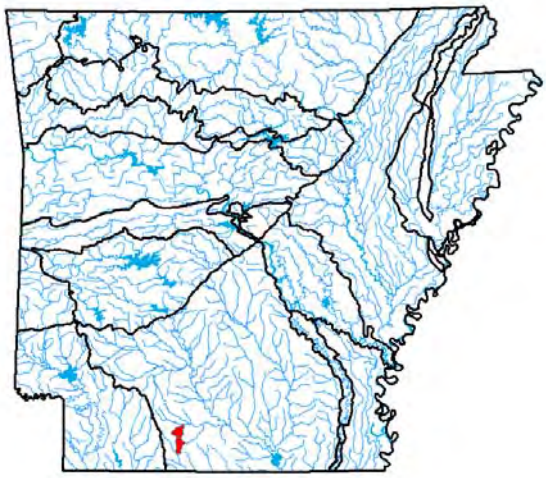
Population Trend: Unknown

Global Rank: G1 — Critically imperiled species

State Rank: S1 — Critically imperiled in Arkansas

Distribution

Element Occurrence Records



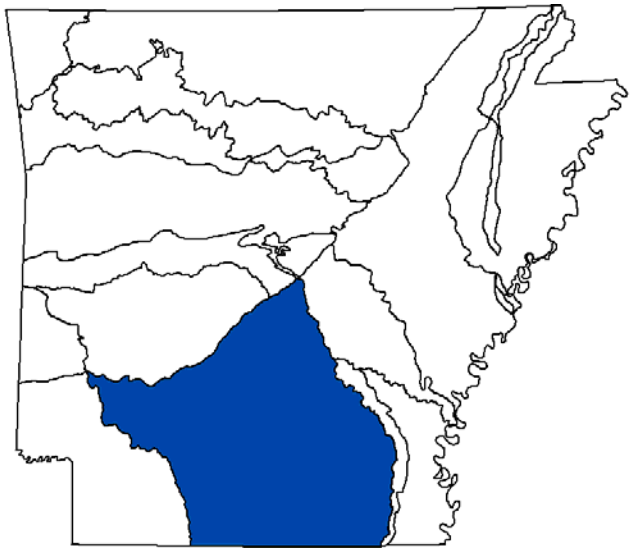
Ecoregions where the species occurs:

- ☐ Ozark Highlands
- ☐ Boston Mountains
- ☐ Arkansas Valley
- ☐ Ouachita Mountains
- ☑ South Central Plains
- ☐ Mississippi Alluvial Plain
- ☐ Mississippi Valley Loess Plains



Terrestrial Habitats





Ecobasins where this species occurs

Ecobasins

South Central Plains - Ouachita River

Terrestrial Habitats

West Gulf Coastal Plain Seepage Swamp and Baygall	Data Gap

Aquatic Habitats

Natural Groundwater:	Data Gap
Natural Seep: - Small	Suitable

Fallicambarus petilicarpus
Slenderwrist Burrowing Crayfish

Problems Faced

Threat: Habitat disturbance
Source: Road construction

Threat: Toxins/contaminants
Source: Road construction

Data Gaps/Research Needs

Identify habitat requirements and threats.

Survey for additional populations.

Conservation Actions	Importance	Category
Protect known occurrences from construction activities and herbicide applications.	Medium	Habitat Protection
Protect known occurrences from construction activities and herbicide applications.	Medium	Threat Abatement

Monitoring Strategies

Determine habitat requirements.

Monitor known occurrences.

Comments

Description: a burrowing crayfish, olive-brown and tan in color (Hobbs and Robison 1989).

This endemic crayfish has been documented from 5 locations in Union and Columbia counties (Robison 2001, Robison et al. 2008). This species is at present known from only 18 specimens, from two collections at the type locality, and an undetermined number of specimens at a second locality in Columbia County (Robinson et al. 2008).

Taxa Team and Peer Reviewers

AGFC Mr. Brian Wagner, UA Dr. Daniel Magoulick

Fallicambarus strawni

Saline Burrowing Crayfish

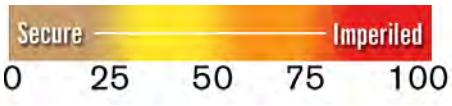


Class: Malacostraca

Order: Decapoda

Family: Cambaridae

Priority Score: **65** out of 100



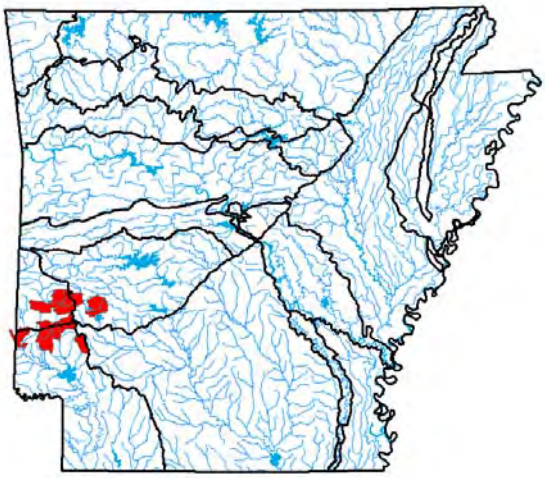
Population Trend: Unknown

Global Rank: G1G2 — Critically imperiled (uncertain rank)

State Rank: S1 — Critically imperiled in Arkansas

Distribution

Element Occurrence Records



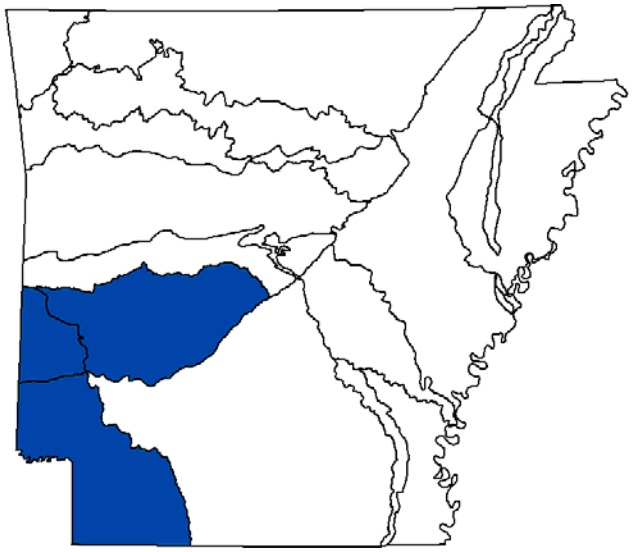
Ecoregions where the species occurs:

- ☐ Ozark Highlands
- ☐ Boston Mountains
- ☐ Arkansas Valley
- ☑ Ouachita Mountains
- ☑ South Central Plains
- ☐ Mississippi Alluvial Plain
- ☐ Mississippi Valley Loess Plains



Terrestrial Habitats





Ecobasins where this species occurs

Ecobasins

Ouachita Mountains - Ouachita River
Ouachita Mountains - Red River
South Central Plains - Red River

Terrestrial Habitats

Ozark-Ouachita Forested Seep	Suitable

Aquatic Habitats

Natural Groundwater:	Data Gap
Natural Seep: Headwater - Small	Suitable

Fallicambarus strawni
Saline Burrowing Crayfish

Problems Faced

Threat: Habitat destruction or conversion
Source: Road construction

Threat: Habitat disturbance
Source: Road construction

Threat: Toxins/contaminants
Source: Management of/for certain species

Data Gaps/Research Needs

Identify habitat requirements and threats.

Survey for additional populations.

Conservation Actions

	Importance	Category
Protect known occurrences from construction activities and herbicide applications.	Medium	Habitat Protection

Monitoring Strategies

Monitor known occurrences.

Comments

Description: a pinkish cream to purplish tan crayfish that was originally described by Riemer (1966).

This endemic crayfish is known from Pike and Howard counties, where it is a primary burrower in marshy areas with sandy clay (Robison and Allen 1995). This species is found in marshes, and. Its preferred substrate is sandy-clay; nearby streams are clear, fast-running, shallow and with rocky substrate (Reimer 1966).

Taxa Team and Peer Reviewers

AGFC Mr. Brian Wagner, UA Dr. Daniel Magoulick

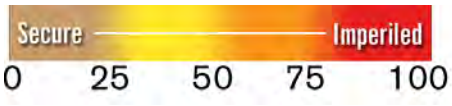
Faxonella blairi

Blair's Fencing Crayfish



Class: Malacostraca
Order: Decapoda
Family: Cambaridae

Priority Score: **46** out of 100



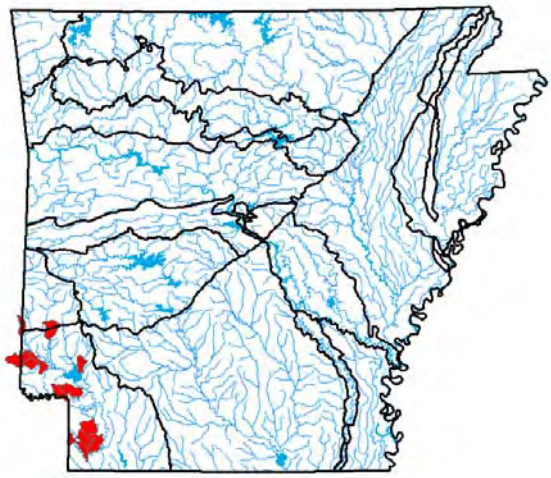
Population Trend: Unknown

Global Rank: G2 — Imperiled species

State Rank: S2 — Imperiled in Arkansas

Distribution

Element Occurrence Records



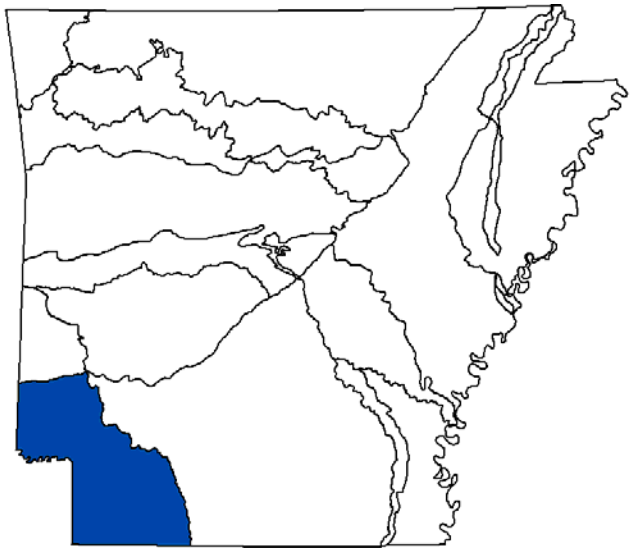
Ecoregions where the species occurs:

- ☐ Ozark Highlands
- ☐ Boston Mountains
- ☐ Arkansas Valley
- ☐ Ouachita Mountains
- ☑ South Central Plains
- ☐ Mississippi Alluvial Plain
- ☐ Mississippi Valley Loess Plains



Terrestrial Habitats





Ecobasins where this species occurs

Ecobasins

South Central Plains - Red River

Terrestrial Habitats

West Gulf Coastal Plain Seepage Swamp and Baygall	Data Gap

Aquatic Habitats

Natural Swamp/Wetlands:	Data Gap

Problems Faced

Threat: Habitat destruction
Source: Road construction

Threat: Habitat disturbance
Source: Forestry activities

Threat: Hydrological alteration
Source: Urban development

Threat: Toxins/contaminants
Source: Road construction

Data Gaps/Research Needs

Identify habitat requirements and threats.

Survey for additional populations.

Conservation Actions

	Importance	Category
Protect known occurrences from construction activities, herbicide applications and timber harvesting.	Medium	Habitat Protection

Monitoring Strategies

Monitor known occurrences.

Comments

Description: a small, wetland crayfish with maximum carapace length of 20mm (Hayes and Riemer 1977). Occurs in southwest Arkansas and southeast Oklahoma (Hayes and Riemer 1977).

Robison and Crandall (2007) found it to be more common than previously thought, and considered it to be stable.

Taxa Team and Peer Reviewers

AGFC Mr. Brian Wagner, UA Dr. Daniel Magoulick

Orconectes acares

Redspotted Stream Crayfish

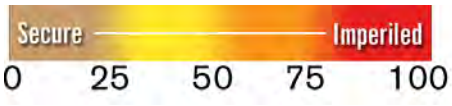


Class: Malacostraca

Order: Decapoda

Family: Cambaridae

Priority Score: **19** **out of 100**



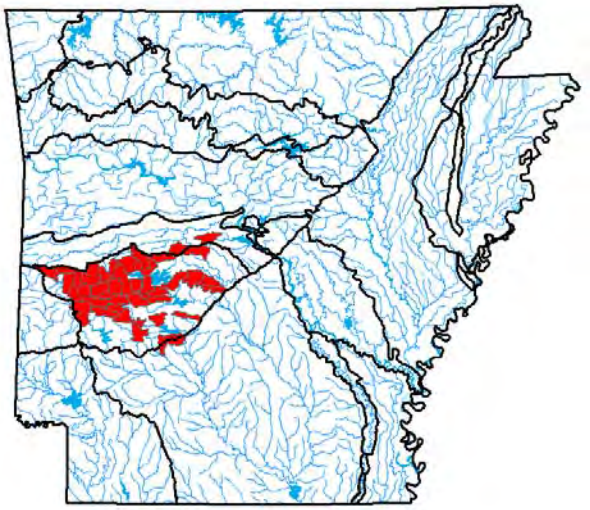
Population Trend: Unknown

Gobal Rank: G4 — Apparently secure species

State Rank: S3 — Vulnerable in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- ☐ Ozark Highlands
- ☐ Boston Mountains
- ☑ Ouachita Mountains
- ☐ Arkansas Valley
- ☐ South Central Plains
- ☐ Mississippi Alluvial Plain
- ☐ Mississippi Valley Loess Plains

Ecobasins

Ouachita Mountains - Arkansas River

Ouachita Mountains - Ouachita River

Habitats	Weight
Natural Littoral: - Small - Medium	Optimal
Natural Riffle: - Small - Medium	Optimal
Natural Run: - Small - Medium	Optimal
Natural Shoal: - Small - Medium	Optimal
Natural Spring Run: - Small	Optimal

Problems Faced

Threat: Habitat destruction
Source:

Threat: Hydrological alteration
Source:

Threat: Nutrient loading
Source:

Threat: Sedimentation
Source: Road construction

Data Gaps/Research Needs

Identify habitat requirements and threats.

Survey for additional populations.

Conservation Actions	Importance	Category
Maintain or, where necessary, restore water quality and stream habitat.	Medium	Habitat Protection

Monitoring Strategies

Monitor incidental to stream crayfish surveys.

Comments

Hobbs (1989) presented the range of Orconectes acares as the tributaries of the Ouachita River in Garland, Hot Springs, Montgomery, Perry, Pike, Polk, and Saline counties. Abundant and widely distributed in the Ouachita uplands of Arkansas - endemic to the state (McAllister and Robison 2010).

Taxa Association Team and Peer Reviewers

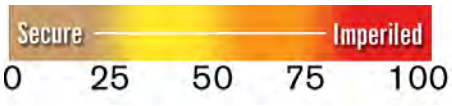
AGFC Mr. Brian Wagner, UA Dr. Daniel Magoulick

Orconectes eupunctus

Coldwater Crayfish

Class: Malacostraca
Order: Decapoda
Family: Cambaridae

Priority Score: **50** **out of 100**



Population Trend: Unknown



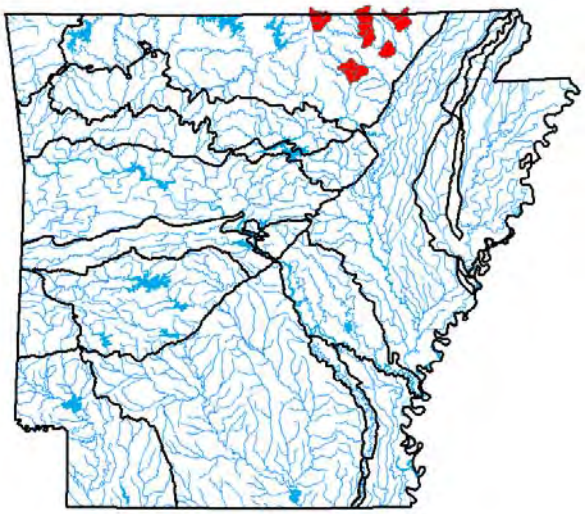
©Dr. Dan Magoulick

Gobal Rank: G2 — Imperiled species

State Rank: S1 — Critically imperiled in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- [x] Ozark Highlands
- [ ] Boston Mountains
- [ ] Ouachita Mountains
- [ ] Arkansas Valley
- [ ] South Central Plains
- [ ] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains

Ecobasins

Ozark Highlands - White River

Habitats	Weight
Natural Riffle: - Medium	Optimal
Natural Run: - Medium	Optimal

Problems Faced

Threat: Biological alteration
Source: Exotic species

Threat: Habitat disturbance
Source: Resource extraction

Threat: Sedimentation
Source: Forestry activities

Threat: Sedimentation
Source: Road construction

Data Gaps/Research Needs

Confirm taxonomic status of potential related new species.

Determine threat from introduced species and mechanisms of displacement.

Identify habitat requirements and threats.

Survey for additional populations.

Conservation Actions	Importance	Category
Maintain or, where necessary, restore water quality and stream habitat.	Medium	Habitat Protection
Prevent introduction of non-native crayfishes.	Medium	Threat Abatement

Monitoring Strategies

Monitor known occurrences every 2-5 years.

Comments

Description: a rather small, stout crayfish with reddish brown thorax and abdomen (Pflieger 1996). Endemic to the Eleven Point and Spring River drainages of Arkansas and Missouri (Williams 1954). Also found in localized areas in Strawberry River (Wagner et al. 2008) and a tributary (Henry Robison, pers. Comm.).

Wagner et al. 2008 found limited ocurrences in random basin-wide surveys and inferred dependence on larger stream habitats. The species is the subject of a current range-wide study by Missouri Department of Conservation, University of Arkansas, USGS, AGFC, and Carnegie Museum of Natural History looking at status, hanitat use, life history, genetics, and thermal stress.

The range of this species is in decline due, predominantly due to inter-specific competition with the invasive crayfish Orconectes neglectus and changes in land use causing a decline in stream habitat quality (Magoulick and DiStefano 2007) where there has been a documented decline in at least one drainage (Magoulick and DiStefano 2007). The precise causes for the decline have not been confirmed (Rabalais and Magoulick 2006).

Taxa Association Team and Peer Reviewers

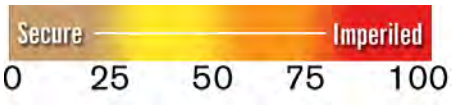
AGFC Mr. Brian Wagner, UA Dr. Daniel Magoulick

Orconectes leptogonopodus

Little River Creek Crayfish

Class: Malacostraca
Order: Decapoda
Family: Cambaridae

Priority Score: 19 out of 100




Chris Lukhaup

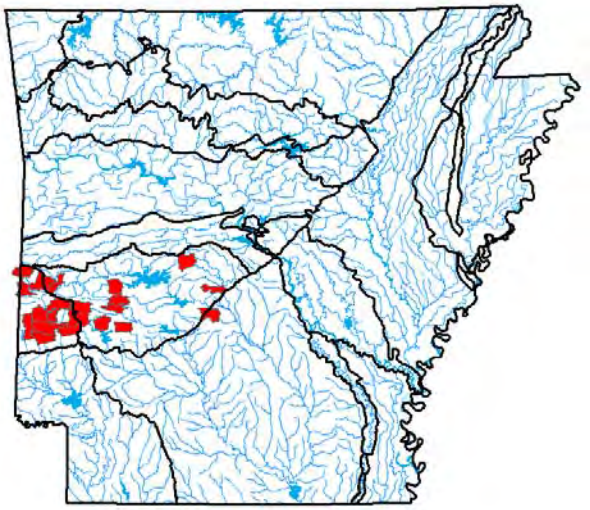
Population Trend: Unknown

Gobal Rank: G4 — Apparently secure species

State Rank: S3 — Vulnerable in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- [ ] Ozark Highlands
- [ ] Boston Mountains
- [x] Ouachita Mountains
- [ ] Arkansas Valley
- [ ] South Central Plains
- [ ] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains

Ecobasins

Ouachita Mountains - Ouachita River

Ouachita Mountains - Red River

Habitats	Weight
Natural Glide: Headwater - Small - Medium	Data Gap
Natural Littoral: Headwater - Small - Medium	Data Gap
Natural Pool: Headwater - Small - Medium	Data Gap
Natural Riffle: Headwater - Small - Medium	Data Gap
Natural Run: Headwater - Small - Medium	Data Gap
Natural Shoal: Headwater - Small - Medium	Data Gap

Problems Faced

Threat: Habitat disturbance
Source: Resource extraction

Threat: Hydrological alteration
Source:

Threat: Nutrient loading
Source:

Threat: Sedimentation
Source: Forestry activities

Threat: Sedimentation
Source: Road construction

Data Gaps/Research Needs

Determine species distribution in Arkansas.

Identify habitat requirements and threats.

Conservation Actions	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

More information is needed before a monitoring strategy can be developed.

Comments

This species is restricted to Ouachita Mountain Province, to the tributaries of the Red River drainage in Arkansas and eastern Oklahoma, USA (Fitzpatrick 1965). Found in clear rocky streams of the upper Little River system in AR & OK (Hobbs 1989).

Taxa Association Team and Peer Reviewers

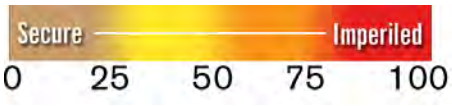
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Orconectes macrus

Neosho Midget Crayfish

Class: Malacostraca
Order: Decapoda
Family: Cambaridae

Priority Score: **23** **out of 100**



Population Trend: Unknown



Gobal Rank: G4 — Apparently secure species

State Rank: S2 — Imperiled in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- [x] Ozark Highlands
- [ ] Boston Mountains
- [ ] Ouachita Mountains
- [ ] Arkansas Valley
- [ ] South Central Plains
- [ ] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains

Ecobasins

Ozark Highlands - Arkansas River

Habitats	Weight
Natural Pool: Headwater - Small	Suitable
Natural Riffle: Headwater - Small	Optimal
Natural Run: Headwater - Small	Optimal
Natural Spring Run: Headwater	Suitable

Problems Faced

Threat: Habitat destruction
Source: Urban development

Threat: Habitat disturbance
Source: Resource extraction

Threat: Sedimentation
Source: Forestry activities

Threat: Sedimentation
Source: Road construction

Threat: Sedimentation
Source: Urban development

Data Gaps/Research Needs

Identify habitat requirements and threats.

Survey for additional populations.

Conservation Actions	Importance	Category
Encourage sediment control BMPs during development.	Medium	Habitat Protection
Maintain riparian vegetation.	Medium	Habitat Protection
Stabilize eroding streambanks.	Medium	Habitat Restoration/Improvement

Monitoring Strategies

More information is needed before a monitoring strategy can be developed.

Comments

Description: a diminutive crayfish (maximum 2 inch total length), tan with a black or olive saddle and sometimes dark brown or black speckles (Pflieger 1996, Brian K. Wagner, personal communication).

Inhabits clear gravelly streams of the Arkansas River drainage in extreme northwest Arkansas and adjacent states (Pflieger 1996). The separation between O. macrus and O. nana was studied by Dillman et al. 2010 and distinctness of the species was strongly supported.

Taxa Association Team and Peer Reviewers

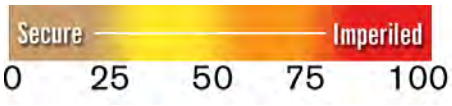
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Orconectes marchandi

Mammoth Spring Crayfish

Class: Malacostraca
Order: Decapoda
Family: Cambaridae

Priority Score: **46** **out of 100**



Population Trend: Unknown



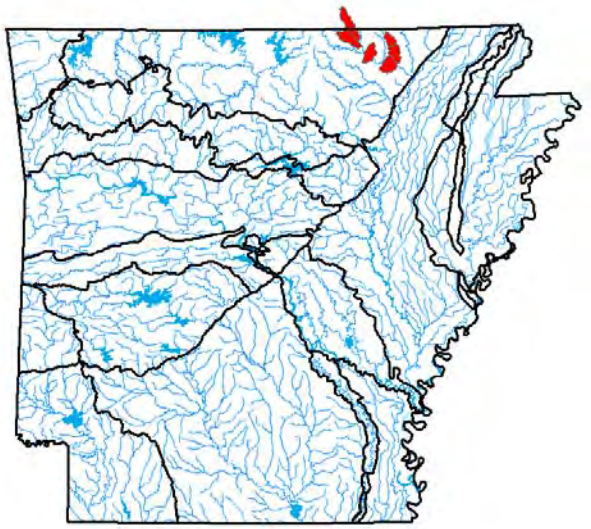
©Dr. Dan Magoulick

Gobal Rank: G2 — Imperiled species

State Rank: S2 — Imperiled in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- [x] Ozark Highlands
- [ ] Boston Mountains
- [ ] Ouachita Mountains
- [ ] Arkansas Valley
- [ ] South Central Plains
- [ ] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains

Ecobasins

Ozark Highlands - White River

Habitats	Weight
Natural Pool: - Small - Medium	Marginal
Natural Riffle: - Small - Medium	Optimal
Natural Run: - Small - Medium	Suitable

Problems Faced

Threat: Biological alteration
Source: Exotic species

Threat: Chemical alteration
Source: Recreation

Threat: Riparian Habitat Destruction
Source: Channel alteration

Threat: Sedimentation
Source: Recreation

Data Gaps/Research Needs

Assess risk from potential introduced species.

Examine population genetics and gene flow between potentially isolated populations.

Resurvey known populations.

Survey for additional populations.

Conservation Actions	Importance	Category
Maintain or, where necessary, restore water quality and stream habitat.	Medium	Habitat Restoration/Improvement
Prevent additional introductions of crayfishes.	High	Threat Abatement

Monitoring Strategies

Monitor known occurrences.

Monitor spread of introduced crayfish in Spring River basin.

Comments

Description: a medium-sized reddish brown crayfish (Pflieger 1996)

This crayfish occupies clear streams with gravel or rubble substrate (Pflieger 1996), but is also found in high numbers in pools and spring fed streams (Dukat and Magoulick 1999). In some parts areas it occurs in higher numbers in non-permanent habitats (Flinders and Magoulick 2003).

This crayfish has a very limited distribution in the Spring River and its tributaries in three counties of Arkansas and Missouri (Pflieger 1996). Introduced ringed crayfish may adversely affect the species (Dan Magoulick, personal communication). Flinders and Magoulick (2005) studied distribution, habitat use, and life history of the species.

Taxa Association Team and Peer Reviewers

AGFC Mr. Brian Wagner, UA Dr. Daniel Magoulick

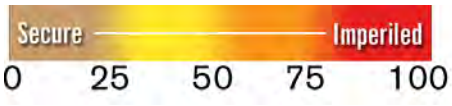
Orconectes meeki brevis

Meek's Short Pointed Crayfish

Class: Malacostraca
Order: Decapoda
Family: Cambaridae



Priority Score: 30 out of 100



Population Trend: Unknown

Gobal Rank: G4T3 — Apparently secure (vulnerable subspecies)

State Rank: S2 — Imperiled in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- [x] Ozark Highlands
- [ ] Boston Mountains
- [ ] Ouachita Mountains
- [ ] Arkansas Valley
- [ ] South Central Plains
- [ ] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains

Ecobasins

Ozark Highlands - Arkansas River

Habitats	Weight
Natural Pool: Headwater - Small	Data Gap
Natural Riffle: Headwater - Small	Data Gap
Natural Run: Headwater - Small	Data Gap

Problems Faced

Threat: Habitat destruction
Source: Urban development

Threat: Nutrient loading
Source: Urban development

Threat: Sedimentation
Source: Road construction

Threat: Sedimentation
Source: Urban development

Data Gaps/Research Needs

Establish genetic status relative to other subspecies.

Identify habitat requirements and threats.

Information is needed on status and distribution rangewide, especially outside of Arkansas.

Survey for additional populations.

Conservation Actions	Importance	Category
Maintain or, where necessary, restore water quality and stream habitat.	Medium	Habitat Protection
Maintain or, where necessary, restore water quality and stream habitat.	Medium	Habitat Restoration/Improvement

Monitoring Strategies

Monitor known occurrences.

Comments

Description: a rather plain brown, medium-sized crayfish (Pflieger 1996). Inhabits rocky streams in extreme northwest Arkansas and eastern Oklahoma (Hobbs 1989).

Robison et al. 2009 expanded AR range to 22 sites, prompting recommended change in S rank. Genetic analyses of the difference between this subspecies and the nominate subspecies were inconclusive in resolving the level of relationship between these two taxa.

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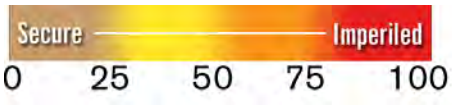
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Orconectes menae

Mena Crayfish

Class: Malacostraca
Order: Decapoda
Family: Cambaridae

Priority Score: 27 out of 100



Population Trend: Stable

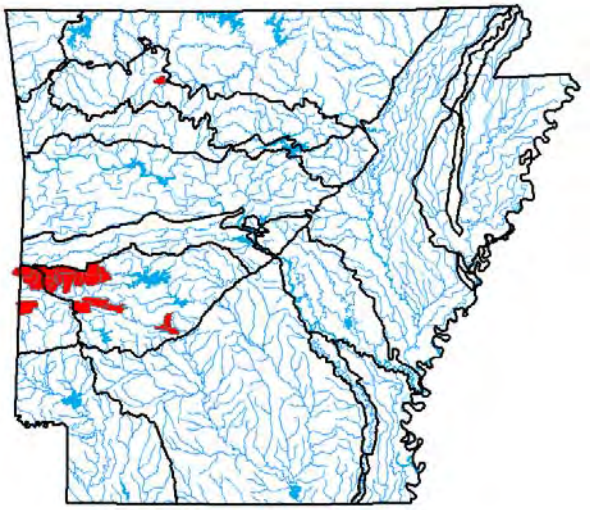


Gobal Rank: G3 — Vulnerable species

State Rank: S3 — Vulnerable in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- ☐ Ozark Highlands
- ☐ Boston Mountains
- ☑ Ouachita Mountains
- ☐ Arkansas Valley
- ☐ South Central Plains
- ☐ Mississippi Alluvial Plain
- ☐ Mississippi Valley Loess Plains

Ecobasins

Ouachita Mountains - Ouachita River

Ouachita Mountains - Red River

Habitats	Weight
Natural Pool: - Small - Medium	Data Gap
Natural Riffle: - Small - Medium	Data Gap
Natural Run: - Small - Medium	Data Gap

Problems Faced

Threat: Habitat disturbance
Source: Forestry activities

Threat: Sedimentation
Source: Road construction

Data Gaps/Research Needs

Survey for additional populations.

Conservation Actions	Importance	Category
Maintain or, where necessary, restore water quality and stream habitat.	Medium	Habitat Protection
Maintain or, where necessary, restore water quality and stream habitat.	Medium	Habitat Restoration/Improvement

Monitoring Strategies

Monitor known occurrences.

Comments

Description: a medium-sized olive to brown crayfish (Brian K. Wagner, personal communication). Restricted to four counties in the upper Ouachitas of extreme western Arkansas and eastern Oklahoma (Hobbs 1989).

Robison (2008) found good numbers of this crayfish. Populations persist in Lake DeGray (Brian K. Wagner, personal communication) and possibly other reservoirs. Robison (2008) found O. menae under rocks and rubble both in the swifter, shallow runs and the shallow pool margins where rocks had been deposited. Occasionally, they were located in burrows under the largest rocks or at the side of large rocks. It seems they prefer the more shallow pool margins and runs whereas Orconectes palmeri longimanus preferred the deeper pool regions.

Taxa Association Team and Peer Reviewers

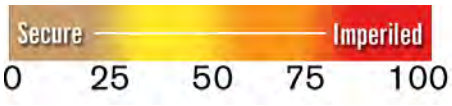
AGFC Mr. Brian Wagner, UA Dr. Daniel Magoulick

Orconectes nana

Midget Crayfish

Class: Malacostraca
Order: Decapoda
Family: Cambaridae

Priority Score: **27** **out of 100**



Population Trend: Unknown

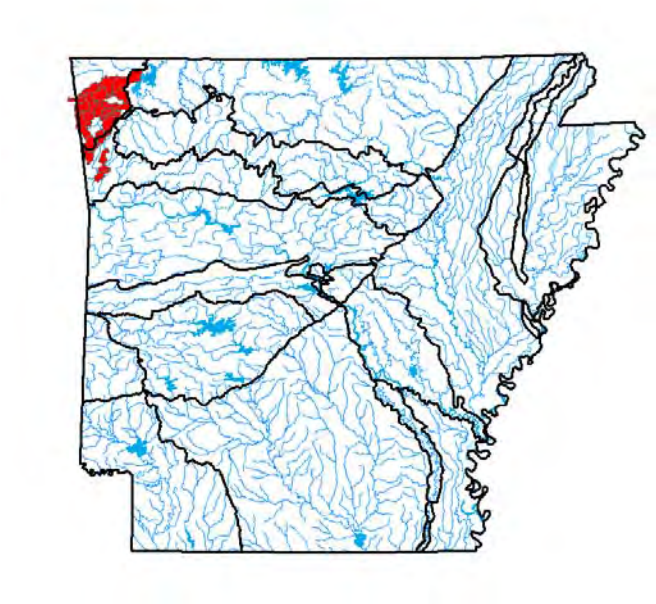


Gobal Rank: G3 — Vulnerable species

State Rank: S3 — Vulnerable in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- [x] Ozark Highlands
- [x] Boston Mountains
- [ ] Ouachita Mountains
- [ ] Arkansas Valley
- [ ] South Central Plains
- [ ] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains

Ecobasins

Boston Mountains - Arkansas River

Boston Mountains - White River

Ozark Highlands - Arkansas River

Ozark Highlands - White River

Habitats	Weight
Natural Pool: - Small - Medium	Data Gap
Natural Riffle: - Small - Medium	Data Gap
Natural Run: - Small - Medium	Data Gap

Problems Faced

Threat: Habitat destruction
Source: Urban development

Threat: Nutrient loading
Source: Urban development

Threat: Sedimentation
Source: Road construction

Threat: Sedimentation
Source: Urban development

Data Gaps/Research Needs

Identify habitat requirements and threats.

Conservation Actions	Importance	Category
Maintain or, where necessary, restore water quality and stream habitat.	Medium	Habitat Protection

Monitoring Strategies

Monitor known occurrences.

Comments

Description: a diminutive crayfish (maximum 2 inches long), tan with a dark saddle and may have brown speckles (Chris Taylor, personal communication). Inhabits clear gravelly streams of the Arkansas River drainage in northwest Arkansas and northeast Oklahoma (Williams 1954). The separation between O. macrus and O. nana was studied by Dillman et al. 2010 and distinctness of the species was strongly supported. Widespread within Illinois River basin small, gravelly streams (Brian K. Wagner, personal communication).

Taxa Association Team and Peer Reviewers

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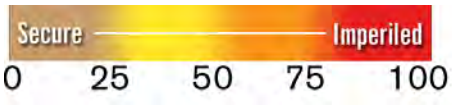
Orconectes neglectus chaenodactylus

Gapped Ringed Crayfish



Class: Malacostraca
Order: Decapoda
Family: Cambaridae

Priority Score: **20** **out of 100**



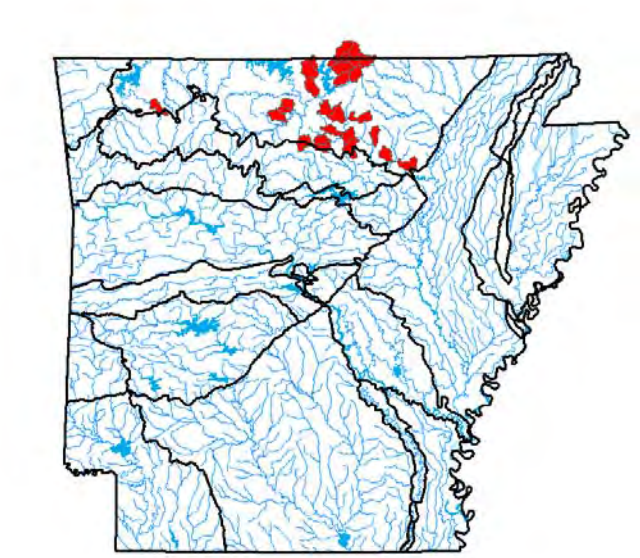
Population Trend: Increasing

Gobal Rank: G5T3 — Secure (vulnerable subspecies)

State Rank: S3 — Vulnerable in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- [x] Ozark Highlands
- [ ] Boston Mountains
- [ ] Ouachita Mountains
- [ ] Arkansas Valley
- [ ] South Central Plains
- [ ] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains

Ecobasins

Ozark Highlands - White River

Habitats

	Weight
Natural Pool: Headwater - Small - Medium	Suitable
Natural Riffle: Headwater - Small - Medium	Suitable
Natural Run: Headwater - Small - Medium	Suitable

Problems Faced

Threat: Habitat disturbance
Source: Resource extraction

Threat: Riparian Habitat Destruction
Source: Road construction

Threat: Sedimentation
Source: Forestry activities

Threat: Sedimentation
Source: Road construction

Data Gaps/Research Needs

Expand genetic work in order to define taxa within Orconectes neglectus group.

Conservation Actions

	Importance	Category
Maintain or, where necessary, restore water quality and stream habitat.	Medium	Habitat Restoration/Improvement

Monitoring Strategies

Monitor known occurrences.

Monitor spread on introduced populations.

Comments

Description: a medium to large, brown crayfish with a dark saddle, a pale band on lower side of abdomen, red-tipped claws with brown or black ring around tip (Pflieger 1996).

This subspecies is restricted to the area from the North Fork White River Basin to Sylamore Creek (Hobbs 1989). This range was examined in more detail by Wagner and others 2010, finding it to be locally abundant. It has recently appeared in the Spring River basin (Dan Magoulick, personal communication) and Eleven Point River Basin (Bob DiStefano, personal communication).

Dillman et al. (2007) examined genetics using the Cytochrome Oxidase I locus and suggested a good deal of unrecognized taxonomic diversity within O. neglectus. Further genetic and morphological evidence is needed to corroborate this indication, and descriptions are needed for the possible new species indicated.

Taxa Association Team and Peer Reviewers

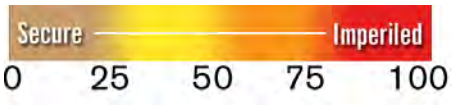
AGFC Mr. Brian Wagner, UA Dr. Daniel Magoulick

Orconectes williamsi

Williams' Crayfish

Class: Malacostraca
Order: Decapoda
Family: Cambaridae

Priority Score: **34** **out of 100**



Population Trend: Unknown

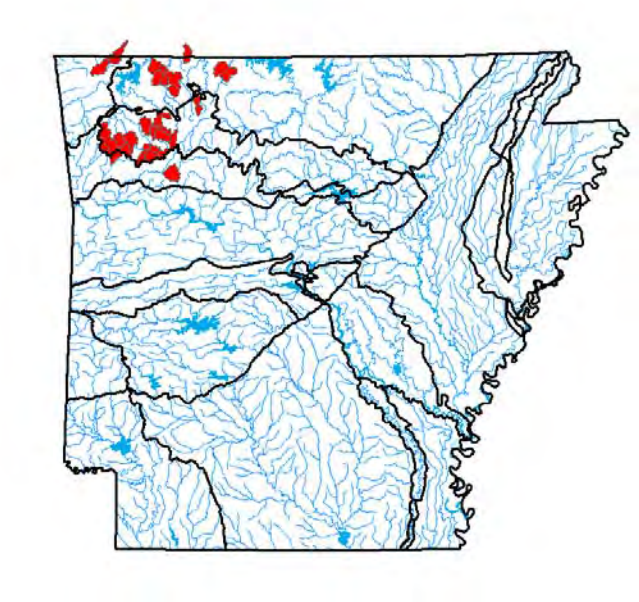


Gobal Rank: G3 — Vulnerable species

State Rank: S1 — Critically imperiled in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- [x] Ozark Highlands
- [x] Boston Mountains
- [ ] Ouachita Mountains
- [ ] Arkansas Valley
- [ ] South Central Plains
- [ ] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains

Ecobasins

Boston Mountains - Arkansas River
Boston Mountains - White River
Ozark Highlands - Arkansas River
Ozark Highlands - White River

Habitats

	Weight
Natural Pool: Headwater - Small	Suitable
Natural Riffle: Headwater - Small	Suitable
Natural Run: Headwater - Small	Optimal
Natural Spring Run: Headwater - Small	Optimal

Problems Faced

Threat: Habitat destruction Source: Urban development
Threat: Habitat disturbance Source: Resource extraction
Threat: Habitat disturbance Source: Road construction
Threat: Nutrient loading Source: Urban development

Data Gaps/Research Needs

Examine population genetics, particularly any differences between Boston Mountain and Ozark Plateau populations.
Survey for additional populations.

Conservation Actions

	Importance	Category
Maintain or, where necessary, restore water quality and stream habitat.	Medium	Habitat Protection

Monitoring Strategies

Monitor known occurrences.

Comments

Description: a small crayfish (shorter than 2 inches long) that is gray to tan in color with a vase shaped pale zone on the carapace (Plieger 1996).

This species has localized occurrences in small headwater creeks of the upper White River basin. The number of known populations has been significantly increased through recent work (Wagner et al. 2010, Westhoff et al. 2006) but populations remain localized.

This species has become fragmented in recent years due to the development of reservoirs (Westhoff et al. 2006). In the White River portion of its range in Missouri, lead and gravel mining and urbanization continue to threaten species that inhabit this river system (Westhoff et al. 2006).

Taxa Association Team and Peer Reviewers

AGFC Mr. Brian Wagner, UA Dr. Daniel Magoulick

Aquatic Habitats

Natural Groundwater: - Small	Suitable
Natural Pool: - Small	Data Gap
Natural Riffle: - Small	Data Gap

Problems Faced

Threat: Groundwater depletion
Source: Excessive groundwater withdrawal

Threat: Habitat destruction
Source: Road construction

Threat: Toxins/contaminants
Source: Agricultural practices

Data Gaps/Research Needs

Determine habitat requirements and threats.

Survey for additional populations.

Conservation Actions

	Importance	Category
Protect known occurrences from construction activities and herbicide applications.	Medium	Habitat Protection

Monitoring Strategies

Monitor known occurrences.

Comments

Description: a tan crayfish, 30 to 40mm in carapace length (Hobbs and Robison 1982).

Robison and others (2009) reported the species from 41 localities, including 9 new locations, in 14 counties. The species is widespread, but uncommonly encountered due to its sporadic distribution and burrowing habit.

Robison and others (2009) state that “Procambarus parasimulans is a primary burrower, i.e. it burrows all year long in one place and rarely exits except during the breeding season when males search for females. This species was never collected in static open water in fields or in ditches with standing water, but rather normally inhabits only burrows. Burrowers tended to be simple in construction and depths of capture ranged from 1-2.5 feet. Soils where burrows were found tended to be of a sandy clay without standing water. Very infrequently, adults wander out into floodplain areas and into temporary pools and backwater pools of small pools.”

Taxa Team and Peer Reviewers

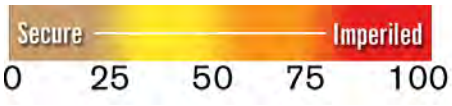
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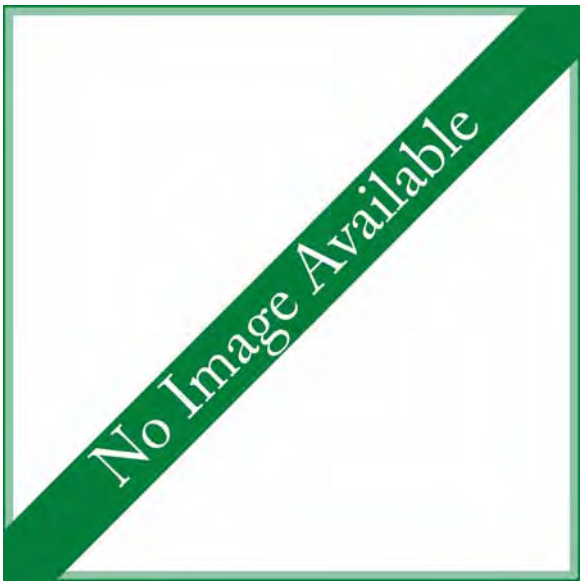
Procambarus parasimulans

Bismark Burrowing Crayfish

Class: Malacostraca
Order: Decapoda
Family: Cambaridae

Priority Score: **19** out of 100





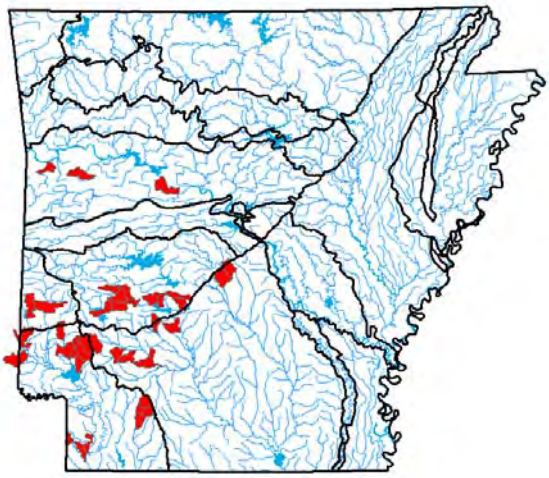
Population Trend: Unknown

Global Rank: G4 — Apparently secure species

State Rank: S3 — Vulnerable in Arkansas

Distribution

Element Occurrence Records



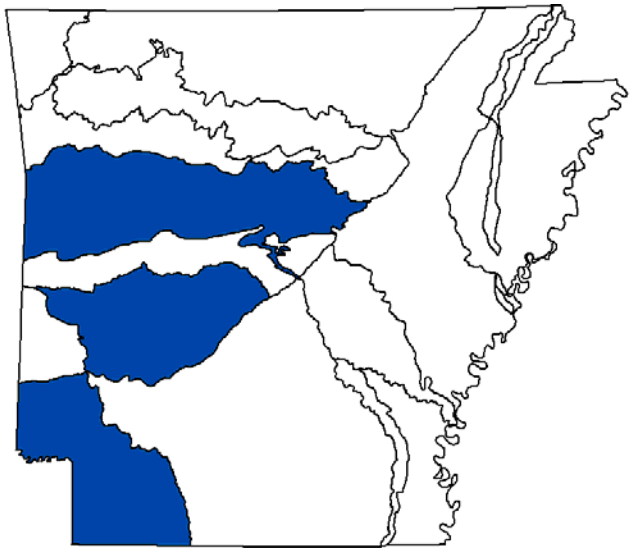
Ecoregions where the species occurs:

- [ ] Ozark Highlands
- [ ] Boston Mountains
- [x] Arkansas Valley
- [x] Ouachita Mountains
- [x] South Central Plains
- [ ] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains



Terrestrial Habitats





Ecobasins where this species occurs

Ecobasins

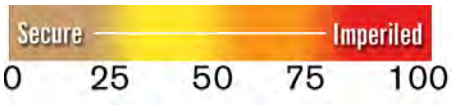
Arkansas Valley - Arkansas River
Ouachita Mountains - Ouachita River
Ouachita Mountains - Red River
South Central Plains - Ouachita River
South Central Plains - Red River

Procambarus regalis

Regal Burrowing Crayfish

Class: Malacostraca
Order: Decapoda
Family: Cambaridae

Priority Score: **38** out of 100



Population Trend: Unknown

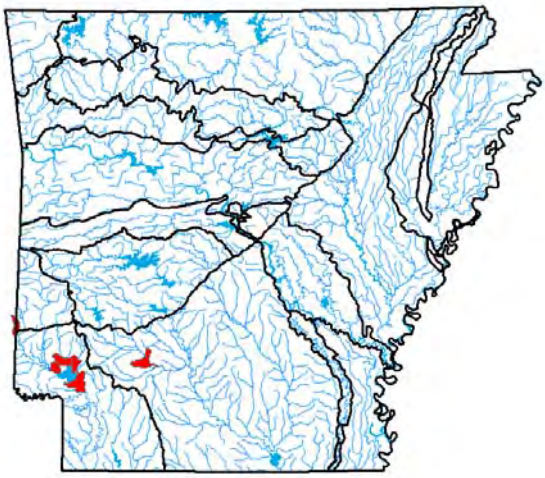


Global Rank: G2G3 — Imperiled (uncertain rank)

State Rank: S2 — Imperiled in Arkansas

Distribution

Element Occurrence Records



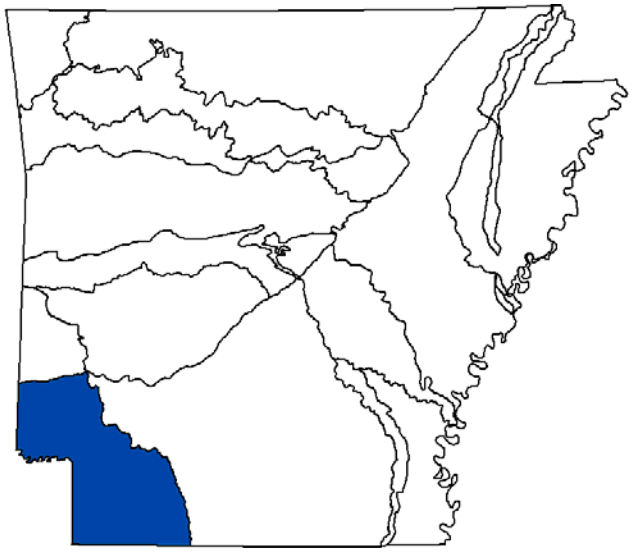
Ecoregions where the species occurs:

- ☐ Ozark Highlands
- ☐ Boston Mountains
- ☐ Arkansas Valley
- ☐ Ouachita Mountains
- ☑ South Central Plains
- ☐ Mississippi Alluvial Plain
- ☐ Mississippi Valley Loess Plains



Terrestrial Habitats





Ecobasins where this species occurs

Ecobasins

South Central Plains - Red River

Terrestrial Habitats

West Gulf Coastal Plain Seepage Swamp and Baygall	Suitable

Aquatic Habitats

Natural Groundwater:	Data Gap
Natural Seep: Headwater - Small	Suitable

Problems Faced

Threat: Chemical alteration
Source: Road construction

Threat: Habitat destruction or conversion
Source: Road construction

Data Gaps/Research Needs

Assess sensitivity to environmental stresses.

Conduct distribution surveys and life history studies.

Determine taxonomic status.

Conservation Actions

	Importance	Category
Protect known occurrences from construction activities and herbicide applications.	Medium	Habitat Protection

Monitoring Strategies

Monitor known occurrences.

Comments

Description: a medium-sized brownish red and orange burrowing crayfish (Robison and Allen 1995).

Inhabits simple burrows in colonies that may be extremely large, in southwestern Arkansas (Hobbs and Robison 1988). Robison and Crandall (2007) found the species to occupy 14 locations confined to 2 counties in the state.

This species may in fact be synonymous with Procambarus steigmani, in which case the range of this species would be increased significantly and would make this species of Least Concern (Crandall and Johnson 2010). Further research on the taxonomy of this species is needed to clarify taxonomic status before a more accurate assessment of conservation status can be made.

Taxa Team and Peer Reviewers

AGFC Mr. Brian Wagner, UA Dr. Daniel Magoulick

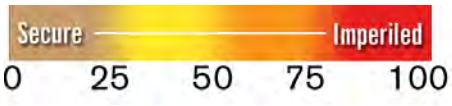
Procambarus reimeri

Irons Fork Burrowing Crayfish



Class: Malacostraca
Order: Decapoda
Family: Cambaridae

Priority Score: **80** out of 100



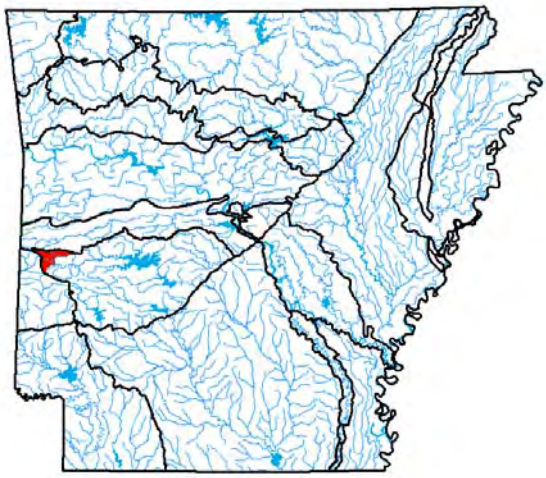
Population Trend: Stable

Global Rank: G1 — Critically imperiled species

State Rank: S1 — Critically imperiled in Arkansas

Distribution

Element Occurrence Records



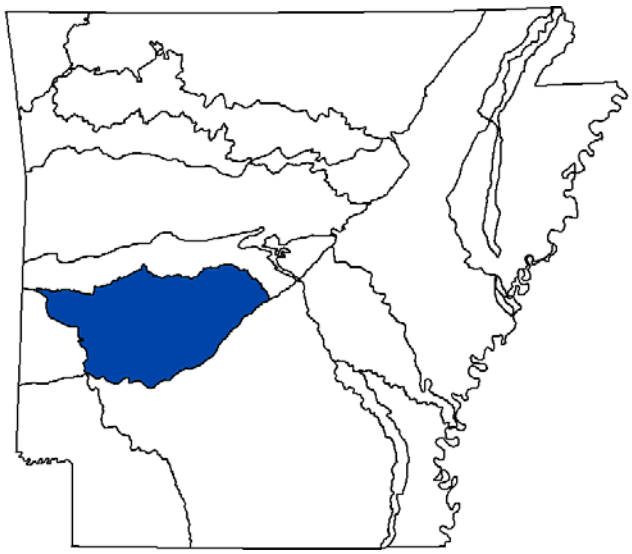
Ecoregions where the species occurs:

- ☐ Ozark Highlands
- ☐ Boston Mountains
- ☐ Arkansas Valley
- ☑ Ouachita Mountains
- ☐ South Central Plains
- ☐ Mississippi Alluvial Plain
- ☐ Mississippi Valley Loess Plains



Terrestrial Habitats





Ecobasins where this species occurs

Ecobasins

Ouachita Mountains - Ouachita River

Terrestrial Habitats

Ozark-Ouachita Forested Seep	Suitable
Ozark-Ouachita Riparian	Data Gap

Aquatic Habitats

Natural Groundwater:	Suitable
Natural Seep: Headwater - Small	Suitable

Procambarus reimeri
Irons Fork Burrowing Crayfish

Problems Faced

Threat: Habitat destruction or conversion
Source: Forestry activities

Threat: Habitat destruction or conversion
Source: Urban development

Threat: Habitat destruction
Source: Road construction

Threat: Toxins/contaminants
Source: Forestry activities

Data Gaps/Research Needs

Identify habitat requirements and threats.

Survey for additional populations.

Conservation Actions

	Importance	Category
Protect known occurrences from construction activities and herbicide applications.	Medium	Habitat Protection
Protect known occurrences from construction activities and herbicide applications.	Medium	Threat Abatement

Monitoring Strategies

Monitor known occurrences.

Comments

Description: a pinkish cream-colored burrowing crayfish (Robison and Allen 1995).

Known from six localities in the Ouachita River basin of Polk county (Hobbs and Robison 1988).Robison (2008) found this species to be stable, but restricted to a limited localized area in Polk County. Rhoden et al. 2016 are currently studying this species in an attempt to model distribution based on habitat characteristics.

Robison (2008) found this species in wet seepage areas and roadside ditches with a sandy clay soil substrate. Specimens of P. reimeri were found in burrows from one-half meter to a meter and a half adjacent to the road or highway. Juveniles were collected in standing water at the edge of a gravel road.

Taxa Team and Peer Reviewers

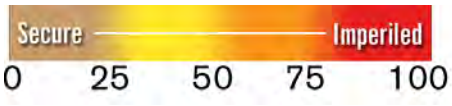
AGFC Mr. Brian Wagner, UA Dr. Daniel Magoulick

Procambarus tenuis

Ouachita Mountain Crayfish

Class: Malacostraca
Order: Decapoda
Family: Cambaridae

Priority Score: **31** out of 100



Population Trend: Unknown

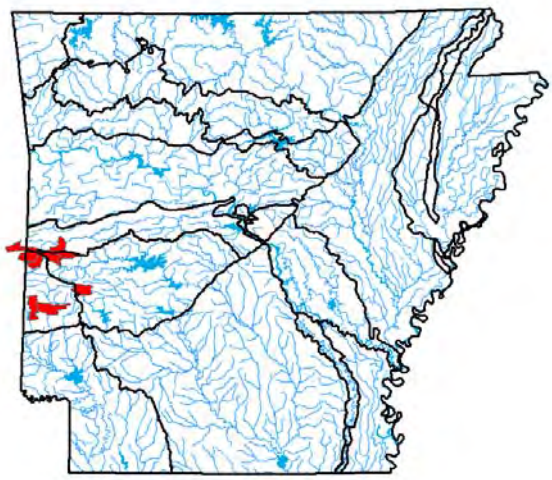

©Brian Wagner

Global Rank: G3 — Vulnerable species

State Rank: S2 — Imperiled in Arkansas

Distribution

Element Occurrence Records



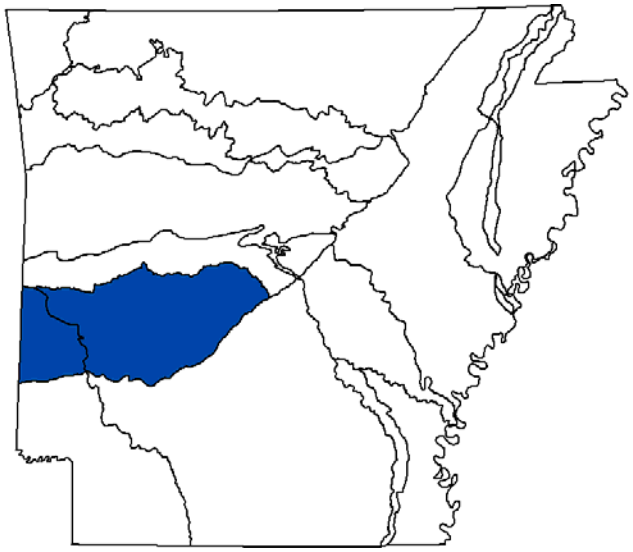
Ecoregions where the species occurs:

- ☐ Ozark Highlands
- ☐ Boston Mountains
- ☐ Arkansas Valley
- ☑ Ouachita Mountains
- ☐ South Central Plains
- ☐ Mississippi Alluvial Plain
- ☐ Mississippi Valley Loess Plains



Terrestrial Habitats





Ecobasins where this species occurs

Ecobasins

Ouachita Mountains - Arkansas River

Ouachita Mountains - Ouachita River

Ouachita Mountains - Red River

Terrestrial Habitats

Ozark-Ouachita Forested Seep	Data Gap

Aquatic Habitats

Natural Groundwater:	Data Gap
Natural Pool: - Small	Suitable
Natural Riffle: - Small	Suitable
Natural Run: - Small	Suitable
Natural Seep:	Data Gap

Problems Faced

Threat: Habitat destruction
Source: Resource extraction

Threat: Habitat disturbance
Source: Road construction

Threat: Riparian Habitat Destruction
Source: Forestry activities

Threat: Toxins/contaminants
Source: Forestry activities

Data Gaps/Research Needs

Identify habitat requirements and threats.

Survey for additional populations.

Conservation Actions

	Importance	Category
Protect known occurrences from construction activities and herbicide applications.	Medium	Habitat Protection

Monitoring Strategies

Monitor known occurrences.

Comments

Occurs in and adjacent to springs and clear cool streams in the Ouachitas of extreme western Arkansas and eastern Oklahoma (Hobbs 1989). Robison (2008) confirmed that this is an uncommon Ouachita mountain endemic with small populations.

Robison (2008) found this crayfish to be a species of small first and second order streams which primarily lived beneath rocks. It was also found in springs and spring run-off in several localities in the Ouachita Mountains. Oftentimes, P. tenuis was the only crayfish species living in the smaller spring-fed, first order and second order streams.

Taxa Team and Peer Reviewers

AGFC Mr. Brian Wagner, UA Dr. Daniel Magoulick

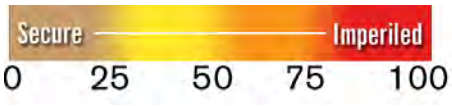
Acipenser fulvescens

Lake Sturgeon

Class: Actinopterygii
Order: Acipenseriformes
Family: Acipenseridae



Priority Score: 27 out of 100



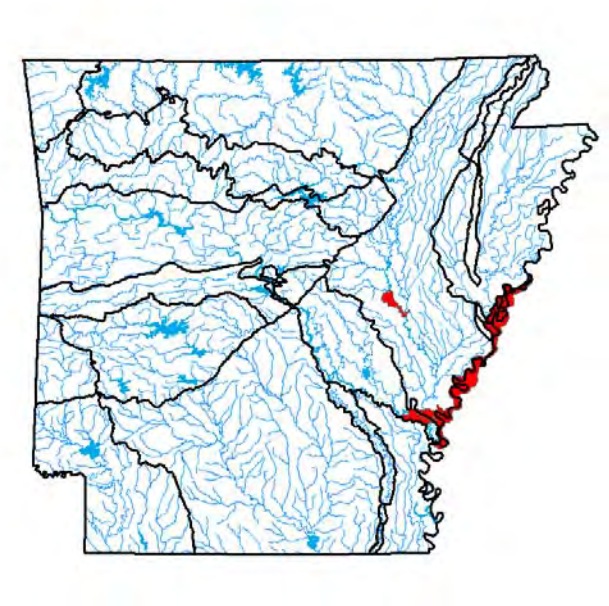
Population Trend: Unknown

Gobal Rank: G3G4 — Vulnerable (uncertain rank)

State Rank: S2 — Imperiled in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- [ ] Ozark Highlands
- [ ] Boston Mountains
- [ ] Ouachita Mountains
- [ ] Arkansas Valley
- [ ] South Central Plains
- [x] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains

Ecobasins

Mississippi River Alluvial Plain - Arkansas River
Mississippi River Alluvial Plain - St. Francis River
Mississippi River Alluvial Plain - White River
Mississippi River Alluvial Plain (Lake Chicot) - Mississippi River

Habitats

	Weight
Natural Littoral: - Large	Suitable
Natural Pool: - Medium - Large	Optimal
Natural Shoal: - Medium - Large	Obligate

Problems Faced

Threat: Biological alteration Source: Commercial harvest
Threat: Biological alteration Source: Exotic species
Threat: Biological alteration Source: Incidental take
Threat: Habitat destruction Source: Channel alteration
Threat: Hydrological alteration Source: Dam

Data Gaps/Research Needs

Continue to track incidental catches.

Conservation Actions

	Importance	Category
Restore fish passage in dammed rivers.	High	Habitat Restoration/Improvement
Restrict commercial harvest (Mississippi River closed to harvest).	High	Population Management

Monitoring Strategies

Monitor population distribution and abundance in large river faunal surveys in cooperation with adjacent states.

Comments

Description: A large sturgeon (maximum size 8 feet long), with a pointed, short, conical snout, and robust body (Robison and Buchanan 1988). A primarily northern species only known from Arkansas from a few records (Robison and Buchanan 1988). Lake sturgeon were not detected in a three-year faunal survey of Arkansas' large rivers (Layher, Crabb, and Spurlock 2005) or by multiple studies performed to capture pallid sturgeon in the lower Mississippi River (Kilgore et al. 2007; Herrala et al. 2014). AGFC does not recognize historical reports of the species from the Ouachita River basin. It is unclear if a breeding population of this species has ever occurred in Arkansas.

Taxa Association Team and Peer Reviewers

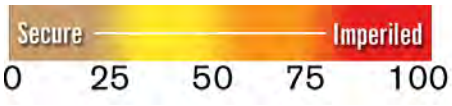
AGFC - retired Mr. Steve Filipek, SAU Dr. Henry Robison, UA/Ft. Smith Dr. Tom Buchanan, AGFC Mr. Jeff Quinn, AGFC Mr. Brian Wagner, ANHC Mr. Jason Throneberry

Alosa alabamae

Alabama Shad

Class: Actinopterygii
Order: Clupeiformes
Family: Clupeidae

Priority Score: **52** **out of 100**





©Native Fish Conservancy

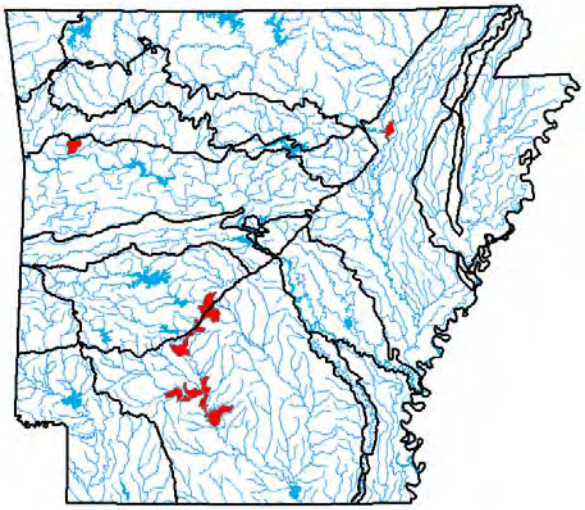
Population Trend: Decreasing

Gobal Rank: G2G3 — Imperiled (uncertain rank)

State Rank: S1 — Critically imperiled in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- [ ] Ozark Highlands
- [ ] Boston Mountains
- [x] Ouachita Mountains
- [x] Arkansas Valley
- [x] South Central Plains
- [x] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains

Ecobasins

Arkansas Valley - Arkansas River
Mississippi River Alluvial Plain - White River
Mississippi River Alluvial Plain (Lake Chicot) - Mississippi River
Ouachita Mountains - Ouachita River
South Central Plains - Ouachita River

Habitats

	Weight
Natural Pool: - Medium - Large	Optimal
Natural Riffle: - Medium - Large	Obligate
Natural Run: - Medium - Large	Suitable
Natural Shoal: - Medium - Large	Obligate

Problems Faced

Threat: Habitat destruction Source: Dam
Threat: Hydrological alteration Source: Channel maintenance
Threat: Hydrological alteration Source: Dam
Threat: Sedimentation Source: unknown
Threat: Temperature alteration Source: Dam

Data Gaps/Research Needs

Conduct status and distribution surveys.
Study migration, fish passage, and mortality at hydropower dams.

Conservation Actions

	Importance	Category
Assure minimum flow requirements are met below Remmel Dam.	Medium	Threat Abatement
Restore Ouachita and Little Missouri rivers to natural flow regime.	High	Habitat Restoration/Improvement
Work across political boundaries to manage an interjurisdictional fish.	High	Public Relations/Education

Monitoring Strategies

Monitor presence through general stream faunal surveys.
Monitor stream flow.
Monitor water quality on a regular basis.

Comments

Description: A streamlined, slab-sided, silvery fish, growing to a maximum size of 18 inches (Robison and Buchanan 1988).

An anadromous fish that travels from the Gulf of Mexico upstream into freshwater rivers to spawn. It has been designated by the National Marine Fisheries Service as a candidate for listing under the Endangered Species Act (Federal Register 1999), and a 90-day finding indicated there is substantial scientific evidence that listing may be warranted (Federal Register 2013). Rigsby (2009) captured 26 specimens from 4 locations in the Ouachita River. Three juvenile Alabama shad were collected in the White River near Newport during 2006 (Layher and others 2005; Buchanan and others 2012).

Taxa Association Team and Peer Reviewers

AGFC - retired Mr. Steve Filipek, SAU Dr. Henry Robison, UA/Ft. Smith Dr. Tom Buchanan, AGFC Mr. Jeff Quinn, AGFC Mr. Brian Wagner, ANHC Mr. Jason Throneberry

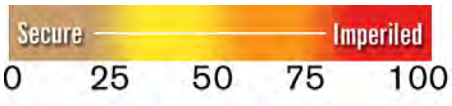
Ameiurus nebulosus

Brown Bullhead

Class: Actinopterygii
Order: Siluriformes
Family: Ictaluridae



Priority Score: 19 out of 100



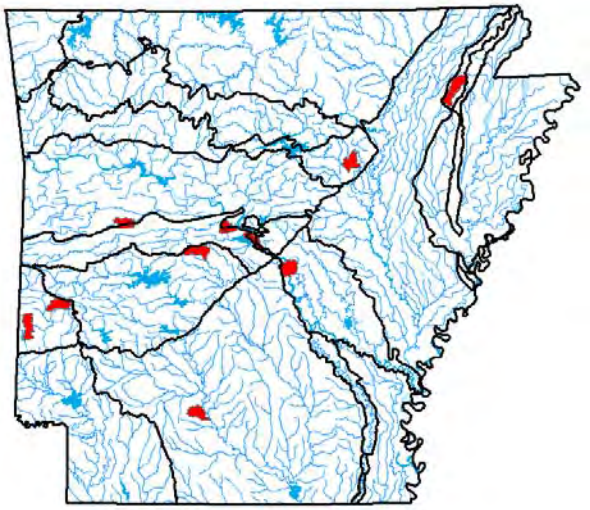
Population Trend: Unknown

Gobal Rank: G5 — Secure

State Rank: S2 — Imperiled in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- [ ] Ozark Highlands
- [x] Boston Mountains
- [x] Ouachita Mountains
- [x] Arkansas Valley
- [x] South Central Plains
- [x] Mississippi Alluvial Plain
- [x] Mississippi Valley Loess Plains

Ecobasins

Arkansas Valley - Arkansas River
Arkansas Valley - White River
Mississippi River Alluvial Plain - Arkansas River
Mississippi River Alluvial Plain - White River
Mississippi River Alluvial Plain (Bayou Bartholomew) - Ouachita River
Mississippi Valley Loess Plains - White River
Ouachita Mountains - Ouachita River
Ouachita Mountains - Red River
South Central Plains - Ouachita River
South Central Plains - Red River

Habitats

	Weight
Natural Pool: - Medium	Suitable

Problems Faced

Threat: Habitat destruction Source: Agricultural practices
Threat: Hydrological alteration Source: Dam
Threat: Hydrological alteration Source: Water diversion

Data Gaps/Research Needs

Determine distribution and habitat requirements.

Conservation Actions

	Importance	Category
Implement best management practices in conjunction with agriculture.	Medium	Threat Abatement
Maintain riparian habitats.	High	Habitat Restoration/Improvement

Monitoring Strategies

Ensure location/occurrence records are compiled into the Arkansas Fish Database.
Monitor population distribution and abundance in stream faunal surveys.

Comments

This species has a sporadic distribution within Arkansas (Robison and Buchanan 1988). Brown bullheads are often associated with quiet streams that have aquatic vegetation.

Taxa Association Team and Peer Reviewers

AGFC Mr. Jeff Quinn, AGFC Mr. Brian Wagner, ANHC Mr. Jason Throneberry

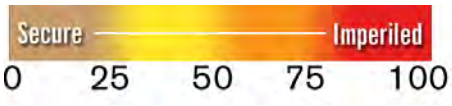
Ameiurus nebulosus
Brown Bullhead

Ammocrypta clara

Western Sand Darter

Class: Actinopterygii
Order: Perciformes
Family: Percidae

Priority Score: **33** out of 100





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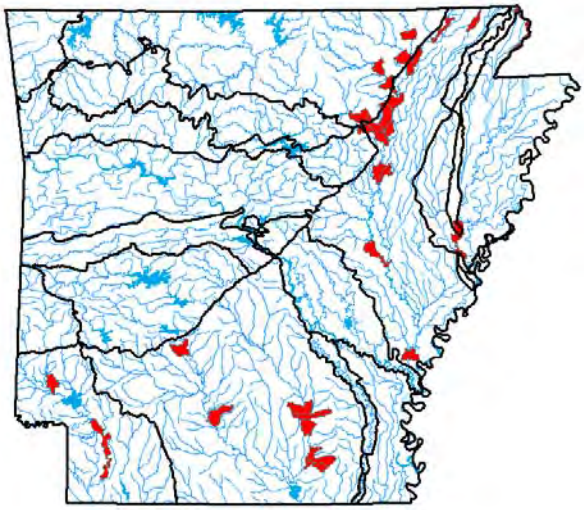
Population Trend: Decreasing

Gobal Rank: G3 — Vulnerable species

State Rank: S3 — Vulnerable in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- [x] Ozark Highlands
- [ ] Boston Mountains
- [ ] Ouachita Mountains
- [ ] Arkansas Valley
- [x] South Central Plains
- [x] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains

Ecobasins

Mississippi River Alluvial Plain - St. Francis River
Mississippi River Alluvial Plain - White River
Ozark Highlands - White River
South Central Plains - Ouachita River
South Central Plains - Red River

Habitats

	Weight
Natural Littoral: - Large	Data Gap
Natural Run: - Medium - Large	Data Gap
Natural Shoal: - Medium - Large	Suitable

Problems Faced

Threat: Habitat destruction Source: Channel maintenance
Threat: Hydrological alteration Source: Dam
Threat: Sedimentation Source: Unknown

Data Gaps/Research Needs

Conduct genetic study.
Conduct status survey.

Conservation Actions

	Importance	Category
Implement best management practices during road construction.	High	Threat Abatement
Maintain riparian habitats.	High	Habitat Restoration/Improvement

Monitoring Strategies

Monitor population distribution and abundance in large river faunal surveys.
Monitor water quality in darter habitats on a regular basis.

Comments

Description: A pale, very slender darter that is largely unscaled and translucent (Robison and Buchanan 1988).

Inhabits moderate size rivers with sandy bottoms and is intolerant of excessive siltation and turbidity (Pflieger 1997). Kuehne and Barbour (1983) reported a trend of decreasing abundance over much of its range. Rigsby (2009) caught 202 individuals from 36 locations in the Black, Current, Eleven Point and Strawberry Rivers. In addition, he captured 17 individuals from 8 locations in the Ouachita and Saline rivers. Driver and Adams (2013) studied the life-history of the species from 379 individuals in northeast Arkansas rivers.

Taxa Association Team and Peer Reviewers

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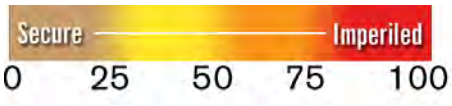
Anguilla rostrata

American Eel



Class: Actinopterygii
Order: Anguilliformes
Family: Anguillidae

Priority Score: **24** **out of 100**



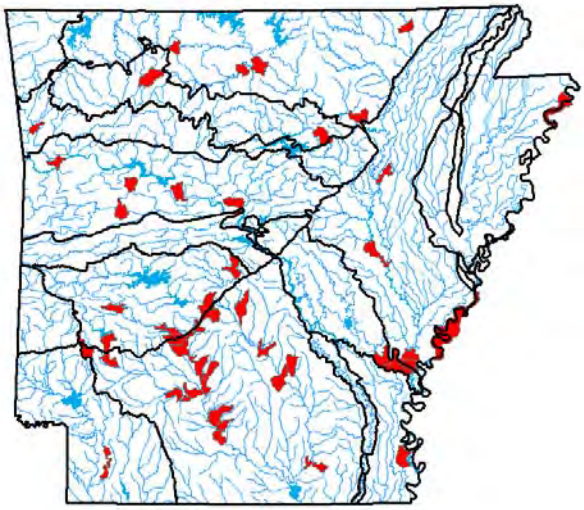
Population Trend: Decreasing

Gobal Rank: G4 — Apparently secure species

State Rank: S3 — Vulnerable in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- [x] Ozark Highlands
- [x] Boston Mountains
- [x] Ouachita Mountains
- [x] Arkansas Valley
- [x] South Central Plains
- [x] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains

Ecobasins

Arkansas Valley - Arkansas River
Boston Mountains - Arkansas River
Boston Mountains - White River
Mississippi River Alluvial Plain - Arkansas River
Mississippi River Alluvial Plain - St. Francis River
Mississippi River Alluvial Plain - White River
Mississippi River Alluvial Plain (Lake Chicot) - Mississippi River
Ouachita Mountains - Arkansas River
Ouachita Mountains - Ouachita River
Ozark Highlands - Arkansas River
Ozark Highlands - White River
South Central Plains - Ouachita River
South Central Plains - Red River

Problems Faced

Threat: Habitat fragmentation
Source: Dam

Data Gaps/Research Needs

Conduct status surveys, especially for the St. Francis River.
Determine downstream eel mortality through turbines at Arkansas and Ouachita River system dams.
Determine the timing and magnitude of out-migration of eels to spawning grounds.

Conservation Actions

	Importance	Category
Create fish passage at Ouachita and Arkansas River navigation systems dams.	High	Habitat Restoration/Improvement
Provide fish passage on the White River at the following dams: Montgomery Point, Dam 1 at Batesville, Dam 2 at Martin, and Dam 3 at Younger.	Medium	

Monitoring Strategies

Establish eel counters and photography installations at newly installed fish ladders for eels.
Targeted monitoring below Ouachita River system dams every 5 years.

Comments

Description: A long, slightly compressed snakelike fish without pelvic fins, not resembling any other Arkansas fishes except lampreys, and then only superficially (Robison and Buchanan 1988). American eels are a pandemic and catadromous species that have declined at multiple locations, and the species is currently under review by the U.S. Fish and Wildlife Service for possible listing under the Endangered Species Act (Federal Register 2011).

Cox (2014) collected 293 American eels from three river systems in Arkansas. Tumlison and Robison (2010) captured 35 eels in the Caddo River below Lake DeGray.

Taxa Association Team and Peer Reviewers

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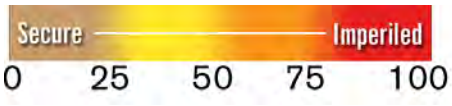
Atractosteus spatula

Alligator Gar

Class: Actinopterygii
Order: Lepisosteiformes
Family: Lepisosteidae



Priority Score: 27 out of 100



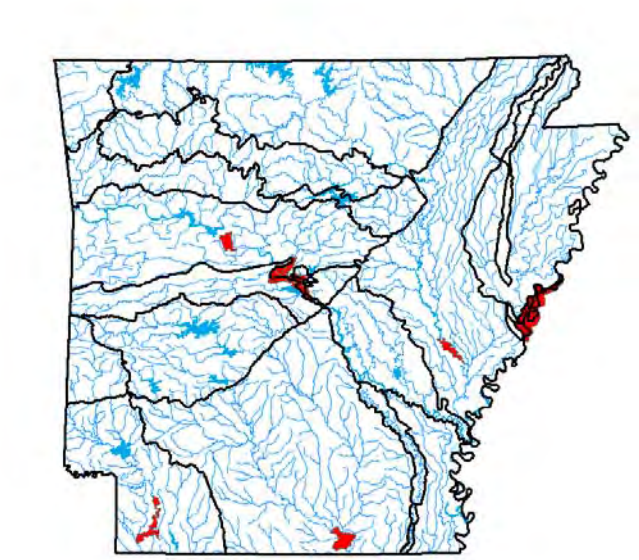
Population Trend: Stable

Gobal Rank: G3G4 — Vulnerable (uncertain rank)

State Rank: S2 — Imperiled in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- [ ] Ozark Highlands
- [ ] Boston Mountains
- [ ] Ouachita Mountains
- [x] Arkansas Valley
- [x] South Central Plains
- [x] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains

Ecobasins

Arkansas Valley - Arkansas River
Mississippi River Alluvial Plain - Arkansas River
Mississippi River Alluvial Plain - St. Francis River
Mississippi River Alluvial Plain - White River
Mississippi River Alluvial Plain (Bayou Bartholomew) - Ouachita River
Mississippi River Alluvial Plain (Lake Chicot) - Mississippi River
South Central Plains - Ouachita River
South Central Plains - Red River

Habitats

	Weight
Man-made Pelagic: - Medium - Large	Marginal
Natural Oxbow - connected: - Medium - Large	Optimal
Natural Oxbow - disconnected: - Medium - Large	Suitable
Natural Pelagic: - Medium - Large	Suitable
Natural Pool: - Medium - Large	Optimal
Natural Side channel: - Medium - Large	Suitable
Natural Slough: - Medium - Large	Suitable
Natural Swamp/Wetlands: - Medium - Large	Obligate

Problems Faced

Threat: Biological alteration Source: Commercial harvest
Threat: Biological alteration Source: Recreation
Threat: Habitat destruction Source: Channel alteration
Threat: Hydrological alteration Source: Channel alteration
Threat: Hydrological alteration Source: Channel maintenance
Threat: Hydrological alteration Source: Dam
Threat: Hydrological alteration Source: Water diversion

Data Gaps/Research Needs

Conduct baseline population survey.
Conduct genetic and taxonomic studies.
Conduct life history study.

Conservation Actions

	Importance	Category
Augment natural populations.	Low	Population Management
Restore connectivity to wetland ecosystems.	High	Habitat Restoration/Improvement
Restore natural hydrologic and thermal regimes.	High	Habitat Restoration/Improvement
Restore sinuousity and channel morphology to river systems.	Medium	Habitat Restoration/Improvement

Monitoring Strategies

Ensure location/occurrence records are compiled into the Arkansas Fish Database.
Monitor population distribution and abundance in large river faunal surveys in cooperation with adjacent states.

Comments

Description: Large, heavy bodied gar with a short, broad snout similar to that of its namesake (Robison and Buchanan 1988).

These large, slow growing fish were heavily harvested in the past. While quite rare, it is evident that they still occur in most of the large rivers of Arkansas (Layher and Phillips 2000).The Fourche La Fave River breeding population has been studied by Inebnit (2009) and Adams and others (2013). The Arkansas Game and Fish Commission developed an independent, species specific management plan for alligator gar (Barnett and others 2011). In 2010, recreational anglers were restricted to 1 fish per day, with a closed the season during the normal spawning season. Commercial harvest is still unrestricted, but annual reporting of the catch is mandatory as of January 2013. Studies to evaluate genetic diversity of Arkansas populations are underway.

Taxa Association Team and Peer Reviewers

AGFC - retired Mr. Steve Filipek, SAU Dr. Henry Robison, UA/Ft. Smith Dr. Tom Buchanan, AGFC Mr. Jeff Quinn, AGFC Mr. Brian Wagner, ANHC Mr. Jason Throneberry, AGFC Mr. Eric Brinkman

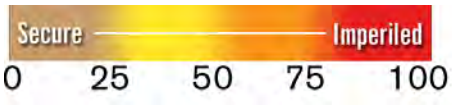
Carpiodes velifer

Highfin Carpsucker

Class: Actinopterygii
Order: Cypriniformes
Family: Catostomidae



Priority Score: 17 out of 100



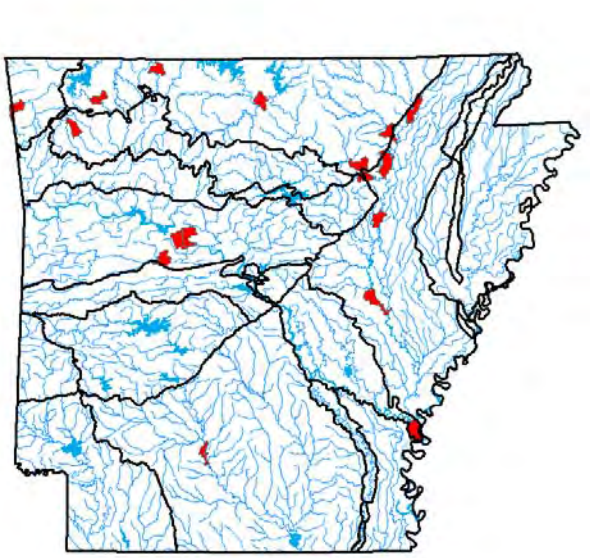
Population Trend: Unknown

Gobal Rank: G4G5 — Apparently secure (uncertain rank)

State Rank: S3 — Vulnerable in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- [x] Ozark Highlands
- [x] Boston Mountains
- [ ] Ouachita Mountains
- [x] Arkansas Valley
- [x] South Central Plains
- [x] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains

Ecobasins

Arkansas Valley - Arkansas River
Boston Mountains - White River
Mississippi River Alluvial Plain - Arkansas River
Mississippi River Alluvial Plain - White River
Ozark Highlands - Arkansas River
Ozark Highlands - White River
South Central Plains - Ouachita River
South Central Plains - Red River

Habitats

	Weight
Natural Pool: - Medium - Large	Suitable
Natural Shoal: - Medium - Large	Suitable

Problems Faced

Threat: Hydrological alteration Source: Dam
Threat: Sedimentation Source: Agricultural practices

Data Gaps/Research Needs

Conduct baseline population surveys.
Conduct life-history studies.

Conservation Actions

	Importance	Category
Establish and enhance riparian corridors.	High	Habitat Restoration/Improvement
Implement best management practices in conjunction with agriculture.	Medium	Threat Abatement

Monitoring Strategies

Ensure location/occurrence records are compiled into the Arkansas Fish Database.
Monitor population distribution and abundance in stream faunal surveys.

Comments

Robison and Buchanan (1988) noted the species is rare. McAllister and others (2010) reported collecting an individual in the Red River, a range extension for the species.

Taxa Association Team and Peer Reviewers

AGFC Mr. Jeff Quinn, AGFC Mr. Brian Wagner, ANHC Mr. Jason Throneberry

Crystallaria asprella

Crystal Darter

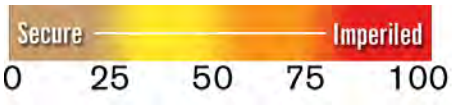


Class: Actinopterygii

Order: Perciformes

Family: Percidae

Priority Score: **38** **out of 100**



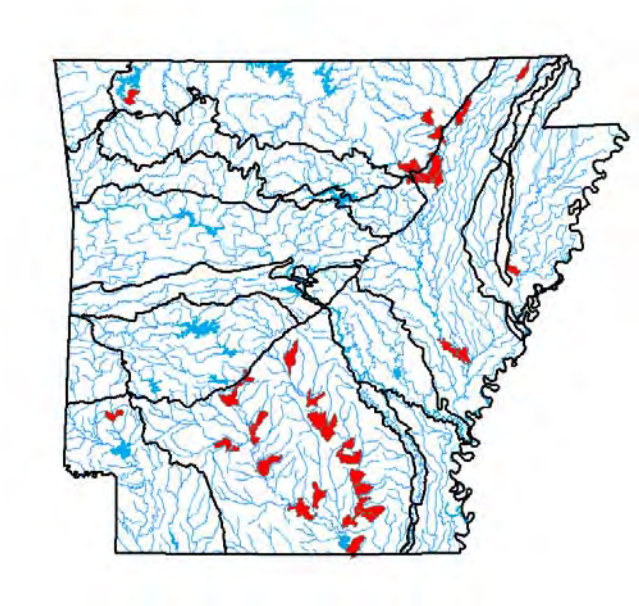
Population Trend: Decreasing

Gobal Rank: G3 — Vulnerable species

State Rank: S2 — Imperiled in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- [x] Ozark Highlands
- [ ] Boston Mountains
- [x] Ouachita Mountains
- [ ] Arkansas Valley
- [x] South Central Plains
- [x] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains

Ecobasins

Mississippi River Alluvial Plain - White River
Mississippi River Alluvial Plain (Bayou Bartholomew) - Ouachita River
Ouachita Mountains - Ouachita River
Ozark Highlands - White River
South Central Plains - Ouachita River
South Central Plains - Red River

Habitats

	Weight
Natural Pool: - Medium - Large	Suitable
Natural Run: - Medium - Large	Obligate
Natural Shoal: - Medium - Large	Optimal

Problems Faced

Threat: Habitat destruction or conversion Source: Channel alteration
Threat: Habitat destruction Source: Channel maintenance
Threat: Habitat destruction Source: Dam
Threat: Sedimentation Source: Agricultural practices
Threat: Sedimentation Source: Confined animal operations
Threat: Sedimentation Source: Grazing/Browsing

Data Gaps/Research Needs

Conduct status and distribution survey.

Conservation Actions

	Importance	Category
Maintain or, where necessary, restore water quality to state standards.	High	Habitat Restoration/Improvement
Protect river corridors using appropriate buffer widths relative to stream size.	High	Habitat Protection

Monitoring Strategies

Ensure location/occurrence records are compiled into the Arkansas Fish Database.
Monitor population distribution and abundance in ongoing stream faunal surveys.
Monitor water quality on a regular basis.

Comments

Description: A slender darter with four wide brown saddles on its back and a silver belly (Robison and Buchanan 1988).

This fish is the sole member of its genus and was once distributed throughout much of the eastern United States, but today persists only in isolated populations (Wood and Raley 2000). It is potentially threatened by impoundment, channelization, dredging, sedimentation, and gravel mining (Grandmaison, Mayasich, and Etnier 2003).

Layher and others (2005) captured 5 individuals in the Ouachita River and 1 individual in the White River. McAllister and others (2010) reported collection of the species in the mainstem Black River. Rigsby (2009) captured 5 individuals from 5 locations in the Black and Strawberry rivers, and he captured 6 individuals from 4 locations in the Ouachita and Saline rivers.

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Cycleptus elongatus

Blue Sucker



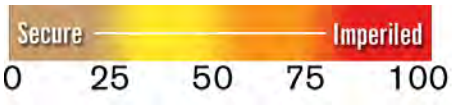
©John Harris

Class: Actinopterygii

Order: Cypriniformes

Family: Catostomidae

Priority Score: **23** **out of 100**



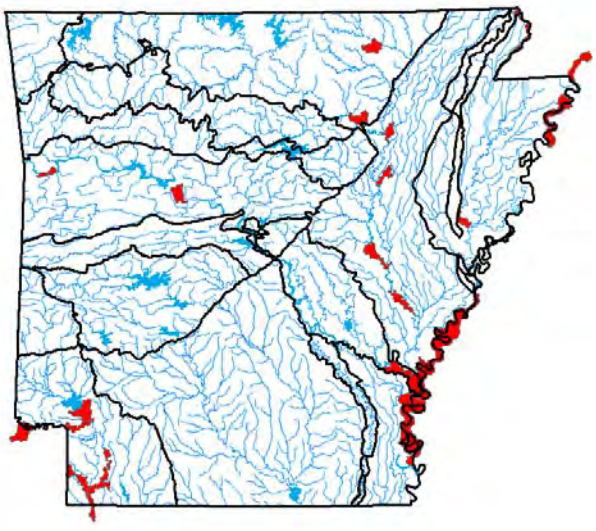
Population Trend: Stable

Gobal Rank: G3G4 — Vulnerable (uncertain rank)

State Rank: S3 — Vulnerable in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- [x] Ozark Highlands
- [ ] Boston Mountains
- [x] Ouachita Mountains
- [x] Arkansas Valley
- [x] South Central Plains
- [x] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains

Ecobasins

Arkansas Valley - Arkansas River
Mississippi River Alluvial Plain - Arkansas River
Mississippi River Alluvial Plain - St. Francis River
Mississippi River Alluvial Plain - White River
Mississippi River Alluvial Plain (Lake Chicot) - Mississippi River
Ouachita Mountains - Arkansas River
Ozark Highlands - White River
South Central Plains - Red River

Habitats

	Weight
Natural Oxbow - connected: - Large	Suitable
Natural Pool: - Medium - Large	Suitable
Natural Riffle: - Medium - Large	Obligate
Natural Run: - Medium - Large	Obligate
Natural Shoal: - Medium - Large	Suitable

Problems Faced

Threat: Habitat destruction Source: Channel alteration
Threat: Hydrological alteration Source: Dam
Threat: Hydrological alteration Source: Water diversion

Data Gaps/Research Needs

Conduct genetic/ taxonomic studies.
Conduct life history studies.
Conduct population surveys.

Conservation Actions

	Importance	Category
Coordinate with U.S. Army Corps of Engineers regarding channel alteration and maintenance.	Medium	Threat Abatement
Coordinate with Water Districts and Arkansas Soil and Water Conservation Commission regarding irrigation projects.	Medium	Threat Abatement

Monitoring Strategies

Ensure location/occurrence records are compiled into the Arkansas Fish Database.
Monitor population distribution and abundance in large river faunal surveys.

Comments

Description: A large streamlined sucker having a long dorsal fin and growing to a maximum size of 40 inches (Robison and Buchanan 1988).

Restricted to large river environment, blue suckers use habitats that are relatively deep with fast current (Layher 1998). Blue suckers are abundant in the Red River (Buchanan and others 2003; Layher and others 2005).

Taxa Association Team and Peer Reviewers

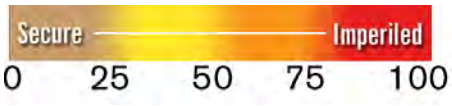
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Cyprinella camura

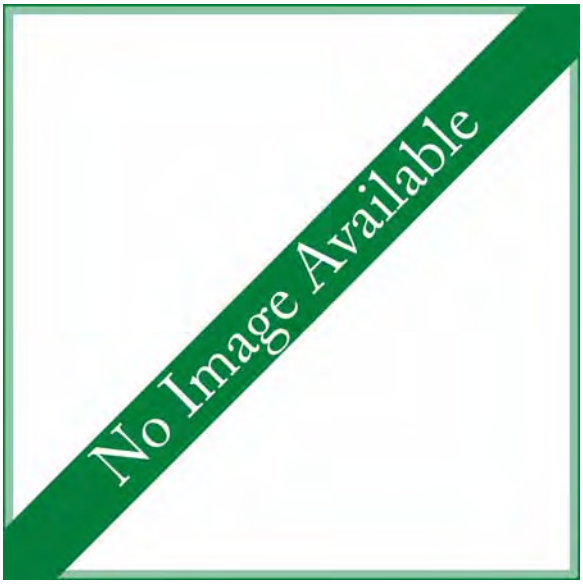
Bluntface Shiner

Class: Actinopterygii
Order: Cypriniformes
Family: Cyprinidae

Priority Score: **23** **out of 100**



Population Trend: Unknown

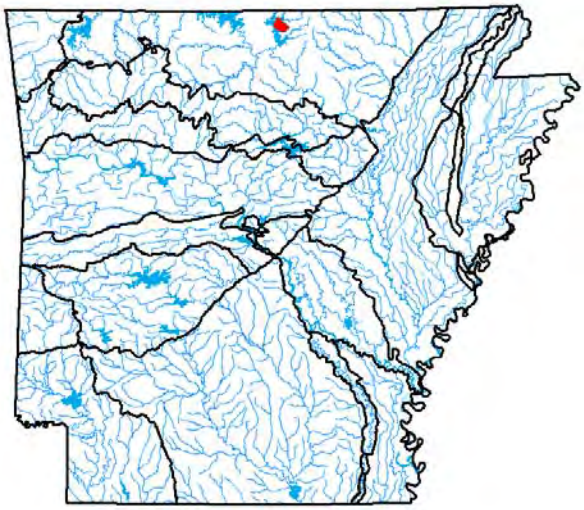


Gobal Rank: G5 — Secure

State Rank: SH — Historic record. Possibly extirpated in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- [x] Ozark Highlands
- [x] Boston Mountains
- [ ] Ouachita Mountains
- [x] Arkansas Valley
- [ ] South Central Plains
- [ ] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains

Ecobasins

Arkansas Valley - Arkansas River

Boston Mountains - Arkansas River

Ozark Highlands - Arkansas River

Habitats

	Weight
Natural Glide: - Small - Medium	Optimal
Natural Pool: - Small - Medium	Suitable
Natural Riffle: - Small - Medium	Suitable
Natural Run: - Small - Medium	Optimal

Problems Faced

Threat: Unknown
Source:

Data Gaps/Research Needs

Conduct baseline population survey.

Conduct genetic/ taxonomic studies.

Determine current status in Arkansas.

Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

Monitor population distribution and abundance in ongoing stream faunal surveys.

Comments

Description: A bluish silver, flattened shiner with a pale area at the base of the tail fin (Cross and Collins 1995).

This species is rare in Arkansas, having been found only in four, pre-1960 collections from northwest Arkansas (Robison and Buchanan 1988).

Taxa Association Team and Peer Reviewers

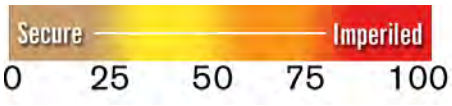
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Cyprinella spiloptera

Spotfin Shiner

Class: Actinopterygii
Order: Cypriniformes
Family: Cyprinidae

Priority Score: **23** **out of 100**





©Konrad P. Schmidt

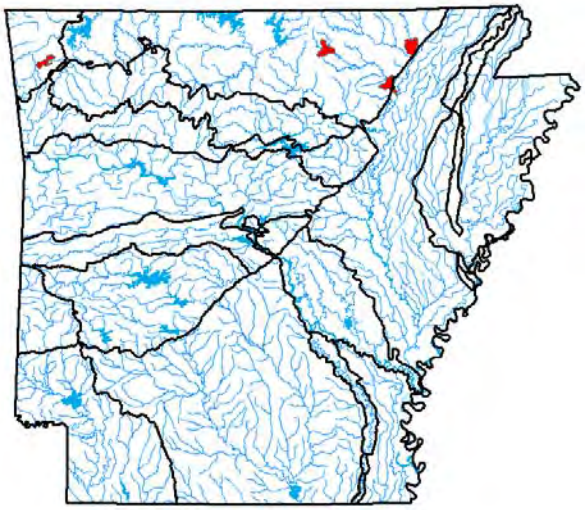
Population Trend: Unknown

Gobal Rank: G5 — Secure

State Rank: S1? — Critically imperiled in Arkansas (inexact numeric rank)

Distribution

Occurrence Records



Ecoregions where the species occurs:

- [x] Ozark Highlands
- [ ] Boston Mountains
- [ ] Ouachita Mountains
- [ ] Arkansas Valley
- [ ] South Central Plains
- [ ] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains

Ecobasins

Ozark Highlands - Arkansas River

Ozark Highlands - White River

Problems Faced

Threat: Unknown
Source:

Data Gaps/Research Needs

Conduct baseline population survey.

Conduct genetic/ taxonomic studies.

Determine status in Arkansas.

Determine threats.

Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

Monitor population distribution and abundance in ongoing stream faunal surveys.

Comments

Description: A compressed, bluish silvery shiner with a dusky lateral band and a black blotch on the dorsal fin (Smith 1979).

This northeastern species is very rare in Arkansas having been collected only twice, from widely separated localities (Robison and Buchanan 1988).

Taxa Association Team and Peer Reviewers

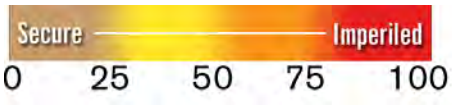
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Erimyzon sucetta

Lake Chubsucker

Class: Actinopterygii
Order: Cypriniformes
Family: Catostomidae

Priority Score: **15** **out of 100**





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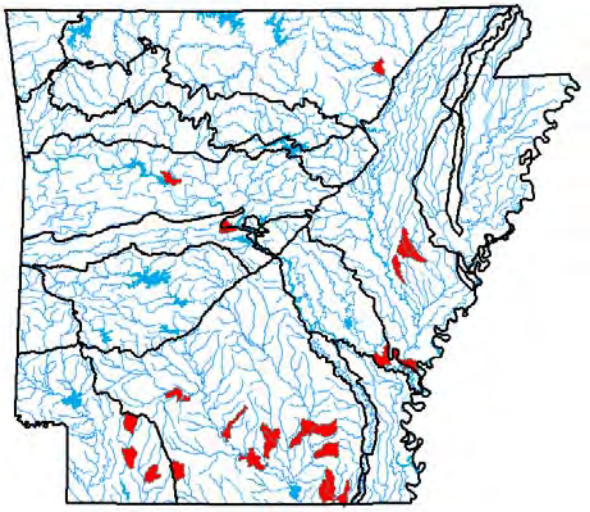
Population Trend: Unknown

Gobal Rank: G5 — Secure

State Rank: S3 — Vulnerable in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- [x] Ozark Highlands
- [ ] Boston Mountains
- [ ] Ouachita Mountains
- [x] Arkansas Valley
- [x] South Central Plains
- [x] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains

Ecobasins

Arkansas Valley - Arkansas River
Mississippi River Alluvial Plain - Arkansas River
Mississippi River Alluvial Plain - White River
Mississippi River Alluvial Plain (Bayou Bartholomew) - Ouachita River
Ozark Highlands - White River
South Central Plains - Ouachita River
South Central Plains - Red River

Habitats

	Weight
Natural Oxbow - connected: - Medium - Large	Optimal
Natural Oxbow - disconnected: - Medium - Large	Marginal
Natural Side channel: - Medium - Large	Suitable
Natural Slough: - Medium - Large	Optimal
Natural Swamp/Wetlands: - Medium - Large	Suitable

Problems Faced

Threat: Habitat destruction Source: Agricultural practices
Threat: Habitat destruction Source: Channel maintenance

Data Gaps/Research Needs

Conduct baseline population survey.
Conduct genetic/ taxonomic studies.
Conduct life history studies.

Conservation Actions

	Importance	Category
Restore connectivity to wetlands and riverine backwaters.	Medium	Habitat Restoration/Improvement

Monitoring Strategies

Monitor population distribution and abundance in ongoing stream and river faunal surveys.

Comments

Description: A small, deep bodied, slightly compressed, olive colored sucker, lacking a lateral line (Robison and Buchanan 1988).A lowland species occurring in quite heavily vegetated areas of oxbow lakes, sloughs, and backwaters (Robison and Buchanan 1988).

Only one single individual was captured out of 220,116 fish in 49 riparian wetlands and backwaters of the Arkansas River (Adams and others 2007). Clark (2006) captured only 6 specimens out of approximately 45,000 fish from 41 White River oxbow lakes.

Taxa Association Team and Peer Reviewers

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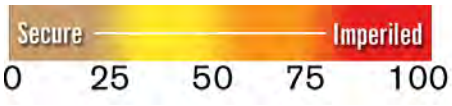
Etheostoma autumnale

Autumn Darter

Class: Actinopterygii
Order: Perciformes
Family: Percidae



Priority Score: 19 out of 100



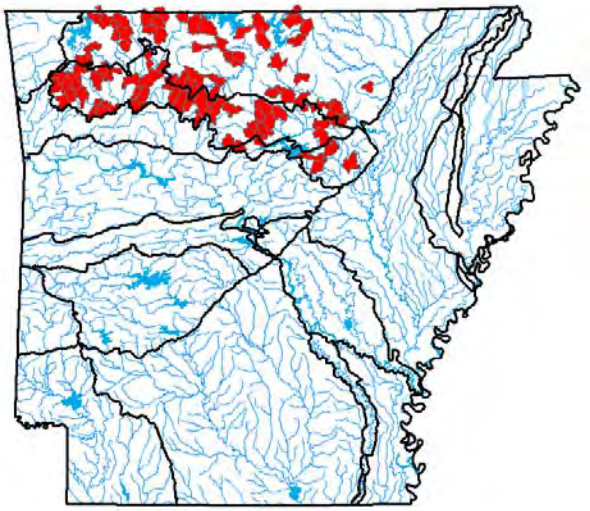
Population Trend: Stable

Gobal Rank: G4 — Apparently secure species

State Rank: S3 — Vulnerable in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- [x] Ozark Highlands
- [x] Boston Mountains
- [ ] Ouachita Mountains
- [x] Arkansas Valley
- [ ] South Central Plains
- [ ] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains

Ecobasins

Arkansas Valley - White River
Boston Mountains - White River
Ozark Highlands - White River

Habitats	Weight
Natural Glide: - Small - Medium	Suitable
Natural Pool: - Small - Medium	Suitable
Natural Riffle: - Small - Medium	Suitable

Problems Faced

Threat: Habitat destruction Source: Resource extraction
Threat: Habitat disturbance Source: Agricultural practices
Threat: Hydrological alteration Source: Dam
Threat: Hydrological alteration Source: Excessive groundwater withdrawal
Threat: Nutrient loading Source: Agricultural practices
Threat: Riparian habitat destruction Source: Agricultural practices
Threat: Sedimentation Source: Road construction

Data Gaps/Research Needs

Conduct baseline population surveys.
Conduct life history study.
Refine range delineation.

Conservation Actions	Importance	Category
Establish and enhance riparian corridors.	High	Habitat Restoration/Improvement
Implement best management practices in conjunction with agriculture and silviculture.	Medium	Threat Abatement

Monitoring Strategies

Ensure location/occurrence records are compiled into the Arkansas Fish Database.
Monitor population distribution and abundance in stream faunal surveys.

Comments

Description: This species was elevated from Etheostoma punctulatum by Mayden (2010). Autumn Darters are often found in small streams with clear, cool water, coarse stream substrates and with vegetation (Mayden 2010). This species occurs in the White River drainage, upper Current River, and the Eleven Point River. The Autumn Darter is rare in the Little Red, Current, and Eleven Point rivers (Mayden 2010). Life-history information appears to be lacking for this species.

Taxa Association Team and Peer Reviewers

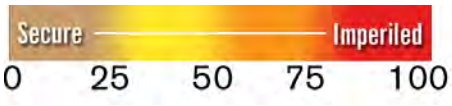
AGFC Mr. Jeff Quinn, AGFC Mr. Brian Wagner, ANHC Mr. Jason Throneberry

Etheostoma clinton

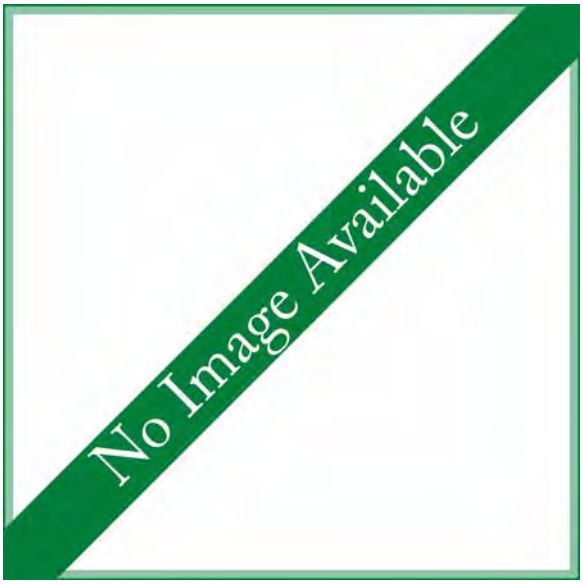
Beaded Darter

Class: Actinopterygii
Order: Perciformes
Family: Percidae

Priority Score: 19 out of 100



Population Trend: Stable

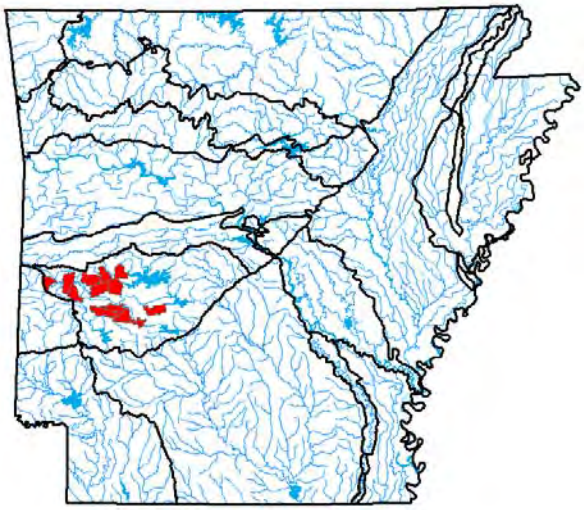


Gobal Rank: GNR — Not yet ranked

State Rank: S2 — Imperiled in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- [ ] Ozark Highlands
- [ ] Boston Mountains
- [x] Ouachita Mountains
- [ ] Arkansas Valley
- [ ] South Central Plains
- [ ] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains

Ecobasins

Ouachita Mountains - Ouachita River

Habitats

	Weight
Natural Glide: - Small - Medium	Suitable
Natural Pool: - Small - Medium	Optimal
Natural Riffle: - Small - Medium	Suitable

Problems Faced

Threat: Habitat destruction
Source: Resource extraction

Threat: Habitat disturbance
Source: Agricultural practices

Threat: Hydrological alteration
Source: Dam

Threat: Nutrient loading
Source: Agricultural practices

Threat: Riparian habitat destruction
Source: Agricultural practices

Threat: Sedimentation
Source: Road construction

Data Gaps/Research Needs

Conduct baseline population surveys.

Refine range delineation.

Conservation Actions

	Importance	Category
Establish and enhance riparian corridors.	High	Habitat Restoration/Improvement
Implement best management practices in conjunction with agriculture and silviculture.	Medium	Threat Abatement

Monitoring Strategies

Monitor population distribution and abundance in stream faunal surveys.

Comments

Description: This species was elevated from Etheostoma stigmaeum by Layman and Mayden (2012). In Arkansas, this species is found in Prairie Creek in Polk County, Mill Creek in Polk County, Ouachita River in Montgomery County, and South Fork Mazarn Creek in Garland County. Layman and Mayden (2012) indicated a status survey was needed to clearly define the distribution of the species. Habitat for this species includes clear, sandy and rock pools of small to medium sized rivers with moderate gradient and swift current.

This species does not have a numerical G-rank, so the priority score on this endemic fish with limited range is greatly underestimated. It has a distribution similar to Noturus taylori (Layman and Mayden 2012), which is a G1 ranked species. The beaded darter appears to be scare or uncommon across its limited range (Layman and Mayden 2012).

Taxa Association Team and Peer Reviewers

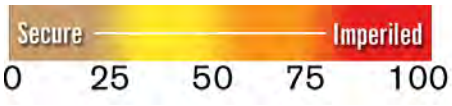
AGFC Mr. Jeff Quinn, AGFC Mr. Brian Wagner, ANHC Mr. Jason Throneberry

Etheostoma cragini

Arkansas Darter

Class: Actinopterygii
Order: Perciformes
Family: Percidae

Priority Score: **38** **out of 100**



Population Trend: Decreasing

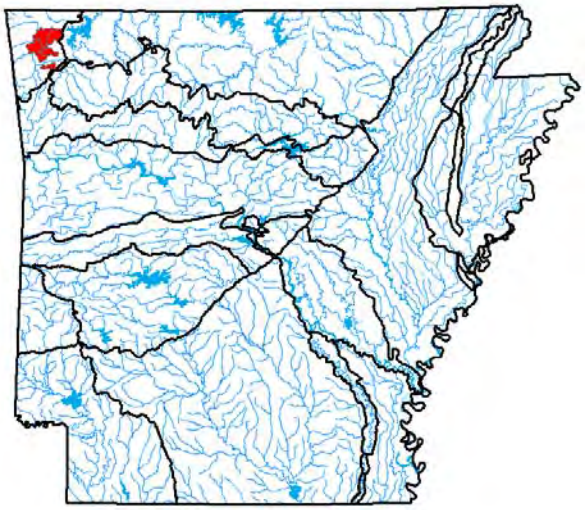

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Gobal Rank: G3G4 — Vulnerable (uncertain rank)

State Rank: S1 — Critically imperiled in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- [x] Ozark Highlands
- [ ] Boston Mountains
- [ ] Ouachita Mountains
- [ ] Arkansas Valley
- [ ] South Central Plains
- [ ] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains

Ecobasins

Ozark Highlands - Arkansas River

Habitats	Weight
Natural Spring Run: Headwater - Small	Obligate

Problems Faced

Threat: Habitat destruction
Source: Channel alteration

Threat: Habitat destruction
Source: Grazing/Browsing

Threat: Habitat destruction
Source: Resource extraction

Threat: Habitat destruction
Source: Road construction

Threat: Habitat destruction
Source: Urban development

Threat: Hydrological alteration
Source: Urban development

Threat: Nutrient loading
Source: Municipal/Industrial point source

Data Gaps/Research Needs

Conduct range-wide genetic study.

Conservation Actions	Importance	Category
Cooperatively develop a management plan for species with local input.	Medium	Public Relations/Education
Maintain and enhance adequate riparian buffers.	Medium	Habitat Restoration/Improvement
Protect recharge area.	Medium	Habitat Protection
Protect water quality from point and non-point pollution. Maintain or, where necessary, restore water quality to state standards.	Medium	Habitat Protection
Provide education and outreach to local citizens and governments concerning this species and its habitat.	Medium	Public Relations/Education

Monitoring Strategies

Monitor known populations every 5 years, with more frequent monitoring if impacts are suspected.

Monitor potential impacts to species' habitat annually.

Comments

Description: A stout, bluntnosed darter, the males of which develop a bright orange abdomen in breeding condition (Robison and Buchanan 1988).

This darter is endemic to the Arkansas River basin and inhabits small spring runs, often with an abundance of water cress and other aquatic plants, and substrates of fine gravel, sand, and silt. It has been found historically at five locations in the Illinois River basin in Arkansas, three of which yielded specimens in a recent study (Hargrave 1998).

Wagner and others (2011) provide the most recent summary of the species status. Recent monitoring of populations has revealed that some newly discovered populations may no longer persist (B. Wagner, pers. Com.).

Taxa Association Team and Peer Reviewers

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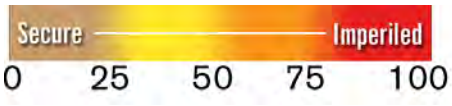
Etheostoma fragi

Strawberry River Darter

Class: Actinopterygii
Order: Perciformes
Family: Percidae



Priority Score: 29 **out of 100**



Population Trend: Decreasing

Gobal Rank: G4 — Apparently secure species

State Rank: S2 — Imperiled in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- [x] Ozark Highlands
- [ ] Boston Mountains
- [ ] Ouachita Mountains
- [ ] Arkansas Valley
- [ ] South Central Plains
- [ ] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains

Ecobasins

Ozark Highlands - White River

Habitats

	Weight
Natural Pool: - Small - Medium	Suitable
Natural Riffle: - Small - Medium	Optimal
Natural Run: - Small - Medium	Suitable

Problems Faced

Threat: Habitat destruction
Source: Dam

Threat: Habitat destruction
Source: Grazing/Browsing

Threat: Habitat destruction
Source: Road construction

Threat: Nutrient loading
Source: Confined animal operations

Threat: Nutrient loading
Source: Grazing/Browsing

Threat: Sedimentation
Source: Grazing/Browsing

Threat: Sedimentation
Source: Road construction

Data Gaps/Research Needs

Determine abundance.

Conservation Actions

	Importance	Category
Improve riparian corridor.	High	Habitat Restoration/Improvement
Protect water quality from non-point sources. Maintain or, where necessary, restore water quality to state standards.	Medium	Threat Abatement
Provide education and outreach to local citizens and governments concerning this species and its habitat.	Medium	Public Relations/Education

Monitoring Strategies

Monitor population distribution and abundance in ongoing stream and river faunal surveys.

Comments

Description: A yellowish brown darter with dark brown saddles. Breeding males have a red throat, turquoise bars on the sides, and orange between some of the bars and on the belly (Robison and Buchanan 1988).

This member of the orangethroat darter group was elevated to species status by Ceas and Page (1997). The species is restricted to the Strawberry River basin and, while it remains locally abundant throughout this range, abundance seems to have declined over the past twenty years (Robison 1998).

The status of the species is currently being evaluated by Kyler Hecke and Dr. Steve Lochmann. The consensus of the Fish Taxa Team is that G-rank calculator should be used to re-evaluate the G4 rank of the species, because the species is only found in Arkansas and the state rank calculator scored the species S2.

Taxa Association Team and Peer Reviewers

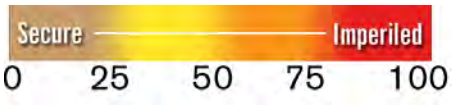
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Etheostoma fusiforme

Swamp Darter

Class: Actinopterygii
Order: Perciformes
Family: Percidae

Priority Score: **15** **out of 100**





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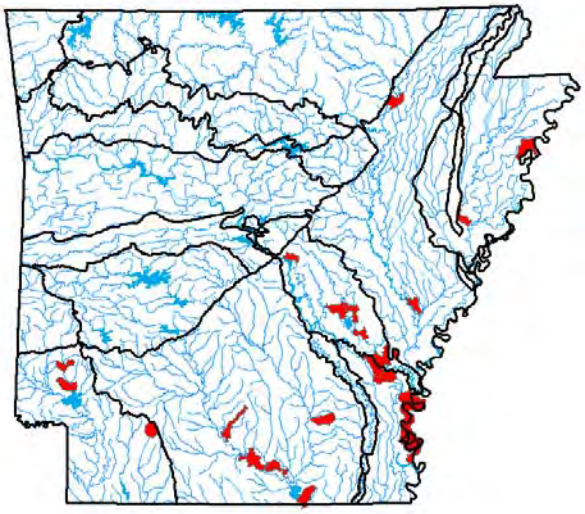
Population Trend: Unknown

Gobal Rank: G5 — Secure

State Rank: S3 — Vulnerable in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- ☐ Ozark Highlands
- ☐ Boston Mountains
- ☐ Ouachita Mountains
- ☐ Arkansas Valley
- ☑ South Central Plains
- ☑ Mississippi Alluvial Plain
- ☐ Mississippi Valley Loess Plains

Ecobasins

Mississippi River Alluvial Plain - Arkansas River
Mississippi River Alluvial Plain - St. Francis River
Mississippi River Alluvial Plain - White River
Mississippi River Alluvial Plain (Lake Chicot) - Mississippi River
South Central Plains - Ouachita River
South Central Plains - Red River

Habitats

	Weight
Natural Oxbow - connected: - Small - Medium - Large	Suitable
Natural Oxbow - disconnected: - Small - Medium - Large	Suitable
Natural Slough: - Small - Medium - Large	Suitable
Natural Swamp/Wetlands: - Small - Medium - Large	Suitable

Problems Faced

Threat: Biological alteration Source: Exotic species
Threat: Habitat destruction Source: Agricultural practices
Threat: Habitat destruction Source: Channel alteration
Threat: Habitat destruction Source: Water diversion

Data Gaps/Research Needs

Conduct distribution surveys.

Conservation Actions

	Importance	Category
Optimize aquatic vegetation management within species' habitat.	Medium	Habitat Protection
Protect and improve riparian buffer.	Medium	Habitat Restoration/Improvement
Protect and improve wetlands.	Medium	Habitat Restoration/Improvement
Use Best Management Practices for agriculture.	Medium	Threat Abatement

Monitoring Strategies

Ensure location/occurrence records are compiled into the Arkansas Fish Database.
Monitor population distribution and abundance in ongoing faunal surveys.

Comments

Description: A small bluntnose, dark mottled darter (Robison and Buchanan 1988).

This darter has a widely scattered distribution in the lowlands of Arkansas, but is never abundant in any one locality (Robison and Buchanan 1988). It is almost always associated with dense aquatic vegetation and can tolerate low pH levels (Kuehne and Barbour 1983). Adams and others (2007) captured 53 individuals from 5 Arkansas River backwaters and wetlands. Clark (2006) captured 47 individuals in White River oxbow lakes.

Taxa Association Team and Peer Reviewers

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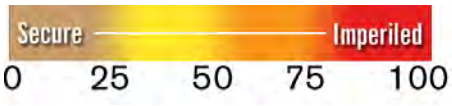
Etheostoma microperca

Least Darter


©Doyle Crosswhite

Class: Actinopterygii
Order: Perciformes
Family: Percidae

Priority Score: 29 out of 100



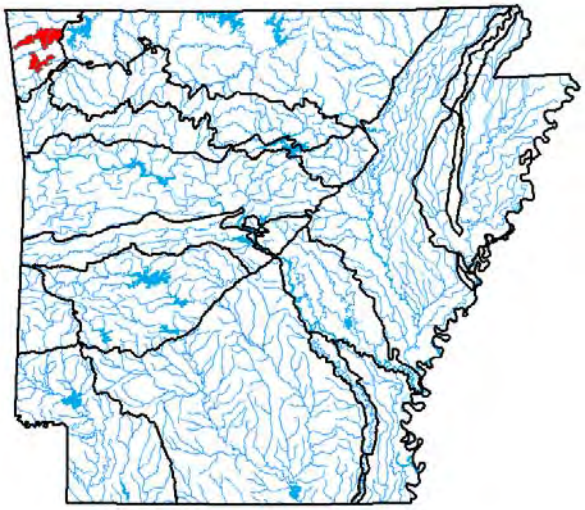
Population Trend: Decreasing

Gobal Rank: G5 — Secure

State Rank: S1 — Critically imperiled in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- [x] Ozark Highlands
- [ ] Boston Mountains
- [ ] Ouachita Mountains
- [ ] Arkansas Valley
- [ ] South Central Plains
- [ ] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains

Ecobasins

Ozark Highlands - Arkansas River

Habitats	Weight
Natural Pool: Headwater - Small	Suitable
Natural Spring Run: Headwater - Small	Obligate

Problems Faced

Threat: Habitat destruction
Source: Channel alteration

Threat: Habitat destruction
Source: Grazing/Browsing

Threat: Habitat destruction
Source: Resource extraction

Threat: Habitat destruction
Source: Road construction

Threat: Habitat destruction
Source: Urban development

Threat: Hydrological alteration
Source: Urban development

Threat: Nutrient loading
Source: Municipal/Industrial point source

Data Gaps/Research Needs

Formally describe this species.

Conservation Actions	Importance	Category
Cooperatively develop a management plan for species with local input.	Medium	Public Relations/Education
Maintain and improve riparian buffers.	Medium	Habitat Restoration/Improvement
Protect core habitat areas.	Medium	Land Acquisition
Protect existing habitat and stream corridors.	High	Habitat Protection
Protect recharge area.	Medium	Habitat Protection
Protect water quality from point and non-point sources. Maintain or, where necessary, restore water quality to state standards/stormwater turbidity standards.	High	Threat Abatement
Provide education and outreach to local citizens and governments concerning this species and its habitat.	Medium	Public Relations/Education

Monitoring Strategies

Monitor known populations every 5 years, with more frequent monitoring if impacts are suspected.

Monitor potential impacts to species' habitat annually.

Etheostoma microperca
Least Darter

Comments

Description: Arkansas' smallest darter, reaching a maximum length of 1.5 inches. It has no lateral line, is tan and brown in color, with some red in the fins (Robison and Buchanan 1988).

While more common in the Great Lakes region, this darter is found in the Arkansas River basin of northwest Arkansas and inhabits small spring runs, often with an abundance of water cress and other aquatic plants, and substrates of fine gravel, sand, and silt. It has been found historically at five locations in the Illinois River basin in Arkansas, two of which yielded specimens in a recent study (Hargrave 1998).

A genetics study of the species indicates that the least darter in Arkansas represents an undescribed cryptic species with a very limited range (Echelle and others 2015). Wagner and others (2012) reported extirpation of the species at three historic sites, so this species appears to be declining. The G-rank of this species does not currently reflect new genetic information. Thus, the Fish Taxa Team recommends that new genetic information be used with the G-rank calculator to re-evaluate this species.

Taxa Association Team and Peer Reviewers

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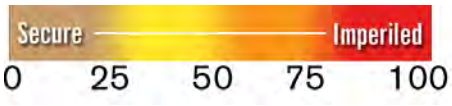
Etheostoma mihileze

Sunburst Darter



Class: Actinopterygii
Order: Perciformes
Family: Percidae

Priority Score: 19 out of 100



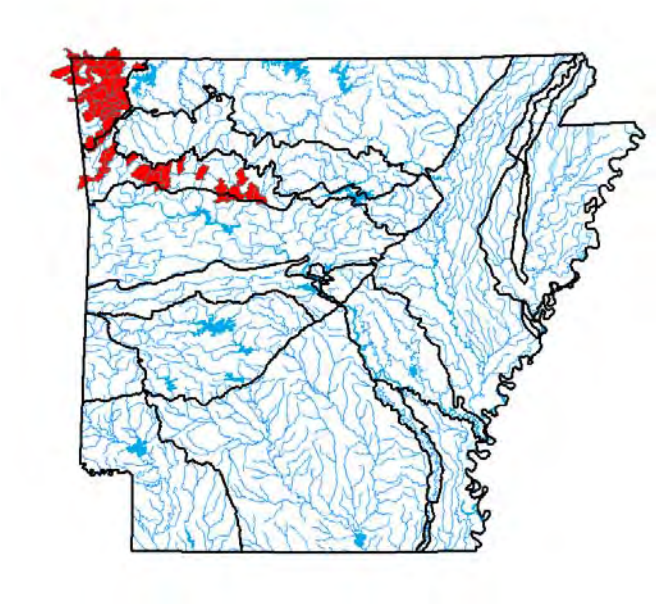
Population Trend: Stable

Gobal Rank: G4 — Apparently secure species

State Rank: S3 — Vulnerable in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- [x] Ozark Highlands
- [x] Boston Mountains
- [ ] Ouachita Mountains
- [x] Arkansas Valley
- [ ] South Central Plains
- [ ] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains

Ecobasins

Arkansas Valley - Arkansas River
Boston Mountains - Arkansas River
Ozark Highlands - Arkansas River

Habitats

	Weight
Natural Glide: - Small - Medium	Suitable
Natural Pool: - Small - Medium	Suitable
Natural Riffle: - Small - Medium	Suitable

Problems Faced

Threat: Habitat destruction Source: Dam
Threat: Habitat destruction Source: Resource extraction
Threat: Habitat destruction Source: Urban development
Threat: Habitat disturbance Source: Agricultural practices
Threat: Hydrological alteration Source: Dam
Threat: Hydrological alteration Source: Excessive groundwater withdrawal
Threat: Nutrient loading Source: Agricultural practices
Threat: Riparian habitat destruction Source: Agricultural practices
Threat: Sedimentation Source: Road construction

Data Gaps/Research Needs

Conduct baseline population surveys.
Refine range delineation.

Conservation Actions

	Importance	Category
Establish and enhance riparian corridors.	High	Habitat Restoration/Improvement
Implement best management practices in conjunction with agriculture and silviculture.	Medium	Threat Abatement

Monitoring Strategies

Ensure location/occurrence records are compiled into the Arkansas Fish Database.
Monitor population distribution and abundance in stream faunal surveys.

Comments

Description: This species was elevated from Etheostoma punctulatum by Mayden (2010). This species is found in small tributatries to the Arkansas River in the northwest portion of the state. It occurs in Benton, Crawford, and Franklin counties. Life history has been studied by two investigations (Mayden 2010). This species inhabits small, clear, cool streams with good water quality over gravel and cobble substrates. They are regularly found in association with aquatic vegetation and organic debris.

Taxa Association Team and Peer Reviewers

AGFC Mr. Jeff Quinn, AGFC Mr. Brian Wagner, ANHC Mr. Jason Throneberry

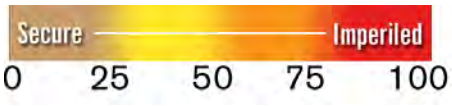
Etheostoma moorei

Yellowcheek Darter



Class: Actinopterygii
Order: Perciformes
Family: Percidae

Priority Score: 100 out of 100



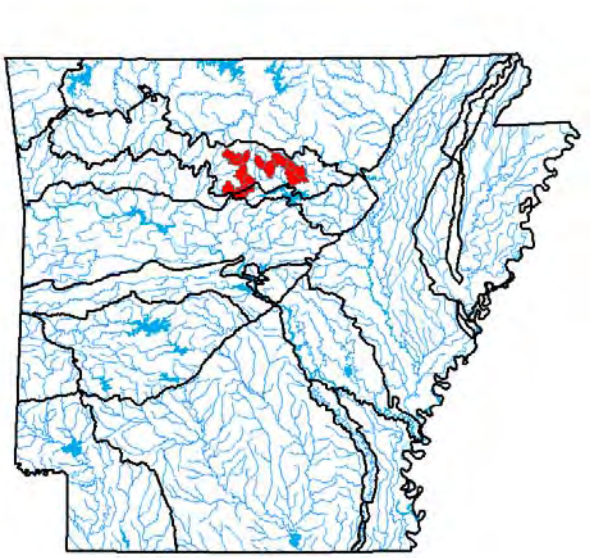
Population Trend: Decreasing

Gobal Rank: G1 — Critically imperiled species

State Rank: S1 — Critically imperiled in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- ☐ Ozark Highlands
- ☑ Boston Mountains
- ☐ Ouachita Mountains
- ☐ Arkansas Valley
- ☐ South Central Plains
- ☐ Mississippi Alluvial Plain
- ☐ Mississippi Valley Loess Plains

Ecobasins

Boston Mountains - White River

Habitats

	Weight
Natural Riffle: - Small - Medium	Optimal
Natural Run: - Small - Medium	Optimal

Problems Faced

Threat: Habitat destruction
Source: Channel maintenance

Threat: Habitat destruction
Source: Dam

Threat: Habitat destruction
Source: Grazing/Browsing

Threat: Hydrological alteration
Source: Channel alteration

Threat: Hydrological alteration
Source: Dam

Threat: Sedimentation
Source: Forestry activities

Threat: Sedimentation
Source: Grazing/Browsing

Threat: Sedimentation
Source: Resource extraction

Threat: Sedimentation
Source: Road construction

Data Gaps/Research Needs

Assess population response to dewatering of riffles.

Conduct genetic study.

Conservation Actions

	Importance	Category
Cooperate with U.S. Fish and Wildlife Service to implement Candidate Conservation Agreement for the yellowcheek darter.	Medium	Other
Coordinate research to reduce disturbance by scientists.	Medium	Threat Abatement
Provide education and outreach to local citizens and governments concerning the yellowcheek darter and its habitat.	Medium	Public Relations/Education
Restore and improve riparian buffers.	Medium	Habitat Restoration/Improvement

Monitoring Strategies

Coordinate AGFC and USFWS monitoring to reduce stress on populations.

Etheostoma moorei
Yellowcheek Darter

Comments

Description: A small brown darter reaching a maximum length of 2.5 inches (Robison and Buchanan 1988).

This Arkansas endemic is restricted to tributaries of the upper Little Red River system. The species was listed by the U.S. Fish and Wildlife Service as endangered during 2011.

Taxa Association Team and Peer Reviewers

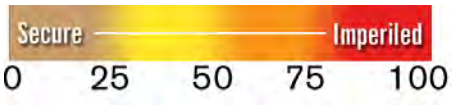
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Etheostoma pallididorsum

Paleback Darter

Class: Actinopterygii
Order: Perciformes
Family: Percidae

Priority Score: **46** **out of 100**



Population Trend: Stable

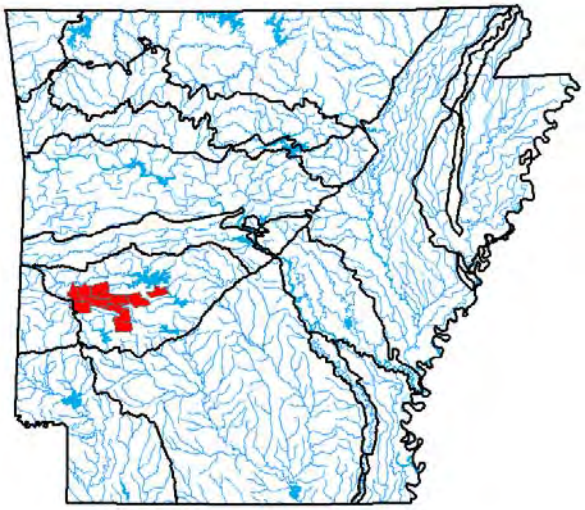

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Gobal Rank: G2 — Imperiled species

State Rank: S2 — Imperiled in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- ☐ Ozark Highlands
- ☐ Boston Mountains
- ☑ Ouachita Mountains
- ☐ Arkansas Valley
- ☐ South Central Plains
- ☐ Mississippi Alluvial Plain
- ☐ Mississippi Valley Loess Plains

Ecobasins

Ouachita Mountains - Ouachita River

Habitats	Weight
Natural Pool: Headwater - Small	Obligate
Natural Riffle: Headwater - Small	Suitable
Natural Run: Headwater - Small	Suitable
Natural Spring Run:	Obligate

Problems Faced

Threat: Biological alteration
Source: Predation

Threat: Chemical alteration
Source: Resource extraction

Threat: Habitat destruction
Source: Dam

Threat: Habitat destruction
Source: Resource extraction

Threat: Sedimentation
Source: Channel alteration

Threat: Sedimentation
Source: Forestry activities

Threat: Sedimentation
Source: Road construction

Data Gaps/Research Needs

Survey for additional spawning habitat.

Conservation Actions	Importance	Category
Maintain or, where necessary, restore the quality and quantity of groundwater to state water quality standards.	Medium	Habitat Restoration/Improvement
Protect spawning habitat.	High	Habitat Protection

Monitoring Strategies

Continue stream surveys by partner agencies annually or biennually.

Comments

Description: A stout, bluntnosed darter, the males of which develop a bright orange abdomen in breeding condition (Robison and Buchanan 1988).

This Arkansas endemic inhabits small tributaries of the upper Caddo and Ouachita River systems. It is threatened by loss of habitat through channelization, which eliminates much of the shallow backwater areas which are preferred by the species (Robison 2004).

Taxa Association Team and Peer Reviewers

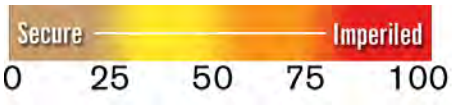
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Etheostoma parvipinne

Goldstripe Darter

Class: Actinopterygii
Order: Perciformes
Family: Percidae

Priority Score: 17 out of 100





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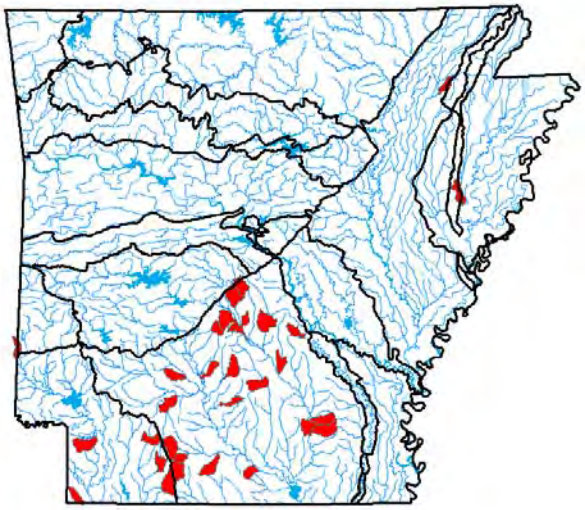
Population Trend: Stable

Gobal Rank: G4G5 — Apparently secure (uncertain rank)

State Rank: S3 — Vulnerable in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- [ ] Ozark Highlands
- [ ] Boston Mountains
- [ ] Ouachita Mountains
- [ ] Arkansas Valley
- [x] South Central Plains
- [x] Mississippi Alluvial Plain
- [x] Mississippi Valley Loess Plains

Ecobasins

Mississippi River Alluvial Plain - White River
Mississippi River Alluvial Plain (Bayou Bartholomew) - Ouachita River
Mississippi Valley Loess Plains - St. Francis River
South Central Plains - Ouachita River
South Central Plains - Red River

Habitats

	Weight
Natural Pool: Headwater - Small	Suitable
Natural Spring Run: Headwater - Small	Data Gap

Problems Faced

Threat:
Source:

Data Gaps/Research Needs

Conduct distribution survey.
Conduct life history study.

Conservation Actions

	Importance	Category
More data is needed to determine conservation actions.	High	Data Gap

Monitoring Strategies

Monitor population distribution and abundance in ongoing stream faunal surveys.

Comments

Description: A small slender darter with a short, round snout, and a pale stripe down its side (Robison and Buchanan 1988).

Fairly widespread in southern Arkansas but not normally abundant (Robison and Buchanan 1988).

Taxa Association Team and Peer Reviewers

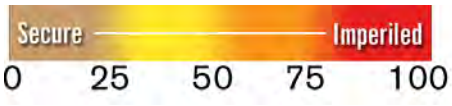
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Etheostoma teddyroosevelt

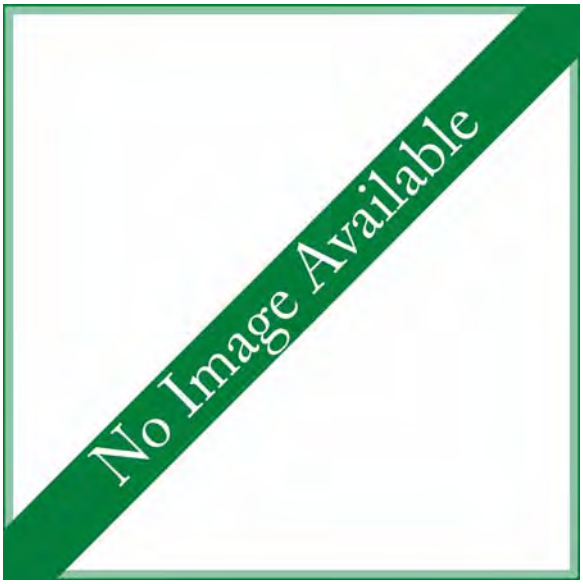
Highland Darter

Class: Actinopterygii
Order: Perciformes
Family: Percidae

Priority Score: 15 out of 100



Population Trend: Unknown

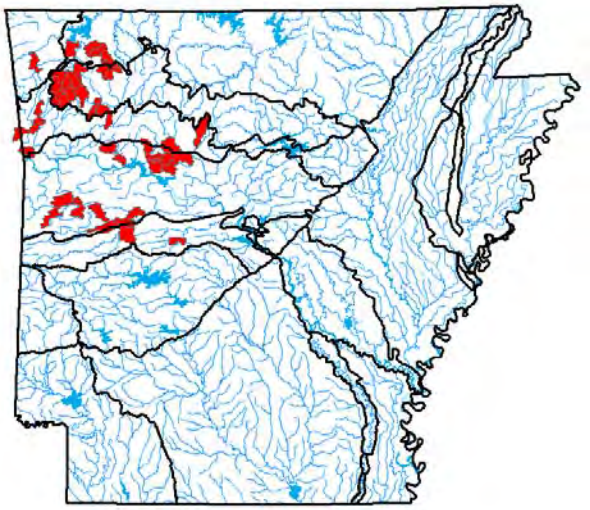


Gobal Rank: GNR — Not yet ranked

State Rank: S3 — Vulnerable in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- [x] Ozark Highlands
- [x] Boston Mountains
- [ ] Ouachita Mountains
- [x] Arkansas Valley
- [ ] South Central Plains
- [ ] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains

Ecobasins

Arkansas Valley - Arkansas River
Boston Mountains - Arkansas River
Ouachita Mountains - Arkansas River
Ozark Highlands - Arkansas River

Habitats

	Weight
Natural Glide: - Small - Medium	Suitable
Natural Pool: - Small - Medium	Optimal
Natural Riffle: - Small - Medium	Suitable

Problems Faced

Threat: Habitat destruction Source: Dam
Threat: Habitat destruction Source: Resource extraction
Threat: Habitat destruction Source: Urban development
Threat: Habitat disturbance Source: Agricultural practices
Threat: Hydrological alteration Source: Dam
Threat: Nutrient loading Source: Agricultural practices
Threat: Riparian habitat destruction Source: Agricultural practices
Threat: Sedimentation Source: Road construction

Data Gaps/Research Needs

Conduct baseline population surveys.
Refine range delineation.

Conservation Actions

	Importance	Category
Establish and enhance riparian corridors.	High	Habitat Restoration/Improvement
Implement best management practices in conjunction with agriculture and silviculture.	Medium	Threat Abatement

Monitoring Strategies

Ensure location/occurrence records are compiled into the Arkansas Fish Database.
Monitor population distribution and abundance in stream faunal surveys.

Etheostoma teddyroosevelt
Highland Darter

Comments

Description: This species was elevated from Etheostoma stigmaeum by Layman and Mayden (2012). They are found in Ozark Highland, Boston Mountain,and Ouachita Mountain tributaries of the Arkansas River in Northwest Arkansas and the upper White River. Habitat for this species includes clear, sandy and rocky pools of small to medium sized river with swift current. This species does not have a numerical G-rank, so the priority score on this fish with limited range is underestimated.

Taxa Association Team and Peer Reviewers

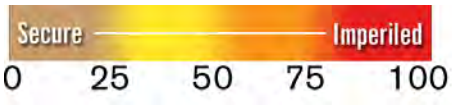
AGFC Mr. Jeff Quinn, AGFC Mr. Brian Wagner, ANHC Mr. Jason Throneberry

Etheostoma uniporum

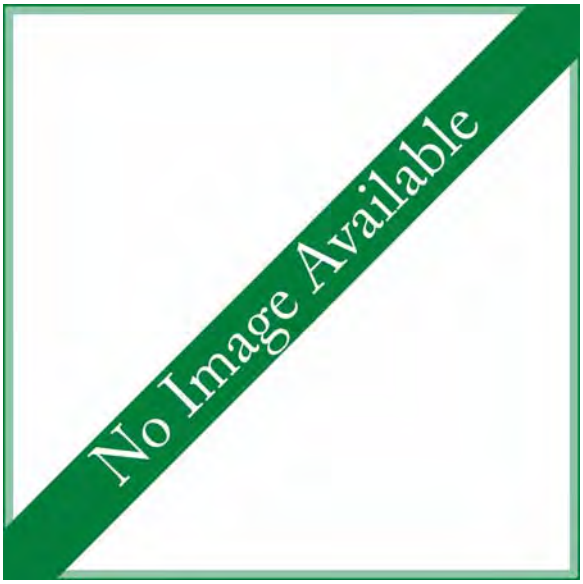
Current Darter

Class: Actinopterygii
Order: Perciformes
Family: Percidae

Priority Score: **19** **out of 100**



Population Trend: Unknown

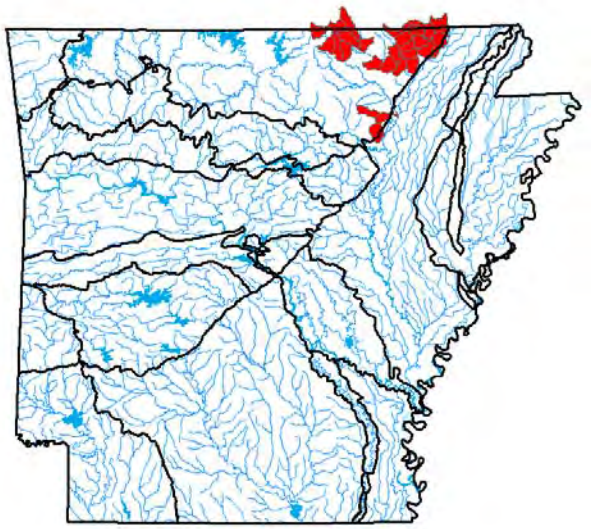


Gobal Rank: G4 — Apparently secure species

State Rank: S3 — Vulnerable in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- [x] Ozark Highlands
- [ ] Boston Mountains
- [ ] Ouachita Mountains
- [ ] Arkansas Valley
- [ ] South Central Plains
- [ ] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains

Ecobasins

Ozark Highlands - White River

Habitats	Weight
Natural Pool: - Small - Medium	Suitable
Natural Riffle: - Small - Medium	Optimal
Natural Run: - Small - Medium	Suitable

Problems Faced

Threat: Habitat destruction
Source: Grazing/Browsing

Threat: Habitat destruction
Source: Road construction

Threat: Nutrient loading
Source: Confined animal operations

Threat: Nutrient loading
Source: Grazing/Browsing

Threat: Sedimentation
Source: Grazing/Browsing

Threat: Sedimentation
Source: Road construction

Data Gaps/Research Needs

Determine numerical abundance and distribution.

Conservation Actions	Importance	Category
Improve riparian corridors.	Medium	Habitat Restoration/Improvement
Provide education and outreach to local citizens and governments concerning this species and its habitat.	Medium	Public Relations/Education
Use non-point source Best Management Practices.	Medium	Threat Abatement

Monitoring Strategies

Monitor population distribution and abundance in ongoing stream faunal surveys.

Comments

Description: A yellowish brown darter with dark brown saddles. Breeding males have predominately blue dorsal fins an orange throat, and forward slanting turquoise bars on the sides, (Robison and Buchanan 1988).

This member of the orangethroat darter group was elevated to species status by Ceas and Page (1997). The species is restricted to the Current, Eleven Point, and Spring River basins (Robison and Buchanan 1988).

Taxa Association Team and Peer Reviewers

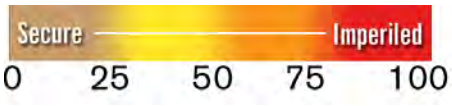
AGFC - retired Mr. Steve Filipek, SAU Dr. Henry Robison, UA/Ft. Smith Dr. Tom Buchanan, AGFC Mr. Jeff Quinn, AGFC Mr. Brian Wagner, ANHC Mr. Jason Throneberry

Fundulus blairae

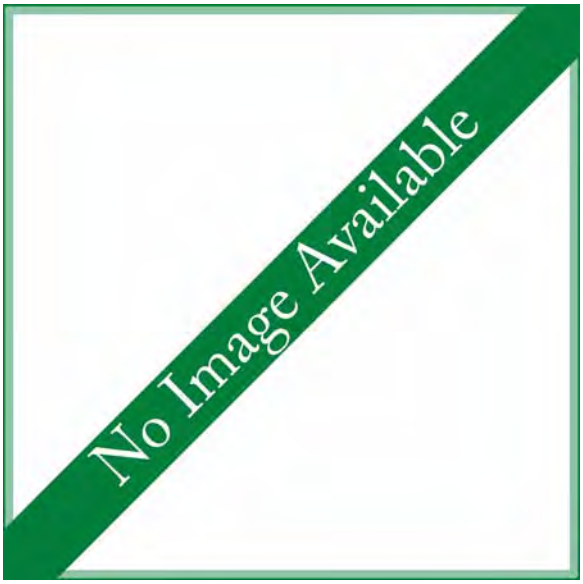
Lowland Topminnow

Class: Actinopterygii
Order: Cyprinodontiformes
Family: Fundulidae

Priority Score: **23** **out of 100**



Population Trend: Unknown

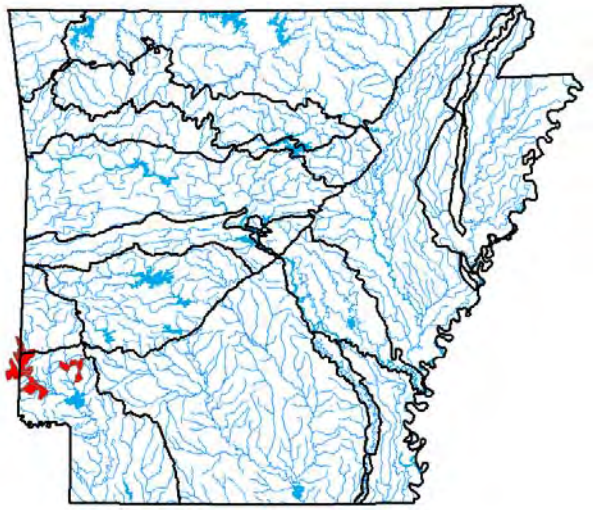


Gobal Rank: G4 — Apparently secure species

State Rank: S2 — Imperiled in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- [ ] Ozark Highlands
- [ ] Boston Mountains
- [x] Ouachita Mountains
- [ ] Arkansas Valley
- [x] South Central Plains
- [ ] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains

Ecobasins

Ouachita Mountains - Red River

South Central Plains - Red River

Habitats

	Weight
Natural Littoral:	Suitable
Natural Pool:	Suitable
Natural Swamp/Wetlands:	Suitable

Problems Faced

Threat: Chemical alteration
Source: Forestry activities

Threat: Hydrological alteration
Source: Dam

Threat: Hydrological alteration
Source: Water diversion

Threat: Nutrient loading
Source: Agricultural practices

Threat: Sedimentation
Source: Road construction

Data Gaps/Research Needs

Conduct baseline population surveys.

Conservation Actions

	Importance	Category
Establish and enhance riparian corridors.	High	Habitat Restoration/Improvement
Implement best management practices in conjunction with agriculture and silviculture.	Medium	Threat Abatement

Monitoring Strategies

Monitor population distribution and abundance in stream faunal surveys.

Comments

The lowland topminnow is only found in Ouachita Mountain streams that drain into the Red River. The species is found in small, clear creeks and swampy backwaters over mud substrate near vegetation (Robison and Buchanan 1988). Buchanan collected 50 individuals from Millwood Lake.

Taxa Association Team and Peer Reviewers

AGFC Mr. Jeff Quinn, AGFC Mr. Brian Wagner, ANHC Mr. Jason Throneberry

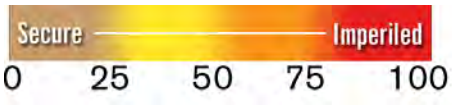
Hiodon alosoides

Goldeye

Class: Actinopterygii
Order: Osteoglossiformes
Family: Hiodontidae



Priority Score: 19 out of 100



Population Trend: Unknown

Gobal Rank: G5 — Secure

State Rank: S2 — Imperiled in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- [ ] Ozark Highlands
- [ ] Boston Mountains
- [ ] Ouachita Mountains
- [x] Arkansas Valley
- [x] South Central Plains
- [x] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains

Ecobasins

Arkansas Valley - Arkansas River
Mississippi River Alluvial Plain - Arkansas River
Mississippi River Alluvial Plain - St. Francis River
Mississippi River Alluvial Plain - White River
Mississippi River Alluvial Plain (Bayou Bartholomew) - Ouachita River
Mississippi River Alluvial Plain (Lake Chicot) - Mississippi River
South Central Plains - Ouachita River
South Central Plains - Red River

Habitats

	Weight
Man-made Pelagic: - Medium - Large	Data Gap
Natural Pool: - Medium - Large	Obligate
Natural Side channel: - Medium - Large	Suitable

Problems Faced

Threat: Habitat destruction Source: Channel alteration
Threat: Habitat destruction Source: Channel maintenance
Threat: Habitat fragmentation Source: Dam
Threat: Hydrological alteration Source: Dam

Data Gaps/Research Needs

Conduct distribution and abundance survey.

Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap
Notch dikes and restore navigation channel.	Low	Habitat Restoration/Improvement

Monitoring Strategies

Monitor population distribution and abundance in large river faunal surveys.

Comments

Description: A deep-bodied, compressed, silvery, shad-like with a large eye (Robison and Buchanan 1988). An inhabitant of medium to large rivers, abundant nowhere in state (Robison and Buchanan 1988). During high flows, the species is captured in moderate numbers by anglers with cast nets at the Arkansas River below Dam 2. Goldeye comprised 0.1% of fish captured in the White River by Vaught 2013.

Taxa Association Team and Peer Reviewers

AGFC - retired Mr. Steve Filipek, SAU Dr. Henry Robison, UA/Ft. Smith Dr. Tom Buchanan, AGFC Mr. Jeff Quinn, AGFC Mr. Brian Wagner, ANHC Mr. Jason Throneberry

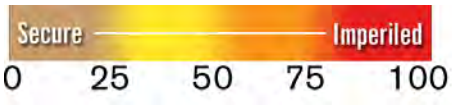
Hiodon tergisus

Mooneye

Class: Actinopterygii
Order: Hiodontiformes
Family: Hiodontidae



Priority Score: 19 **out of 100**



Population Trend: Unknown

Gobal Rank: G5 — Secure

State Rank: S2 — Imperiled in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- [x] Ozark Highlands
- [ ] Boston Mountains
- [ ] Ouachita Mountains
- [x] Arkansas Valley
- [x] South Central Plains
- [x] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains

Ecobasins

Arkansas Valley - Arkansas River
Mississippi River Alluvial Plain - White River
Mississippi River Alluvial Plain (Lake Chicot) - Mississippi River
Ozark Highlands - White River
South Central Plains - Ouachita River

Habitats

	Weight
Natural Riffle: - Large	Obligate
Natural Shoal: - Large	Suitable

Problems Faced

Threat: Hydrological alteration
Source: Dam

Data Gaps/Research Needs

Conduct baseline population surveys.
Conduct life history study.

Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

Ensure location/occurrence records are compiled into the Arkansas Fish Database.
Monitor population distribution and abundance in large river surveys.

Comments

Mooneye inhabit the large rivers of the state including the Arkansas, White, Black, Little Red, Strawberry, Spring, Current, and Ouachita Rivers. The species is found in swift current over firm substrate. Buchanan (2003) did not report the species from the Red River. Vogt (2013) reported that mooneye represented 2% of fish captured with boat electrofishing in the lower White River during 2010, and CPUE was 0.14 and 0.17 fish/hr in the warm and transitional areas of the river.

Taxa Association Team and Peer Reviewers

AGFC Mr. Jeff Quinn, AGFC Mr. Brian Wagner, ANHC Mr. Jason Throneberry

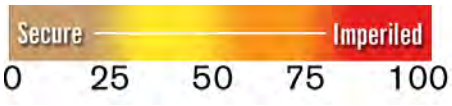
Hybognathus placitus

Plains Minnow

Class: Actinopterygii
Order: Cypriniformes
Family: Cyprinidae



Priority Score: 27 out of 100



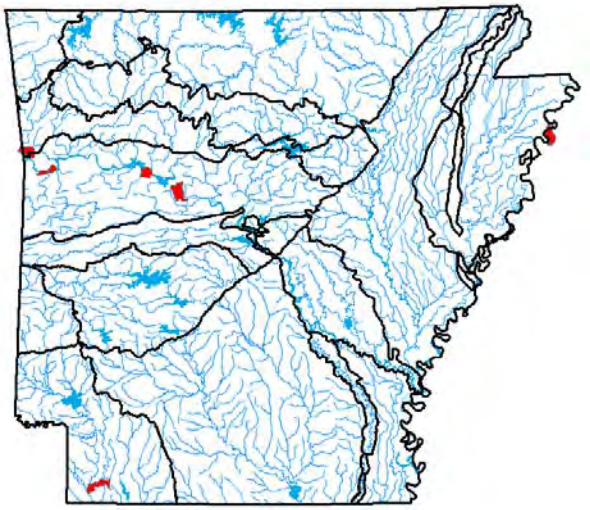
Population Trend: Unknown

Gobal Rank: G4 — Apparently secure species

State Rank: SH — Historic record. Possibly extirpated in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- [ ] Ozark Highlands
- [ ] Boston Mountains
- [ ] Ouachita Mountains
- [x] Arkansas Valley
- [x] South Central Plains
- [x] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains

Ecobasins

Arkansas Valley - Arkansas River

Mississippi Valley Loess Plains - St. Francis River

South Central Plains - Red River

Problems Faced

Threat: Biological alteration
Source: Dam

Threat: Habitat destruction
Source: Dam

Threat: Hydrological alteration
Source: Dam

Data Gaps/Research Needs

Conduct baseline population surveys.

Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

Monitor population distribution and abundance in large river surveys.

Comments

Description: a large minnow with a short head, blunt snout, sub-terminal mouth, and very small eye (Robison and Buchanan 1988). The species has been collected in the Mississippi, Arkansas, and Red rivers, and no breeding populations are known to occur in the state.

Taxa Association Team and Peer Reviewers

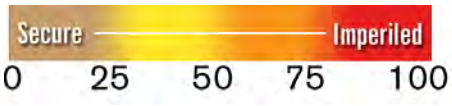
AGFC Mr. Jeff Quinn, AGFC Mr. Brian Wagner, ANHC Mr. Jason Throneberry

Lampetra aepyptera

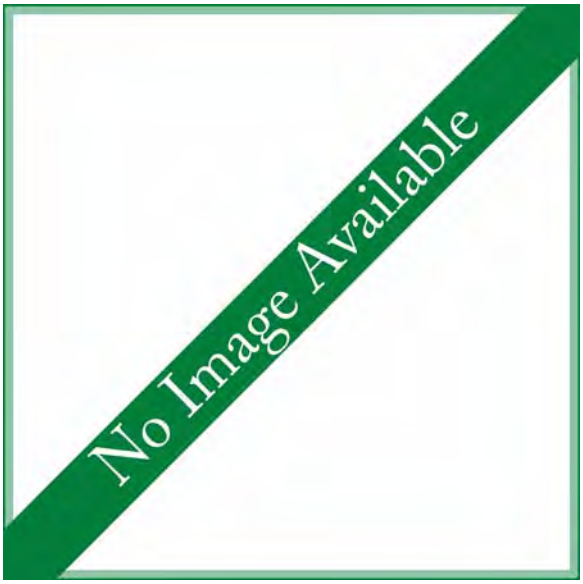
Least Brook Lamprey

Class: Petromyzontida
Order: Petromyzontiformes
Family: Petromyzontidae

Priority Score: **15** **out of 100**



Population Trend: Unknown

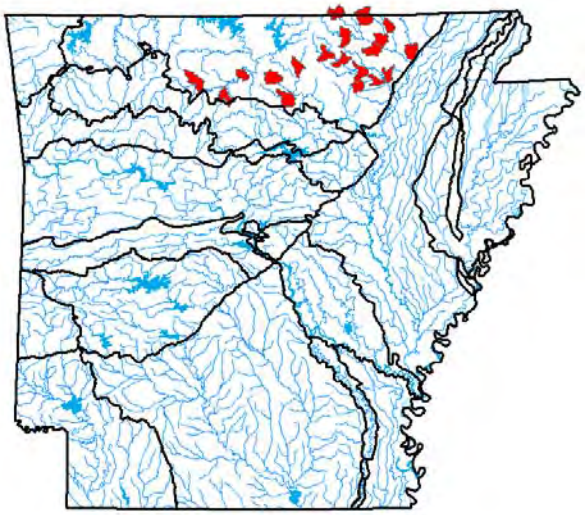


Gobal Rank: G5 — Secure

State Rank: S3 — Vulnerable in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- [x] Ozark Highlands
- [ ] Boston Mountains
- [ ] Ouachita Mountains
- [ ] Arkansas Valley
- [ ] South Central Plains
- [ ] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains

Ecobasins

Ozark Highlands - White River

Habitats	Weight
Natural Pool: - Medium	Suitable

Problems Faced

Threat: Hydrological alteration
Source: Dam

Threat: Riparian habitat destruction
Source: Conversion of riparian forest

Threat: Sedimentation
Source: Agricultural practices

Data Gaps/Research Needs

Conduct baseline population surveys.

Conduct life history study.

Conservation Actions	Importance	Category
Establish and enhance riparian corridors.	High	Habitat Restoration/Improvement
Implement best management practices in conjunction with agriculture and silviculture.	Medium	Threat Abatement

Monitoring Strategies

Ensure location/occurrence records are compiled into the Arkansas Fish Database.

Monitor population distribution and abundance in stream faunal surveys.

Comments

This species typically inhabits headwater to medium-sized streams with clean gravel riffles, and the species inhabits smaller streams than other Arkansas lampreys (Robison and Buchanan 1988).

Taxa Association Team and Peer Reviewers

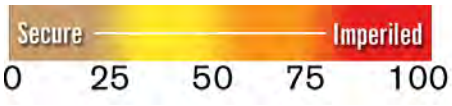
AGFC Mr. Jeff Quinn, AGFC Mr. Brian Wagner, ANHC Mr. Jason Throneberry

Lethenteron appendix

American Brook Lamprey

Class: Petromyzontida
Order: Petromyzontiformes
Family: Petromyzontidae

Priority Score: 19 out of 100



Population Trend: Unknown



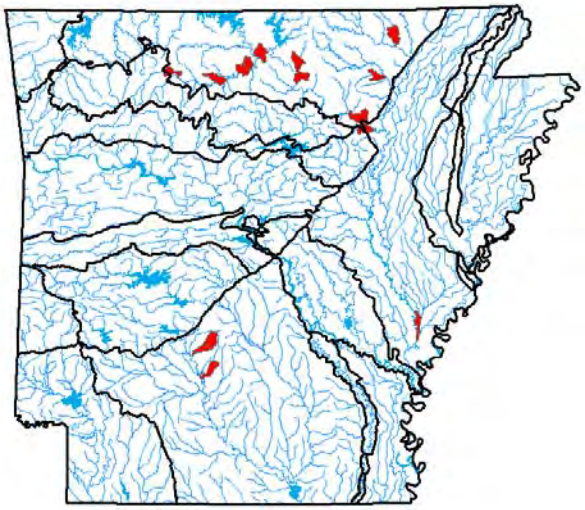
©Konrad P. Schmidt

Gobal Rank: G4 — Apparently secure species

State Rank: S3 — Vulnerable in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- [x] Ozark Highlands
- [x] Boston Mountains
- [ ] Ouachita Mountains
- [ ] Arkansas Valley
- [x] South Central Plains
- [x] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains

Ecobasins

Boston Mountains - White River
Mississippi River Alluvial Plain - White River
Ozark Highlands - White River
South Central Plains - Ouachita River

Habitats	Weight
Natural Pool: - Small - Medium	Suitable
Natural Riffle: - Small - Medium	Obligate

Problems Faced

Threat: Hydrological alteration Source: Dam
Threat: Riparian habitat destruction Source: Conversion of riparian forest
Threat: Sedimentation Source: Agricultural practices

Data Gaps/Research Needs

Conduct targeted baseline population surveys.
Determine spawning sites.

Conservation Actions	Importance	Category
Establish and enhance riparian corridors.	High	Habitat Restoration/Improvement
Implement best management practices in conjunction with agriculture and silviculture.	Medium	Threat Abatement

Monitoring Strategies

Ensure location/occurrence records are compiled into the Arkansas Fish Database.
Monitor population distribution and abundance in stream faunal surveys.

Comments

Description: This species name was changed from Lamptera appendix. It inhabits cool, clear, small to medium sized streams in gravel bottom runs and flowing pools.

Taxa Association Team and Peer Reviewers

AGFC Mr. Jeff Quinn, AGFC Mr. Brian Wagner, ANHC Mr. Jason Throneberry

Lythrurus snelsoni

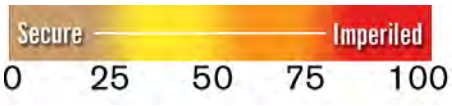
Ouachita Shiner



©Daniel Fenner

Class: Actinopterygii
Order: Cypriniformes
Family: Cyprinidae

Priority Score: 27 out of 100



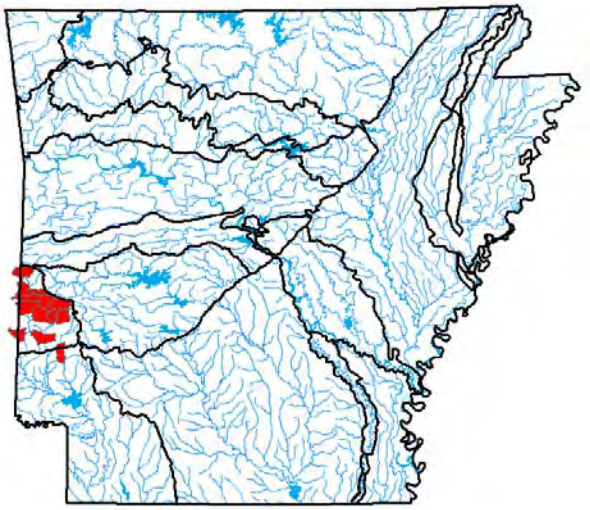
Population Trend: Unknown

Gobal Rank: G3G4 — Vulnerable (uncertain rank)

State Rank: S2 — Imperiled in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- [ ] Ozark Highlands
- [ ] Boston Mountains
- [x] Ouachita Mountains
- [ ] Arkansas Valley
- [x] South Central Plains
- [ ] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains

Ecobasins

Ouachita Mountains - Red River

South Central Plains - Red River

Habitats

	Weight
Natural Glide: - Medium	Suitable
Natural Pool: - Medium	Obligate

Problems Faced

Threat: Chemical alteration
Source: Forestry activities

Threat: Hydrological alteration
Source: Dam

Threat: Hydrological alteration
Source: Water diversion

Threat: Nutrient loading
Source: Agricultural practices

Threat: Sedimentation
Source: Conversion of riparian forest

Threat: Sedimentation
Source: Road construction

Data Gaps/Research Needs

Conduct baseline population surveys.

Conduct life history study.

Conservation Actions

	Importance	Category
Establish and enhance riparian corridors.	High	Habitat Restoration/Improvement
Implement best management practices in conjunction with agriculture and silviculture.	Medium	Threat Abatement

Monitoring Strategies

Monitor population distribution and abundance in stream faunal surveys.

Comments

The species lives in pools of clear, high-gradient streams of the Mountain Fork and Cossatot river basins (Robison and Buchanan 1988). Buchanan (2005) collected 8 specimens from Gillham Lake.

Taxa Association Team and Peer Reviewers

AGFC Mr. Jeff Quinn, AGFC Mr. Brian Wagner, ANHC Mr. Jason Throneberry

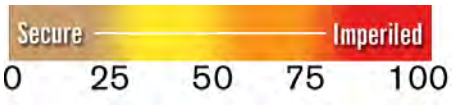
Macrhybopsis hyostoma

Shoal Chub

Class: Actinopterygii
Order: Cypriniformes
Family: Cyprinidae



Priority Score: 15 out of 100



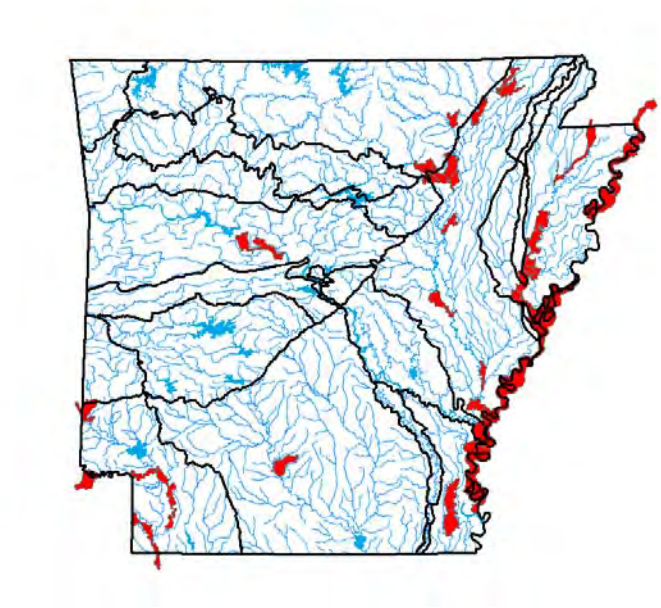
Population Trend: Stable

Gobal Rank: G5 — Secure

State Rank: S3 — Vulnerable in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- [x] Ozark Highlands
- [ ] Boston Mountains
- [ ] Ouachita Mountains
- [x] Arkansas Valley
- [x] South Central Plains
- [x] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains

Ecobasins

Arkansas Valley - Arkansas River
Mississippi River Alluvial Plain - Arkansas River
Mississippi River Alluvial Plain - White River
Mississippi River Alluvial Plain (Lake Chicot) - Mississippi River
Mississippi Valley Loess Plains - St. Francis River
Ozark Highlands - White River
South Central Plains - Ouachita River
South Central Plains - Red River

Habitats

	Weight
Natural Pool: - Large	Suitable
Natural Shoal: - Large	Optimal
Natural Side channel: - Large	Suitable

Problems Faced

Threat: Habitat destruction Source: Channel alteration
Threat: Habitat fragmentation Source: Dam
Threat: Hydrological alteration Source: Dam
Threat: Sedimentation Source: Non-point source pollution

Data Gaps/Research Needs

Conduct baseline population surveys.

Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

Ensure location/occurrence records are compiled into the Arkansas Fish Database.
Monitor population distribution and abundance in large river surveys.

Comments

The Shoal Chub is one of the species that used to be included in M. aestivalis (McAllister and others 2010, 2012). Layher and others (2005) captured 995 individuals from 7 large rivers in Arkansas. The Fish Taxa Team recommends using the S-rank calculator to re-evaluate the species once distributional records are entered into the fish database.

Taxa Association Team and Peer Reviewers

AGFC Mr. Jeff Quinn, AGFC Mr. Brian Wagner, ANHC Mr. Jason Throneberry

Macrhybopsis meeki

Sicklefin Chub

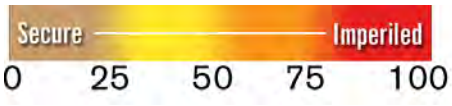


Class: Actinopterygii

Order: Cypriniformes

Family: Cyprinidae

Priority Score: **43** **out of 100**



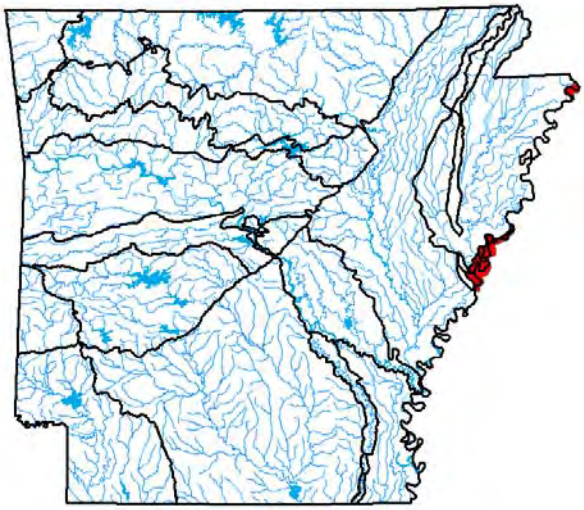
Population Trend: Decreasing

Gobal Rank: G3 — Vulnerable species

State Rank: S1 — Critically imperiled in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- ☐ Ozark Highlands
- ☐ Boston Mountains
- ☐ Ouachita Mountains
- ☐ Arkansas Valley
- ☐ South Central Plains
- ☑ Mississippi Alluvial Plain
- ☐ Mississippi Valley Loess Plains

Ecobasins

Mississippi River Alluvial Plain - Arkansas River
Mississippi River Alluvial Plain - St. Francis River
Mississippi River Alluvial Plain - White River
Mississippi River Alluvial Plain (Lake Chicot) - Mississippi River

Habitats

	Weight
Natural Run: - Large	Obligate
Natural Shoal: - Large	Obligate

Problems Faced

Threat: Habitat destruction Source: Channel alteration
Threat: Habitat destruction Source: Channel maintenance
Threat: Habitat destruction Source: Resource extraction

Data Gaps/Research Needs

Conduct distribution study.

Conservation Actions

	Importance	Category
Coordinate with other agencies and entities for conservation measures.	Medium	Public Relations/Education

Monitoring Strategies

More information is needed before a monitoring strategy can be developed.

Comments

Description: A pale, silvery, barbeled minnow with a round snout and small eyes (Robison and Buchanan 1988). Only one istorical Arkansas record, which is from the Mississippi River (Robison and Buchanan 1988). Recent collections of three individuals (2006, 2008) have been made by the U.S. Army Corps of Engineers at Mhoon Bend and Island 63 (Dr. Todd Slack, personal communication). This species has declined in the Missouri portion of the Mississippi River (Robert Hrabik, personal communication).

Taxa Association Team and Peer Reviewers

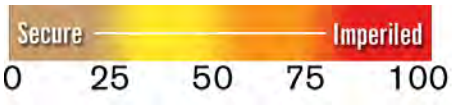
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Moxostoma anisurum

Silver Redhorse

Class: Actinopterygii
Order: Cypriniformes
Family: Catostomidae

Priority Score: 29 out of 100





©Konrad P. Schmidt

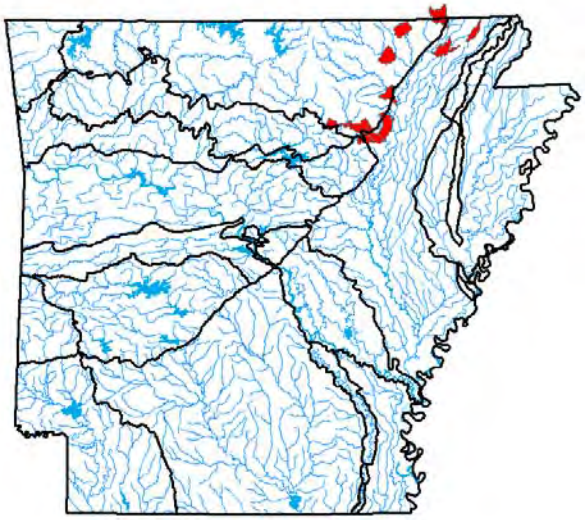
Population Trend: Decreasing

Gobal Rank: G5 — Secure

State Rank: S1 — Critically imperiled in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- [x] Ozark Highlands
- [ ] Boston Mountains
- [ ] Ouachita Mountains
- [ ] Arkansas Valley
- [ ] South Central Plains
- [x] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains

Ecobasins

Mississippi River Alluvial Plain - White River
Ozark Highlands - White River

Habitats

	Weight
Natural Pool: - Medium - Large	Optimal
Natural Riffle: - Medium - Large	Obligate

Problems Faced

Threat: Habitat destruction Source: Resource extraction
Threat: Nutrient loading Source: Confined animal operations
Threat: Sedimentation Source: Confined animal operations
Threat: Sedimentation Source: Grazing/Browsing
Threat: Sedimentation Source: Resource extraction
Threat: Sedimentation Source: Road construction

Data Gaps/Research Needs

Assess abundance in the middle White River and the Current River.
Conduct distribution survey.

Conservation Actions

	Importance	Category
Establish or improve riparian buffers.	Medium	Habitat Restoration/Improvement
Reduce or eliminate resource extraction.	Medium	Threat Abatement
Reduce sedimentation using Best Management Practices.	Medium	Threat Abatement

Monitoring Strategies

Ensure location/occurrence records are compiled into the Arkansas Fish Database.
Monitor distribution and abundance with general river surveys.

Comments

Description: A robust, pale yellow or silvery sucker growing to a maximum of 20 inches (Robison and Buchanan 1988).

The silver redhorse is rare in Arkansas (Robison and Buchanan 1988), and only 23 specimens have been collected from five rivers (McAllister and others 2009).

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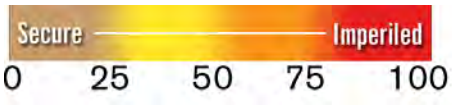
Moxostoma pisolabrum

Pealip Redhorse

Class: Actinopterygii
Order: Cypriniformes
Family: Catostomidae



Priority Score: 19 out of 100



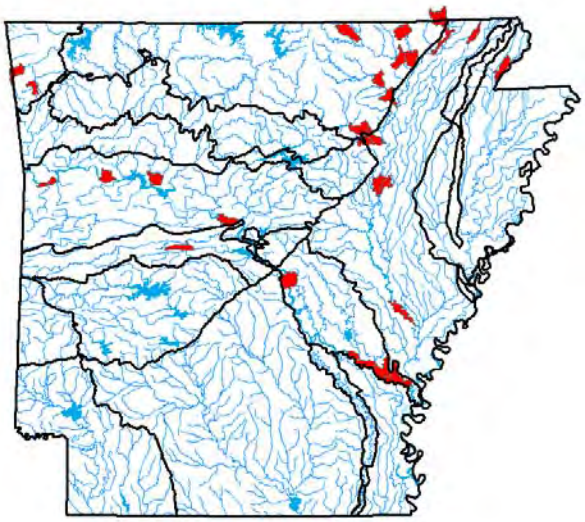
Population Trend: Unknown

Gobal Rank: G5 — Secure

State Rank: S2 — Imperiled in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- [x] Ozark Highlands
- [ ] Boston Mountains
- [ ] Ouachita Mountains
- [x] Arkansas Valley
- [ ] South Central Plains
- [x] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains

Ecobasins

Arkansas Valley - Arkansas River
Mississippi River Alluvial Plain - Arkansas River
Mississippi River Alluvial Plain - St. Francis River
Mississippi River Alluvial Plain - White River
Ouachita Mountains - Arkansas River
Ozark Highlands - Arkansas River
Ozark Highlands - White River

Habitats

	Weight
Natural Other: - Small - Medium - Large	Suitable
Natural Pool: - Small - Medium - Large	Optimal
Natural Riffle: - Small - Medium - Large	Obligate
Natural Run: - Small - Medium - Large	Obligate

Problems Faced

Threat: Habitat destruction Source: Channel alteration
Threat: Habitat destruction Source: Dam
Threat: Habitat destruction Source: Resource extraction
Threat: Hydrological alteration Source: Dam

Data Gaps/Research Needs

Conduct distribution surveys.

Conservation Actions

	Importance	Category
Establish or improve riparian buffers.	Medium	Habitat Restoration/Improvement
Minimize migration barriers.	Medium	Threat Abatement
Reduce or eliminate resource extraction.	Medium	Threat Abatement

Monitoring Strategies

Monitor distribution and abundance with general large river surveys.

Comments

Description: A slender sucker with a red tail, growing to 24 inches (Robison and Buchanan 1988). This species was elevated from the shorthead redhorse by Nelson and others (2004).

Sparse records for this species are likely due to limited sampling of large rivers instead of rarity (Robison and Buchanan 1988; McAllister and others 2010).

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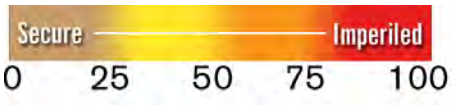
Mugil cephalus

Striped Mullet

Class: Actinopterygii
Order: Mugiliformes
Family: Mugilidae



Priority Score: 19 out of 100



Population Trend: Stable

Gobal Rank: G5 — Secure

State Rank: S2 — Imperiled in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- [x] Ozark Highlands
- [ ] Boston Mountains
- [ ] Ouachita Mountains
- [x] Arkansas Valley
- [x] South Central Plains
- [x] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains

Ecobasins

Arkansas Valley - Arkansas River
Mississippi River Alluvial Plain - Arkansas River
Mississippi River Alluvial Plain - White River
Mississippi River Alluvial Plain (Lake Chicot) - Mississippi River
Ozark Highlands - White River
South Central Plains - Ouachita River

Habitats

	Weight
Natural Pool: - Large	Suitable
Natural Riffle: - Large	Suitable

Problems Faced

Threat: Habitat destruction Source: Dam
Threat: Hydrological alteration Source: Dam

Data Gaps/Research Needs

Determine abundance in large river surveys.

Conservation Actions

	Importance	Category
Improve fish passage.	Medium	Threat Abatement

Monitoring Strategies

Ensure location/occurrence records are compiled into the Arkansas Fish Database.
Monitor population distribution and abundance in stream faunal surveys.

Comments

Marine and estuarine, often ascending coastal rivers for considerable distances. Grimes (2015) captured 817 individuals in the lower Arkansas River downstream of Wilber D. Mills Dam. Vogt (2013) reported that striped mullet electrofishing CPUE was 0.07 and 0.17 fish/hour in the warm and transitional areas of the lower White River.

Taxa Association Team and Peer Reviewers

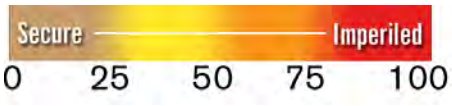
AGFC Mr. Jeff Quinn, AGFC Mr. Brian Wagner, ANHC Mr. Jason Throneberry

Nocomis asper

Redspot Chub

Class: Actinopterygii
Order: Cypriniformes
Family: Cyprinidae

Priority Score: **19** **out of 100**



Population Trend: Unknown

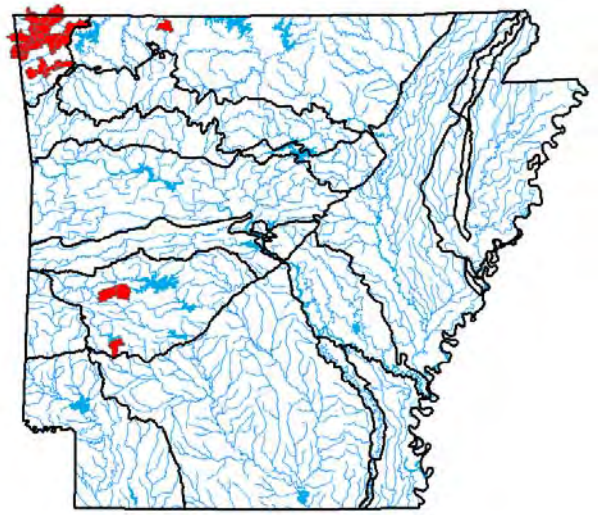


Gobal Rank: G4 — Apparently secure species

State Rank: S3 — Vulnerable in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- [x] Ozark Highlands
- [ ] Boston Mountains
- [x] Ouachita Mountains
- [ ] Arkansas Valley
- [ ] South Central Plains
- [ ] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains

Ecobasins

Ouachita Mountains - Ouachita River
Ozark Highlands - Arkansas River

Habitats	Weight
Natural Glide: - Small - Medium	Suitable
Natural Pool: - Small - Medium	Suitable
Natural Riffle: - Small - Medium	Obligate
Natural Run: - Small - Medium	Obligate

Problems Faced

Threat: Habitat destruction Source: Channel alteration
Threat: Habitat destruction Source: Resource extraction
Threat: Habitat destruction Source: Urban development
Threat: Hydrological alteration Source: Dam
Threat: Hydrological alteration Source: Urban development
Threat: Nutrient loading Source: Confined animal operations
Threat: Nutrient loading Source: Grazing/Browsing
Threat: Nutrient loading Source: Municipal/Industrial point source
Threat: Sedimentation Source: Grazing/Browsing
Threat: Sedimentation Source: Road construction
Threat: Sedimentation Source: Urban development

Data Gaps/Research Needs

Conduct abundance and distribution surveys.

Conservation Actions	Importance	Category
Maintain or, where necessary, restore groundwater quality to state standards.	Low	Habitat Restoration/Improvement
Maintain or, where necessary, restore instream aquatic habitat, substrate and flow regime.	Medium	Habitat Restoration/Improvement
Protect river corridors using appropriate buffer widths relative to stream size.	High	Habitat Protection

Monitoring Strategies

Monitor population distribution and abundance in stream faunal surveys.

Comments

Description: A large (10 inches max), robust, cylindrical minnow with a red spot behind the eye of adults (Robison and Buchanan 1988).

Inhabits upland, clear, gravelly, spring-fed streams, mostly in the Arkansas River drainage in northwest Arkansas, with a couple of disjunct populations in the Ouachita River system (Robison and Buchanan 1988). Echelle et al. (2014) indicated genetic structure is weak among the disjunct populations, indicating they are likely the same species.

Taxa Association Team and Peer Reviewers

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Notropis atrocaudalis

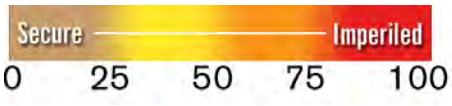
Blackspot Shiner

Class: Actinopterygii
Order: Cypriniformes
Family: Cyprinidae



©G. W. Sneegas

Priority Score: 19 out of 100



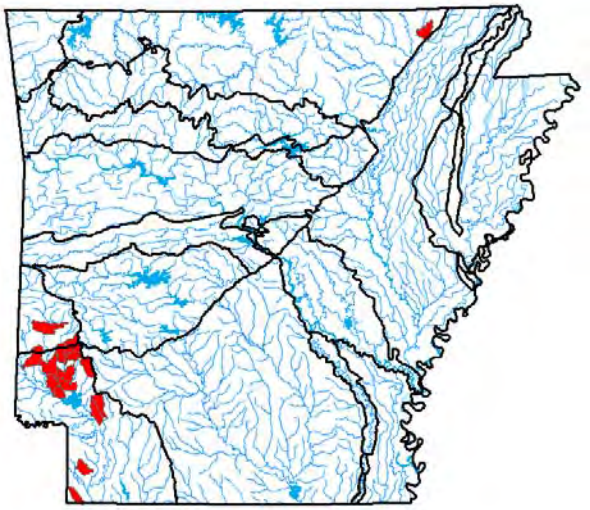
Population Trend: Unknown

Gobal Rank: G4 — Apparently secure species

State Rank: S3 — Vulnerable in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- [ ] Ozark Highlands
- [ ] Boston Mountains
- [ ] Ouachita Mountains
- [ ] Arkansas Valley
- [x] South Central Plains
- [ ] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains

Ecobasins

Ouachita Mountains - Red River
South Central Plains - Red River

Habitats

	Weight
Natural Pool: - Small	Suitable
Natural Riffle: - Small	Suitable
Natural Run: - Small	Optimal
Natural Spring Run: - Small	Optimal

Problems Faced

Threat: Habitat destruction Source: Channel alteration
Threat: Habitat destruction Source: Dam
Threat: Hydrological alteration Source: Channel alteration
Threat: Hydrological alteration Source: Dam
Threat: Sedimentation Source: Grazing/Browsing
Threat: Sedimentation Source: Urban development

Data Gaps/Research Needs

Conduct distribution surveys.

Conservation Actions

	Importance	Category
Conserve the water quality and habitat integrity of small stream tributaries and spring runs in the Little River and Red River systems.	High	Habitat Protection
Promote and implement measures to reduce sedimentation and turbidity in stream habitat.	Medium	Habitat Restoration/Improvement

Monitoring Strategies

Monitor presence through general stream faunal surveys.

Comments

Description: A robust, blunt-nosed, small-headed shiner with a fairly large eye and a black stripe down its side (Robison and Buchanan 1988).

The Blackspot shiner is a rare fish in small, clear streams of the Red River basin (Robison and Buchanan 1988). Bean and others (2010) described habitat use, life history, and diet of the species.

Taxa Association Team and Peer Reviewers

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Notropis bairdi

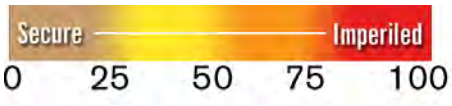
Red River Shiner

Class: Actinopterygii
Order: Cypriniformes
Family: Cyprinidae



©G. W. Sneegas

Priority Score: 27 out of 100



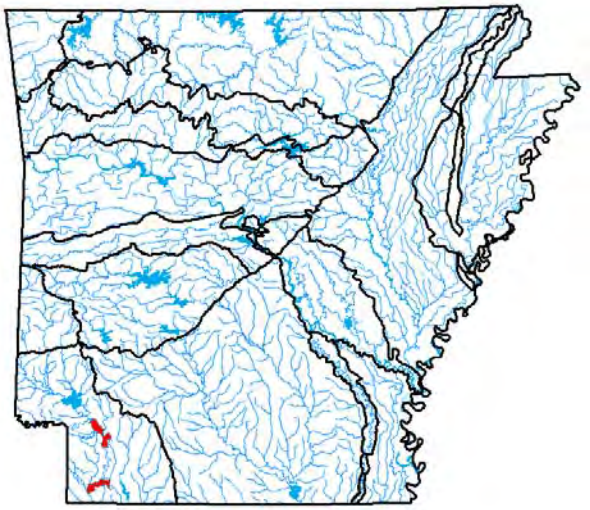
Population Trend: Unknown

Gobal Rank: G4 — Apparently secure species

State Rank: SH — Historic record. Possibly extirpated in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- ☐ Ozark Highlands
- ☐ Boston Mountains
- ☐ Ouachita Mountains
- ☐ Arkansas Valley
- ☑ South Central Plains
- ☐ Mississippi Alluvial Plain
- ☐ Mississippi Valley Loess Plains

Ecobasins

South Central Plains - Red River

Habitats	Weight
Natural Pool: - Large	Suitable
Natural Shoal: - Large	Suitable

Problems Faced

Threat: Habitat destruction
Source: Channel alteration

Threat: Habitat destruction
Source: Dam

Threat: Habitat destruction
Source: Resource extraction

Threat: Hydrological alteration
Source: Water diversion

Data Gaps/Research Needs

Conduct distribution surveys.

Conservation Actions	Importance	Category
Restore natural flow regime.	High	Habitat Protection
Work across political boundaries to conserve and enhance populations.	Medium	Population Management
Work with USACOE to minimize impacts from proposed Southwest Arkansas Navigation Project.	High	Threat Abatement

Monitoring Strategies

Survey for this species in the Red River.

Comments

Description: A small, tan to gray, compressed shiner (Robison and Buchanan 1988).

Species is locally abundant in Oklahoma/Texas, occurs in Arkansas only on periphery of its range. Only known in Arkansas from 2 pre-1950 records from the Red River (Robison and Buchanan 1988). The species has been collected 18-km upstream of the Arkansas state line as recently as 1995, so future sampling of the Red River could possibly detect the species (Buchanan and others 2003).

Taxa Association Team and Peer Reviewers

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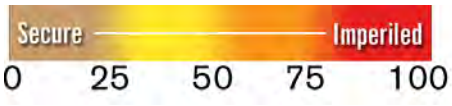
Notropis girardi

Arkansas River Shiner

Class: Actinopterygii
Order: Cypriniformes
Family: Cyprinidae



Priority Score: **50** **out of 100**



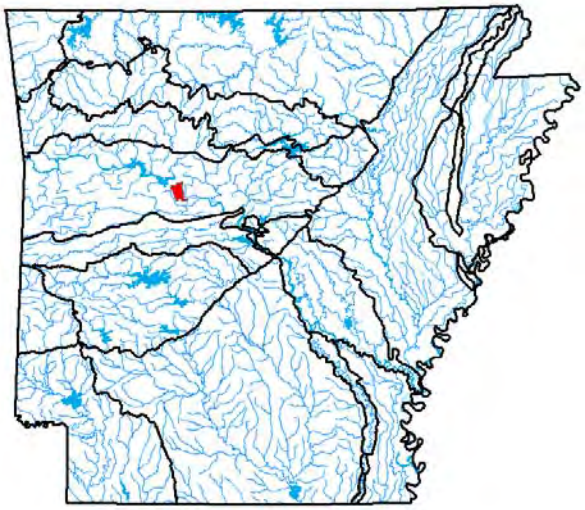
Population Trend: Unknown

Gobal Rank: G2 — Imperiled species

State Rank: SH — Historic record. Possibly extirpated in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- [ ] Ozark Highlands
- [ ] Boston Mountains
- [ ] Ouachita Mountains
- [x] Arkansas Valley
- [ ] South Central Plains
- [ ] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains

Ecobasins

Arkansas Valley - Arkansas River

Habitats

	Weight
Natural Pool: - Large	Data Gap
Natural Shoal: - Large	Data Gap
Natural Side channel: - Large	Data Gap

Problems Faced

Threat: Habitat fragmentation
Source: Dam

Threat: Hydrological alteration
Source: Dam

Data Gaps/Research Needs

It is unclear if this species was ever a regular part of the Arkansas fauna, or if it only was found as waifs from upstream.

Conservation Actions

	Importance	Category
More data is needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

Be alert for species presence in any sampling on the Arkansas River in western Arkansas.

Comments

Description: A small, compressed, tan shiner (Robison and Buchanan 1988).

Great Plains endemic of the Arkansas River, taken only once in Arkansas and likely extirpated today (Robison and Buchanan 1988). It has declined greatly across its range (Larson 1991) and has been listed as threatened under the Endangered Species Act (Federal Register 1998).

This species is believed extirpated from Arkansas. The only record of its occurrence dates from 1939. If populations are discovered in Arkansas, this information will be included in future iterations of this report.

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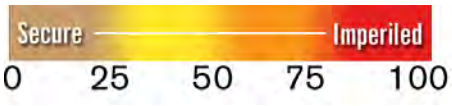
Notropis ortenburgeri

Kiamichi Shiner



Class: Actinopterygii
Order: Cypriniformes
Family: Cyprinidae

Priority Score: **33** **out of 100**



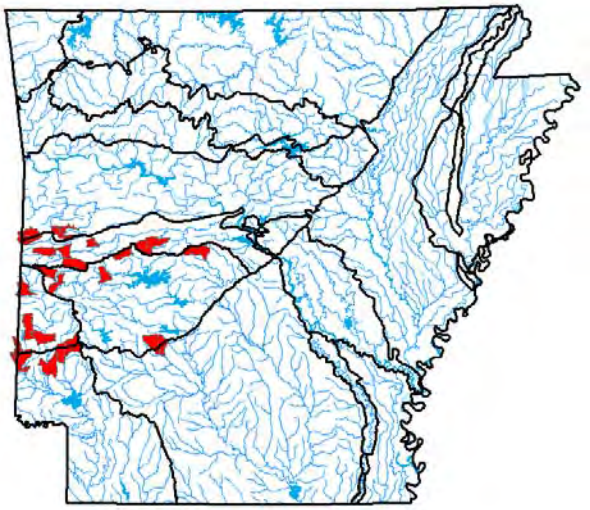
Population Trend: Decreasing

Gobal Rank: G3 — Vulnerable species

State Rank: S3 — Vulnerable in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- ☐ Ozark Highlands
- ☐ Boston Mountains
- ☑ Ouachita Mountains
- ☐ Arkansas Valley
- ☐ South Central Plains
- ☐ Mississippi Alluvial Plain
- ☐ Mississippi Valley Loess Plains

Ecobasins

Ouachita Mountains - Arkansas River

Ouachita Mountains - Ouachita River

Ouachita Mountains - Red River

South Central Plains - Red River

Habitats

	Weight
Natural Pool: - Small - Medium	Obligate

Problems Faced

Threat: Habitat destruction
Source: Dam

Threat: Sedimentation
Source: Forestry activities

Threat: Sedimentation
Source: Grazing/Browsing

Threat: Sedimentation
Source: Road construction

Data Gaps/Research Needs

Conduct distribution and abundance survey.

Conduct life history study.

Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.	High	Data Gap

Monitoring Strategies

Monitor population distribution and abundance in ongoing stream faunal surveys.

Comments

Description: A slim, silvery shiner with a large eye (Robison and Buchanan 1988).

Good populations are present in in the Little Missouri and Ouachita river basins, but recent surveys did not locate any specimens in several other basins where they were historically found (Robison 2001a). Robison (2005) indicated this is a widespread, locally abundant minnow that has not greatly decreased in abundance or range.

Taxa Association Team and Peer Reviewers

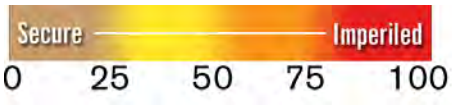
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Notropis ozarcanus

Ozark Shiner

Class: Actinopterygii
Order: Cypriniformes
Family: Cyprinidae

Priority Score: **33** **out of 100**





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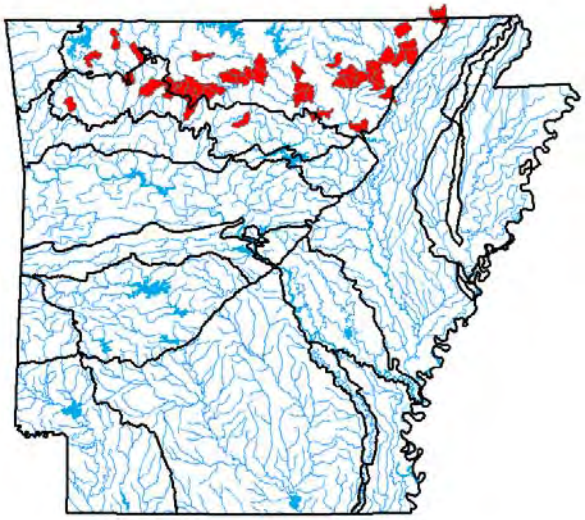
Population Trend: Decreasing

Gobal Rank: G3 — Vulnerable species

State Rank: S3 — Vulnerable in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- [x] Ozark Highlands
- [x] Boston Mountains
- [ ] Ouachita Mountains
- [ ] Arkansas Valley
- [ ] South Central Plains
- [ ] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains

Ecobasins

Boston Mountains - White River
Ozark Highlands - White River

Habitats

	Weight
Natural Pool: - Small - Medium - Large	Suitable
Natural Run: - Small - Medium - Large	Optimal

Problems Faced

Threat: Habitat destruction Source: Dam
Threat: Habitat destruction Source: Resource extraction
Threat: Habitat destruction Source: Road construction
Threat: Hydrological alteration Source: Dam
Threat: Sedimentation Source: Forestry activities
Threat: Sedimentation Source: Grazing/Browsing
Threat: Sedimentation Source: Resource extraction

Data Gaps/Research Needs

Conduct distribution and status survey.
Conduct life history study.

Conservation Actions

	Importance	Category
Enhance riparian zone.	Medium	Habitat Restoration/Improvement
Preserve habitat.	Medium	Habitat Protection
Promote alternative livestock water source.	Medium	Threat Abatement
Reduce sedimetation.	Medium	Habitat Restoration/Improvement

Monitoring Strategies

Conduct comprehensive aquatic community sampling.
Share data with other agencies and organizations.

Comments

Description: A pale yellow and silvery shiner with a blunt nose and large eye (Robison and Buchanan 1988).

Recent surveys revealed healthy populations of this fish in the Buffalo and Spring rivers. Numbers were low or absent in several rivers where the species historically was found (Robison 1995). Rigsby (2009) reported collecting 7 individuals from 2 locations in the Eleven Point River.

Taxa Association Team and Peer Reviewers

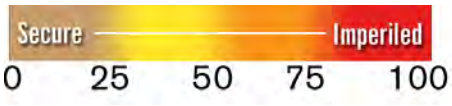
AGFC - retired Mr. Steve Filipek, SAU Dr. Henry Robison, UA/Ft. Smith Dr. Tom Buchanan, AGFC Mr. Jeff Quinn, AGFC Mr. Brian Wagner, ANHC Mr. Jason Throneberry

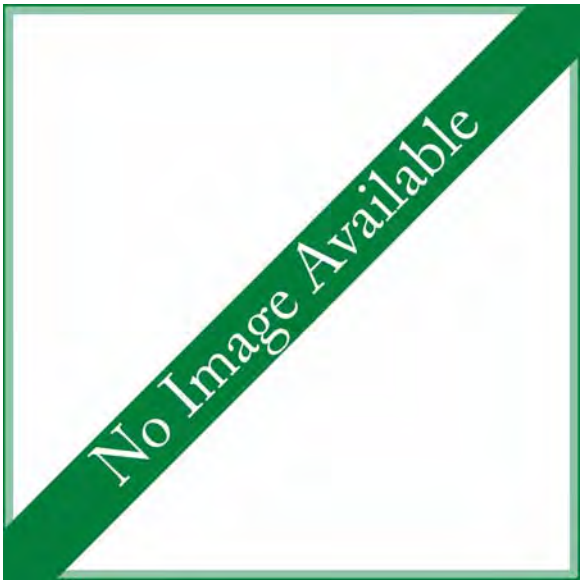
Notropis perpallidus

Peppered Shiner

Class: Actinopterygii
Order: Cypriniformes
Family: Cyprinidae

Priority Score: **33** out of 100





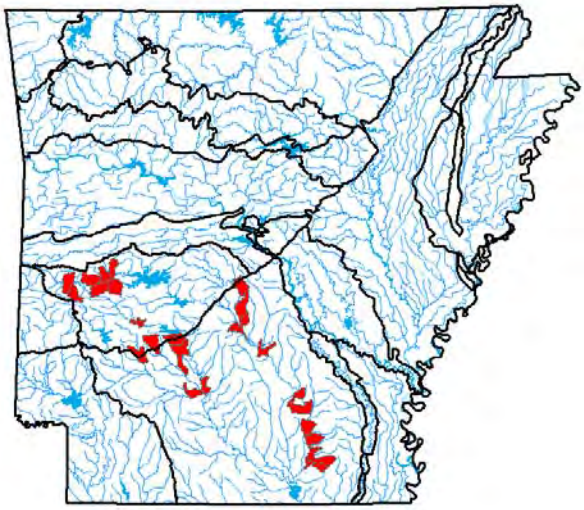
Population Trend: Decreasing

Gobal Rank: G3 — Vulnerable species

State Rank: S3 — Vulnerable in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- [ ] Ozark Highlands
- [ ] Boston Mountains
- [x] Ouachita Mountains
- [ ] Arkansas Valley
- [x] South Central Plains
- [ ] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains

Ecobasins

Ouachita Mountains - Ouachita River

South Central Plains - Ouachita River

Habitats

	Weight
Natural Pool: - Medium	Obligate

Problems Faced

Threat: Habitat destruction
Source: Dam

Threat: Habitat destruction
Source: Urban development

Threat: Sedimentation
Source: Forestry activities

Data Gaps/Research Needs

Conduct distribution and abundance surveys.

Conduct life history study.

Identify threats and sources.

Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.	High	Data Gap

Monitoring Strategies

Monitor population distribution and abundance in ongoing stream faunal surveys.

Comments

Description: A small, pale shiner sprinkled randomly with black speckles (Robison and Buchanan 1988).

Wagner, Echelle, and Maughan (1987) found significant niche overlap with N. snelsoni and N. volucellus. Robison (2006) recommended a vulnerable status for this rare fish. He collected only 17 specimens from 81 collections. He suggested the species has declined in Arkansas, only occurring in the Ouachita and Saline rivers.

Taxa Association Team and Peer Reviewers

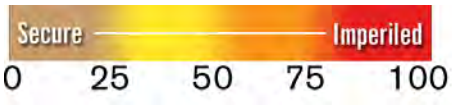
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Notropis potteri

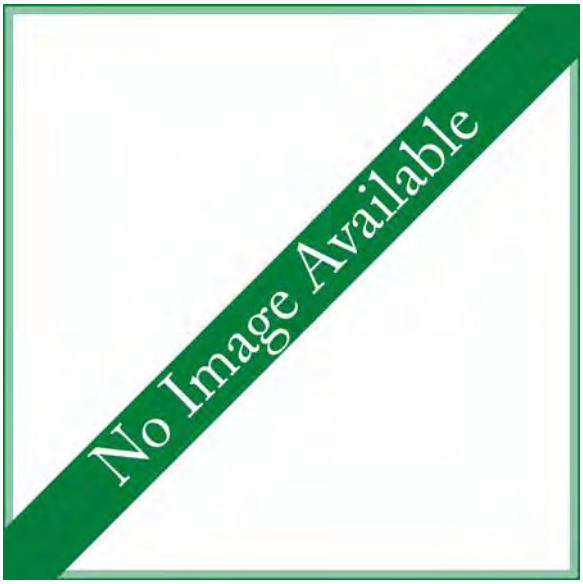
Chub Shiner

Class: Actinopterygii
Order: Cypriniformes
Family: Cyprinidae

Priority Score: **23** **out of 100**



Population Trend: Stable

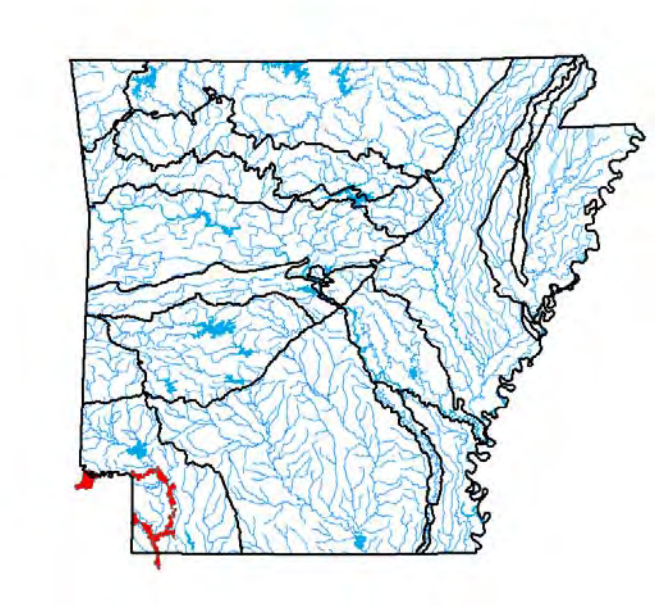


Gobal Rank: G4 — Apparently secure species

State Rank: S2 — Imperiled in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- ☐ Ozark Highlands
- ☐ Boston Mountains
- ☐ Ouachita Mountains
- ☐ Arkansas Valley
- ☑ South Central Plains
- ☐ Mississippi Alluvial Plain
- ☐ Mississippi Valley Loess Plains

Ecobasins

South Central Plains - Red River

Habitats	Weight
Natural Pool: - Large	Suitable
Natural Shoal: - Large	Suitable

Problems Faced

Threat: Hydrological alteration
Source: Dam

Data Gaps/Research Needs

Conduct baseline surveys.

Conduct life history study.

Conservation Actions	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

Monitor population distribution and abundance in the Red River.

Comments

This species is restricted to the Red River, where it was the second most abundant species captured (Buchanan et al. 2003).

Taxa Association Team and Peer Reviewers

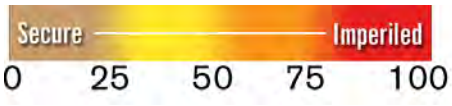
AGFC Mr. Jeff Quinn, AGFC Mr. Brian Wagner, ANHC Mr. Jason Throneberry

Notropis sabinae

Sabine Shiner

Class: Actinopterygii
Order: Cypriniformes
Family: Cyprinidae

Priority Score: **23** **out of 100**



Population Trend: Unknown

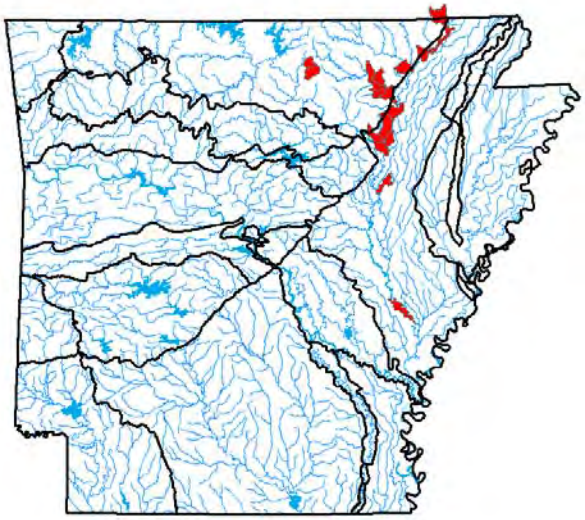

©Bill Roston

Gobal Rank: G4 — Apparently secure species

State Rank: S2 — Imperiled in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- [x] Ozark Highlands
- [ ] Boston Mountains
- [ ] Ouachita Mountains
- [ ] Arkansas Valley
- [ ] South Central Plains
- [x] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains

Ecobasins

Mississippi River Alluvial Plain - St. Francis River
Mississippi River Alluvial Plain - White River
Ozark Highlands - White River

Habitats

	Weight
Natural Glide: - Small - Medium	Data Gap
Natural Pool: - Small - Medium	Data Gap

Problems Faced

Threat: Chemical alteration Source: Non-point source pollution
Threat: Habitat destruction Source: Channel alteration
Threat: Habitat destruction Source: Resource extraction
Threat: Habitat destruction Source: Road construction
Threat: Sedimentation Source: Agricultural practices
Threat: Sedimentation Source: Channel alteration
Threat: Sedimentation Source: Road construction

Data Gaps/Research Needs

Conduct distribution and abundance surveys.
Conduct genetic analysis of similar, allopatric populations.

Conservation Actions

	Importance	Category
Protect habitat.	High	Habitat Protection
Reduce sediment.	Medium	Habitat Restoration/Improvement

Monitoring Strategies

Monitor population distribution and abundance in ongoing stream faunal surveys.

Comments

Description: A small, silver-sided shiner with a small eye (Robison and Buchanan 1988).

Populations in rivers of the eastern Ozarks are widely disjunct from range in the coastal plain of east Texas and west Louisiana (Robison and Buchanan 1988).

Taxa Association Team and Peer Reviewers

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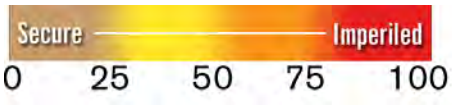
Notropis suttkusi

Rocky Shiner



Class: Actinopterygii
Order: Cypriniformes
Family: Cyprinidae

Priority Score: 27 out of 100



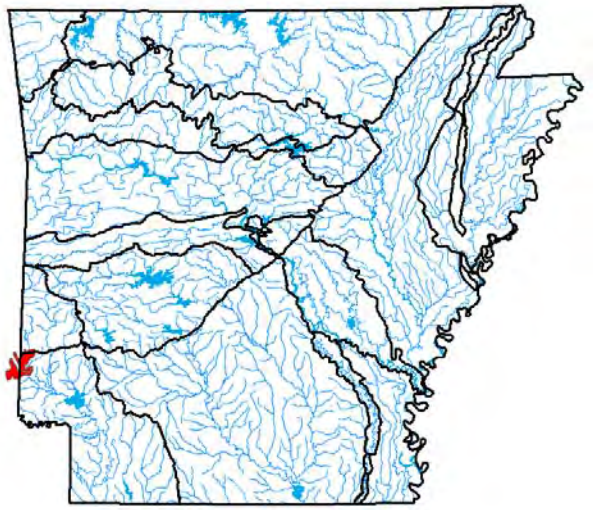
Population Trend: Unknown

Gobal Rank: G3G4 — Vulnerable (uncertain rank)

State Rank: S2 — Imperiled in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- ☐ Ozark Highlands
- ☐ Boston Mountains
- ☑ Ouachita Mountains
- ☐ Arkansas Valley
- ☐ South Central Plains
- ☐ Mississippi Alluvial Plain
- ☐ Mississippi Valley Loess Plains

Ecobasins

Ouachita Mountains - Red River
South Central Plains - Red River

Habitats

	Weight
Natural Glide:	Suitable
Natural Pool:	Suitable
Natural Riffle:	Suitable

Problems Faced

Threat: Chemical alteration Source: Forestry activities
Threat: Hydrological alteration Source: Dam
Threat: Hydrological alteration Source: Water diversion
Threat: Nutrient loading Source: Agricultural practices
Threat: Sedimentation Source: Conversion of riparian forest
Threat: Sedimentation Source: Road construction

Data Gaps/Research Needs

Conduct baseline population surveys.
Conduct life history study.

Conservation Actions

	Importance	Category
Establish and enhance riparian corridors.	High	Habitat Restoration/Improvement
Implement best management practices for road construction.	High	Threat Abatement
Implement best management practices in conjunction with agriculture and silviculture.	High	Threat Abatement

Monitoring Strategies

Monitor population distribution and abundance in stream faunal surveys.

Comments

This species was elevated from Notropis rubellus (Humphries and Cashner 1994) and appears to be abundant within its limited range (Schwemm 2013). The rocky shiner inhabits clear water streams of moderate to high gradient with gravel and rubble substrates.

Taxa Association Team and Peer Reviewers

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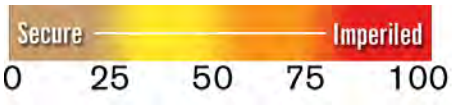
Notropis wickliffi

Channel Shiner



Class: Actinopterygii
Order: Cypriniformes
Family: Cyprinidae

Priority Score: **19** **out of 100**



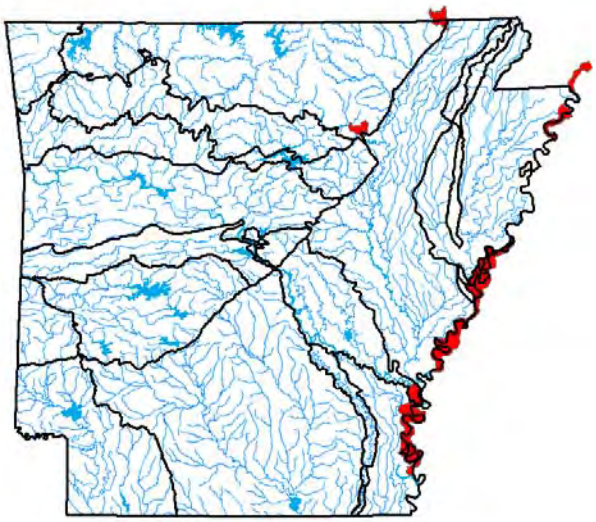
Population Trend: Unknown

Gobal Rank: G5 — Secure

State Rank: S2 — Imperiled in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- [x] Ozark Highlands
- [ ] Boston Mountains
- [ ] Ouachita Mountains
- [ ] Arkansas Valley
- [ ] South Central Plains
- [x] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains

Ecobasins

Mississippi River Alluvial Plain - Arkansas River
Mississippi River Alluvial Plain - White River
Mississippi River Alluvial Plain (Lake Chicot) - Mississippi River
Ozark Highlands - White River

Habitats

	Weight
Natural Shoal: - Medium - Large	Optimal

Problems Faced

Threat: Habitat destruction Source: Channel alteration
Threat: Hydrological alteration Source: Dam

Data Gaps/Research Needs

Conduct life history study.
Determine distribution and abundance.
Determine genetics of the Current River form.

Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

Ensure location/occurrence records are compiled into the Arkansas Fish Database.
Monitor population distribution and abundance in large river surveys.

Comments

Description: This species was long regarded as a subspecies of the mimic shiner, N. volucellus (McAllister et al. 2009). McAllister et al. (2009) reported collecting 211 channel shiners from the lower Arkansas and Mississippi rivers. Robison and Buchanan (1994) provided historical localities and noted the taxonomic status of the Current River form is unresolved. Distribution of the species is poorly understood.

Taxa Association Team and Peer Reviewers

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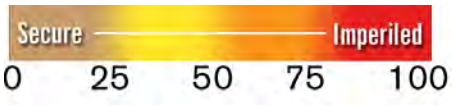
Noturus flavus

Stonecat

Class: Actinopterygii
Order: Siluriformes
Family: Ictaluridae



Priority Score: 29 out of 100



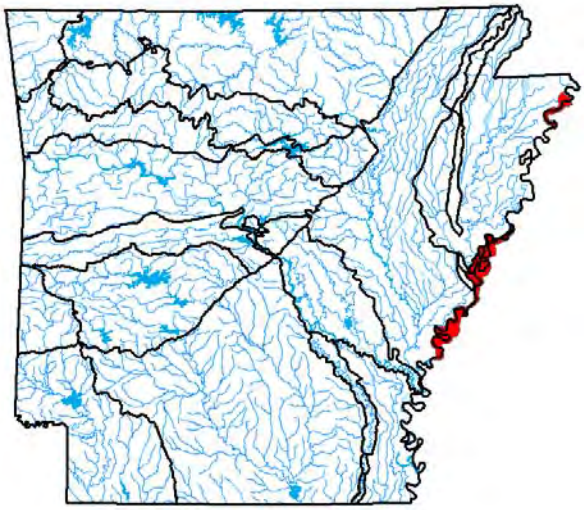
Population Trend: Decreasing

Gobal Rank: G5 — Secure

State Rank: S1 — Critically imperiled in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- ☐ Ozark Highlands
- ☐ Boston Mountains
- ☐ Ouachita Mountains
- ☐ Arkansas Valley
- ☐ South Central Plains
- ☑ Mississippi Alluvial Plain
- ☐ Mississippi Valley Loess Plains

Ecobasins

Mississippi River Alluvial Plain - St. Francis River
Mississippi River Alluvial Plain (Lake Chicot) - Mississippi River

Habitats

	Weight
Natural Shoal:	Optimal
Natural Side channel:	Suitable

Problems Faced

Threat: Biological alteration Source: Exotic species
Threat: Chemical alteration Source: Urban development
Threat: Habitat destruction Source: Channel alteration
Threat: Toxins/contaminants Source: Agricultural practices

Data Gaps/Research Needs

Determine distribution and abundance in the Mississippi River.
Determine habitat requirements.

Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

Ensure location/occurrence records are compiled into the Arkansas Fish Database.
Monitor population distribution and abundance in large river surveys. Be aware that the species could possibly be discovered in clear streams in far Northwest Arkansas.

Comments

This primarily northern species inhabits the Mississippi River in Arkansas, but clear gravel-bed streams elsewhere. McAllister and others (2012) provided recent records for the Noturus flavus in Arkansas, which have all been collected using rotenone. This species has been collected from large rip rap dike habitat in the Mississippi River.

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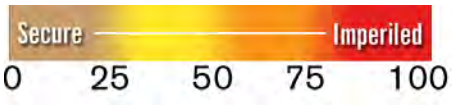
Noturus lachneri

Ouachita Madtom

Class: Actinopterygii
Order: Siluriformes
Family: Ictaluridae



Priority Score: 46 out of 100



Population Trend: Unknown

Gobal Rank: G2 — Imperiled species

State Rank: S2 — Imperiled in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- ☐ Ozark Highlands
- ☐ Boston Mountains
- ☑ Ouachita Mountains
- ☐ Arkansas Valley
- ☐ South Central Plains
- ☐ Mississippi Alluvial Plain
- ☐ Mississippi Valley Loess Plains

Ecobasins

Ouachita Mountains - Ouachita River

Habitats

	Weight
Natural Glide: - Small - Medium	Obligate
Natural Pool: - Small - Medium	Marginal
Natural Riffle: - Small - Medium	Suitable

Problems Faced

Threat: Habitat destruction
Source: Dam

Threat: Habitat destruction
Source: Resource extraction

Threat: Hydrological alteration
Source: Water diversion

Threat: Sedimentation
Source: Forestry activities

Threat: Sedimentation
Source: Resource extraction

Data Gaps/Research Needs

Conduct distribution surveys.

Conservation Actions

	Importance	Category
Maintain or, where necessary, restore instream aquatic habitat and substrate.	Medium	Habitat Restoration/Improvement

Monitoring Strategies

Monitor population distribution and abundance in ongoing stream faunal surveys.

Comments

Description: A slender, elongate, brown to gray, uniformly colored, small catfish - maximum size 2.7 inches (Robison and Buchanan 1988).

This Ouachita endemic is found in the upper Saline River basin and one tributary of the Ouachita River (Robison and Harp 1985). Gagen and Stoeckel (1994) reported that madtoms in riffles die when the riffles dry and these areas are recolonized from pools the following season. Buchanan (2005) collected 329 specimens from 6 Saline River basin reservoirs (Balboa, Coronado, Cortez, DeSoto, Pineda, Winona). Stoeckel and others (2011) studied feeding and reproductive biology of the species.

Taxa Association Team and Peer Reviewers

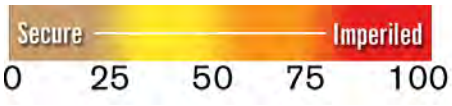
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Noturus phaeus

Brown Madtom

Class: Actinopterygii
Order: Siluriformes
Family: Ictaluridae

Priority Score: **27** **out of 100**



Population Trend: Unknown

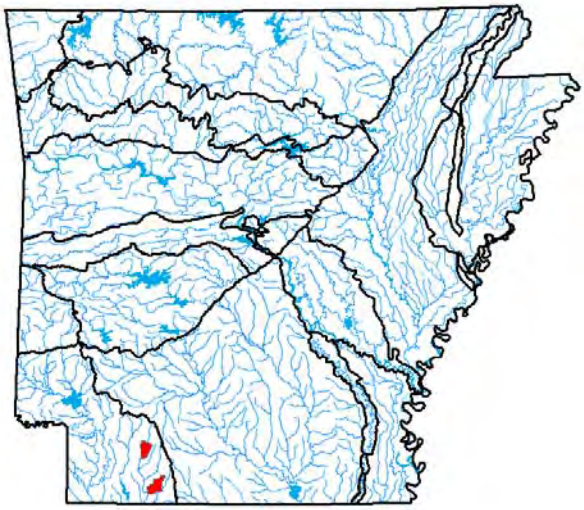


Gobal Rank: G4 — Apparently secure species

State Rank: S1? — Critically imperiled in Arkansas (inexact numeric rank)

Distribution

Occurrence Records



Ecoregions where the species occurs:

- ☐ Ozark Highlands
- ☐ Boston Mountains
- ☐ Ouachita Mountains
- ☐ Arkansas Valley
- ☑ South Central Plains
- ☐ Mississippi Alluvial Plain
- ☐ Mississippi Valley Loess Plains

Ecobasins

South Central Plains - Red River

Habitats	Weight
Natural Pool: - Small - Medium	Marginal
Natural Riffle: - Small - Medium	Optimal
Natural Run: - Small - Medium	Optimal
Natural Spring Run: - Small	Suitable

Problems Faced

Threat: Chemical alteration
Source: Forestry activities

Threat: Chemical alteration
Source: Resource extraction

Threat: Habitat destruction
Source: Dam

Threat: Habitat destruction
Source: Forestry activities

Threat: Sedimentation
Source: Forestry activities

Threat: Sedimentation
Source: Resource extraction

Data Gaps/Research Needs

Conduct distribution surveys.

Conservation Actions	Importance	Category
Enhance and conserve the riparian corridor.	Medium	Habitat Restoration/Improvement
Use Best Management Practices for resource extraction.	Medium	Threat Abatement

Monitoring Strategies

More information is needed before a monitoring strategy can be developed.

Comments

Description: A heavy-bodied, brown, small catfish (Robison and Buchanan 1988).

This species has been reported from Bayou Dorcheat and a tributary to Horsehead Creek. The Bayou Dorcheat occurrence is the only one that is post-1972.

Taxa Association Team and Peer Reviewers

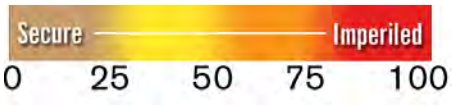
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Noturus taylori

Caddo Madtom

Class: Actinopterygii
Order: Siluriformes
Family: Ictaluridae

Priority Score: **80** out of 100



Population Trend: Stable

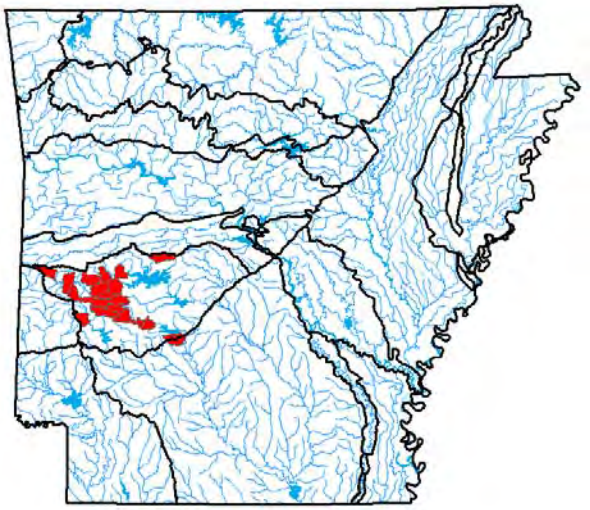


Gobal Rank: G1 — Critically imperiled species

State Rank: S1 — Critically imperiled in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- ☐ Ozark Highlands
- ☐ Boston Mountains
- ☑ Ouachita Mountains
- ☐ Arkansas Valley
- ☐ South Central Plains
- ☐ Mississippi Alluvial Plain
- ☐ Mississippi Valley Loess Plains

Ecobasins

Ouachita Mountains - Ouachita River

Habitats	Weight
Natural Glide: - Small - Medium	Optimal
Natural Pool: - Small - Medium	Suitable
Natural Riffle: - Small - Medium	Marginal
Natural Run: - Small - Medium	Optimal

Problems Faced

Threat: Hydrological alteration
Source: Dam

Threat: Hydrological alteration
Source: Resource extraction

Threat: Sedimentation
Source: Conversion of riparian forest

Threat: Sedimentation
Source: Forestry activities

Threat: Sedimentation
Source: Resource extraction

Threat: Sedimentation
Source: Road construction

Data Gaps/Research Needs

Conduct distribution surveys.

Conduct life history study.

Conduct survey to identify spawning sites.

Conservation Actions	Importance	Category
Maintain or, where necessary, restore instream aquatic habitat and substrate.	Medium	Habitat Protection
Maintain or, where necessary, restore riparian habitat using appropriate river corridor management techniques.	High	Habitat Restoration/Improvement
Reduce sedimentation through Best Management Practices.	Medium	Threat Abatement

Monitoring Strategies

Monitor population distribution and abundance in ongoing stream faunal surveys.

Comments

Description: An elongate, slender, small catfish with black dorsal saddles and a black tip on the dorsal fin (Robison and Buchanan 1988).

This species was described in 1972 form the upper Caddo River (Douglas 1972). The most recent work indicated that populations are stable (Robison 1993). Endemic to the south-central Ouachita Mountains (Upper Caddo, Little Missouri and Ouachita rivers). Relatively abundant in the Caddo, but uncommon in the Little Misouri and Ouachita rivers. Turner and Robison (2006) found high genetic divergence for the Caddo madtom between Ouachita and Caddo river systems (Fst = 0.71) with a fixed allelic difference. Buchanan (2005) observed 612 madtoms in the Lake Ouachita that shared characteristics of both N. miurus and N. taylori.

Taxa Association Team and Peer Reviewers

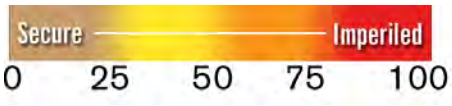
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Percina brucethompsoni

Ouachita Darter

Class: Actinopterygii
Order: Perciformes
Family: Percidae

Priority Score: **46** **out of 100**



Population Trend: Stable

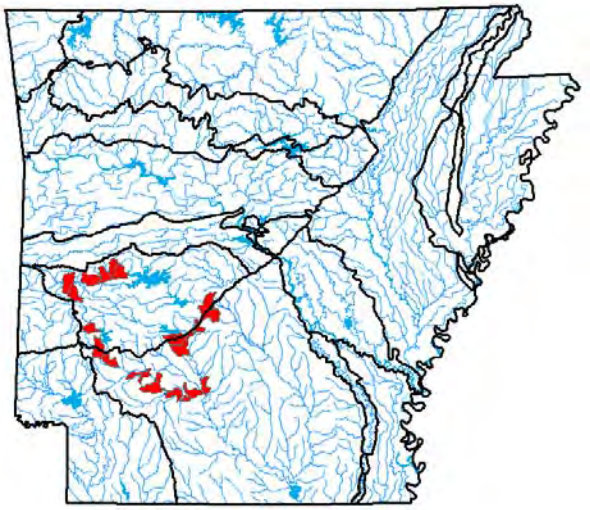

©Richard Standage

Gobal Rank: G2? — Imperiled (inexact numeric rank)

State Rank: S2 — Imperiled in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- ☐ Ozark Highlands
- ☐ Boston Mountains
- ☑ Ouachita Mountains
- ☐ Arkansas Valley
- ☑ South Central Plains
- ☐ Mississippi Alluvial Plain
- ☐ Mississippi Valley Loess Plains

Ecobasins

Ouachita Mountains - Ouachita River

South Central Plains - Ouachita River

Habitats	Weight
Natural Glide: - Medium	Obligate
Natural Pool: - Medium	Obligate
Natural Riffle: - Medium	Suitable
Natural Run: - Medium	Suitable

Problems Faced

Threat: Chemical alteration
Source: Non-point source pollution

Threat: Habitat destruction
Source: Dam

Threat: Hydrological alteration
Source: Dam

Threat: Sedimentation
Source: Road construction

Data Gaps/Research Needs

Study population abundance and distribution.

Conservation Actions	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

Ensure location/occurrence records are compiled into the Arkansas Fish Database.

Monitor population distribution and abundance in ongoing stream faunal surveys.

Comments

Description: A slender darter with a long head and pointed snout and dark blotches or bars on its sides (Robison and Buchanan 1988). This Ouachita River drainage endemic was recently described by Robison and others (2014), and they noted the species is never abundant at a locality. Caldwell (2011) reported density of the Ouachita darter was higher in transition areas flooded by Lake Ouachita (1.36 fish/100 m2) than in the upstream Ouachita River (0.24 fish/100 m2).

Present at all historic localities and no apparent decline overall (Robison 1992b).

Taxa Association Team and Peer Reviewers

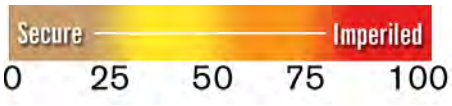
AGFC - retired Mr. Steve Filipek, SAU Dr. Henry Robison, UA/Ft. Smith Dr. Tom Buchanan, AGFC Mr. Jeff Quinn, AGFC Mr. Brian Wagner, ANHC Mr. Jason Throneberry

Percina evides

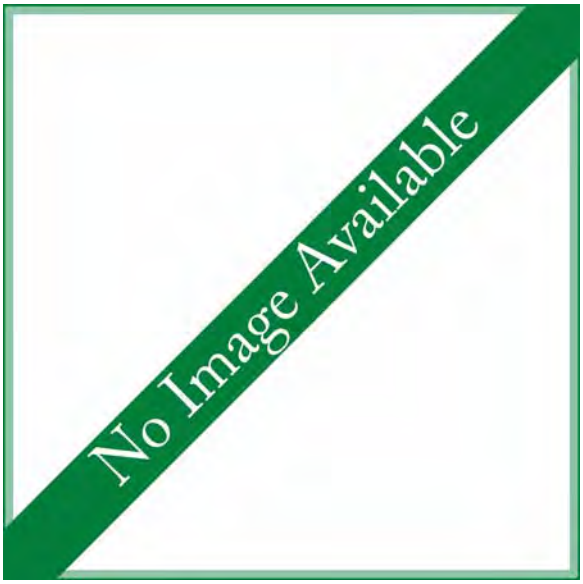
Gilt Darter

Class: Actinopterygii
Order: Perciformes
Family: Percidae

Priority Score: **19** **out of 100**



Population Trend: Unknown

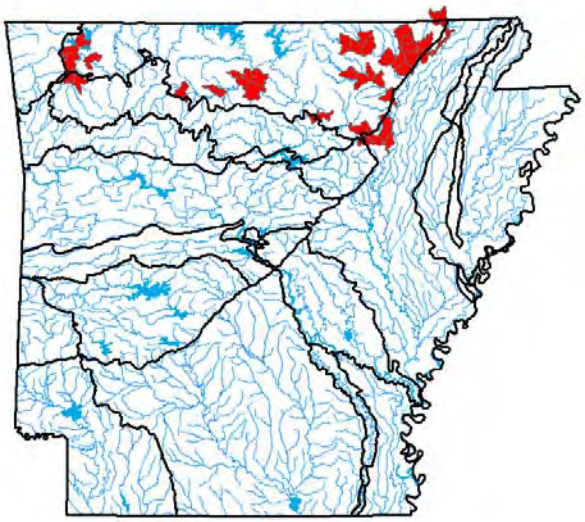


Gobal Rank: G4 — Apparently secure species

State Rank: S3 — Vulnerable in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- [x] Ozark Highlands
- [x] Boston Mountains
- [ ] Ouachita Mountains
- [ ] Arkansas Valley
- [ ] South Central Plains
- [x] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains

Ecobasins

Boston Mountains - White River
Mississippi River Alluvial Plain - White River
Ozark Highlands - White River

Habitats	Weight
Natural Glide: - Medium	Suitable
Natural Pool: - Medium	Suitable
Natural Riffle: - Medium	Obligate

Problems Faced

Threat: Habitat destruction Source: Resource extraction
Threat: Hydrological alteration Source: Dam
Threat: Nutrient loading Source: Agricultural practices
Threat: Riparian habitat destruction Source: Agricultural practices
Threat: Sedimentation Source: Agricultural practices
Threat: Sedimentation Source: Road construction

Data Gaps/Research Needs

Conduct baseline population surveys.
Conduct life history study.

Conservation Actions	Importance	Category
Establish and enhance riparian corridors.	High	Habitat Restoration/Improvement

Monitoring Strategies

Ensure location/occurrence records are compiled into the Arkansas Fish Database.
Monitor population distribution and abundance in stream faunal surveys.

Comments

Robison and Buchanan (1988) noted the species has been eliminated from areas impacted by the construction of Beaver Dam. Gilt darter was among the top 4 species collected by trawling in the Current, Eleven Point, Spring and Strawberry rivers (Rigsby 2009).

Taxa Association Team and Peer Reviewers

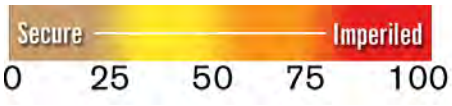
AGFC Mr. Jeff Quinn, AGFC Mr. Brian Wagner, ANHC Mr. Jason Throneberry

Percina nasuta

Longnose Darter

Class: Actinopterygii
Order: Perciformes
Family: Percidae

Priority Score: 27 out of 100



Population Trend: Stable

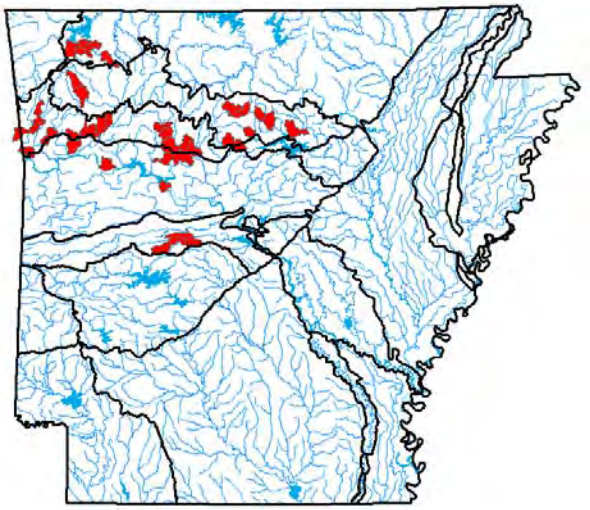

©David Ostendorf

Gobal Rank: G3 — Vulnerable species

State Rank: S3 — Vulnerable in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- [x] Ozark Highlands
- [x] Boston Mountains
- [x] Ouachita Mountains
- [x] Arkansas Valley
- [ ] South Central Plains
- [ ] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains

Ecobasins

Arkansas Valley - Arkansas River
Boston Mountains - Arkansas River
Boston Mountains - White River
Ouachita Mountains - Arkansas River
Ozark Highlands - White River

Habitats

	Weight
Man-made Littoral: - Large	Suitable
Natural Glide: - Medium	Obligate
Natural Pool: - Medium	Obligate
Natural Riffle: - Medium	Suitable
Natural Run: - Medium	Suitable

Problems Faced

Threat: Hydrological alteration Source: Channel alteration
Threat: Hydrological alteration Source: Dam
Threat: Sedimentation Source: Grazing/Browsing
Threat: Sedimentation Source: Resource extraction
Threat: Sedimentation Source: Road construction

Data Gaps/Research Needs

Assess distribution and abundance in lakes and large stream pools.

Conservation Actions

	Importance	Category
Maintain watershed condition by enforcing Best Management Practices for highway construction, urban development, agriculture and silviculture.	High	Threat Abatement

Monitoring Strategies

Ensure location/occurrence records are compiled into the Arkansas Fish Database.
Monitor population distribution and abundance in ongoing stream faunal surveys.

Comments

Description: A slender darter with a long head and pointed snout and dark blotches or bars on its sides (Robison and Buchanan 1988).

While rare, this darter persists throughout its historical distribution (Robison 1992a). Arkansas Department of Environmental Quality biologists captured 99 specimens from nine Boston Mountain streams during 2014 (Tate Wentz, personal communication). Buchanan (2005) captured 7 specimens from Greers Ferry Lake, where the species was regularly captured by AGFC biologists during rotenone sampling.

Taxa Association Team and Peer Reviewers

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Percina pantherina

Leopard Darter

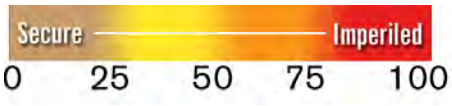

©Richard Standage

Class: Actinopterygii

Order: Perciformes

Family: Percidae

Priority Score: **62** **out of 100**



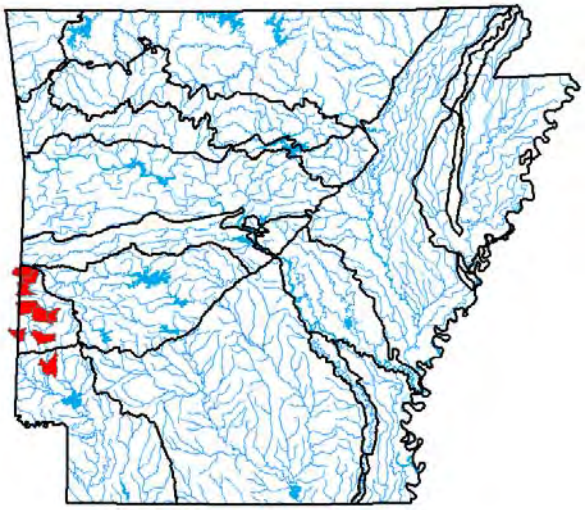
Population Trend: Decreasing

Gobal Rank: G2 — Imperiled species

State Rank: S1 — Critically imperiled in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- ☐ Ozark Highlands
- ☐ Boston Mountains
- ☑ Ouachita Mountains
- ☐ Arkansas Valley
- ☑ South Central Plains
- ☐ Mississippi Alluvial Plain
- ☐ Mississippi Valley Loess Plains

Ecobasins

Ouachita Mountains - Red River
South Central Plains - Red River

Habitats

	Weight
Natural Pool: - Medium	Obligate
Natural Riffle: - Medium	Optimal
Natural Run: - Medium	Suitable

Problems Faced

Threat: Chemical alteration Source: Conversion of riparian forest
Threat: Habitat destruction Source: Dam
Threat: Hydrological alteration Source: Dam
Threat: Nutrient loading Source: Municipal/Industrial point source
Threat: Sedimentation Source: Forestry activities
Threat: Sedimentation Source: Road construction

Data Gaps/Research Needs

Conduct spawning site survey.
Determine if the Robinson Fork population has been extirpated.
Determine the amount of thermally suitable habitat for the species.

Conservation Actions

	Importance	Category
Protect, enhance and restore habitat.	High	Habitat Restoration/Improvement
Support Cossatot River State Park educational program.	Medium	Public Relations/Education

Monitoring Strategies

Monitor results of annual joint surveys by USFS, FWS and AGFC.

Comments

Description: A medium-sized, greenish darter with 10-14 distinct spots along the side (Robison and Buchanan 1988).

This species is listed as threatened under the Endangered Species Act due to impoundments, silviculture, agriculture, industry, and gravel removal (USFWS 1984). USFWS and Ouachita National Forest monitoring indicates declining populations in the Cossatot and Robinson Fork rivers (Richard Standage, USFS, personal communication). Schwemm (2013) noted extremely small genetic effective population sizes, and Arkansas populations appear highly susceptible to extinction. Population monitoring using snorkeling and eDNA techniques is planned for 2015-2017. The Arkansas fish Taxa Team recommends that the G-rank calculator be used with new genetics and trend data to revise the score for this species. This species priority score appears low considering the low genetically effective population size for the species.

Taxa Association Team and Peer Reviewers

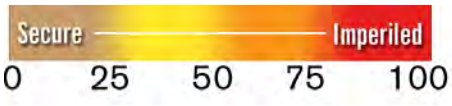
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Percina phoxocephala

Slenderhead Darter

Class: Actinopterygii
Order: Perciformes
Family: Percidae

Priority Score: 19 out of 100





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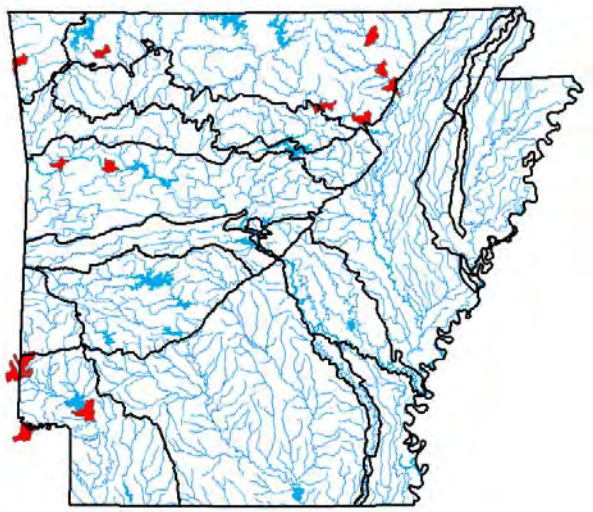
Population Trend: Unknown

Gobal Rank: G5 — Secure

State Rank: S2 — Imperiled in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- [x] Ozark Highlands
- [ ] Boston Mountains
- [ ] Ouachita Mountains
- [x] Arkansas Valley
- [x] South Central Plains
- [ ] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains

Ecobasins

Arkansas Valley - Arkansas River
Ozark Highlands - Arkansas River
Ozark Highlands - White River
South Central Plains - Red River

Habitats

	Weight
Man-made Littoral: - Large	Marginal
Natural Pool: - Small - Medium	Suitable
Natural Riffle: - Small - Medium	Optimal
Natural Side channel: - Large	Suitable

Problems Faced

Threat: Habitat destruction Source: Channel alteration
Threat: Habitat destruction Source: Grazing/Browsing
Threat: Sedimentation Source: Channel maintenance
Threat: Sedimentation Source: Grazing/Browsing
Threat: Sedimentation Source: Road construction

Data Gaps/Research Needs

Conduct distribution study.
Conduct genetic relationship study with morphologically similar but disjunct populations.
Conduct habitat preference study.

Conservation Actions

	Importance	Category
More data is needed are determine other conservation actions.	Medium	Data Gap
Use Best Management Practices in applicable watersheds.	Medium	Threat Abatement

Monitoring Strategies

More information is needed before a monitoring strategy can be developed.

Comments

Description: A medium-sized, yellow-brown darter with 10-15 indistinct blotches along the side (Robison and Buchanan 1988).

Rarely occurs in the Arkansas River drainage of northwest Arkansas (Robison and Buchanan 1988). This is the most widely distributed member of its subgenus, Swainia, ranging from Oklahoma east to Pennsylvania and north to Wisconsin (Page and Smith 1971).

The taxonomic status of specimens from the White River, Ozark Mountains Ecoregion is uncertain at this time (Robison and Buchanan 1988). Buchanan (2005) captured 4 specimens in two Arkansas River reservoirs (Lake Dardanelle, Ozark Lake).

Taxa Association Team and Peer Reviewers

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Percina uranidea

Stargazing Darter

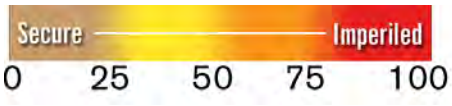


Class: Actinopterygii

Order: Perciformes

Family: Percidae

Priority Score: **38** **out of 100**



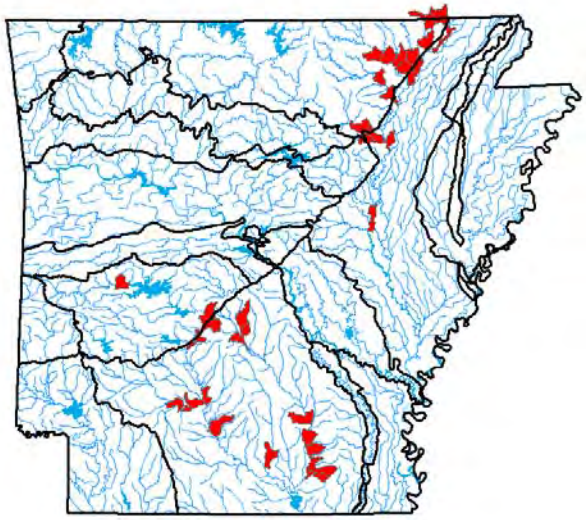
Population Trend: Decreasing

Gobal Rank: G3 — Vulnerable species

State Rank: S2 — Imperiled in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- [x] Ozark Highlands
- [ ] Boston Mountains
- [x] Ouachita Mountains
- [ ] Arkansas Valley
- [x] South Central Plains
- [x] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains

Ecobasins

Mississippi River Alluvial Plain - White River
Ouachita Mountains - Ouachita River
Ozark Highlands - White River
South Central Plains - Ouachita River

Habitats

	Weight
Natural Riffle: - Medium	Optimal
Natural Run: - Medium	Optimal

Problems Faced

Threat: Habitat destruction Source: Dam
Threat: Habitat destruction Source: Resource extraction
Threat: Sedimentation Source: Forestry activities
Threat: Sedimentation Source: Grazing/Browsing
Threat: Sedimentation Source: Road construction

Data Gaps/Research Needs

Conduct distribution and abundance study.
Conduct genetic study of disjunct populations.
Conduct life history study of Black River drainage population.

Conservation Actions

	Importance	Category
Reduce sediment through Best Management Practices.	Medium	Threat Abatement

Monitoring Strategies

More information is needed before a monitoring strategy can be developed.

Comments

Description: A robust darter with 4 dark saddles and eyes closely set high on the head (Robison and Buchanan 1988). Prefers clear water and is intolerant of silt - extirpated in Illinois and Indiana (Robison and Buchanan 1988).

Rigsby (2009) used mitochondrial DNA to conclude that disjunct populations in the Ouachita and Black river drainages are divergent and should be considered separate management units.

Populations in the Black River drainage are large and stable (Rigsby 2009; Stroman 2014). Populations in the Ouachita River drainage have declined. Rigsby (2009) did not detect the species in the Saline River, and Stroman (2014) collected only 4 specimens at two lower Saline River sites and one Ouachita River site. Caldwell (2011) only captured stargazing darters (0.26 fish/100 m2) in the transition area of the Ouachita River that is flooded by Lake Ouachita.

Taxa Association Team and Peer Reviewers

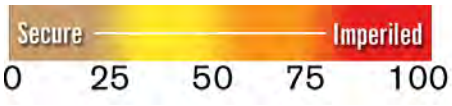
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Percina vigil

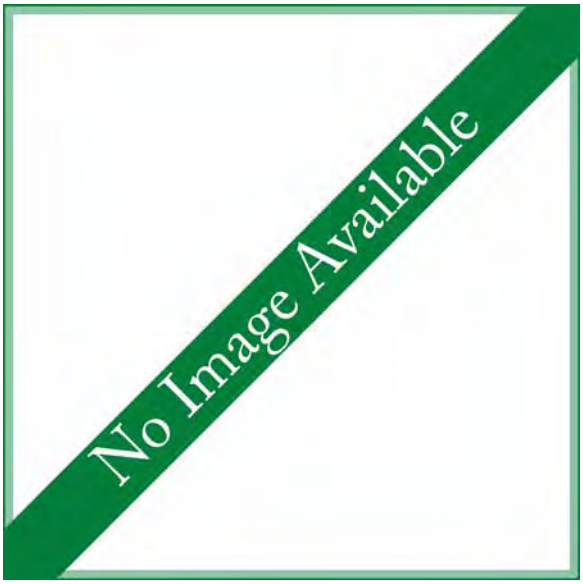
Saddleback Darter

Class: Actinopterygii
Order: Perciformes
Family: Percidae

Priority Score: **15** **out of 100**



Population Trend: Stable

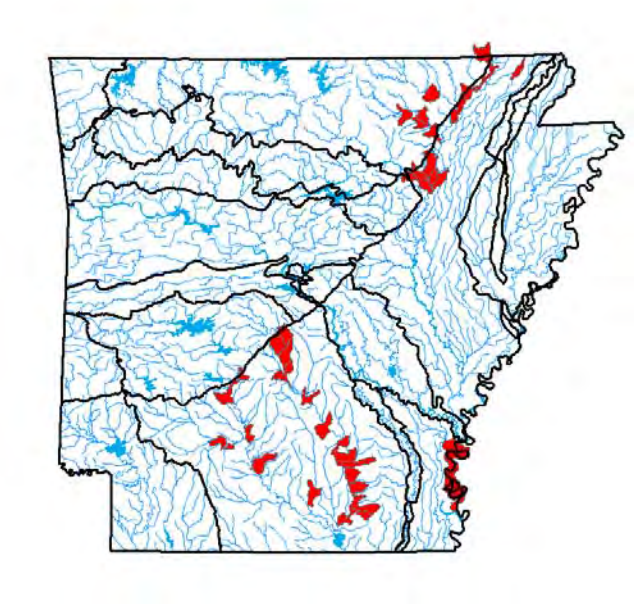


Gobal Rank: G5 — Secure

State Rank: S3 — Vulnerable in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- [x] Ozark Highlands
- [ ] Boston Mountains
- [x] Ouachita Mountains
- [x] Arkansas Valley
- [x] South Central Plains
- [x] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains

Ecobasins

Arkansas Valley - Arkansas River
Mississippi River Alluvial Plain (Lake Chicot) - Mississippi River
Ouachita Mountains - Ouachita River
Ozark Highlands - White River
South Central Plains - Ouachita River

Habitats

	Weight
Natural Glide: - Medium	Suitable
Natural Pool: - Medium	Suitable
Natural Riffle: - Medium	Optimal

Problems Faced

Threat: Habitat destruction Source: Resource extraction
Threat: Habitat destruction Source: Urban development
Threat: Habitat disturbance Source: Agricultural practices
Threat: Hydrological alteration Source: Dam
Threat: Nutrient loading Source: Agricultural practices
Threat: Riparian habitat destruction Source: Agricultural practices
Threat: Sedimentation Source: Road construction

Data Gaps/Research Needs

Conduct baseline population surveys.
Conduct life history study.

Conservation Actions

	Importance	Category
Establish and enhance riparian corridors.	High	Habitat Restoration/Improvement

Monitoring Strategies

Ensure location/occurrence records are compiled into the Arkansas Fish Database.
Monitor population distribution and abundance in stream faunal surveys.

Comments

The saddleback darter is often collected in shallow riffle habitat. Rigsby (2009) collected 503 individuals from 53 of 186 sites sampled from 2006-2008.

Taxa Association Team and Peer Reviewers

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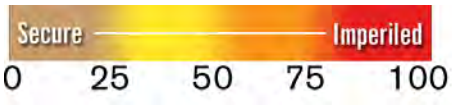
Phenacobius mirabilis

Suckermouth Minnow

Class: Actinopterygii
Order: Cypriniformes
Family: Cyprinidae


©G. W. Sneegas

Priority Score: **23** **out of 100**



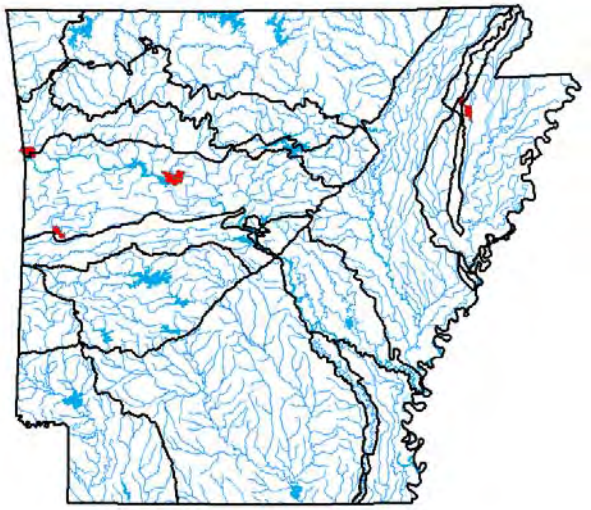
Population Trend: Unknown

Gobal Rank: G5 — Secure

State Rank: S1? — Critically imperiled in Arkansas (inexact numeric rank)

Distribution

Occurrence Records



Ecoregions where the species occurs:

- [ ] Ozark Highlands
- [ ] Boston Mountains
- [x] Ouachita Mountains
- [x] Arkansas Valley
- [ ] South Central Plains
- [x] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains

Ecobasins

Arkansas Valley - Arkansas River
Mississippi River Alluvial Plain - St. Francis River
Ouachita Mountains - Arkansas River

Habitats

	Weight
Natural Riffle: - Small - Medium	Obligate
Natural Run: - Small - Medium	Optimal

Problems Faced

Threat: Habitat destruction Source: Channel alteration
Threat: Habitat destruction Source: Dam
Threat: Habitat destruction Source: Resource extraction
Threat: Habitat destruction Source: Urban development

Data Gaps/Research Needs

Conduct distribution surveys with emphasis on Red River tributaries and Mississippi Alluvial Plain streams.

Conservation Actions

	Importance	Category
Maintain or, where necessary, restore habitat.	Medium	Habitat Restoration/Improvement

Monitoring Strategies

More information is needed before a monitoring strategy can be developed.

Comments

Description: A fairly large, streamlined minnow with a blunt snout and sucker-like mouth (Robison and Buchanan 1988).

Rare in Arkansas, with only one collection since 1940 (Robison and Buchanan 1988).

Taxa Association Team and Peer Reviewers

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Platygobio gracilis

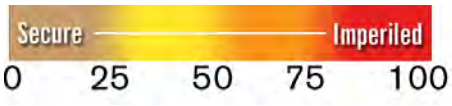
Flathead Chub

Class: Actinopterygii
Order: Cypriniformes
Family: Cyprinidae



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Priority Score: 23 out of 100



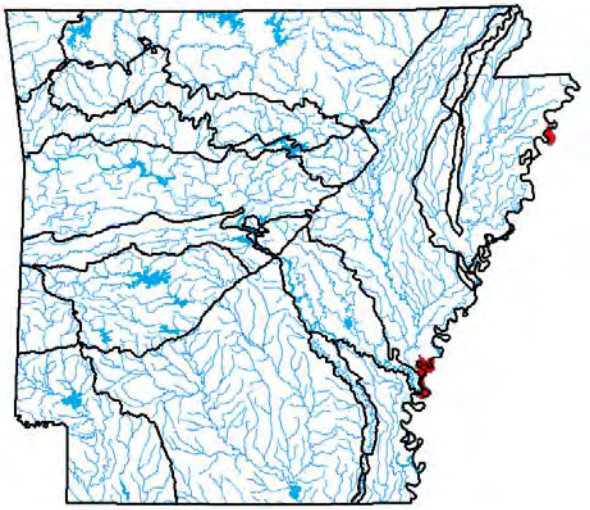
Population Trend: Unknown

Gobal Rank: G5 — Secure

State Rank: SH — Historic record. Possibly extirpated in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- ☐ Ozark Highlands
- ☐ Boston Mountains
- ☐ Ouachita Mountains
- ☐ Arkansas Valley
- ☐ South Central Plains
- ☑ Mississippi Alluvial Plain
- ☐ Mississippi Valley Loess Plains

Ecobasins

Mississippi River Alluvial Plain - Arkansas River
Mississippi River Alluvial Plain - St. Francis River
Mississippi River Alluvial Plain - White River
Mississippi River Alluvial Plain (Lake Chicot) - Mississippi River

Habitats

	Weight
Natural Pool: - Large	Suitable
Natural Shoal: - Large	Optimal

Problems Faced

Threat: Habitat destruction Source: Channel alteration
Threat: Hydrological alteration Source: Dam
Threat: Sedimentation Source: Channel maintenance

Data Gaps/Research Needs

Conduct distribution study.

Conservation Actions

	Importance	Category
Additional conservation actions will be determined based on distributional surveys.	Medium	Data Gap
Maintain or restore natural flow, sediment and temperature regimes.	Medium	Habitat Restoration/Improvement

Monitoring Strategies

Monitor distribution and abundance with general large river surveys.

Comments

Description: A large, silvery chub reaching 9 inches maximum length (Robison and Buchanan 1988).

Known in Arkansas from only 3 collections on the Mississippi River (Robison and Buchanan 1988). It inhabits turbid, alkaline waters with shifting sand substrate (Tibbs 1998).

Taxa Association Team and Peer Reviewers

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Polyodon spathula

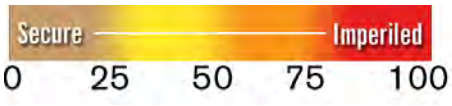
Paddlefish

Class: Actinopterygii
Order: Acipenseriformes
Family: Polyodontidae



©G. W. Sneegas

Priority Score: 24 out of 100



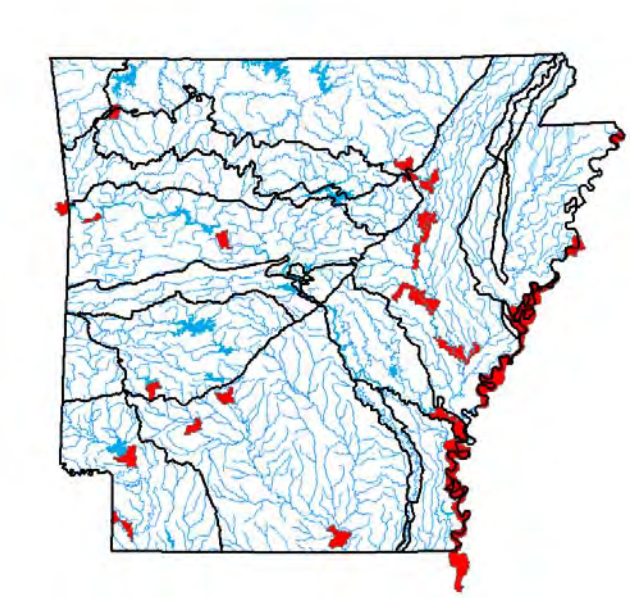
Population Trend: Decreasing

Gobal Rank: G4 — Apparently secure species

State Rank: S3 — Vulnerable in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- [x] Ozark Highlands
- [x] Boston Mountains
- [x] Ouachita Mountains
- [x] Arkansas Valley
- [x] South Central Plains
- [x] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains

Ecobasins

Arkansas Valley - Arkansas River
Boston Mountains - White River
Mississippi River Alluvial Plain - Arkansas River
Mississippi River Alluvial Plain - St. Francis River
Mississippi River Alluvial Plain - White River
Mississippi River Alluvial Plain (Lake Chicot) - Mississippi River
Ouachita Mountains - Ouachita River
Ozark Highlands - White River
South Central Plains - Ouachita River
South Central Plains - Red River

Habitats

	Weight
Man-made Pelagic: - Large	Optimal
Man-made Pool: - Large	Optimal
Natural Oxbow - connected: - Large	Suitable
Natural Oxbow - disconnected: - Large	Suitable
Natural Pelagic: - Large	Optimal
Natural Pool: - Medium - Large	Optimal
Natural Shoal: - Large	Obligate
Natural Side channel: - Large	Suitable
Natural Slough: - Medium - Large	Suitable

Problems Faced

Threat: Biological alteration Source: Commercial harvest
Threat: Biological alteration Source: Exotic species
Threat: Habitat destruction Source: Channel alteration
Threat: Habitat destruction Source: Channel maintenance
Threat: Habitat destruction Source: Dam
Threat: Habitat destruction Source: Resource extraction
Threat: Hydrological alteration Source: Dam
Threat: Hydrological alteration Source: Water diversion
Threat: Sedimentation Source: Channel maintenance
Threat: Sedimentation Source: Dam

Data Gaps/Research Needs

Conduct spawning sites survey.
Determine the impacts of introduced Asian carp on paddlefish populations.

Conservation Actions

	Importance	Category
Implement the Arkansas Game and Fish Commission paddlefish and sturgeon management plan.	Medium	Population Management
Maintain adequate instream flow and natural flow regime.	High	Habitat Protection
Manage and monitor a conservative commercial harvest.	Medium	Population Management
Schedule channel maintenance to accommodate spawning.	Medium	Threat Abatement
Work across political boundaries to manage an inter-jurisdictional fish.	Medium	Public Relations/Education

Monitoring Strategies

Monitor commercial harvest.
Monitor export of this species through Convention on International Trade of Endangered Species (CITES).
Monitor population distribution and abundance in ongoing large river faunal surveys.

Comments

Description: A very large (maximum length 60 inches), scaleless, cartilaginous fish with an elongated paddle-like nose or rostrum (Robison and Buchanan 1988).

Found in most of the large rivers in Arkansas; harvest for the caviar industry is impacting size structure and recruitment in some areas (Quinn and others 2009; Leone and others 2012; Sharov and others 2014). Paddlefish habitat use and spawning areas were determined for Ozark Lake (Donabauer and others 2009), and studies are underway to evaluate habitat use on Lake Dardanelle.

Taxa Association Team and Peer Reviewers

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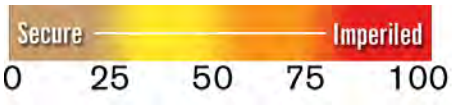
Pteronotropis hubbsi

Bluehead Shiner

Class: Actinopterygii
Order: Cypriniformes
Family: Cyprinidae


©G. W. Sneegas

Priority Score: 33 out of 100



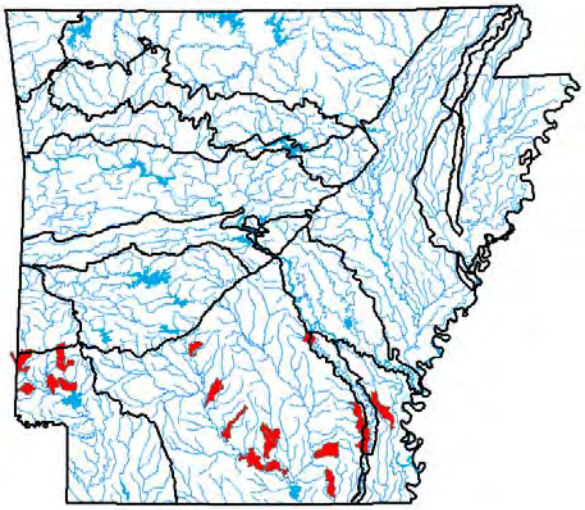
Population Trend: Decreasing

Gobal Rank: G3 — Vulnerable species

State Rank: S3 — Vulnerable in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- [ ] Ozark Highlands
- [ ] Boston Mountains
- [ ] Ouachita Mountains
- [ ] Arkansas Valley
- [x] South Central Plains
- [x] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains

Ecobasins

Mississippi River Alluvial Plain (Bayou Bartholomew) - Ouachita River
Mississippi River Alluvial Plain (Lake Chicot) - Mississippi River
South Central Plains - Ouachita River
South Central Plains - Red River

Habitats

	Weight
Natural Other: Headwater	Suitable
Natural Oxbow - disconnected: - Small	Suitable
Natural Pool: Headwater	Optimal

Problems Faced

Threat: Chemical alteration Source: Resource extraction
Threat: Habitat destruction Source: Channel alteration
Threat: Habitat destruction Source: Forestry activities
Threat: Habitat destruction Source: Resource extraction
Threat: Sedimentation Source: Forestry activities
Threat: Sedimentation Source: Resource extraction

Data Gaps/Research Needs

Determine population status.
Determine populations for monitoring.
Determine spawning migration patterns.

Conservation Actions

	Importance	Category
Conserve and enhance habitat. Implement non-point source Best Management Practices.	Medium	Habitat Restoration/Improvement
Conserve and enhance riparian buffer zones.	Medium	Habitat Restoration/Improvement
Minimize migration barriers.	Medium	Habitat Protection

Monitoring Strategies

Monitor known populations every 3-5 years.

Comments

Description: A small (2.5 inches maximum length), slab-sided minnow with a broad black lateral stripe and iridescent blue on top of head (Robison and Buchanan 1988).

The species typically inhabits quiet backwaters of sluggish streams and oxbow lakes and spawns in association with sunfish nests (Ranvestel and Burr 2002).

Taxa Association Team and Peer Reviewers

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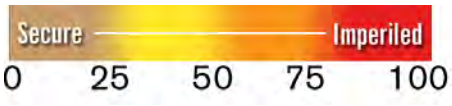
Scaphirhynchus albus

Pallid Sturgeon

Class: Actinopterygii
Order: Acipenseriformes
Family: Acipenseridae



Priority Score: 48 out of 100



Population Trend: Unknown

Gobal Rank: G2 — Imperiled species

State Rank: S1S2 — Critically imperiled in Arkansas (uncertain rank)

Distribution

Occurrence Records



Ecoregions where the species occurs:

- ☐ Ozark Highlands
- ☐ Boston Mountains
- ☐ Ouachita Mountains
- ☐ Arkansas Valley
- ☐ South Central Plains
- ☑ Mississippi Alluvial Plain
- ☐ Mississippi Valley Loess Plains

Ecobasins

Mississippi River Alluvial Plain - Arkansas River
Mississippi River Alluvial Plain - St. Francis River
Mississippi River Alluvial Plain - White River
Mississippi River Alluvial Plain (Lake Chicot) - Mississippi River

Habitats

	Weight
Natural Pool: - Large	Obligate

Problems Faced

Threat: Biological alteration Source: Crossbreeding
Threat: Habitat destruction Source: Channel maintenance
Threat: Habitat destruction Source: Dam
Threat: Habitat destruction Source: Resource extraction
Threat: Hydrological alteration Source: Dam

Data Gaps/Research Needs

Conduct spawning sites survey.
Determine catch rates for pallid sturgeon in the lower Arkansas and St. Francis rivers during winter.
Determine use and importance of tributaries like the St. Francis and Arkansas rivers to the life history of the species.
Further genetic study is needed to understand the hybridization issue with shovelnose sturgeon.

Conservation Actions

	Importance	Category
Attempt to restore the Mississippi River's hydrologic integrity.	Medium	Habitat Restoration/Improvement
Work with the lower basin pallid sturgeon work group to implement the pallid sturgeon recovery plan.	High	Population Management

Monitoring Strategies

Work with the Lower Mississippi River Conservation Committee and Mississippi Interstate Cooperative Resource Association to share information on the distribution, habitat preferences and abundance of the species across its range.

Comments

Description: A pale sturgeon with a flattened, shovel-shaped snout and a long, slender caudal peduncle (Robison and Buchanan 1988).

This species was listed as endangered under the Endangered Species Act, due to impacts on its large river habitats (USFWS 1993). A large research program has greatly increased understanding of this Mississippi River species, and over 500 pallid sturgeon have been captured during the past 10 years (e.g., Kilgore and others 2007). Habitat selection was documented by Herrala and others (2014), and the species was detected using the lower Arkansas River during two consecutive winters. Shovelnose sturgeon were listed based on similarity of appearance with pallid sturgeon to eliminate the threat of accidental and illegal commercial harvest (Federal Register 2010). The U.S. Army Corps of Engineers (2013) recently developed a 7(a)(1) conservation plan for pallid sturgeon.

Taxa Association Team and Peer Reviewers

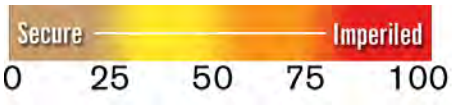
AGFC - retired Mr. Steve Filipek, SAU Dr. Henry Robison, UA/Ft. Smith Dr. Tom Buchanan, AGFC Mr. Jeff Quinn, AGFC Mr. Brian Wagner, ANHC Mr. Jason Throneberry

Troglichthys rosae

Ozark Cavefish

Class: Actinopterygii
Order: Percopsiformes
Family: Amblyopsidae

Priority Score: **43** out of 100



Population Trend: Decreasing

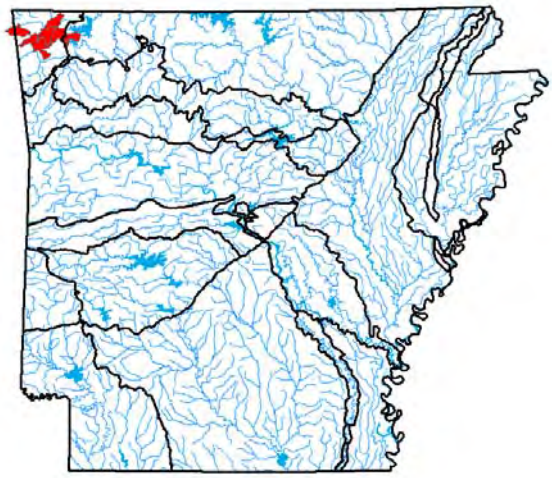


Global Rank: G3 — Vulnerable species

State Rank: S1 — Critically imperiled in Arkansas

Distribution

Element Occurrence Records



Ecoregions where the species occurs:

- [x] Ozark Highlands
- [ ] Boston Mountains
- [ ] Arkansas Valley
- [ ] Ouachita Mountains
- [ ] South Central Plains
- [ ] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains



Terrestrial Habitats



Ecobasins

Ozark Highlands - Arkansas River
Ozark Highlands - White River

Terrestrial Habitats

Caves, Mines, Sinkholes and other Karst Features	Obligate

Aquatic Habitats

Natural Cave Stream: Headwater - Small	Obligate
Natural Groundwater: Headwater - Small	Obligate
Natural Spring Run: Headwater - Small	Marginal

Troglichthys rosae
Ozark Cavefish

Problems Faced

Threat: Biological alteration
Source: Recreation

Threat: Chemical alteration
Source: Confined animal operations

Threat: Chemical alteration
Source: Urban development

Threat: Hydrological alteration
Source: Urban development

Threat: Hydrological alteration
Source: Water diversion

Threat: Nutrient loading
Source: Confined animal operations

Threat: Nutrient loading
Source: Urban development

Data Gaps/Research Needs

Search for new populations.

Conservation Actions

	Importance	Category
Protect karst habitats and cave recharge zones.	High	Habitat Protection
Restrict access to caves with sensitive species.	High	Threat Abatement

Monitoring Strategies

Conduct visual surveys of known populations biannually.

Comments

Description: A small, eyeless, unpigmented fish with an elongated, flattened head and a rounded tail fin (Robison and Buchanan 1988).

This species was listed as threatened under the Endangered Species Act, due to habitat destruction, collection, and disturbance (USFWS 1988). Joint surveys are conducted biennially by a survey team from AGFC, USFWS, Arkansas Natural Heritage Commission, and The Nature Conservancy. The team is also actively working with developers in the rapidly growing northwest Arkansas portion of this species' range to minimize impacts on its habitat (David Kampwerth, personal communication).Graening and others (2010) indicated the species appears to be stable. The locations with the largest observable populations are under conservation ownership, with USFWS protecting Logan Cave and ANHC protecting Cave Springs Cave. The Illinois River Watershed Partnership development of educational facilities adjacent to Cave Springs Cave provides good opportunities for education, but may also increase illegal human entry to the cave.

Arkansas has the large majority of observed individuals and ranks the species as an S1, Oklahoma also ranks it as S1, and Missouri ranks it as S2 based on based on a larger number of locations with rare sightings. In light of this, the global rank of G3 may be too high. The USFWS categorizes the population trend for this species as <30% to relatively stable, citing that 10 populations are stable, 6 have declined and 25 are undetermined. The long-term trend is a decline of 10-70% (USFWS 2011).

Taxa Team and Peer Reviewers

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Typhlichthys subterraneus

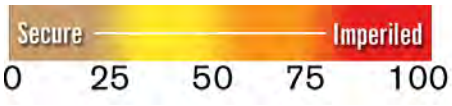
Southern Cavefish

Class: Actinopterygii

Order: Percopsiformes

Family: Amblyopsidae

Priority Score: 27 out of 100



Population Trend: Unknown

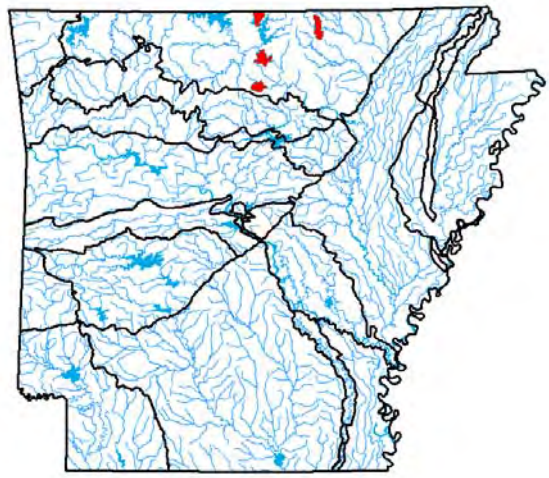
Global Rank: G4 — Apparently secure species

State Rank: S1 — Critically imperiled in Arkansas



Distribution

Element Occurrence Records



Ecoregions where the species occurs:

- [x] Ozark Highlands
- [ ] Boston Mountains
- [ ] Arkansas Valley
- [ ] Ouachita Mountains
- [ ] South Central Plains
- [ ] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains



Terrestrial Habitats



Ecobasins

Ozark Highlands - White River

Terrestrial Habitats

Caves, Mines, Sinkholes and other Karst Features	Obligate

Aquatic Habitats

Natural Cave Stream: Headwater - Small	Obligate
Natural Groundwater: Headwater - Small	Obligate
Natural Spring Run: Headwater - Small	Marginal

Problems Faced

Threat: Habitat destruction
Source: Dam

Threat: Habitat destruction
Source: Recreation

Threat: Hydrological alteration
Source: Water diversion

Threat: Nutrient loading
Source: Confined animal operations

Threat: Nutrient loading
Source: Grazing/Browsing

Threat: Toxins/contaminants
Source: Non-point source pollution

Typhlichthys subterraneus
Southern Cavefish

Data Gaps/Research Needs

Conduct distribution surveys.
Conduct genetic studies of this and other cavefish species in Arkansas.
Delineate and monitor recharge areas.
Describe new Ozark species.

Conservation Actions

	Importance	Category
Limit cave access for recreational uses.	Medium	Threat Abatement
Limit take by scientific investigators.	Medium	Threat Abatement
Protect karst habitats and cave recharge zones.	High	Habitat Protection
Public outreach and education with local landowners and rural communities.	Medium	Public Relations/Education
Restrict access to caves with sensitive species.	High	Threat Abatement
Use of Best Management Practices within cave recharge zone.	High	Threat Abatement

Monitoring Strategies

Coordinate sampling with other scientific efforts and monitor no more than once every two years.

Comments

Description: A small, eyeless, unpigmented fish with an elongated, flattened head and a rounded tail fin (Robison and Buchanan 1988).

There are a small number of historic records of this species from wells and caves in the eastern Ozarks of Arkansas (Robison and Buchanan 1988). Ozark populations of the species appear to be a new species (Romero and Conner 2007; Niemiller and others 2011), thus the G-score and priority score for this species are functionally too low and need revision.

Taxa Team and Peer Reviewers

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Umbra limi

Central Mudminnow

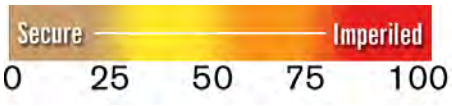


Class: Actinopterygii

Order: Esociformes

Family: Esocidae

Priority Score: **23** **out of 100**



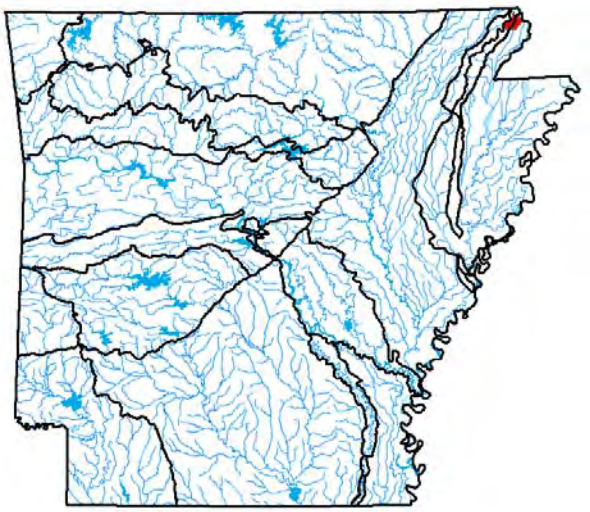
Population Trend: Unknown

Gobal Rank: G5 — Secure

State Rank: SH — Historic record. Possibly extirpated in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- ☐ Ozark Highlands
- ☐ Boston Mountains
- ☐ Ouachita Mountains
- ☐ Arkansas Valley
- ☐ South Central Plains
- ☑ Mississippi Alluvial Plain
- ☐ Mississippi Valley Loess Plains

Ecobasins

Mississippi River Alluvial Plain - St. Francis River

Habitats

	Weight
Natural Pool:	Suitable
Natural Swamp/Wetlands:	Suitable

Problems Faced

Threat: Habitat destruction
Source: Agricultural practices

Threat: Habitat destruction
Source: Channel alteration

Data Gaps/Research Needs

Determine distribution and abundance.

Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Comments

This northern species has only been collected once in Arkansas during 1894 in Clay County. Evidently, a large population occurs in Reelfoot Lake, Tennessee (Pflieger 1997). This species is highly tolerant of low dissolved oxygen and often lives in swamps.

Taxa Association Team and Peer Reviewers

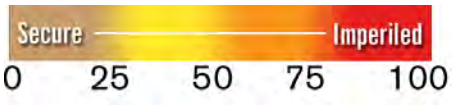
AGFC Mr. Jeff Quinn, AGFC Mr. Brian Wagner, ANHC Mr. Jason Throneberry

Acalypta lillianus

Lace Bug

Class: Insecta
Order: Heteroptera
Family: Tingidae

Priority Score: **19** out of 100



Population Trend: Unknown



Global Rank: G3 — Vulnerable species

State Rank: SNR — Species not ranked in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☐
- Boston Mountains ☐
- Arkansas Valley ☑
- Ouachita Mountains ☐
- South Central Plains ☐
- Mississippi Alluvial Plain ☐
- Mississippi Valley Loess Plain ☐



Habitat Map



Habitats

	Weight
Ozark-Ouachita Prairie and Woodland	Optimal

Problems Faced

Forestry practices that disturb litter layer and create xeric conditions.	Threat: Habitat disturbance Source: Forestry activities
Loss of habitat to development.	Threat: Habitat destruction or conversion Source: Urban development

Data Gaps/Research Needs

Need to obtain baseline information on distribution and population status.

Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

Survey areas near known occurrences to locate additional populations.

Comments

An Arkansas endemic insect limited to the Arkansas Valley (Robison and Allen 1995).

Taxa Association Team and Peer Reviewers

ANHC Mr. Michael Warriner

Acalypta susanae

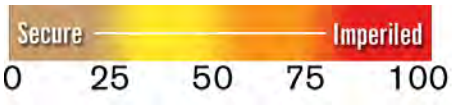
Lace Bug

Class: Insecta

Order: Heteroptera

Family: Tingidae

Priority Score: **23** out of 100



Population Trend: Unknown



Global Rank: GNR — Not yet ranked

State Rank: S1 — Critically imperiled in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☑
- Boston Mountains ☐
- Arkansas Valley ☑
- Ouachita Mountains ☐
- South Central Plains ☐
- Mississippi Alluvial Plain ☐
- Mississippi Valley Loess Plain ☐



Habitat Map



Habitats

	Weight
Ozark-Ouachita Mesic Hardwood Forest	Optimal

Problems Faced

Forestry practices that disturb litter layer and create xeric conditions.	Threat: Habitat disturbance Source: Forestry activities
Loss of habitat to development.	Threat: Habitat destruction or conversion Source: Urban development

Data Gaps/Research Needs

Obtain baseline information on distribution and population status.

Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

Survey areas near known occurrences to locate additional populations.

Comments

An Arkansas endemic insect (Allen and others 1988). Several specimens of this species were collected near the Buffalo National River, Newton County in 2013 (A. Dowling, pers. Comm).

Taxa Association Team and Peer Reviewers

ANHC Mr. Michael Warriner

Agapetus medicus

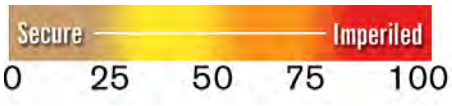
Arkansas Agapetus Caddisfly

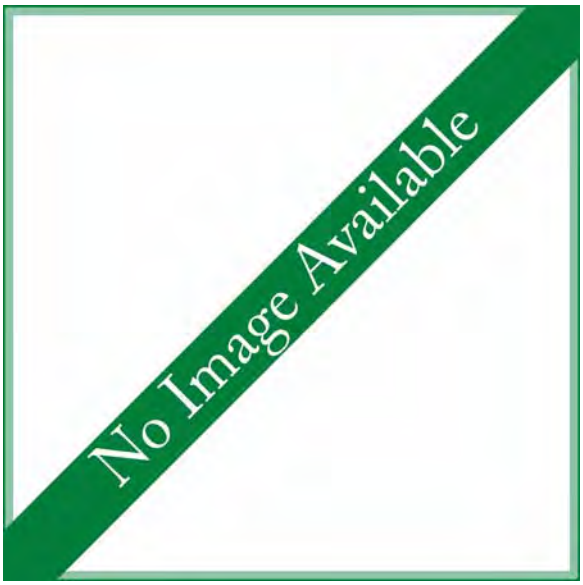
Class: Insecta

Order: Trichoptera

Family: Glossosomatidae

Priority Score: **50** out of 100





Population Trend: Unknown

Global Rank: G1G2 — Critically imperiled (uncertain rank)

State Rank: SNR — Species not ranked in Arkansas

Distribution

Element Occurrence Records



Ecoregions where the species occurs:

- [x] Ozark Highlands
- [ ] Boston Mountains
- [ ] Arkansas Valley
- [x] Ouachita Mountains
- [ ] South Central Plains
- [ ] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains



Terrestrial Habitats





Ecobasins where this species occurs

Ecobasins

Ouachita Mountains - Ouachita River
Ouachita Mountains - Red River
Ozark Highlands - Arkansas River
Ozark Highlands - White River

Terrestrial Habitats

Ozark-Ouachita Riparian	Suitable

Aquatic Habitats

Natural Riffle: - Small	Suitable

Agapetus medicus
Arkansas Agapetus Caddisfly

Problems Faced

Threat: Hydrological alteration
Source: Dam

Threat: Sedimentation
Source: Resource extraction

Threat: Toxins/contaminants
Source: Municipal/Industrial point source

Data Gaps/Research Needs

Need to obtain baseline information on distribution and population status.

Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

Surveys to locate additional populations and protection of stream habitats.

Comments

An Arkansas endemic insect known from five counties in the state. Inhabits cool, swift-moving mountain streams (Ross 1938).

Taxa Team and Peer Reviewers

ANHC Mr. Michael Warriner

Allocapnia jeanae

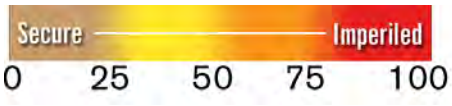
Winter Stonefly

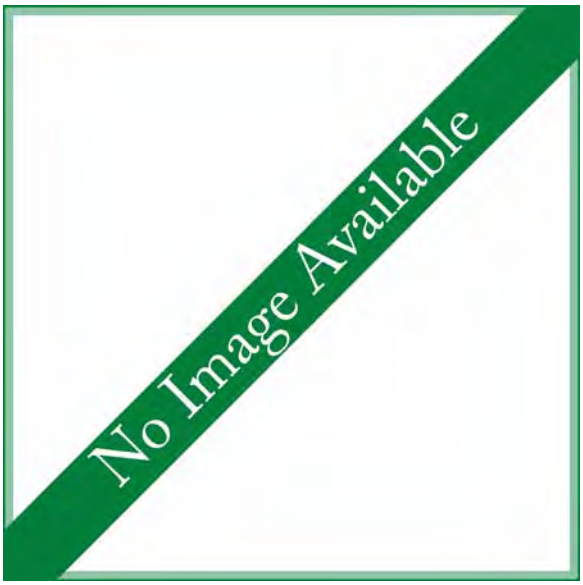
Class: Insecta

Order: Plecoptera

Family: Capniidae

Priority Score: **50** out of 100





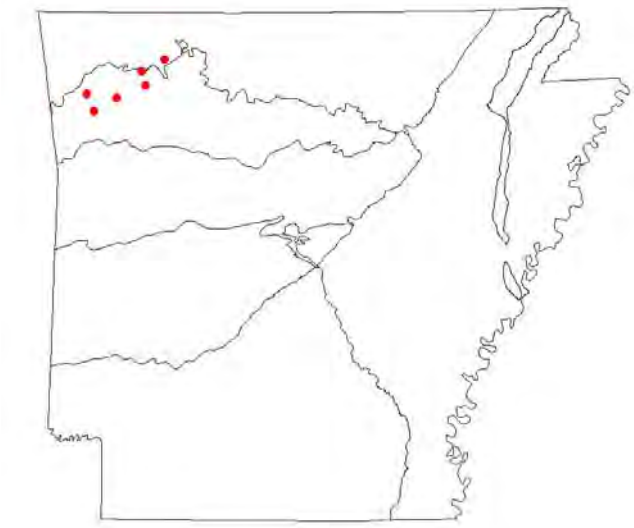
Population Trend: Unknown

Global Rank: G2 — Imperiled species

State Rank: S1? — Critically imperiled in Arkansas (inexact numeric rank)

Distribution

Element Occurrence Records



Ecoregions where the species occurs:

- [x] Ozark Highlands
- [x] Boston Mountains
- [ ] Arkansas Valley
- [ ] Ouachita Mountains
- [ ] South Central Plains
- [ ] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains



Terrestrial Habitats





Ecobasins where this species occurs

Ecobasins

Boston Mountains - Arkansas River
Boston Mountains - White River
Ozark Highlands - White River

Terrestrial Habitats

Ozark-Ouachita Riparian	Suitable

Aquatic Habitats

Natural Pool: - Small	Suitable
Natural Riffle: - Small	Suitable

Allocapnia jeanae
Winter Stonefly

Problems Faced

Threat: Hydrological alteration
Source: Dam

Threat: Sedimentation
Source: Resource extraction

Threat: Toxins/contaminants
Source: Municipal/Industrial point source

Data Gaps/Research Needs

Need to obtain baseline information on distribution and population status.

Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

Surveys to locate additional populations and protection of stream habitats.

Comments

An endemic stonefly found only in the Ozark Mountains of Arkansas.

Taxa Team and Peer Reviewers

ANHC Mr. Michael Warriner

Allocapnia malverna

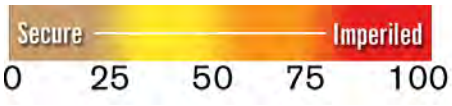
Winter Stonefly

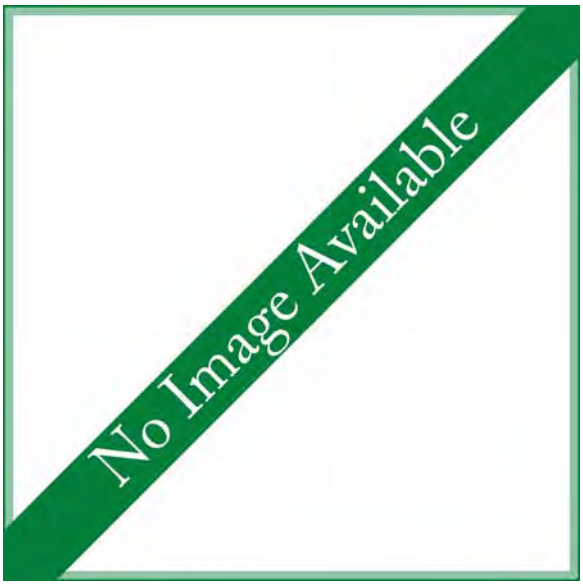
Class: Insecta

Order: Plecoptera

Family: Capniidae

Priority Score: **11** out of 100





Population Trend: Unknown

Global Rank: G4 — Apparently secure species

State Rank: SNR — Species not ranked in Arkansas

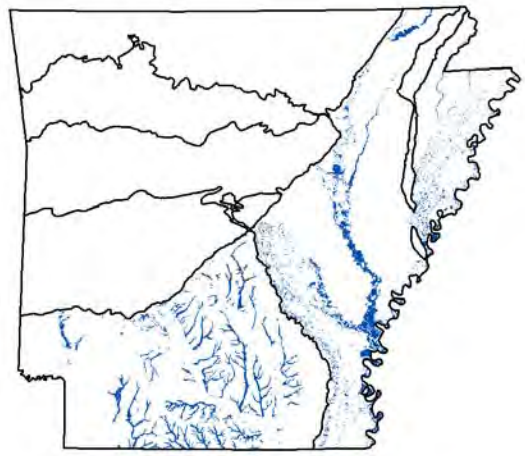
Distribution

Element Occurrence Records



Ecoregions where the species occurs:

- ☐ Ozark Highlands
- ☐ Boston Mountains
- ☐ Arkansas Valley
- ☐ Ouachita Mountains
- ☑ South Central Plains
- ☑ Mississippi Alluvial Plain
- ☐ Mississippi Valley Loess Plains



Terrestrial Habitats





Ecobasins where this species occurs

Ecobasins

South Central Plains - Ouachita River

Terrestrial Habitats

Lower Mississippi River Riparian Forest	Suitable
West Gulf Coastal Plain Small Stream/River Forest	Suitable

Aquatic Habitats

Natural Pool: - Small - Medium	Data Gap

Allocapnia malverna
Winter Stonefly

Problems Faced

Threat: Hydrological alteration
Source: Dam

Threat: Sedimentation
Source: Resource extraction

Threat: Toxins/contaminants
Source: Municipal/Industrial point source

Data Gaps/Research Needs

Need to obtain baseline information on distribution and population status.

Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

Surveys to locate additional populations and protection of stream habitats.

Comments

An endemic stonefly found only in Arkansas.

Taxa Team and Peer Reviewers

ANHC Mr. Michael Warriner

Allocapnia oribata

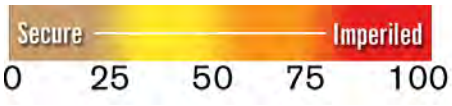
Bowed Snowfly

Class: Insecta

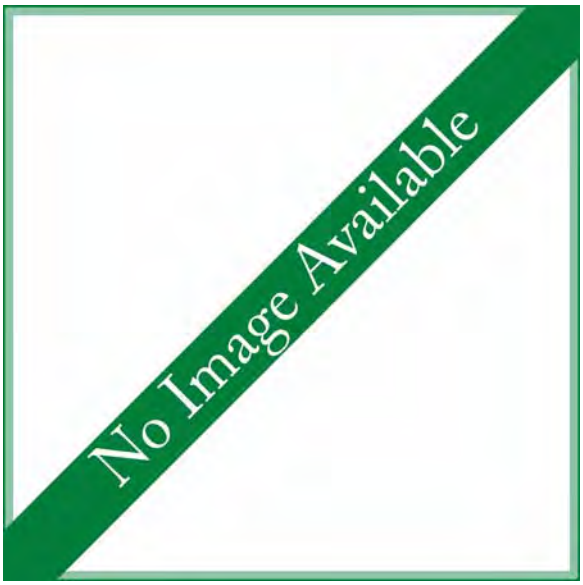
Order: Plecoptera

Family: Capniidae

Priority Score: **80** out of 100



Population Trend: Unknown



Global Rank: G1 — Critically imperiled species

State Rank: S1 — Critically imperiled in Arkansas

Distribution

Element Occurrence Records



Ecoregions where the species occurs:

- ☐ Ozark Highlands
- ☑ Boston Mountains
- ☐ Arkansas Valley
- ☐ Ouachita Mountains
- ☐ South Central Plains
- ☐ Mississippi Alluvial Plain
- ☐ Mississippi Valley Loess Plains



Terrestrial Habitats





Ecobasins where this species occurs

Ecobasins

Boston Mountains - White River

Terrestrial Habitats

Ozark-Ouachita Riparian	Suitable

Aquatic Habitats

Natural Riffle: - Small - Medium	Suitable

Allocapnia oribata
Bowed Snowfly

Problems Faced

Threat: Hydrological alteration
Source: Dam

Threat: Sedimentation
Source: Resource extraction

Threat: Toxins/contaminants
Source: Municipal/Industrial point source

Data Gaps/Research Needs

Need to obtain baseline information on distribution and population status.

Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

Surveys to locate additional populations and protection of stream habitats.

Comments

An endemic stonefly known only from the Middle Fork of the Little Red River in Searcy County Poulton and Stewart 1987).

Taxa Team and Peer Reviewers

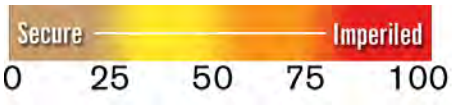
ANHC Mr. Michael Warriner

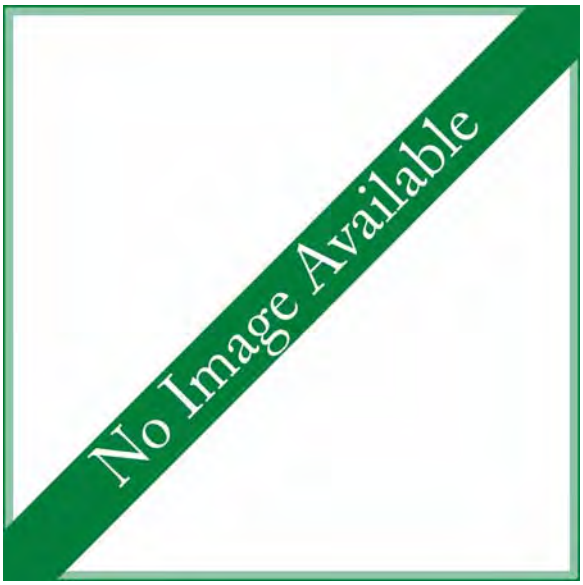
Allocapnia ozarkana

Winter Stonefly

Class: Insecta
Order: Plecoptera
Family: Capniidae

Priority Score: **50** out of 100





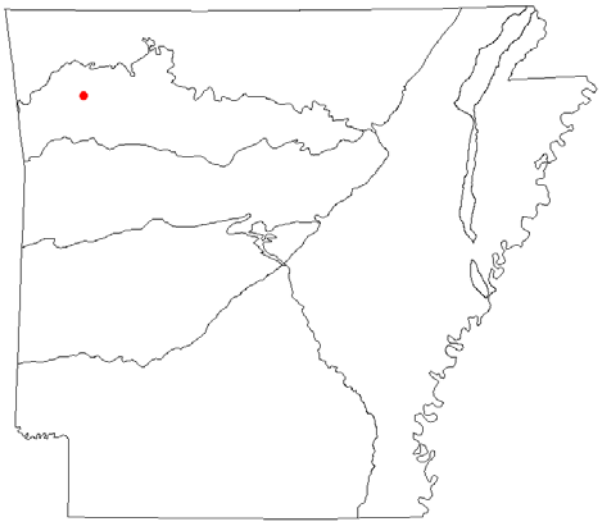
Population Trend: Unknown

Global Rank: G2 — Imperiled species

State Rank: S1? — Critically imperiled in Arkansas (inexact numeric rank)

Distribution

Element Occurrence Records



Ecoregions where the species occurs:

- ☐ Ozark Highlands
- ☑ Boston Mountains
- ☐ Arkansas Valley
- ☐ Ouachita Mountains
- ☐ South Central Plains
- ☐ Mississippi Alluvial Plain
- ☐ Mississippi Valley Loess Plains



Terrestrial Habitats





Ecobasins where this species occurs

Ecobasins

Boston Mountains - White River

Terrestrial Habitats

Ozark-Ouachita Riparian	Suitable

Aquatic Habitats

Natural Pool: - Small - Medium	Data Gap
Natural Riffle: - Small	Suitable

Allocapnia ozarkana
Winter Stonefly

Problems Faced

Threat: Hydrological alteration
Source: Dam

Threat: Sedimentation
Source: Resource extraction

Threat: Toxins/contaminants
Source: Municipal/Industrial point source

Data Gaps/Research Needs

Need to obtain baseline information on distribution and population status.

Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

Surveys to locate additional populations and protection of stream habitats.

Comments

An endemic stonefly known only from Cannon Creek in Madison County (Ross 1964).

Taxa Team and Peer Reviewers

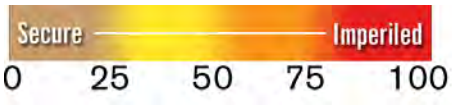
ANHC Mr. Michael Warriner

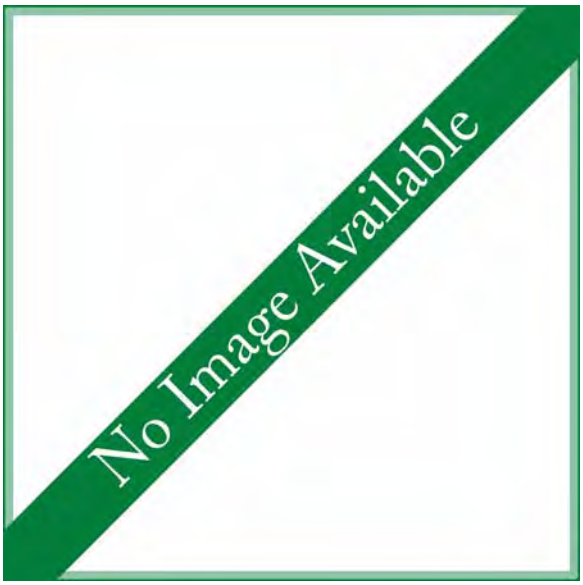
Allocapnia warreni

Winter Stonefly

Class: Insecta
Order: Plecoptera
Family: Capniidae

Priority Score: **80** out of 100





Population Trend: Unknown

Global Rank: GH — Possibly extinct

State Rank: SH — Historic record. Possibly extirpated in Arkansas

Distribution

Element Occurrence Records



Ecoregions where the species occurs:

- [x] Ozark Highlands
- [ ] Boston Mountains
- [ ] Arkansas Valley
- [ ] Ouachita Mountains
- [ ] South Central Plains
- [ ] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains



Terrestrial Habitats





Ecobasins where this species occurs

Ecobasins

Boston Mountains - Arkansas River

Terrestrial Habitats

Ozark-Ouachita Riparian	Suitable

Aquatic Habitats

Natural Riffle: - Small	Suitable

Allocapnia warreni
Winter Stonefly

Problems Faced

Threat: Hydrological alteration
Source: Dam

Threat: Sedimentation
Source: Resource extraction

Threat: Toxins/contaminants
Source: Municipal/Industrial point source

Data Gaps/Research Needs

Need to obtain baseline information on distribution and population status.

Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

Surveys to locate additional populations and protection of stream habitats.

Comments

Known only from Clear Creek in the city of Fayetteville. This stonefly is now thought to be extinct after Fayetteville began dumping treated sewage effluent into Clear Creek in 1988. This species has not been recollected since 1962 (Robison and Allen 1995).

Taxa Team and Peer Reviewers

ANHC Mr. Michael Warriner

Alloperla caddo

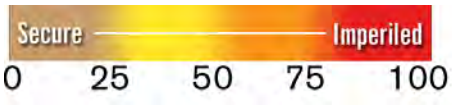
Caddo Sallfly

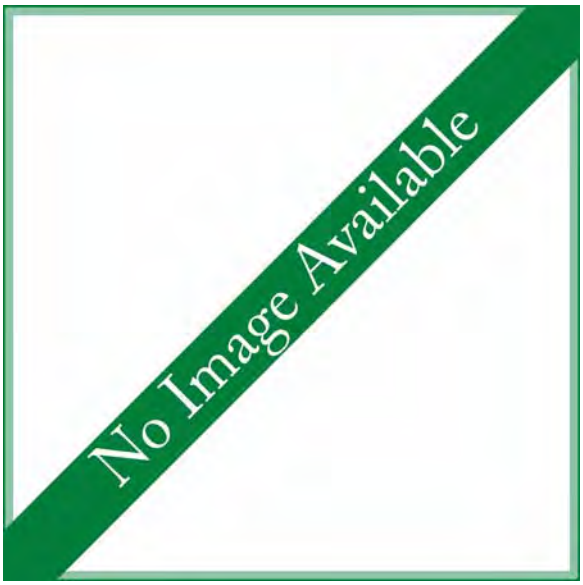
Class: Insecta

Order: Plecoptera

Family: Chloroperlidae

Priority Score: **65** out of 100





Population Trend: Unknown

Global Rank: G1G2 — Critically imperiled (uncertain rank)

State Rank: S1 — Critically imperiled in Arkansas

Distribution

Element Occurrence Records



Ecoregions where the species occurs:

- ☐ Ozark Highlands
- ☐ Boston Mountains
- ☐ Arkansas Valley
- ☑ Ouachita Mountains
- ☐ South Central Plains
- ☐ Mississippi Alluvial Plain
- ☐ Mississippi Valley Loess Plains



Terrestrial Habitats





Ecobasins where this species occurs

Ecobasins

Ouachita Mountains - Ouachita River

Aquatic Habitats

Natural Riffle: - Small	Suitable

Alloperla caddo
Caddo Sallfly

Problems Faced

Threat: Hydrological alteration
Source: Dam

Threat: Sedimentation
Source: Resource extraction

Threat: Toxins/contaminants
Source: Municipal/Industrial point source

Data Gaps/Research Needs

Need to obtain baseline information on distribution and population status.

Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

Surveys to locate additional populations and protection of stream habitats.

Comments

A recently described species of the Ouachita subregion of Arkansas. Known from fewer than five occurrences, usually small intermittent streams in Garland Co., Perry Co., Scott Co., Arkansas. (Poulton and Stewart 1987, Robison and Allen 1995, Stark 1998)

Taxa Team and Peer Reviewers

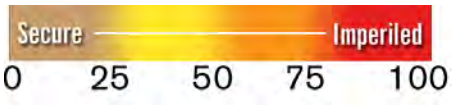
ANHC Mr. Michael Warriner

Amblyscirtes aesculapius

Lace-winged Roadside-Skipper

Class: Insecta
Order: Lepidoptera
Family: Hesperiidae

Priority Score: **27** out of 100



Population Trend: Unknown

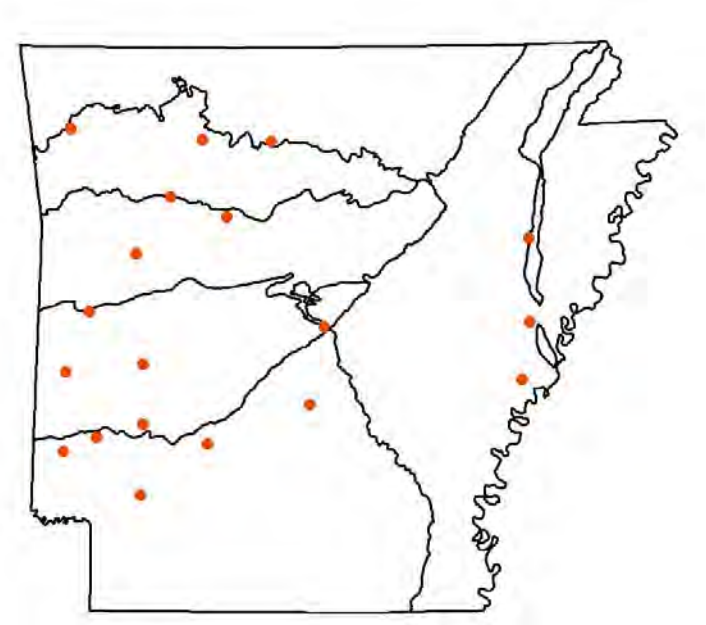


Global Rank: G3G4 — Vulnerable (uncertain rank)

State Rank: S1S3 — Critically imperiled in Arkansas (uncertain rank)

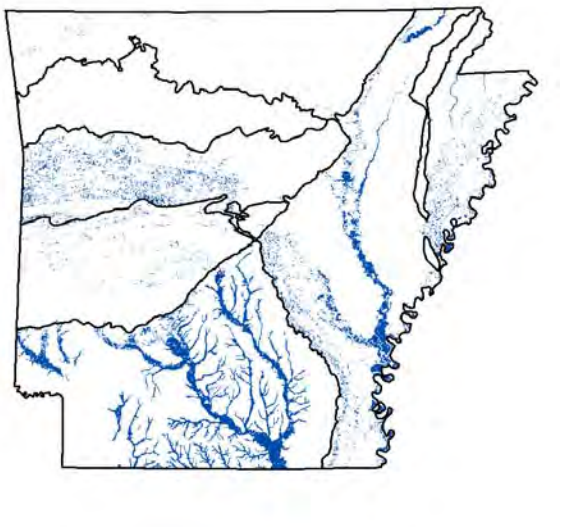
Distribution

Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☑
- Boston Mountains ☑
- Arkansas Valley ☑
- Ouachita Mountains ☑
- South Central Plains ☑
- Mississippi Alluvial Plain ☑
- Mississippi Valley Loess Plain ☐



Habitat Map



Habitats	Weight
Lower Mississippi River High Bottomland Forest	Suitable
Lower Mississippi River Riparian Forest	Suitable
Ozark-Ouachita Large Floodplain	Optimal
Ozark-Ouachita Riparian	Optimal
West Gulf Coastal Plain Large River Floodplain Forest	Suitable
West Gulf Coastal Plain Small Stream/River Forest	Suitable

Problems Faced

Fire suppression.	Threat: Alteration of natural fire regimes Source: Fire suppression
Loss of canebrake habitat.	Threat: Habitat destruction or conversion Source: Conversion of riparian forest

Data Gaps/Research Needs

Need to obtain baseline information on distribution and population status.

Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

Need a thorough survey of high-quality canebrakes to determine status of this and other cane-dependent species in the state.

Comments

Considered by Schweitzer et al. (2011) to be the most secure of the cane-feeding skippers in the genus Amblyscirtes, but note that its occurrence and population viability are not well known. In Missouri regarded as very local, found in only a few scattered localities in the southern portion of the state (Heitzman and Heitzman 1996). Spencer (2006) characterizes this skipper as being rare to uncommon statewide in canebrakes. Recorded from 27 Arkansas counties (Baltosser et al. 2015); widely distributed and fairly common in high-quality cane habitats of northern Arkansas (Dr. William Baltosser, personal communication, 2015), whereas records from south-central and southwestern counties generally consist of one or two individuals (Drs. Craig Rudolph and Charles Ely, personal communication, 2015). An on-going study of skippers in the genus Amblyscirtes by Baltosser (Dr. William Baltosser, personal communication, 2015) will provide additional information, but at present there is insufficient information to fully evaluate the status of the species. Continued surveys of cane habitats throughout Arkansas are needed before any change in listing.

Taxa Association Team and Peer Reviewers

UALR Dr. William Baltosser, ANHC Ms. Samantha Scheiman, USFS Dr. Craig Rudolph, and Dr. Charles Ely

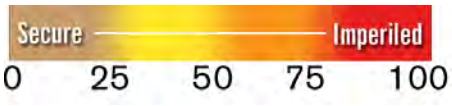
Amblyscirtes belli

Bell's Roadside-Skipper



Class: Insecta
Order: Lepidoptera
Family: Hesperiidae

Priority Score: **21** out of 100



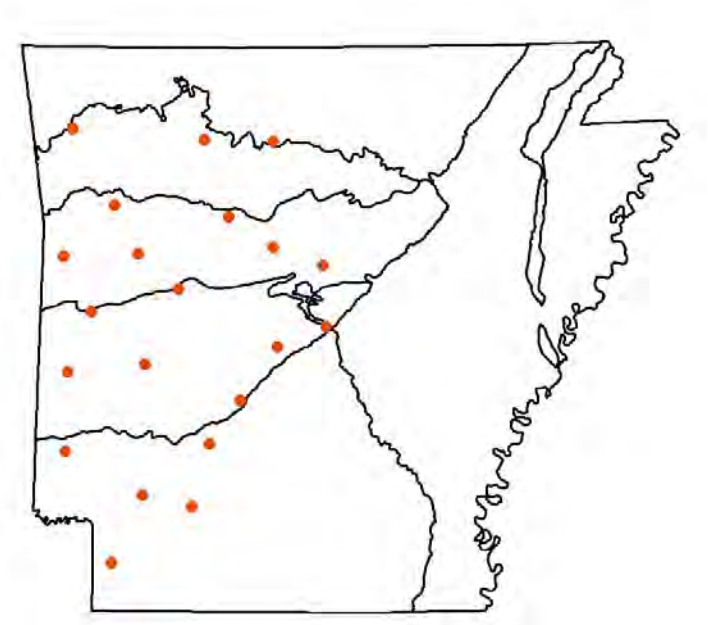
Population Trend: Unknown

Global Rank: G3G4 — Vulnerable (uncertain rank)

State Rank: S3S4 — Vulnerable species in Arkansas (uncertain rank)

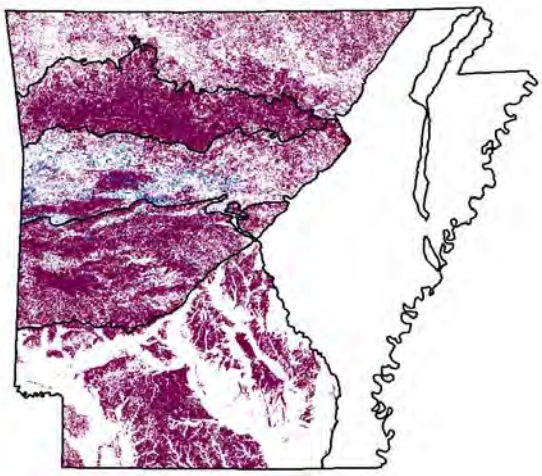
Distribution

Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☑
- Boston Mountains ☑
- Arkansas Valley ☑
- Ouachita Mountains ☑
- South Central Plains ☑
- Mississippi Alluvial Plain ☐
- Mississippi Valley Loess Plain ☐



Habitat Map



Habitats	Weight
Ozark-Ouachita Dry Oak and Pine Woodland	Optimal
Ozark-Ouachita Dry-Mesic Oak Forest/Woodland	Optimal
Ozark-Ouachita Large Floodplain	Suitable
Ozark-Ouachita Pine-Bluestem Woodland	Optimal
Ozark-Ouachita Pine-Oak Forest/Woodland	Optimal
Ozark-Ouachita Prairie and Woodland	Optimal
Ozark-Ouachita Riparian	Suitable
West Gulf Coastal Plain Calcareous Prairie and Woodland	Suitable
West Gulf Coastal Plain Pine-Hardwood Forest/Woodland	Optimal
West Gulf Coastal Plain Sandhill Oak and Shortleaf Pine Forest/Woodland	Optimal

Problems Faced

KNOWN PROBLEM: Habitat loss.	Threat: Habitat destruction or conversion Source: Forestry activities
KNOWN PROBLEM: Reduced habitat quality due to invasive species.	Threat: Altered composition/structure Source: Exotic species
POTENTIAL PROBLEM: Loss of habitat due to deer browsing.	Threat: Excessive herbivory Source: Grazing/Browsing
POTENTIAL PROBLEM: Use of pesticides for gypsy moths.	Threat: Toxins/contaminants Source: Forestry activities

Data Gaps/Research Needs

Need to obtain baseline information on distribution and population status.

Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

Survey grassy areas at woodland edges and city gardens, especially along creeks.

Comments

NatureServe (2015) describes this species as being local and uncommon but not in trouble globally; if it is indeed starting to use Johnson grass (Sorghum halepense) as a larval foodplant in addition to its usual foodplant, Indian Woodoats (Chasmanthium latifolium), it could become more common. Within Arkansas, Spencer (2006) notes that this skipper is uncommon to common nearly statewide except in the southern Delta. Drs. William Baltosser, Craig Rudolph, and Charles Ely have detected this species in 21 counties (personal communication, 2015) and, when coupled with additional occurrences depicted by Raney (2012), the occurrence of this species totals to 29 Arkansas counties (Baltosser et al. 2015). The former suggest that at present the species does not warrant listing, but Schweitzer et al. (2011) question whether there is sufficient evidence to consider this species secure. Given this, it is recommended that the Bell's Roadside-Skipper should be monitored if habitats are to be altered and be among the species tracked when any Lepidoptera studies within suitable habitat are undertaken.

Taxa Association Team and Peer Reviewers

UALR Dr. William Baltosser, ANHC Ms. Samantha Scheiman, USFS Dr. Craig Rudolph, and Dr. Charles Ely

Amblyscirtes carolina

Carolina Roadside-Skipper

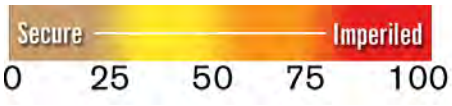


Class: Insecta

Order: Lepidoptera

Family: Hesperiidae

Priority Score: **27** **out of 100**



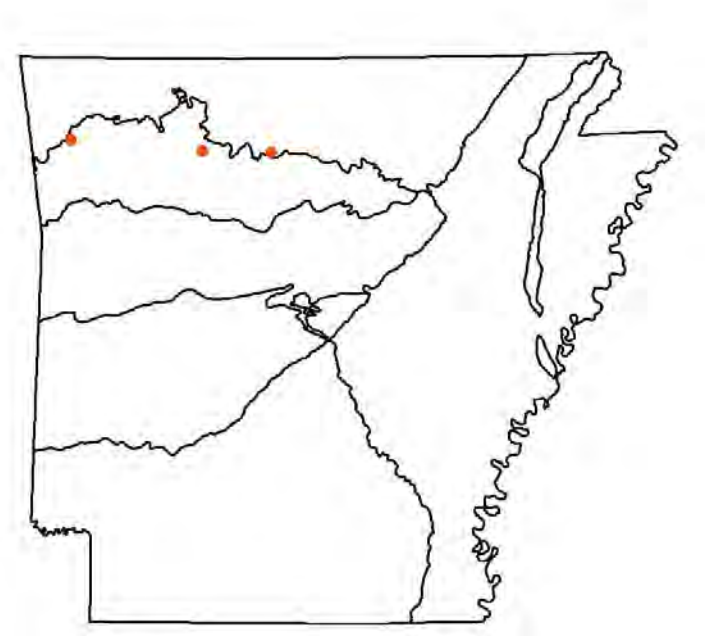
Population Trend: Unknown

Global Rank: G3G4 — Vulnerable (uncertain rank)

State Rank: S1S3 — Critically imperiled in Arkansas (uncertain rank)

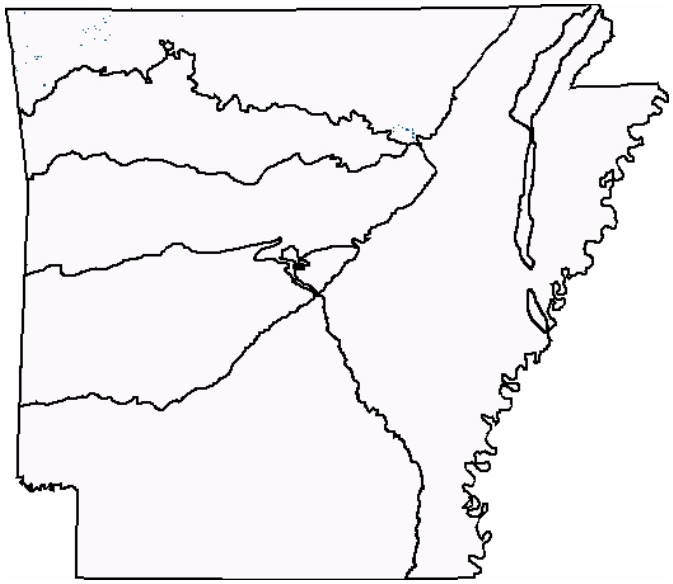
Distribution

Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☐
- Boston Mountains ☑
- Arkansas Valley ☐
- Ouachita Mountains ☐
- South Central Plains ☐
- Mississippi Alluvial Plain ☐
- Mississippi Valley Loess Plain ☐



Habitat Map



Habitats

	Weight
Ozark-Ouachita Large Floodplain	Optimal
Ozark-Ouachita Riparian	Optimal

Problems Faced

Fire suppression.	Threat: Alteration of natural fire regimes Source: Fire suppression
Loss of canebrake habitat.	Threat: Habitat destruction or conversion Source: Conversion of riparian forest

Data Gaps/Research Needs

Obtain baseline information on distribution and population status.

Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

Need a thorough survey of high-quality canebrakes to determine status of this and other cane-dependent species in the state.

Comments

Dependent upon canebrakes. Arkansas populations of this skipper are greatly disjunct from the main range of the species to the east, with records of occurrence in the state from only 4 counties (Baltosser et al. 2015). Occurrences documented by Baltosser lie to the east of the single disjunct population for Arkansas shown by Opler and Malikul (1998). Species occasionally somewhat numerous (locally) in on-going study of skippers in the genus Amblyscirtes being conducted by Baltosser (Dr. William Baltosser, personal communication, 2015). This study will provide additional data, but at present there is insufficient information to fully evaluate the status of the species other than to be aware of its presence and limited distribution.

Taxa Association Team and Peer Reviewers

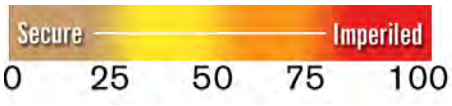
UALR Dr. William Baltosser, ANHC Ms. Samantha Scheiman, USFS Dr. Craig Rudolph, and Dr. Charles Ely

Amblyscirtes linda

Linda's Roadside-Skipper

Class: Insecta
Order: Lepidoptera
Family: Hesperiidae

Priority Score: **38** out of 100





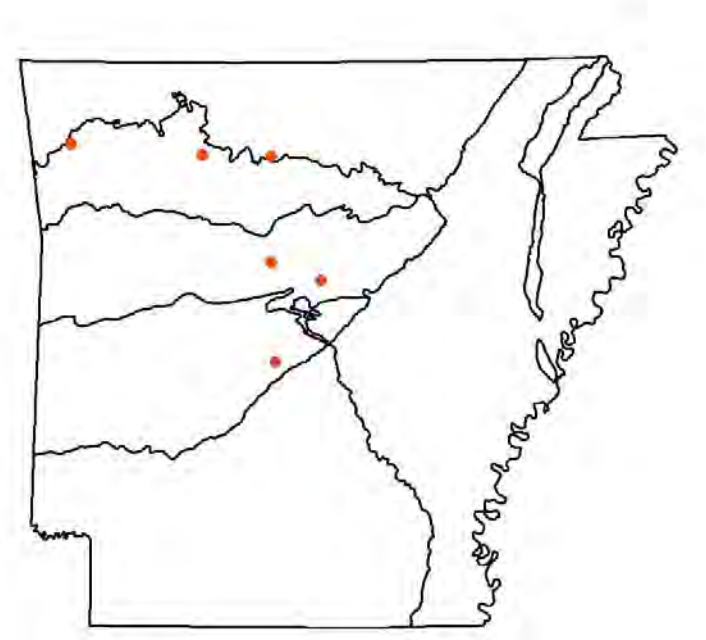
Population Trend: Unknown

Global Rank: G2G3 — Imperiled (uncertain rank)

State Rank: S1S3 — Critically imperiled in Arkansas (uncertain rank)

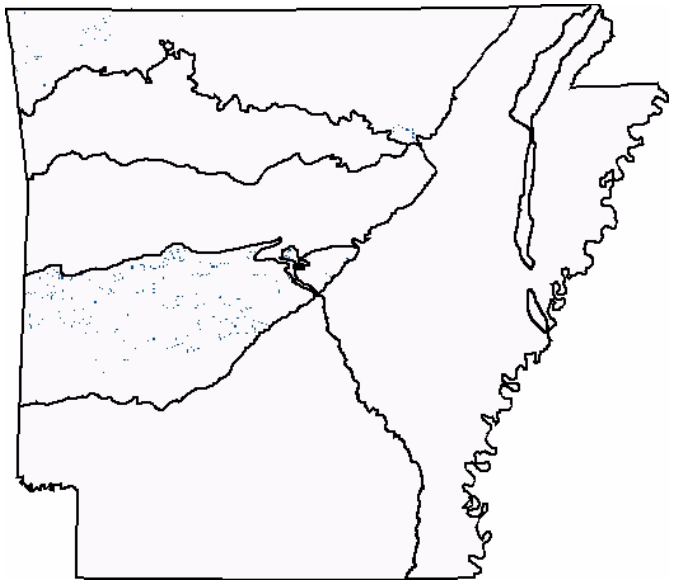
Distribution

Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☑
- Boston Mountains ☑
- Arkansas Valley ☐
- Ouachita Mountains ☑
- South Central Plains ☐
- Mississippi Alluvial Plain ☐
- Mississippi Valley Loess Plain ☐



Habitat Map



Habitats

	Weight
Ozark-Ouachita Dry Oak and Pine Woodland	Optimal

Problems Faced

KNOWN PROBLEM: Loss/conversion of woodland stream habitat.	Threat: Habitat destruction or conversion Source: Conversion of riparian forest

Data Gaps/Research Needs

Need to obtain baseline information on distribution and population status.

Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

Need a thorough survey of the Ozark and Ouachita regions to determine status of this and other rare species in the state.

Comments

Limited range; rare breeding native species that is known to use only spike grass (Chasmanthium latifolium) as a larval host plant. Preferred habitat is along woodland streams (Opler and Malikul 1998). Heitzman and Heitzman (1996) list this butterfly as a rare breeding species native to the Ozark region. Species has been found in 10 Arkansas counties (Baltosser et al. 2015); more information needed. An on-going study of skippers in the genus Amblyscirtes being conducted by Baltosser (Dr. William Baltosser, personal communication, 2015) will provide additional insight. However, there is currently insufficient information to fully evaluate the status of the species other than to be aware of its presence and limited distribution.

Taxa Association Team and Peer Reviewers

UALR Dr. William Baltosser, ANHC Ms. Samantha Scheiman, USFS Dr. Craig Rudolph, and Dr. Charles Ely

Arianops copelandi

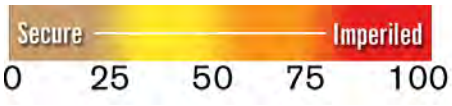
Copeland's Mold Beetle

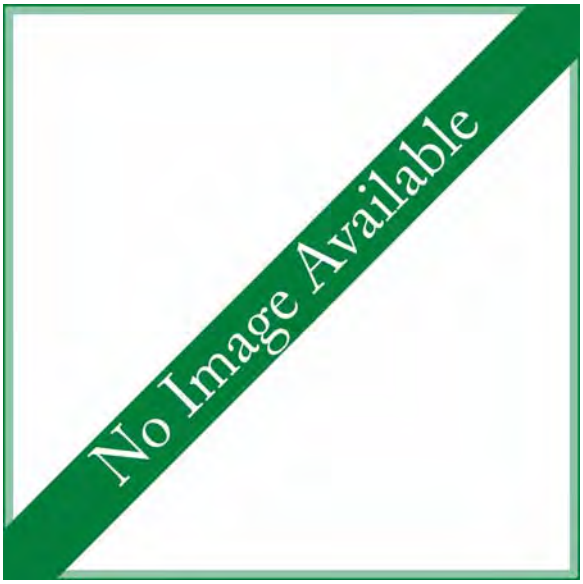
Class: Insecta

Order: Coleoptera

Family: Pselaphidae

Priority Score: **23** out of 100





Population Trend: Unknown

Global Rank: GNR — Not yet ranked

State Rank: S1 — Critically imperiled in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☐
- Boston Mountains ☐
- Arkansas Valley ☐
- Ouachita Mountains ☑
- South Central Plains ☐
- Mississippi Alluvial Plain ☐
- Mississippi Valley Loess Plain ☐



Habitat Map



Habitats

	Weight
Ozark-Ouachita Mesic Hardwood Forest	Suitable

Problems Faced

Forestry practices that disturb litter layer and create xeric conditions.	Threat: Habitat disturbance Source: Forestry activities
Recreational development.	Threat: Habitat disturbance Source: Recreation

Data Gaps/Research Needs

Need to obtain baseline information on distribution and population status.

Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

Survey areas near known occurrences to locate additional populations.

Comments

An endemic beetle known only from the northeastern slope of Pinnacle Mountain in Pulaski County (Carlton and Cox 1990).

Taxa Association Team and Peer Reviewers

ANHC Mr. Michael Warriner

Arianops sandersoni

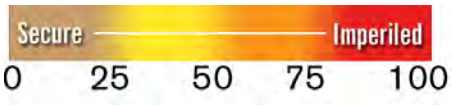
Magazine Mountain Mold Beetle

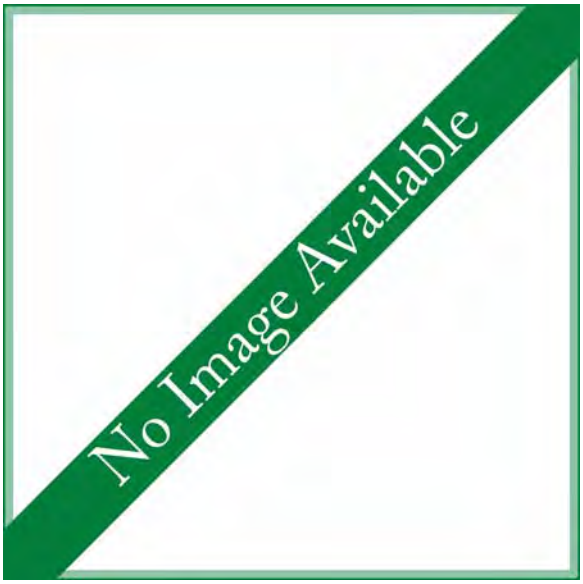
Class: Insecta

Order: Coleoptera

Family: Pselaphidae

Priority Score: **80** out of 100





Population Trend: Unknown

Global Rank: G1? — Critically imperiled (inexact numeric rank)

State Rank: S1? — Critically imperiled in Arkansas (inexact numeric rank)

Distribution

Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☐
- Boston Mountains ☐
- Arkansas Valley ☑
- Ouachita Mountains ☐
- South Central Plains ☐
- Mississippi Alluvial Plain ☐
- Mississippi Valley Loess Plain ☐



Habitat Map



Habitats	Weight
Ozark-Ouachita Mesic Hardwood Forest	Suitable

Problems Faced

Forestry practices that disturb litter layer and create xeric conditions.	Threat: Habitat disturbance Source: Commercial harvest
Recreational development.	Threat: Habitat disturbance Source: Recreation

Data Gaps/Research Needs

Need to obtain baseline information on distribution and population status.

Conservation Actions	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

Survey areas near known occurrences to locate additional populations.

Comments

An endemic beetle known only from Bear Hollow on Magazine Mountain in Logan County (Barr 1974).

Taxa Association Team and Peer Reviewers

ANHC Mr. Michael Warriner

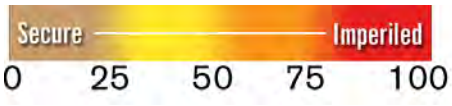
Atrytone arogos iowa

Arogos Skipper

Class: Insecta
Order: Lepidoptera
Family: Hesperiidae



Priority Score: 19 out of 100



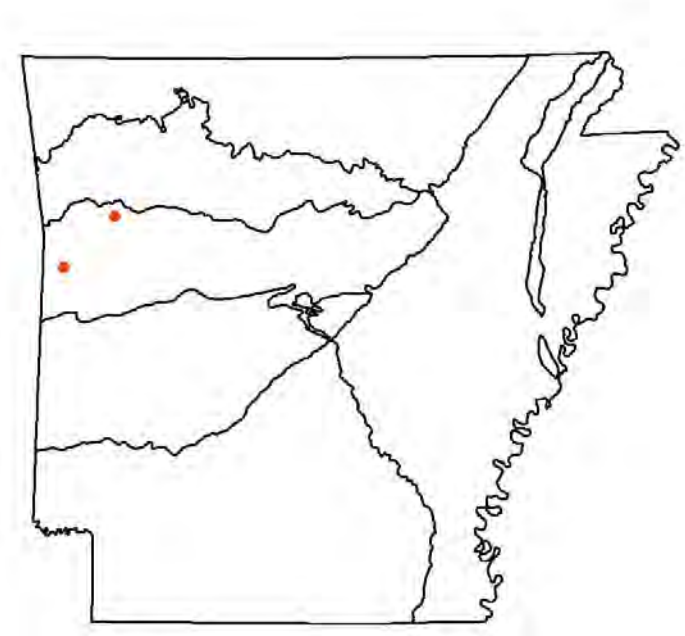
Population Trend: Unknown

Global Rank: G3T3 — Vulnerable (vulnerable subspecies)

State Rank: S1 — Critically imperiled in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☐
- Boston Mountains ☐
- Arkansas Valley ☑
- Ouachita Mountains ☐
- South Central Plains ☐
- Mississippi Alluvial Plain ☐
- Mississippi Valley Loess Plain ☐



Habitat Map



Habitats

	Weight
Ozark-Ouachita Prairie and Woodland	Obligate

Problems Faced

KNOWN PROBLEM: Loss of tallgrass prairie habitat.	Threat: Habitat destruction or conversion Source: Fire suppression
KNOWN PROBLEM: Loss of tallgrass prairie habitat.	Threat: Habitat destruction or conversion Source: Agricultural practices

Data Gaps/Research Needs

Determine the effects of prescribed burning on populations.

Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

Survey tallgrass prairies (especially in Franklin County) for this and other rare species.

Comments

Intensive surveys for this skipper were made annually over a four-year period in Franklin County on three tallgrass prairies administered by the Arkansas Natural Heritage Commission and The Nature Conservancy (Baltosser 2008, 2009, 2010). Within these areas the species appears to be reasonably secure, though local extirpation with subsequent colonization from segments of one or both of the other areas appears common (Dr. William Baltosser, personal communication, 2015). This skipper is an indicator of high-quality, pristine tallgrass prairie habitat and as such, even though local abundance can occasionally be high, the species is in jeopardy due to loss and degradation of habitat throughout its range (see Schweitzer et al. 2011 and NatureServe 2015). The former was evident following controlled burning or haying activities that are periodically required to maintain these habitats. Both activities in the short-term negatively impact the species, but with the provision of temporary local refugia (untreated acreage of approximate equal size in close proximity to management activities), the detrimental impact upon the local population was offset through improved habitat and subsequent recovery (Dr. William Baltosser, personal communication, 2015). Designating this species as a "Species of Special Concern" is well justified given the tremendous loss of habitat throughout its historical range, continued threats to its few remaining habitats (found in only 2 Arkansas counties - Baltosser et al. 2015), and the removal of ecological factors that served to maintain tallgrass prairie habitats (e.g., fire and bison grazing).

Taxa Association Team and Peer Reviewers

UALR Dr. William Baltosser, ANHC Ms. Samantha Scheiman, USFS Dr. Craig Rudolph, and Dr. Charles Ely

Autochton cellus

Golden-banded Skipper

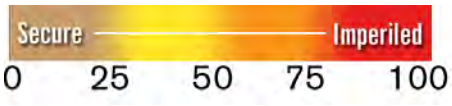


Class: Insecta

Order: Lepidoptera

Family: Hesperiidae

Priority Score: 21 out of 100



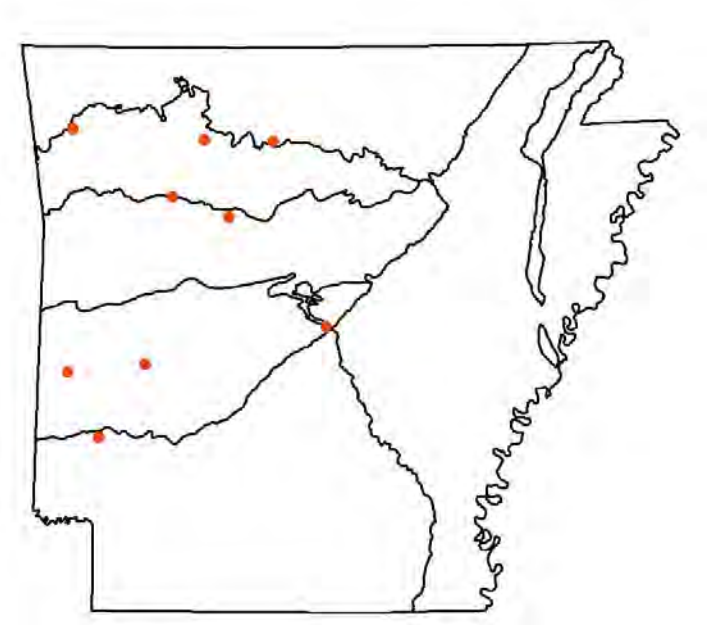
Population Trend: Unknown

Global Rank: G4 — Apparently secure species

State Rank: S2S3 — Imperiled species in Arkansas (uncertain rank)

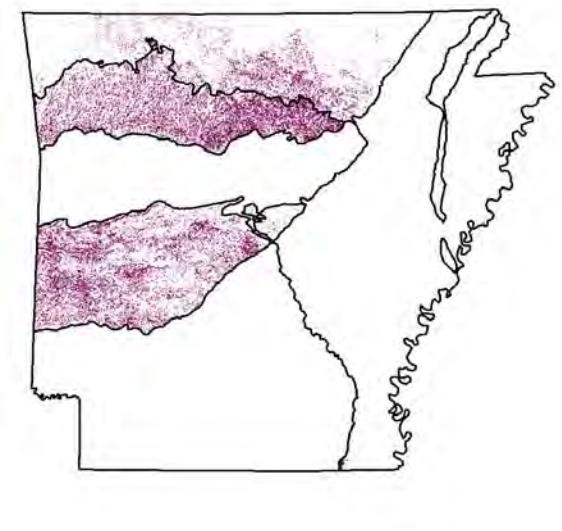
Distribution

Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☑
- Boston Mountains ☑
- Arkansas Valley ☐
- Ouachita Mountains ☑
- South Central Plains ☐
- Mississippi Alluvial Plain ☑
- Mississippi Valley Loess Plain ☐



Habitat Map



Habitats

	Weight
Ozark-Ouachita Dry Oak and Pine Woodland	Optimal
Ozark-Ouachita Pine-Oak Forest/Woodland	Optimal

Problems Faced

KNOWN PROBLEM: Loss of habitat.

Threat:
Source:

Data Gaps/Research Needs

Need to obtain baseline information on distribution and population status.

Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

Survey rich woodlands that contain the host plant, Hog Peanut (Amphicarpaea).

Autochton cellus
Golden-banded Skipper

Comments

Schweitzer et al. (2011) note the disjunct distribution of this skipper, which has both eastern U.S. and southwestern U.S. populations. In Missouri the species is stated to be rare and local and found in only a few eastern and southern Ozark counties (Heitzman and Heitzman 1996). Spencer (2006) characterizes this skipper in Arkansas as being local in its distribution and rare to uncommon statewide, except for the southern Delta. Surveys conducted over multiple years and, in some instances, spanning a period in excess of 10 years, demonstrate the localized distribution and rarity often associated with this species (Drs. William Baltosser, Craig Rudolph, and Charles Ely, personal communication, 2015). Rudolph and Ely have only five records for this skipper and all are from the same locality. They have been aware of the larval foodplant and of the presence of other "look-alike-skippers" (e.g., Hoary Edge), so their failure to detect this skipper on other surveys throughout the region is noteworthy. In contrast, in surveys along the Buffalo National River and vicinity, Baltosser has found the species to be widespread as documented by 35 records of occurrence across three counties. Although documented to occur in 15 Arkansas counties (Baltosser et al. 2015), surveys are still needed to determine baseline information, and conservation measures need to be explored once there is more insight regarding the status and distribution of this species.

Taxa Association Team and Peer Reviewers

UALR Dr. William Baltosser, ANHC Ms. Samantha Scheiman, USFS Dr. Craig Rudolph, and Dr. Charles Ely

Calephelis borealis

Northern Metalmark

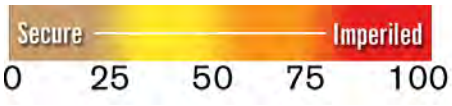


Class: Insecta

Order: Lepidoptera

Family: Riodinidae

Priority Score: **23** **out of 100**



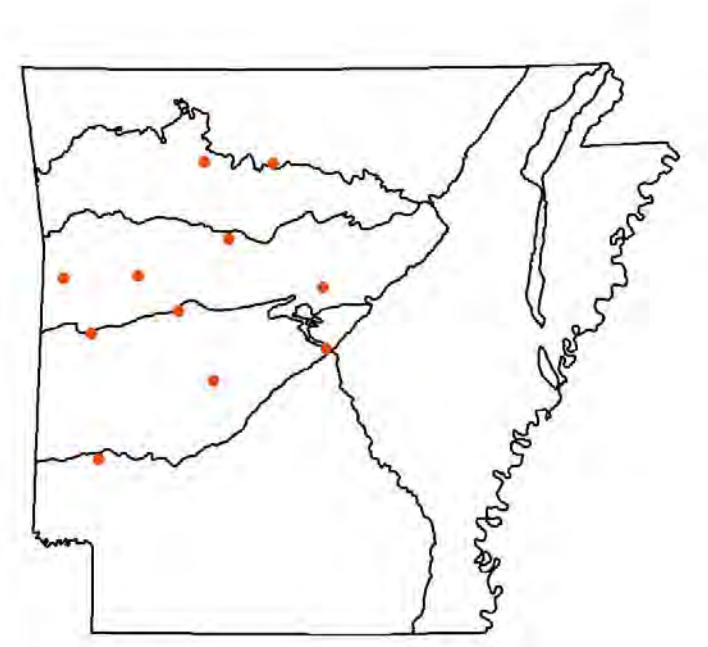
Population Trend: Unknown

Global Rank: G3G4 — Vulnerable (uncertain rank)

State Rank: S3 — Vulnerable in Arkansas

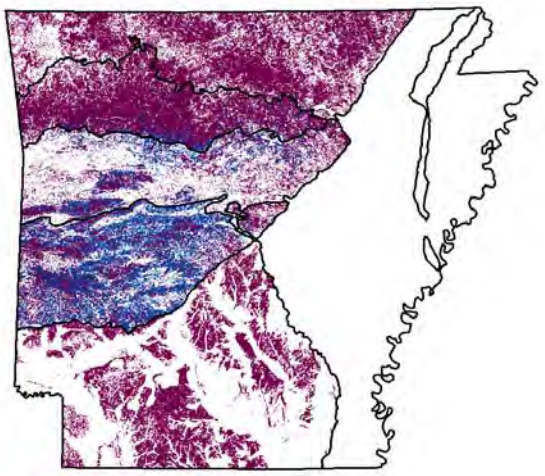
Distribution

Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☑
- Boston Mountains ☑
- Arkansas Valley ☑
- Ouachita Mountains ☑
- South Central Plains ☑
- Mississippi Alluvial Plain ☐
- Mississippi Valley Loess Plain ☐



Habitat Map



Habitats

	Weight
Interior Highlands Calcareous Glade and Barrens	Optimal
Interior Highlands Dry Acidic Glade and Barrens	Optimal
Ozark-Ouachita Dry Oak and Pine Woodland	Optimal
Ozark-Ouachita Dry-Mesic Oak Forest/Woodland	Optimal
Ozark-Ouachita Pine-Bluestem Woodland	Suitable
West Gulf Coastal Plain Calcareous Prairie and Woodland	Suitable

Problems Faced

POTENTIAL PROBLEM: Habitat degradation due to deer browsing.	Threat: Excessive herbivory Source: Grazing/Browsing
POTENTIAL PROBLEM: Habitat degradation due to invasive exotic plant species such as Japanese honeysuckle.	Threat: Altered composition/structure Source: Exotic species

Data Gaps/Research Needs

Need to obtain baseline information on distribution and population status.

Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Calephelis borealis
Northern Metalmark

Monitoring Strategies

Survey openings, which may be natural outcrops, shale or limestone barrens, glades, or powerline rights-of-way within forested or wooded areas.

Comments

The separation of this species and Swamp Metalmark (Calephelis muticum) is not necessarily an easy task. Both are rare in Arkansas and can occur in the same geographic area. Co-occurrence of the two species is especially a problem in Missouri and Arkansas (Heitzman and Heitzman 1996, Schweitzer et al. 2011) and thus habitat, while being an important component of identification (Spencer 2006), cannot be used as the only indicator in identification (Dr. William Baltosser, personal communication, 2015). Records of occurrence exist for 13 Arkansas counties; virtually all metalmarks encountered by Drs. Baltosser, Rudolph, and Ely have proved (even when from wet habitats) to be Northern Metalmarks (personal communication, 2015); more information needed to evaluate status.

Taxa Association Team and Peer Reviewers

UALR Dr. William Baltosser, ANHC Ms. Samantha Scheiman, USFS Dr. Craig Rudolph, and Dr. Charles Ely

Calephelis muticum

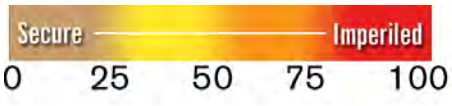
Swamp Metalmark

Class: Insecta

Order: Lepidoptera

Family: Riodinidae

Priority Score: **34** out of 100





©Jeffrey K. Barnes

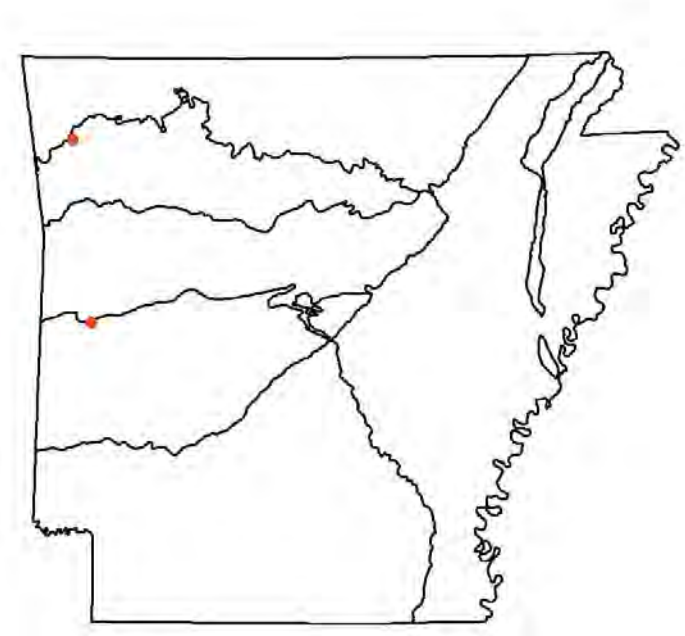
Population Trend: Unknown

Global Rank: G3 — Vulnerable species

State Rank: S1 — Critically imperiled in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☑
- Boston Mountains ☑
- Arkansas Valley ☐
- Ouachita Mountains ☐
- South Central Plains ☐
- Mississippi Alluvial Plain ☐
- Mississippi Valley Loess Plain ☐



Habitat Map



Habitats	Weight
Herbaceous Wetland	Data Gap
Ozark-Ouachita Forested Seep	Optimal

Problems Faced

KNOWN PROBLEM: Habitat loss and degradation.	Threat: Habitat destruction or conversion Source: Conversion of riparian forest

Data Gaps/Research Needs

Need to obtain baseline information on distribution and population status.

Conservation Actions	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

Need a thorough inventory of high-quality glade complexes in the Ozarks for this and other rare insect species.

Comments

The Swamp Metalmark is associated with wetland habitat (Opler and Malikul 1998). However, the separation of this species and Northern Metalmark (Calephelis borealis) is not necessarily an easy task. Both are rare in Arkansas and can occur in the same geographic area. Co-occurrence of the two species is especially a problem in Missouri and Arkansas (Heitzman and Heitzman 1996, Schweitzer et al. 2011) and thus habitat, while being an important component of identification (Spencer 2006), cannot be used as the only indicator in identification (Dr. William Baltosser, personal communication, 2015). Records of occurrence exist for 6 Arkansas counties, but virtually all metalmarks encountered by Drs. Baltosser, Rudolph, and Ely have proved (even when from wet habitats) to be Northern Metalmarks; more information needed to evaluate status. This species is thought to be associated with deep muck fens such as occur near Bull Shoals Lake. Fen habitats herein are incorporated into the Ozark-Ouachita Forested Seep habitat type.

Taxa Association Team and Peer Reviewers

UALR Dr. William Baltosser, ANHC Ms. Samantha Scheiman, USFS Dr. Craig Rudolph, and Dr. Charles Ely

Callophrys irus hadros

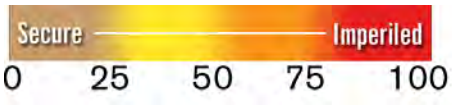
Texas Frosted Elfin

Class: Insecta

Order: Lepidoptera

Family: Lycaenidae

Priority Score: **42** out of 100





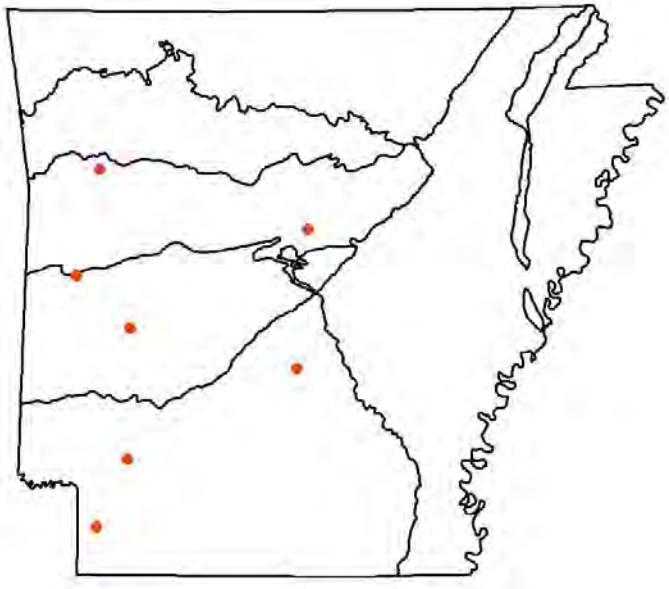
Population Trend: Unknown

Global Rank: G3T2T3 — Vulnerable (imperiled or vulnerable subspecies)

State Rank: S1 — Critically imperiled in Arkansas

Distribution

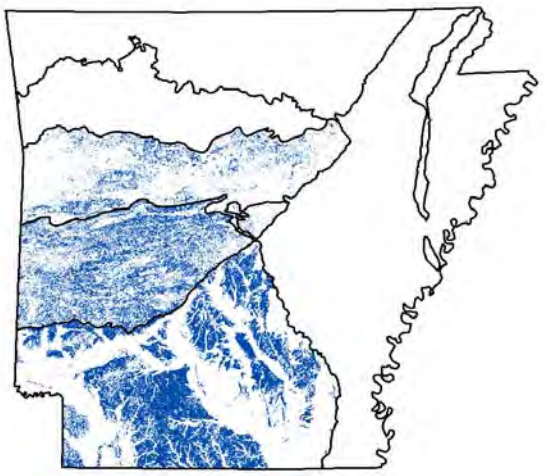
Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☐
- Boston Mountains ☐
- Arkansas Valley ☑
- Ouachita Mountains ☑
- South Central Plains ☑
- Mississippi Alluvial Plain ☐
- Mississippi Valley Loess Plain ☐

Habitat Map





Habitats	Weight
Ozark-Ouachita Dry Oak and Pine Woodland	Suitable
Ozark-Ouachita Pine-Bluestem Woodland	Suitable
Ozark-Ouachita Prairie and Woodland	Suitable
West Gulf Coastal Plain Calcareous Prairie and Woodland	Suitable
West Gulf Coastal Plain Sandhill Oak and Shortleaf Pine Forest/Woodland	Suitable

Problems Faced

Fire suppression.	Threat: Alteration of natural fire regimes Source: Fire suppression
Habitat degradation.	Threat: Habitat destruction or conversion Source: Forestry activities

Data Gaps/Research Needs

Need to obtain baseline information on distribution and population status.

Conservation Actions	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Callophrys irus hadros
Texas Frosted Elfin

Monitoring Strategies

Intensive surveys should be conducted to determine the distribution and general abundance of the Texas Frosted Elfin in Arkansas.

Comments

It has been suggested that the Texas subspecies (hadros), a rare and localized butterfly, is perhaps a full species (Shepherd 2005). In Arkansas, habitat includes areas that are sandy, rocky, scrub, burned, and also woodland edges (Spencer 2006). The species has occurred in 7 Arkansas counties (Baltosser et al. 2015). Recently it has been found in tallgrass prairie habitats in the Arkansas Valley in early spring, subsequent to fall and early winter habitat manipulations the previous year (Baltosser, 2010); more information needed to evaluate status.

Taxa Association Team and Peer Reviewers

UALR Dr. William Baltosser, ANHC Ms. Samantha Scheiman, USFS Dr. Craig Rudolph, and Dr. Charles Ely

Catocala lincolnana

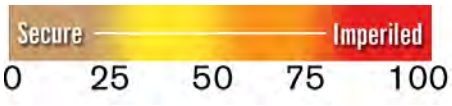
Lincoln Underwing

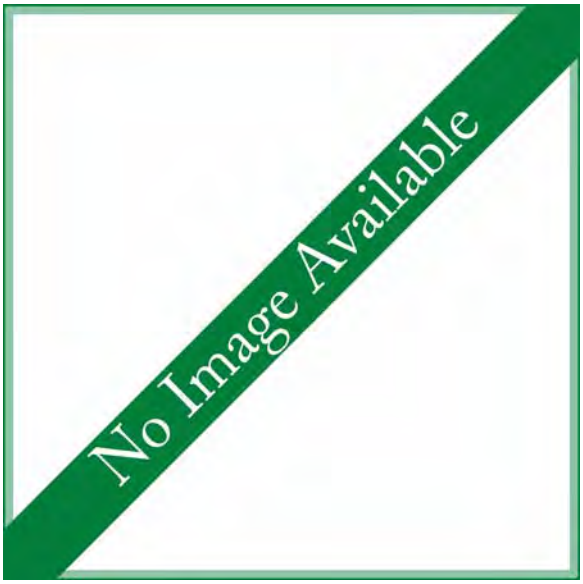
Class: Insecta

Order: Lepidoptera

Family: Noctuidae

Priority Score: **23** **out of 100**





Population Trend: Unknown

Global Rank: G3G4 — Vulnerable (uncertain rank)

State Rank: S3 — Vulnerable in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☐
- Boston Mountains ☐
- Arkansas Valley ☐
- Ouachita Mountains ☐
- South Central Plains ☐
- Mississippi Alluvial Plain ☐
- Mississippi Valley Loess Plain ☐



Habitat Map



Habitats

	Weight
Lower Mississippi River Bottomland Depression	Data Gap
West Gulf Coastal Plain Large River Floodplain Forest	Data Gap

Problems Faced

KNOWN PROBLEM: Habitat destruction.	Threat: Habitat destruction or conversion Source: Forestry activities

Data Gaps/Research Needs

Need to obtain baseline information on distribution and population status.

Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

Survey forested southern hardwood swamps or mixed cypress swamps for this and other species. Known sites are in association with rivers, and larvae feed on certain species of subcanopy hawthorns.

Comments

No locality data available in Arkansas. NatureServe describes the species as occurring in cypress-tupelo swamp habitats. Several underwing specimens that have been taken from on-going moth surveys along the Buffalo National River (Drs. William Baltosser and Charles Ely, personal communication, 2015) are still being examined, some by outside experts. Over 20 species of Catocala have been identified to date from these surveys and no specimens of the Lincoln Underwing have been detected. Continuation of on-going and related studies is required if information on the status and distribution of this species is to be resolved.

Taxa Association Team and Peer Reviewers

UALR Dr. William Baltosser, ANHC Ms. Samantha Scheiman, USFS Dr. Craig Rudolph, and Dr. Charles Ely

Celastrina neglectamajor

Appalachian Azure

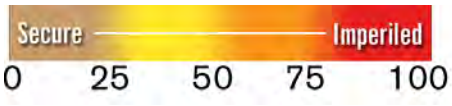


Class: Insecta

Order: Lepidoptera

Family: Lycaenidae

Priority Score: **27** **out of 100**



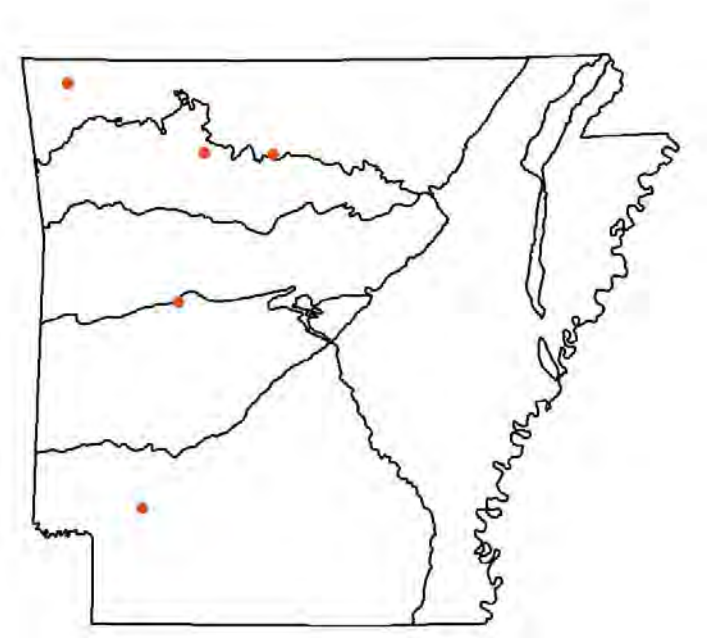
Population Trend: Unknown

Global Rank: G4 — Apparently secure species

State Rank: S1 — Critically imperiled in Arkansas

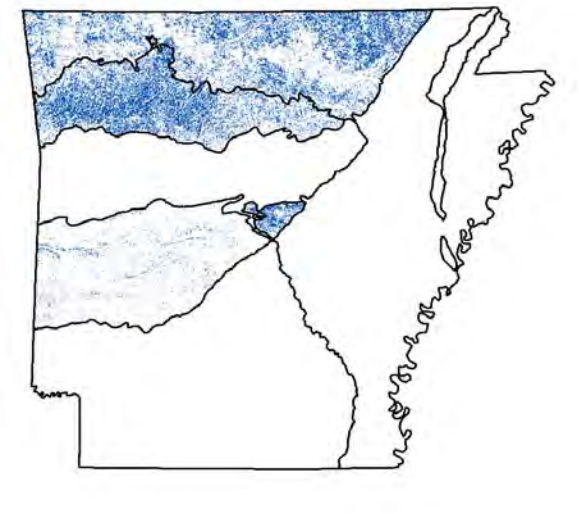
Distribution

Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☑
- Boston Mountains ☑
- Arkansas Valley ☐
- Ouachita Mountains ☑
- South Central Plains ☑
- Mississippi Alluvial Plain ☐
- Mississippi Valley Loess Plain ☐



Habitat Map



Habitats

	Weight
Ozark-Ouachita Dry-Mesic Oak Forest/Woodland	Suitable
Ozark-Ouachita Mesic Hardwood Forest	Suitable

Problems Faced

KNOWN PROBLEM: The foodplant (Actaea racemosa) is harvested legally and illegally for alleged medicinal value.	Threat: Habitat destruction Source: Excessive non-commercial harvest or collection

Data Gaps/Research Needs

Need to obtain baseline information on distribution and population status.

Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

Survey a variety of forest types in northern Arkansas to assess the current status of this species in the state.

Comments

Arkansas populations of this butterfly are greatly disjunct from the main range of the species to the east, but not without precedent when compared with the occurrence of the species in Missouri as depicted by Opler and Malikul (1998). Species present in surveys of Lepidoptera along the Buffalo National River and vicinity (at least two specimens), with perhaps several others (tentative identifications … species can be confused with Spring Azure and Summer Azure, Dr. William Baltosser, personal communication, 2015). One specimen record is available from Yell County (Drs. Craig Rudolph and Charles Ely, personal communication, 2015). A record from Hempstead County seems out of place but has been included in the total of 5 counties from which records of this species have been reported (Baltosser et al. 2015). Surveys are needed to determine baseline information, and conservation measures should be explored once there is more insight regarding the status and distribution of this species. Molecular DNA analysis is likely to be required at some point.

Taxa Association Team and Peer Reviewers

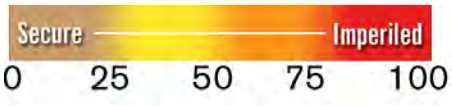
UALR Dr. William Baltosser, ANHC Ms. Samantha Scheiman, USFS Dr. Craig Rudolph, and Dr. Charles Ely

Celastrina nigra

Dusky Azure

Class: Insecta
Order: Lepidoptera
Family: Lycaenidae

Priority Score: **23** out of 100





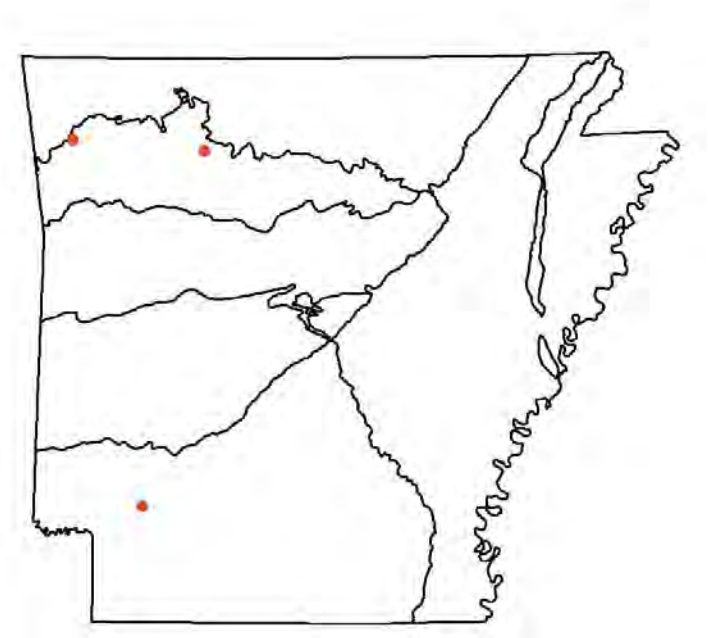
Population Trend: Unknown

Global Rank: G4 — Apparently secure species

State Rank: S2 — Imperiled in Arkansas

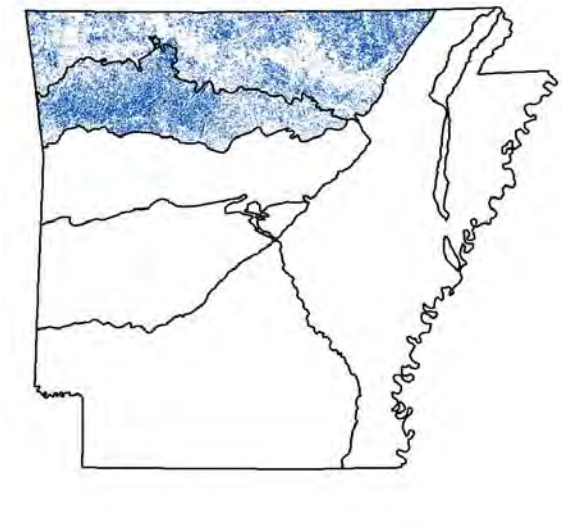
Distribution

Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☑
- Boston Mountains ☑
- Arkansas Valley ☐
- Ouachita Mountains ☐
- South Central Plains ☑
- Mississippi Alluvial Plain ☐
- Mississippi Valley Loess Plain ☐



Habitat Map



Habitats

	Weight
Ozark-Ouachita Dry-Mesic Oak Forest/Woodland	Suitable
Ozark-Ouachita Mesic Hardwood Forest	Suitable
West Gulf Coastal Plain Calcareous Prairie and Woodland	Suitable

Problems Faced

POTENTIAL PROBLEM: Loss of habitat due to invasion of the non-native garlic mustard (Alliaria officinalis).	Threat: Altered composition/structure Source: Exotic species

Data Gaps/Research Needs

Need to obtain baseline information on distribution and population status.

Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

Survey moist, shaded deciduous forests for this and other rare species.

Comments

The species is stated to be extremely local in Missouri and known only from a few counties in the eastern Ozarks (Heitzman and Heitzman 1996). The same publication further states that this is one of the rarest butterflies in the eastern United States. The occurrence of this insect in Arkansas is very much disjunct from the main range of the species to the east; it is recorded from only 3 Arkansas counties (Baltosser et al. 2015). Spencer (2006) notes that the species is local and rare, being recorded at the time of publication from only Washington and Hempstead counties. However, multiple individuals of this species were present in northern Arkansas (Newton Co.) in 2009, but it was not detected during the following two years despite extensive searches (Dr. William Baltosser, personal communication, 2015). Surveys to determine baseline information needed, and as more insight regarding the status and distribution of this species emerges (relict population?), then appropriate conservation and management strategies should be implemented.

Taxa Association Team and Peer Reviewers

UALR Dr. William Baltosser, ANHC Ms. Samantha Scheiman, USFS Dr. Craig Rudolph, and Dr. Charles Ely

Chlosyne gorgone

Gorgone Checkerspot

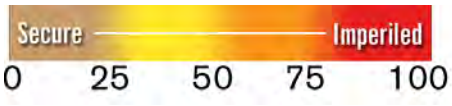


Class: Insecta

Order: Lepidoptera

Family: Nymphalidae

Priority Score: **15** out of 100



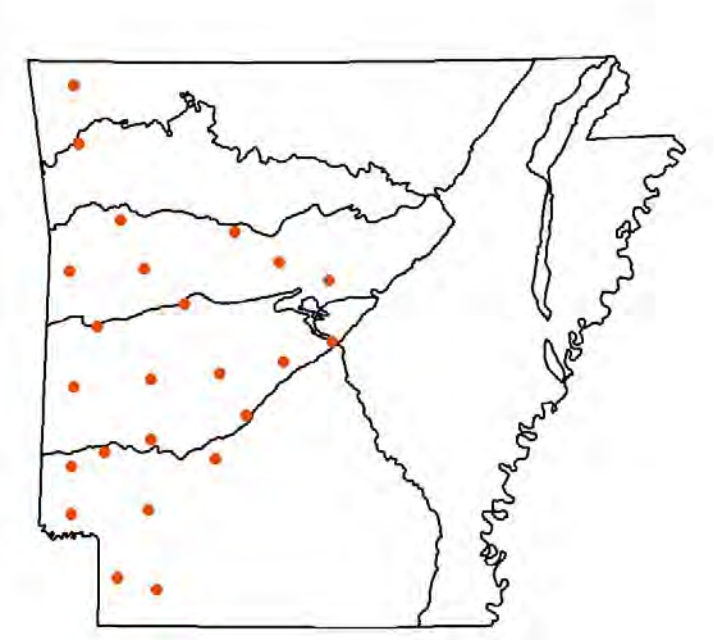
Population Trend: Unknown

Global Rank: G5 — Secure

State Rank: S3 — Vulnerable in Arkansas

Distribution

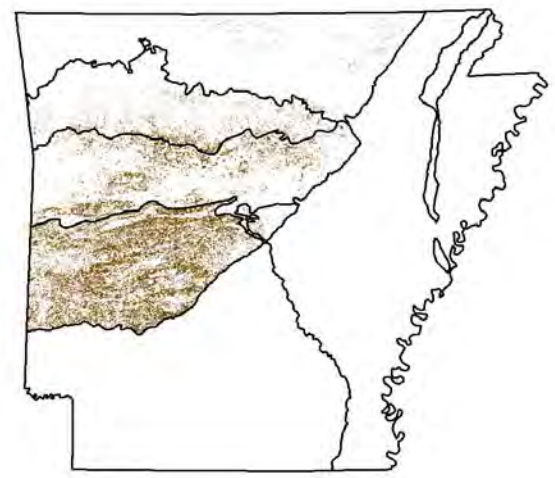
Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☑
- Boston Mountains ☑
- Arkansas Valley ☑
- Ouachita Mountains ☑
- South Central Plains ☑
- Mississippi Alluvial Plain ☑
- Mississippi Valley Loess Plain ☐

Habitat Map





Habitats	Weight
Ozark-Ouachita Pine-Bluestem Woodland	Data Gap
Ozark-Ouachita Prairie and Woodland	Data Gap
West Gulf Coastal Plain Calcareous Prairie and Woodland	Data Gap

Comments

This species is listed as one of concern in the publication, Rare, Declining, and Poorly Known Butterflies and Moths (Lepidoptera) of Forests and Woodlands in the Eastern United States (Schweitzer et al. 2011). Although of concern in some regions of the U.S., there are numerous occurrences for the species in Arkansas; records from 31 Arkansas counties (Baltosser et al. 2015). For example, Dr. William Baltosser has records of occurrence for the tallgrass prairies and blackland woodland prairies of Arkansas. Drs. Craig Rudolph and Charles Ely have found it in 13 counties and have records for the species throughout the Ouachita Mountain region. Records depicted by Raney (2012) show a similar pattern. Spencer (2006) characterizes its occurrence as local and rare but also notes that the species has several broods. Based on these records of occurrence, it is unlikely that this species is in need of listing in Arkansas at this time. However, given that it is of concern in other segments of its range, it should be inventoried whenever Lepidoptera surveys are conducted and these occurrences reported to appropriate land management agencies to help insure that populations are not in decline.

Taxa Association Team and Peer Reviewers

UALR Dr. William Baltosser, ANHC Ms. Samantha Scheiman, USFS Dr. Craig Rudolph, and Dr. Charles Ely

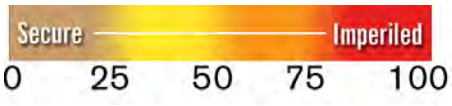
Chlosyne gorgone
Gorgone Checkerspot

Cicindela cursitans

Ant-like Tiger Beetle

Class: Insecta
Order: Coleoptera
Family: Cicindelidae

Priority Score: **21** out of 100



Population Trend: Unknown

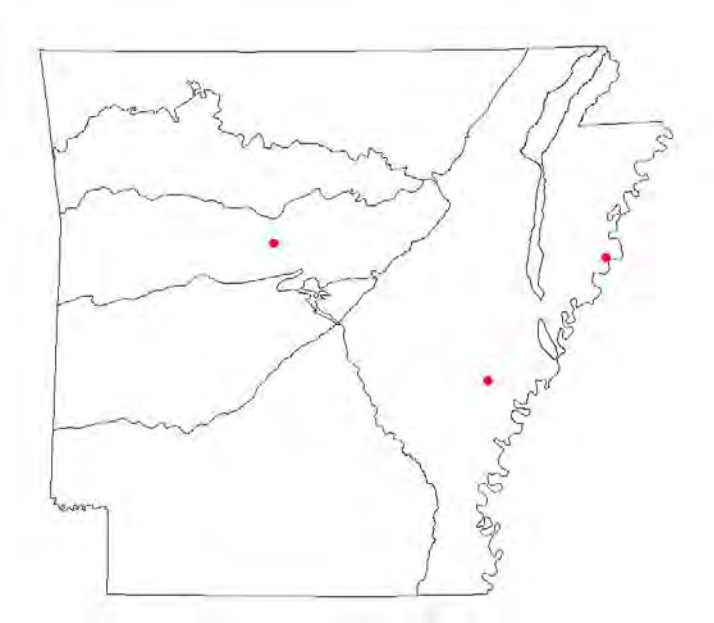


Global Rank: G4 — Apparently secure species

State Rank: S2S3 — Imperiled species in Arkansas (uncertain rank)

Distribution

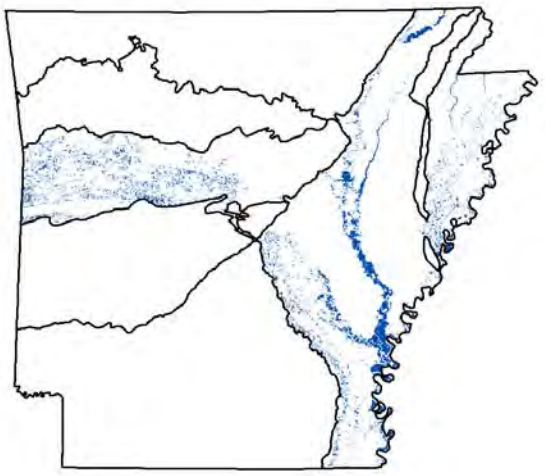
Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☐
- Boston Mountains ☐
- Arkansas Valley ☑
- Ouachita Mountains ☐
- South Central Plains ☐
- Mississippi Alluvial Plain ☑
- Mississippi Valley Loess Plain ☐

Habitat Map





Habitats

	Weight
Ozark-Ouachita Large Floodplain	Suitable

Problems Faced

Loss of riverbank/sand bar habitat.

Threat: Habitat destruction or conversion
Source: Dam

Data Gaps/Research Needs

Need to obtain baseline information on distribution and population status.

Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

Survey areas of known occurrence to verify persistence and examine areas that contain suitable habitat for unknown populations.

Comments

A species dependent upon open, sandy habitats such as river sandbars (Graves and Pearson 1973).

Taxa Association Team and Peer Reviewers

ANHC Mr. Michael Warriner

Cicindela duodecimguttata

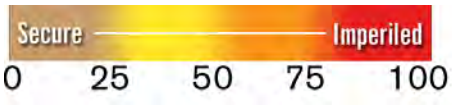
Twelve-spotted Tiger Beetle

Class: Insecta

Order: Coleoptera

Family: Cicindelidae

Priority Score: **13** out of 100



Population Trend: Unknown

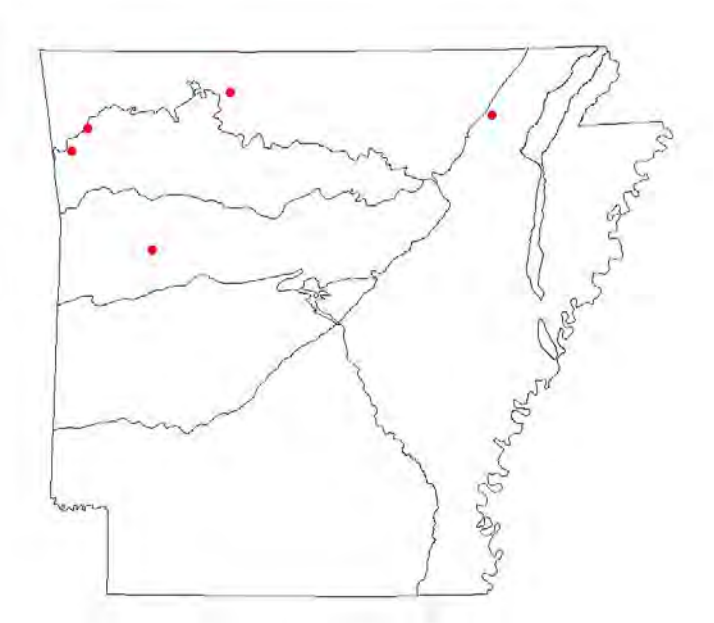


Global Rank: G5 — Secure

State Rank: S3S4 — Vulnerable species in Arkansas (uncertain rank)

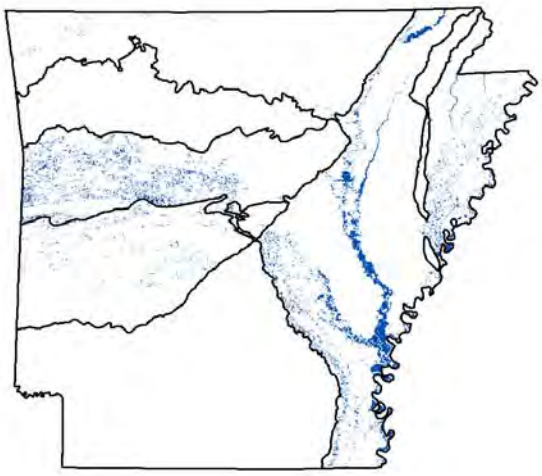
Distribution

Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☑
- Boston Mountains ☑
- Arkansas Valley ☑
- Ouachita Mountains ☑
- South Central Plains ☐
- Mississippi Alluvial Plain ☑
- Mississippi Valley Loess Plain ☐



Habitat Map



Habitats

	Weight
Ozark-Ouachita Large Floodplain	Suitable

Problems Faced

Loss of riverbank/sand bar habitat.

Threat: Habitat destruction or conversion
Source: Dam

Data Gaps/Research Needs

Need to obtain baseline information on distribution and population status.

Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

Survey areas of known occurrence to verify persistence and examine areas that contain suitable habitat for unknown populations.

Comments

A species dependent upon open,sandy habitats such as river sandbars (Graves and Pearson 1973).

Taxa Association Team and Peer Reviewers

ANHC Mr. Michael Warriner

Cicindela duodecimguttata
Twelve-spotted Tiger Beetle

Cicindela formosa pigmentosignata

Big Sand Tiger Beetle

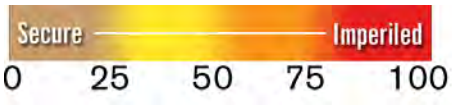


Class: Insecta

Order: Coleoptera

Family: Cicindelidae

Priority Score: **17** out of 100



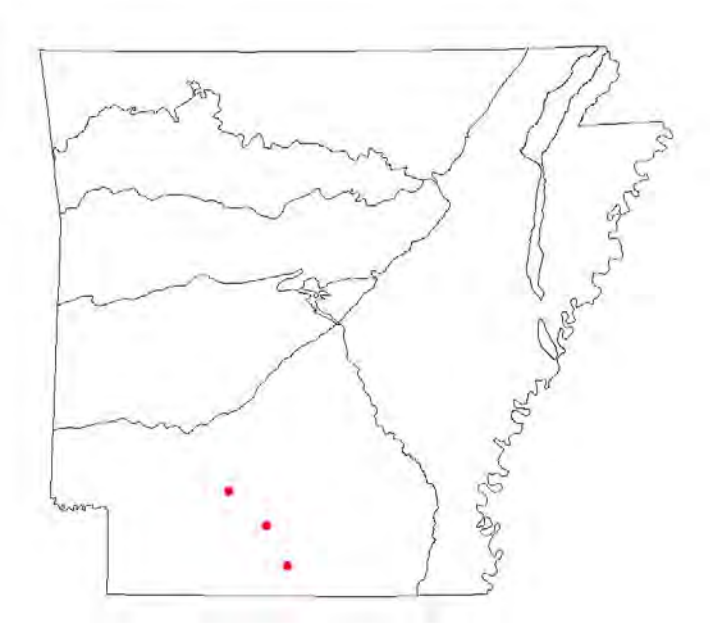
Population Trend: Unknown

Global Rank: G5T5 — Secure (secure subspecies)

State Rank: S2S3 — Imperiled species in Arkansas (uncertain rank)

Distribution

Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☐
- Boston Mountains ☐
- Arkansas Valley ☑
- Ouachita Mountains ☐
- South Central Plains ☐
- Mississippi Alluvial Plain ☐
- Mississippi Valley Loess Plain ☐



Habitat Map



Habitats

	Weight
Ozark-Ouachita Large Floodplain	Suitable

Problems Faced

Loss of riverbank/sand bar habitat.

Threat: Habitat destruction or conversion
Source: Dam

Data Gaps/Research Needs

Need to obtain baseline information on distribution and population status.

Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

Survey areas of known occurrence to verify persistence and examine areas that contain suitable habitat for unknown populations.

Comments

A species dependent upon open,sandy habitats such as river sandbars (Graves and Pearson 1973).

Taxa Association Team and Peer Reviewers

ANHC Mr. Michael Warriner

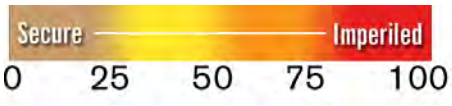
Cicindela formosa pigmentosignata
Big Sand Tiger Beetle

Cicindela hirticollis

Beach-dune Tiger Beetle

Class: Insecta
Order: Coleoptera
Family: Cicindelidae

Priority Score: **17** out of 100



Population Trend: Unknown

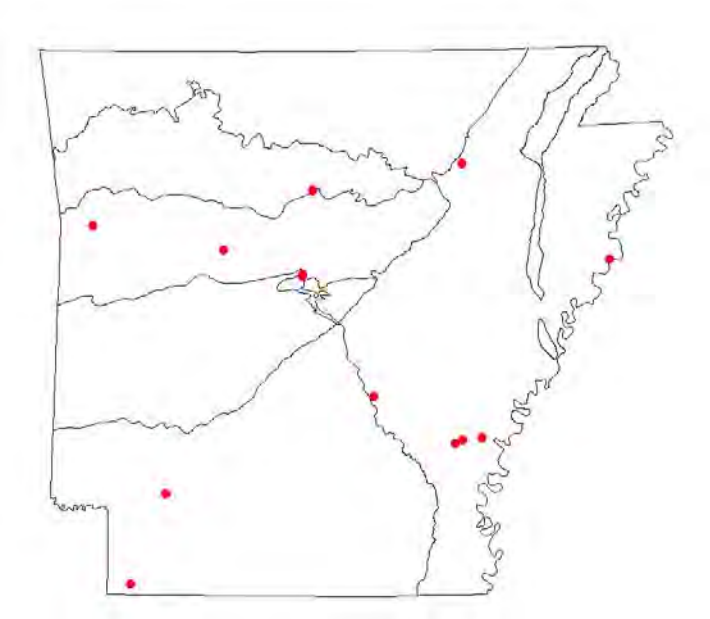


Global Rank: G5 — Secure

State Rank: S2S3 — Imperiled species in Arkansas (uncertain rank)

Distribution

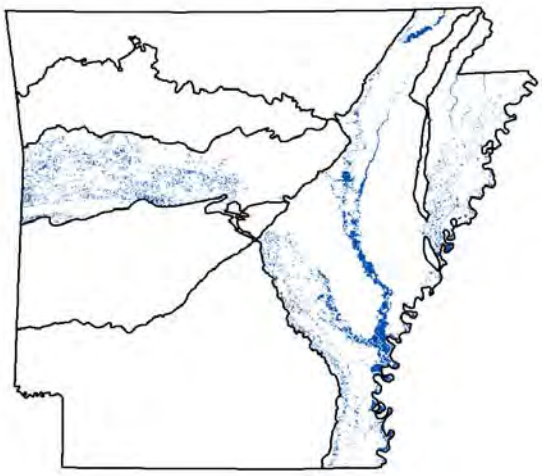
Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☐
- Boston Mountains ☑
- Arkansas Valley ☑
- Ouachita Mountains ☐
- South Central Plains ☑
- Mississippi Alluvial Plain ☑
- Mississippi Valley Loess Plain ☐

Habitat Map





Habitats

	Weight
Ozark-Ouachita Large Floodplain	Suitable

Problems Faced

Loss of riverbank/sand bar habitat.

Threat: Habitat destruction or conversion
Source: Dam

Data Gaps/Research Needs

Need to obtain baseline information on distribution and population status.

Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

Survey areas of known occurrence to verify persistence and examine areas that contain habitat for unknown populations.

Comments

A species dependent upon open,sandy habitats such as river sandbars (Graves and Pearson 1973).

Taxa Association Team and Peer Reviewers

ANHC Mr. Michael Warriner

Cicindela lepida

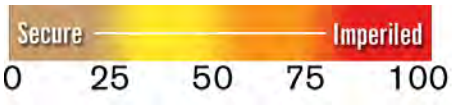
Tiger Beetle

Class: Insecta

Order: Coleoptera

Family: Cicindelidae

Priority Score: **25** out of 100





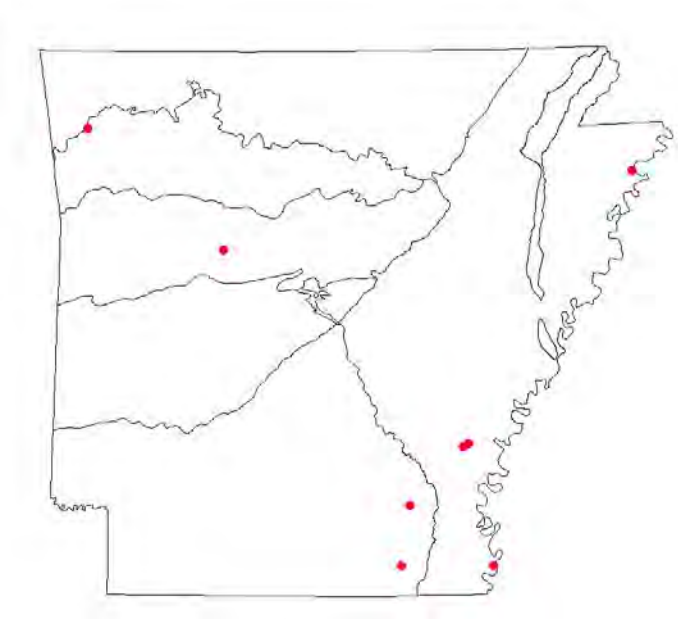
Population Trend: Unknown

Global Rank: G3G4 — Vulnerable (uncertain rank)

State Rank: S2S3 — Imperiled species in Arkansas (uncertain rank)

Distribution

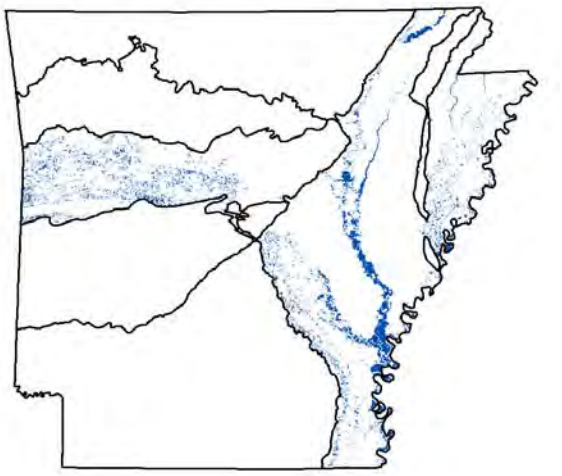
Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☐
- Boston Mountains ☑
- Arkansas Valley ☑
- Ouachita Mountains ☐
- South Central Plains ☑
- Mississippi Alluvial Plain ☑
- Mississippi Valley Loess Plain ☐

Habitat Map





Habitats

	Weight
Ozark-Ouachita Large Floodplain	Suitable

Problems Faced

Habitat degradation.	Threat: Habitat disturbance Source: Recreation
Loss of sandbar habitat.	Threat: Habitat destruction or conversion Source: Dam

Data Gaps/Research Needs

Need to obtain baseline information on distribution and population status.

Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

Survey areas of known occurrence to verify persistence and examine areas that contain suitable habitat for unknown populations.

Comments

A species highly dependent upon open, sandy areas such as sandbars and blowouts (Graves and Pearson 1973).

Taxa Association Team and Peer Reviewers

ANHC Mr. Michael Warriner

Cicindela macra

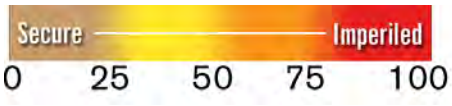
Sandy Stream Tiger Beetle

Class: Insecta

Order: Coleoptera

Family: Cicindelidae

Priority Score: 17 out of 100





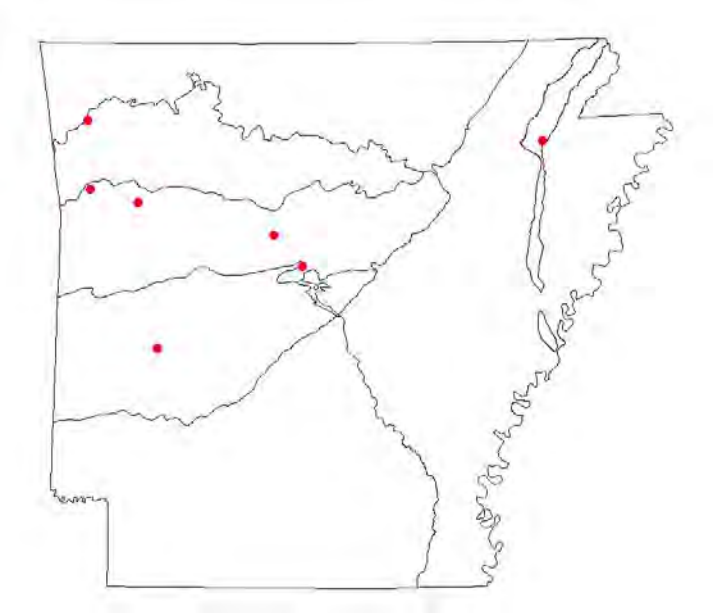
Population Trend: Unknown

Global Rank: G5 — Secure

State Rank: S2S3 — Imperiled species in Arkansas (uncertain rank)

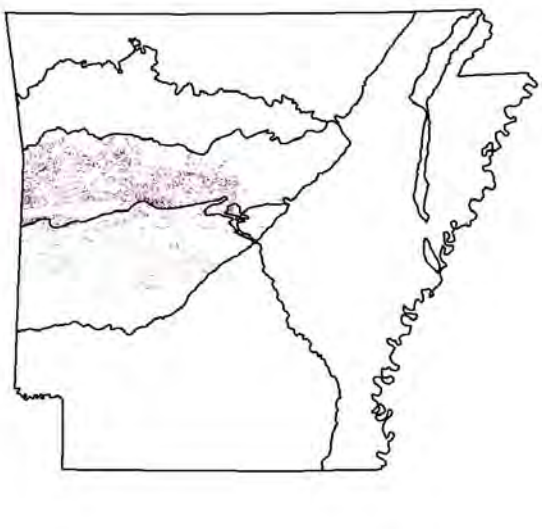
Distribution

Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☐
- Boston Mountains ☑
- Arkansas Valley ☑
- Ouachita Mountains ☑
- South Central Plains ☐
- Mississippi Alluvial Plain ☐
- Mississippi Valley Loess Plain ☑



Habitat Map



Habitats

	Weight
Ozark-Ouachita Large Floodplain	Optimal

Problems Faced

Loss of riverbank/sand bar habitat.

Threat: Habitat destruction or conversion
Source: Dam

Data Gaps/Research Needs

Need to obtain baseline information on distribution and population status.

Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

Survey of known occurrence to verify persistence and examine areas that contain suitable habitat for unknown populations.

Comments

A species dependent upon open,sandy habitats such as river sandbars (Graves and Pearson 1973).

Taxa Association Team and Peer Reviewers

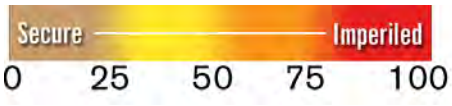
ANHC Mr. Michael Warriner

Cicindela obsoleta

Scrubland Tiger Beetle

Class: Insecta
Order: Coleoptera
Family: Cicindelidae

Priority Score: **21** out of 100





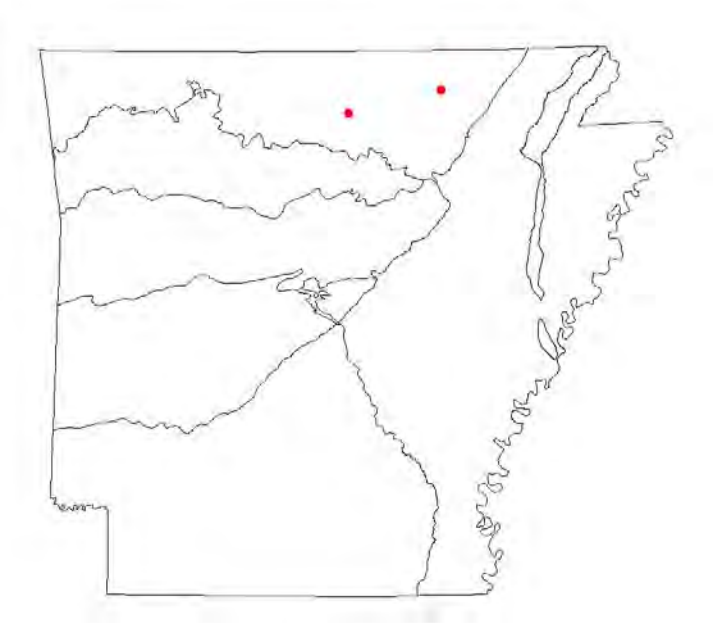
Population Trend: Unknown

Global Rank: G5 — Secure

State Rank: S1S2 — Critically imperiled in Arkansas (uncertain rank)

Distribution

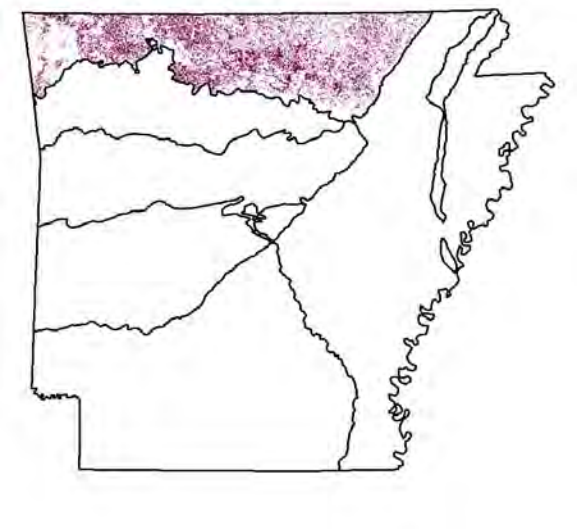
Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☑
- Boston Mountains ☐
- Arkansas Valley ☐
- Ouachita Mountains ☐
- South Central Plains ☐
- Mississippi Alluvial Plain ☐
- Mississippi Valley Loess Plain ☐

Habitat Map





Habitats

	Weight
Interior Highlands Calcareous Glade and Barrens	Optimal

Problems Faced

Development.	Threat: Habitat destruction or conversion Source: Urban development
Fire suppression within glade habitats.	Threat: Alteration of natural fire regimes Source: Fire suppression
Overgrazing.	Threat: Habitat disturbance Source: Confined animal operations

Data Gaps/Research Needs

Need to obtain baseline information on distribution and population status.

Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

Survey areas of known occurrence to verify persistence and examine areas that contain suitable habitat for unknown populations.

Comments

The Arkansas populations of this species are isolated and greatly disjunct from the species' main range to the west. In Arkansas, it is only known from a very small number of glades/barrens near Calico Rock (Graves and Pearson 1973).

Taxa Association Team and Peer Reviewers

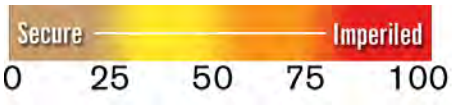
ANHC Mr. Michael Warriner

Cicindela purpurea

Cow Path Tiger Beetle

Class: Insecta
Order: Coleoptera
Family: Cicindelidae

Priority Score: **15** out of 100



Population Trend: Unknown

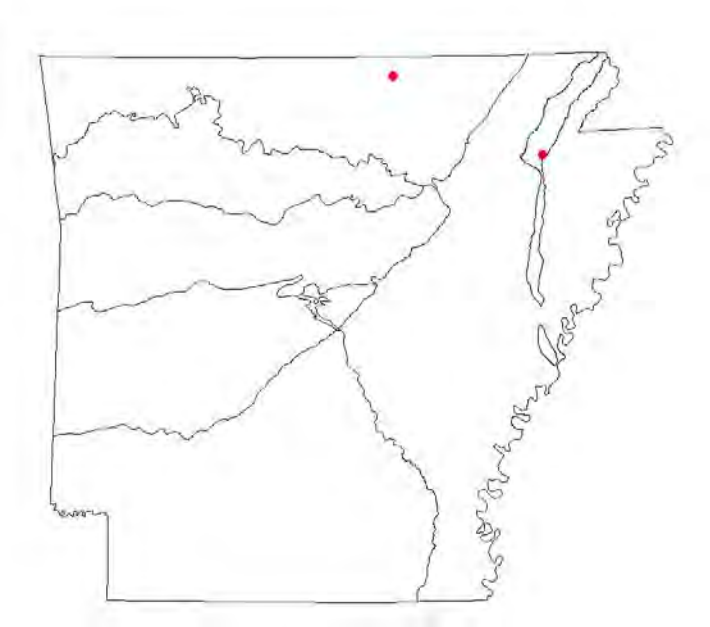


Global Rank: G5 — Secure

State Rank: S3 — Vulnerable in Arkansas

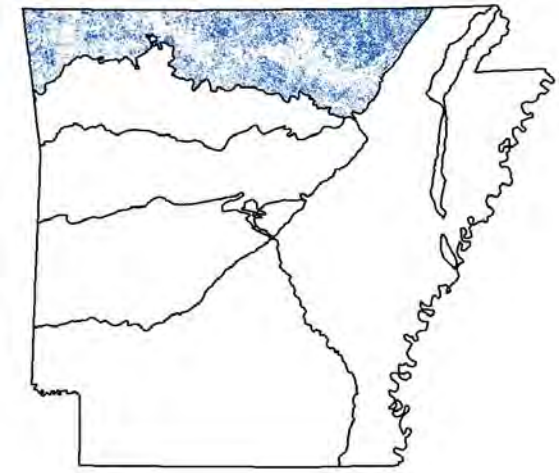
Distribution

Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☑
- Boston Mountains ☐
- Arkansas Valley ☐
- Ouachita Mountains ☐
- South Central Plains ☐
- Mississippi Alluvial Plain ☐
- Mississippi Valley Loess Plain ☑



Habitat Map



Habitats

	Weight
Ozark-Ouachita Dry-Mesic Oak Forest	Suitable

Problems Faced

Degredation of dry upland habitats.

Threat: Alteration of natural fire regimes
Source: Fire suppression

Data Gaps/Research Needs

Need to obtain baseline information on distribution and population status.

Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

Survey areas of known occurrence to verify persistence and examine areas that contain suitable habitat for unknown populations.

Comments

An upland species dependent upon open woodlands and grassy areas (Graves and Pearson 1973).

Taxa Association Team and Peer Reviewers

ANHC Mr. Michael Warriner

Cicindela purpurea
Cow Path Tiger Beetle

Cicindela unipunctata

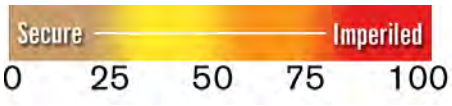
Woodland Tiger Beetle

Class: Insecta

Order: Coleoptera

Family: Cicindelidae

Priority Score: **21** out of 100



Population Trend: Unknown

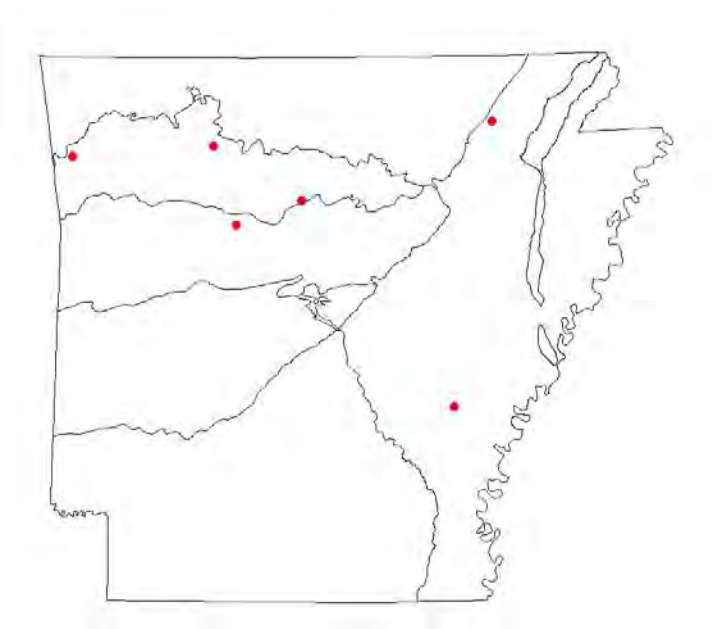


Global Rank: G4G5 — Apparently secure (uncertain rank)

State Rank: S2 — Imperiled in Arkansas

Distribution

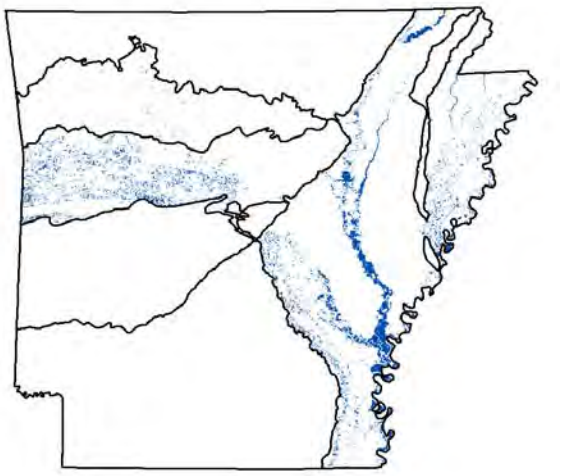
Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☐
- Boston Mountains ☑
- Arkansas Valley ☑
- Ouachita Mountains ☐
- South Central Plains ☐
- Mississippi Alluvial Plain ☑
- Mississippi Valley Loess Plain ☐

Habitat Map





Habitats

	Weight
Lower Mississippi River High Bottomland Forest	Suitable
Ozark-Ouachita Mesic Hardwood Forest	Suitable

Problems Faced

This species prefers relatively mature forests. clear-cutting or other timber management practices that greatly open a stand could negatively impact populations of this species.

Threat: Habitat destruction or conversion
Source: Forestry activities

Data Gaps/Research Needs

Need to obtain baseline information on distribution and population status.

Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

Survey areas of known occurrence to verify persistence and examine areas that contain suitable habitat for unknown populations.

Comments

A beetle that is thought to be dependent upon mature forest habitats (Graves and Pearson 1973).

Taxa Association Team and Peer Reviewers

ANHC Mr. Michael Warriner

Cogia outis

Outis Skipper

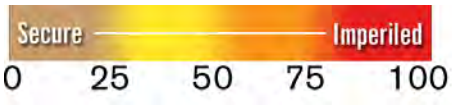


Class: Insecta

Order: Lepidoptera

Family: Hesperiidae

Priority Score: **23** **out of 100**



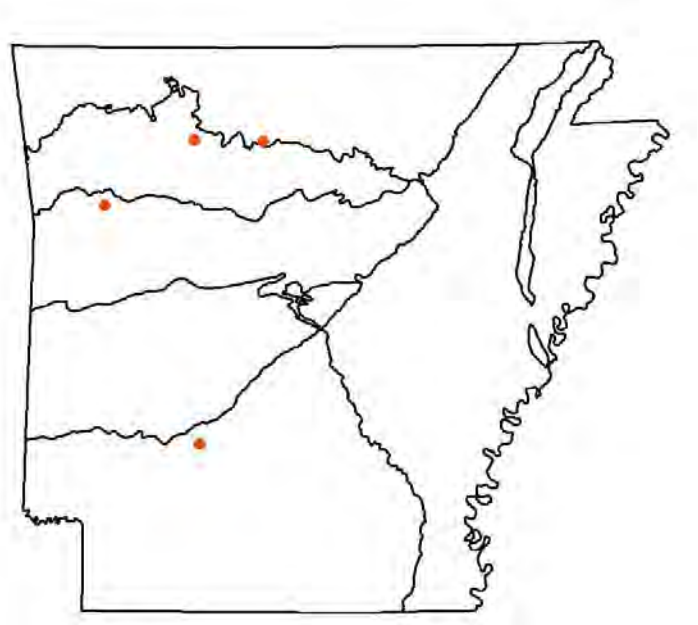
Population Trend: Unknown

Global Rank: G3G4 — Vulnerable (uncertain rank)

State Rank: S3 — Vulnerable in Arkansas

Distribution

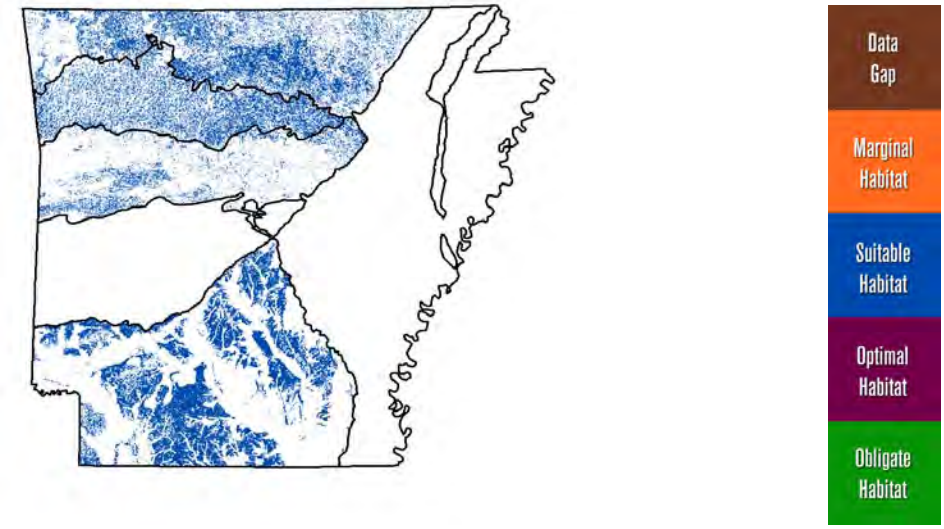
Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☑
- Boston Mountains ☑
- Arkansas Valley ☑
- Ouachita Mountains ☐
- South Central Plains ☑
- Mississippi Alluvial Plain ☐
- Mississippi Valley Loess Plain ☐

Habitat Map



Habitats

	Weight
Interior Highlands Calcareous Glade and Barrens	Suitable
Interior Highlands Dry Acidic Glade and Barrens	Suitable
Ozark-Ouachita Dry Oak and Pine Woodland	Suitable
West Gulf Coastal Plain Calcareous Prairie and Woodland	Suitable

Problems Faced

POTENTIAL PROBLEM: Limited range.

Threat:
Source:

Data Gaps/Research Needs

Need to obtain baseline information on distribution and population status.

Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

Surveys should be conducted in appropriate habitat to locate additional populations of this species.

Cogia outis
Outis Skipper

Comments

NatureServe (2015) describes the species as having a limited range and, perhaps being inadequately protected, with threats needing evaluation. Scott (1986) shows the northern segment of the range of this species as extending from extreme southern Missouri and adjacent Arkansas through part of Oklahoma and much of central Texas. Information provided by Heitzman and Heitzman (1996) is relevant in that the species is characterized as a breeding resident in the extreme southwestern corner of Missouri and that adults are found in close association with the larval food plant. In surveys along the Buffalo National River and vicinity the species has been detected in low numbers on multiple occasions in at least three locations (Dr. William Baltosser, personal communication, 2015). In most instances, records obtained by Baltosser (including a few much farther south) have been in association with the larval food plant (prairie acacia – Heitzman and Heitzman 1996) and mirror occurrences of this plant (Acaciella angustissima) as depicted by Gentry et al. (2013). Spencer (2006) characterizes the species within Arkansas as an occasional stray. Baltosser considers records along the Buffalo National River and vicinity to represent resident, breeding populations, while the few records to the south are perhaps stray animals. More information is needed to better gauge the current status and distribution of this species in Arkansas, which includes records from 6 Arkansas counties (Baltosser et al. 2015).

Taxa Association Team and Peer Reviewers

UALR Dr. William Baltosser, ANHC Ms. Samantha Scheiman, USFS Dr. Craig Rudolph, and Dr. Charles Ely

Cordulegaster talaria

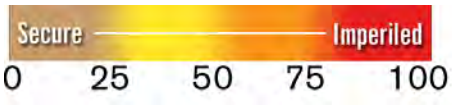
Ouachita Spiketail

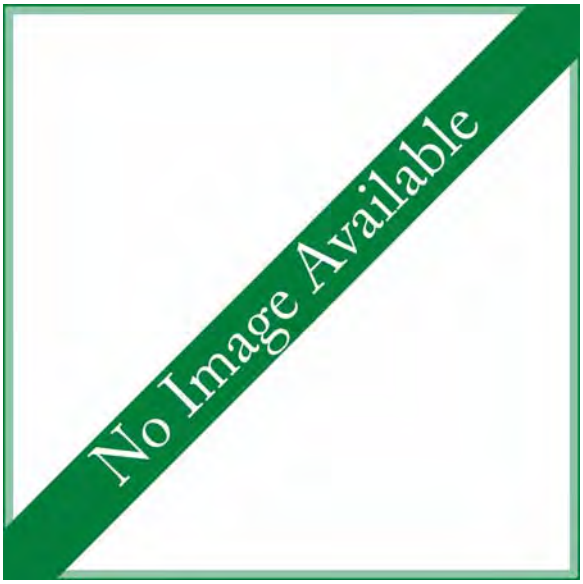
Class: Insecta

Order: Odonata

Family: Cordulegastridae

Priority Score: **65** out of 100





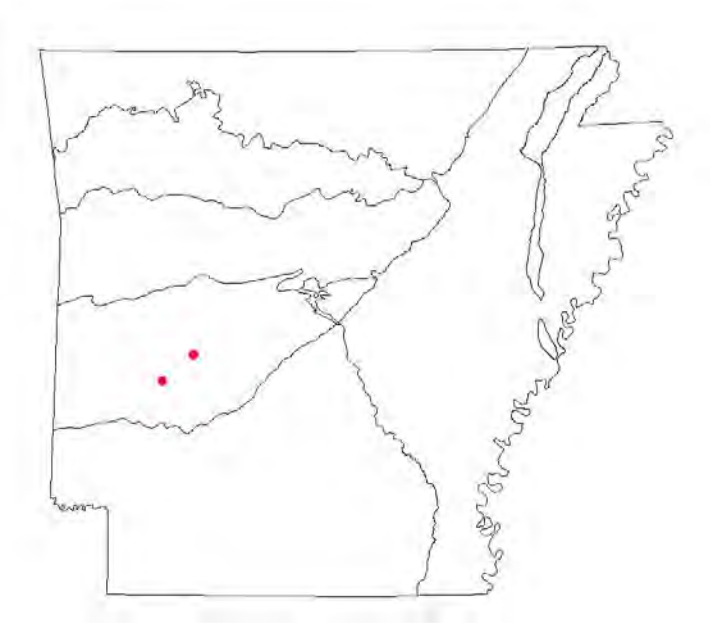
Population Trend: Unknown

Global Rank: G1G2 — Critically imperiled (uncertain rank)

State Rank: S1 — Critically imperiled in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☐
- Boston Mountains ☐
- Arkansas Valley ☐
- Ouachita Mountains ☑
- South Central Plains ☐
- Mississippi Alluvial Plain ☐
- Mississippi Valley Loess Plain ☐



Habitat Map



Habitats	Weight
Ozark-Ouachita Forested Seep	Optimal
Ozark-Ouachita Large Floodplain	Optimal
Ozark-Ouachita Riparian	Suitable

Problems Faced

KNOWN PROBLEM: Destruction of habitat due to cattle grazing.	Threat: Habitat destruction or conversion Source: Grazing/Browsing
POTENTIAL PROBLEM: Destruction of habitat due to off-road vehicle use.	Threat: Habitat destruction or conversion Source: Recreation
POTENTIAL PROBLEM: Loss of seep habitat due to conversion.	Threat: Habitat destruction or conversion Source: Forestry activities

Data Gaps/Research Needs

Determine specific habitat requirements.
Surveys to locate other potential populations are needed.
The status of known populations should be assessed.

Conservation Actions

	Importance	Category
Protect seep and riverine habitats.	High	Habitat Protection

Monitoring Strategies

Monitor known populations every 3 years.

Comments

This species is endemic to a small area within the Ouachita Mountains. This rare dragonfly appears to be strongly associated with seep/riverine habitats (Robison and others 2008).

Taxa Association Team and Peer Reviewers

Xerces Society Ms. Michele Blackburn, Dr. John Abbott, Mr. Scott Black, Dr. Celeste Searles Mazzacano and Mr. Dennis Paulson

Danaus plexippus

Monarch

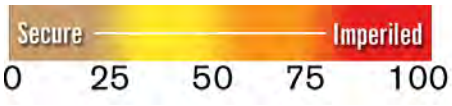


Class: Insecta

Order: Lepidoptera

Family: Nymphalidae

Priority Score: **15** out of 100



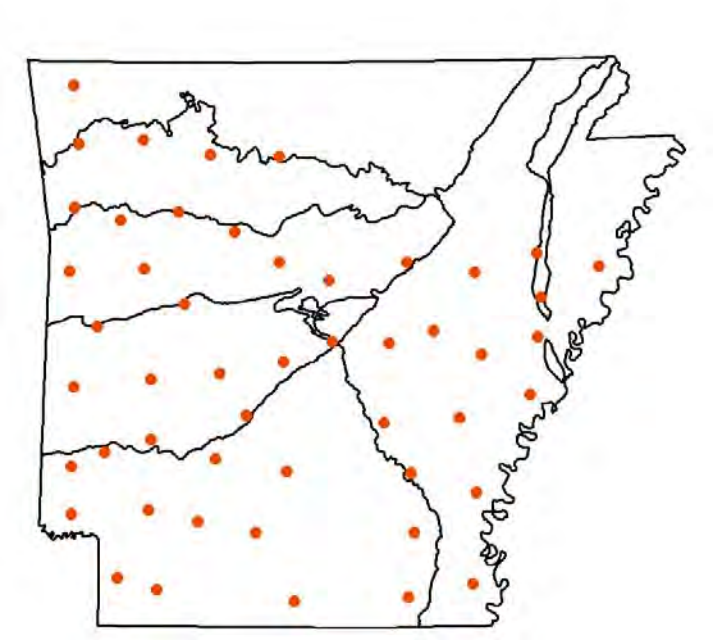
Population Trend: Unknown

Global Rank: G4 — Apparently secure species

State Rank: S4 — Apparently secure in Arkansas

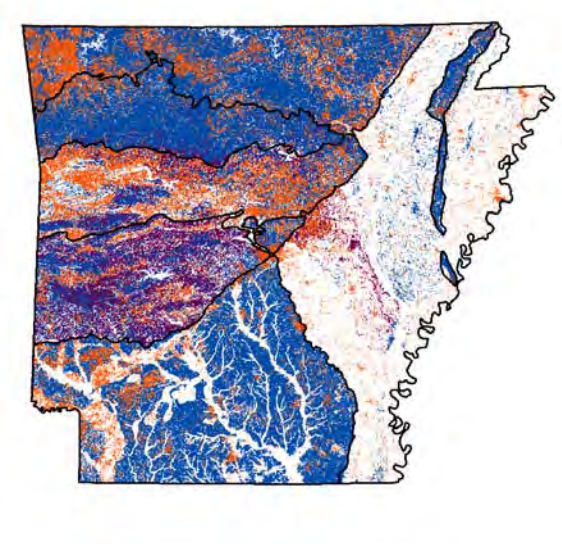
Distribution

Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☑
- Boston Mountains ☑
- Arkansas Valley ☑
- Ouachita Mountains ☑
- South Central Plains ☑
- Mississippi Alluvial Plain ☑
- Mississippi Valley Loess Plain ☑



Habitat Map



Habitats	Weight
Crowley's Ridge Loess Slope Forest	Suitable
Interior Highlands Calcareous Glade and Barrens	Suitable
Interior Highlands Dry Acidic Glade and Barrens	Suitable
Lower Mississippi Alluvial Plain Grand Prairie	Optimal
Lower Mississippi Flatwoods Woodland and Forest	Suitable
Ozark-Ouachita Dry Oak and Pine Woodland	Suitable
Ozark-Ouachita Dry-Mesic Oak Forest/Woodland	Suitable
Ozark-Ouachita Pine-Bluestem Woodland	Optimal
Ozark-Ouachita Pine-Oak Forest/Woodland	Suitable
Ozark-Ouachita Prairie and Woodland	Optimal
Pasture Land	Marginal
Urban/Suburban	Marginal
West Gulf Coastal Plain Calcareous Prairie and Woodland	Optimal
West Gulf Coastal Plain Pine-Hardwood Flatwoods	Suitable
West Gulf Coastal Plain Pine-Hardwood Forest/Woodland	Suitable

Danaus plexippus
Monarch

Problems Faced

KNOWN PROBLEM: Loss of habitat.	Threat: Habitat destruction or conversion Source: Urban development
KNOWN PROBLEM: Loss of habitat.	Threat: Habitat destruction or conversion Source: Agricultural practices
KNOWN PROBLEM: Loss of habitat.	Threat: Habitat destruction or conversion Source: Exotic species
KNOWN PROBLEM: Loss of habitat.	Threat: Habitat destruction or conversion Source: Fire suppression

Data Gaps/Research Needs

Determine milkweed species preferences.
Identify important areas or "hot spots" for breeding Monarchs.
Identify migration corridors.

Conservation Actions

	Importance	Category
Provide information on native plant gardens to the public.	Medium	Public Relations/Education
Provide technical assistance to private landowners to enhance lands for Monarchs.	Medium	Public Relations/Education
Restore habitats to provide nectar-producing flowering plants and host plants (milkweeds).	High	Habitat Restoration/Improvement

Monitoring Strategies

Survey and monitor habitats containing milkweed (Asclepias) throughout the range of this species over multi-year periods. Monitor habitats in which natural processes have been restored to gauge the impact of such management on improving habitat quality, particularly in regard to important plant species upon which monarchs depend.

Comments

This species has always been of interest owing to its coloration, large size, migratory behavior, and its rather ubiquitous distribution. Given real and perceived declines in various portions of its range, interest in this species has never been greater. Given existing data, the status of this species in Arkansas is probably not as grave as the much-publicized concerns might seem to indicate (documented in at least 69 of 75 Arkansas counties; Baltosser et al. 2015). However, data sets are incomplete and somewhat dated so designating the Monarch as a Species of Greatest Conservation Need is prudent and should be done to improve our understanding of the current and perhaps changing status of this species. Habitats listed here are those that would most likely support plant species utilized by Monarchs.

Taxa Association Team and Peer Reviewers

UALR Dr. William Baltosser, ANHC Ms. Samantha Scheiman, USFS Dr. Craig Rudolph, and Dr. Charles Ely

Dannella provonshai

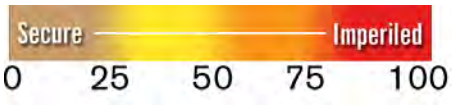
Mayfly

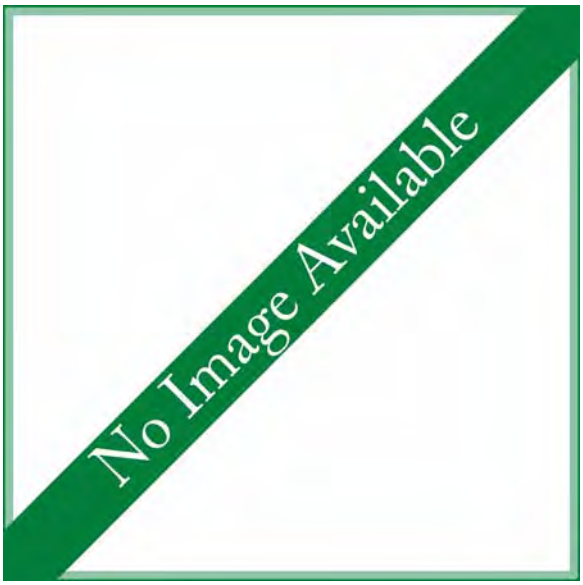
Class: Insecta

Order: Ephemeroptera

Family: Ephemerellidae

Priority Score: **31** out of 100





Population Trend: Unknown

Global Rank: G3G4 — Vulnerable (uncertain rank)

State Rank: S1? — Critically imperiled in Arkansas (inexact numeric rank)

Distribution

Element Occurrence Records



Ecoregions where the species occurs:

- ☐ Ozark Highlands
- ☑ Boston Mountains
- ☐ Arkansas Valley
- ☐ Ouachita Mountains
- ☐ South Central Plains
- ☐ Mississippi Alluvial Plain
- ☐ Mississippi Valley Loess Plains



Terrestrial Habitats





Ecobasins where this species occurs

Ecobasins

Boston Mountains - Arkansas River

Terrestrial Habitats

Ozark-Ouachita Riparian	Suitable

Aquatic Habitats

Natural Riffle: - Small	Suitable

Dannella provonshai
Mayfly

Problems Faced

Threat: Hydrological alteration
Source: Dam

Threat: Sedimentation
Source: Resource extraction

Threat: Toxins/contaminants
Source: Municipal/Industrial point source

Data Gaps/Research Needs

Need to obtain baseline information on distribution and population status.

Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

Surveys to locate additional populations and protection of stream habitats

Comments

This mayfly is an Arkansas endemic known only from a single locality along the Mulberry River in Johnson County (McCafferty 1977).

Taxa Team and Peer Reviewers

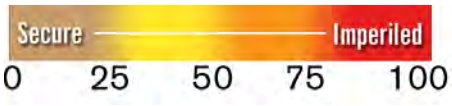
ANHC Mr. Michael Warriner

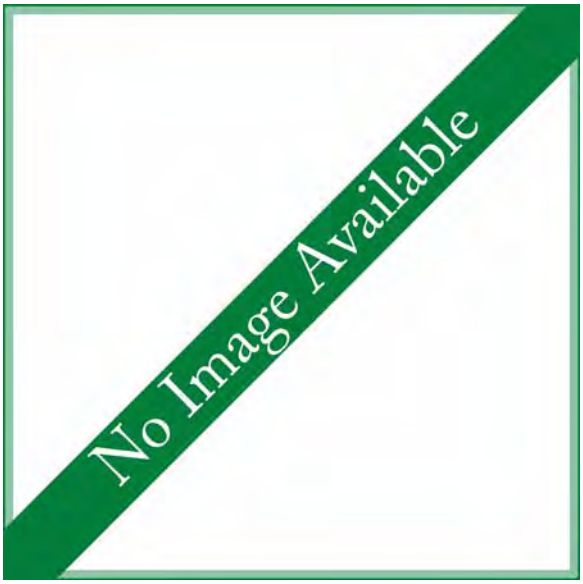
Derops divalis

Beetle

Class: Insecta
Order: Coleoptera
Family: Staphylinidae

Priority Score: **23** out of 100





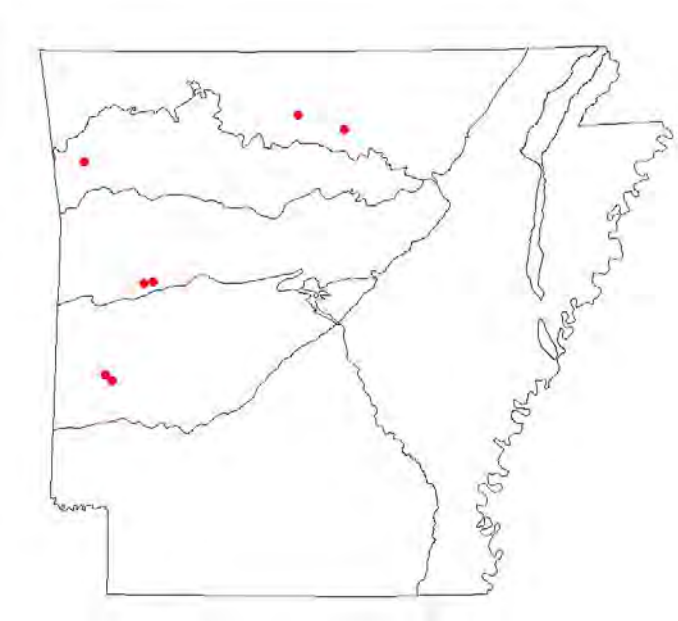
Population Trend: Unknown

Global Rank: GNR — Not yet ranked

State Rank: S1 — Critically imperiled in Arkansas

Distribution

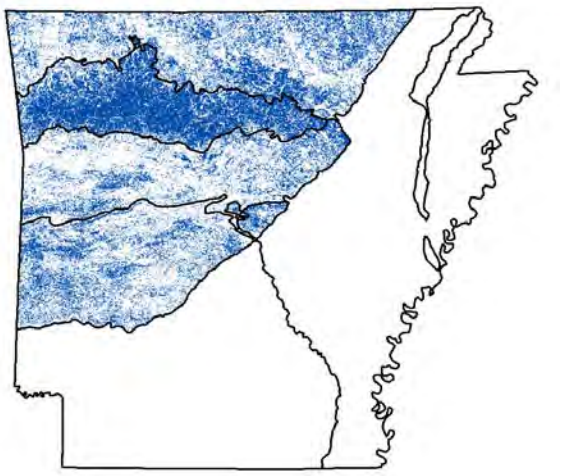
Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☑
- Boston Mountains ☑
- Arkansas Valley ☑
- Ouachita Mountains ☑
- South Central Plains ☐
- Mississippi Alluvial Plain ☐
- Mississippi Valley Loess Plain ☐

Habitat Map





Habitats	Weight
Ozark-Ouachita Dry Oak and Pine Woodland	Suitable
Ozark-Ouachita Dry-Mesic Oak Forest	Suitable
Ozark-Ouachita Mesic Hardwood Forest	Suitable
Ozark-Ouachita Pine-Oak Forest	Suitable

Problems Faced

Forestry practices that disturb litter layer and create xeric conditions.	Threat: Habitat disturbance Source: Forestry activities

Data Gaps/Research Needs

Need to obtain baseline information on distribution and population status.

Conservation Actions	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

Survey areas near known occurrences to locate additional populations.

Derops divalis
Beetle

Comments

A species partially dependent upon caves, this beetle is often found in very deep litter in rock cracks (Smetama 1983).

Taxa Association Team and Peer Reviewers

ANHC Mr. Michael Warriner

Dryobius sexnotatus

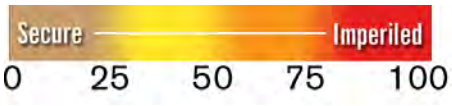
Six-banded Longhorn Beetle

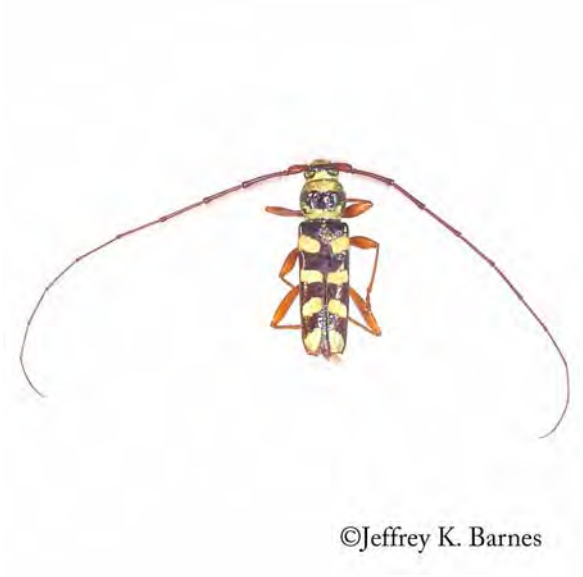
Class: Insecta

Order: Coleoptera

Family: Cerambycidae

Priority Score: 19 out of 100





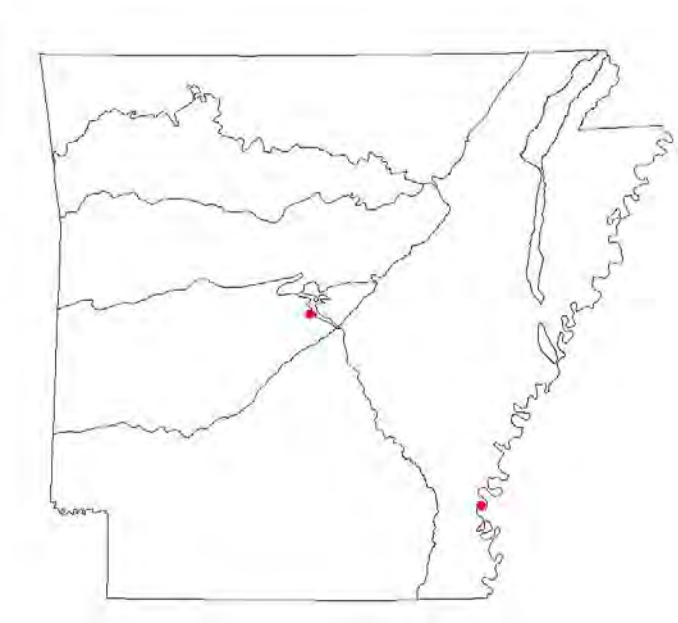
Population Trend: Unknown

Global Rank: GNR — Not yet ranked

State Rank: S2 — Imperiled in Arkansas

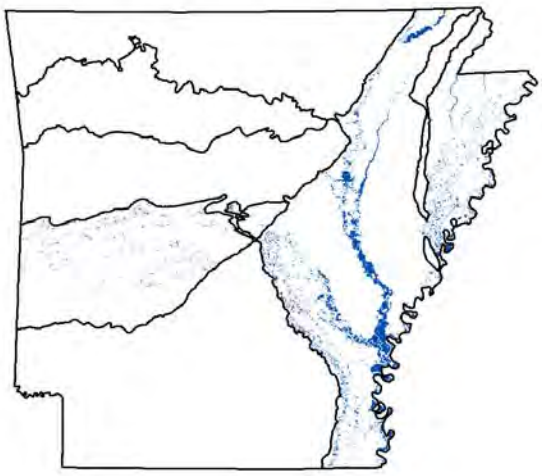
Distribution

Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☐
- Boston Mountains ☐
- Arkansas Valley ☐
- Ouachita Mountains ☑
- South Central Plains ☐
- Mississippi Alluvial Plain ☑
- Mississippi Valley Loess Plain ☐



Habitat Map



Habitats	Weight
Lower Mississippi River High Bottomland Forest	Suitable
Ozark-Ouachita Mesic Hardwood Forest	Suitable

Problems Faced

Forestry practices that reduce number of large, dead trees.	Threat: Habitat destruction or conversion Source: Forestry activities

Data Gaps/Research Needs

Need to obtain baseline information on distribution and population status.

Conservation Actions	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

Survey forest stands to locate additional populations of this species.

Comments

A relativley rare longhorned beetle that is thought to be dependent upon very large dead elms and maples as larval hosts (Perry and others 1974).

Taxa Association Team and Peer Reviewers

ANHC Mr. Michael Warriner

Erynnis martialis

Mottled Duskywing

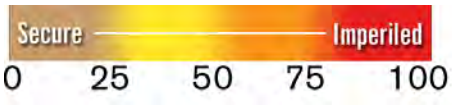


Class: Insecta

Order: Lepidoptera

Family: Hesperiidae

Priority Score: **29** **out of 100**



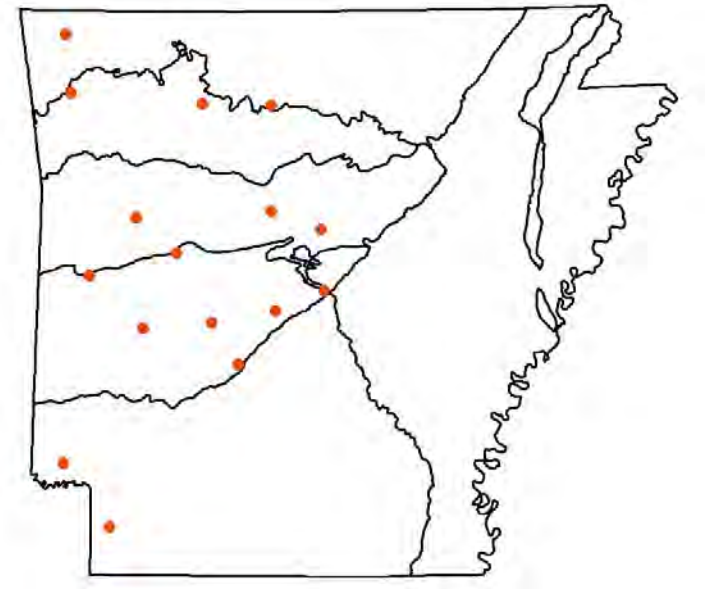
Population Trend: Unknown

Global Rank: G3 — Vulnerable species

State Rank: S2S3 — Imperiled species in Arkansas (uncertain rank)

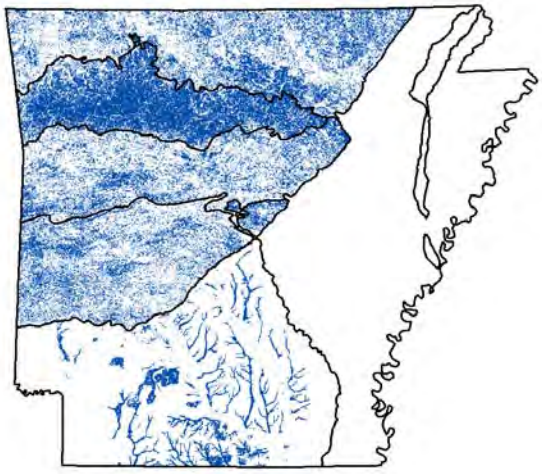
Distribution

Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☑
- Boston Mountains ☑
- Arkansas Valley ☑
- Ouachita Mountains ☑
- South Central Plains ☑
- Mississippi Alluvial Plain ☐
- Mississippi Valley Loess Plain ☐



Habitat Map



Habitats

	Weight
Ozark-Ouachita Dry-Mesic Oak Forest/Woodland	Suitable
Ozark-Ouachita Pine-Oak Forest/Woodland	Suitable
Ozark-Ouachita Riparian	Suitable
West Gulf Coastal Plain Sandhill Oak and Shortleaf Pine Forest/Woodland	Suitable
West Gulf Coastal Plain Small Stream/River Forest	Suitable

Problems Faced

KNOWN PROBLEM: Habitat loss.	Threat: Alteration of natural fire regimes Source: Fire suppression
KNOWN PROBLEM: Loss of habitat due to deer browsing.	Threat: Excessive herbivory Source: Grazing/Browsing
POTENTIAL PROBLEM: Negative effects due to spraying of pesticides for gypsy moths.	Threat: Toxins/contaminants Source: Management of/for certain species

Data Gaps/Research Needs

Need to obtain baseline information on distribution and population status.

Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

Search appropriate habitat in hilly country where the host plant, New Jersey Tea (Ceanothus americanus), is common or at least widely distributed.

Comments

NatureServe (2015) describes this species as now being "rare, very rare, seriously imperiled, historic, or known extirpated from about the eastern 40% of its range and is not common anywhere." Schweitzer et al. (2011) chronicle the decline of this species and discuss a variety of relevant items, including the early decline of this skipper probably due to factors such as fire suppression, succession, reforestation, and urbanization. According to Spencer (2006), this species in Arkansas is a breeding resident with several broods and is local and uncommon statewide; the flight season is May through July. Reported from 21 Arkansas counties (Baltosser et al. 2015) but there can be difficulties in identifying this species. Schweitzer et al. (2011) state that "sight records should not be accepted as the basis for documenting new occurrences of this species, and occasionally even photographs may not be identifiable." Specimen records are available for each of the 10 counties for which Drs. William Baltosser, Craig Rudolph, and Charles Ely have data (personal communication, 2015). Surveys are needed to determine baseline information, and conservation measures need to be explored once there is more insight regarding the status and distribution of this species.

Taxa Association Team and Peer Reviewers

UALR Dr. William Baltosser, ANHC Ms. Samantha Scheiman, USFS Dr. Craig Rudolph, and Dr. Charles Ely

Euphydryas phaeton ozarkae

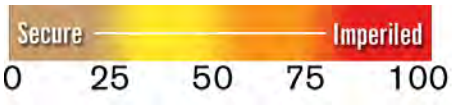
Baltimore Checkerspot

Class: Insecta

Order: Lepidoptera

Family: Nymphalidae

Priority Score: **27** out of 100



Population Trend: Unknown

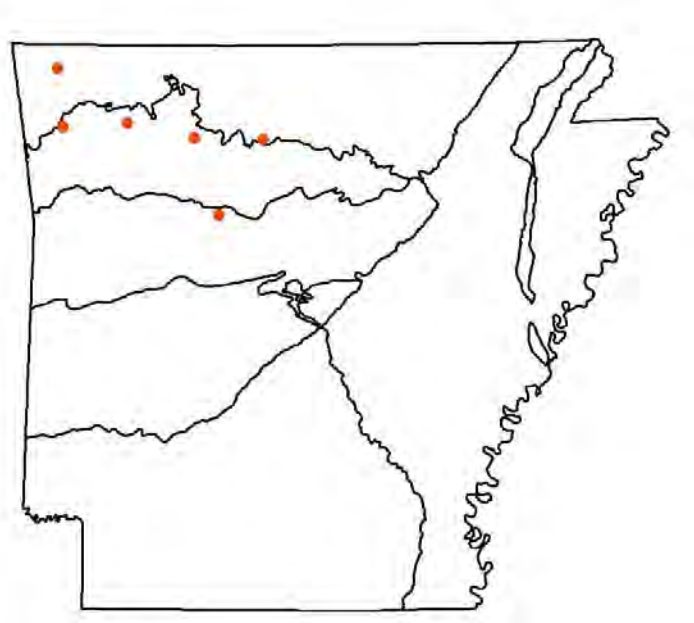


Global Rank: G4T3 — Apparently secure (vulnerable subspecies)

State Rank: S3 — Vulnerable in Arkansas

Distribution

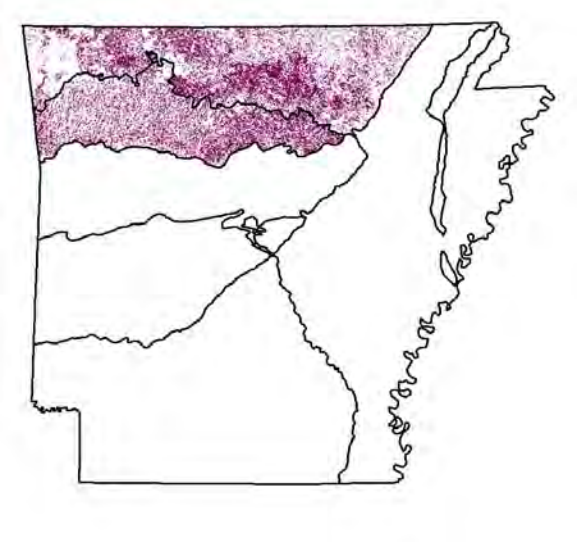
Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☑
- Boston Mountains ☑
- Arkansas Valley ☐
- Ouachita Mountains ☐
- South Central Plains ☐
- Mississippi Alluvial Plain ☐
- Mississippi Valley Loess Plain ☐

Habitat Map





Habitats

	Weight
Interior Highlands Calcareous Glade and Barrens	Optimal
Interior Highlands Dry Acidic Glade and Barrens	Optimal
Ozark-Ouachita Dry Oak and Pine Woodland	Optimal

Problems Faced

POTENTIAL PROBLEM: Habitat degradation due to deer browsing.	Threat: Excessive herbivory Source: Grazing/Browsing

Data Gaps/Research Needs

More research is needed to determine whether populations in the southwestern portion of the species' range might actually be a second, cryptic species with its own set of habitat needs.

Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

Survey dry, open wooded hillsides and glades in northern Arkansas that contain false foxglove (Aureolaria spp.), the larval foodplant in Arkansas prior to overwintering.

Comments

Ozark populations of this species described as distinct subspecies from eastern populations (Masters 1968). Virtually all published descriptions regarding the biology of this species refer to the eastern subspecies (E. p. phaeton). Investigations begun in 2009 by Baltosser, followed by in-depth studies of this butterfly by Stephen Robertson (MS Thesis 2015), have identified a number of sites of occurrence throughout the Ozark Mountains of northern Arkansas (Stephen Robertson and William Baltosser, personal communication, 2015). An extensive study of the subspecies in Arkansas shows that the ecology of the Ozark subspecies is in many ways very different from the eastern subspecies. These findings add support for a growing consensus that Ozark populations warrant full species status, an idea put forth among some investigators prior to the year 2000 (e.g., “Some question whether there might be two cryptic species instead of one widespread butterfly.” Opler and Malikul 1998). Heitzman and Heitzman (1996) characterize Missouri populations as being rare in western segments of the state but locally abundant in the eastern Ozarks. Within Arkansas, Spencer (2006) indicates that this species is local, being rare to uncommon in scattered colonies throughout the Ozarks; she considers this butterfly to be of special concern. Restricted range (recorded from 11 Arkansas counties; Baltosser et al. 2015), peculiarities in reproductive mode, and in some cases negative impacts by high density deer populations (noted for numerous species of Lepidoptera, Schweitzer et al. 2011) each contribute to vulnerability. Management decisions should take the protection and preservation of this butterfly into consideration. Noteworthy in this regard is the apparent need for periodic fire (late winter/early spring burns) to maintain suitable habitat; late summer/fall burns would presumably be highly detrimental.

Taxa Association Team and Peer Reviewers

UALR Dr. William Baltosser, ANHC Ms. Samantha Scheiman, USFS Dr. Craig Rudolph, and Dr. Charles Ely

Euphyes dion

Dion Skipper

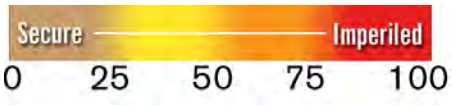


Class: Insecta

Order: Lepidoptera

Family: Hesperiidae

Priority Score: **19** out of 100



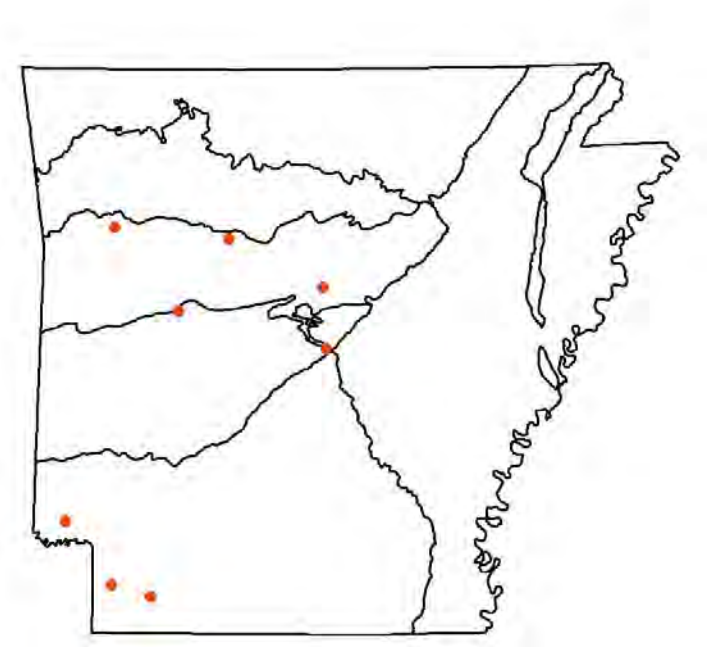
Population Trend: Unknown

Global Rank: G4 — Apparently secure species

State Rank: S3 — Vulnerable in Arkansas

Distribution

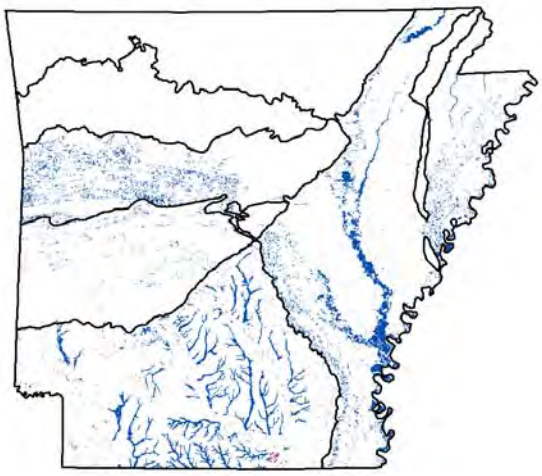
Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☐
- Boston Mountains ☐
- Arkansas Valley ☑
- Ouachita Mountains ☑
- South Central Plains ☑
- Mississippi Alluvial Plain ☑
- Mississippi Valley Loess Plain ☐

Habitat Map





Habitats

	Weight
Herbaceous Wetland	Optimal
Ozark-Ouachita Prairie and Woodland	Optimal
Ozark-Ouachita Riparian	Suitable
West Gulf Coastal Plain Small Stream/River Forest	Suitable

Problems Faced

KNOWN PROBLEM: Clearing and draining of wetlands have greatly reduced the available habitat for this species.	Threat: Habitat destruction or conversion Source: Conversion of riparian forest

Data Gaps/Research Needs

Need to obtain baseline information on distribution and population status.

Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

Survey wetlands for this and other rare species.

Euphyes dion
Dion Skipper

Comments

State ranking for this species in NatureServe (2015) listed as SU, which indicates that the species is presumed to be extirpated in Arkansas. To the contrary, Spencer (2006) describes the species as inhabiting wetlands and being locally uncommon to locally common statewide in proper habitat; records for 9 Arkansas counties (Baltosser et al. 2015). The species is described as being "rare on coastal plain as it is in east Texas," with five records for Arkansas for only 2 counties (Lafayette and Little River; Drs. Craig Rudolph and Charles Ely, personal communication, 2015). Up to three individuals of this species have been noted multiple times (including mated/attached pairs) in marsh habitats in the Arkansas Valley (Franklin Co.) that bisect segments of tallgrass prairies (Dr. William Baltosser, personal communication, 2015). More information on the status of this species is needed, as a state ranking of SU has not been appropriate.

Taxa Association Team and Peer Reviewers

UALR Dr. William Baltosser, ANHC Ms. Samantha Scheiman, USFS Dr. Craig Rudolph, and Dr. Charles Ely

Euphyes dukesi

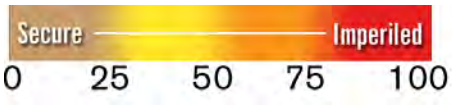
Dukes' Skipper

Class: Insecta

Order: Lepidoptera

Family: Hesperiidae

Priority Score: **32** out of 100





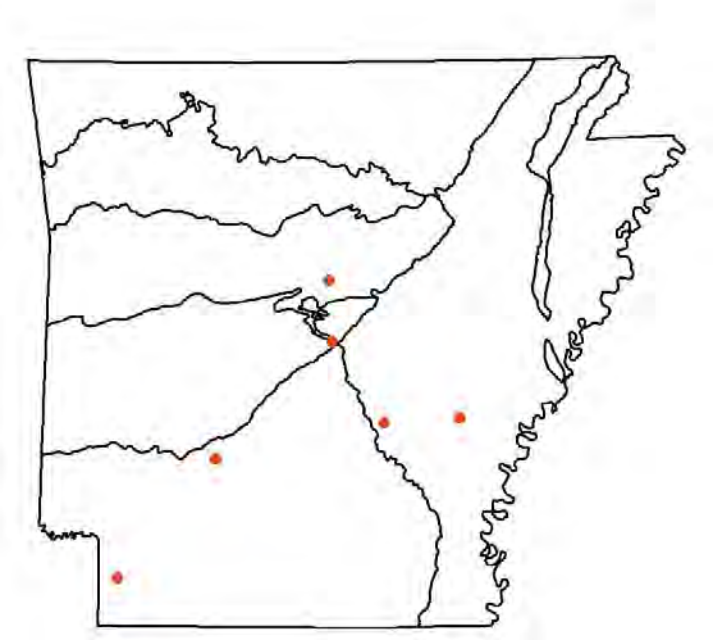
Population Trend: Unknown

Global Rank: G3 — Vulnerable species

State Rank: S1S2 — Critically imperiled in Arkansas (uncertain rank)

Distribution

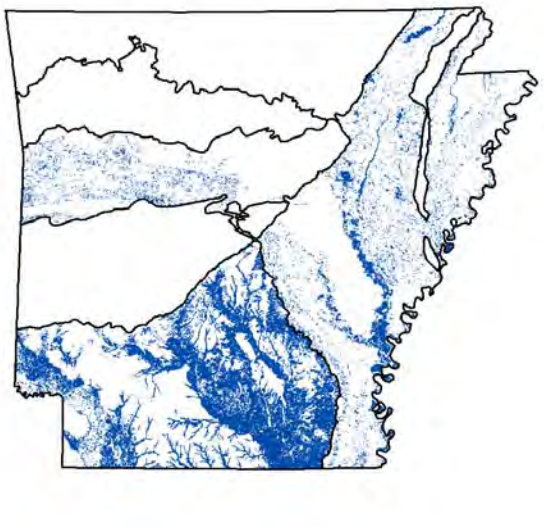
Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☐
- Boston Mountains ☐
- Arkansas Valley ☑
- Ouachita Mountains ☐
- South Central Plains ☑
- Mississippi Alluvial Plain ☑
- Mississippi Valley Loess Plain ☐

Habitat Map





Habitats

	Weight
Herbaceous Wetland	Optimal
Lower Mississippi Flatwoods Woodland and Forest	Suitable
Lower Mississippi River High Bottomland Forest	Suitable
Ozark-Ouachita Large Floodplain	Suitable
West Gulf Coastal Plain Calcareous Prairie and Woodland	Optimal
West Gulf Coastal Plain Large River Floodplain Forest	Suitable
West Gulf Coastal Plain Red River Floodplain Forest	Suitable
West Gulf Coastal Plain Seepage Swamp and Baygall	Suitable
West Gulf Coastal Plain Small Stream/River Forest	Suitable

Problems Faced

KNOWN PROBLEM: Clearing and draining of bottomland forests and associated wetlands have greatly reduced the available habitat for this species.	Threat: Habitat destruction or conversion Source: Conversion of riparian forest

Data Gaps/Research Needs

Need to obtain baseline information on distribution and population status.

Euphyes dukesi
Dukes' Skipper

Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

Survey high-quality riverine wetlands in the Delta and West Gulf Coastal Plain regions for this and other rare species.

Comments

Vaughan and Shepherd (2005) describe Dukes' Skipper as occurring in scattered locations across the United States and southern Canada. Populations are listed as being fragmented throughout the range of the species and it is considered uncommon at all sites. This skipper occupies a variety of moist habitats with long grass, which includes marshes and ditches, but the primary habitat is stated to be patches of sedge in forested swamps. Vaughan and Shepherd also state that Dukes' Skipper deserves conservation efforts wherever it is found. Within Arkansas, the species has been found in 9 counties (Baltosser et al. 2015) and Spencer (2006) describes the species as a breeding resident occupying shady swamps, marshes, and ditches. She lists distribution and abundance as local, being rare to uncommon throughout the Coastal Plain. More information is needed to gauge the status of this very rare skipper; it should be looked for in all moist habitats.

Taxa Association Team and Peer Reviewers

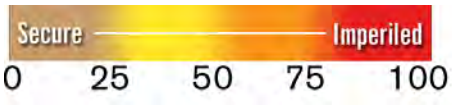
UALR Dr. William Baltosser, ANHC Ms. Samantha Scheiman, USFS Dr. Craig Rudolph, and Dr. Charles Ely

Gomphus ozarkensis

Ozark Clubtail Dragonfly

Class: Insecta
Order: Odonata
Family: Gomphidae

Priority Score: **27** out of 100



Population Trend: Unknown

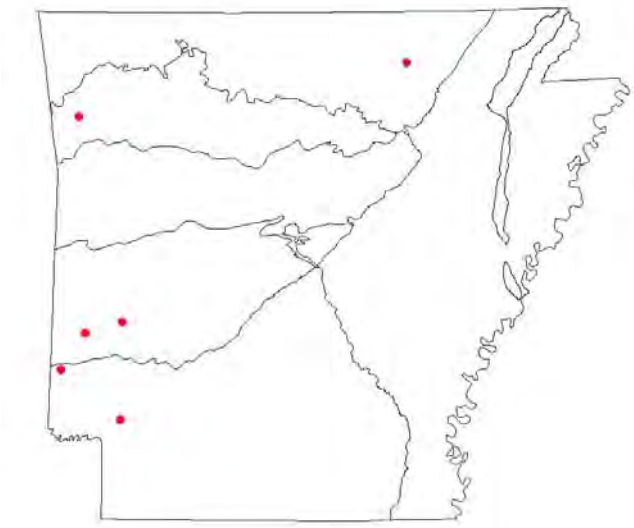


Global Rank: G4 — Apparently secure species

State Rank: S1 — Critically imperiled in Arkansas

Distribution

Element Occurrence Records



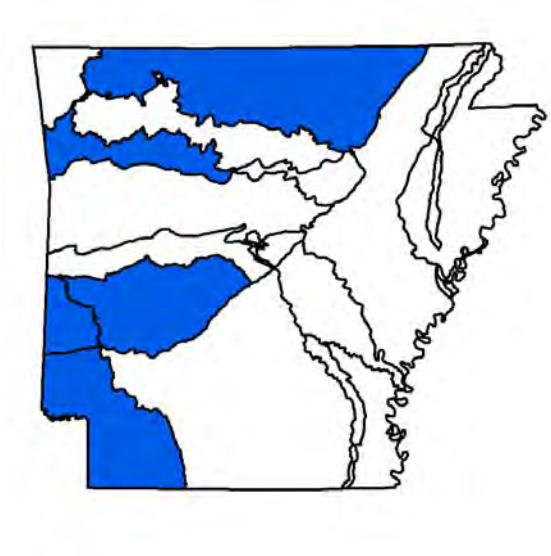
Ecoregions where the species occurs:

- ☐ Ozark Highlands
- ☑ Boston Mountains
- ☐ Arkansas Valley
- ☑ Ouachita Mountains
- ☑ South Central Plains
- ☐ Mississippi Alluvial Plain
- ☐ Mississippi Valley Loess Plains



Terrestrial Habitats





Ecobasins where this species occurs

Ecobasins

Boston Mountains - Arkansas River
Ouachita Mountains - Ouachita River
South Central Plains - Red River

Terrestrial Habitats

Ozark-Ouachita Large Floodplain	Data Gap
Ozark-Ouachita Riparian	Optimal
West Gulf Coastal Plain Small Stream/River Forest	Optimal

Gomphus ozarkensis
Ozark Clubtail Dragonfly

Aquatic Habitats

Natural Pool: - Small - Medium	Suitable

Problems Faced

Threat: Hydrological alteration
Source: Dam

Threat: Sedimentation
Source: Resource extraction

Threat: Toxins/contaminants
Source: Municipal/Industrial point source

Data Gaps/Research Needs

Need to obtain baseline information on distribution and population status.

Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

Surveys to locate additional populations and protection of stream habitats.

Comments

The Ozark clubtail is a regional endemic found in Missouri, Kansas, Oklahoma, and Arkansas.

Taxa Team and Peer Reviewers

ANHC Mr. Michael Warriner

Gryllotalpa major

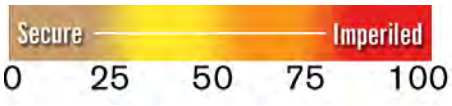
Prairie Mole Cricket

Class: Insecta

Order: Orthoptera

Family: Gryllotalpidae

Priority Score: **32** out of 100




©ANHC

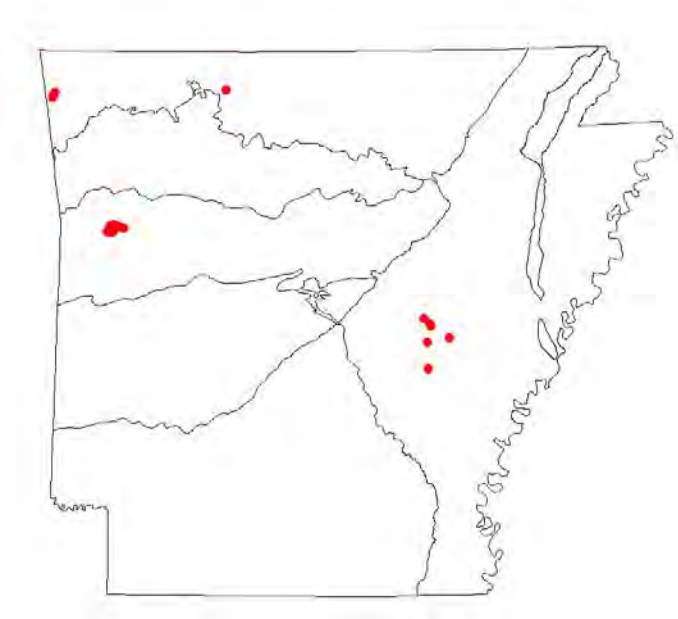
Population Trend: Unknown

Global Rank: G3 — Vulnerable species

State Rank: S1S2 — Critically imperiled in Arkansas (uncertain rank)

Distribution

Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☑
- Boston Mountains ☐
- Arkansas Valley ☑
- Ouachita Mountains ☐
- South Central Plains ☐
- Mississippi Alluvial Plain ☑
- Mississippi Valley Loess Plain ☐



Habitat Map



Habitats

	Weight
Lower Mississippi Alluvial Plain Grand Prairie	Obligate
Ozark-Ouachita Prairie and Woodland	Obligate

Problems Faced

Loss and degradation of prairie habitat.	Threat: Habitat destruction or conversion Source: Grazing/Browsing
Loss and degradation of prairie habitat.	Threat: Habitat destruction or conversion Source: Commercial/industrial development
Loss and degradation of prairie habitat.	Threat: Habitat fragmentation Source: Urban development

Data Gaps/Research Needs

Need status assessments of known populations.

Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

Most occurrences are known. Habitat restoration on surrounding lands is critical for this species survival.

Comments

A prairie-specialist, the prairie mole cricket is restricted to good-quality tallgrass prairie habitat.

Taxa Association Team and Peer Reviewers

ANHC Mr. Michael Warriner

Hesperia leonardus

Leonard's Skipper

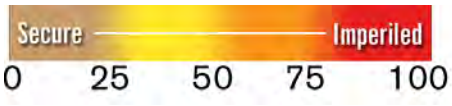


Class: Insecta

Order: Lepidoptera

Family: Hesperiidae

Priority Score: **19** out of 100



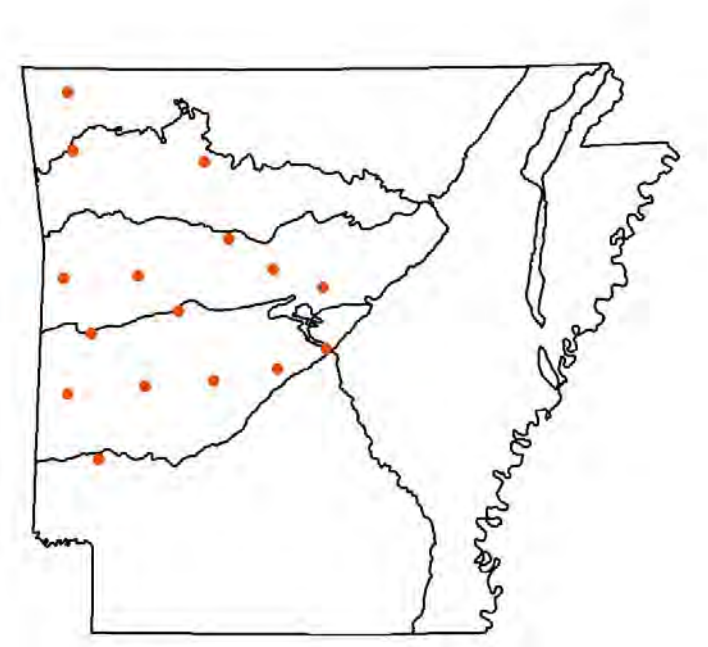
Population Trend: Unknown

Global Rank: G4 — Apparently secure species

State Rank: S3 — Vulnerable in Arkansas

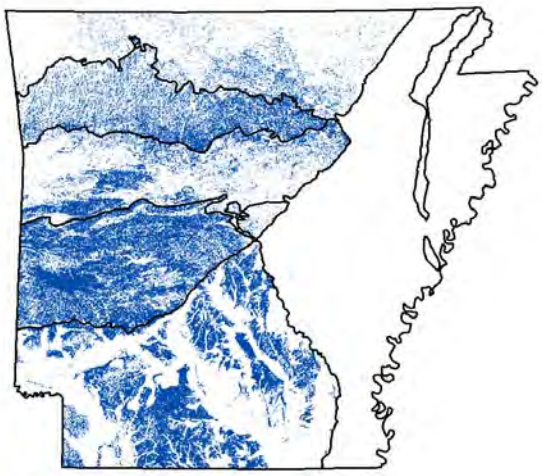
Distribution

Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☑
- Boston Mountains ☑
- Arkansas Valley ☑
- Ouachita Mountains ☑
- South Central Plains ☑
- Mississippi Alluvial Plain ☐
- Mississippi Valley Loess Plain ☐



Habitat Map



Habitats

	Weight
Ozark-Ouachita Dry Oak and Pine Woodland	Suitable
Ozark-Ouachita Pine-Bluestem Woodland	Suitable
Ozark-Ouachita Pine-Oak Forest/Woodland	Suitable
Ozark-Ouachita Prairie and Woodland	Suitable
West Gulf Coastal Plain Calcareous Prairie and Woodland	Suitable

Problems Faced

KNOWN PROBLEM: Loss of habitat.	Threat: Habitat destruction or conversion Source: Agricultural practices
KNOWN PROBLEM: Loss of habitat.	Threat: Altered composition/structure Source: Fire suppression

Data Gaps/Research Needs

Need to obtain baseline information on distribution and population status.

Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Hesperia leonardus
Leonard's Skipper

Monitoring Strategies

Look for this species in open oak, pine, or mixed woodlands; oak savannas; rights of way in dry oak woods or pine barrens; edges of airport grasslands; grassy rock outcrops; native sand plain grasslands; and dry meadows. Flight season is between August and October in Arkansas.

Comments

According to NatureServe (2015), this species is of possible long-term concern, but for now there are a substantial number of presumably viable occurrences, and it is credibly ranked S3 or S4 in several states. No S5 ranks are supportable now and may have never been. Surveys are needed to determine baseline information, and conservation measures need to be explored once there is more insight regarding the status and distribution of this species. With respect to Arkansas, Spencer (2006) indicates that this species is an irregular emigrant in low numbers and has been seen in scattered locations from north to central Arkansas. A single specimen has recently been obtained from Newton County (Dr. William Baltosser, personal communication, 2015), Drs. Craig Rudolph and Charles Ely have records for 9 counties, and records depicted by Raney (2012) round out the known occurrence of the species and bring the total to 17 Arkansas counties of occurrence (Baltosser et al. 2015).

Taxa Association Team and Peer Reviewers

UALR Dr. William Baltosser, ANHC Ms. Samantha Scheiman, USFS Dr. Craig Rudolph, and Dr. Charles Ely

Hesperia meskei

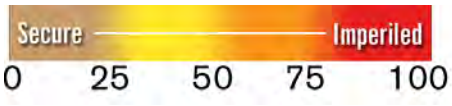
Meske's Skipper

Class: Insecta

Order: Lepidoptera

Family: Hesperiidae

Priority Score: **29** out of 100





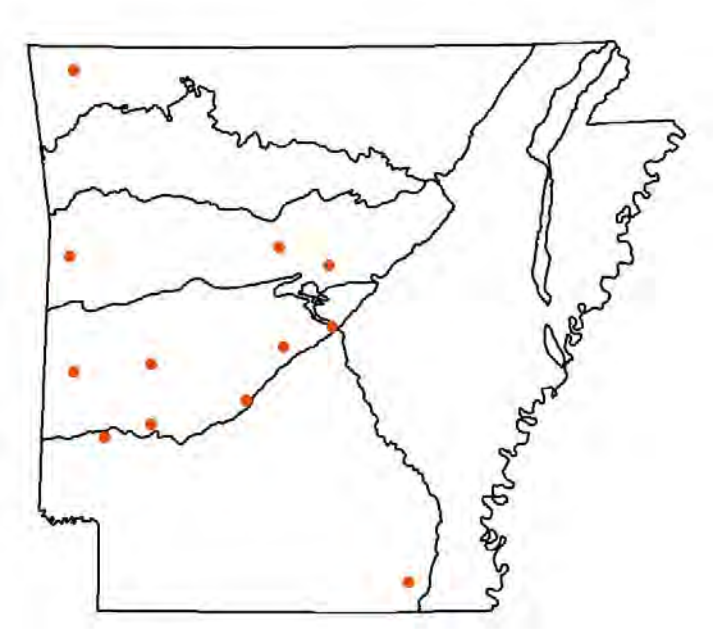
Population Trend: Unknown

Global Rank: G3G4 — Vulnerable (uncertain rank)

State Rank: S1S2 — Critically imperiled in Arkansas (uncertain rank)

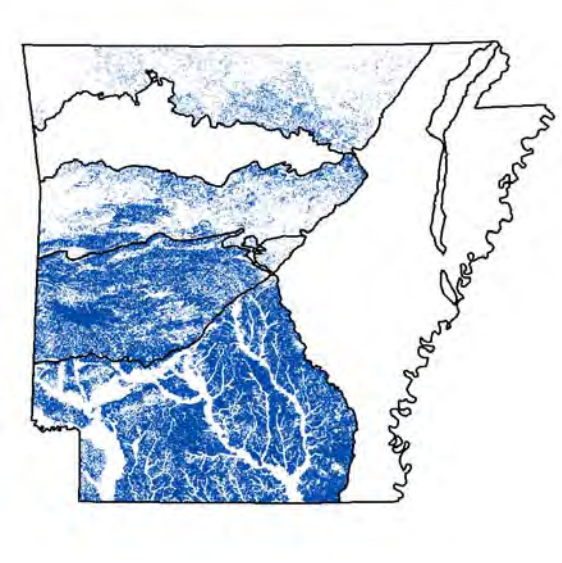
Distribution

Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☑
- Boston Mountains ☐
- Arkansas Valley ☑
- Ouachita Mountains ☑
- South Central Plains ☑
- Mississippi Alluvial Plain ☐
- Mississippi Valley Loess Plain ☐



Habitat Map



Habitats	Weight
Lower Mississippi Flatwoods Woodland and Forest	Suitable
Ozark-Ouachita Dry Oak and Pine Woodland	Suitable
Ozark-Ouachita Pine-Bluestem Woodland	Suitable
Ozark-Ouachita Pine-Oak Forest/Woodland	Suitable
Ozark-Ouachita Prairie and Woodland	Suitable
West Gulf Coastal Plain Calcareous Prairie and Woodland	Suitable
West Gulf Coastal Plain Sandhill Oak and Shortleaf Pine Forest/Woodland	Suitable

Problems Faced

KNOWN PROBLEM: Fire suppression has had a negative impact on potential habitat.	Threat: Alteration of natural fire regimes Source: Fire suppression
KNOWN PROBLEM: Habitat destruction.	Threat: Habitat destruction or conversion Source: Urban development

Data Gaps/Research Needs

Need to obtain baseline information on distribution and population status.

Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

Need a thorough survey of the Ozark Highlands, Boston Mountains, Southern Coastal Plains, and Ouachita Mountains ecoregions to determine status of this and other rare species in the state.

Comments

Associated with sparse, open woodlands (Opler and Malikul 1998). NatureServe (2015) indicates that if the species is not currently globally rare it will probably become so soon. An isolated population cluster in central Arkansas is noted within the discussion. There are records of occurrence from 12 Arkansas counties (Baltosser et al. 2015). Surveys conducted in and around the Buffalo National River, in prairie habitats in Franklin Co., and in blackland woodland habitats farther to the south have not resulted in the detection of this species (Dr. William Baltosser, personal communication 2015). In contrast, Drs. Craig Rudolph and Charles Ely have seven records from 6 counties. The species in Arkansas should continue to be monitored for occurrence and ultimately for population trends.

Taxa Association Team and Peer Reviewers

UALR Dr. William Baltosser, ANHC Ms. Samantha Scheiman, USFS Dr. Craig Rudolph, and Dr. Charles Ely

Hesperia metea

Cobweb Skipper

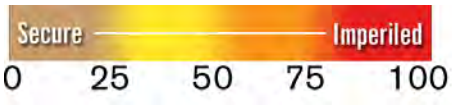


Class: Insecta

Order: Lepidoptera

Family: Hesperiidae

Priority Score: **19** out of 100



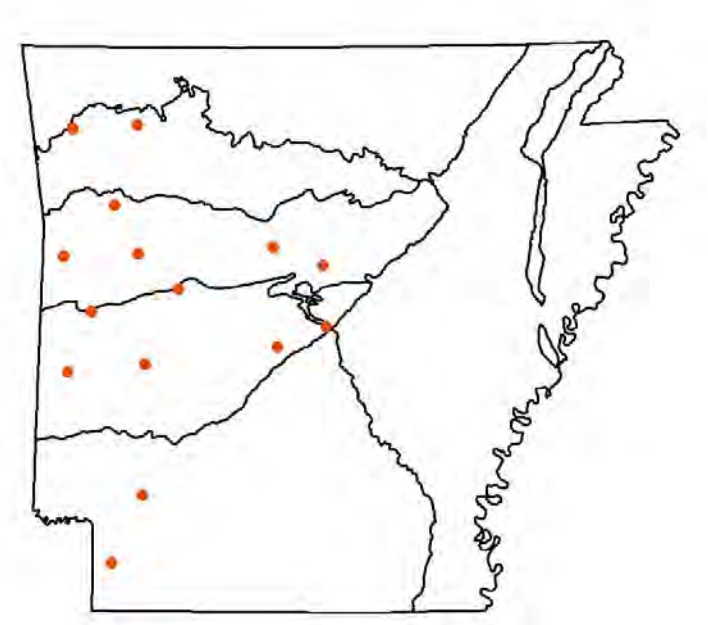
Population Trend: Unknown

Global Rank: G4 — Apparently secure species

State Rank: S3 — Vulnerable in Arkansas

Distribution

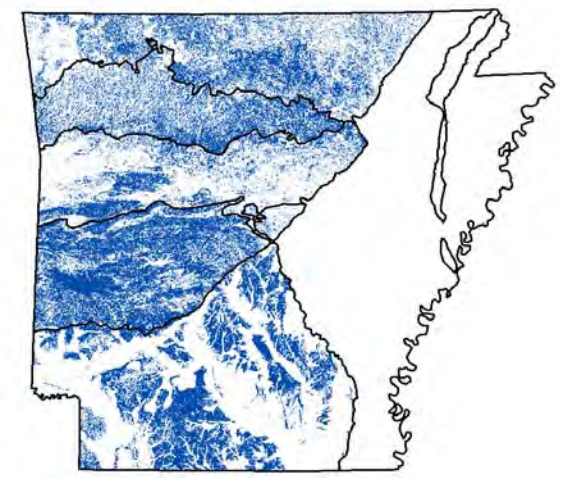
Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☑
- Boston Mountains ☑
- Arkansas Valley ☑
- Ouachita Mountains ☑
- South Central Plains ☑
- Mississippi Alluvial Plain ☐
- Mississippi Valley Loess Plain ☐

Habitat Map





Habitats	Weight
Cultivated Forest	Suitable
Interior Highlands Calcareous Glade and Barrens	Suitable
Interior Highlands Dry Acidic Glade and Barrens	Suitable
Ozark-Ouachita Dry Oak and Pine Woodland	Suitable
Ozark-Ouachita Pine-Bluestem Woodland	Suitable
Ozark-Ouachita Pine-Oak Forest/Woodland	Suitable
West Gulf Coastal Plain Pine-Hardwood Forest/Woodland	Suitable

Comments

State ranking for this species in NatureServe (2015) is listed as SU, which indicates that the species is presumed to be extirpated in Arkansas. To the contrary, Spencer (2006) describes the species as inhabiting open grassy areas and being locally rare to common, mainly in central and western Arkansas (records for 18 Arkansas counties; Baltosser et al. 2015). The species is described as being "regular on dry, open hillsides" (Dr. Craig Rudolph, personal communication, 2015); he has documented the species as occurring in 6 Arkansas counties. There is an additional record from Hempstead County (9 June 2006) of an individual of this species on an open hillside (barren pine plantation) adjacent to Rick Evans WMA (Dr. William Baltosser, personal communication, 2015). More information on the status of this species is needed as a state ranking of SU is not appropriate.

Taxa Association Team and Peer Reviewers

UALR Dr. William Baltosser, ANHC Ms. Samantha Scheiman, USFS Dr. Craig Rudolph, and Dr. Charles Ely

Heterosternuta ouachita

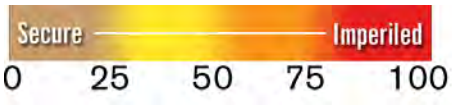
Ouachita Diving Beetle

Class: Insecta

Order: Coleoptera

Family: Dytiscidae

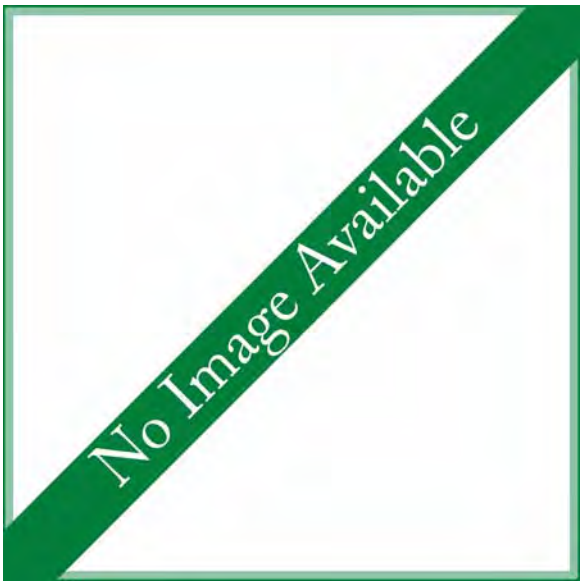
Priority Score: **19** out of 100



Population Trend: Unknown

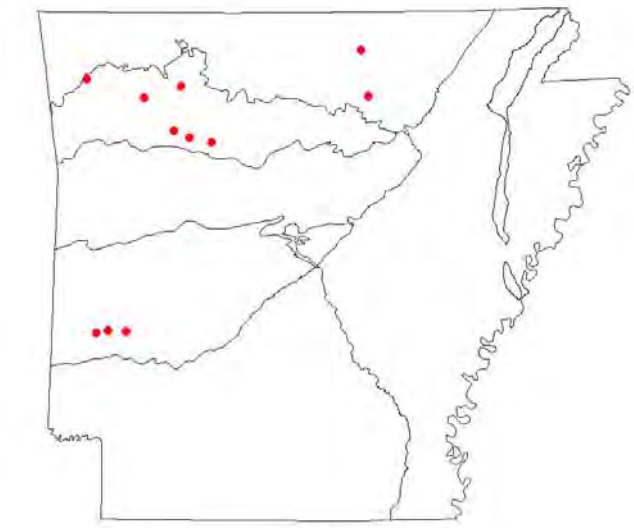
Global Rank: GNR — Not yet ranked

State Rank: S2 — Imperiled in Arkansas



Distribution

Element Occurrence Records



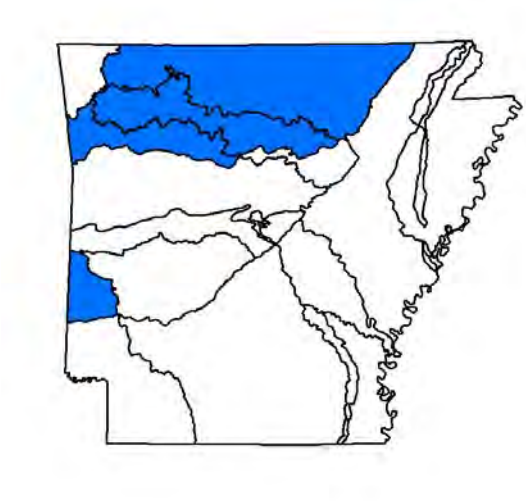
Ecoregions where the species occurs:

- [x] Ozark Highlands
- [x] Boston Mountains
- [ ] Arkansas Valley
- [x] Ouachita Mountains
- [ ] South Central Plains
- [ ] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains



Terrestrial Habitats





Ecobasins where this species occurs

Ecobasins

Boston Mountains - Arkansas River
Boston Mountains - White River
Ouachita Mountains - Red River
Ozark Highlands - White River

Terrestrial Habitats

Ozark-Ouachita Riparian	Optimal

Aquatic Habitats

Natural Pool: - Small	Suitable
Natural Riffle: - Small	Suitable

Problems Faced

Threat: Hydrological alteration
Source: Dam

Threat: Sedimentation
Source: Resource extraction

Threat: Toxins/contaminants
Source: Municipal/Industrial point source

Data Gaps/Research Needs

Need to obtain baseline information on distribution and population status.

Conservation Actions

	Importance	Category
Limit activities that impair water quality.	Medium	Habitat Protection
Protect stream habitat from construction of impoundments.	Medium	Habitat Protection

Monitoring Strategies

Survey for additional populations and monitor known occurrences.

Comments

No information available.

Taxa Team and Peer Reviewers

ANHC Mr. Michael Warriner

Heterosternuta phoebeae

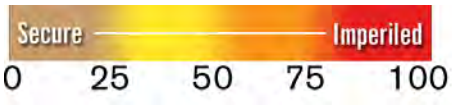
Predaceous Diving Beetle

Class: Insecta

Order: Coleoptera

Family: Dysticidae

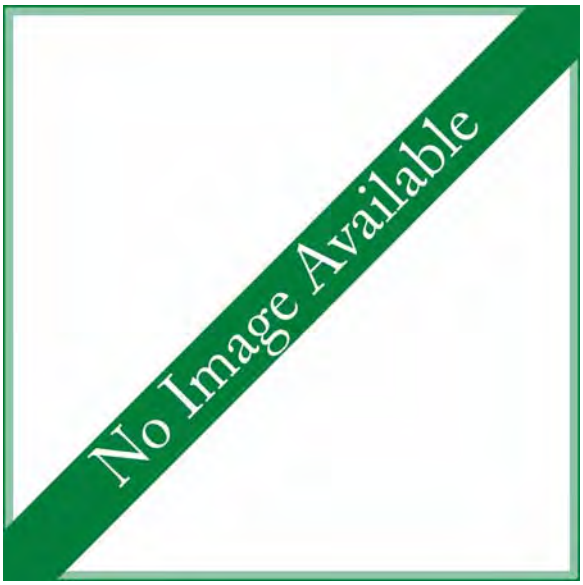
Priority Score: **46** out of 100



Population Trend: Unknown

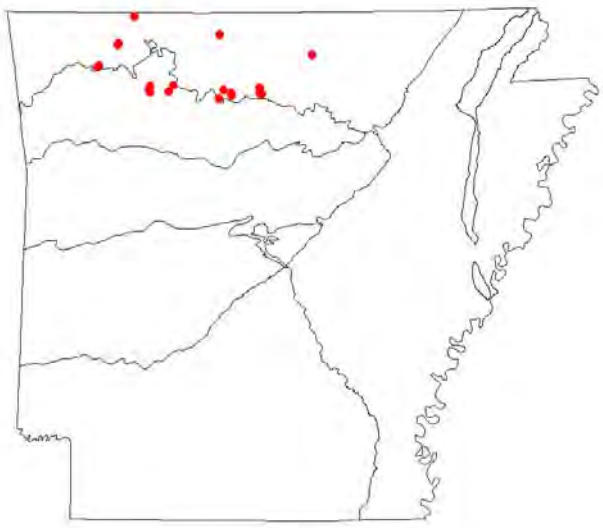
Global Rank: G2 — Imperiled species

State Rank: S2 — Imperiled in Arkansas



Distribution

Element Occurrence Records



Ecoregions where the species occurs:

- [x] Ozark Highlands
- [x] Boston Mountains
- [ ] Arkansas Valley
- [ ] Ouachita Mountains
- [ ] South Central Plains
- [ ] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains



Terrestrial Habitats





Ecobasins where this species occurs

Ecobasins

Boston Mountains - White River
Ozark Highlands - White River

Terrestrial Habitats

Ozark-Ouachita Riparian	Optimal

Aquatic Habitats

Natural Pool: - Small	Suitable
Natural Riffle: - Small	Suitable

Heterosternuta phoebeae
Predaceous Diving Beetle

Problems Faced

Threat: Hydrological alteration
Source: Dam

Threat: Sedimentation
Source: Resource extraction

Threat: Toxins/contaminants
Source: Municipal/Industrial point source

Data Gaps/Research Needs

Need to obtain baseline information on distribution and population status.

Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Comments

An Arkansas endemic beetle with a limited distribution along the Buffalo River watershed.

Taxa Team and Peer Reviewers

ANHC Mr. Michael Warriner

Heterosternuta sulphuria

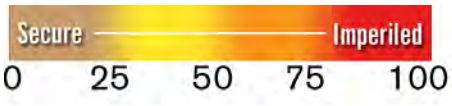
Sulphur Springs Diving Beetle

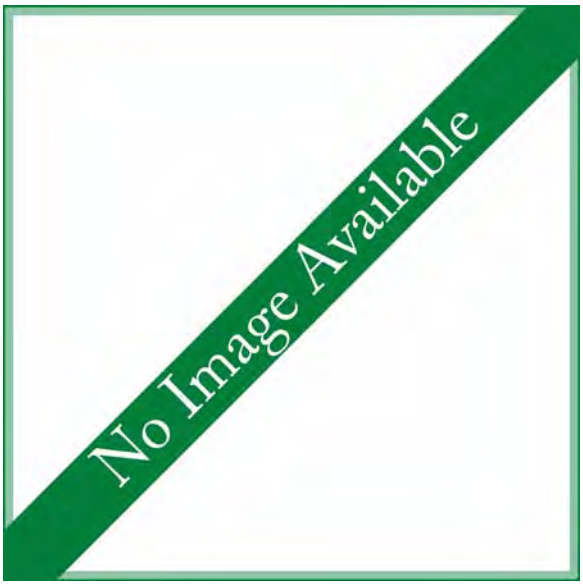
Class: Insecta

Order: Coleoptera

Family: Dytiscidae

Priority Score: **80** out of 100





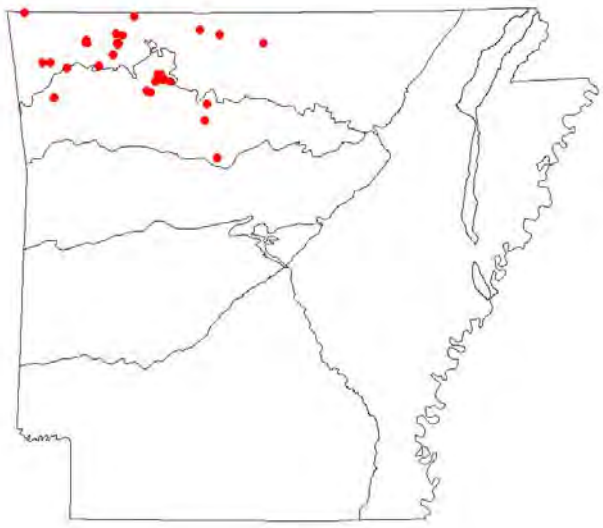
Population Trend: Unknown

Global Rank: G1? — Critically imperiled (inexact numeric rank)

State Rank: S1? — Critically imperiled in Arkansas (inexact numeric rank)

Distribution

Element Occurrence Records



Ecoregions where the species occurs:

- [x] Ozark Highlands
- [ ] Boston Mountains
- [ ] Arkansas Valley
- [ ] Ouachita Mountains
- [ ] South Central Plains
- [ ] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains



Terrestrial Habitats





Ecobasins where this species occurs

Ecobasins

Ozark Highlands - Arkansas River

Terrestrial Habitats

Ozark-Ouachita Riparian	Optimal

Aquatic Habitats

Natural Spring Run: - Small	Optimal

Problems Faced

Threat: Sedimentation
Source: Road construction

Threat: Toxins/contaminants
Source: Municipal/Industrial point source

Data Gaps/Research Needs

Need to obtain baseline information on distribution and population status.

Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

Surveys to locate additional populations and protection of stream habitats.

Comments

An Arkansas endemic beetle known only from a single natural spring in Benton County (Matta and Wolfe 1979).

Taxa Team and Peer Reviewers

ANHC Mr. Michael Warriner

Isoperla szczytkoi

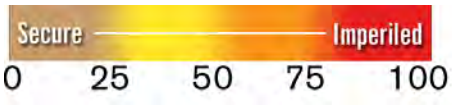
Magazine Stripetail

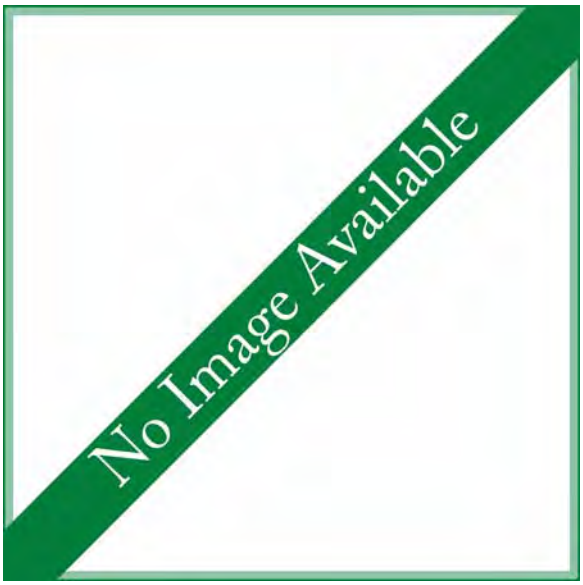
Class: Insecta

Order: Plecoptera

Family: Perlodidae

Priority Score: **80** out of 100





Population Trend: Unknown

Global Rank: G1 — Critically imperiled species

State Rank: S1 — Critically imperiled in Arkansas

Distribution

Element Occurrence Records



Ecoregions where the species occurs:

- ☐ Ozark Highlands
- ☐ Boston Mountains
- ☑ Arkansas Valley
- ☐ Ouachita Mountains
- ☐ South Central Plains
- ☐ Mississippi Alluvial Plain
- ☐ Mississippi Valley Loess Plains



Terrestrial Habitats





Ecobasins where this species occurs

Ecobasins

Arkansas Valley - Arkansas River

Terrestrial Habitats

Ozark-Ouachita Prairie and Woodland	Suitable

Aquatic Habitats

Natural Other: - Small	Suitable

Problems Faced

Threat: Sedimentation
Source: Forestry activities

Isoperla szczytkoi
Magazine Stripetail

Data Gaps/Research Needs

Need to obtain baseline information on distribution and population status.

Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

Surveys to locate additional populations and protection of stream habitats.

Comments

This stonefly is endemic to Arkansas and is only known from Gutter Rock Creek on Magazine Mountain in Logan County (Poulton and Stewart 1987).

Taxa Team and Peer Reviewers

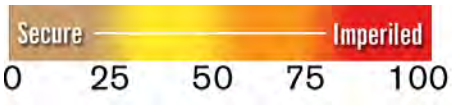
ANHC Mr. Michael Warriner

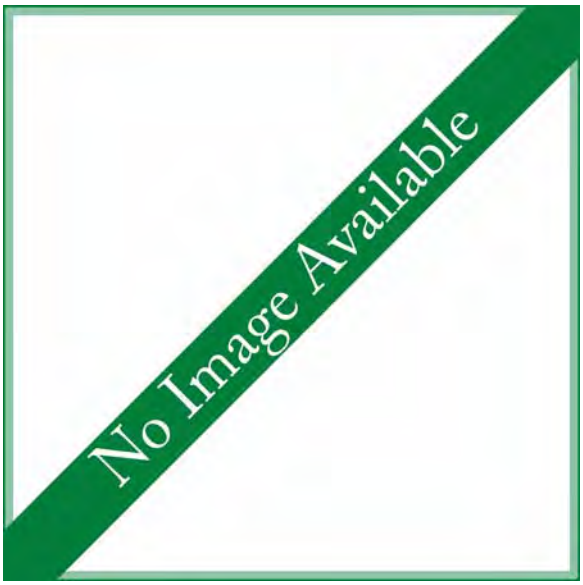
Leuctra paleo

Stonefly

Class: Insecta
Order: Plecoptera
Family: Leuctridae

Priority Score: **50** out of 100





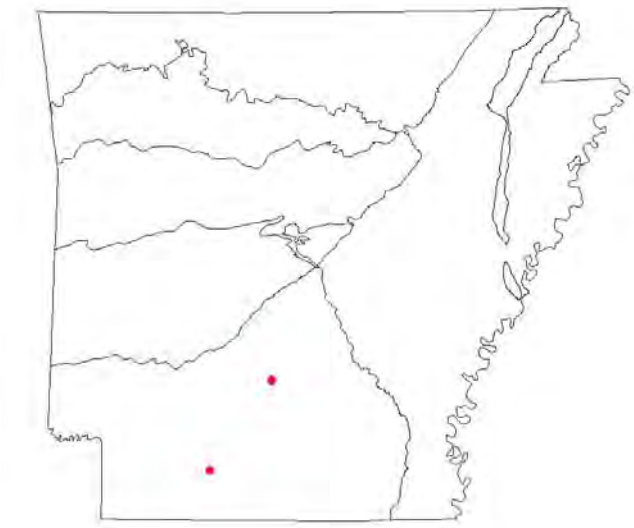
Population Trend: Unknown

Global Rank: G2 — Imperiled species

State Rank: S1 — Critically imperiled in Arkansas

Distribution

Element Occurrence Records



Ecoregions where the species occurs:

- ☐ Ozark Highlands
- ☐ Boston Mountains
- ☐ Arkansas Valley
- ☐ Ouachita Mountains
- ☑ South Central Plains
- ☐ Mississippi Alluvial Plain
- ☐ Mississippi Valley Loess Plains



Terrestrial Habitats





Ecobasins where this species occurs

Ecobasins

Ouachita Mountains - Ouachita River

Problems Faced

Threat: Sedimentation
Source: Resource extraction

Threat: Toxins/contaminants
Source: Municipal/Industrial point source

Data Gaps/Research Needs

Need to obtain baseline information on distribution and population status.

Leuctra paleo
Stonefly

Conservation Actions

Importance	Category
Medium	Data Gap

More data are needed to determine conservation actions.

Monitoring Strategies

Surveys to locate additional populations and protection of stream habitats.

Comments

Known from two streams in Columbia Co., and Dallas Co., Arkansas. (Robison and Allen 1995, Stark 1998)

Taxa Team and Peer Reviewers

ANHC Mr. Michael Warriner

Lucanus elaphus

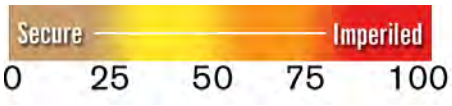
Giant Stag Beetle

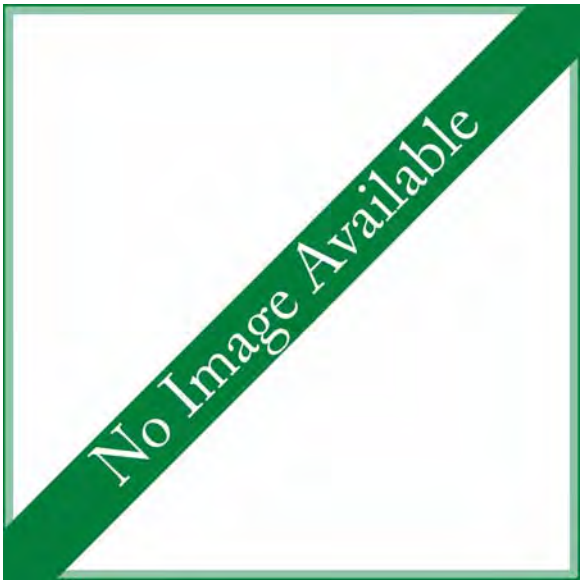
Class: Insecta

Order: Coleoptera

Family: Lucanidae

Priority Score: **25** out of 100





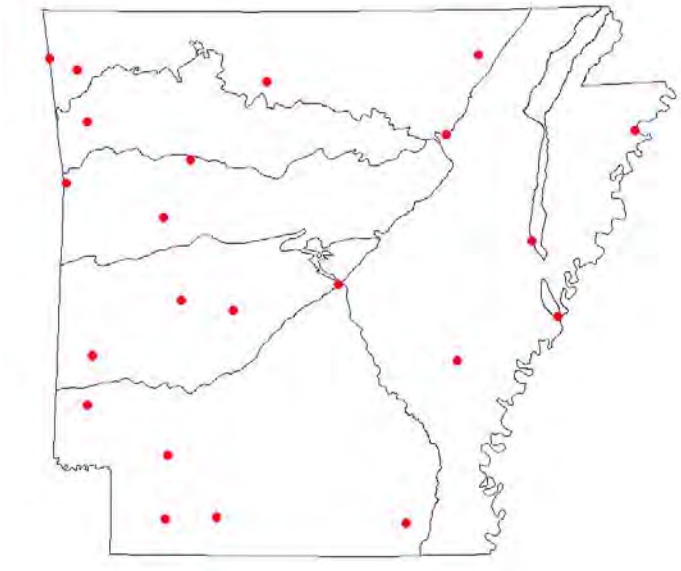
Population Trend: Unknown

Global Rank: G3G5 — Vulnerable (uncertain rank)

State Rank: S2 — Imperiled in Arkansas

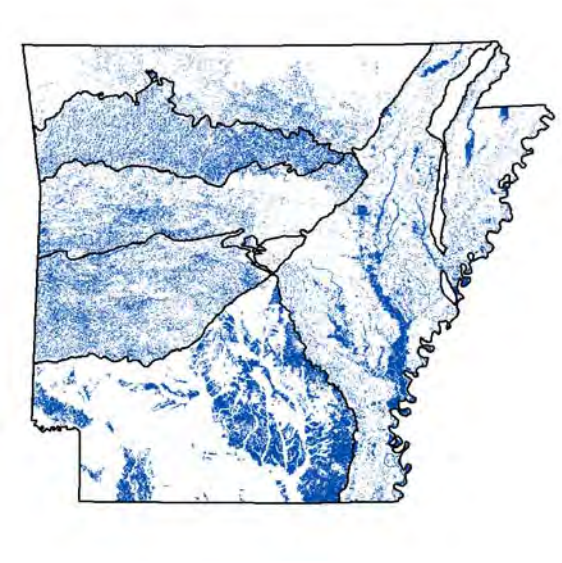
Distribution

Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☑
- Boston Mountains ☑
- Arkansas Valley ☑
- Ouachita Mountains ☑
- South Central Plains ☑
- Mississippi Alluvial Plain ☑
- Mississippi Valley Loess Plain ☑



Habitat Map



Habitats

	Weight
Lower Mississippi River High Bottomland Forest	Suitable
Lower Mississippi River Low Bottomland Forest	Suitable
Ozark-Ouachita Mesic Hardwood Forest	Suitable
West Gulf Coastal Plain Mesic Hardwood Forest	Suitable
West Gulf Coastal Plain Pine-Hardwood Forest	Suitable

Problems Faced

Forestry practices that reduce number of large, dead trees.	Threat: Resource depletion Source: Forestry activities

Data Gaps/Research Needs

Need to obtain baseline information on distribution and population status.

Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

Survey forest stands to locate additional populations of this species.

Comments

A large beetle species dependent upon large pieces of decaying wood as larval host sites (Staines 2001).

Taxa Association Team and Peer Reviewers

ANHC Mr. Michael Warriner

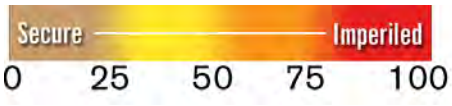
Lycaena hyllus

Bronze Copper



Class: Insecta
Order: Lepidoptera
Family: Lycaenidae

Priority Score: **11** out of 100



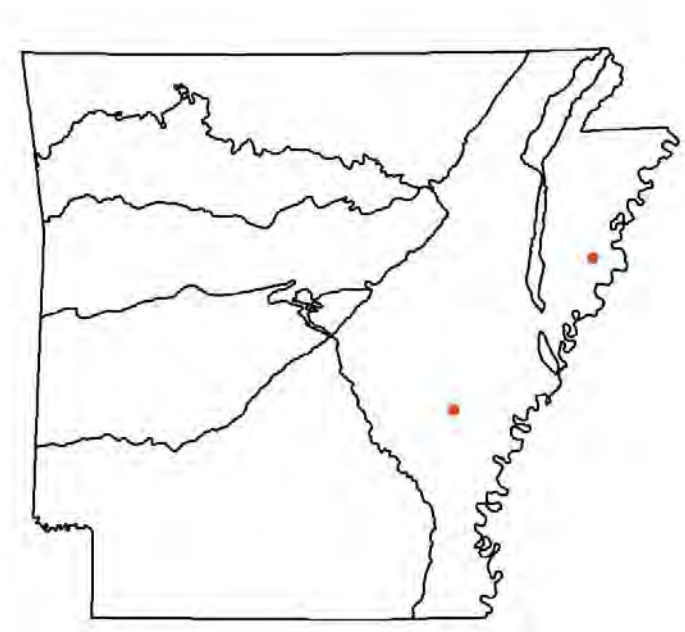
Population Trend: Unknown

Global Rank: G5 — Secure

State Rank: S4 — Apparently secure in Arkansas

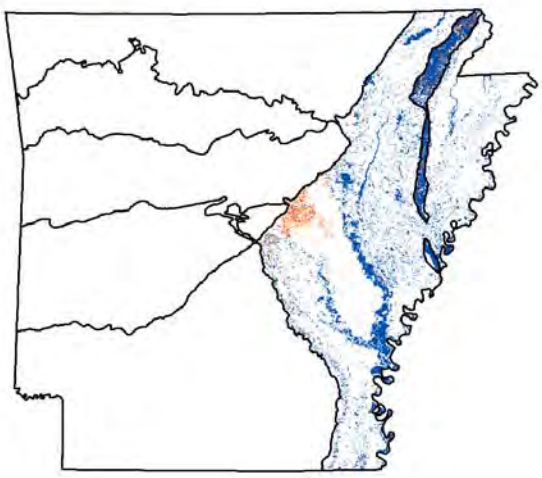
Distribution

Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☐
- Boston Mountains ☐
- Arkansas Valley ☐
- Ouachita Mountains ☐
- South Central Plains ☐
- Mississippi Alluvial Plain ☑
- Mississippi Valley Loess Plain ☑



Habitat Map



Habitats	Weight
Crowley's Ridge Loess Slope Forest	Suitable
Herbaceous Wetland	Suitable
Lower Mississippi Flatwoods Woodland and Forest	Suitable
Lower Mississippi River High Bottomland Forest	Suitable
Lower Mississippi River Riparian Forest	Suitable
Pasture Land	Marginal

Problems Faced

POTENTIAL PROBLEM: Population declines due to flooding.	Threat: Hydrological alteration Source: Urban development

Data Gaps/Research Needs

Need to obtain baseline information on distribution and population status.

Conservation Actions	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Lycaena hyllus
Bronze Copper

Monitoring Strategies

Survey wet open areas (e.g., streams, swamps, rivers) in eastern Arkansas for this and other rare species.

Comments

Heitzman and Heitzman (1996) characterize the species as being rare in the Ozarks of Missouri; there are no records of the species for the Ozarks of Arkansas (Baltosser et al. 2015). With regard to Arkansas, the following is from Spencer (2006): Eastern Arkansas is part of the southern periphery of the range of this butterfly. Most known colonies are from the Delta and Crowley's Ridge near the Mississippi River. This is a species of special concern. Habitat wet open areas (e.g., streams, swamps, rivers); breeding resident with several broods; local, rare to uncommon. More information needed to better gauge the current status and distribution of this species in Arkansas, which includes records from 6 eastern Arkansas counties (Baltosser et al. 2015).

Taxa Association Team and Peer Reviewers

UALR Dr. William Baltosser, ANHC Ms. Samantha Scheiman, USFS Dr. Craig Rudolph, and Dr. Charles Ely

Microstylum morosum

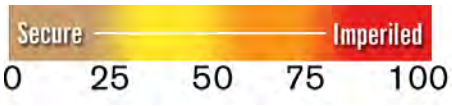
Giant Prairie Robberfly

Class: Insecta

Order: Diptera

Family: Asilidae

Priority Score: **31** out of 100





Population Trend: Unknown

Global Rank: G3G4 — Vulnerable (uncertain rank)

State Rank: S1 — Critically imperiled in Arkansas

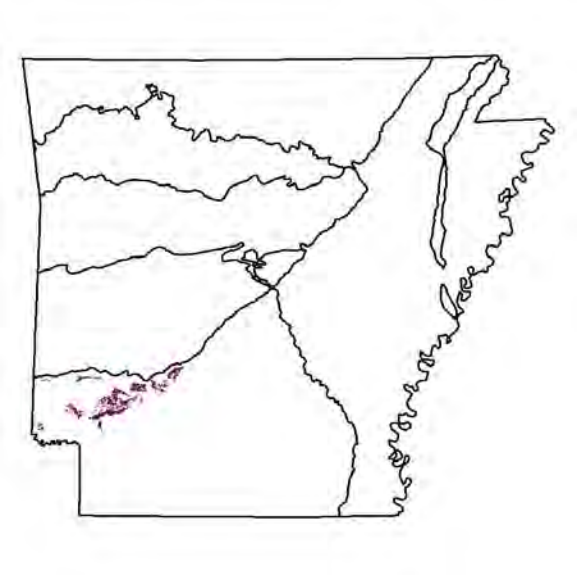
Distribution

Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☑
- Boston Mountains ☐
- Arkansas Valley ☐
- Ouachita Mountains ☐
- South Central Plains ☑
- Mississippi Alluvial Plain ☐
- Mississippi Valley Loess Plain ☐



Habitat Map



Habitats	Weight
Ozark-Ouachita Prairie and Woodland	Optimal
West Gulf Coastal Plain Calcareous Prairie and Woodland	Optimal

Problems Faced

Loss and degradation of grassland habitat.	Threat: Habitat destruction or conversion Source: Urban development
Loss and degradation of grassland habitat.	Threat: Alteration of natural fire regimes Source: Fire suppression
Loss and degradation of grassland habitat.	Threat: Habitat destruction or conversion Source: Grazing/Browsing

Data Gaps/Research Needs

Need to obtain baseline information on distribution and population status.

Conservation Actions	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

Surveys should be conducted to locate additional populations of this species.

Comments

This predaceous robberfly was only known from one site in southwestern Arkansas and is Arkansas' largest fly species (Warriner 2004). A survey for other records found that the species also occurs in prairie edge habitats in Howard County (Millwood Lake) and Hempstead County (Grandview Prairie Wildlife Management Area), and an isolated specimen was collected from Baxter County near the Missouri border (Tumlison and Benjamin 2011). Relatively recent surveys (2010, 2011, and 2012) of the Terre Noire Natural Area, where the species was first discovered in Arkansas, confirm the continued presence of the species at the site (Tumlison and Benjamin 2013). These surveys have discovered that this species is probably not an outright prairie species, but instead uses the ecotone between wooded and prairie habitat. The latter has important ramifications in view of potential timber sales and the clearing of woody vegetation in many areas of occupied habitat. Habitat management for this species needs to factor the woodland component into the management of this species.

Taxa Association Team and Peer Reviewers

ANHC Mr. Michael Warriner, HSU Dr. Renn Tumlison, HSU Ms. Kristen Benjamin, UALR Dr. William Baltosser

Neonympha areolatus

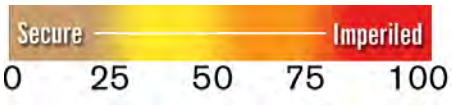
Georgia Satyr

Class: Insecta

Order: Lepidoptera

Family: Nymphalidae

Priority Score: **27** out of 100



Population Trend: Unknown

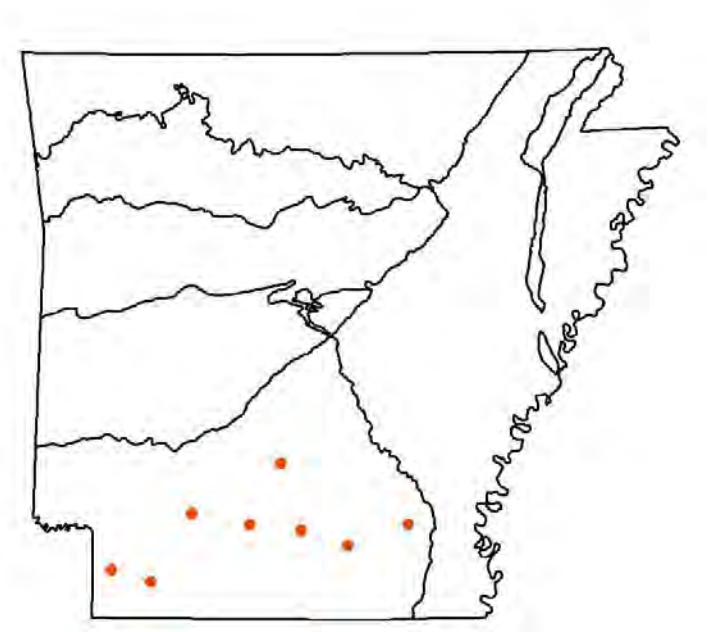


Global Rank: G3G4 — Vulnerable (uncertain rank)

State Rank: S2 — Imperiled in Arkansas

Distribution

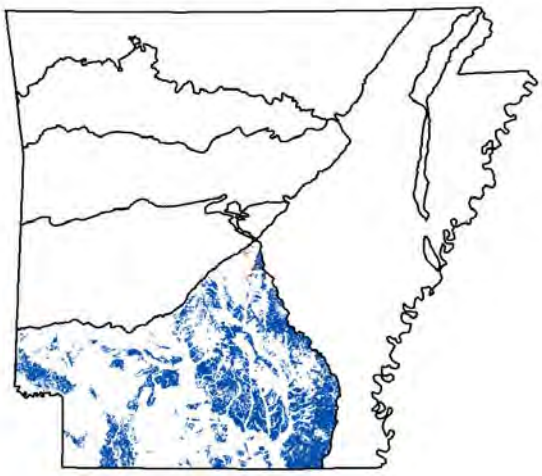
Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☐
- Boston Mountains ☐
- Arkansas Valley ☐
- Ouachita Mountains ☐
- South Central Plains ☑
- Mississippi Alluvial Plain ☐
- Mississippi Valley Loess Plain ☐

Habitat Map





Habitats

	Weight
West Gulf Coastal Plain Pine-Hardwood Flatwoods	Suitable
West Gulf Coastal Plain Sandhill Oak and Shortleaf Pine Forest/Woodland	Suitable

Problems Faced

KNOWN PROBLEM: Fire suppression.	Threat: Alteration of natural fire regimes Source: Fire suppression
KNOWN PROBLEM: Habitat loss due to conversion to plantations.	Threat: Habitat destruction or conversion Source: Forestry activities

Data Gaps/Research Needs

Need to obtain baseline information on distribution and population status.

Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

Inventory high-quality pine woodland remnants in the West Gulf Coastal Plain for this and other rare species.

Comments

NatureServe (2015) states that the species was historically rather common but there is growing concern because of loss of habitat to pine plantations and development. This butterfly is dependent upon openings in sandy pinewoods or pinebarrens (Opler and Malikul 1998). Eight counties of occurrence in Arkansas with no apparent recent records of occurrence (Baltosser et al. 2015). The species should be monitored for its presence and ultimately for population trends in Arkansas.

Taxa Association Team and Peer Reviewers

UALR Dr. William Baltosser, ANHC Ms. Samantha Scheiman, USFS Dr. Craig Rudolph, and Dr. Charles Ely

Nicrophorus americanus

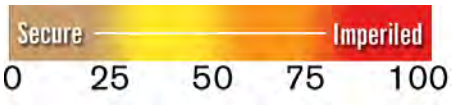
American Burying Beetle

Class: Insecta

Order: Coleoptera

Family: Silphidae

Priority Score: **42** **out of 100**



Population Trend: Unknown

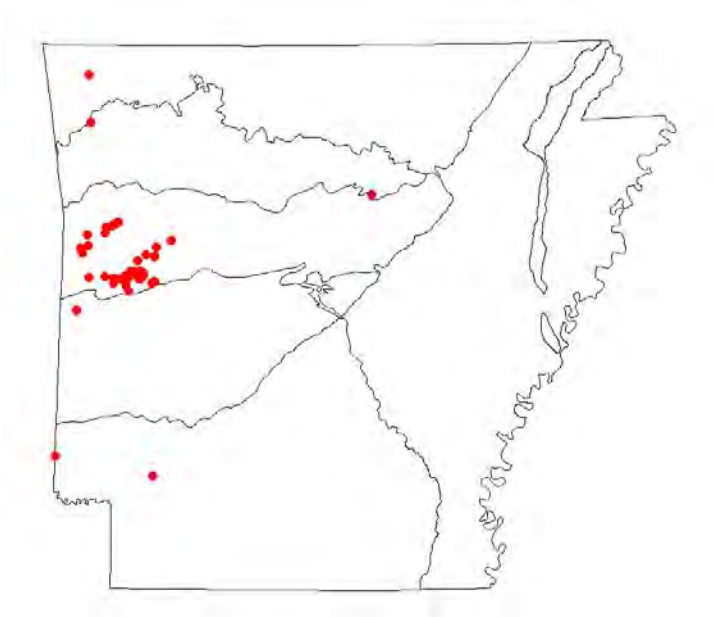


Global Rank: G2G3 — Imperiled (uncertain rank)

State Rank: S1 — Critically imperiled in Arkansas

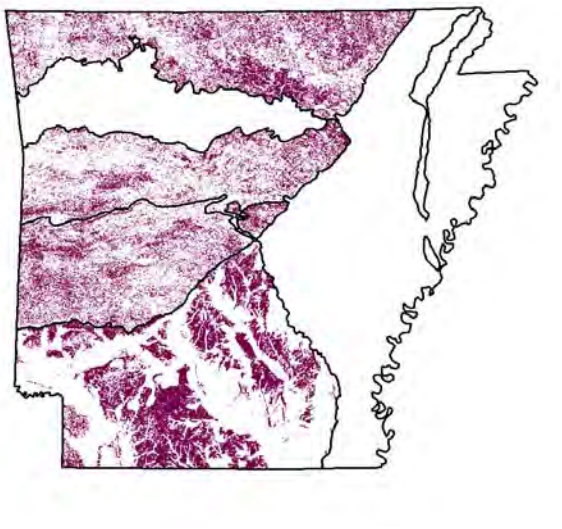
Distribution

Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☑
- Boston Mountains ☐
- Arkansas Valley ☑
- Ouachita Mountains ☑
- South Central Plains ☑
- Mississippi Alluvial Plain ☐
- Mississippi Valley Loess Plain ☐



Habitat Map



Habitats

	Weight
Ozark-Ouachita Dry Oak and Pine Woodland	Optimal
Ozark-Ouachita Dry-Mesic Oak Forest/Woodland	Optimal
Ozark-Ouachita Mesic Hardwood Forest	Optimal
Ozark-Ouachita Pine-Oak Forest/Woodland	Optimal
Ozark-Ouachita Prairie and Woodland	Obligate

Problems Faced

Competition with other scavengers for suitable carcasses.	Threat: Extraordinary competition for resources Source: Predation
Habitat destruction.	Threat: Habitat destruction or conversion Source: Urban development
Habitat fragmentation.	Threat: Habitat fragmentation Source: Commercial/industrial development

Data Gaps/Research Needs

Need surveys of historical occurrences to determine persistence.

Conservation Actions

	Importance	Category
Manage areas where this species occurs to increase numbers of small mammals and ground-nesting birds.	High	Habitat Restoration/Improvement
Reduce habitat fragmentation.	High	Habitat Restoration/Improvement
Suspend application of herbicides.	High	Habitat Protection

Monitoring Strategies

Survey for additional populations and monitor known occurrences.

Comments

In Arkansas, occurrences are limited to five counties in the western part of the state. Most of these occurrences are from federal lands, such as Fort Chaffee Military Reservation and the Ouachita National Forest (ANHI 2003, ONHI 2003).

Taxa Association Team and Peer Reviewers

ANHC Mr. Michael Warriner

Ochrotrichia contorta

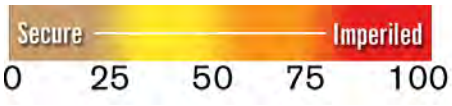
Contorted Ochrotrichian Microcaddisfl

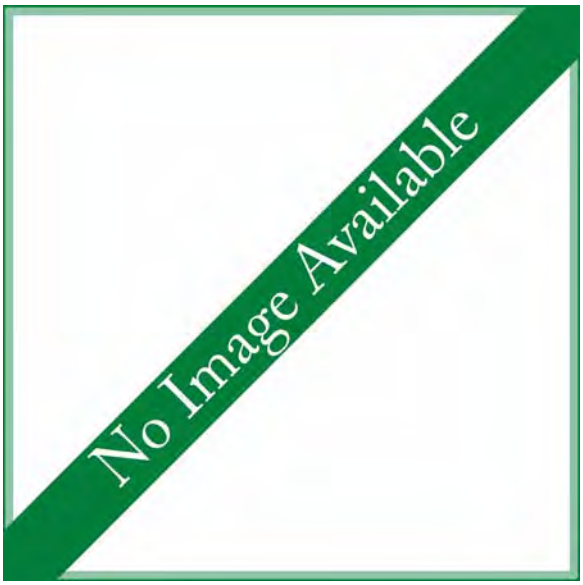
Class: Insecta

Order: Trichoptera

Family: Hydroptilidae

Priority Score: **50** out of 100





Population Trend: Unknown

Global Rank: G1G2 — Critically imperiled (uncertain rank)

State Rank: SNR — Species not ranked in Arkansas

Distribution

Element Occurrence Records



Ecoregions where the species occurs:

- [x] Ozark Highlands
- [ ] Boston Mountains
- [ ] Arkansas Valley
- [ ] Ouachita Mountains
- [ ] South Central Plains
- [ ] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains



Terrestrial Habitats





Ecobasins where this species occurs

Ecobasins

Ozark Highlands - Arkansas River

Terrestrial Habitats

Ozark-Ouachita Riparian	Suitable

Aquatic Habitats

Natural Pool: - Small - Medium	Data Gap
Natural Riffle: - Small - Medium	Data Gap

Problems Faced

Threat: Sedimentation
Source: Resource extraction

Threat: Toxins/contaminants
Source: Municipal/Industrial point source

Data Gaps/Research Needs

Need to obtain baseline information on distribution and population status.

Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

Surveys to locate additional populations and protection of stream habitats.

Comments

A regional endemic insect known only from sites in Arkansas and Missouri (Robison and Allen 1995).

Taxa Team and Peer Reviewers

ANHC Mr. Michael Warriner

Ochrotrichia robisoni

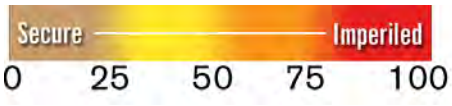
Microcaddisfly

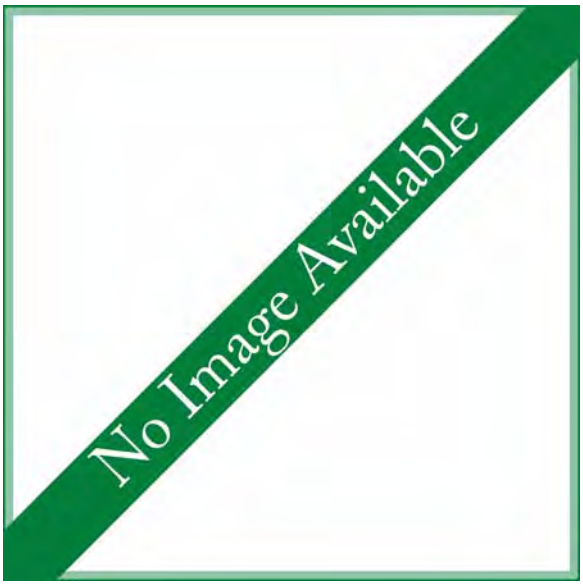
Class: Insecta

Order: Trichoptera

Family: Hydroptilidae

Priority Score: **57** out of 100





Population Trend: Unknown

Global Rank: G1G3 — Critically imperiled (uncertain rank)

State Rank: S1 — Critically imperiled in Arkansas

Distribution

Element Occurrence Records



Ecoregions where the species occurs:

- ☐ Ozark Highlands
- ☐ Boston Mountains
- ☐ Arkansas Valley
- ☑ Ouachita Mountains
- ☐ South Central Plains
- ☐ Mississippi Alluvial Plain
- ☐ Mississippi Valley Loess Plains



Terrestrial Habitats





Ecobasins where this species occurs

Ecobasins

Ouachita Mountains - Arkansas River

Terrestrial Habitats

Ozark-Ouachita Riparian	Suitable

Aquatic Habitats

Natural Pool: - Small	Suitable
Natural Riffle: - Small	Suitable

Ochrotrichia robisoni
Microcaddisfly

Problems Faced

Threat: Sedimentation
Source: Road construction

Threat: Toxins/contaminants
Source: Municipal/Industrial point source

Data Gaps/Research Needs

Need to obtain baseline information on distribution and population status.

Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

Surveys to locate additional populations and protection of stream habitats.

Comments

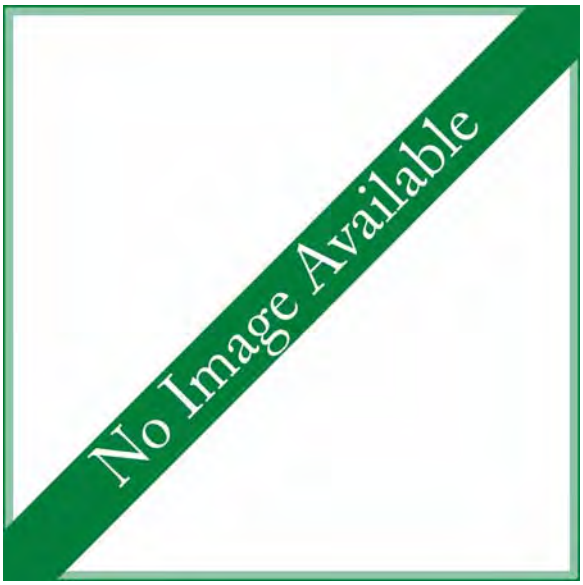
An endemic caddisfly known only from Bear Creek in Perry County (Frazer and Harris 1991).

Taxa Team and Peer Reviewers

ANHC Mr. Michael Warriner

Ophiogomphus westfalli

Ozark Snaketail Dragonfly

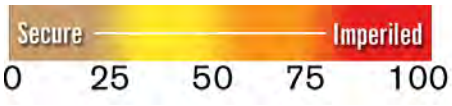


Class: Insecta

Order: Odonata

Family: Gomphidae

Priority Score: **32** **out of 100**



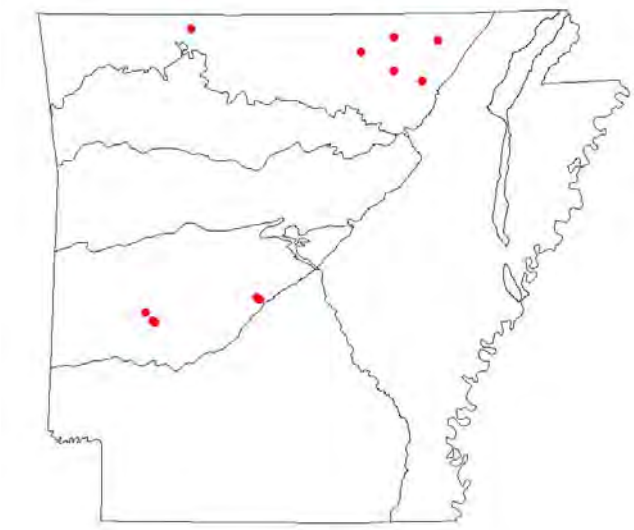
Population Trend: Unknown

Global Rank: G3 — Vulnerable species

State Rank: S1S2 — Critically imperiled in Arkansas (uncertain rank)

Distribution

Element Occurrence Records



Ecoregions where the species occurs:

- [x] Ozark Highlands
- [ ] Boston Mountains
- [ ] Arkansas Valley
- [x] Ouachita Mountains
- [ ] South Central Plains
- [ ] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains



Terrestrial Habitats





Ecobasins where this species occurs

Ecobasins

Ouachita Mountains - Ouachita River
Ouachita Mountains - Red River
Ozark Highlands - White River

Terrestrial Habitats

Ozark-Ouachita Large Floodplain	Data Gap
Ozark-Ouachita Riparian	Obligate

Aquatic Habitats

Natural Pool: - Small - Medium	Suitable

Ophiogomphus westfalli
Ozark Snaketail Dragonfly

Problems Faced

Threat: Sedimentation
Source: Recreation

Threat: Sedimentation
Source: Resource extraction

Threat: Toxins/contaminants
Source: Municipal/Industrial point source

Data Gaps/Research Needs

Need to obtain baseline information on distribution and population status.

Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

Surveys to locate additional populations and protection of stream habitats.

Comments

A regionally endemic dragonfly found in Arkansas, Kansas and Missouri (Cook and Daigle 1985).

Taxa Team and Peer Reviewers

ANHC Mr. Michael Warriner

Ouachitychus parvoculus

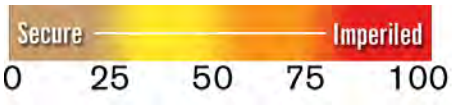
Small-eyed Mold Beetle

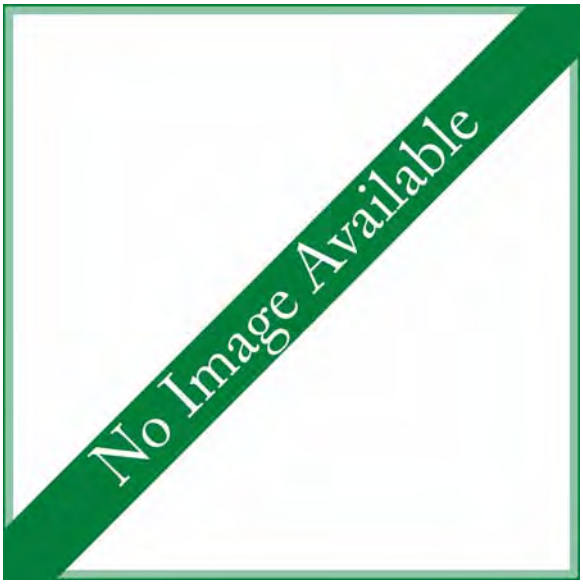
Class: Insecta

Order: Coleoptera

Family: Pselaphidae

Priority Score: **19** out of 100





Population Trend: Unknown

Global Rank: GNR — Not yet ranked

State Rank: S2 — Imperiled in Arkansas

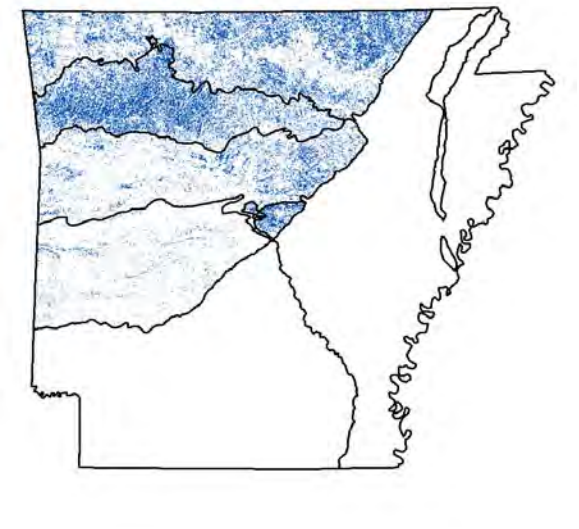
Distribution

Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☑
- Boston Mountains ☑
- Arkansas Valley ☑
- Ouachita Mountains ☑
- South Central Plains ☐
- Mississippi Alluvial Plain ☐
- Mississippi Valley Loess Plain ☐



Habitat Map



Habitats

	Weight
Ozark-Ouachita Dry-Mesic Oak Forest	Suitable
Ozark-Ouachita Mesic Hardwood Forest	Suitable

Problems Faced

Forestry practices that disturb litter layer and create xeric conditions.	Threat: Habitat destruction or conversion Source: Forestry activities

Data Gaps/Research Needs

Need to obtain baseline information on distribution and population status.

Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.	Medium	Population Management

Monitoring Strategies

Survey areas near known occurrences to locate additional populations.

Comments

An endemic beetle once known only from Bear Hollow on Magazine Mountain in Logan County. This species was collected at Roaring Branch Research Natural Area in Polk County, in the Ozark-St. Francis National Forest, and at Devil's Den State Park in 2013 (A. Dowling, pers. Comm.).

Taxa Association Team and Peer Reviewers

ANHC Mr. Michael Warriner

Paduniella nearctica

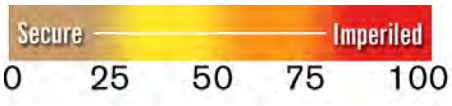
Nearctic Paduniellan Caddisfly

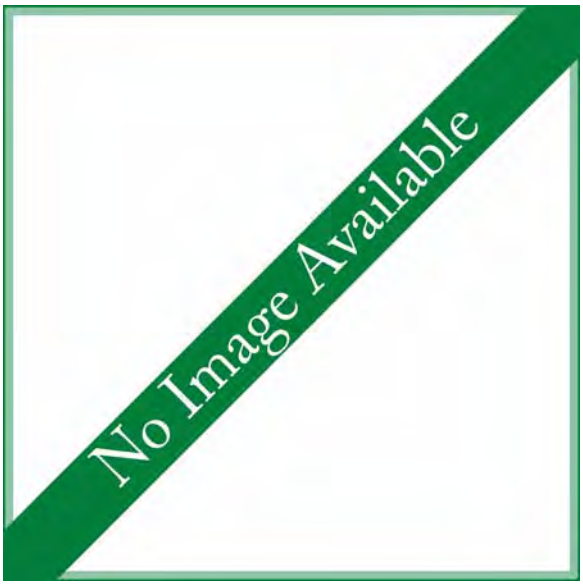
Class: Insecta

Order: Trichoptera

Family: Psychomyiidae

Priority Score: **65** out of 100





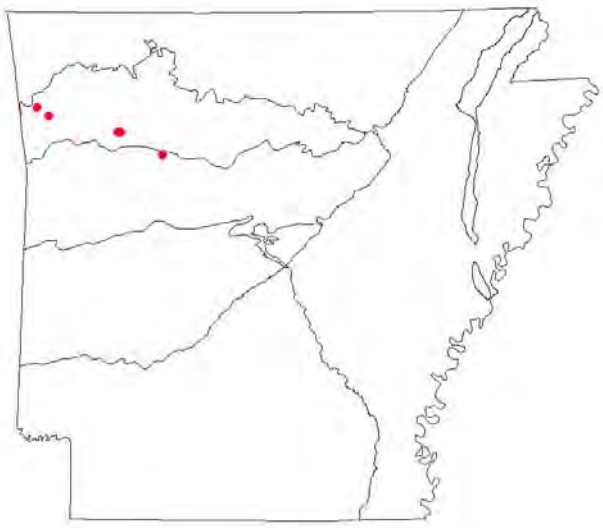
Population Trend: Unknown

Global Rank: G1G2 — Critically imperiled (uncertain rank)

State Rank: S1? — Critically imperiled in Arkansas (inexact numeric rank)

Distribution

Element Occurrence Records



Ecoregions where the species occurs:

- ☐ Ozark Highlands
- ☑ Boston Mountains
- ☑ Arkansas Valley
- ☐ Ouachita Mountains
- ☐ South Central Plains
- ☐ Mississippi Alluvial Plain
- ☐ Mississippi Valley Loess Plains



Terrestrial Habitats





Ecobasins where this species occurs

Ecobasins

Arkansas Valley - Arkansas River

Boston Mountains - Arkansas River

Terrestrial Habitats

Ozark-Ouachita Riparian	Suitable

Aquatic Habitats

Natural Riffle: - Small	Suitable

Paduniella nearctica
Nearctic Paduniellan Caddisfly

Problems Faced

Threat: Sedimentation
Source: Resource extraction

Threat: Toxins/contaminants
Source: Municipal/Industrial point source

Data Gaps/Research Needs

Need to obtain baseline information on distribution and population status.

Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

Surveys to locate additional populations and protection of stream habitats.

Comments

An endemic caddisfly known only from sites in Johnson and Washington Counties (Flint 1967).

Taxa Team and Peer Reviewers

ANHC Mr. Michael Warriner

Papaipema eryngii

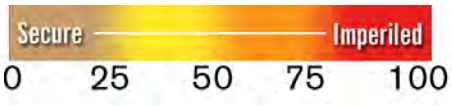
Rattlesnake-Master Borer Moth

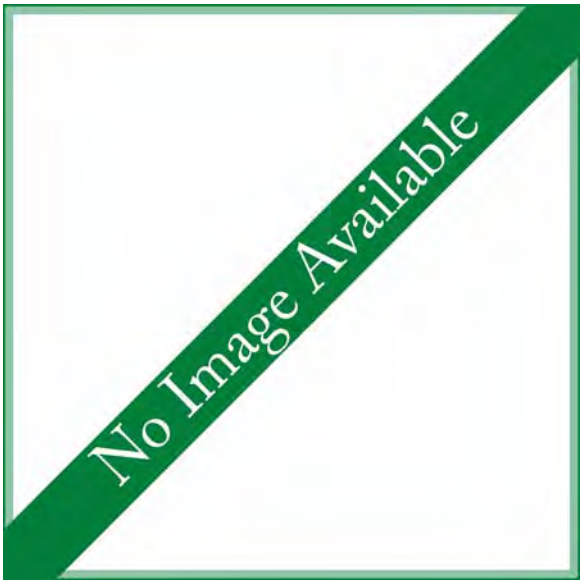
Class: Insecta

Order: Lepidoptera

Family: Noctuidae

Priority Score: **65** out of 100





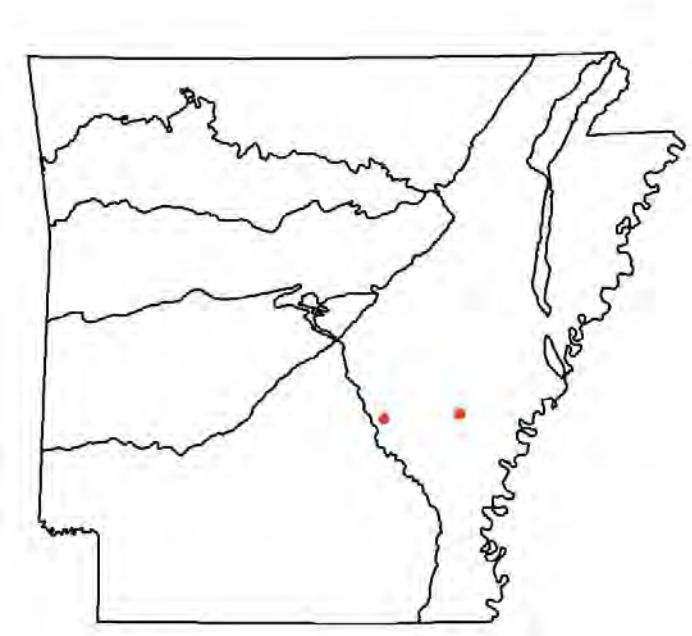
Population Trend: Unknown

Global Rank: G1G2 — Critically imperiled (uncertain rank)

State Rank: S1 — Critically imperiled in Arkansas

Distribution

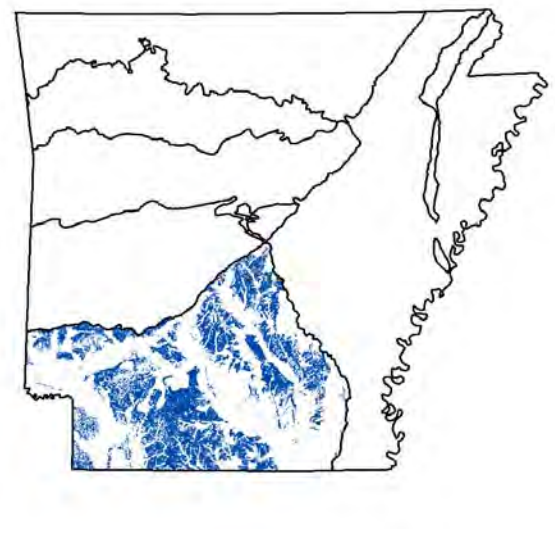
Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☐
- Boston Mountains ☐
- Arkansas Valley ☐
- Ouachita Mountains ☑
- South Central Plains ☑
- Mississippi Alluvial Plain ☐
- Mississippi Valley Loess Plain ☐

Habitat Map





Habitats	Weight
Ozark-Ouachita Dry Oak and Pine Woodland	Suitable
Ozark-Ouachita Prairie and Woodland	Suitable
West Gulf Coastal Plain Calcareous Prairie and Woodland	Suitable

Problems Faced

KNOWN PROBLEM: Habitat fragmentation.	Threat: Habitat fragmentation Source: Urban development
KNOWN PROBLEM: Habitat loss.	Threat: Habitat destruction or conversion Source: Fire suppression

Data Gaps/Research Needs

Need to obtain baseline information on distribution and population status.

Conservation Actions	Importance	Category
Provide connectivity between habitats.	Medium	Habitat Restoration/Improvement
Restore savanna and prairie habitats with significant amounts of rattlesnake master plants.	High	Habitat Restoration/Improvement

Monitoring Strategies

Search appropriate habitat containing a substantial amount of Rattlesnake Master (Eryngium yuccifolium) at night (ideally after 11 p.m., when most adult moths are active) and when the temperature is over 10 degrees Celsius.

Comments

Available information suggests this species probably qualifies for G1, but some level of protection exists at extant sites, and some are well-managed (NatureServe 2015). About seven occurrences have been documented since 1990, but one may have been lost to fire. According to the U.S. Fish and Wildlife Service (2013), the Rattlesnake-Master Borer Moth is listed as a candidate species under the Endangered Species Act and is known or believed to occur in Arkansas in 2 counties: Pulaski and Jefferson. This species is not among the species of moths detected in moth surveys in northern Arkansas; the only species in the genus to be detected is Papaipema furcate (Drs. William Baltosser and Charles Ely, personal communication, 2015). Additionally, no individuals of this species were detected in extensive patches of Rattlesnake Master at the Terre Noire NA in Clark County during two evenings of surveys in mid-September 2013 (Drs. William Baltosser and Craig Rudolph, personal communication, 2015). Given the critically imperiled status of this species throughout its range, efforts to acquire more information on the distribution and status of the species in Arkansas are warranted.

Taxa Association Team and Peer Reviewers

UALR Dr. William Baltosser, ANHC Ms. Samantha Scheiman, USFS Dr. Craig Rudolph, and Dr. Charles Ely

Papilio joanae

Ozark Swallowtail

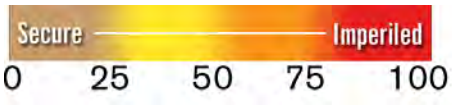


Class: Insecta

Order: Lepidoptera

Family: Papilionidae

Priority Score: **31** out of 100



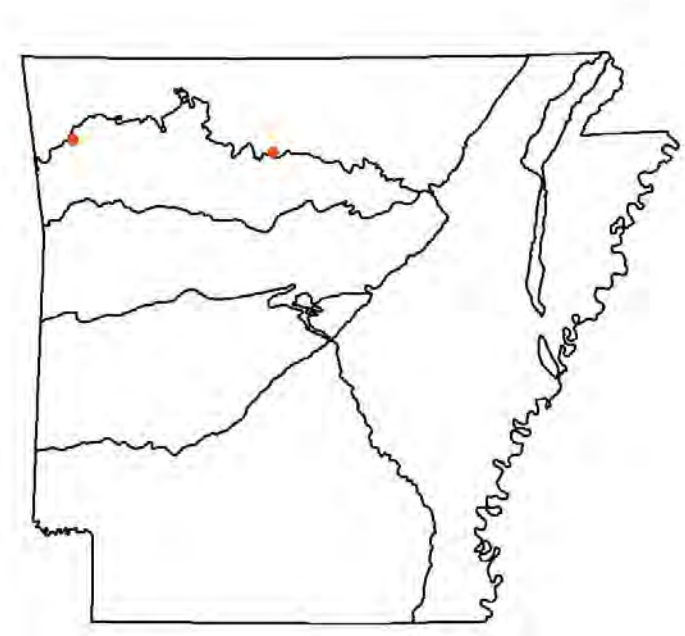
Population Trend: Unknown

Global Rank: G3 — Vulnerable species

State Rank: S2 — Imperiled in Arkansas

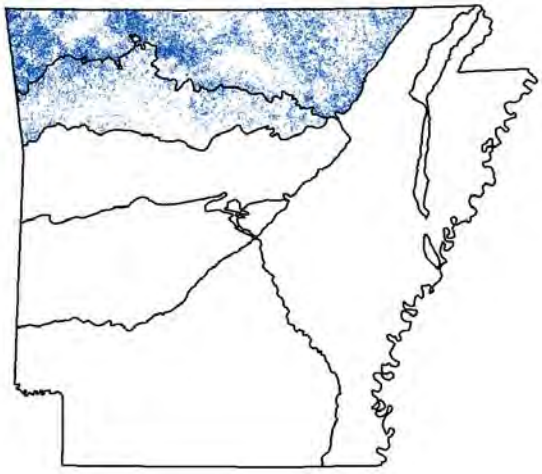
Distribution

Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☑
- Boston Mountains ☑
- Arkansas Valley ☐
- Ouachita Mountains ☐
- South Central Plains ☐
- Mississippi Alluvial Plain ☐
- Mississippi Valley Loess Plain ☐



Habitat Map



Habitats

	Weight
Ozark-Ouachita Prairie and Woodland	Data Gap
Pasture Land	Suitable

Problems Faced

KNOWN PROBLEM: Loss of habitat.	Threat: Habitat destruction or conversion Source: Urban development
POTENTIAL PROBLEM: Increases in gypsy moth populations in the Ozarks are likely to bring on widespread spraying of insecticides, which will be detrimental to many non-target species such as this swallowtail.	Threat: Toxins/contaminants Source: Forestry activities

Data Gaps/Research Needs

Need to obtain baseline information on distribution and population status.

Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

Survey cedar glades, various other openings, and sparsely wooded areas within Ozark dry forests to determine distribution and general abundance of this rare butterfly in Arkansas.

Comments

This swallowtail has a very restricted range and is apparently not a synonym of Papilio polyxenes (Black Swallowtail) in that recent mitochondrial DNA work by Felix Sperling shows these two taxa to be distinct species (NatureServe 2015). Heitzman and Heitzman (1996) describe the species as being found in cedar glades and woodlands in the Missouri Ozarks. They indicated that it probably has a wider range, but at the time of publication the species had not been found outside of Missouri. Spencer (2006) characterized the species as being “incredibly difficult” to distinguish from the Black Swallowtail and being rare and local in the Ozarks of Arkansas; found in 2 Arkansas counties (Baltosser et al. 2015). Schweitzer et al. (2011) assessment of the status of this butterfly is that it is local, but it was not considered to be especially rare in its range. There is disagreement with this statement, at least as it pertains to populations in Arkansas, because despite extensive efforts to locate this species along the Buffalo National River and vicinity, most individuals that are captured prove to be (> 95% of the time) Black Swallowtails and not Ozark Swallowtails (Dr. William Baltosser, personal communication, 2015). More animals need to be captured, examined, and most subsequently released to tease out the true status of the Ozark Swallowtail in the state.

Taxa Association Team and Peer Reviewers

UALR Dr. William Baltosser, ANHC Ms. Samantha Scheiman, USFS Dr. Craig Rudolph, and Dr. Charles Ely

Paraleptophlebia calcarica

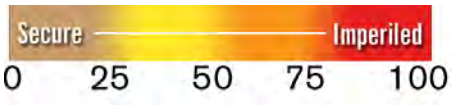
Mayfly

Class: Insecta

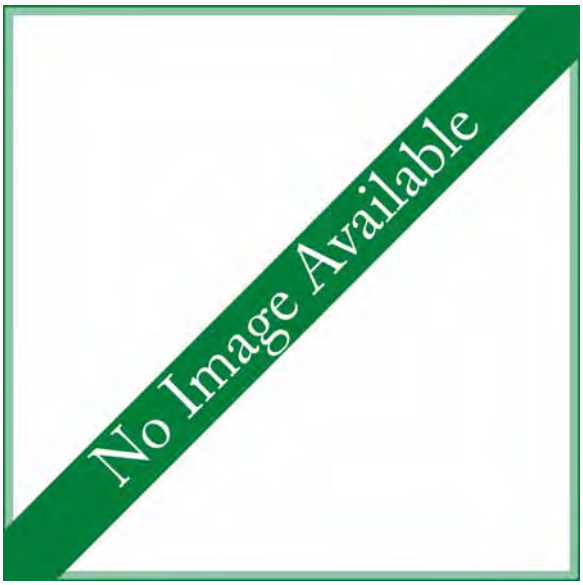
Order: Ephemeroptera

Family: Leptophlebiidae

Priority Score: **65** out of 100



Population Trend: Unknown

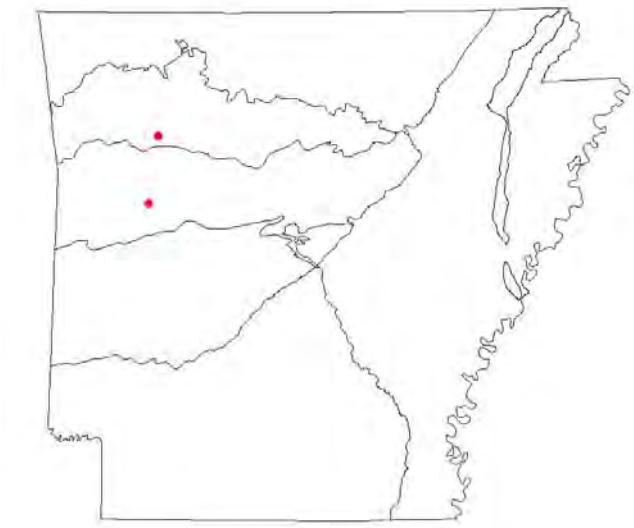


Global Rank: G1G2 — Critically imperiled (uncertain rank)

State Rank: S1? — Critically imperiled in Arkansas (inexact numeric rank)

Distribution

Element Occurrence Records



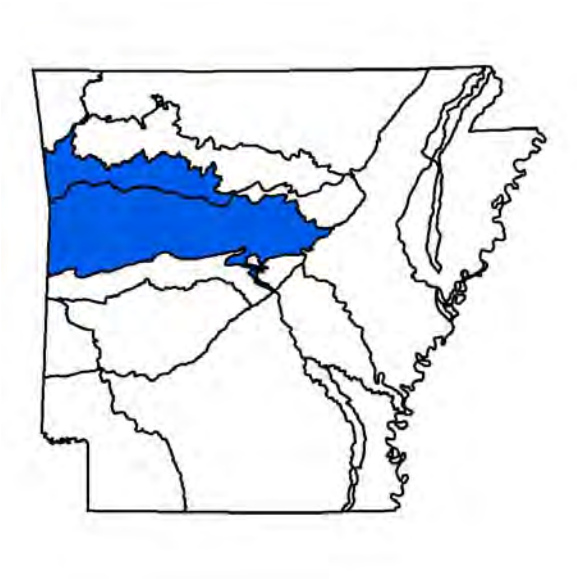
Ecoregions where the species occurs:

- ☐ Ozark Highlands
- ☐ Boston Mountains
- ☑ Arkansas Valley
- ☐ Ouachita Mountains
- ☐ South Central Plains
- ☐ Mississippi Alluvial Plain
- ☐ Mississippi Valley Loess Plains



Terrestrial Habitats





Ecobasins where this species occurs

Ecobasins

Arkansas Valley - Arkansas River

Terrestrial Habitats

Ozark-Ouachita Prairie and Woodland	Suitable

Aquatic Habitats

Natural Other: - Small	Suitable

Problems Faced

Threat: Sedimentation
Source: Forestry activities

Paraleptophlebia calcarica
Mayfly

Data Gaps/Research Needs

Need to obtain baseline information on distribution and population status.

Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

Surveys to locate additional populations and protection of stream habitats.

Comments

An endemic mayfly known only from Gutter Rock Creek on Magazine Mountain in Logan County (Robotham Allen 1988).

Taxa Team and Peer Reviewers

ANHC Mr. Michael Warriner

Paucicalcaria ozarkensis

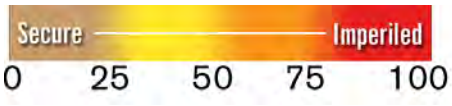
Microcaddisfly

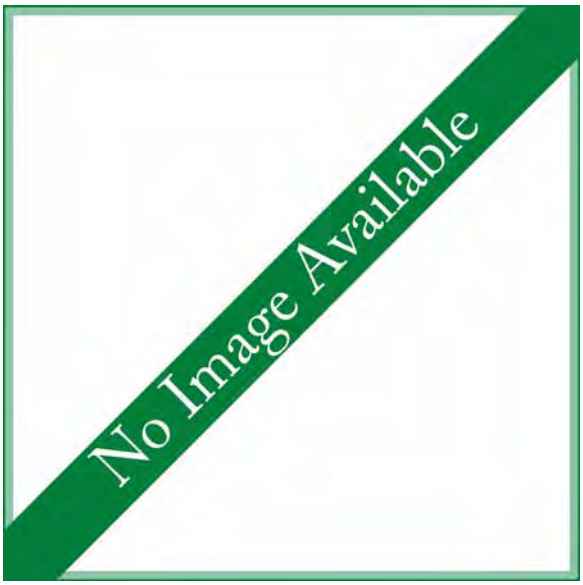
Class: Insecta

Order: Trichoptera

Family: Hydroptilidae

Priority Score: **80** out of 100





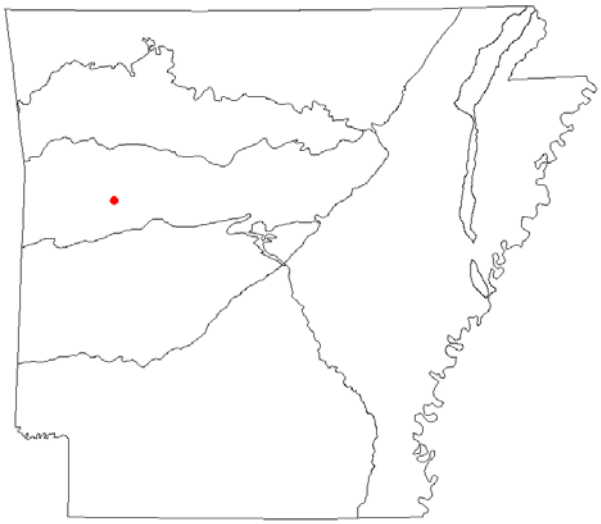
Population Trend: Unknown

Global Rank: G1 — Critically imperiled species

State Rank: S1 — Critically imperiled in Arkansas

Distribution

Element Occurrence Records



Ecoregions where the species occurs:

- ☐ Ozark Highlands
- ☐ Boston Mountains
- ☑ Arkansas Valley
- ☐ Ouachita Mountains
- ☐ South Central Plains
- ☐ Mississippi Alluvial Plain
- ☐ Mississippi Valley Loess Plains



Terrestrial Habitats





Ecobasins where this species occurs

Ecobasins

Arkansas Valley - Arkansas River

Terrestrial Habitats

Ozark-Ouachita Prairie and Woodland	Suitable

Aquatic Habitats

Natural Other: - Small	Suitable

Problems Faced

Threat: Sedimentation
Source: Forestry activities

Paucicalcaria ozarkensis
Microcaddisfly

Data Gaps/Research Needs

Need to obtain baseline information on distribution and population status.

Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

Surveys to locate additional populations and protection of stream habitats.

Comments

An endemic microcaddisfly known only from Gutter Rock Creek on Magazine Mountain in Logan County (Mathis and Bowles 1989).

Taxa Team and Peer Reviewers

ANHC Mr. Michael Warriner

Pentacora ouachita

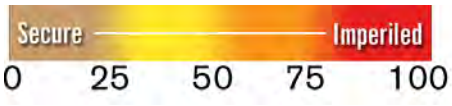
Ouachita Shore Bug

Class: Insecta

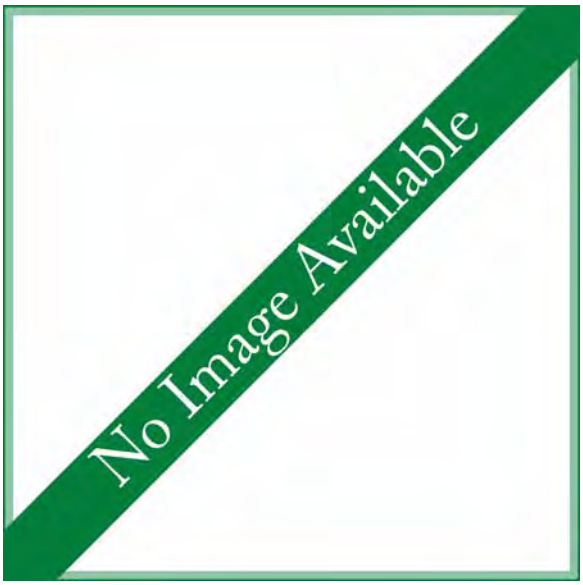
Order: Heteroptera

Family: Saldidae

Priority Score: 23 out of 100



Population Trend: Unknown

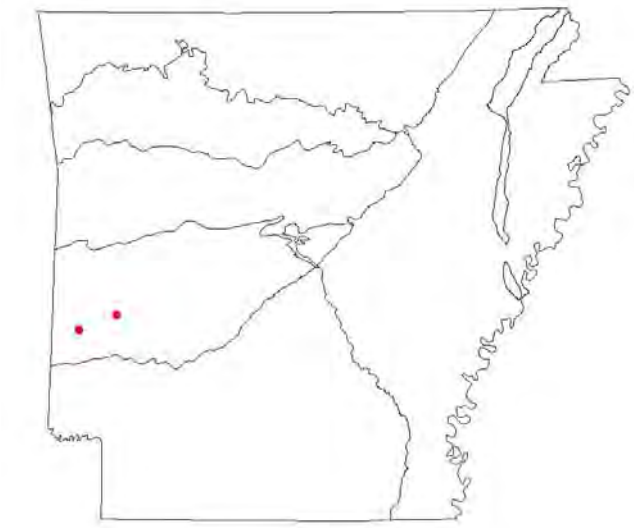


Global Rank: GNR — Not yet ranked

State Rank: S1 — Critically imperiled in Arkansas

Distribution

Element Occurrence Records



Ecoregions where the species occurs:

- ☐ Ozark Highlands
- ☐ Boston Mountains
- ☐ Arkansas Valley
- ☑ Ouachita Mountains
- ☐ South Central Plains
- ☐ Mississippi Alluvial Plain
- ☐ Mississippi Valley Loess Plains



Terrestrial Habitats





Ecobasins where this species occurs

Ecobasins

Ouachita Mountains - Ouachita River

Ouachita Mountains - Red River

Problems Faced

Threat: Sedimentation
Source: Resource extraction

Threat: Toxins/contaminants
Source: Municipal/Industrial point source

Pentacora ouachita
Ouachita Shore Bug

Data Gaps/Research Needs

Need to obtain baseline information on distribution and population status.

Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

Surveys to locate additional populations and protection of stream habitats.

Comments

This insect is endemic to the Ouachita Mountains of Arkansas (Polhemus 1993).

Taxa Team and Peer Reviewers

ANHC Mr. Michael Warriner

Poanes viator

Broad-winged Skipper

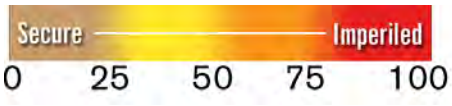


Class: Insecta

Order: Lepidoptera

Family: Hersperiidae

Priority Score: **15** out of 100



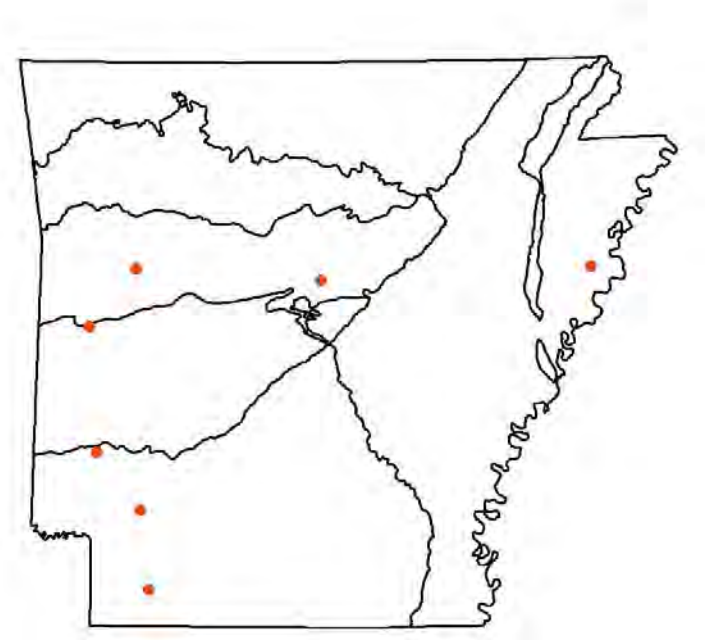
Population Trend: Unknown

Global Rank: G5 — Secure

State Rank: S3 — Vulnerable in Arkansas

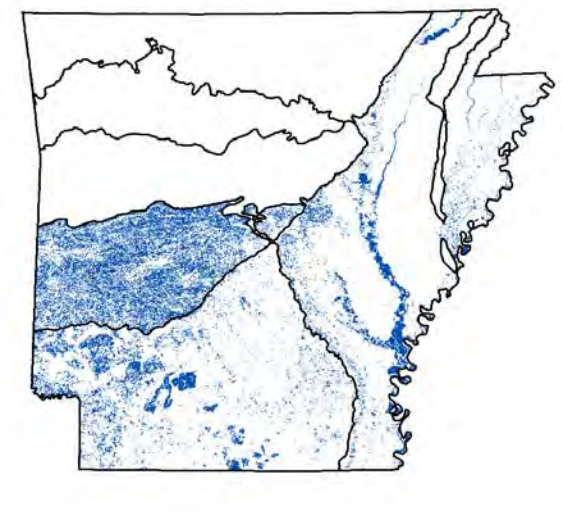
Distribution

Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☐
- Boston Mountains ☐
- Arkansas Valley ☐
- Ouachita Mountains ☑
- South Central Plains ☑
- Mississippi Alluvial Plain ☑
- Mississippi Valley Loess Plain ☐



Habitat Map



Habitats	Weight
Lower Mississippi River Riparian Forest	Suitable
Ozark-Ouachita Pine-Bluestem Woodland	Suitable
Pasture Land	Suitable
West Gulf Coastal Plain Sandhill Oak and Shortleaf Pine Forest/Woodland	Suitable

Problems Faced

KNOWN PROBLEM: Loss of habitat.	Threat: Hydrological alteration Source: Water diversion
KNOWN PROBLEM: Loss of habitat.	Threat: Habitat destruction or conversion Source: Forestry activities

Data Gaps/Research Needs

Need to obtain baseline information on distribution and population status.

Conservation Actions	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

Survey wetlands with tall grass, particularly Phragmites, for this and other rare species.

Comments

Spencer (2006) describes the habitat of this species as being wetlands with tall grass, with individuals being rare to locally common; when found generally in wetlands of southeastern Arkansas. To underscore the apparent rarity of the species in Arkansas, Dr. Craig Rudolph (personal communication, 2015) states that the species is "rare on the Coastal Plain of Arkansas, as is the case in eastern Texas", he having recorded it from only Howard County. Dr. William Baltosser has similar experience with the species with only a single record from an area near Waldron in Scott County. Records depicted by Raney (2012) include additional counties to the east and bring the total to 9 Arkansas counties of occurrence (Baltosser et al. 2015). Given what appears to be a very rare species in Arkansas, efforts to acquire more information on the distribution and status of the species in Arkansas are warranted.

Taxa Association Team and Peer Reviewers

UALR Dr. William Baltosser, ANHC Ms. Samantha Scheiman, USFS Dr. Craig Rudolph, and Dr. Charles Ely

Poanes yehl

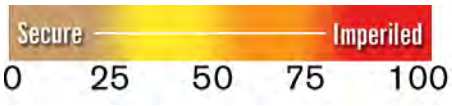
Yehl Skipper

Class: Insecta

Order: Lepidoptera

Family: Hesperiidae

Priority Score: **23** out of 100



Population Trend: Unknown

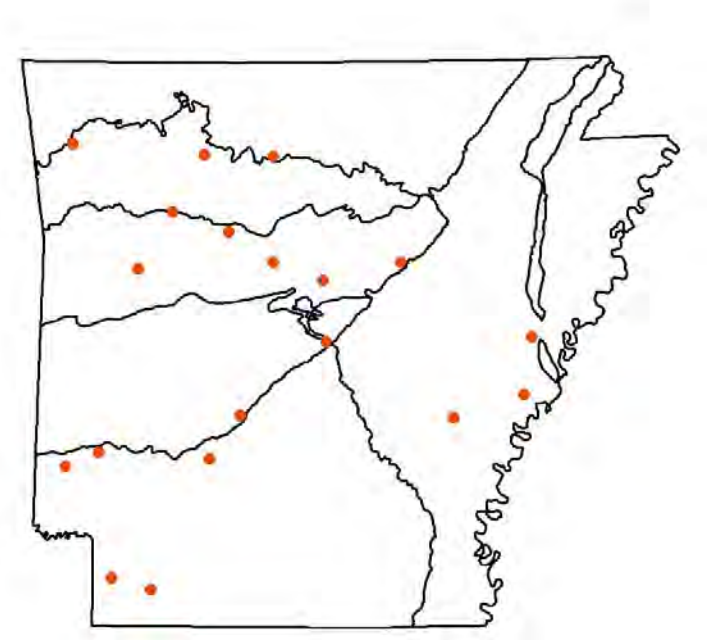


Global Rank: G4 — Apparently secure species

State Rank: S1S3 — Critically imperiled in Arkansas (uncertain rank)

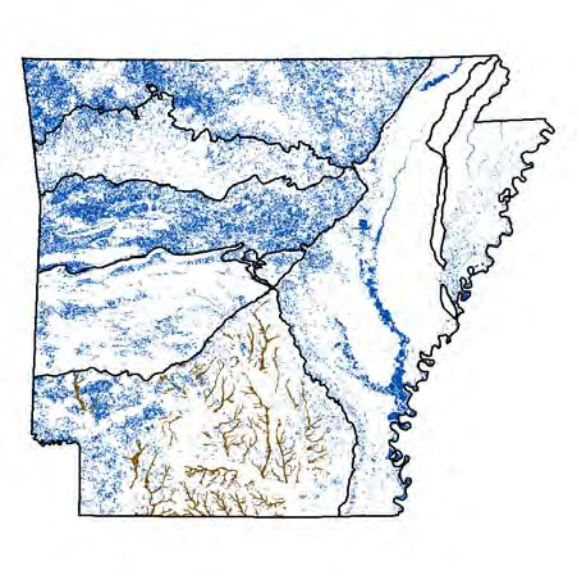
Distribution

Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☑
- Boston Mountains ☑
- Arkansas Valley ☑
- Ouachita Mountains ☑
- South Central Plains ☑
- Mississippi Alluvial Plain ☑
- Mississippi Valley Loess Plain ☐



Habitat Map



Habitats

	Weight
Ozark-Ouachita Large Floodplain	Suitable
Ozark-Ouachita Riparian	Suitable
Pasture Land	Suitable
West Gulf Coastal Plain Calcareous Prairie and Woodland	Suitable
West Gulf Coastal Plain Small Stream/River Forest	Data Gap

Problems Faced

KNOWN PROBLEM: Clearing and draining of bottomland forests have greatly reduced the available habitat for this species.	Threat: Habitat destruction or conversion Source: Conversion of riparian forest

Data Gaps/Research Needs

Need to obtain baseline information on distribution and population status.

Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Poanes yehl
Yehl Skipper

Monitoring Strategies

Survey areas in moist or swampy woods for this and other rare species.

Comments

NatureServe (2015) states that the food plant of this species is not known but is certainly grasses. March Minno (personal comment to Schweitzer, 2004) suggests the genus Chasmanthium seems likely and that this skipper does not appear to be associated with canes as previously thought. This species has been reported from 22 Arkansas counties (Baltosser et al. 2015) and has been found (locally common) at several localities in northern Arkansas and in blackland woodland in more southern regions of the state (Dr. William Baltosser, personal communication, 2015). Drs. Rudolph and Ely (personal communication, 2015) indicate that the species is never common, but they have recorded it from 7 counties in the Ouachita Mountains and Coastal Plain in extreme SW Arkansas. More information on the status of this species is needed before considering any change in ranking with regard to priority score.

Taxa Association Team and Peer Reviewers

UALR Dr. William Baltosser, ANHC Ms. Samantha Scheiman, USFS Dr. Craig Rudolph, and Dr. Charles Ely

Polygonia progne

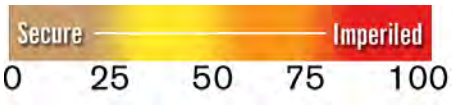
Gray Comma

Class: Insecta

Order: Lepidoptera

Family: Nymphalidae

Priority Score: **19** out of 100



Population Trend: Unknown

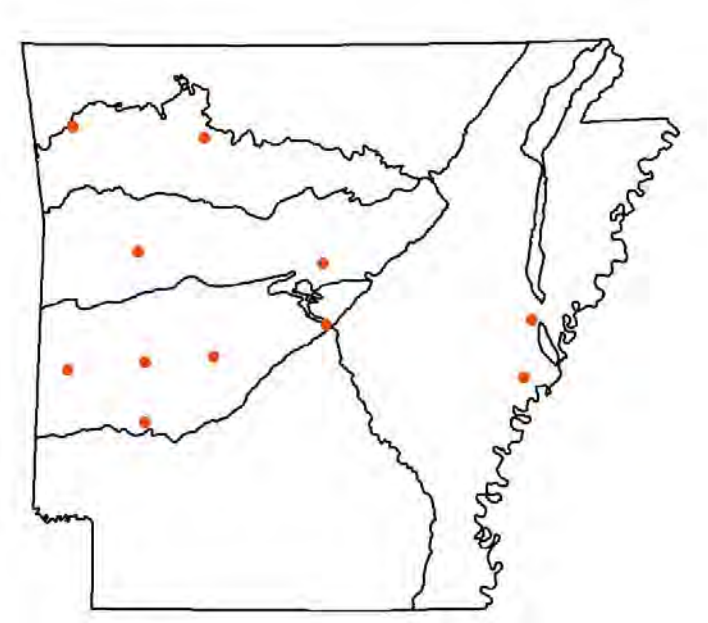


Global Rank: G4G5 — Apparently secure (uncertain rank)

State Rank: S2S3 — Imperiled species in Arkansas (uncertain rank)

Distribution

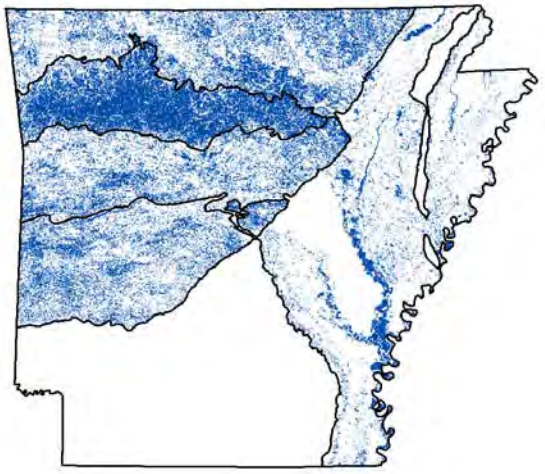
Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☑
- Boston Mountains ☑
- Arkansas Valley ☑
- Ouachita Mountains ☑
- South Central Plains ☐
- Mississippi Alluvial Plain ☑
- Mississippi Valley Loess Plain ☐

Habitat Map





Habitats	Weight
Lower Mississippi Flatwoods Woodland and Forest	Suitable
Lower Mississippi River High Bottomland Forest	Suitable
Ozark-Ouachita Dry-Mesic Oak Forest/Woodland	Suitable
Ozark-Ouachita Large Floodplain	Suitable
Ozark-Ouachita Mesic Hardwood Forest	Suitable
Ozark-Ouachita Pine-Oak Forest/Woodland	Suitable
Ozark-Ouachita Riparian	Suitable
West Gulf Coastal Plain Pine-Hardwood Forest/Woodland	Suitable
West Gulf Coastal Plain Small Stream/River Forest	Suitable

Data Gaps/Research Needs

Determine habitat requirements.

Conservation Actions	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Polygonia progne
Gray Comma

Monitoring Strategies

Survey a variety of forest types to monitor the status of this species.

Comments

This species historically declined or disappeared in much of the southeastern portion of its range, and this was due in large part, or perhaps entirely, to deliberate efforts to eradicate the foodplant (Ribes spp.), which is an alternative host for white pine rust fungus (NatureServe 2015). Over the course of the last several years, Drs. Baltosser, Rudolph, and Ely have come to the same conclusion; this species is never common. Collectively, these investigators have 10 records from 4 counties. Habitat requirements and most other aspects of the biology of this species in Arkansas are poorly known even though it has been recorded from 15 Arkansas counties (Baltosser et al. 2015). This is a species that should be monitored if habitats are to be altered and be among the species tracked when any Lepidoptera studies within suitable habitat are undertaken.

Taxa Association Team and Peer Reviewers

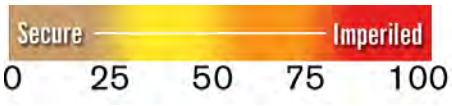
UALR Dr. William Baltosser, ANHC Ms. Samantha Scheiman, USFS Dr. Craig Rudolph, and Dr. Charles Ely

Problema byssus

Byssus Skipper

Class: Insecta
Order: Lepidoptera
Family: Hesperiidae

Priority Score: **23** out of 100



Population Trend: Unknown

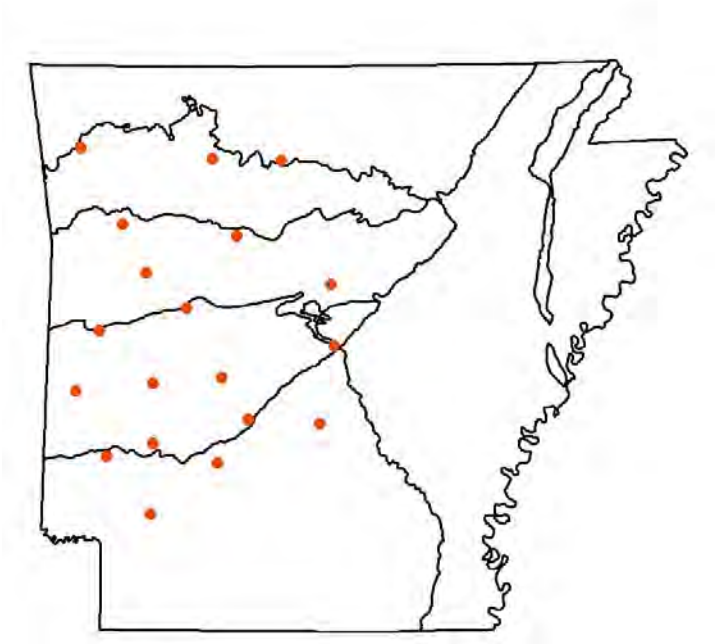


Global Rank: G3G4 — Vulnerable (uncertain rank)

State Rank: S3 — Vulnerable in Arkansas

Distribution

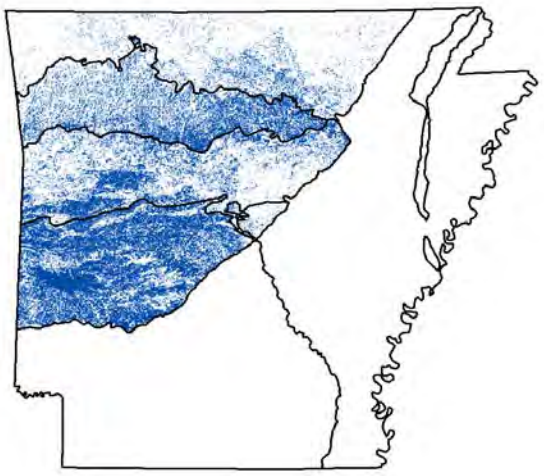
Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☑
- Boston Mountains ☑
- Arkansas Valley ☑
- Ouachita Mountains ☑
- South Central Plains ☑
- Mississippi Alluvial Plain ☐
- Mississippi Valley Loess Plain ☐

Habitat Map





Habitats	Weight
Ozark-Ouachita Large Floodplain	Suitable
Ozark-Ouachita Pine-Bluestem Woodland	Suitable
Ozark-Ouachita Pine-Oak Forest/Woodland	Suitable
Ozark-Ouachita Prairie and Woodland	Optimal
Ozark-Ouachita Riparian	Suitable
West Gulf Coastal Plain Calcareous Prairie and Woodland	Optimal

Problems Faced

Habitat destruction.	Threat: Habitat destruction or conversion Source: Commercial/industrial development

Data Gaps/Research Needs

Need a thorough survey of the Ozark, West Gulf Coastal Plain, and Ouachita regions to locate additional populations of this and other rare species in the state.

Conservation Actions	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Problema byssus
Byssus Skipper

Monitoring Strategies

Survey a variety of habitats of known occurrence to monitor the status of this species.

Comments

NatureServe (2015) states that the species is local in all parts of its range and notes that several states track this skipper with nearly all considering it to be very rare to rare to uncommon; the single exception (Wisconsin) ranks it as extremely rare. This skipper is considered a prairie-dependent species in the Midwest by Opler and Malikul (1998). Within Arkansas, this skipper has been recorded from 23 Arkansas counties (Baltosser et al. 2015). Present but rare in surveys of Lepidoptera along the Buffalo National River, in tallgrass prairies in the Arkansas Valley, and in surveys of blackland woodland habitats in more southern localities (Dr. William Baltosser, personal communication, 2015). Considered fairly regular in some areas of the Ouachita Mountains (Drs. Craig Rudolph and Charles Ely, personal communication, 2015). The species in Arkansas should continue to be monitored for occurrences and ultimately for population trends.

Taxa Association Team and Peer Reviewers

UALR Dr. William Baltosser, ANHC Ms. Samantha Scheiman, USFS Dr. Craig Rudolph, and Dr. Charles Ely

Pseudactium magazinensis

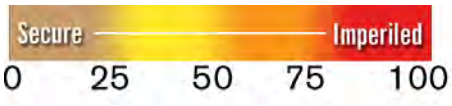
Ouachita Pseudactium

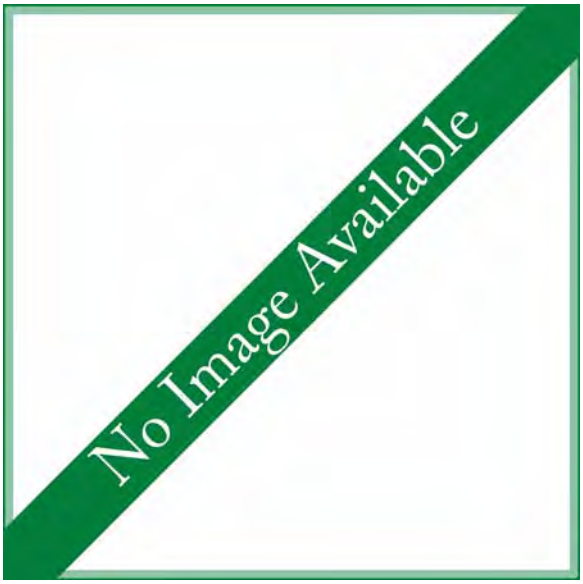
Class: Insecta

Order: Coleoptera

Family: Pselaphidae

Priority Score: **23** **out of 100**





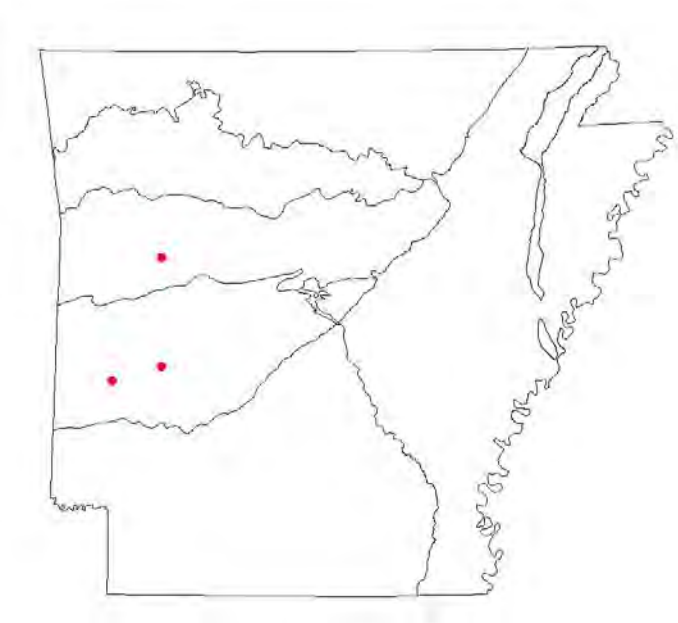
Population Trend: Unknown

Global Rank: GNR — Not yet ranked

State Rank: S1 — Critically imperiled in Arkansas

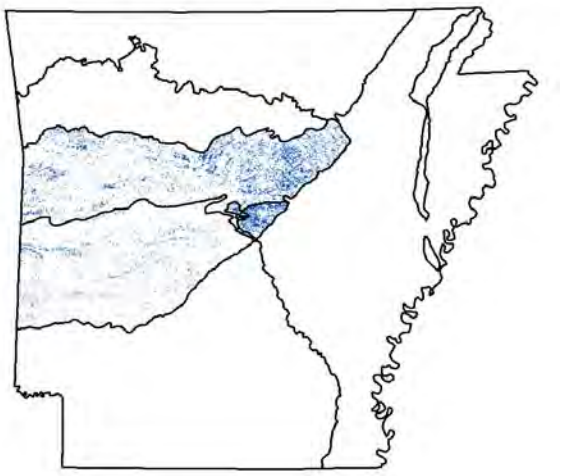
Distribution

Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☐
- Boston Mountains ☐
- Arkansas Valley ☑
- Ouachita Mountains ☑
- South Central Plains ☐
- Mississippi Alluvial Plain ☐
- Mississippi Valley Loess Plain ☐



Habitat Map



Habitats	Weight
Ozark-Ouachita Dry-Mesic Oak Forest	Suitable
Ozark-Ouachita Mesic Hardwood Forest	Suitable

Problems Faced

Forestry practices that disturb litter layer and create xeric conditions.	Threat: Habitat disturbance Source: Forestry activities

Data Gaps/Research Needs

Need to obtain baseline information on distribution and population status.

Conservation Actions	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

Survey areas near known occurrences to locate additional populations.

Comments

No information available.

Taxa Association Team and Peer Reviewers

ANHC Mr. Michael Warriner

Pseudactium magazinensis
Ouachita Pseudactium

Pseudactium ursum

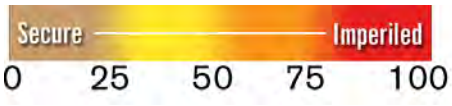
Ozark Pseudactium

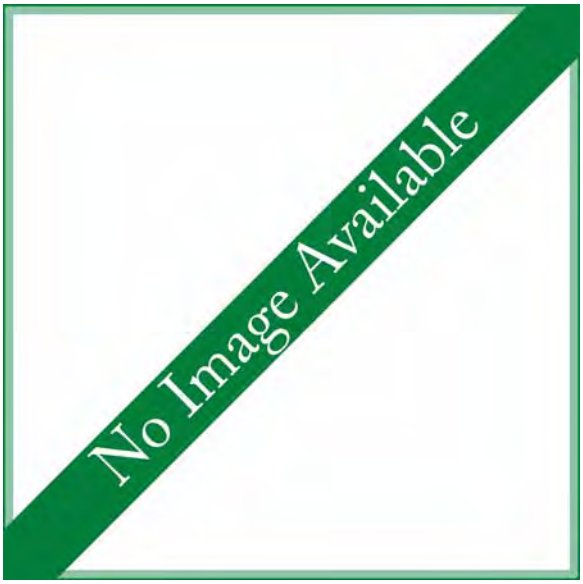
Class: Insecta

Order: Coleoptera

Family: Pselaphidae

Priority Score: **23** **out of 100**





Population Trend: Unknown

Global Rank: GNR — Not yet ranked

State Rank: S1 — Critically imperiled in Arkansas

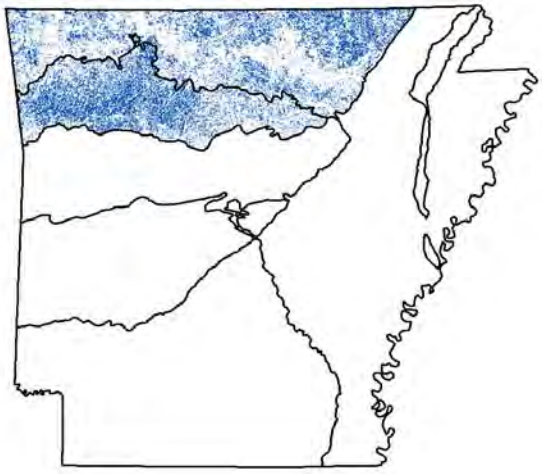
Distribution

Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☑
- Boston Mountains ☑
- Arkansas Valley ☐
- Ouachita Mountains ☐
- South Central Plains ☐
- Mississippi Alluvial Plain ☐
- Mississippi Valley Loess Plain ☐



Habitat Map



Habitats	Weight
Ozark-Ouachita Dry-Mesic Oak Forest	Suitable
Ozark-Ouachita Mesic Hardwood Forest	Suitable

Problems Faced

Forestry practices that disturb litter layer and create xeric conditions.	Threat: Habitat disturbance Source: Forestry activities

Data Gaps/Research Needs

Need to obtain baseline information on distribution and population status.

Conservation Actions	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

Survey areas near known occurrences to locate additional populations.

Comments

No information available.

Taxa Association Team and Peer Reviewers

ANHC Mr. Michael Warriner

Pseudactium ursum
Ozark Pseudactium

Rhadine ozarkensis

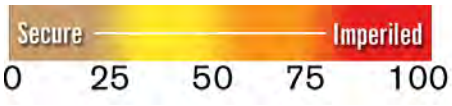
Ground Beetle

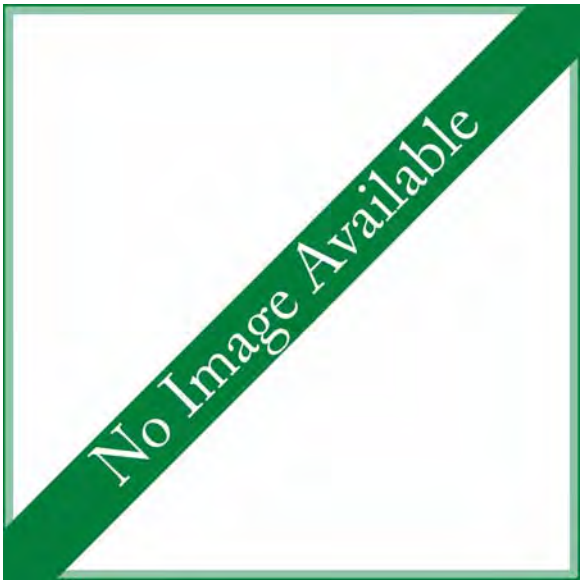
Class: Insecta

Order: Coleoptera

Family: Carabidae

Priority Score: **80** **out of 100**





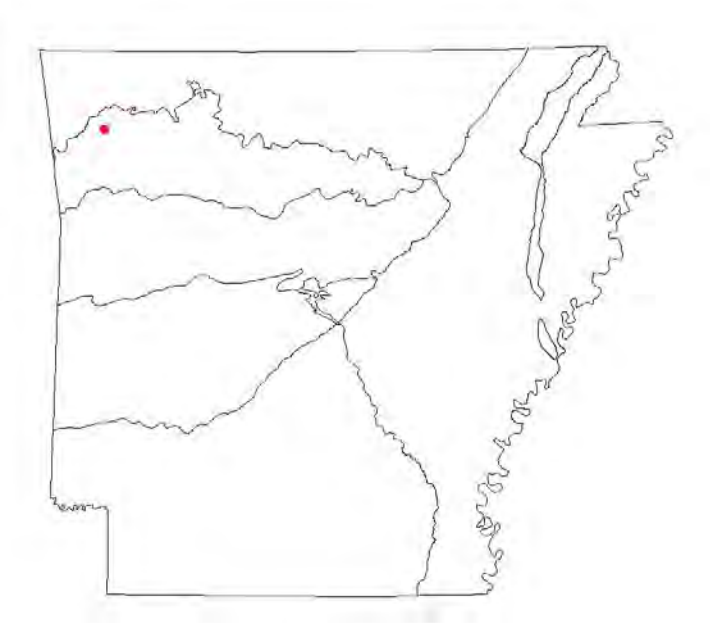
Population Trend: Unknown

Global Rank: GH — Possibly extinct

State Rank: SH — Historic record. Possibly extirpated in Arkansas

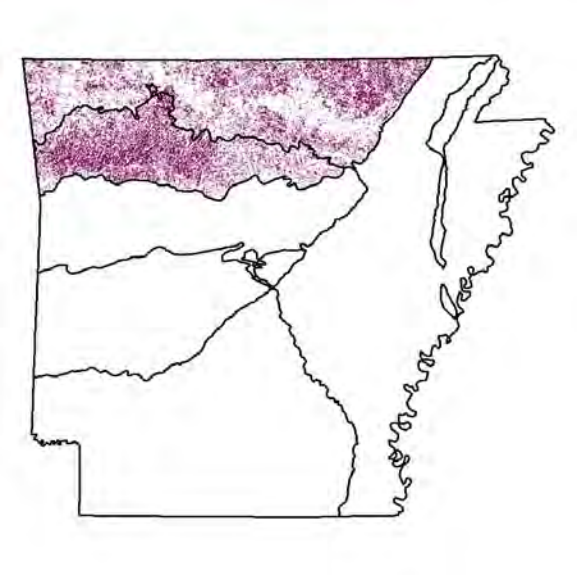
Distribution

Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☑
- Boston Mountains ☑
- Arkansas Valley ☐
- Ouachita Mountains ☐
- South Central Plains ☐
- Mississippi Alluvial Plain ☐
- Mississippi Valley Loess Plain ☐



Habitat Map



Habitats

	Weight
Caves, Mines, Sinkholes and other Karst Features	Optimal

Problems Faced

Disturbance of cave habitats.

Threat: Habitat destruction or conversion
Source: Recreation

Data Gaps/Research Needs

Need to obtain baseline information on distribution and population status.

Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

Survey areas near known occurrences to locate additional populations.

Comments

An endemic beetle known Fincher Cave in Washington County (Sanderson and Miller 1941). This species was reportedly collected at Steel Creek Recreation area at the Buffalo National River in 2013 (A. Dowling, pers. Comm).

Taxa Association Team and Peer Reviewers

ANHC Mr. Michael Warriner

Rhadine ozarkensis
Ground Beetle

Satyrium favonius ontario

Oak Hairstreak

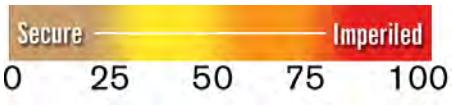


Class: Insecta

Order: Lepidoptera

Family: Lycaenidae

Priority Score: **19** out of 100



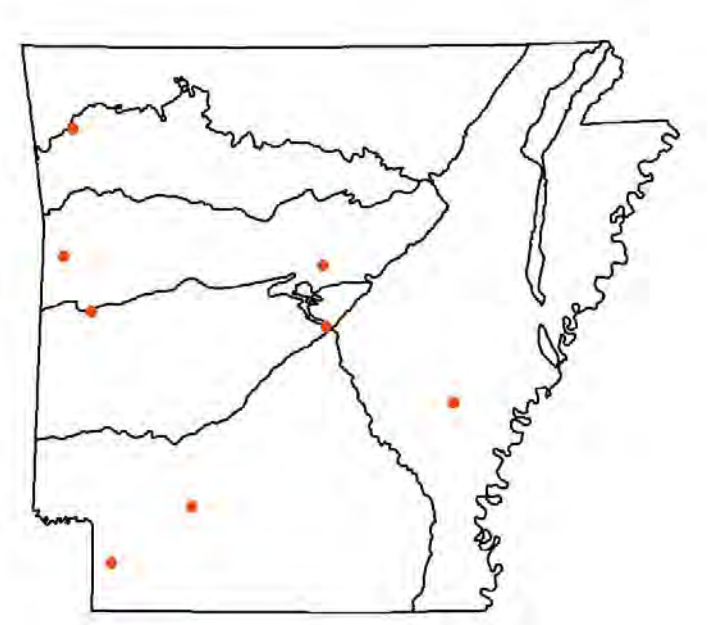
Population Trend: Unknown

Global Rank: G4T4 — Apparently secure (apparently secure subspecies)

State Rank: S3 — Vulnerable in Arkansas

Distribution

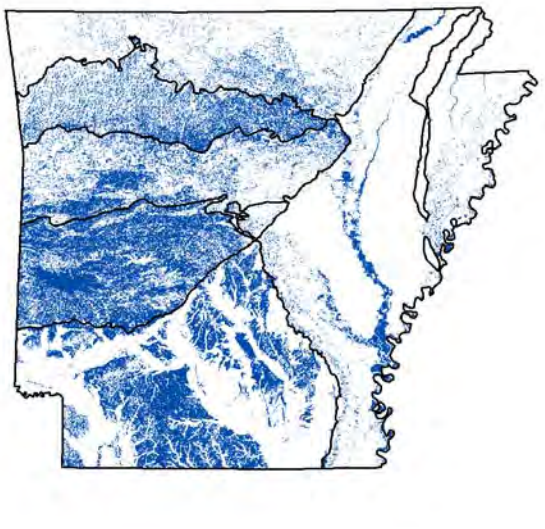
Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☑
- Boston Mountains ☑
- Arkansas Valley ☑
- Ouachita Mountains ☑
- South Central Plains ☑
- Mississippi Alluvial Plain ☑
- Mississippi Valley Loess Plain ☐

Habitat Map





Habitats

	Weight
Lower Mississippi River High Bottomland Forest	Suitable
Ozark-Ouachita Dry Oak and Pine Woodland	Suitable
Ozark-Ouachita Pine-Bluestem Woodland	Suitable
Ozark-Ouachita Pine-Oak Forest/Woodland	Suitable
West Gulf Coastal Plain Sandhill Oak and Shortleaf Pine Forest/Woodland	Suitable

Problems Faced

POTENTIAL PROBLEM: Insecticide use for gypsy moths.	Threat: Toxins/contaminants Source: Forestry activities

Data Gaps/Research Needs

Need to obtain baseline information on distribution and population status.

Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

Surveys should be conducted in appropriate habitat to assess the current status of this species in Arkansas.

Satyrium favonius ontario
Oak Hairstreak

Comments

Taxonomy and nomenclature of this butterfly somewhat confusing. For example, southern populations were previously considered to be a species separate from more northern and western butterflies, which were called Satyrium favonius ontario, the Northern Hairstreak (Opler and Malikul 1998). More recent works (Opler et al. 2010) list S. favonius as the Southern Hairstreak and S. favonius ontario as the "Northern" Southern Hairstreak. Spenser (2006) uses yet another name "Oak Hairstreak" to refer to S. f. ontario. Nomenclature aside, Spenser (2006) lists this butterfly as being uncommon statewide. Drs. Craig Rudolph and Charles Ely (personal communication, 2015) have records for only 2 Arkansas counties (Scott and Sebastian, each of single individuals). Collectively, the species has been reported from 16 Arkansas counties (Baltosser et al. 2015). More information needed to better gauge the current status and distribution of this species in Arkansas.

Taxa Association Team and Peer Reviewers

UALR Dr. William Baltosser, ANHC Ms. Samantha Scheiman, USFS Dr. Craig Rudolph, and Dr. Charles Ely

Satyrium kingi

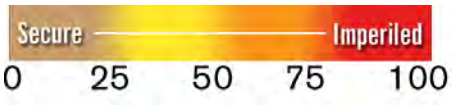
King's Hairstreak

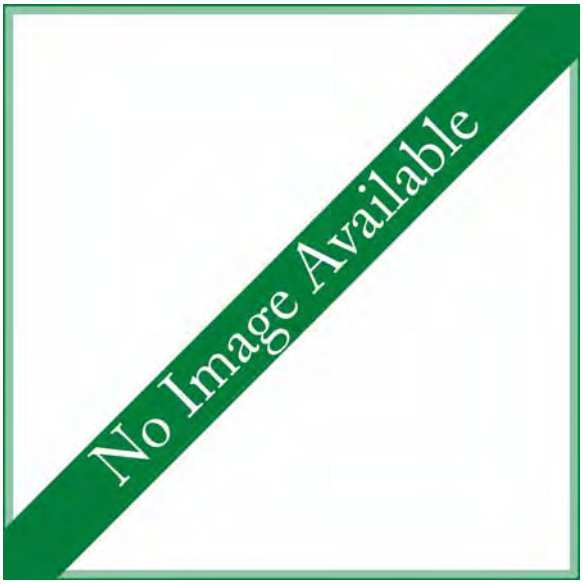
Class: Insecta

Order: Lepidoptera

Family: Lycaenidae

Priority Score: **27** out of 100





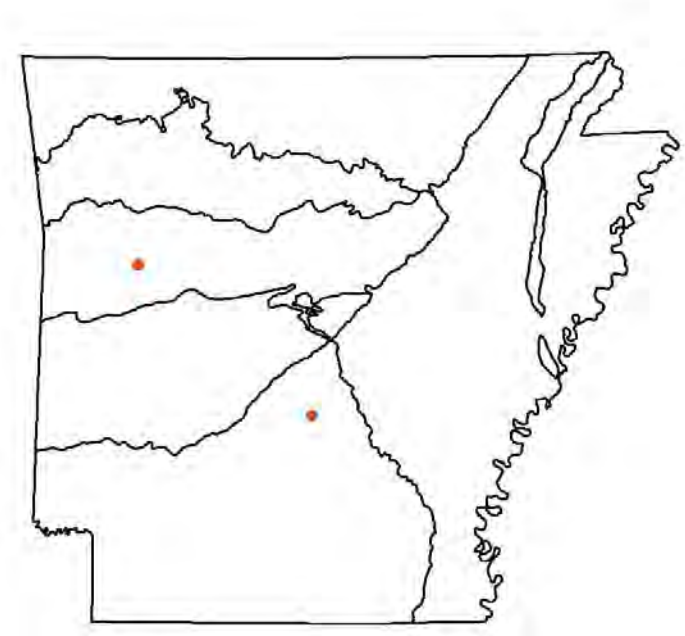
Population Trend: Unknown

Global Rank: G3G4 — Vulnerable (uncertain rank)

State Rank: S2 — Imperiled in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☐
- Boston Mountains ☐
- Arkansas Valley ☑
- Ouachita Mountains ☐
- South Central Plains ☑
- Mississippi Alluvial Plain ☐
- Mississippi Valley Loess Plain ☐

Habitat Map





Habitats

	Weight
West Gulf Coastal Plain Pine-Hardwood Forest/Woodland	Suitable

Problems Faced

KNOWN PROBLEM: Habitat loss and degradation.

Threat: Habitat destruction or conversion
Source: Conversion of riparian forest

Data Gaps/Research Needs

Need to obtain baseline information on distribution and population status.

Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

Surveys should be conducted at all known localities where the larval host plant occurs to determine distribution and general abundance of this rare butterfly in Arkansas.

Comments

King's Hairstreak is limited in both its larval host preference of common sweetleaf (Symplocos tinctoria) and in the only two nectaring sources for the species: Allegheny chinquapin (Castanea pumila) and sourwood (Oxydendrum arboreum). Associated with hardwood hammocks and wooded swamp edges (Opler and Malikul 1998). Several species in the genus Satyrium can be difficult to distinguish in the field. King's Hairstreak is probably most easily confused with the Striped Hairstreak (S. liparops) and to a somewhat lesser extent with the Banded Hairstreak (S. calanus). Given this potential source of confusion and the uncommonness of the latter and the apparent localized occurrence and rarity of S. kingi (records for only 2 Arkansas counties; Baltosser et al. 2015) and S. liparops, few data are available. See NatureServe (2015) for information, but clearly more should be done to clarify the status of this localized and rare species.

Taxa Association Team and Peer Reviewers

UALR Dr. William Baltosser, ANHC Ms. Samantha Scheiman, USFS Dr. Craig Rudolph, and Dr. Charles Ely

Scaphinotus inflectus

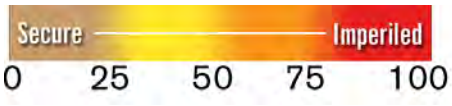
Ground Beetle

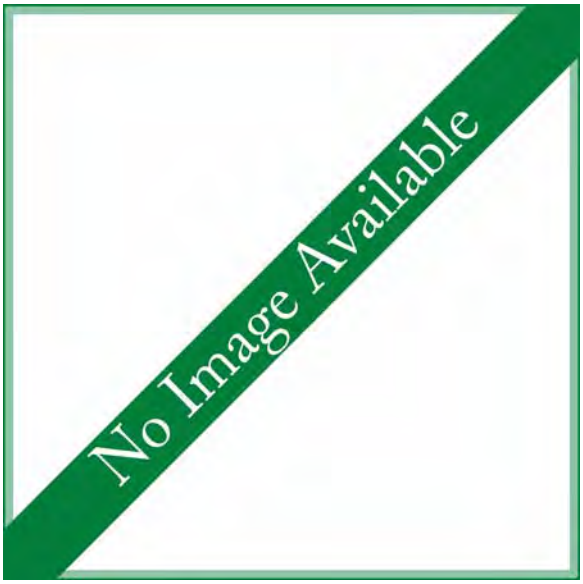
Class: Insecta

Order: Coleoptera

Family: Carabidae

Priority Score: **23** **out of 100**





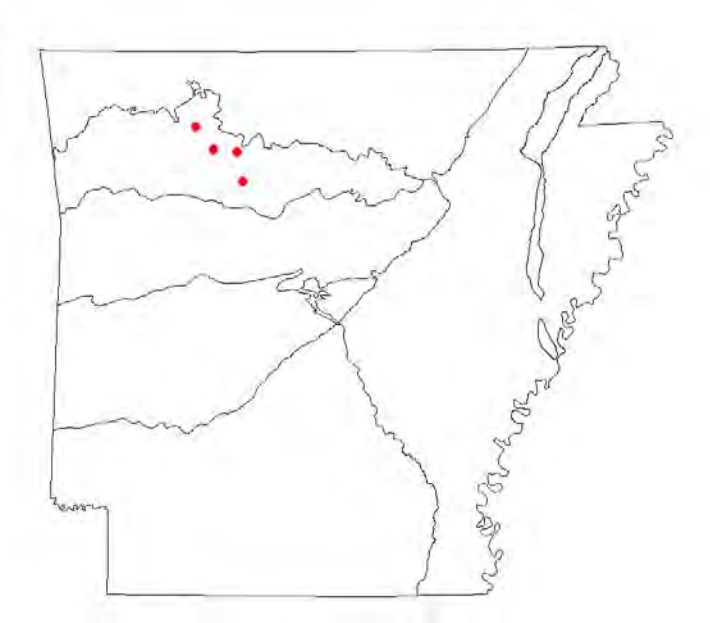
Population Trend: Unknown

Global Rank: GNR — Not yet ranked

State Rank: S1 — Critically imperiled in Arkansas

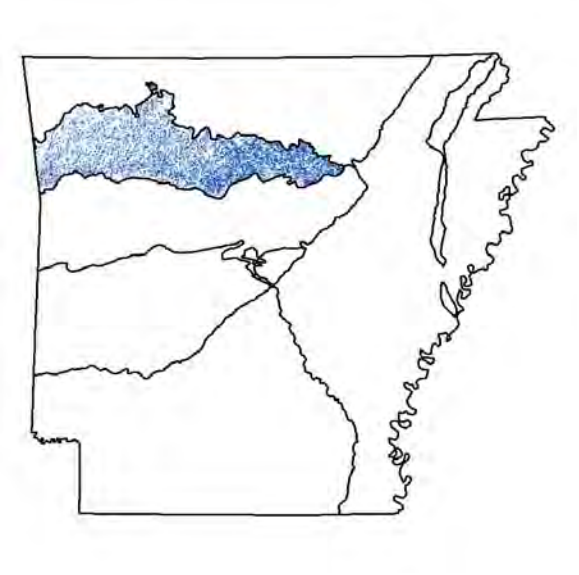
Distribution

Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☐
- Boston Mountains ☑
- Arkansas Valley ☐
- Ouachita Mountains ☐
- South Central Plains ☐
- Mississippi Alluvial Plain ☐
- Mississippi Valley Loess Plain ☐



Habitat Map



Habitats	Weight
Ozark-Ouachita Mesic Hardwood Forest	Optimal
Ozark-Ouachita Pine-Oak Forest	Suitable

Problems Faced

Forestry practices that disturb litter layer and create xeric conditions.	Threat: Habitat disturbance Source: Forestry activities

Data Gaps/Research Needs

Need to obtain baseline information on distribution and population status.

Conservation Actions	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

Survey areas near known occurrences to locate additional populations.

Comments

An endemic beetle once known only from Natural Bridge Recreation Area in Newton County (Allen and Carlton 1988). The species was collected in 2013 at the Steel Creek Recreation Area on the Buffalo National River (A. Dowling, pers. comm.).

Taxa Association Team and Peer Reviewers

ANHC Mr. Michael Warriner

Scaphinotus parisiana

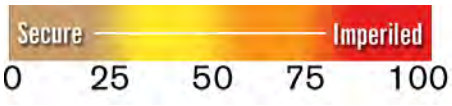
Ground Beetle

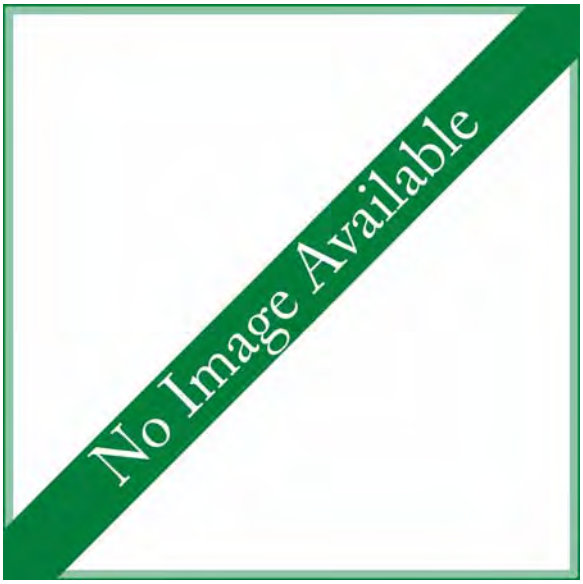
Class: Insecta

Order: Coleoptera

Family: Carabidae

Priority Score: **23** **out of 100**





Population Trend: Unknown

Global Rank: GNR — Not yet ranked

State Rank: S1 — Critically imperiled in Arkansas

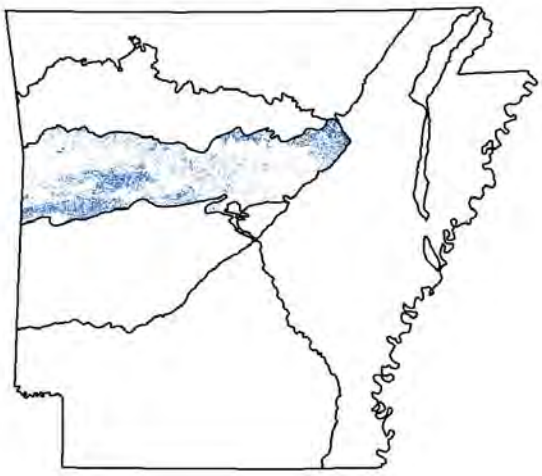
Distribution

Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☐
- Boston Mountains ☐
- Arkansas Valley ☑
- Ouachita Mountains ☐
- South Central Plains ☐
- Mississippi Alluvial Plain ☐
- Mississippi Valley Loess Plain ☐



Habitat Map



Habitats	Weight
Ozark-Ouachita Mesic Hardwood Forest	Optimal
Ozark-Ouachita Pine-Oak Forest	Suitable

Problems Faced

Forestry practices that disturb litter layer and create xeric conditions.	Threat: Habitat disturbance Source: Forestry activities

Data Gaps/Research Needs

Need to obtain baseline information on distribution and population status.

Conservation Actions	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

Survey areas near known occurrences to locate additional populations.

Comments

An endemic beetle known only from Logan and Washington Counties (Allen and Carlton 1988).

Taxa Association Team and Peer Reviewers

ANHC Mr. Michael Warriner

Scaphinotus parisiana
Ground Beetle

Schinia indiana

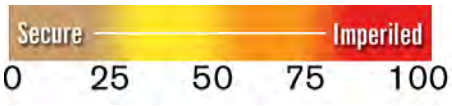
Indiana Phlox Moth

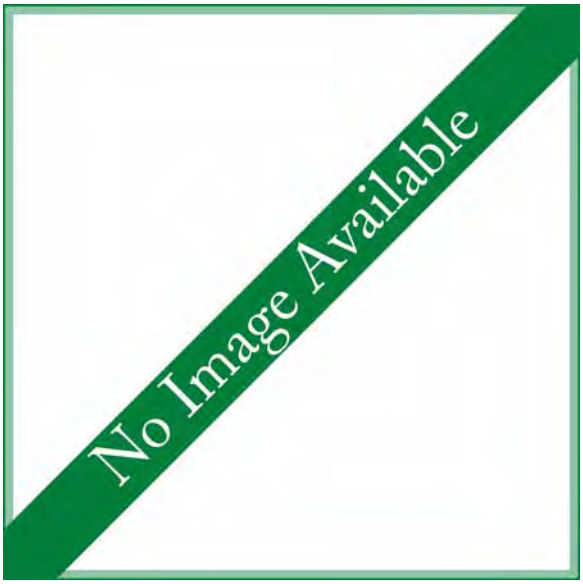
Class: Insecta

Order: Lepidoptera

Family: Noctuidae

Priority Score: **38** out of 100





Population Trend: Unknown

Global Rank: G2G4 — Imperiled (uncertain rank)

State Rank: SH — Historic record. Possibly extirpated in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☐
- Boston Mountains ☐
- Arkansas Valley ☐
- Ouachita Mountains ☑
- South Central Plains ☐
- Mississippi Alluvial Plain ☐
- Mississippi Valley Loess Plain ☐



Habitat Map



Habitats

	Weight
Ozark-Ouachita Dry Oak and Pine Woodland	Suitable

Problems Faced

KNOWN PROBLEM: Habitat loss.	Threat: Habitat destruction or conversion Source: Commercial/industrial development
POTENTIAL PROBLEM: Herbicide use along roadsides.	Threat: Toxins/contaminants Source: Road construction

Data Gaps/Research Needs

Need to obtain baseline information on distribution and population status.

Conservation Actions

	Importance	Category
Suspend application of herbicides where this species occurs.	High	Threat Abatement

Monitoring Strategies

Survey for additional populations and monitor known occurrences.

Comments

A prairie/savanna species strongly associated with Phlox pilosa (Hodges and others 1983, Schweitzer 1989). Look for this species on Phlox pilosa flowers on cloudy, cool days. Available information suggests this species is imperiled, but there is considerable uncertainty about its status, especially in the southern parts of its range (NatureServe 2015). The only Schinia identified to date from on-going moth surveys being conducted along the Buffalo National River are the Arcigera Flower Moth (S. arcigera), Thoreau's Flower Moth (S. thoreaui), Three-lined Flower Moth (S. trifascia), and Goldenrod Flower Moth (S. nundina); (Drs. William Baltosser and Charles Ely, personal communication, 2015). Continuation of on-going and related studies is required if information on the status and distribution of the Indiana Phlox (Flower) Moth is to be resolved.

Taxa Association Team and Peer Reviewers

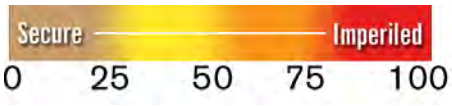
UALR Dr. William Baltosser, ANHC Ms. Samantha Scheiman, USFS Dr. Craig Rudolph, and Dr. Charles Ely

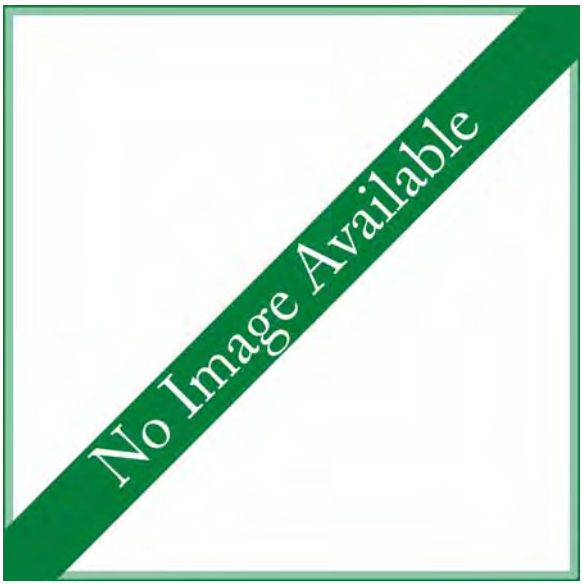
Somatochlora ozarkensis

Ozark Emerald

Class: Insecta
Order: Odonata
Family: Corduliidae

Priority Score: **34** out of 100





Population Trend: Stable

Global Rank: G3 — Vulnerable species

State Rank: S1 — Critically imperiled in Arkansas

Distribution

Element Occurrence Records



Ecoregions where the species occurs:

- [x] Ozark Highlands
- [x] Boston Mountains
- [ ] Arkansas Valley
- [x] Ouachita Mountains
- [ ] South Central Plains
- [ ] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains



Terrestrial Habitats





Ecobasins where this species occurs

Terrestrial Habitats

Ozark-Ouachita Forested Seep	Suitable
Ozark-Ouachita Large Floodplain	Data Gap
Ozark-Ouachita Riparian	Optimal

Problems Faced

Threat: Habitat destruction or conversion
Source: Forestry activities

Threat: Habitat destruction or conversion
Source: Urban development

Threat: Toxins/contaminants
Source: Agricultural practices

Data Gaps/Research Needs

More information is needed on the specie's ecology and behavior.

Surveys are needed to determine distribution and abundance.

Conservation Actions

	Importance	Category
Protect riparian habitat.	High	Habitat Protection

Monitoring Strategies

Conduct surveys in appropriate habitats on the National Forests.

Comments

The Ozark Emerald is known from the Ouachita and Ozark Mountain ecoregions. The species requires perennial streams with woodland canopy cover. (Paulson and Dunkle 1999)

Taxa Team and Peer Reviewers

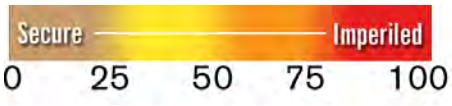
Xerces Society Ms. Michele Blackburn, Dr. John Abbott, Mr. Scott Black, Dr. Celeste Searles Mazzacano and Mr. Dennis Paulson

Speyeria diana

Diana

Class: Insecta
Order: Lepidoptera
Family: Nymphalidae

Priority Score: **25** out of 100



Population Trend: Unknown

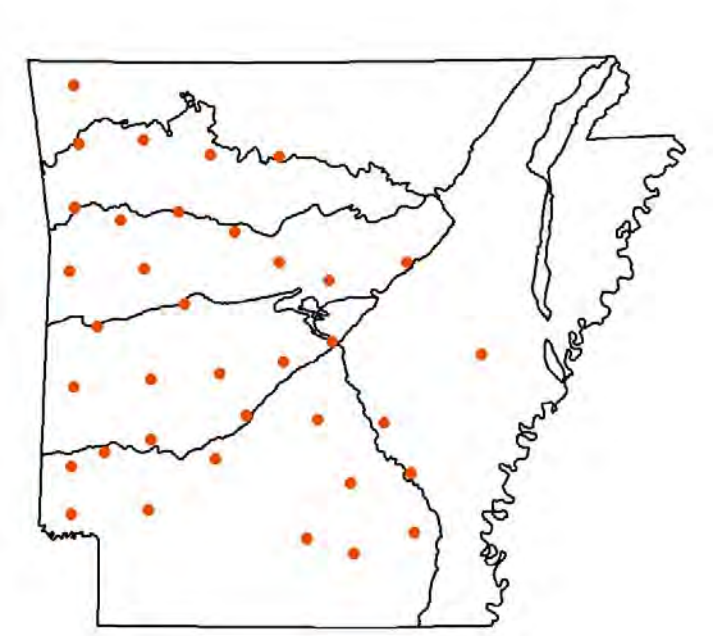


Global Rank: G3G4 — Vulnerable (uncertain rank)

State Rank: S2S3 — Imperiled species in Arkansas (uncertain rank)

Distribution

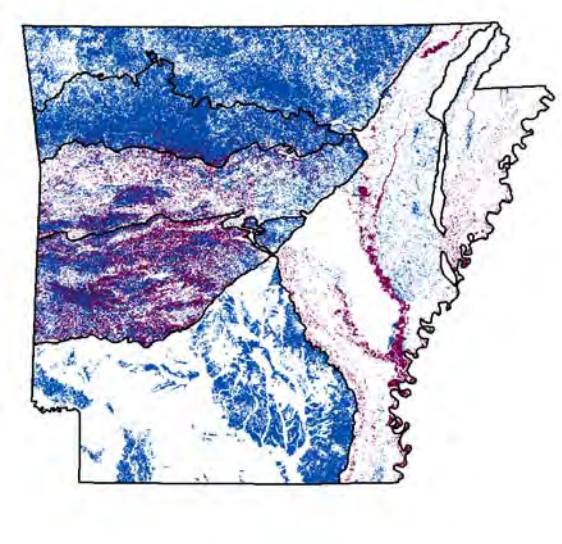
Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☑
- Boston Mountains ☑
- Arkansas Valley ☑
- Ouachita Mountains ☑
- South Central Plains ☑
- Mississippi Alluvial Plain ☑
- Mississippi Valley Loess Plain ☐

Habitat Map





Habitats	Weight
Interior Highlands Calcareous Glade and Barrens	Suitable
Interior Highlands Dry Acidic Glade and Barrens	Suitable
Lower Mississippi Flatwoods Woodland and Forest	Suitable
Ozark-Ouachita Dry-Mesic Oak Forest/Woodland	Suitable
Ozark-Ouachita Mesic Hardwood Forest	Suitable
Ozark-Ouachita Pine-Bluestem Woodland	Optimal
Ozark-Ouachita Pine-Oak Forest/Woodland	Optimal
Ozark-Ouachita Prairie and Woodland	Optimal
Ozark-Ouachita Riparian	Optimal
West Gulf Coastal Plain Calcareous Prairie and Woodland	Suitable
West Gulf Coastal Plain Pine-Hardwood Flatwoods	Suitable

Problems Faced

KNOWN PROBLEM: Habitat loss and degradation.	Threat: Habitat destruction or conversion Source: Forestry activities

Data Gaps/Research Needs

Need surveys to assess population status in areas of known occurrence.

Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

Find areas that females are utilizing to lay eggs and where the larvae overwinter and feed.

Comments

Even though Baltosser (2007) found the Diana to still occur in 28 Arkansas counties (some historical sites in northwest Arkansas no longer occupied), with additional counties added since (species documented to occur in 41 Arkansas counties, Baltosser et al. 2015), the species continues to warrant attention. Most land-management agencies are aware of the overall habitat gestalt preferred by this species (fire-maintained communities, see Rudolph et al. 2006). However, such habitats will not support viable populations unless there is an uninterrupted continuum of high-quality nectar supplies from mid-May through at least September (Drs. William Baltosser, Craig Rudolph, and Charles Ely, personal communication, 2015). The propensity of this species to avoid crossing large open areas is also of concern in that habitat fragmentation is widespread, which can restrict movement and further isolate the many small metapopulations that comprise nearly all Diana populations in Arkansas. The former, coupled with the fact that the species remains a highly sought-after species prized by individuals and professional collectors from throughout the world, argues for continued oversight.

Taxa Association Team and Peer Reviewers

UALR Dr. William Baltosser, ANHC Ms. Samantha Scheiman, USFS Dr. Craig Rudolph, and Dr. Charles Ely

Tetraloniella albata

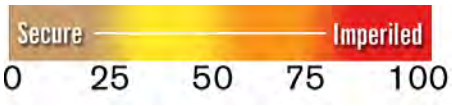
Anthophorid Bee

Class: Insecta

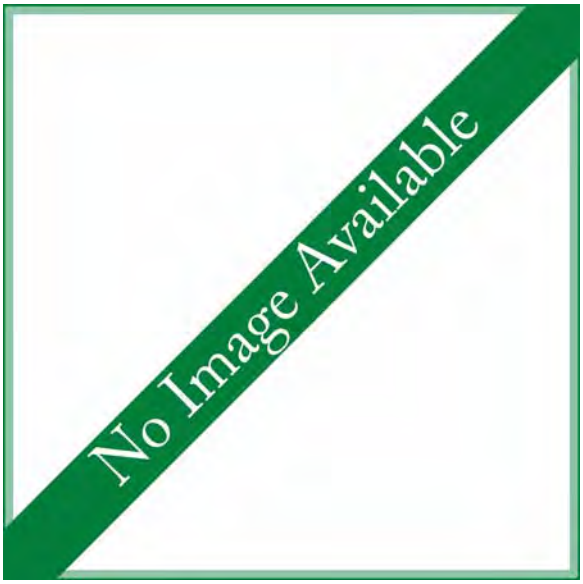
Order: Hymenoptera

Family: Anthophoridae

Priority Score: **23** **out of 100**



Population Trend: Unknown



Global Rank: GNR — Not yet ranked

State Rank: S1 — Critically imperiled in Arkansas

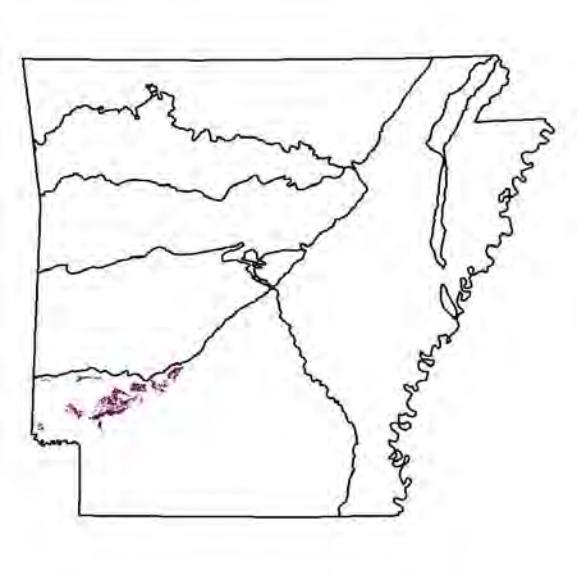
Distribution

Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☐
- Boston Mountains ☐
- Arkansas Valley ☐
- Ouachita Mountains ☐
- South Central Plains ☑
- Mississippi Alluvial Plain ☐
- Mississippi Valley Loess Plain ☐



Habitat Map



Habitats

	Weight
Ozark-Ouachita Prairie and Woodland	Optimal
West Gulf Coastal Plain Calcareous Prairie and Woodland	Optimal

Problems Faced

Degradation of prairies.	Threat: Habitat disturbance Source: Grazing/Browsing
Loss of prairie habitat.	Threat: Habitat destruction or conversion Source: Commercial/industrial development

Data Gaps/Research Needs

Need to obtain baseline information on distribution and population status.

Conservation Actions

	Importance	Category
Protect prairie habitat hosting this species.	High	Habitat Protection
Restore prairies to achieve habitat connectivity.	High	Habitat Restoration/Improvement

Monitoring Strategies

Survey for additional populations and monitor known occurrences.

Tetraloniella albata
Anthophorid Bee

Comments

A small native bee only known from one site in southwestern Arkansas. Relatively narrow floral foraging preferences (purple prairie clover) (LaBerge 2001).

Taxa Association Team and Peer Reviewers

ANHC Mr. Michael Warriner

Tetraopes quinquemaculatus

Red Milkweed Beetle

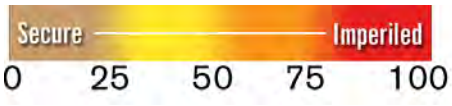


Class: Insecta

Order: Coleoptera

Family: Cerambycidae

Priority Score: **21** out of 100



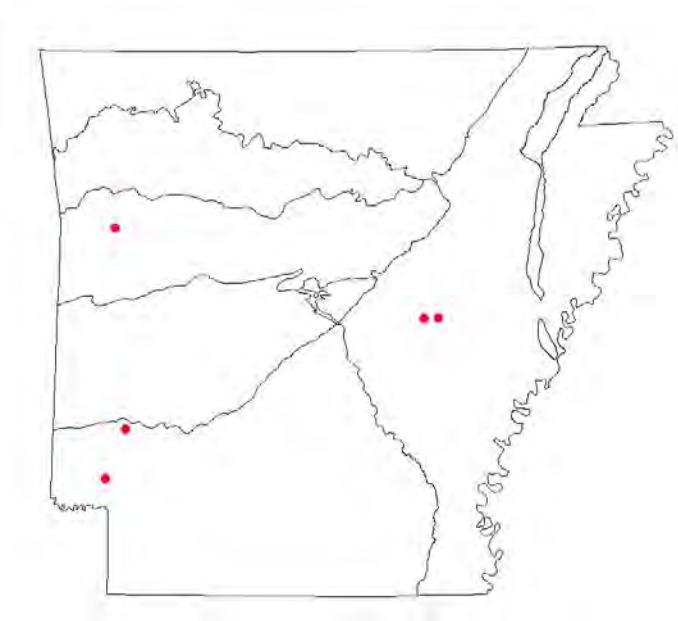
Population Trend: Unknown

Global Rank: GNR — Not yet ranked

State Rank: S1S2 — Critically imperiled in Arkansas (uncertain rank)

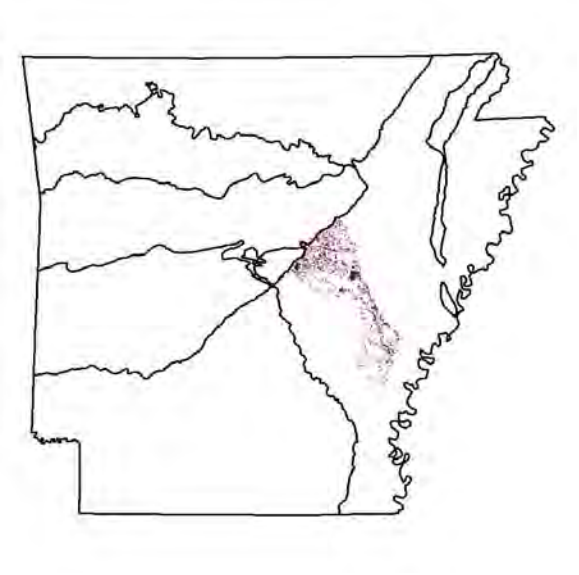
Distribution

Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☐
- Boston Mountains ☐
- Arkansas Valley ☑
- Ouachita Mountains ☐
- South Central Plains ☑
- Mississippi Alluvial Plain ☑
- Mississippi Valley Loess Plain ☐



Habitat Map



Habitats	Weight
Lower Mississippi Alluvial Plain Grand Prairie	Optimal
Ozark-Ouachita Prairie and Woodland	Optimal
West Gulf Coastal Plain Calcareous Prairie and Woodland	Suitable

Problems Faced

Loss of prairie habitat.	Threat: Habitat destruction or conversion Source: Commercial/industrial development
Loss of prairie habitat.	Threat: Habitat destruction or conversion Source: Agricultural practices
Loss of prairie habitat.	Threat: Habitat destruction or conversion Source: Urban development

Data Gaps/Research Needs

Need to obtain baseline information on distribution and population status.

Conservation Actions	Importance	Category
Protect prairie habitat hosting this species.	High	Habitat Protection
Restore prairies to achieve habitat connectivity.	High	Habitat Restoration/Improvement

Tetraopes quinquemaculatus
Red Milkweed Beetle

Monitoring Strategies

Survey for additional populations and monitor known occurrences.

Comments

A milkweed beetle dependent upon prairie habitat hosting sufficient amounts of the milkweed Asclepias viridiflora (Warriner 2004).

Taxa Association Team and Peer Reviewers

ANHC Mr. Michael Warriner

Tetraopes texanus

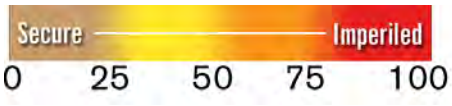
Texas Milkweed Beetle

Class: Insecta

Order: Coleoptera

Family: Cerambycidae

Priority Score: **21** out of 100



Population Trend: Unknown

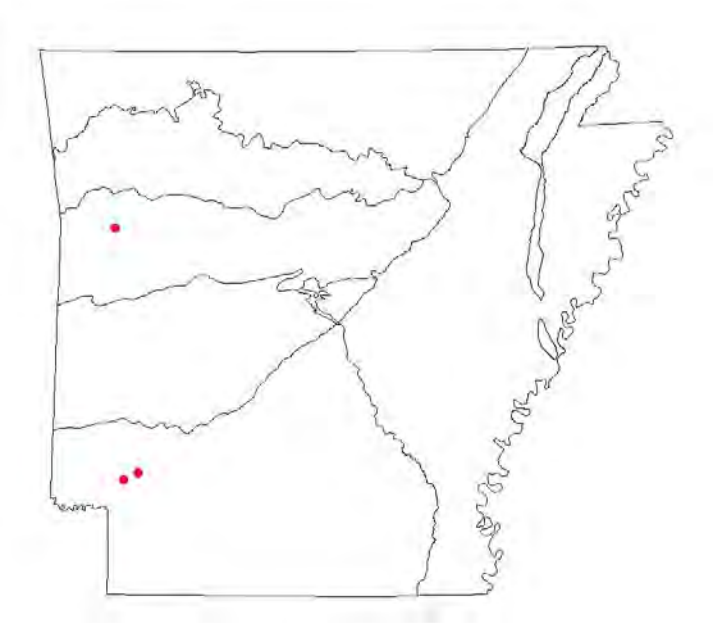


Global Rank: GNR — Not yet ranked

State Rank: S1S2 — Critically imperiled in Arkansas (uncertain rank)

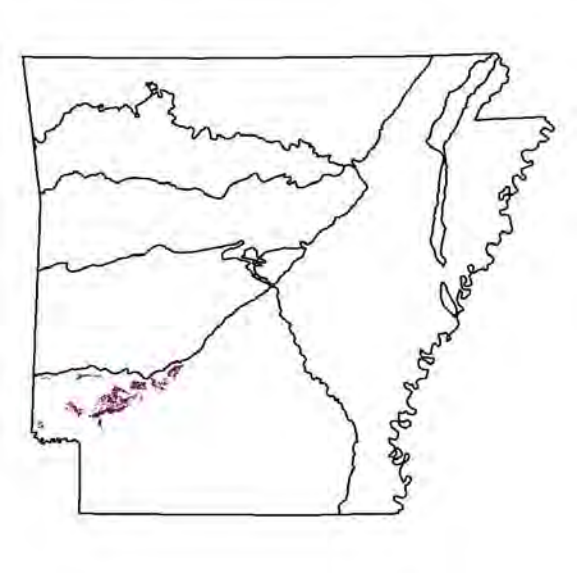
Distribution

Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☐
- Boston Mountains ☐
- Arkansas Valley ☑
- Ouachita Mountains ☐
- South Central Plains ☑
- Mississippi Alluvial Plain ☐
- Mississippi Valley Loess Plain ☐



Habitat Map



Habitats	Weight
Ozark-Ouachita Prairie and Woodland	Optimal
West Gulf Coastal Plain Calcareous Prairie and Woodland	Optimal

Problems Faced

Loss of prairie habitat.	Threat: Habitat destruction or conversion Source: Commercial/industrial development
Loss of prairie habitat.	Threat: Habitat destruction or conversion Source: Urban development
Loss of prairie habitat.	Threat: Habitat destruction or conversion Source: Agricultural practices

Data Gaps/Research Needs

Need to obtain baseline information on distribution and population status.

Conservation Actions	Importance	Category
Protect prairie habitat hosting this species.	High	Habitat Protection
Restore prairies to achieve habitat connectivity.	High	Habitat Restoration/Improvement

Tetraopes texanus
Texas Milkweed Beetle

Monitoring Strategies

Survey for additional populations and monitor known occurrences.

Comments

A milkweed beetle dependent upon prairie habitat hosting sufficient amounts of the milkweed Asclepias viridis (Warriner 2004).

Taxa Association Team and Peer Reviewers

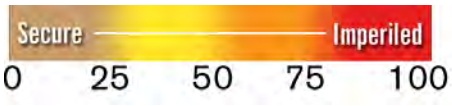
ANHC Mr. Michael Warriner

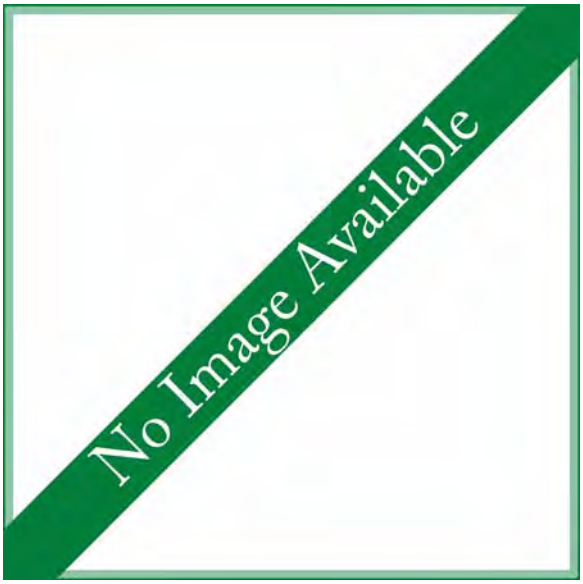
Abacion wilhelminae

Millipede

Class: Diplopoda
Order: Callipodida
Family: Abacionidae

Priority Score: **23** out of 100





Population Trend: Unknown

Global Rank: GNR — Not yet ranked

State Rank: S1 — Critically imperiled in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☐
- Boston Mountains ☐
- Arkansas Valley ☐
- Ouachita Mountains ☑
- South Central Plains ☐
- Mississippi Alluvial Plain ☐
- Mississippi Valley Loess Plain ☐



Habitat Map



Problems Faced

Habitat destruction.

Threat: Habitat destruction
Source:

Data Gaps/Research Needs

Life history, status surveys and basic biological information needs to be obtained.

Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Comments

Endemic millipede of the Ouachita Mountains of Arkansas (Robison and Allen 1995).

Taxa Association Team and Peer Reviewers

ANHC Mr. Michael Warriner, AGFC Mr. Brian Wagner

Abacion wilhelminae
Millipede

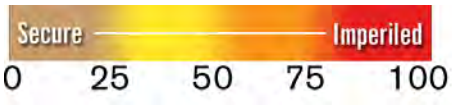
Allocrangonyx hubrichti

Hubricht's Long-tailed Amphipod



Class: Malacostraca
Order: Amphipoda
Family: Crangonyctidae

Priority Score: **42** out of 100



Population Trend: Unknown

Global Rank: G2G3 — Imperiled (uncertain rank)

State Rank: S1? — Critically imperiled in Arkansas (inexact numeric rank)

Distribution

Element Occurrence Records



Ecoregions where the species occurs:

- ☐ Ozark Highlands
- ☐ Boston Mountains
- ☑ Arkansas Valley
- ☐ Ouachita Mountains
- ☐ South Central Plains
- ☐ Mississippi Alluvial Plain
- ☐ Mississippi Valley Loess Plains



Terrestrial Habitats





Ecobasins where this species occurs

Ecobasins

Arkansas Valley - White River

Terrestrial Habitats

Caves, Mines, Sinkholes and other Karst Features	Obligate

Aquatic Habitats

Natural Cave Stream: Headwater - Small	Suitable
Natural Groundwater:	Optimal
Natural Seep: Headwater - Small	Suitable
Natural Spring Run: Headwater - Small	Marginal

Allocrangonyx hubrichti
Hubricht's Long-tailed Amphipod

Problems Faced

Threat: Sedimentation
Source: Urban development

Threat: Toxins/contaminants
Source: Urban development

Data Gaps/Research Needs

Obtain baseline information on distribution and population status, and confirm validity of occurrence record in Arkansas Valley.

Conservation Actions

	Importance	Category
Maintain groundwater quality.	Medium	Habitat Protection
Protect cave habitat and recharge zone from development or disturbance.	Medium	Habitat Protection

Monitoring Strategies

Additional information is needed before a monitoring strategy can be developed.

Comments

Crustacean.This species' distribution may not be resticted to caves. In Missouri, it has been documented from benthic stream habitats (personal communication, Mike E. Slay).

Taxa Team and Peer Reviewers

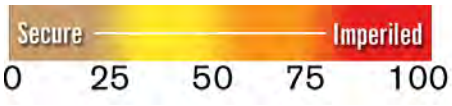
ANHC Mr. Michael Warriner, AGFC Mr. Brian Wagner

Amnicola cora

Foushee Cavesnail

Class: Gastropoda
Order: Neotaenioglossa
Family: Hydrobiidae

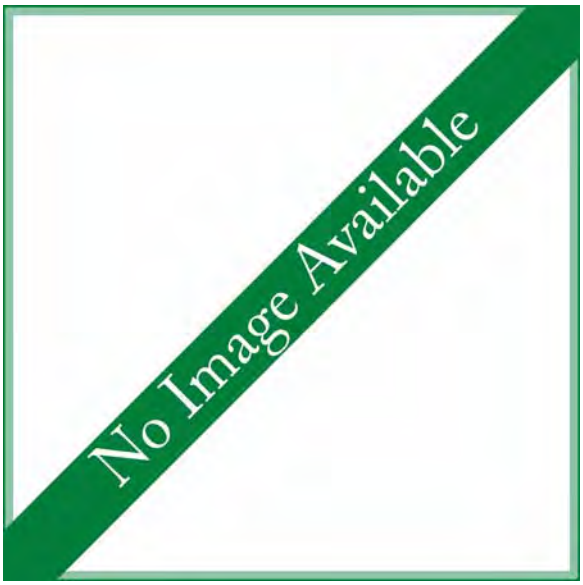
Priority Score: **80** out of 100



Population Trend: Unknown

Global Rank: G1 — Critically imperiled species

State Rank: S1 — Critically imperiled in Arkansas



Distribution

Element Occurrence Records



Ecoregions where the species occurs:

- [x] Ozark Highlands
- [ ] Boston Mountains
- [ ] Arkansas Valley
- [ ] Ouachita Mountains
- [ ] South Central Plains
- [ ] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains



Terrestrial Habitats





Ecobasins where this species occurs

Ecobasins

Ozark Highlands - White River

Terrestrial Habitats

Caves, Mines, Sinkholes and other Karst Features	Obligate

Aquatic Habitats

Natural Cave Stream: Headwater - Small	Obligate

Problems Faced

Threat: Habitat disturbance
Source: Recreation

Threat: Sedimentation
Source: Urban development

Threat: Toxins/contaminants
Source: Municipal/Industrial point source

Data Gaps/Research Needs

Determine life history information.

Obtain baseline information on distribution and population status.

Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

More data are needed before a monitoring strategy can be developed.

Comments

A cave-obligate snail only known from Foushee Cave in Independence County (Hubricht 1979).

Taxa Team and Peer Reviewers

ANHC Mr. Michael Warriner, AGFC Mr. Brian Wagner

Apochthonius diabolus

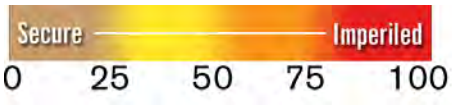
Cave Obligate Pseudoscorpion

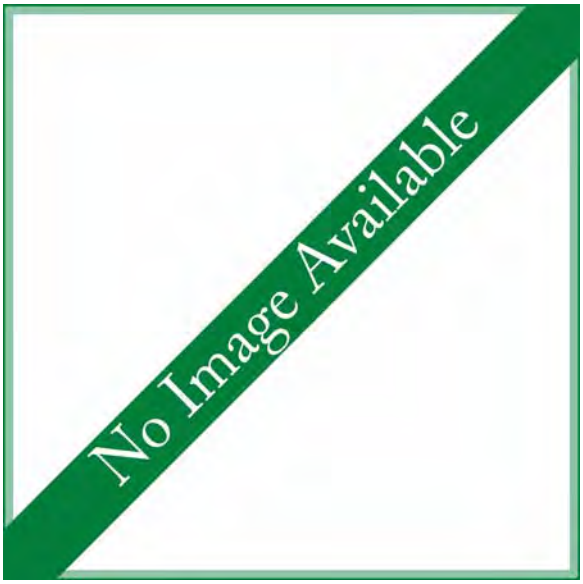
Class: Arachnida

Order: Pseudoscorpiones

Family: Chthoniidae

Priority Score: **65** out of 100





Population Trend: Unknown

Global Rank: G1G2 — Critically imperiled (uncertain rank)

State Rank: S1 — Critically imperiled in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☐
- Boston Mountains ☑
- Arkansas Valley ☐
- Ouachita Mountains ☐
- South Central Plains ☐
- Mississippi Alluvial Plain ☐
- Mississippi Valley Loess Plain ☐



Habitat Map



Habitats

Habitats	Weight
Caves, Mines, Sinkholes and other Karst Features	Obligate

Problems Faced

Development/disturbance of cave habitat and recharge zone.	Threat: Habitat destruction or conversion Source: Urban development
Groundwater contamination.	Threat: Toxins/contaminants Source: Urban development

Conservation Actions

Conservation Actions	Importance	Category
Maintain groundwater quality.	Medium	Habitat Protection
Protect cave habitat and recharge zone from development or disturbance.	Medium	Habitat Protection

Monitoring Strategies

Survey for additional populations and monitor known occurrences

Comments

Pseudoscorpion. No information available.

Taxa Association Team and Peer Reviewers

ANHC Mr. Michael Warriner, AGFC Mr. Brian Wagner

Apochthonius titanicus

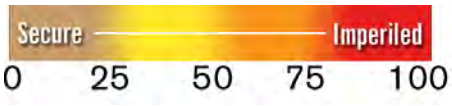
Cave Obligate Pseudoscorpion

Class: Arachnida

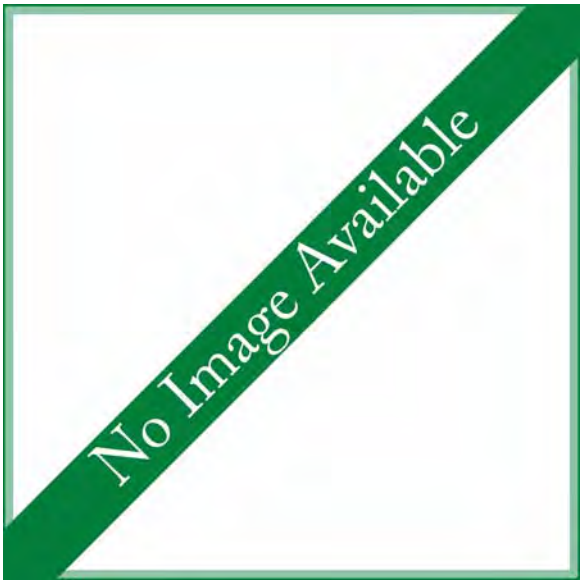
Order: Pseudoscorpiones

Family: Chthoniidae

Priority Score: **65** out of 100



Population Trend: Unknown



Global Rank: G1G2 — Critically imperiled (uncertain rank)

State Rank: S1 — Critically imperiled in Arkansas

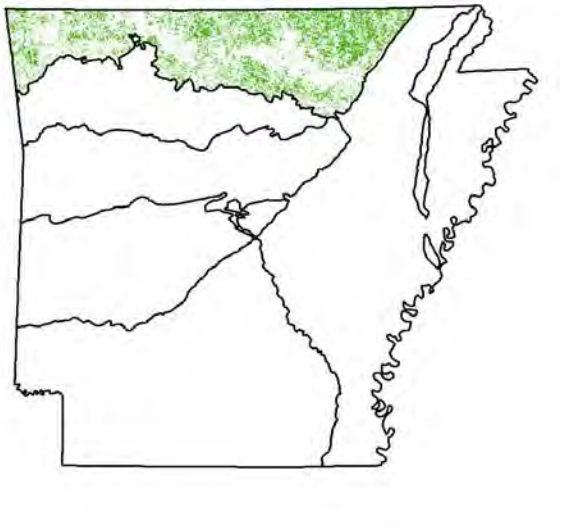
Distribution

Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☑
- Boston Mountains ☐
- Arkansas Valley ☐
- Ouachita Mountains ☐
- South Central Plains ☐
- Mississippi Alluvial Plain ☐
- Mississippi Valley Loess Plain ☐



Habitat Map



Habitats

	Weight
Caves, Mines, Sinkholes and other Karst Features	Obligate

Problems Faced

Development/disturbance of cave habitat and recharge zone.	Threat: Habitat destruction or conversion Source: Urban development
Groundwater contamination.	Threat: Toxins/contaminants Source: Urban development

Data Gaps/Research Needs

No data gaps or research needs were identified.

Conservation Actions

	Importance	Category
Maintain groundwater quality.	Medium	Habitat Protection
Protect cave habitat and recharge zone from development or disturbance.	Medium	Habitat Protection

Monitoring Strategies

Survey for additional populations and monitor known occurrences.

Comments

Pseudoscorpion.

Taxa Association Team and Peer Reviewers

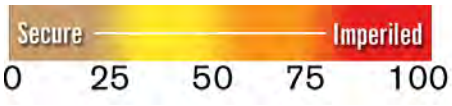
ANHC Mr. Michael Warriner, AGFC Mr. Brian Wagner

Bactrurus pseudomucronatus

Amphipod

Class: Malacostraca
Order: Amphipoda
Family: Crangonyctidae

Priority Score: **42** out of 100



Population Trend: Unknown

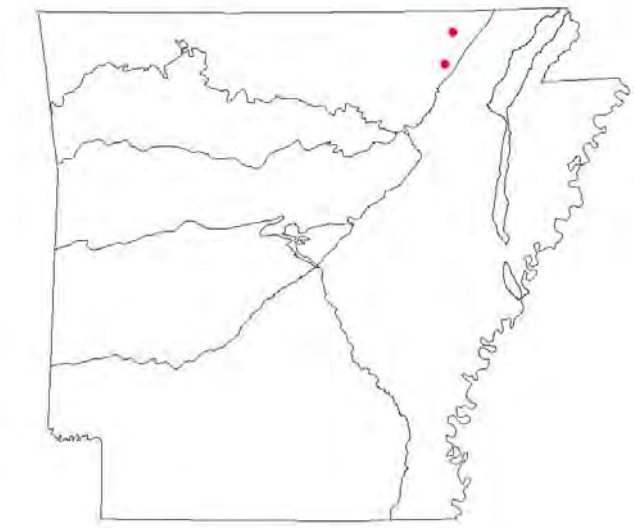


Global Rank: G2G3 — Imperiled (uncertain rank)

State Rank: S1? — Critically imperiled in Arkansas (inexact numeric rank)

Distribution

Element Occurrence Records



Ecoregions where the species occurs:

- [x] Ozark Highlands
- [ ] Boston Mountains
- [ ] Arkansas Valley
- [ ] Ouachita Mountains
- [ ] South Central Plains
- [ ] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains



Terrestrial Habitats





Ecobasins where this species occurs

Ecobasins

Ozark Highlands - White River

Terrestrial Habitats

Caves, Mines, Sinkholes and other Karst Features	Obligate

Aquatic Habitats

Natural Cave Stream: Headwater - Small	Obligate
Natural Groundwater:	Obligate

Bactrurus pseudomucronatus
Amphipod

Problems Faced

Threat: Sedimentation
Source: Urban development

Threat: Toxins/contaminants
Source: Urban development

Data Gaps/Research Needs

Determine life history information.

Evaluate taxonomic relationships.

Survey for additional populations.

Conservation Actions

	Importance	Category
Maintain groundwater quality.	Medium	Habitat Protection
Protect cave habitat and recharge zone from development or disturbance.	Medium	Habitat Protection

Monitoring Strategies

Additional information is needed before a monitoring strategy can be developed.

Comments

This crustacean species is one of the largest groundwater amphipods in North America (personal communication, Mike E. Slay).

Taxa Team and Peer Reviewers

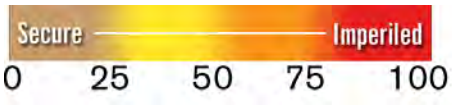
ANHC Mr. Michael Warriner, AGFC Mr. Brian Wagner

Caecidotea ancyla

Isopod

Class: Malacostraca
Order: Isopoda
Family: Asellidae

Priority Score: **27** out of 100



Population Trend: Unknown

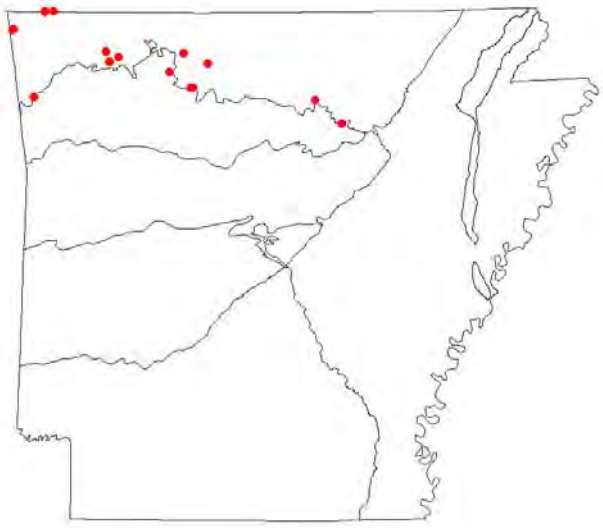

Caecidotea spp.
©Dante B. Fenolio

Global Rank: G3G4 — Vulnerable (uncertain rank)

State Rank: S2 — Imperiled in Arkansas

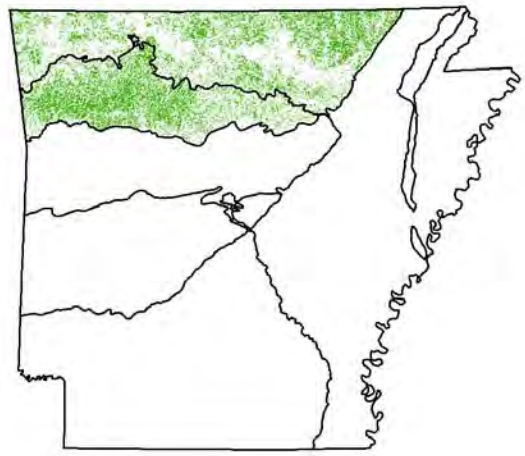
Distribution

Element Occurrence Records



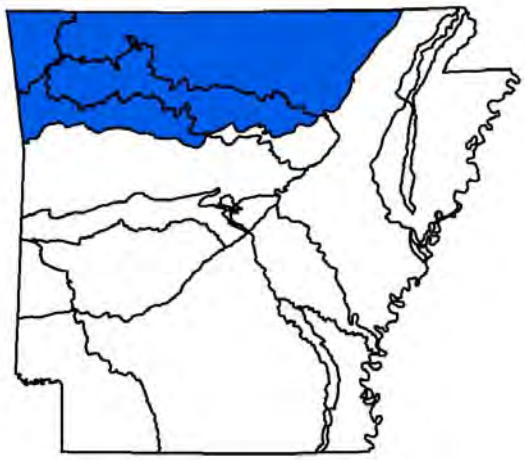
Ecoregions where the species occurs:

- [x] Ozark Highlands
- [x] Boston Mountains
- [ ] Arkansas Valley
- [ ] Ouachita Mountains
- [ ] South Central Plains
- [ ] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains



Terrestrial Habitats





Ecobasins where this species occurs

Ecobasins

Boston Mountains - Arkansas River
Boston Mountains - White River
Ozark Highlands - Arkansas River
Ozark Highlands - White River

Terrestrial Habitats

Caves, Mines, Sinkholes and other Karst Features	Obligate

Caecidotea ancyla
Isopod

Aquatic Habitats

Natural Cave Stream: Headwater - Small	Optimal
Natural Groundwater:	Optimal
Natural Seep: Headwater - Small	Suitable
Natural Spring Run: Headwater - Small	Marginal

Problems Faced

Threat: Habitat disturbance
Source: Urban development

Threat: Nutrient loading
Source: Urban development

Threat: Sedimentation
Source: Urban development

Data Gaps/Research Needs

Determine life history information.

Survey for baseline information on distribution and population status.

Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

More data are needed before a monitoring strategy can be developed.

Comments

Crustacean. This species is a cave-adapted aquatic isopod.

Taxa Team and Peer Reviewers

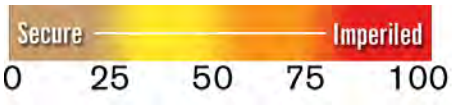
ANHC Mr. Michael Warriner, AGFC Mr. Brian Wagner

Caecidotea dimorpha

Isopod

Class: Malacostraca
Order: Isopoda
Family: Asellidae

Priority Score: **38** out of 100



Population Trend: Unknown

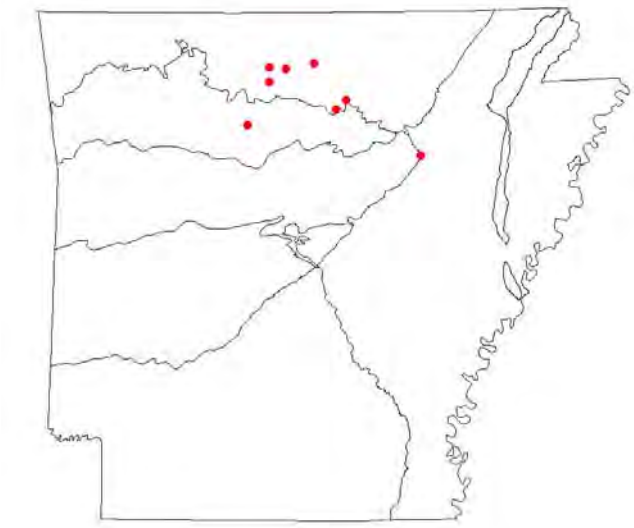


Global Rank: G2G3 — Imperiled (uncertain rank)

State Rank: S2 — Imperiled in Arkansas

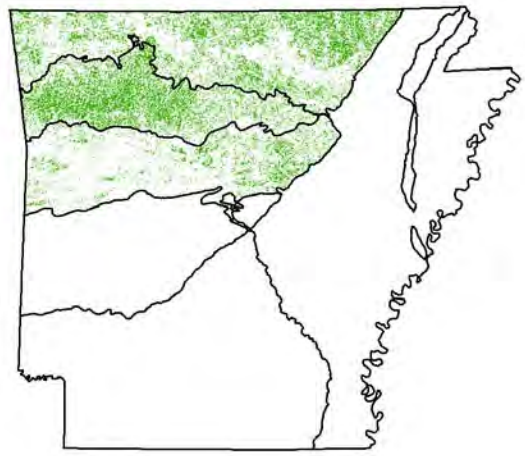
Distribution

Element Occurrence Records



Ecoregions where the species occurs:

- [x] Ozark Highlands
- [x] Boston Mountains
- [x] Arkansas Valley
- [ ] Ouachita Mountains
- [ ] South Central Plains
- [ ] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains



Terrestrial Habitats





Ecobasins where this species occurs

Ecobasins

Arkansas Valley - White River
Boston Mountains - White River
Ozark Highlands - White River

Terrestrial Habitats

Caves, Mines, Sinkholes and other Karst Features	Obligate

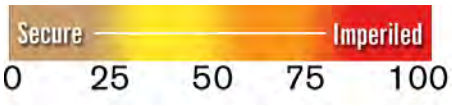
Caecidotea dimorpha
Isopod

Caecidotea fonticulus

Isopod

Class: Malacostraca
Order: Isopoda
Family: Asellidae

Priority Score: **23** **out of 100**



Population Trend: Unknown


Caecidotea spp.

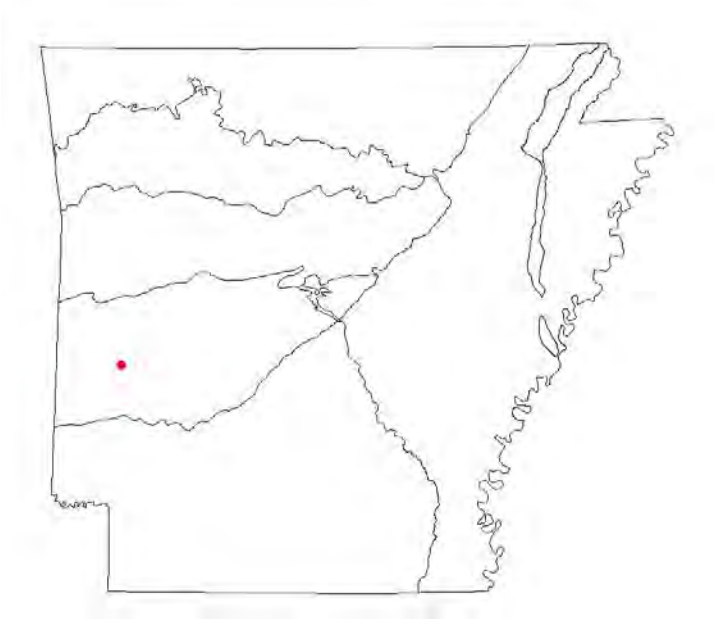
©Dante B. Fenolio

Gobal Rank: GNR — Not yet ranked

State Rank: S1 — Critically imperiled in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- ☐ Ozark Highlands
- ☐ Boston Mountains
- ☑ Ouachita Mountains
- ☐ Arkansas Valley
- ☐ South Central Plains
- ☐ Mississippi Alluvial Plain
- ☐ Mississippi Valley Loess Plains



Ecobasins where the species occurs

Ecobasins

Ouachita Mountains - Ouachita River

Habitats	Weight
Natural Groundwater: Headwater - Small	Data Gap
Natural Seep: Headwater - Small	Data Gap
Natural Spring Run: Headwater - Small	Obligate

Problems Faced

Threat: Habitat destruction or conversion
Source: Forestry activities

Threat: Toxins/contaminants
Source: Municipal/Industrial point source

Data Gaps/Research Needs

Need to obtain baseline information on distribution and population status.

Conservation Actions	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

Surveys to locate additional populations and protection of stream habitats.

Comments

An Arkansas endemic isopod known only from Abernathy Spring in Polk County (Lewis 1983).

Taxa Association Team and Peer Reviewers

ANHC Mr. Michael Warriner, AGFC Mr. Brian Wagner

Caecidotea fonticulus
Isopod

Aquatic Habitats

Natural Cave Stream: Headwater - Small	Optimal
Natural Groundwater: Headwater - Small	Optimal
Natural Seep: Headwater - Small	Suitable
Natural Spring Run: Headwater - Small	Marginal

Problems Faced

Threat: Habitat disturbance
Source: Urban development

Threat: Nutrient loading
Source: Urban development

Threat: Sedimentation
Source: Urban development

Data Gaps/Research Needs

Determine life history information.

Survey for baseline information on distribution and population status.

Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

More data are needed before a monitoring strategy can be developed.

Comments

Crustacean. This species is a cave-adapted aquatic isopod.

Taxa Team and Peer Reviewers

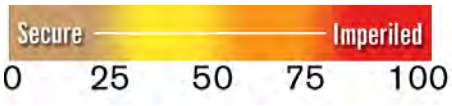
ANHC Mr. Michael Warriner, AGFC Mr. Brian Wagner

Caecidotea macropropoda

Bat Cave Isopod

Class: Malacostraca
Order: Isopoda
Family: Asellidae

Priority Score: **38** out of 100



Population Trend: Unknown


Caecidotea spp.

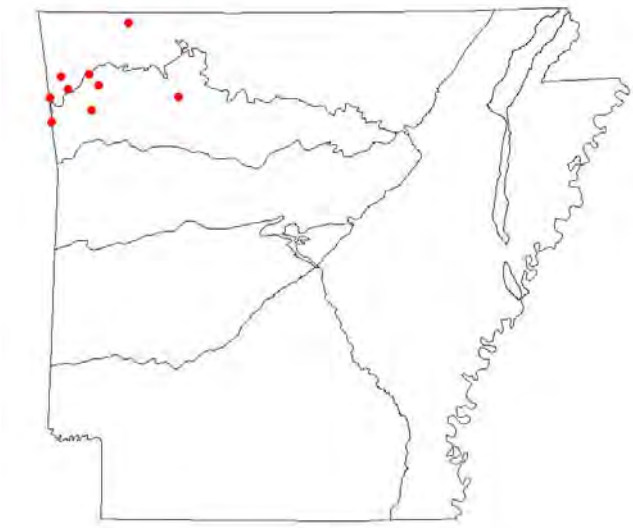
©Dante B. Fenolio

Global Rank: G2G3 — Imperiled (uncertain rank)

State Rank: S2 — Imperiled in Arkansas

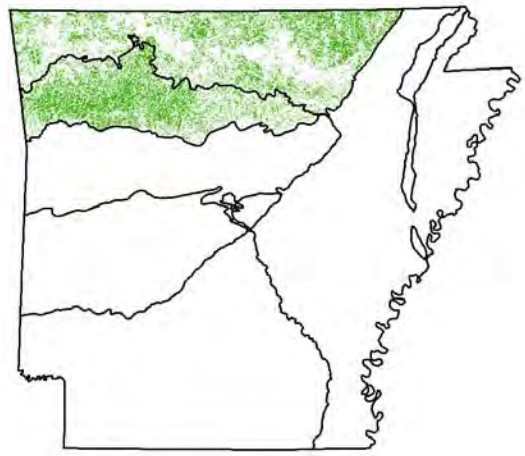
Distribution

Element Occurrence Records



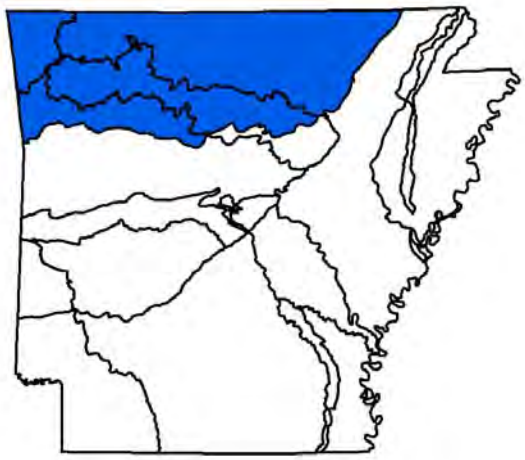
Ecoregions where the species occurs:

- [x] Ozark Highlands
- [x] Boston Mountains
- [ ] Arkansas Valley
- [ ] Ouachita Mountains
- [ ] South Central Plains
- [ ] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains



Terrestrial Habitats





Ecobasins where this species occurs

Ecobasins

Boston Mountains - Arkansas River

Ozark Highlands - Arkansas River

Terrestrial Habitats

Caves, Mines, Sinkholes and other Karst Features	Obligate

Caecidotea macropropoda
Bat Cave Isopod

Aquatic Habitats

Natural Cave Stream: Headwater - Small	Optimal
Natural Groundwater:	Optimal
Natural Seep: Headwater - Small	Suitable
Natural Spring Run: Headwater - Small	Marginal

Problems Faced

Threat: Habitat disturbance
Source: Urban development

Threat: Nutrient loading
Source: Urban development

Threat: Sedimentation
Source: Urban development

Data Gaps/Research Needs

Determine life history information.

Survey for baseline information on distribution and population status.

Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

More data are needed before a monitoring strategy can be developed.

Comments

Crustacean.

Taxa Team and Peer Reviewers

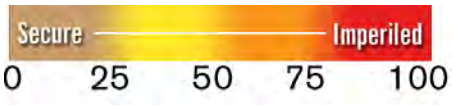
ANHC Mr. Michael Warriner, AGFC Mr. Brian Wagner

Caecidotea oculata

Isopod

Class: Malacostraca
Order: Isopoda
Family: Asellidae

Priority Score: **42** out of 100



Population Trend: Unknown

Caecidotea spp.



©Dante B. Fenolio

Global Rank: G2G3 — Imperiled (uncertain rank)

State Rank: S1 — Critically imperiled in Arkansas

Distribution

Element Occurrence Records



Ecoregions where the species occurs:

- ☐ Ozark Highlands
- ☑ Boston Mountains
- ☐ Arkansas Valley
- ☐ Ouachita Mountains
- ☐ South Central Plains
- ☐ Mississippi Alluvial Plain
- ☐ Mississippi Valley Loess Plains



Terrestrial Habitats





Ecobasins where this species occurs

Ecobasins

Boston Mountains - White River

Terrestrial Habitats

Caves, Mines, Sinkholes and other Karst Features	Obligate

Aquatic Habitats

Natural Cave Stream: Headwater - Small	Data Gap
Natural Groundwater:	Data Gap
Natural Seep: Headwater - Small	Data Gap
Natural Spring Run: Headwater - Small	Obligate

Caecidotea oculata
Isopod

Problems Faced

Threat: Habitat disturbance
Source: Urban development

Threat: Nutrient loading
Source: Urban development

Threat: Sedimentation
Source: Urban development

Data Gaps/Research Needs

Determine life history information.

Survey for baseline information on distribution and population status.

Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

More data are needed before a monitoring strategy can be developed.

Comments

Crustacean.

Taxa Team and Peer Reviewers

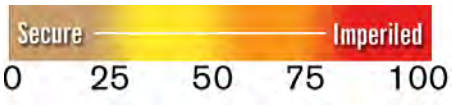
ANHC Mr. Michael Warriner, AGFC Mr. Brian Wagner

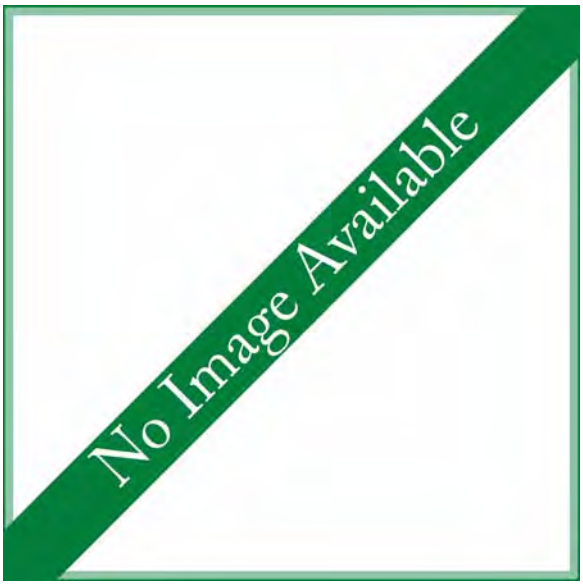
Caecidotea salemensis

Isopod

Class: Malacostraca
Order: Isopoda
Family: Asellidae

Priority Score: 27 out of 100





Population Trend: Unknown

Global Rank: G4 — Apparently secure species

State Rank: S1 — Critically imperiled in Arkansas

Distribution

Element Occurrence Records



Ecoregions where the species occurs:

- [x] Ozark Highlands
- [ ] Boston Mountains
- [ ] Arkansas Valley
- [ ] Ouachita Mountains
- [ ] South Central Plains
- [ ] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains



Terrestrial Habitats





Ecobasins where this species occurs

Ecobasins

Ozark Highlands - White River

Terrestrial Habitats

Caves, Mines, Sinkholes and other Karst Features	Obligate

Aquatic Habitats

Natural Cave Stream: Headwater - Small	Optimal
Natural Groundwater:	Optimal
Natural Seep: Headwater - Small	Suitable
Natural Spring Run: Headwater - Small	Marginal

Caecidotea salemensis
Isopod

Problems Faced

Threat: Habitat disturbance
Source: Urban development

Threat: Nutrient loading
Source: Urban development

Threat: Sedimentation
Source: Urban development

Data Gaps/Research Needs

Determine life history information.

Survey for baseline information on distribution and population status.

Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

More data are needed before a monitoring strategy can be developed.

Comments

Crustacean.

Taxa Team and Peer Reviewers

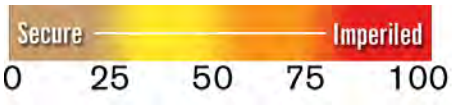
ANHC Mr. Michael Warriner, AGFC Mr. Brian Wagner

Caecidotea simulator

Cave Obligate Isopod

Class: Malacostraca
Order: Isopoda
Family: Asellidae

Priority Score: **42** out of 100



Population Trend: Unknown


Caecidotea spp.

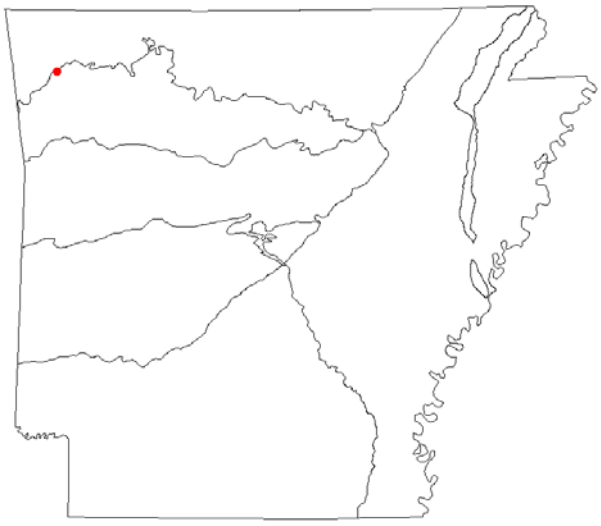
©Dante B. Fenolio

Global Rank: G2G3 — Imperiled (uncertain rank)

State Rank: S1 — Critically imperiled in Arkansas

Distribution

Element Occurrence Records



Ecoregions where the species occurs:

- ☐ Ozark Highlands
- ☑ Boston Mountains
- ☐ Arkansas Valley
- ☐ Ouachita Mountains
- ☐ South Central Plains
- ☐ Mississippi Alluvial Plain
- ☐ Mississippi Valley Loess Plains



Terrestrial Habitats





Ecobasins where this species occurs

Ecobasins

Boston Mountains - Arkansas River

Terrestrial Habitats

Caves, Mines, Sinkholes and other Karst Features	Obligate

Aquatic Habitats

Natural Cave Stream: Headwater - Small	Data Gap
Natural Groundwater:	Obligate
Natural Seep: Headwater - Small	Data Gap
Natural Spring Run: Headwater - Small	Data Gap

Caecidotea simulator
Cave Obligate Isopod

Problems Faced

Threat: Habitat disturbance
Source: Urban development

Threat: Sedimentation
Source: Urban development

Threat: Toxins/contaminants
Source: Urban development

Data Gaps/Research Needs

Determine life history information.

Survey for baseline information on distribution and population status.

Conservation Actions

	Importance	Category
Maintain groundwater quality.	Medium	Habitat Protection
Protect cave habitat and recharge zone from development or disturbance.	Medium	Habitat Protection

Monitoring Strategies

More data are needed before a monitoring strategy can be developed.

Comments

This crustacean species is one of the rarest aquatic cave-adapted isopods in Arkansas.

Taxa Team and Peer Reviewers

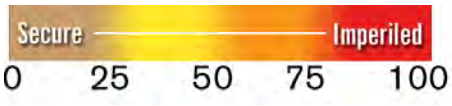
ANHC Mr. Michael Warriner, AGFC Mr. Brian Wagner

Caecidotea steevesi

Isopod

Class: Malacostraca
Order: Isopoda
Family: Asellidae

Priority Score: **31** out of 100



Population Trend: Unknown

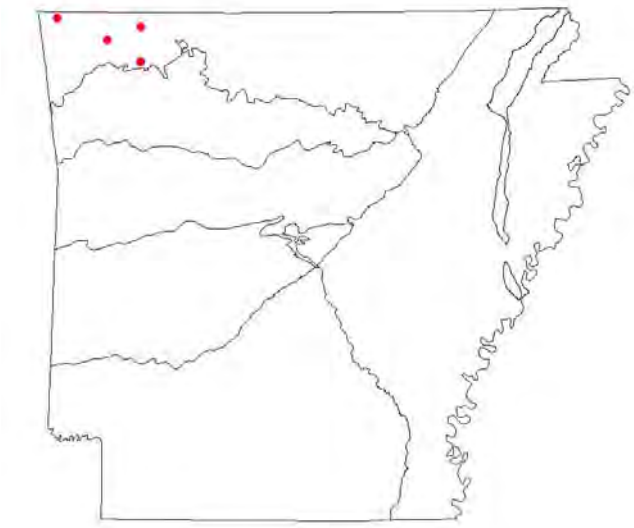

Caecidotea spp.
©Dante B. Fenolio

Global Rank: G3G4 — Vulnerable (uncertain rank)

State Rank: S1 — Critically imperiled in Arkansas

Distribution

Element Occurrence Records



Ecoregions where the species occurs:

- [x] Ozark Highlands
- [ ] Boston Mountains
- [ ] Arkansas Valley
- [ ] Ouachita Mountains
- [ ] South Central Plains
- [ ] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains



Terrestrial Habitats





Ecobasins where this species occurs

Ecobasins

Ozark Highlands - Arkansas River

Ozark Highlands - White River

Terrestrial Habitats

Caves, Mines, Sinkholes and other Karst Features	Obligate

Caecidotea steevesi
Isopod

Aquatic Habitats

Natural Cave Stream: Headwater - Small	Optimal
Natural Groundwater:	Optimal
Natural Seep: Headwater - Small	Suitable
Natural Spring Run: Headwater - Small	Marginal

Problems Faced

Threat: Habitat disturbance
Source: Urban development

Threat: Nutrient loading
Source: Urban development

Threat: Sedimentation
Source: Urban development

Data Gaps/Research Needs

Determine life history information.

Survey for baseline information on distribution and population status.

Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

More data are needed before a monitoring strategy can be developed.

Comments

This crustacean species is a cave-adapted aquatic isopod.

Taxa Team and Peer Reviewers

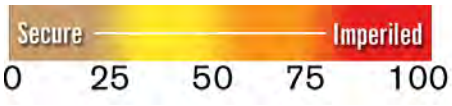
ANHC Mr. Michael Warriner, AGFC Mr. Brian Wagner

Caecidotea stiladactyla

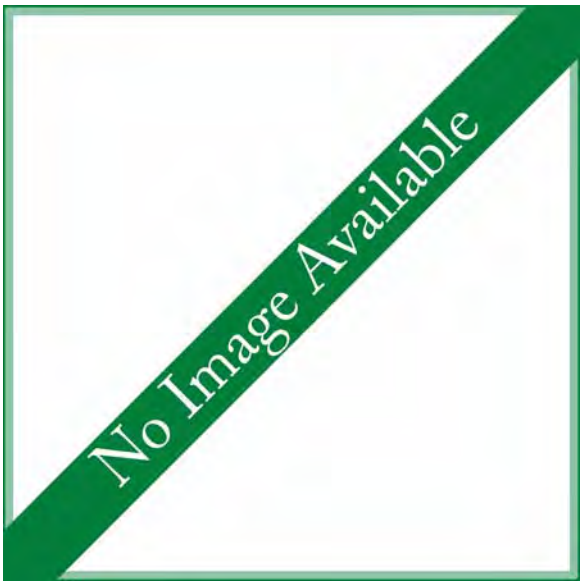
Isopod

Class: Malacostraca
Order: Isopoda
Family: Asellidae

Priority Score: **23** out of 100



Population Trend: Unknown

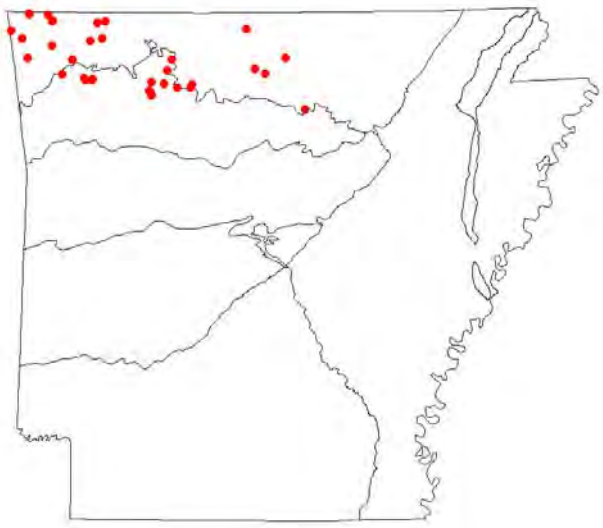


Global Rank: G3G4 — Vulnerable (uncertain rank)

State Rank: S3 — Vulnerable in Arkansas

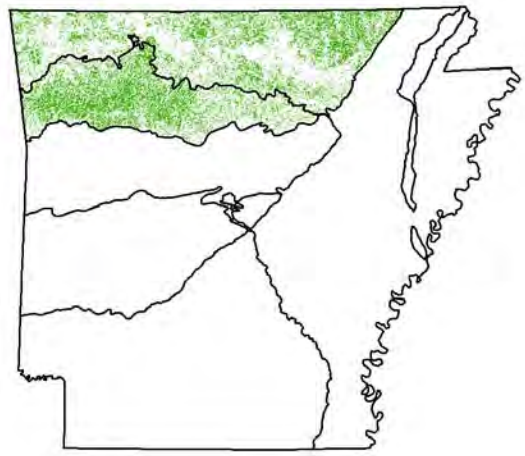
Distribution

Element Occurrence Records



Ecoregions where the species occurs:

- [x] Ozark Highlands
- [x] Boston Mountains
- [ ] Arkansas Valley
- [ ] Ouachita Mountains
- [ ] South Central Plains
- [ ] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains



Terrestrial Habitats





Ecobasins where this species occurs

Ecobasins

Boston Mountains - White River

Ozark Highlands - Arkansas River

Ozark Highlands - White River

Terrestrial Habitats

Caves, Mines, Sinkholes and other Karst Features	Obligate

Caecidotea stiladactyla
Isopod

Aquatic Habitats

Natural Cave Stream: Headwater - Small	Optimal
Natural Groundwater: Headwater - Small	Optimal
Natural Seep: Headwater - Small	Suitable
Natural Spring Run: Headwater - Small	Marginal

Problems Faced

Threat: Habitat disturbance
Source: Urban development

Threat: Nutrient loading
Source: Urban development

Threat: Sedimentation
Source: Urban development

Data Gaps/Research Needs

Determine life history information.

Survey for baseline information on distribution and population status.

Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

More data are needed before a monitoring strategy can be developed.

Comments

This crustacean species is a cave-adapted aquatic isopod.

Taxa Team and Peer Reviewers

ANHC Mr. Michael Warriner, AGFC Mr. Brian Wagner

Crosbyella distincta

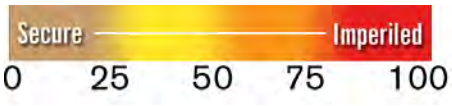
Cave Obligate Harvestman

Class: Arachnida

Order: Opiliones

Family: Phalangodidae

Priority Score: **65** out of 100



Population Trend: Unknown

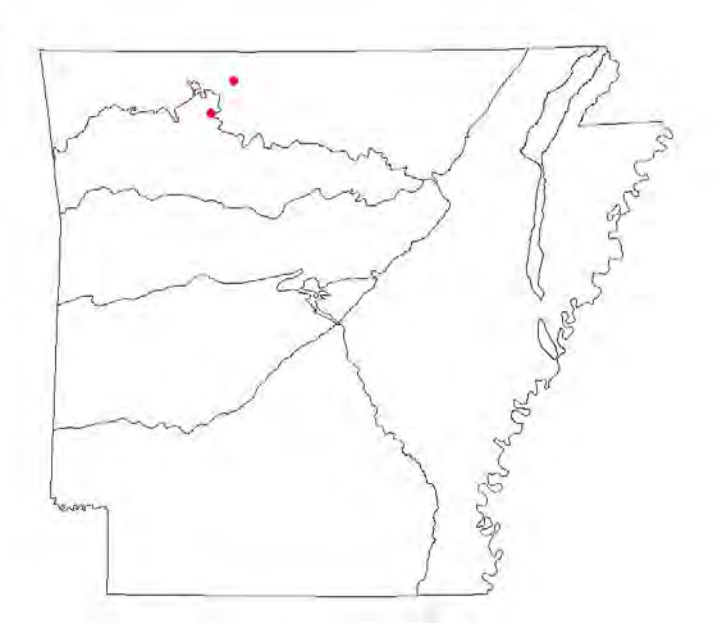


Global Rank: G1G2 — Critically imperiled (uncertain rank)

State Rank: S1 — Critically imperiled in Arkansas

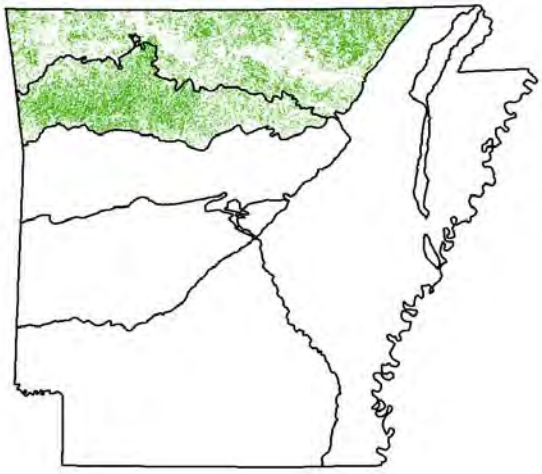
Distribution

Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☑
- Boston Mountains ☑
- Arkansas Valley ☐
- Ouachita Mountains ☐
- South Central Plains ☐
- Mississippi Alluvial Plain ☐
- Mississippi Valley Loess Plain ☐



Habitat Map



Habitats

	Weight
Caves, Mines, Sinkholes and other Karst Features	Obligate

Problems Faced

Development/disturbance of cave habitat and recharge zone.	Threat: Habitat destruction or conversion Source: Urban development
Groundwater contamination.	Threat: Toxins/contaminants Source: Urban development

Conservation Actions

	Importance	Category
Maintain groundwater quality.	Medium	Habitat Protection
Protect cave habitat and recharge zone from development or disturbance.	Medium	Habitat Protection

Monitoring Strategies

Survey for additional populations and monitor known occurrences.

Comments

Arachnid.

Taxa Association Team and Peer Reviewers

ANHC Mr. Michael Warriner, AGFC Mr. Brian Wagner

Crosbyella distincta
Cave Obligate Harvestman

Crosbyella roeweri

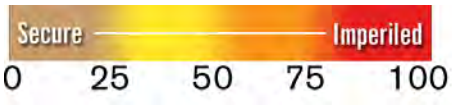
Cave Obligate Harvestman

Class: Arachnida

Order: Opiliones

Family: Phalangodidae

Priority Score: **65** out of 100



Population Trend: Unknown

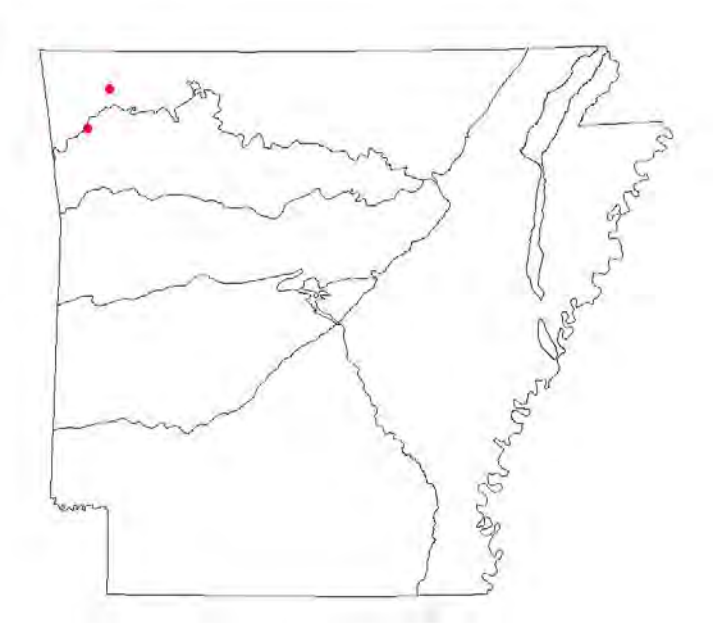


Global Rank: G1G2 — Critically imperiled (uncertain rank)

State Rank: S1 — Critically imperiled in Arkansas

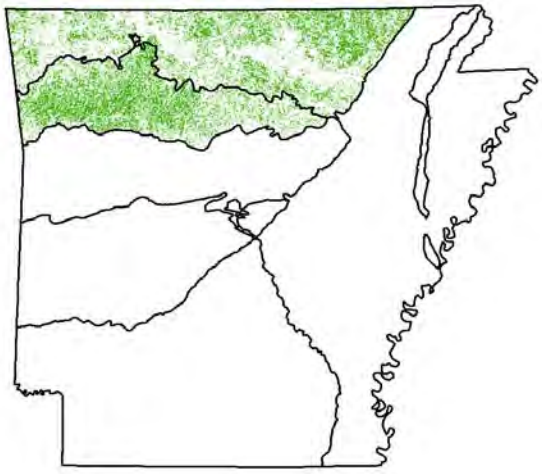
Distribution

Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☑
- Boston Mountains ☑
- Arkansas Valley ☐
- Ouachita Mountains ☐
- South Central Plains ☐
- Mississippi Alluvial Plain ☐
- Mississippi Valley Loess Plain ☐



Habitat Map



Habitats

	Weight
Caves, Mines, Sinkholes and other Karst Features	Obligate

Problems Faced

Development/disturbance of cave habitat and recharge zone.	Threat: Habitat destruction or conversion Source: Urban development
Groundwater contamination.	Threat: Toxins/contaminants Source: Urban development

Conservation Actions

	Importance	Category
Maintain groundwater quality.	Medium	Habitat Protection
Protect cave habitat and recharge zone from development or disturbance.	Medium	Habitat Protection

Monitoring Strategies

Survey for additional populations and monitor known occurrences.

Comments

Arachnid.

Taxa Association Team and Peer Reviewers

ANHC Mr. Michael Warriner, AGFC Mr. Brian Wagner

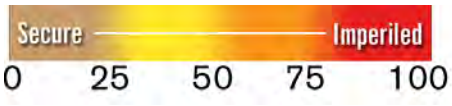
Crosbyella roeweri
Cave Obligate Harvestman

Daedalochila peregrina

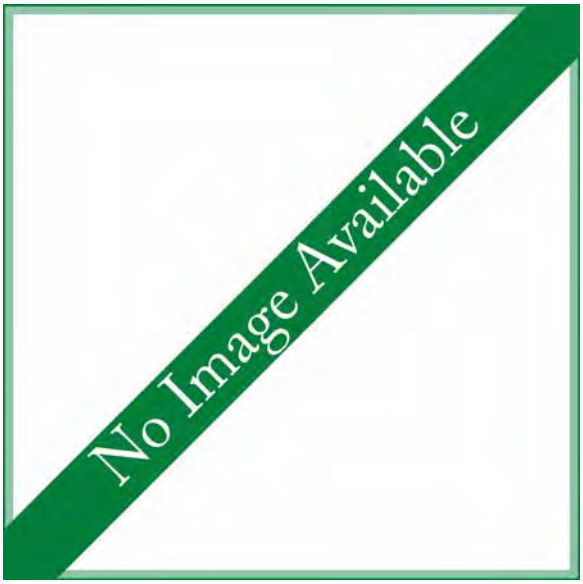
White Liptooth

Class: Gastropoda
Order: Stylommatophora
Family: Polygyridae

Priority Score: **34** out of 100



Population Trend: Unknown

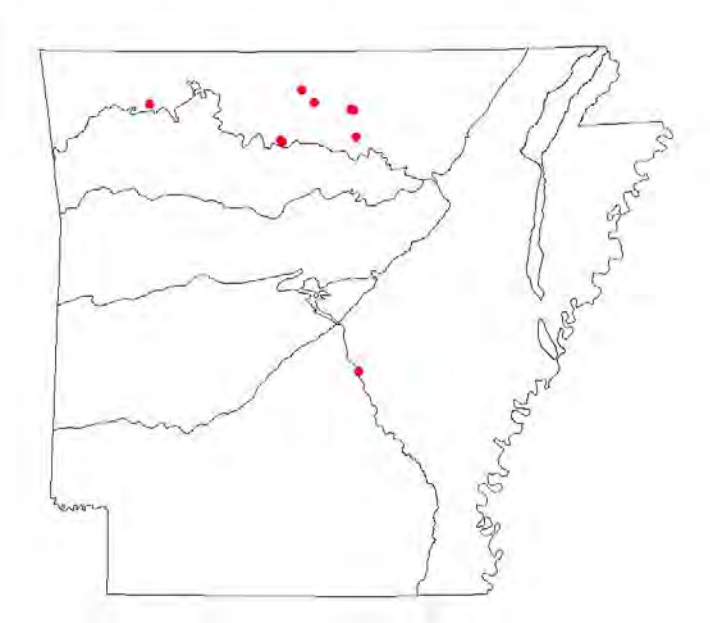


Global Rank: G2 — Imperiled species

State Rank: SNR — Species not ranked in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☑
- Boston Mountains ☐
- Arkansas Valley ☐
- Ouachita Mountains ☐
- South Central Plains ☐
- Mississippi Alluvial Plain ☐
- Mississippi Valley Loess Plain ☐



Habitat Map



Habitats	Weight
Ozark-Ouachita Mesic Hardwood Forest	Data Gap

Conservation Actions	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

Surveys to locate additional populations and protection of stream habitats.

Comments

Terrestrial snail. (Turgeon and others 1998)

Taxa Association Team and Peer Reviewers

ANHC Mr. Michael Warriner, AGFC Mr. Brian Wagner

Dendrocoelopsis americana

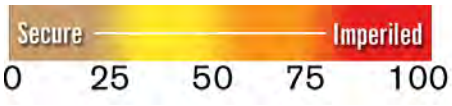
Cave Obligate Planarian

Class: Turbellaria

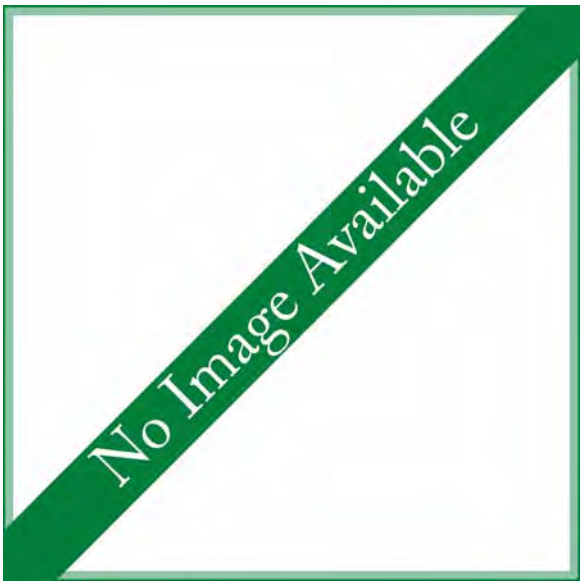
Order: Tricladida

Family: Dendrocoelidae

Priority Score: 42 out of 100



Population Trend: Unknown

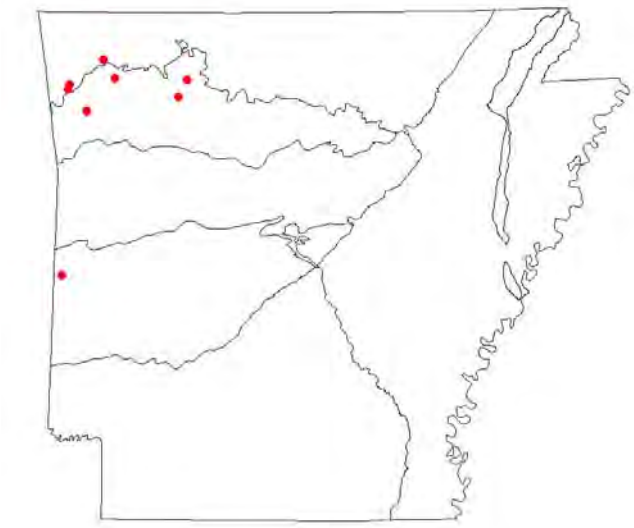


Global Rank: G2G3 — Imperiled (uncertain rank)

State Rank: S1 — Critically imperiled in Arkansas

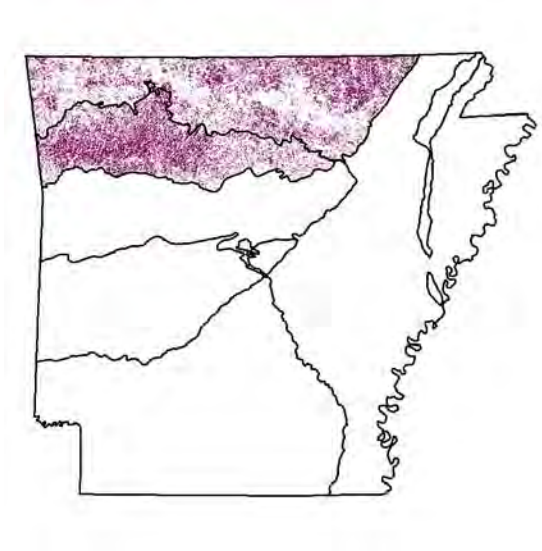
Distribution

Element Occurrence Records



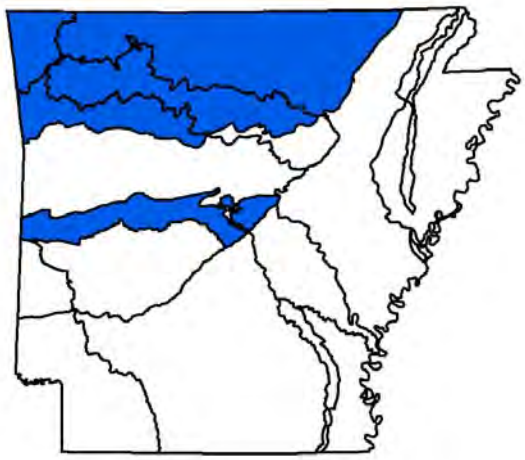
Ecoregions where the species occurs:

- [x] Ozark Highlands
- [x] Boston Mountains
- [ ] Arkansas Valley
- [ ] Ouachita Mountains
- [ ] South Central Plains
- [ ] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains



Terrestrial Habitats





Ecobasins where this species occurs

Ecobasins

Boston Mountains - Arkansas River
Boston Mountains - White River
Ozark Highlands - Arkansas River
Ozark Highlands - White River

Terrestrial Habitats

Caves, Mines, Sinkholes and other Karst Features	Optimal

Aquatic Habitats

Natural Cave Stream: Headwater - Small	Optimal
Natural Groundwater:	Optimal
Natural Seep: Headwater - Small	Optimal
Natural Spring Run: Headwater - Small	Optimal

Problems Faced

Threat: Habitat disturbance
Source: Urban development

Threat: Sedimentation
Source: Urban development

Threat: Toxins/contaminants
Source: Urban development

Data Gaps/Research Needs

Determine life history information.

Survey for baseline information on distribution and population status.

Conservation Actions

	Importance	Category
Maintain groundwater quality.	Medium	Habitat Restoration/Improvement
Protect cave habitat and recharge zone from development or disturbance.	Medium	Habitat Protection

Monitoring Strategies

More data are needed before a monitoring strategy can be developed.

Comments

Flatworm.

Taxa Team and Peer Reviewers

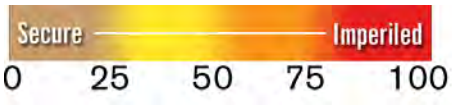
ANHC Mr. Michael Warriner, AGFC Mr. Brian Wagner

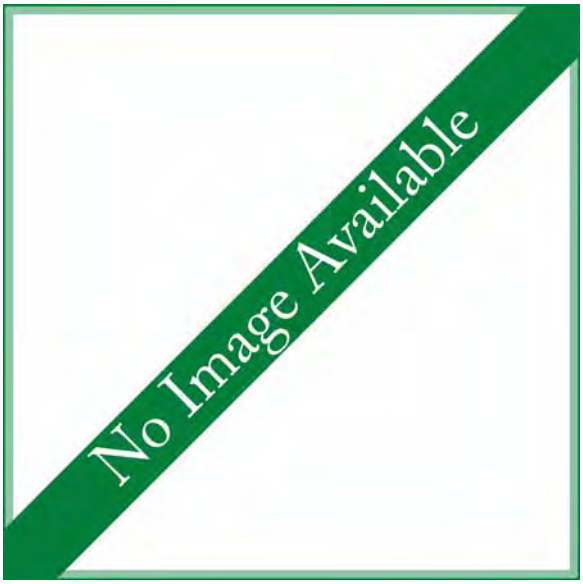
Diplocardia meansi

Earthworm

Class: Oligochaeta
Order: Opisthopora
Family: Acanthodrilidae

Priority Score: 17 out of 100





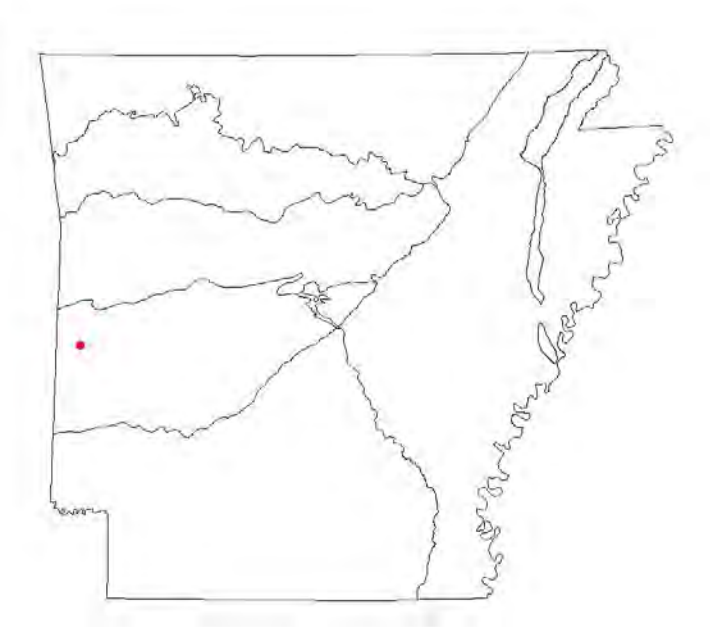
Population Trend: Unknown

Global Rank: GNR — Not yet ranked

State Rank: S2S3 — Imperiled species in Arkansas (uncertain rank)

Distribution

Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☐
- Boston Mountains ☐
- Arkansas Valley ☐
- Ouachita Mountains ☑
- South Central Plains ☐
- Mississippi Alluvial Plain ☐
- Mississippi Valley Loess Plain ☐



Habitat Map



Habitats	Weight
Ozark-Ouachita Mesic Hardwood Forest	Suitable

Problems Faced

Habitat degradation/disturbance.	Threat: Habitat disturbance Source: Forestry activities

Data Gaps/Research Needs

Need to obtain baseline information on distribution and population status.

Conservation Actions	Importance	Category
Limit soil disturbance.	High	Habitat Protection
Suspend application of herbicides where this species occurs.	Medium	Habitat Protection

Monitoring Strategies

Survey for additional populations and monitor known occurrences.

Comments

The second largest earthworm in the United States, D. meansi is an Arkansas endemic only known from the slopes of Rich Mountain (Gates 1977).

Taxa Association Team and Peer Reviewers

ANHC Mr. Michael Warriner, AGFC Mr. Brian Wagner

Diplocardia meansi
Earthworm

Gastrocopta rogersensis

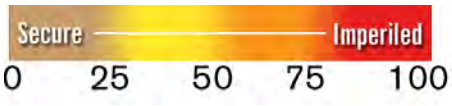
Land Snail

Class: Gastropoda

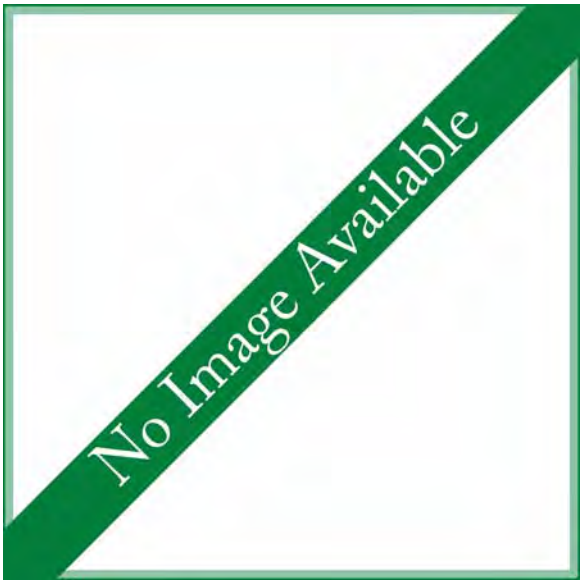
Order: Stylommatophora

Family: Pupillidae

Priority Score: 27 out of 100



Population Trend: Unknown

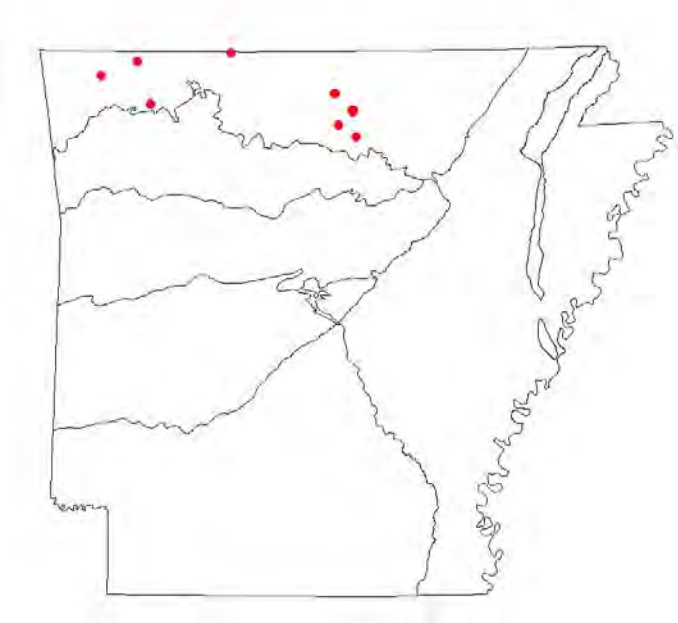


Global Rank: G3G4 — Vulnerable (uncertain rank)

State Rank: S2 — Imperiled in Arkansas

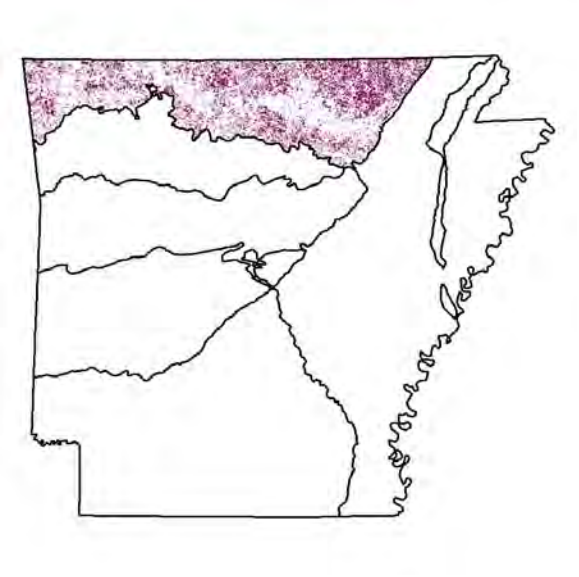
Distribution

Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☑
- Boston Mountains ☐
- Arkansas Valley ☐
- Ouachita Mountains ☐
- South Central Plains ☐
- Mississippi Alluvial Plain ☐
- Mississippi Valley Loess Plain ☐



Habitat Map



Habitats	Weight
Ozark-Ouachita Cliff and Talus	Optimal

Problems Faced

Forestry practices that disturb litter layer and create xeric conditions.	Threat: Habitat disturbance Source: Forestry activities

Data Gaps/Research Needs

Need to assess population status of known occurrences.

Conservation Actions	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

Survey areas near known occurrences to locate additional populations.

Comments

A regionally endemic (Arkansas, Missouri) terrestrial snail that occupies habitat in and along bluff lines (Nekola and Coles 2001).

Taxa Association Team and Peer Reviewers

ANHC Mr. Michael Warriner, AGFC Mr. Brian Wagner

Hesperochernes occidentalis

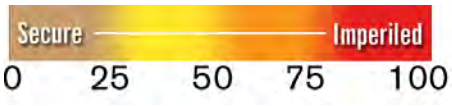
Pseudoscorpion

Class: Arachnida

Order: Pseudoscorpiones

Family: Chernetidae

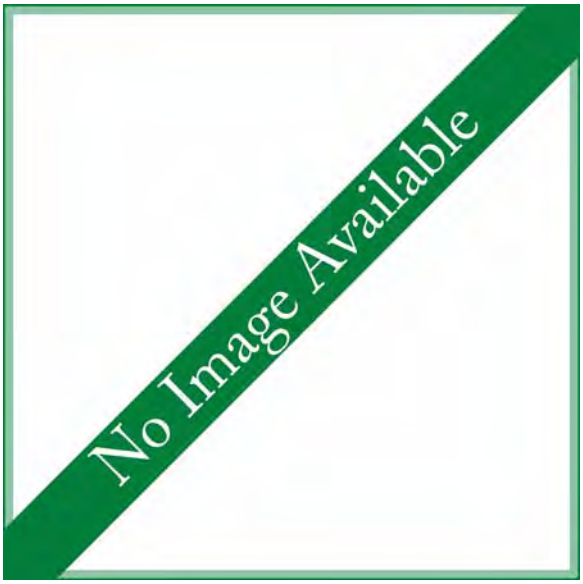
Priority Score: **23** **out of 100**



Population Trend: Unknown

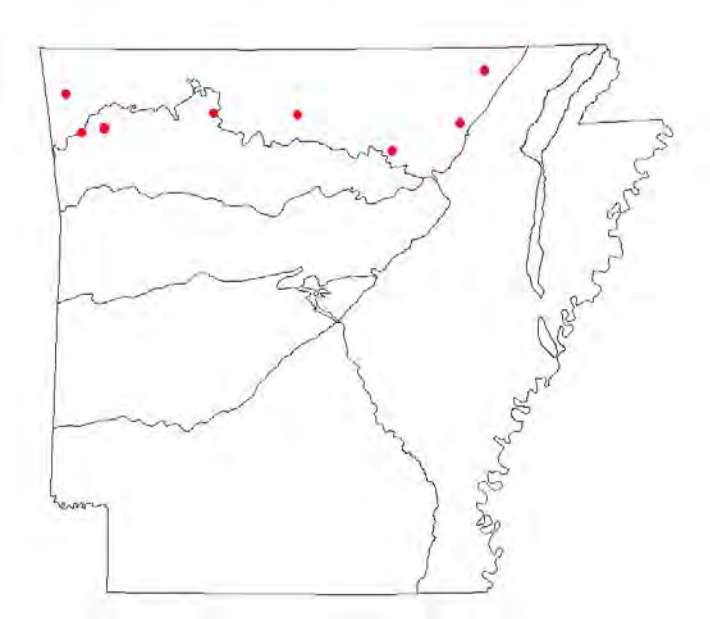
Global Rank: G5 — Secure

State Rank: S1 — Critically imperiled in Arkansas



Distribution

Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☐
- Boston Mountains ☑
- Arkansas Valley ☐
- Ouachita Mountains ☐
- South Central Plains ☐
- Mississippi Alluvial Plain ☐
- Mississippi Valley Loess Plain ☐



Habitat Map



Habitats	Weight
Caves, Mines, Sinkholes and other Karst Features	Obligate

Problems Faced

Disturbance of cave habitat and recharge zone.	Threat: Habitat disturbance Source: Recreation
Groundwater contamination.	Threat: Toxins/contaminants Source: Municipal/Industrial point source

Data Gaps/Research Needs

Need to obtain baseline information on distribution and population status.

Conservation Actions	Importance	Category
Maintain groundwater quality.	Medium	Habitat Protection
Protect cave habitat and recharge zone from development or disturbance.	Medium	Habitat Protection

Monitoring Strategies

Survey for additional populations and monitor known occurrences.

Comments

An Arkansas endemic species, this pseudoscorpion is only known from Fincher and Carrol Caves in Washington County (Hoff and Bolsterti 1956).

Taxa Association Team and Peer Reviewers

ANHC Mr. Michael Warriner, AGFC Mr. Brian Wagner

Inflectarius magazinensis

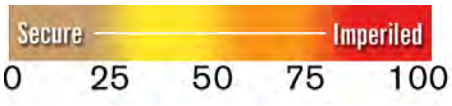
Magazine Mountain Shagreen

Class: Gastropoda

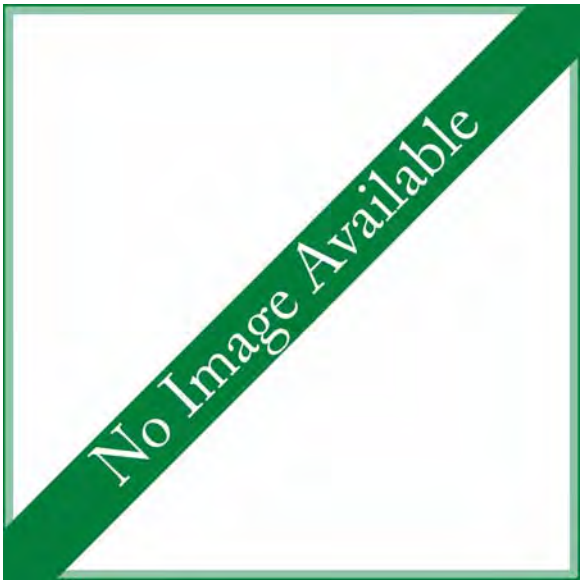
Order: Stylommatophora

Family: Polygyridae

Priority Score: **80** out of 100



Population Trend: Unknown



Global Rank: G1 — Critically imperiled species

State Rank: S1 — Critically imperiled in Arkansas

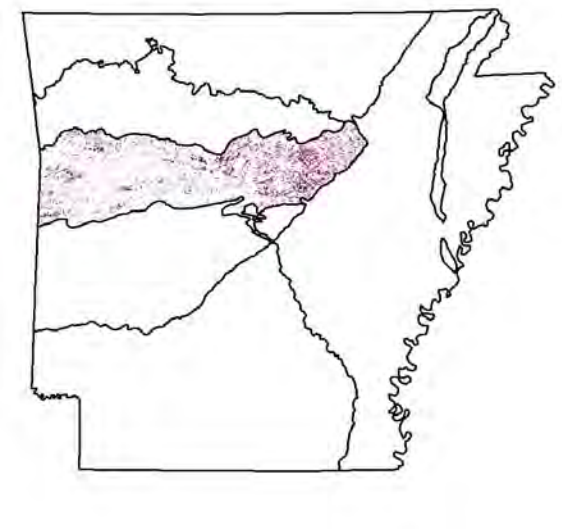
Distribution

Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☐
- Boston Mountains ☐
- Arkansas Valley ☑
- Ouachita Mountains ☐
- South Central Plains ☐
- Mississippi Alluvial Plain ☐
- Mississippi Valley Loess Plain ☐



Habitat Map



Habitats

	Weight
Ozark-Ouachita Cliff and Talus	Optimal

Problems Faced

Development or activities that alter talus slopes where this species occurs.	Threat: Habitat disturbance Source: Forestry activities
Development or activities that alter talus slopes where this species occurs.	Threat: Habitat disturbance Source: Recreation

Data Gaps/Research Needs

Need to assess population status of known occurrences.

Conservation Actions

	Importance	Category
Protect known occurrences from development or activities that could alter talus slopes.	High	Habitat Protection

Monitoring Strategies

Survey for additional populations and monitor known occurrences.

Comments

An Arkansas endemic species only known from sites on Magazine Mountain in Logan County (Pilsbry and Ferriss 1906).

Taxa Association Team and Peer Reviewers

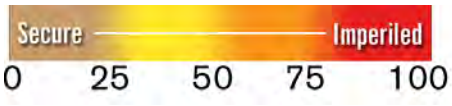
ANHC Mr. Michael Warriner, AGFC Mr. Brian Wagner

Lirceus bicuspidatus

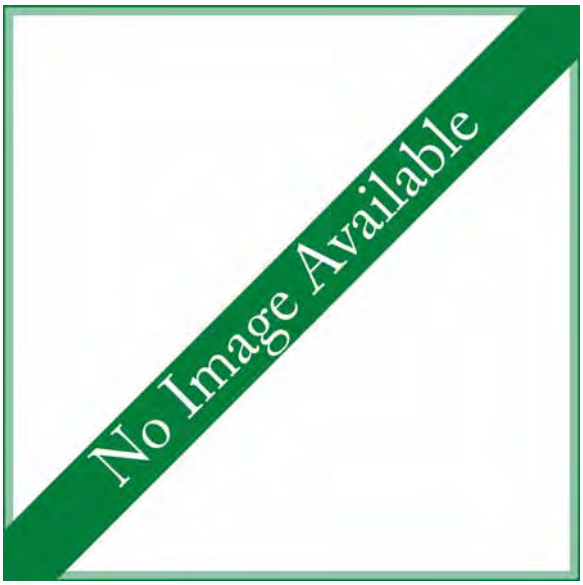
Isopod

Class: Malacostraca
Order: Isopoda
Family: Asellidae

Priority Score: **31** out of 100



Population Trend: Unknown

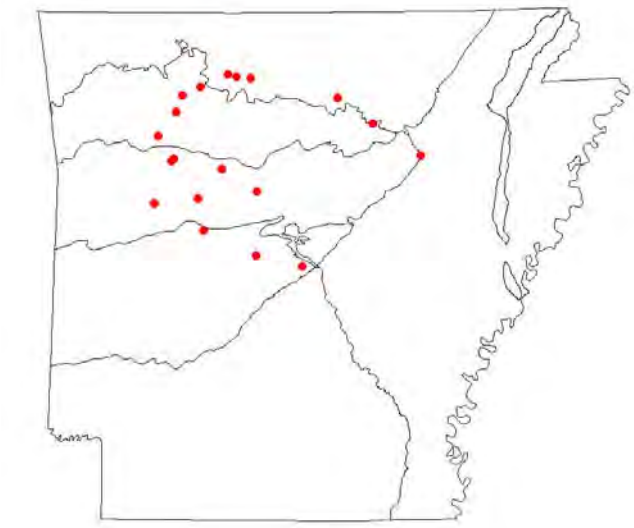


Global Rank: G3Q — Vulnerable (questionable taxonomy)

State Rank: S2 — Imperiled in Arkansas

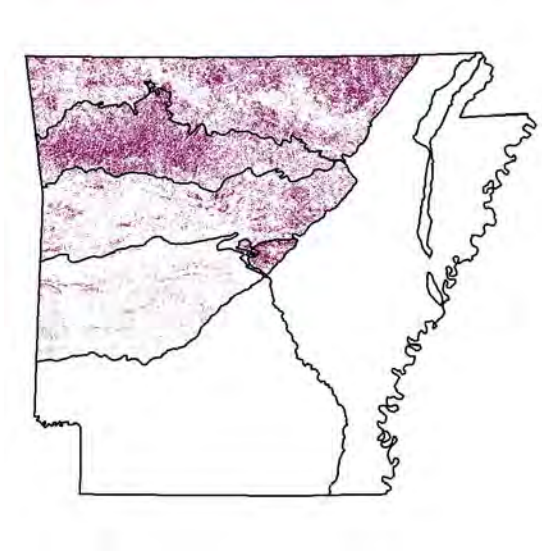
Distribution

Element Occurrence Records



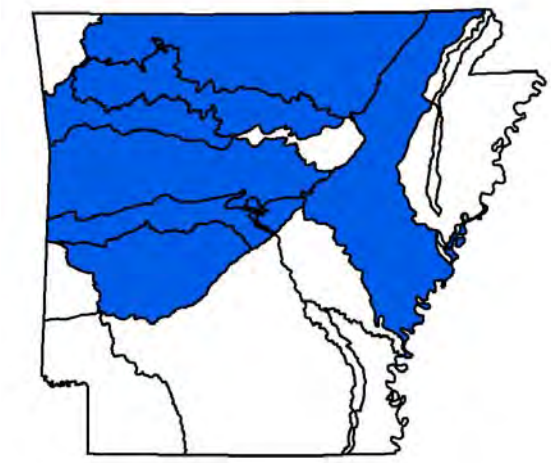
Ecoregions where the species occurs:

- [x] Ozark Highlands
- [x] Boston Mountains
- [x] Arkansas Valley
- [x] Ouachita Mountains
- [ ] South Central Plains
- [ ] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains



Terrestrial Habitats





Ecobasins where this species occurs

Ecobasins

Arkansas Valley - Arkansas River
Arkansas Valley - White River
Boston Mountains - White River
Ouachita Mountains - Arkansas River
Ozark Highlands - White River

Terrestrial Habitats

Caves, Mines, Sinkholes and other Karst Features	Optimal

Lirceus bicuspidatus
Isopod

Aquatic Habitats

Natural Cave Stream: Headwater - Small	Suitable
Natural Seep: Headwater - Small	Suitable
Natural Spring Run: Headwater - Small	Optimal

Problems Faced

Threat: Sedimentation
Source: Resource extraction

Threat: Toxins/contaminants
Source: Municipal/Industrial point source

Data Gaps/Research Needs

Determine life history information.

Determine validity of location data for records in Arkansas Valley and Ouachita Mountains.

Surveys to locate additional populations.

Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

Additional information is needed before a monitoring strategy can be developed.

Comments

This isopod inhabits a variety of biotopes including small seep/springs and streams, and cave streams. Nothing more is known about the biology of this species, except that it is widely known from the mountainous region of Arkansas. (ANHI 2003, Robison and Allen, 1995)

Taxa Team and Peer Reviewers

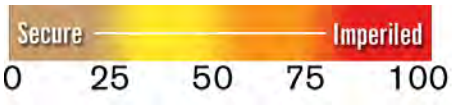
ANHC Mr. Michael Warriner, AGFC Mr. Brian Wagner

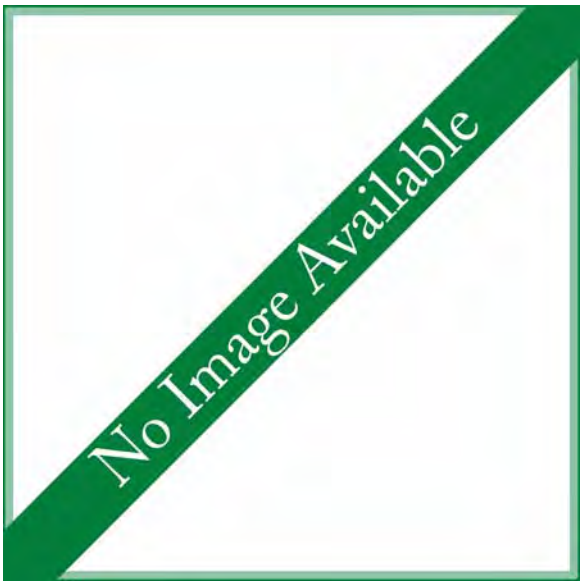
Lirceus bidentatus

Isopod

Class: Malacostraca
Order: Isopoda
Family: Asellidae

Priority Score: **80** out of 100





Population Trend: Unknown

Global Rank: G1? — Critically imperiled (inexact numeric rank)

State Rank: S1 — Critically imperiled in Arkansas

Distribution

Element Occurrence Records



Ecoregions where the species occurs:

- [x] Ozark Highlands
- [ ] Boston Mountains
- [ ] Arkansas Valley
- [ ] Ouachita Mountains
- [ ] South Central Plains
- [ ] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains



Terrestrial Habitats





Ecobasins where this species occurs

Ecobasins

Ozark Highlands - White River

Terrestrial Habitats

Caves, Mines, Sinkholes and other Karst Features	Obligate

Aquatic Habitats

Natural Cave Stream: Headwater - Small	Obligate
Natural Groundwater:	Data Gap
Natural Seep: Headwater - Small	Data Gap
Natural Spring Run: Headwater - Small	Data Gap

Lirceus bidentatus
Isopod

Problems Faced

Threat: Sedimentation
Source: Forestry activities

Threat: Toxins/contaminants
Source: Municipal/Industrial point source

Data Gaps/Research Needs

Determine life history information.

Determine taxonomic status. Validity of this species is in question.

Survey for baseline information on distribution and population status.

Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

More data are needed before a monitoring strategy can be developed.

Comments

This Arkansas endemic isopod is only known from a seep in the Ozark Mountains of Boone County (Hubricht and Mackin 1949).

Taxa Team and Peer Reviewers

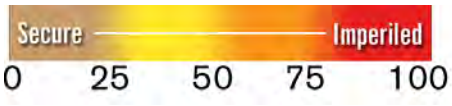
ANHC Mr. Michael Warriner, AGFC Mr. Brian Wagner

Marstonia ozarkensis

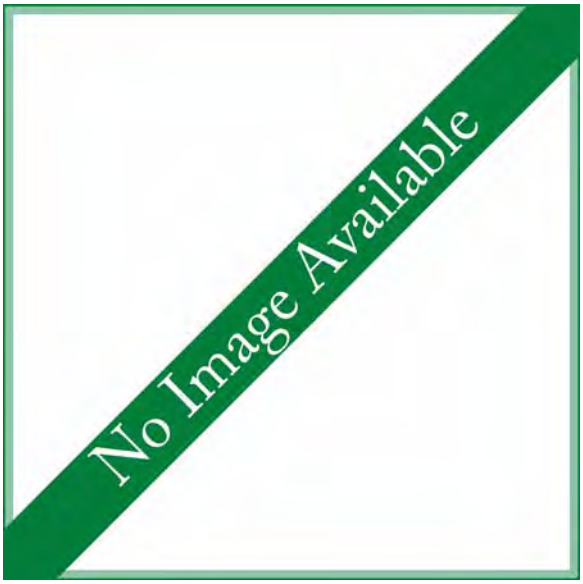
Ozark Pyrg

Class: Gastropoda
Order: Neotaenioglossa
Family: Hydrobiidae

Priority Score: **80** **out of 100**



Population Trend: Unknown



Gobal Rank: G1 — Critically imperiled species

State Rank: S1? — Critically imperiled in Arkansas (inexact numeric rank)

Distribution

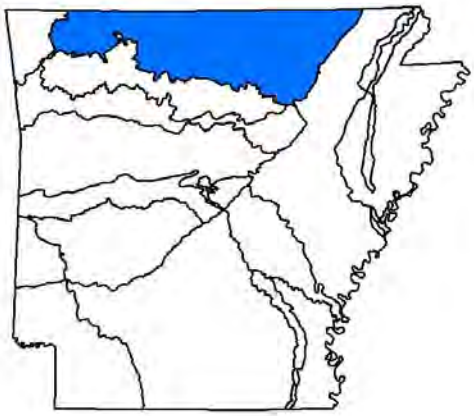
Occurrence Records



Ecoregions where the species occurs:

- [x] Ozark Highlands
- [ ] Boston Mountains
- [ ] Ouachita Mountains
- [ ] Arkansas Valley
- [ ] South Central Plains
- [ ] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains

Ecobasins where the species occurs



Ecobasins

Ozark Highlands - White River

Problems Faced

Threat:
Source:

Data Gaps/Research Needs

Conduct distribution and abundance studies.

Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

Surveys to locate additional populations and protection of stream habitats.

Comments

Freshwater snail reclassified as Marstonia ozarkensis (Hershler and Thompson 1987, Thompson and Hershler 2002, Turgeon and others 1998).

Taxa Association Team and Peer Reviewers

ANHC Mr. Michael Warriner, AGFC Mr. Brian Wagner

Paravitrea aulacogyra

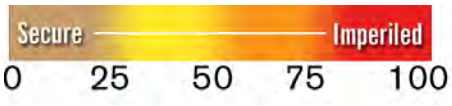
Striate Supercoil

Class: Gastropoda

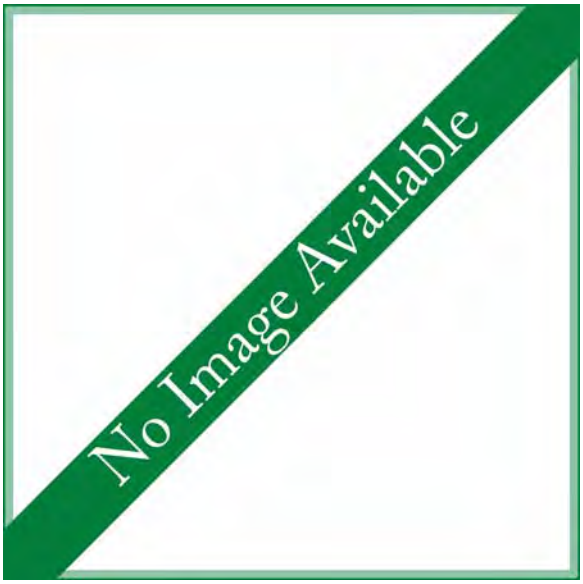
Order: Stylommatophora

Family: Zonitidae

Priority Score: **80** out of 100



Population Trend: Unknown



Global Rank: GHQ — Historic record of questionable taxonomy

State Rank: SH — Historic record. Possibly extirpated in Arkansas

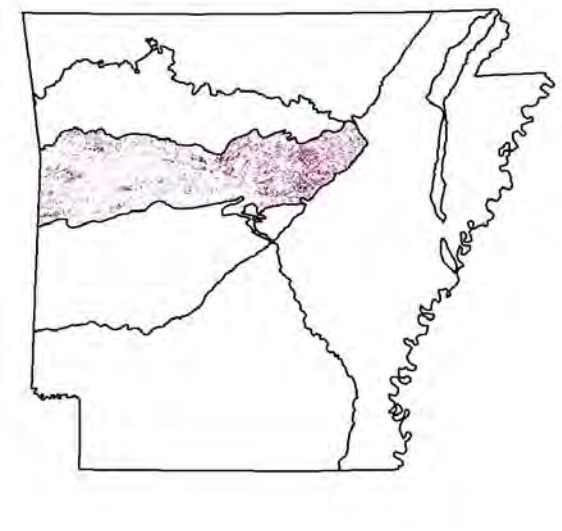
Distribution

Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☐
- Boston Mountains ☐
- Arkansas Valley ☑
- Ouachita Mountains ☐
- South Central Plains ☐
- Mississippi Alluvial Plain ☐
- Mississippi Valley Loess Plain ☐



Habitat Map



Habitats

	Weight
Ozark-Ouachita Cliff and Talus	Optimal

Problems Faced

Forestry practices that disturb litter layer and create xeric conditions.	Threat: Habitat disturbance Source: Forestry activities
Loss of habitat to development.	Threat: Habitat destruction or conversion Source: Recreation

Data Gaps/Research Needs

Need to obtain baseline information on distribution and population status.

Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

Survey areas near known occurrences to locate additional populations.

Comments

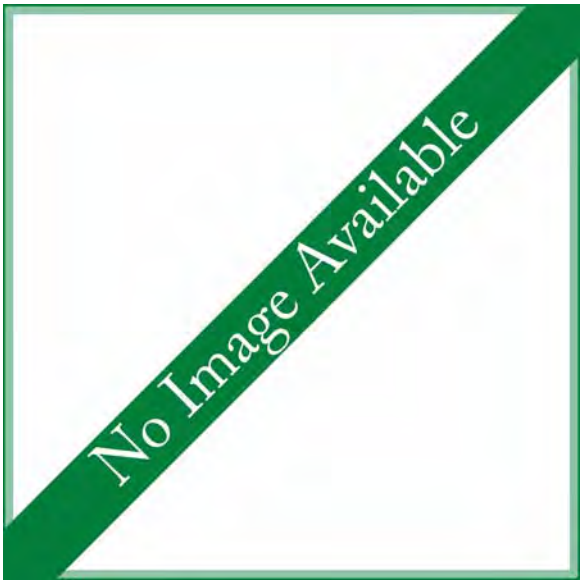
An Arkansas endemic species, this terrestrial snail is known only from a site on the northern summit of Magazine Mountain in Logan County (Pislbry and Ferriss 1906).

Taxa Association Team and Peer Reviewers

ANHC Mr. Michael Warriner, AGFC Mr. Brian Wagner

Patera clenchi

Calico Rock Oval

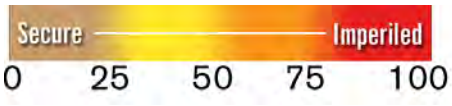


Class: Gastropoda

Order: Stylommatophora

Family: Polygyridae

Priority Score: **65** out of 100



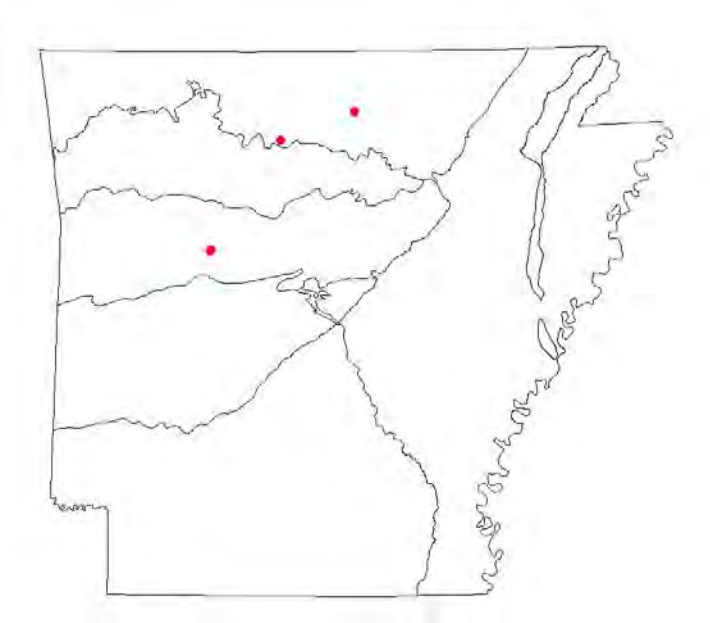
Population Trend: Unknown

Global Rank: G1 — Critically imperiled species

State Rank: SNR — Species not ranked in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☑
- Boston Mountains ☐
- Arkansas Valley ☑
- Ouachita Mountains ☐
- South Central Plains ☐
- Mississippi Alluvial Plain ☐
- Mississippi Valley Loess Plain ☐



Habitat Map



Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

Surveys to locate additional populations.

Comments

Terrestrial snail. (Turgeon and others 1998).

Taxa Association Team and Peer Reviewers

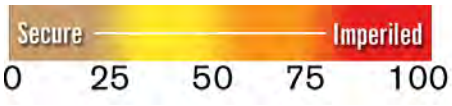
ANHC Mr. Michael Warriner, AGFC Mr. Brian Wagner

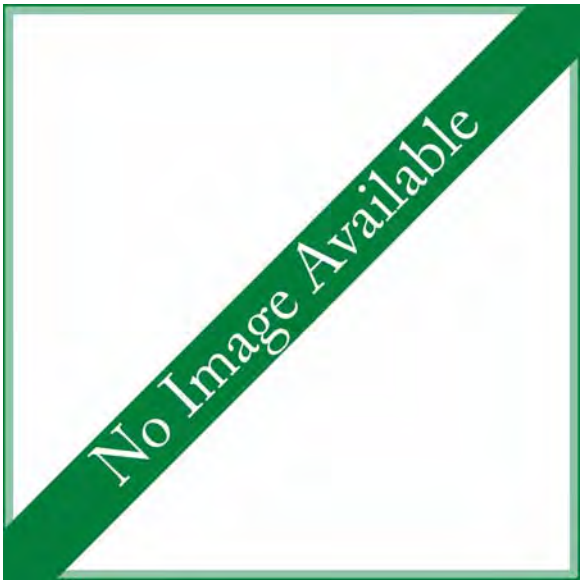
Pseudosinella dubia

Springtail

Class: Elliplura
Order: Collembola
Family: Entomobryidae

Priority Score: **50** out of 100





Population Trend: Unknown

Global Rank: G1G2 — Critically imperiled (uncertain rank)

State Rank: SNR — Species not ranked in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☐
- Boston Mountains ☑
- Arkansas Valley ☐
- Ouachita Mountains ☐
- South Central Plains ☐
- Mississippi Alluvial Plain ☐
- Mississippi Valley Loess Plain ☐



Habitat Map



Habitats

	Weight
Caves, Mines, Sinkholes and other Karst Features	Obligate

Problems Faced

Disturbed litter layer creates xeric conditions.	Threat: Habitat disturbance Source: Forestry activities
Loss of habitat to development.	Threat: Habitat destruction or conversion Source: Urban development

Data Gaps/Research Needs

Determine life history information.

Evaluate taxonomic relationships.

Survey for additional populations.

Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

Additional information is needed before a monitoring strategy can be developed.

Comments

Collembola.

Taxa Association Team and Peer Reviewers

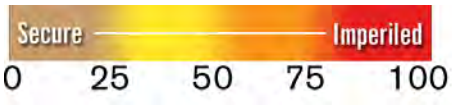
ANHC Mr. Michael Warriner, AGFC Mr. Brian Wagner

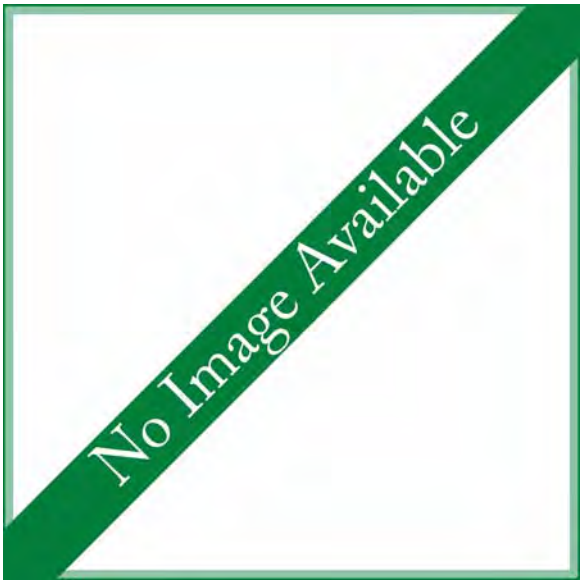
Pseudosinella testa

Shelled Cave Springtail

Class: Elliplura
Order: Collembola
Family: Entomobryidae

Priority Score: **27** out of 100





Population Trend: Unknown

Global Rank: G2G3 — Imperiled (uncertain rank)

State Rank: SNR — Species not ranked in Arkansas

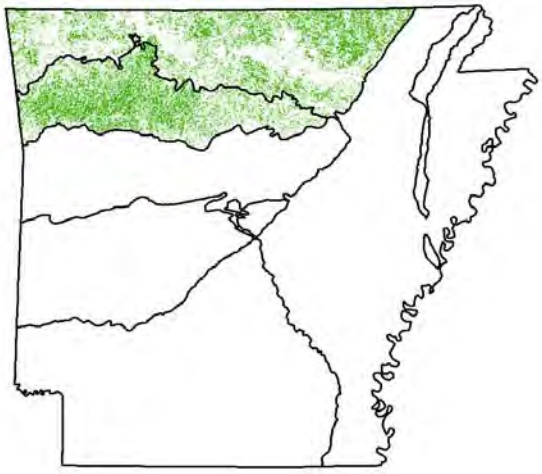
Distribution

Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☑
- Boston Mountains ☑
- Arkansas Valley ☐
- Ouachita Mountains ☐
- South Central Plains ☐
- Mississippi Alluvial Plain ☐
- Mississippi Valley Loess Plain ☐



Habitat Map



Habitats

	Weight
Caves, Mines, Sinkholes and other Karst Features	Obligate

Problems Faced

Development/disturbance of cave habitat and recharge zone.	Threat: Habitat disturbance Source: Urban development
Groundwater contamination.	Threat: Habitat disturbance Source: Urban development

Data Gaps/Research Needs

Determine life history information.

Obtain baseline information on distribution and population status.

Conservation Actions

	Importance	Category
Maintain groundwater quality.	Medium	Habitat Protection
Protect cave habitat and recharge zone from development or disturbance.	Medium	Habitat Protection

Monitoring Strategies

More data are needed before a monitoring strategy can be developed.

Comments

Collembola.

Taxa Association Team and Peer Reviewers

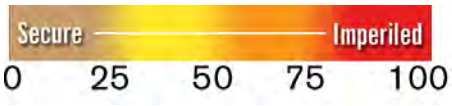
ANHC Mr. Michael Warriner, AGFC Mr. Brian Wagner

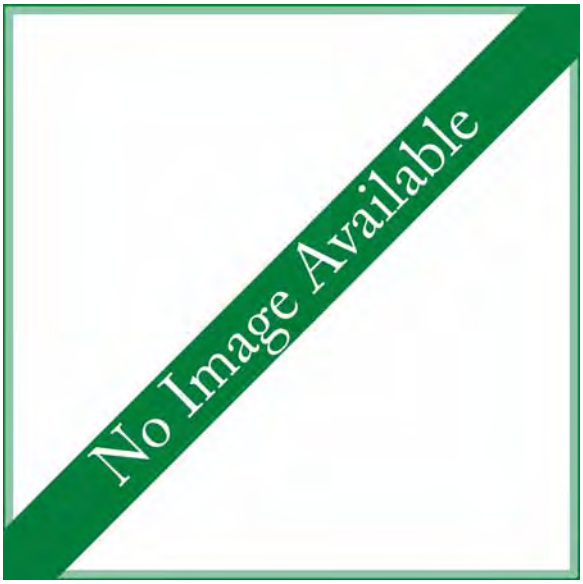
Pygmarrhopalites clarus

Springtail

Class: Elliplura
Order: Collembola
Family: Sminthuridae

Priority Score: 25 out of 100





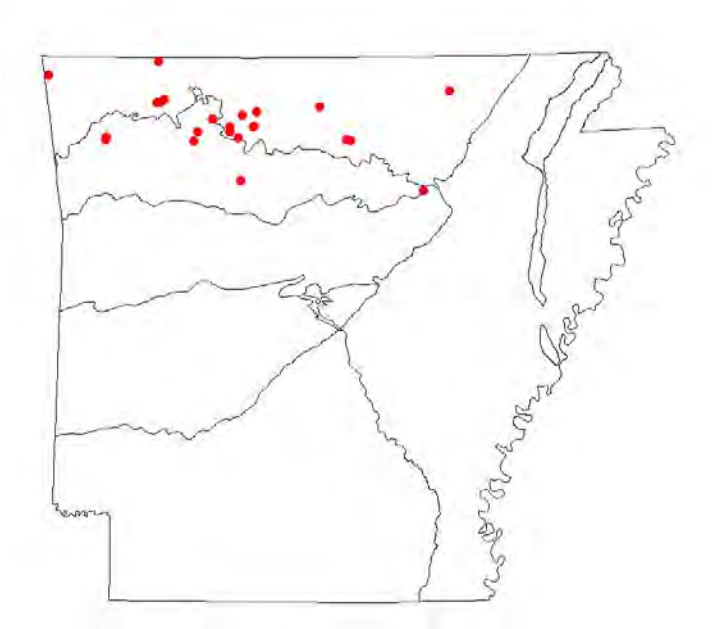
Population Trend: Unknown

Global Rank: G4 — Apparently secure species

State Rank: S1S2 — Critically imperiled in Arkansas (uncertain rank)

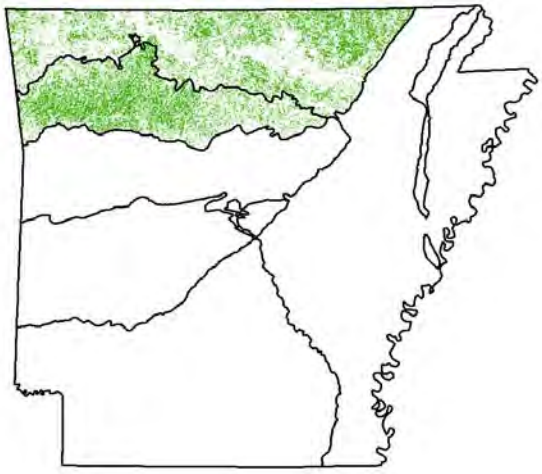
Distribution

Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☑
- Boston Mountains ☑
- Arkansas Valley ☐
- Ouachita Mountains ☐
- South Central Plains ☐
- Mississippi Alluvial Plain ☐
- Mississippi Valley Loess Plain ☐



Habitat Map



Habitats

	Weight
Caves, Mines, Sinkholes and other Karst Features	Obligate

Problems Faced

Development/disturbance of cave habitat and recharge zone.	Threat: Habitat destruction or conversion Source: Urban development
Groundwater contamination.	Threat: Toxins/contaminants Source: Urban development

Data Gaps/Research Needs

Determine life history information.

Survey for baseline information on distribution and population status.

Conservation Actions

	Importance	Category
Maintain groundwater quality.	Medium	Habitat Protection
Protect cave habitat and recharge zone from development or disturbance.	Medium	Habitat Protection

Monitoring Strategies

More data is needed before a monitoring strategy can be developed.

Pygmarrhopalites clarus
Springtail

Comments

Collembola. This is a terrestrial cave adapted springtail that is only known from caves in the Ozarks (personal communication, Mike E. Slay).

Taxa Association Team and Peer Reviewers

ANHC Mr. Michael Warriner, AGFC Mr. Brian Wagner

Schaefferia alabamensis

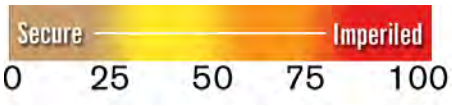
Cave Obligate Springtail

Class: Elliplura

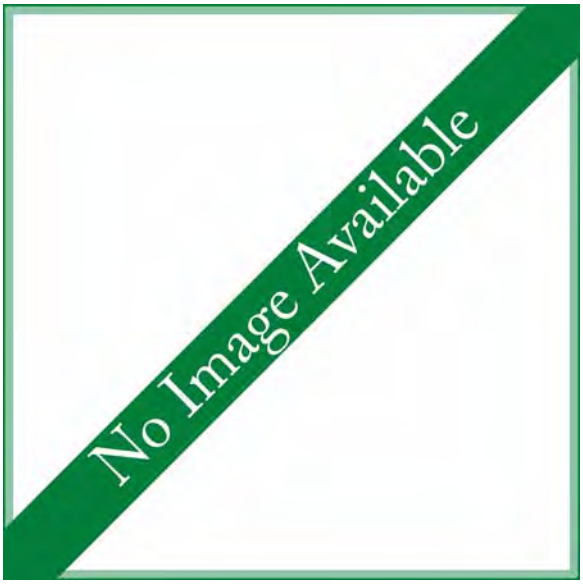
Order: Collembola

Family: Hypogastruridae

Priority Score: **50** out of 100



Population Trend: Unknown



Global Rank: G1G2 — Critically imperiled (uncertain rank)

State Rank: SNR — Species not ranked in Arkansas

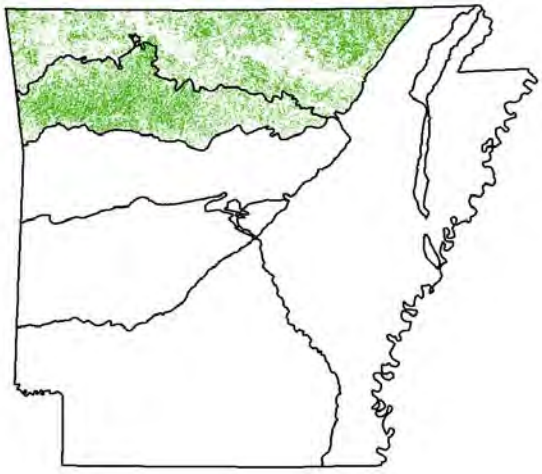
Distribution

Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☑
- Boston Mountains ☑
- Arkansas Valley ☐
- Ouachita Mountains ☐
- South Central Plains ☐
- Mississippi Alluvial Plain ☐
- Mississippi Valley Loess Plain ☐



Habitat Map



Habitats

	Weight
Caves, Mines, Sinkholes and other Karst Features	Obligate

Problems Faced

Development/disturbance of cave habitat and recharge zone.	Threat: Habitat disturbance Source: Urban development
Groundwater contamination.	Threat: Toxins/contaminants Source: Urban development

Data Gaps/Research Needs

Determine life history information.

Survey for baseline information on distribution and population status.

Conservation Actions

	Importance	Category
Maintain groundwater quality.	Medium	Habitat Protection
Protect cave habitat and recharge zone from development or disturbance.	Medium	Habitat Protection

Monitoring Strategies

More data are needed before a monitoring strategy can be developed.

Comments

Collembola. The Arkansas specimens that have been called this species are currently being redescribed as a new species (pers comm., Mike E. Slay).

Taxa Association Team and Peer Reviewers

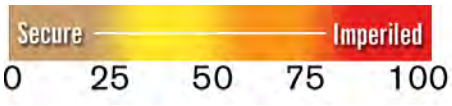
ANHC Mr. Michael Warriner, AGFC Mr. Brian Wagner

Somatogyrus amnicoloides

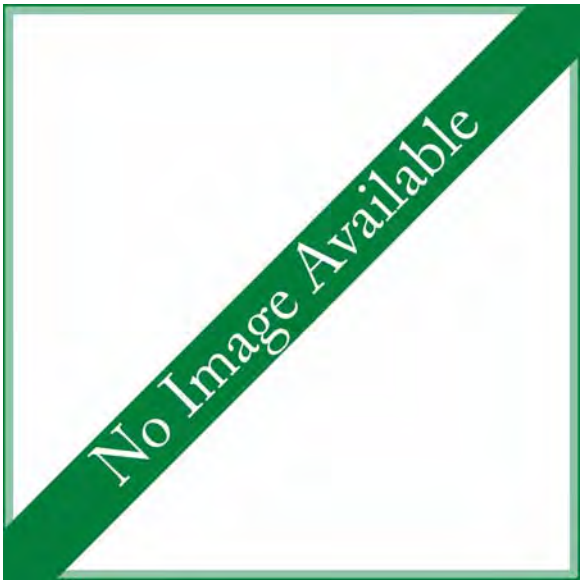
Ouachita Pebblesnail

Class: Gastropoda
Order: Neotaenioglossa
Family: Hydrobiidae

Priority Score: **80** **out of 100**



Population Trend: Unknown

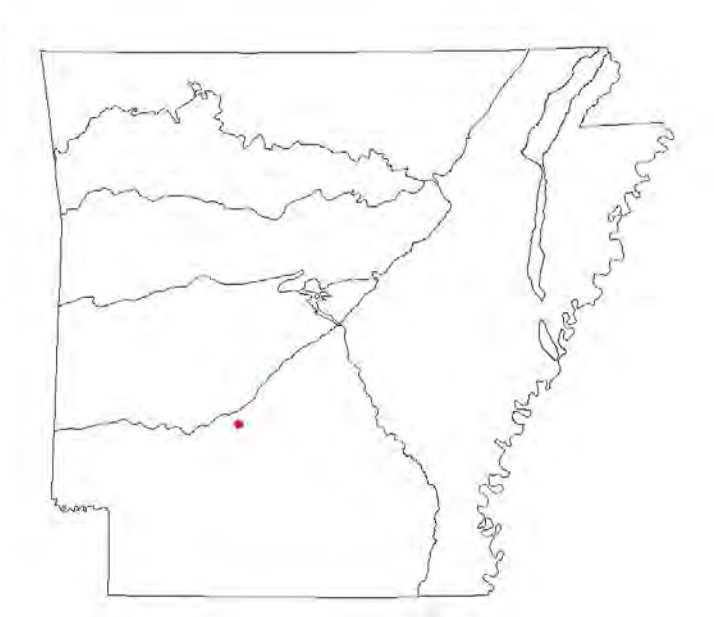


Gobal Rank: GX — Presumed extinct

State Rank: SX — Presumed extinct

Distribution

Occurrence Records



Ecoregions where the species occurs:

- ☐ Ozark Highlands
- ☐ Boston Mountains
- ☐ Ouachita Mountains
- ☐ Arkansas Valley
- ☑ South Central Plains
- ☐ Mississippi Alluvial Plain
- ☐ Mississippi Valley Loess Plains



Ecobasins where the species occurs

Problems Faced

Threat: Toxins/contaminants
Source: Municipal/Industrial point source

Data Gaps/Research Needs

Need to obtain baseline information on distribution and population status.

Conservation Actions

	Importance	Category
More data is needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

Surveys to locate additional populations and protection of stream habitats.

Comments

An endemic freshwater snail known only from the Ouachita River at Arkadelphia in Clark County.
Walker, B. 1915. Apical characters in Somatogyrus with descriptions of three new species. The Nautilus 29(4):37-41.

Taxa Association Team and Peer Reviewers

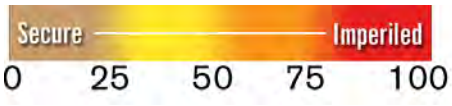
ANHC Mr. Michael Warriner, AGFC Mr. Brian Wagner

Somatogyrus crassilabris

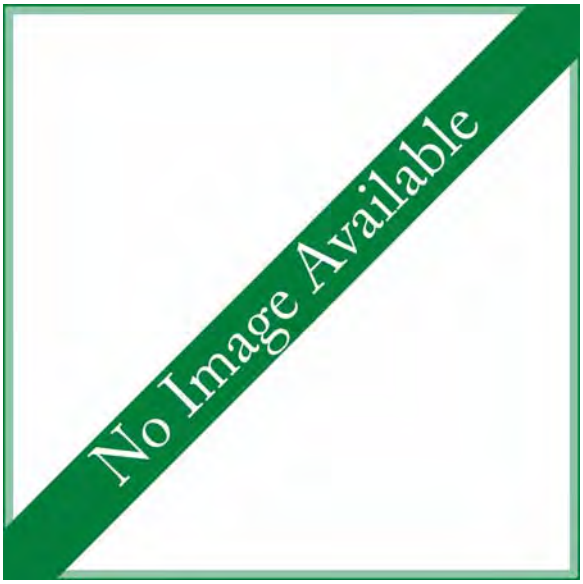
Thicklipped Pebblesnail

Class: Gastropoda
Order: Neotaenioglossa
Family: Hydrobiidae

Priority Score: 80 out of 100



Population Trend: Unknown

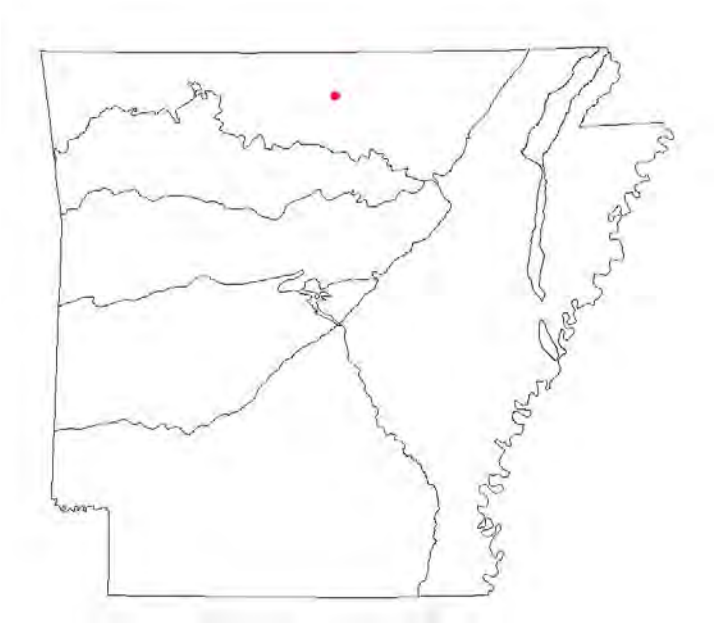


Gobal Rank: GX — Presumed extinct

State Rank: SX — Presumed extinct

Distribution

Occurrence Records



Ecoregions where the species occurs:

- [x] Ozark Highlands
- [ ] Boston Mountains
- [ ] Ouachita Mountains
- [ ] Arkansas Valley
- [ ] South Central Plains
- [ ] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains



Ecobasins where the species occurs

Ecobasins

Ozark Highlands - White River

Problems Faced

Threat: Hydrological alteration
Source: Dam

Data Gaps/Research Needs

Need to obtain baseline information on distribution and population status.

Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

Surveys to locate additional populations.

Comments

This freshwater snail species is also known as the Thick-lip Pebblesnail. It is known only from the North Fork of the White River in Baxter County, Arkansas (Robison and Allen 1995). Presumed extinct from the North Fork of the White River, Norfolk, Arkansas (Burch and Tottenham 1980).

Taxa Association Team and Peer Reviewers

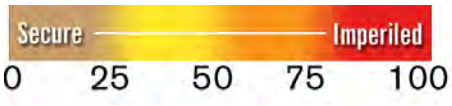
ANHC Mr. Michael Warriner, AGFC Mr. Brian Wagner

Somatogyrus wheeleri

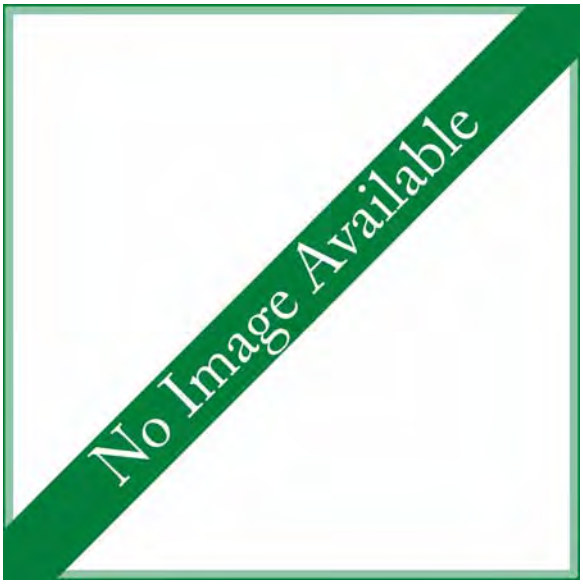
Channelled Pebblesnail

Class: Gastropoda
Order: Neotaenioglossa
Family: Hydrobiidae

Priority Score: **80** **out of 100**



Population Trend: Unknown

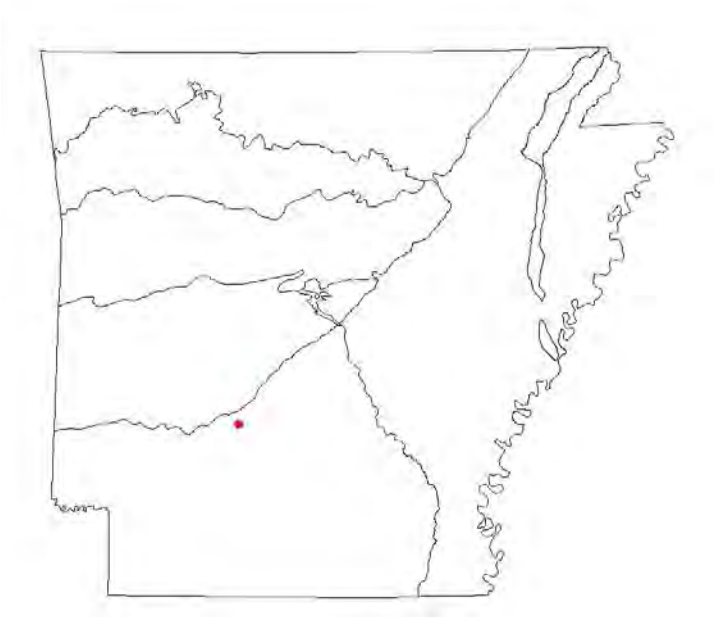


Gobal Rank: GX — Presumed extinct

State Rank: SX — Presumed extinct

Distribution

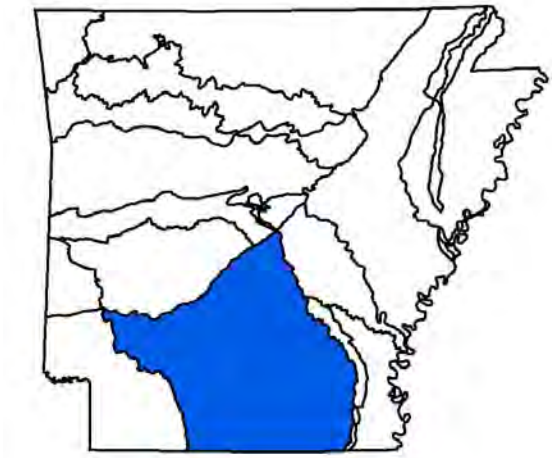
Occurrence Records



Ecoregions where the species occurs:

- ☐ Ozark Highlands
- ☐ Boston Mountains
- ☐ Ouachita Mountains
- ☐ Arkansas Valley
- ☑ South Central Plains
- ☐ Mississippi Alluvial Plain
- ☐ Mississippi Valley Loess Plains

Ecobasins where the species occurs



Ecobasins

South Central Plains - Ouachita River

Problems Faced

Threat: Hydrological alteration
Source: Dam

Data Gaps/Research Needs

Need to obtain baseline information on distribution and population status.

Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

Comments

This freshwater snail species is extirpated in the subnation. Habitat probably destroyed by reservoirs. Known only from the Ouachita River in Clark County, AR (Robison and Allen 1995, Turgeon and others 1998).

Taxa Association Team and Peer Reviewers

ANHC Mr. Michael Warriner, AGFC Mr. Brian Wagner

Stenotrema pilsbryi

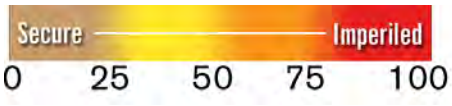
Rich Mountain Slitmouth

Class: Gastropoda

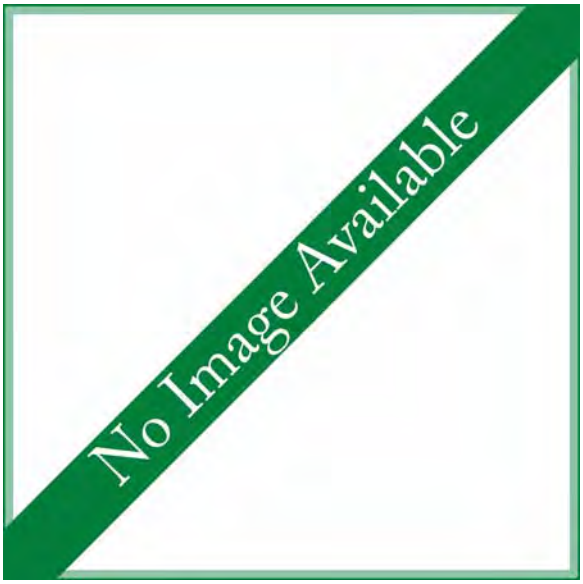
Order: Stylommatophora

Family: Polygyridae

Priority Score: **46** out of 100



Population Trend: Unknown



Global Rank: G2 — Imperiled species

State Rank: S2 — Imperiled in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☐
- Boston Mountains ☐
- Arkansas Valley ☐
- Ouachita Mountains ☑
- South Central Plains ☐
- Mississippi Alluvial Plain ☐
- Mississippi Valley Loess Plain ☐



Habitat Map



Habitats

	Weight
Ozark-Ouachita Cliff and Talus	Obligate

Problems Faced

Road construction maintenance.	Threat: Habitat destruction or conversion Source: Road construction

Data Gaps/Research Needs

Need to obtain baseline information on distribution and population status.

Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

Surveys to locate additional populations and protection of stream habitats.

Comments

Terrestrial snail. It is known from numerous locations associated with rock glaciers usually above the 1600 ft. contour, and usually under hardwood forest cover, on Rich and Black Fork Mountains in AR and OK, and on Winding Stair Mountain, OK. There are no major threats to any of the populations. However, there are some activities that could conceivably impact snail habitat, including mowing, paving and repaving of the Talimena Scenic Drive, maintenance of vistas involving periodic localized vegetation management, and maintenance of hiking trails, electronic transmission sites, and one power line right-of way. Population trends are assumed to be steady (ANHI 2003, Robison and Allen 1995).

Taxa Association Team and Peer Reviewers

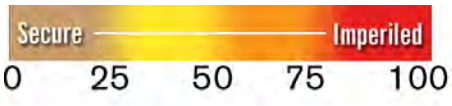
ANHC Mr. Michael Warriner, AGFC Mr. Brian Wagner

Stenotrema unciferum

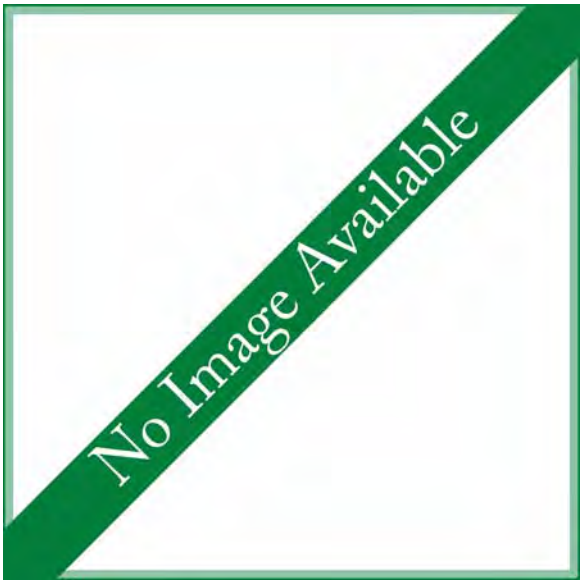
Ouachita Slitmouth

Class: Gastropoda
Order: Stylommatophora
Family: Polygyridae

Priority Score: **34** out of 100



Population Trend: Unknown

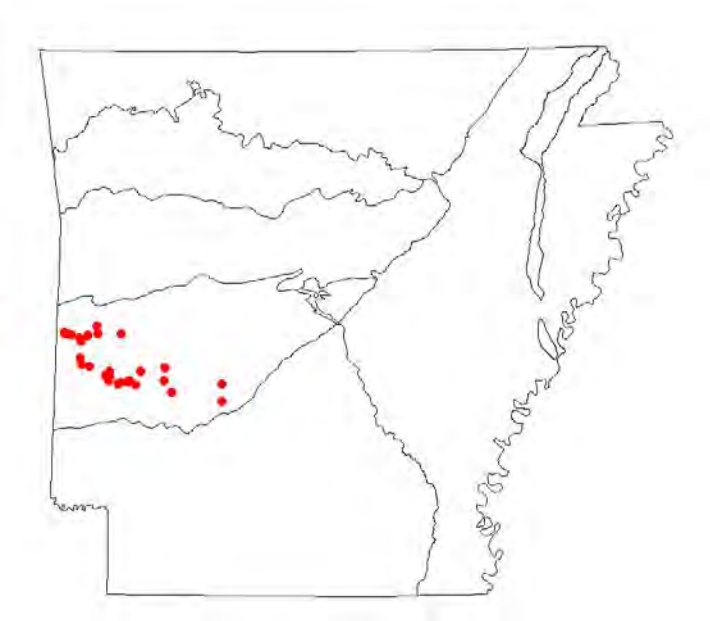


Global Rank: G2 — Imperiled species

State Rank: SNR — Species not ranked in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☐
- Boston Mountains ☐
- Arkansas Valley ☐
- Ouachita Mountains ☑
- South Central Plains ☐
- Mississippi Alluvial Plain ☐
- Mississippi Valley Loess Plain ☐



Habitat Map



Habitats	Weight
Ozark-Ouachita Mesic Hardwood Forest	Obligate

Problems Faced

Habitat disturbance that limits access to dead wood and creates xeric conditions.	Threat: Habitat disturbance Source: Forestry activities

Data Gaps/Research Needs

Need to obtain baseline information on distribution and population status.

Conservation Actions	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

Surveys to locate additional populations and protection of stream habitats.

Comments

Terrestrial snail. Found to occur on moist slopes in rotting timbers, but most particularly under small talus (Brian Coles, pers. Comm.).

Taxa Association Team and Peer Reviewers

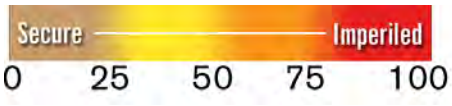
ANHC Mr. Michael Warriner, AGFC Mr. Brian Wagner

Stygobromus elatus

Elevated Spring Amphipod

Class: Malacostraca
Order: Amphipoda
Family: Crangonyctidae

Priority Score: **65** **out of 100**



Population Trend: Unknown



Gobal Rank: G1G2 — Critically imperiled (uncertain rank)

State Rank: S1? — Critically imperiled in Arkansas (inexact numeric rank)

Distribution

Occurrence Records



Ecoregions where the species occurs:

- ☐ Ozark Highlands
- ☐ Boston Mountains
- ☐ Ouachita Mountains
- ☑ Arkansas Valley
- ☐ South Central Plains
- ☐ Mississippi Alluvial Plain
- ☐ Mississippi Valley Loess Plains



Ecobasins where the species occurs

Ecobasins

Arkansas Valley - Arkansas River

Habitats	Weight
Natural Groundwater:	Data Gap
Natural Seep: Headwater - Small	Obligate
Natural Spring Run: Headwater - Small	Data Gap

Problems Faced

Threat: Habitat destruction or conversion
Source: Recreation

Data Gaps/Research Needs

Determine life history information.

Survey for baseline information on distribution and population status.

Conservation Actions	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

More data are needed before a monitoring strategy can be developed.

Comments

An Arkansas endemic amphipod, this species has only been collected from a seep on Magazine Mountain in Logan County (Holsinger 1967).

Taxa Association Team and Peer Reviewers

ANHC Mr. Michael Warriner, AGFC Mr. Brian Wagner

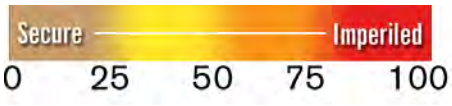
Stygobromus elatus
Elevated Spring Amphipod

Stygobromus montanus

Mountain Cave Amphipod

Class: Malacostraca
Order: Amphipoda
Family: Crangonyctidae

Priority Score: **65** **out of 100**



Population Trend: Unknown

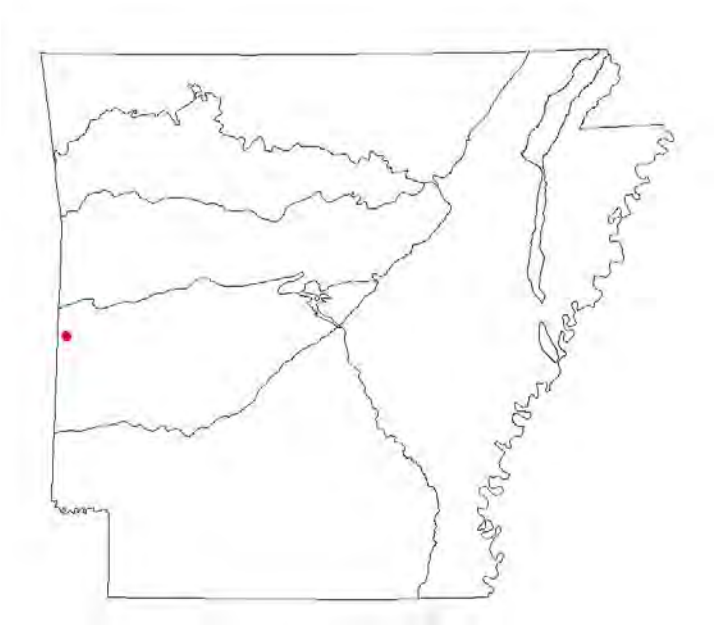


Gobal Rank: G1G2 — Critically imperiled (uncertain rank)

State Rank: S1? — Critically imperiled in Arkansas (inexact numeric rank)

Distribution

Occurrence Records



Ecoregions where the species occurs:

- ☐ Ozark Highlands
- ☐ Boston Mountains
- ☑ Ouachita Mountains
- ☐ Arkansas Valley
- ☐ South Central Plains
- ☐ Mississippi Alluvial Plain
- ☐ Mississippi Valley Loess Plains



Ecobasins where the species occurs

Ecobasins

Ouachita Mountains - Arkansas River

Habitats

	Weight
Natural Groundwater:	Data Gap
Natural Seep: Headwater - Small	Optimal

Problems Faced

Threat: Habitat disturbance
Source: Forestry activities

Threat: Toxins/contaminants
Source: Municipal/Industrial point source

Data Gaps/Research Needs

Determine life history information.

Survey for baseline information on distribution and population status.

Conservation Actions

	Importance	Category
Protect seeps and seep recharge zones.	Medium	Habitat Protection

Monitoring Strategies

More data are needed before a monitoring strategy can be developed.

Comments

This Arkansas endemic amphipod has only been collected from a unidentified spring on Rich Mountain (Holsinger 1967).

Taxa Association Team and Peer Reviewers

ANHC Mr. Michael Warriner, AGFC Mr. Brian Wagner

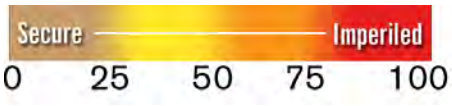
Stygobromus montanus
Mountain Cave Amphipod

Stygobromus ozarkensis

Ozark Cave Amphipod

Class: Malacostraca
Order: Amphipoda
Family: Crangonyctidae

Priority Score: **23** out of 100



Population Trend: Unknown

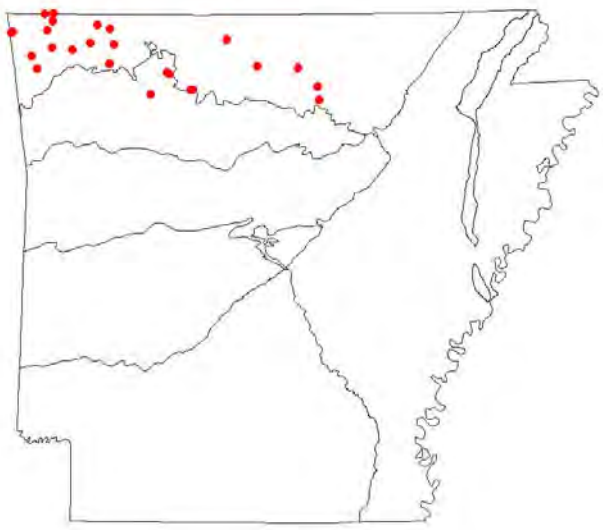
Global Rank: G4 — Apparently secure species

State Rank: S2 — Imperiled in Arkansas



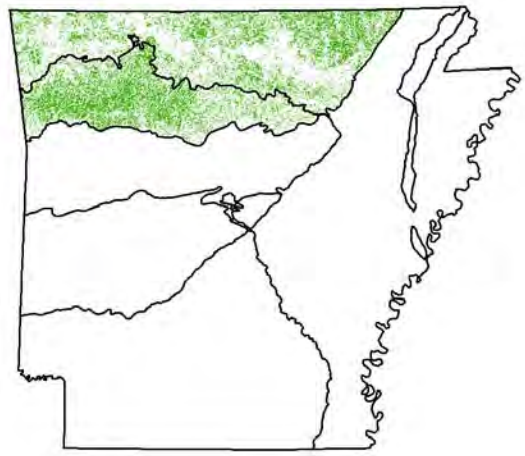
Distribution

Element Occurrence Records



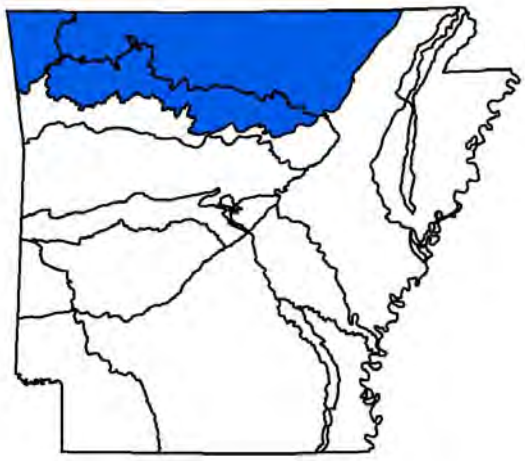
Ecoregions where the species occurs:

- [x] Ozark Highlands
- [x] Boston Mountains
- [ ] Arkansas Valley
- [ ] Ouachita Mountains
- [ ] South Central Plains
- [ ] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains



Terrestrial Habitats





Ecobasins where this species occurs

Ecobasins

Boston Mountains - Arkansas River
Boston Mountains - White River
Ozark Highlands - Arkansas River
Ozark Highlands - White River

Terrestrial Habitats

Caves, Mines, Sinkholes and other Karst Features	Obligate

Stygobromus ozarkensis
Ozark Cave Amphipod

Aquatic Habitats

Natural Cave Stream: Headwater - Small	Optimal
Natural Groundwater:	Optimal
Natural Seep: Headwater - Small	Suitable
Natural Spring Run: Headwater - Small	Marginal

Problems Faced

Threat: Sedimentation
Source: Urban development

Threat: Toxins/contaminants
Source: Urban development

Data Gaps/Research Needs

Determine life history information.

Evaluate taxonomic relationships.

Survey and model for additional occurrences.

Conservation Actions

	Importance	Category
Protect caves and cave recharge zones.	Medium	Habitat Protection

Monitoring Strategies

Monitor known occurrences in cave surveys.

Comments

This crustacean species is limited to groundwater habitats and occurs in fewer than 15 caves in Arkansas (personal communication, Mike E. Slay).

Taxa Team and Peer Reviewers

ANHC Mr. Michael Warriner, AGFC Mr. Brian Wagner

Tartarocreagris ozarkensis

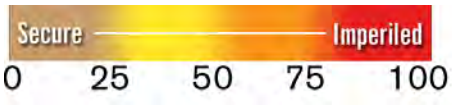
Pseudoscorpion

Class: Arachnida

Order: Pseudoscorpiones

Family: Neobisiidae

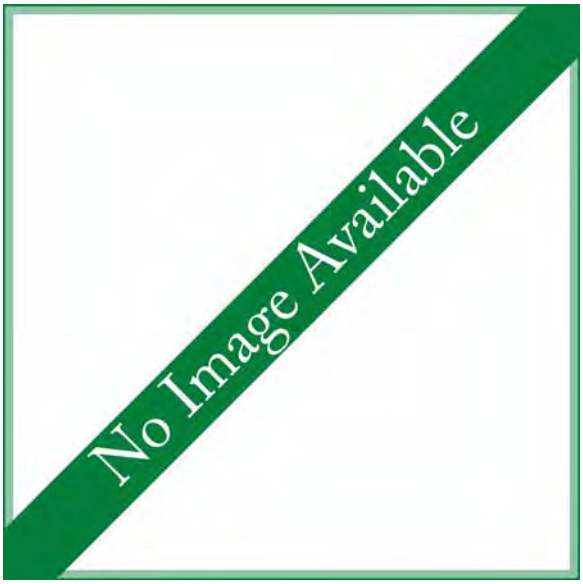
Priority Score: **23** **out of 100**



Population Trend: Unknown

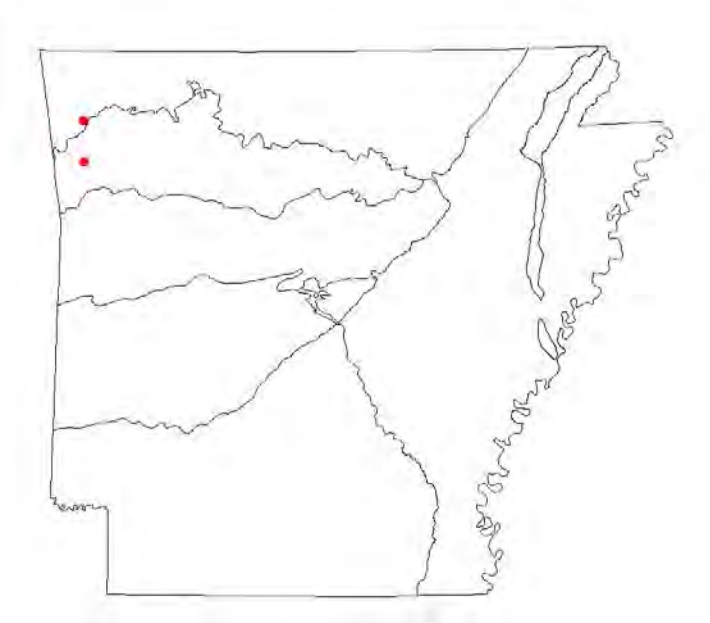
Global Rank: GNR — Not yet ranked

State Rank: S1 — Critically imperiled in Arkansas



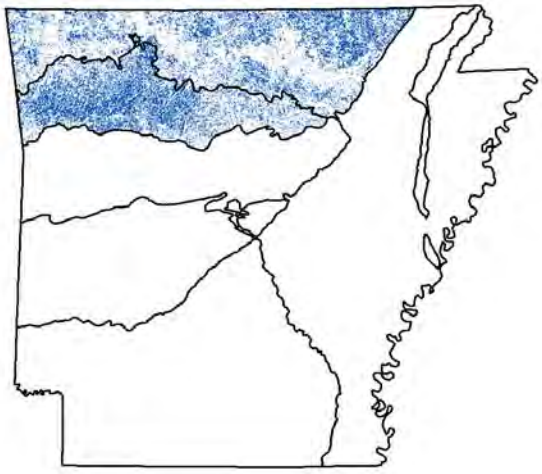
Distribution

Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☑
- Boston Mountains ☑
- Arkansas Valley ☐
- Ouachita Mountains ☐
- South Central Plains ☐
- Mississippi Alluvial Plain ☐
- Mississippi Valley Loess Plain ☐



Habitat Map



Habitats	Weight
Ozark-Ouachita Dry-Mesic Oak Forest	Suitable
Ozark-Ouachita Mesic Hardwood Forest	Suitable

Problems Faced

Timber harvesting that decreases available dead wood and leads to more xeric forest conditions.	Threat: Habitat disturbance Source: Forestry activities

Data Gaps/Research Needs

Need to obtain baseline information on distribution and population status.

Conservation Actions

	Importance	Category
Limit timber harvesting in areas where this species is known to occur.	Medium	Habitat Protection

Monitoring Strategies

Survey for additional populations and monitor known occurrences.

Comments

An Arkansas endemic pseudoscorpion that has been collected only from Washington County (Hoff 1945).

Taxa Association Team and Peer Reviewers

ANHC Mr. Michael Warriner, AGFC Mr. Brian Wagner

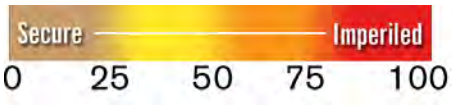
Tartarocreagris ozarkensis
Pseudoscorpion

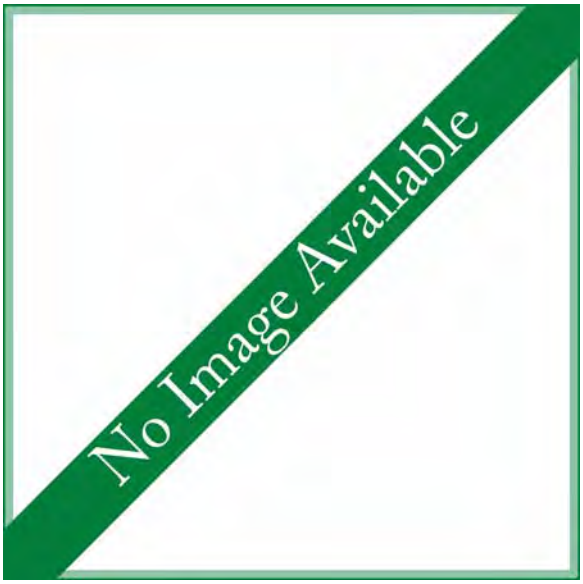
Trigenotyla parca

Cave Obligate Millipede

Class: Diplopoda
Order: Chordeumatida
Family: Trichopetalidae

Priority Score: **65** out of 100





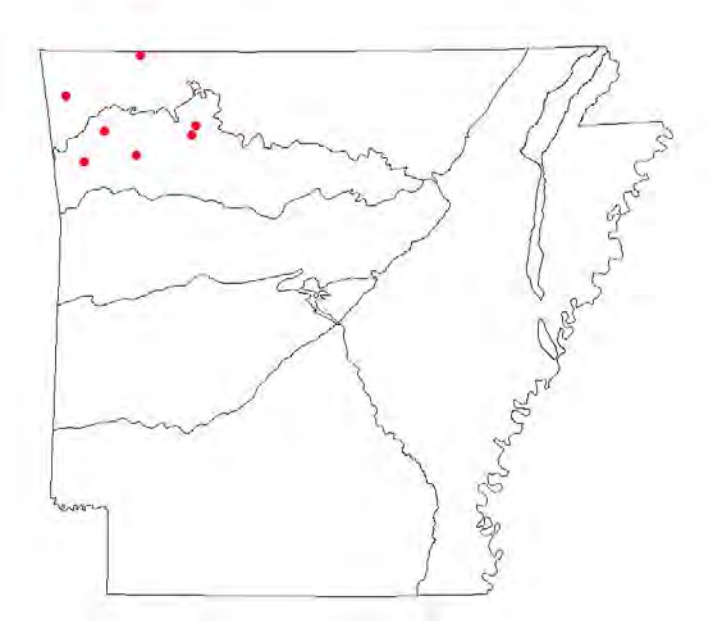
Population Trend: Unknown

Global Rank: G1G2 — Critically imperiled (uncertain rank)

State Rank: S1 — Critically imperiled in Arkansas

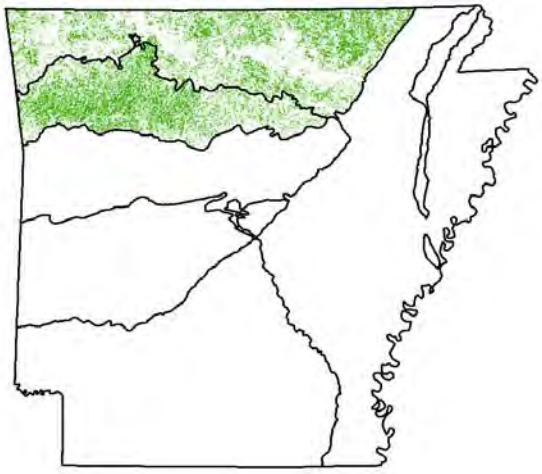
Distribution

Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☑
- Boston Mountains ☑
- Arkansas Valley ☐
- Ouachita Mountains ☐
- South Central Plains ☐
- Mississippi Alluvial Plain ☐
- Mississippi Valley Loess Plain ☐



Habitat Map



Habitats

	Weight
Caves, Mines, Sinkholes and other Karst Features	Obligate

Problems Faced

Development/disturbance of cave habitat and recharge zone.	Threat: Habitat destruction Source: Urban development
Groundwater contamination.	Threat: Toxins/contaminants Source: Non-point source pollution

Data Gaps/Research Needs

Determine life history information.
Obtain baseline information on distribution and population status.

Conservation Actions

	Importance	Category
Maintain groundwater quality.	Medium	Habitat Protection
Protect cave habitat and recharge zone from development or disturbance.	Medium	Habitat Protection

Monitoring Strategies

More data are needed before a monitoring strategy can be developed.

Comments

No information available.

Taxa Association Team and Peer Reviewers

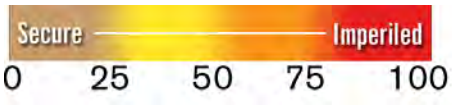
ANHC Mr. Michael Warriner, AGFC Mr. Brian Wagner

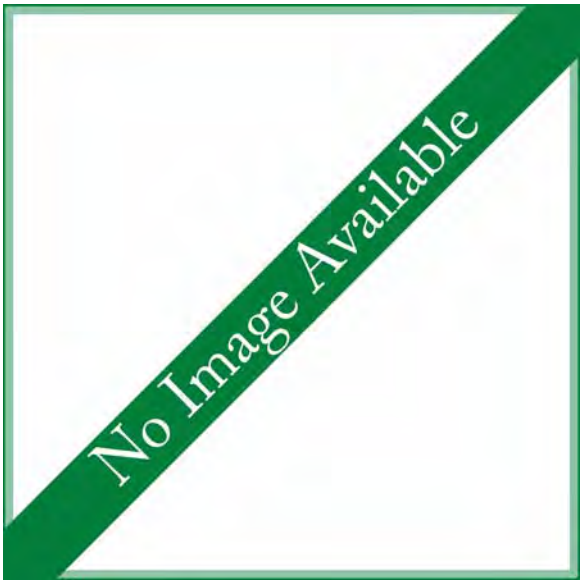
Xolotrema occidentale

Arkansas Wedge

Class: Gastropoda
Order: Stylommatophora
Family: Polygyridae

Priority Score: **65** out of 100





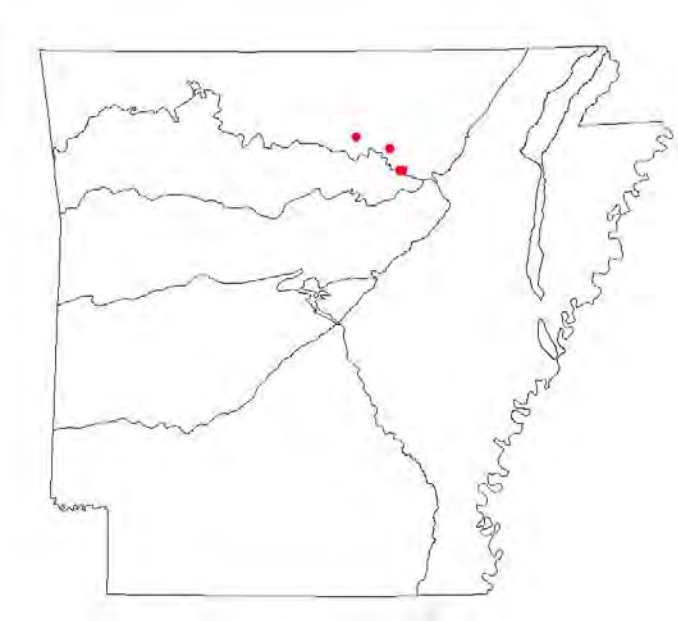
Population Trend: Unknown

Global Rank: G1 — Critically imperiled species

State Rank: SNR — Species not ranked in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☑
- Boston Mountains ☐
- Arkansas Valley ☐
- Ouachita Mountains ☐
- South Central Plains ☐
- Mississippi Alluvial Plain ☐
- Mississippi Valley Loess Plain ☐



Habitat Map



Data Gaps/Research Needs

Need to obtain baseline information on distribution and population status.

Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

Surveys to locate additional populations and protection of stream habitats.

Comments

Terrestrial snail. (Turgeon and others 1998)

Taxa Association Team and Peer Reviewers

ANHC Mr. Michael Warriner, AGFC Mr. Brian Wagner

Zealeuctra wachita

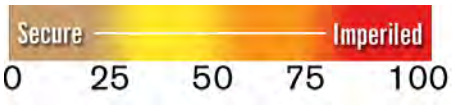
Ouachita Needlefly

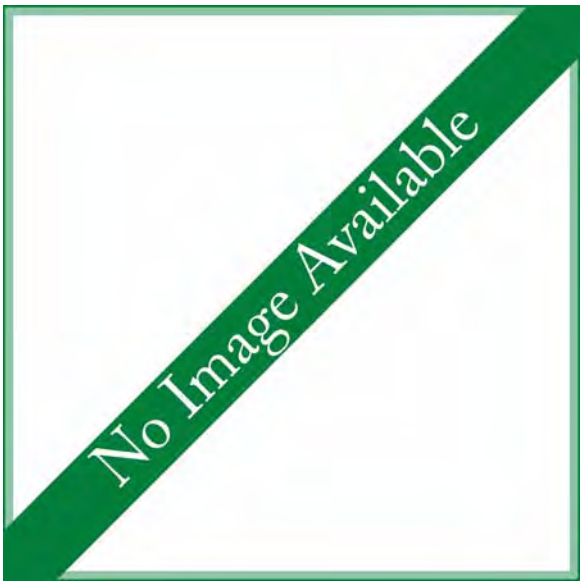
Class: Insecta

Order: Plecoptera

Family: Leuctridae

Priority Score: **50** out of 100





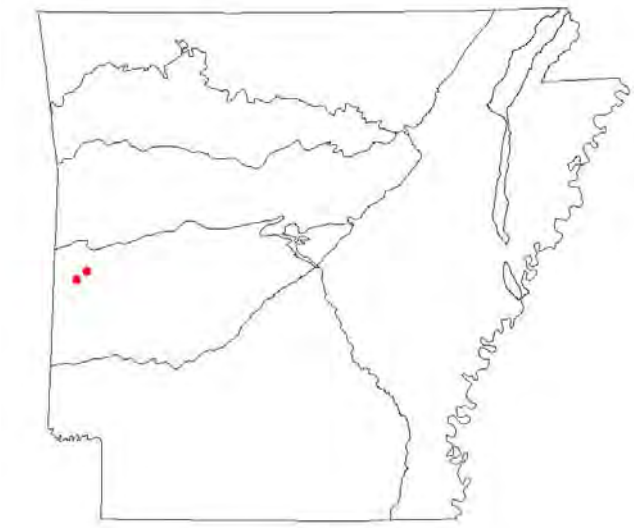
Population Trend: Unknown

Global Rank: G2 — Imperiled species

State Rank: S1 — Critically imperiled in Arkansas

Distribution

Element Occurrence Records



Ecoregions where the species occurs:

- ☐ Ozark Highlands
- ☐ Boston Mountains
- ☐ Arkansas Valley
- ☑ Ouachita Mountains
- ☐ South Central Plains
- ☐ Mississippi Alluvial Plain
- ☐ Mississippi Valley Loess Plains



Terrestrial Habitats





Ecobasins where this species occurs

Ecobasins

Ouachita Mountains - Red River

Problems Faced

Threat: Sedimentation
Source: Resource extraction

Threat: Toxins/contaminants
Source: Municipal/Industrial point source

Data Gaps/Research Needs

Need to obtain baseline information on distribution and population status.

Zealeuctra wachita
Ouachita Needlefly

Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

Surveys to locate additional populations and protection of stream habitats.

Comments

Only known from Polk Co. and Scott Co., Arkansas from fewer than five occurrences. Inhabits intermittent streams (Ricker and Ross 1969).

Taxa Team and Peer Reviewers

ANHC Mr. Michael Warriner, AGFC Mr. Brian Wagner

Corynorhinus rafinesquii

Rafinesque's Big-Eared Bat

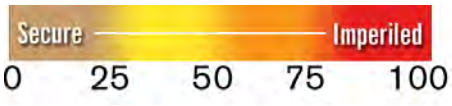


Class: Mammalia

Order: Chiroptera

Family: Vespertilionidae

Priority Score: **29** out of 100



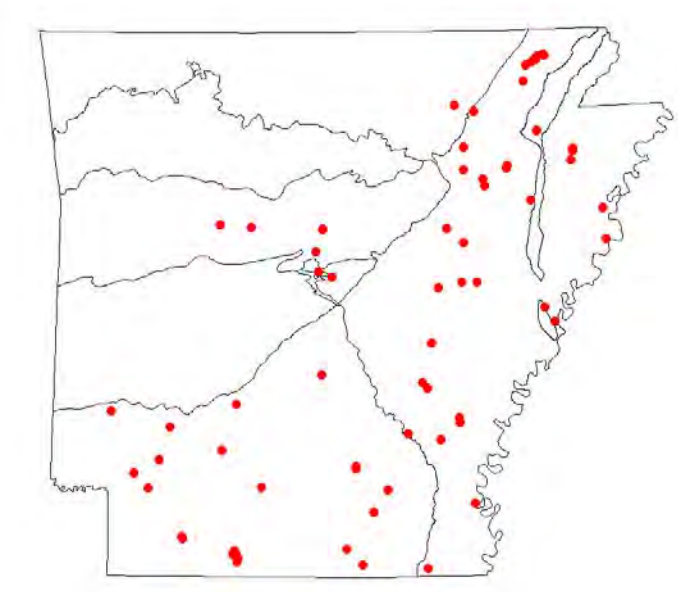
Population Trend: Decreasing

Global Rank: G3G4 — Vulnerable (uncertain rank)

State Rank: S3 — Vulnerable in Arkansas

Distribution

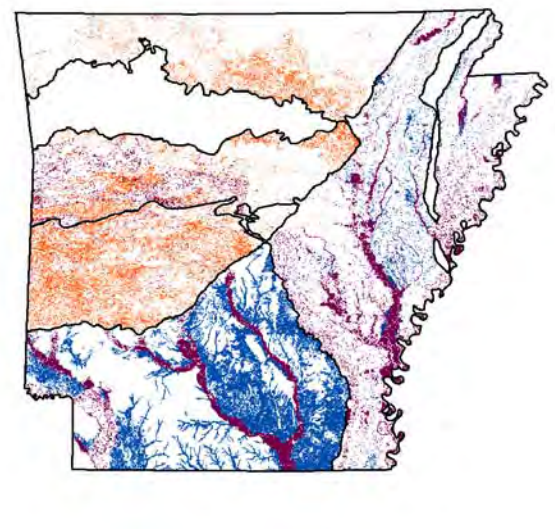
Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☑
- Boston Mountains ☐
- Arkansas Valley ☑
- Ouachita Mountains ☑
- South Central Plains ☑
- Mississippi Alluvial Plain ☑
- Mississippi Valley Loess Plain ☑

Habitat Map





Habitats	Weight
Lower Mississippi River Bottomland Depression	Optimal
Lower Mississippi River Dune Woodland, Pond, and Forest	Marginal
Lower Mississippi River High Bottomland Forest	Optimal
Lower Mississippi River Low Bottomland Forest	Optimal
Lower Mississippi River Riparian Forest	Optimal
Ozark-Ouachita Large Floodplain	Optimal
West Gulf Coastal Plain Large River Floodplain Forest	Optimal
West Gulf Coastal Plain Pine-Hardwood Forest	Marginal
West Gulf Coastal Plain Red River Floodplain Forest	Optimal
West Gulf Coastal Plain Seepage Swamp and Baygall	Optimal
West Gulf Coastal Plain Small Stream/River Forest	Suitable
West Gulf Coastal Plain Wet Hardwood Flatwoods	Suitable

Problems Faced

	Threat: Habitat destruction or conversion Source: Conversion of riparian forest
	Threat: Habitat destruction or conversion Source: Forestry activities
	Threat: Toxins/contaminants Source: Agricultural practices
	Threat: Biological alteration Source: Conversion of riparian forest
Fragmentation of habitat. Loss of habitat. Genetic diversity loss. Loss of old houses and wells.	Threat: Habitat fragmentation Source: Conversion of riparian forest

Data Gaps/Research Needs

Determine foraging behavior.
Determine forest roosting ecology.
Determine if reduction in habitat has reduced genetic diversity.

Conservation Actions

	Importance	Category
Preserve potential artificial roosts.	Low	Habitat Protection
Restore bottomland hardwoods.	High	Habitat Restoration/Improvement

Monitoring Strategies

More information is needed before a monitoring strategy can be developed.

Comments

Occurrence records from the Ozark Highlands and the Boston Mountains are suspect and may be Ozark Big-eared bats.

General Description: Very large ears (27-37 mm); ventral hairs black or blackish at the base, white or whitish at the tips; dorsum pale brown; total length 80-110 mm; hind foot length 8-13 mm; length of forearm 38.8-43.5 mm; greatest length of skull 13.2-15.1 mm; supraorbital region not ridged; maxillary toothrow length 4.7-5.4 mm; first upper incisor has two cusps; 36 teeth; male mass 7.9-9.5 g, female mass 7.9-13.6 g. (ANHI 2003, Baker and Ward 1967, Black 1936, Bunch and Dye 1998, Crump 2003, Crump and others 2003A, 2003C, 2003D, 2003H, Elliot 1994, Gardner and McDaniel 1978, Gardner 1978, Gardner 1978a, Graves and Harvey 1974, Heath and others 1983, Heidt and others 1987, Hoffmeister and Goodpaster 1962, Hurst and Lacki 1999, Kiser and Elliot 1996, McAllister and others 1995, McDaniel and Gardner 1977, Mumford and Cope 1964, NatureServe 2005, Nelson and others 1991, Odegard 2003, ONHI 2003: Penor and others 1996, Pitts and others 1996, Sasse and others 2004, Saugey and others 1993, Sealander 1956, Sealander and Heidt 1990, Steward 1988, Steward 1986, Tumlison 1995).

2007: S Rank changed from S2 to S3.

Research on the genetics of this species has found low genetic connectivity between populations in Arkansas, and that protection of roosts and improvement of habitat corridors could have a positive impact on this factor (Medlin and Risch 2008, Medlin and others 2010, Piaggio and others 2011). Old water wells appear to be important winter habitat for this species, and a technique developed in Arkansas to allow for their continued use by bats while addressing public safety concerns seems to be successful (Sasse and others 2011, Sasse and Saugey 2014). The known distribution of this species by county has been expanded by several studies (Fokidis and others 2005, Medlin and others 2006, Sasse and Saugey 2008).

Taxa Association Team and Peer Reviewers

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Corynorhinus townsendii ingens

Ozark Big-eared Bat

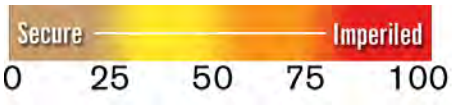


Class: Mammalia

Order: Chiroptera

Family: Vespertilionidae

Priority Score: **80** out of 100



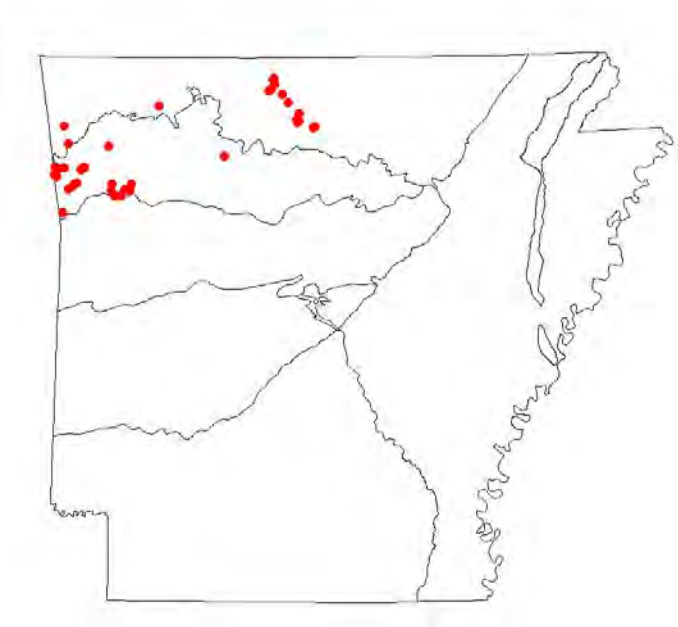
Population Trend: Stable

Global Rank: G3G4T1 — Vulnerable (uncertain rank, critically imperiled subspecies)

State Rank: S1 — Critically imperiled in Arkansas

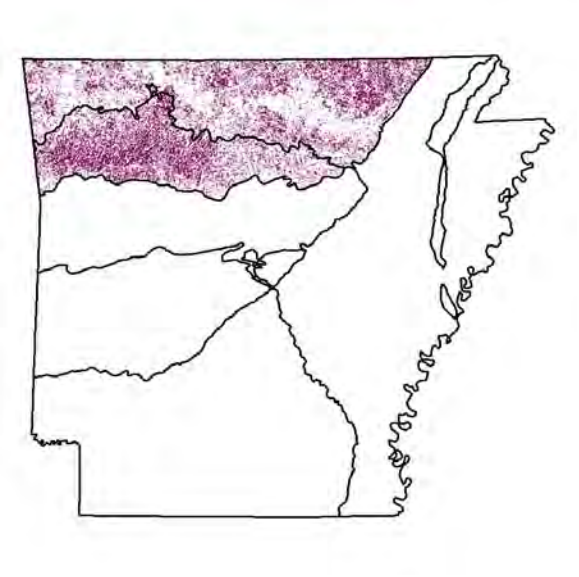
Distribution

Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☑
- Boston Mountains ☑
- Arkansas Valley ☐
- Ouachita Mountains ☐
- South Central Plains ☐
- Mississippi Alluvial Plain ☐
- Mississippi Valley Loess Plain ☐



Habitat Map



Habitats

	Weight
Caves, Mines, Sinkholes and other Karst Features	Optimal
Ozark-Ouachita Cliff and Talus	Optimal
Ozark-Ouachita Dry Oak and Pine Woodland	Suitable
Ozark-Ouachita Riparian	Suitable

Problems Faced

Human disturbance of bats in caves.	Threat: Habitat disturbance Source: Recreation
White-nose Syndrome.	Threat: Extraordinary predation/parasitism/disease Source: Parasites/pathogens
Wind power development.	Threat: Collision with man-made structures Source: Commercial/industrial development

Data Gaps/Research Needs

Address data gaps identified by national white-nose syndrome plan.
Continue search for caves used for roosting.
Determine presence of white-nose syndrome or the fungus that causes it in hibernacula.

Conservation Actions

	Importance	Category
Implement conservation actions recommended by national white-nose syndrome plan.	High	Threat Abatement
Protect caves used by this species.	High	Habitat Protection

Monitoring Strategies

Monitor impacts of white-nose syndrome on populations.
Monitor summer and winter caves in accordance with U.S. Fish and Wildlife Service recovery plan.

Comments

General description: Dorsal hairs brown with fuscous bases, ventral hairs cinnamon with fuscous bases; contrast between hair tips and bases is fairly sharp.

The species is more common in the western U.S. Two subspecies are listed as endangered species.

(Natureserve 2005, Sasse and others 2004, Sealander and Heidt 1990)

2007: No change in S Rank.

A long-term assessment of the overall status of this species in Arkansas and Oklahoma found that populations may be increasing though gaps in survey data make population trends difficult to determine at many sites (Graening and others 2011). Moths, the primary prey species of the Ozark big-eared bat, were found to vary in abundance by habitat type near maternity caves used by this species and that forested riparian corridors are important as foraging habitat (Dodd and Lacki 2007; Dodd and others 2008, Dodd and others 2011).

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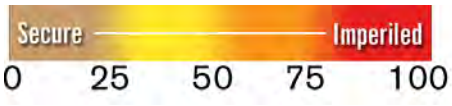
Geomys bursarius ozarkensis

Ozark Pocket Gopher

Class: Mammalia
Order: Rodentia
Family: Geomyidae



Priority Score: **57** **out of 100**



Population Trend: Unknown

Global Rank: G5T1T3 — Secure (critically imperiled or imperiled subspecies)

State Rank: S1 — Critically imperiled in Arkansas

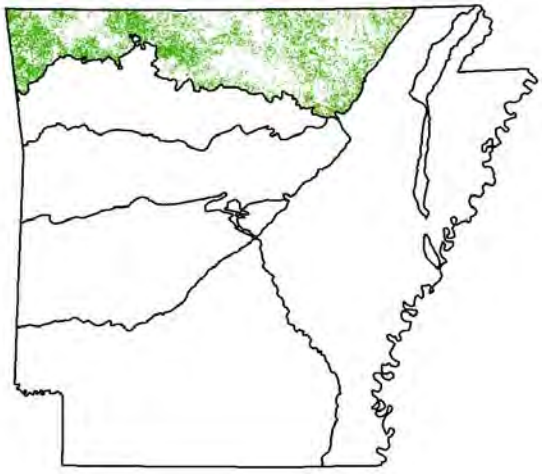
Distribution

Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☑
- Boston Mountains ☐
- Arkansas Valley ☐
- Ouachita Mountains ☐
- South Central Plains ☐
- Mississippi Alluvial Plain ☐
- Mississippi Valley Loess Plain ☐



Habitat Map



Habitats

Habitats	Weight
Crop Land	Marginal
Ozark-Ouachita Riparian	Obligate
Pasture Land	Obligate

Problems Faced

Nuisance control by landowners. Restricted range.	Threat: Death caused by humans Source: Excessive non-commercial harvest or collection
Restricted range.	Threat: Biological alteration Source: Restricted range in Arkansas

Data Gaps/Research Needs

Determine if range restrictions have caused decline in genetic diversity.

Study fall dispersal rates.

Conservation Actions

	Importance	Category
Purchase conservation easements on pasture land to maintain them in grasses and to reduce mortality due to nuisance wildlife control efforts.	High	Land Acquisition

Geomys bursarius ozarkensis
Ozark Pocket Gopher

Monitoring Strategies

Monitor status of known locations on a regular basis.

Comments

This species has a small range and is known only from Izard County, Arkansas. The subspecies was first described in 2000.

(Elrod and others 2000, Natureserve 2005, Sasse and others 2004)

2007: S Rank changed from S? to S1.

Projects conducted under this program have closed data gaps relating to the home range, survival, dispersal, and habitat use for this species, while developing new techniques for capture and monitoring using radiotelemetry (Connior and Risch 2009a, Connior and Risch 2009b, Connior and others 2010, Connior and Risch 2010). A wide number of other species were found to be associated with Ozark pocket gopher burrows (Connior and others 2008).

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Lepus californicus

Black-tailed Jackrabbit

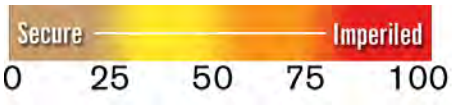


Class: Mammalia

Order: Lagomorpha

Family: Leporidae

Priority Score: **21** **out of 100**



Population Trend: Unknown

Global Rank: G5 — Secure

State Rank: S1S2 — Critically imperiled in Arkansas (uncertain rank)

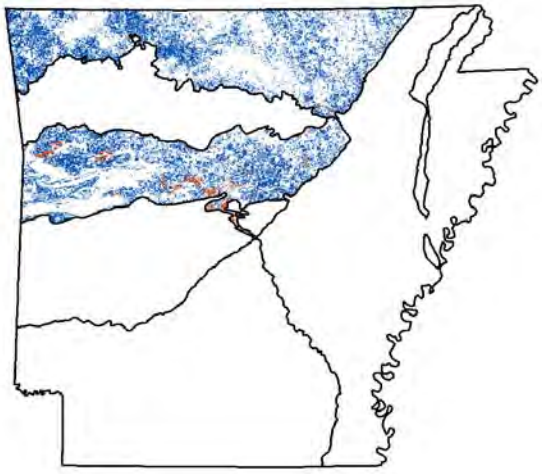
Distribution

Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☑
- Boston Mountains ☐
- Arkansas Valley ☑
- Ouachita Mountains ☐
- South Central Plains ☐
- Mississippi Alluvial Plain ☐
- Mississippi Valley Loess Plain ☐



Habitat Map



Habitats	Weight
Crop Land	Marginal
Ozark-Ouachita Prairie and Woodland	Suitable
Pasture Land	Suitable

Problems Faced

	Threat: Habitat destruction or conversion Source: Agricultural practices
Urbanization with habitat loss.	Threat: Habitat destruction or conversion Source: Urban development

Data Gaps/Research Needs

Determine habitat suitability at potential reintroduction sites.

Survey hunters to obtain observation information.

Conservation Actions	Importance	Category
Encourage conservation easements on open land.	Medium	Habitat Protection
Reintroduce jackrabbits to Arkansas.	Medium	Population Management

Monitoring Strategies

More information is needed before a monitoring strategy can be developed.

Comments

Common in western U.S. Inhabits open plains, fields and deserts, open country with scattered thickets or patches of shrubs. Rests by day in shallow depression (form).

(Natureserve 2005, Sasse and others 2004, Sealander and Heidt 1990)

2007 : S Rank changed from S3 to S1S2.

Taxa Association Team and Peer Reviewers

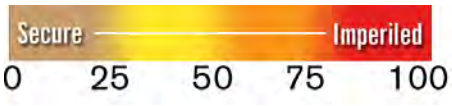
AGFC Mr. Blake Sasse, UALR Dr. Bob Sikes, UAM Dr. Don White, UALR Dr. Gary Heidt, Mr. J. D. Wilhide, HSU Dr. Renn Tumlison, ATU Dr. Tom Nupp, ASU Dr. Thomas Risch, USFS Mr. David Saugey, USFS Dr. Roger Perry, SAU Mr. Matthew Connior, ASU Mr. Stephen Brandenbura

Mustela frenata

Long-tailed Weasel

Class: Mammalia
Order: Carnivora
Family: Mustelidae

Priority Score: **15** out of 100



Population Trend: Unknown

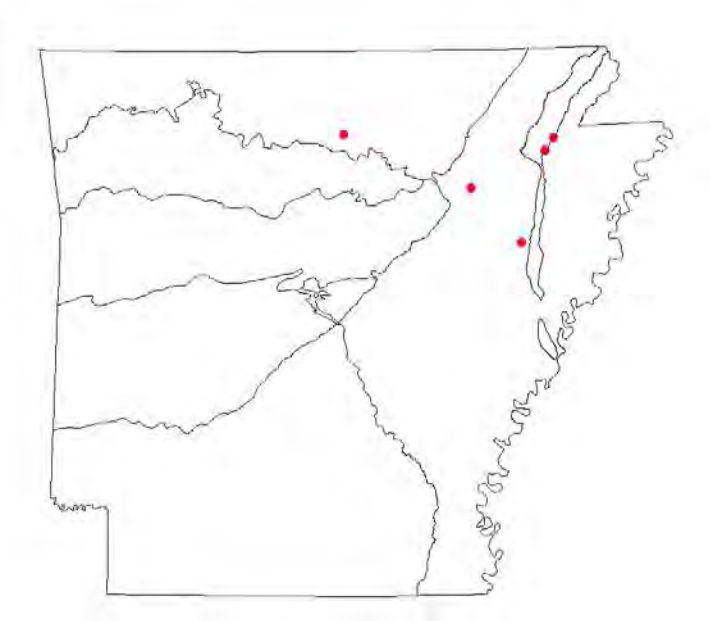


Global Rank: G5 — Secure

State Rank: S3 — Vulnerable in Arkansas

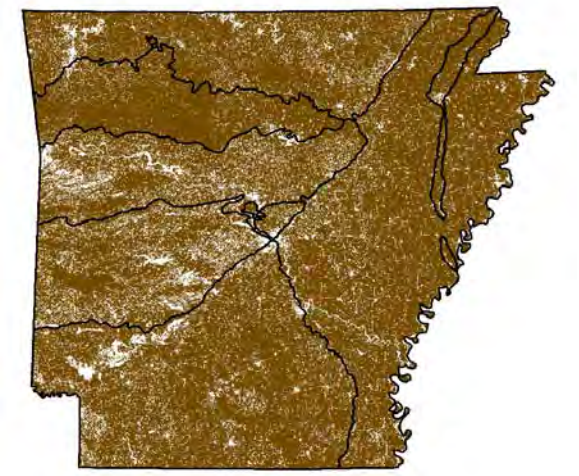
Distribution

Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☑
- Boston Mountains ☑
- Arkansas Valley ☑
- Ouachita Mountains ☑
- South Central Plains ☑
- Mississippi Alluvial Plain ☑
- Mississippi Valley Loess Plain ☑



Habitat Map



Mustela frenata
Long-tailed Weasel

Habitats	Weight
Crop Land	Data Gap
Crowley's Ridge Loess Slope Forest	Data Gap
Cultivated Forest	Data Gap
Interior Highlands Calcareous Glade and Barrens	Data Gap
Interior Highlands Dry Acidic Glade and Barrens	Data Gap
Lower Mississippi Alluvial Plain Grand Prairie	Data Gap
Lower Mississippi Flatwoods Woodland and Forest	Data Gap
Lower Mississippi River Dune Woodland and Forest	Data Gap
Lower Mississippi River Dune Woodland, Pond, and Forest	Data Gap
Lower Mississippi River High Bottomland Forest	Data Gap
Lower Mississippi River Low Bottomland Forest	Data Gap
Lower Mississippi River Riparian Forest	Data Gap
Ouachita Montane Oak Forest	Data Gap
Ozark-Ouachita Dry Oak and Pine Woodland	Data Gap
Ozark-Ouachita Dry-Mesic Oak Forest	Data Gap
Ozark-Ouachita Large Floodplain	Data Gap
Ozark-Ouachita Mesic Hardwood Forest	Data Gap
Ozark-Ouachita Pine/Bluestem Woodland	Data Gap
Ozark-Ouachita Pine-Oak Forest/Woodland	Data Gap
Ozark-Ouachita Prairie and Woodland	Data Gap
Ozark-Ouachita Riparian	Data Gap
Pasture Land	Data Gap
West Gulf Coastal Plain Calcareous Prairie and Woodland	Data Gap
West Gulf Coastal Plain Dry Pine-Hardwood Flatwoods	Data Gap

Habitats	Weight
West Gulf Coastal Plain Large River Floodplain Forest	Data Gap
West Gulf Coastal Plain Mesic Hardwood Forest	Data Gap
West Gulf Coastal Plain Pine-Hardwood Forest	Data Gap
West Gulf Coastal Plain Red River Floodplain Forest	Data Gap
West Gulf Coastal Plain Sandhill Oak and Shortleaf Pine Forest and Woodland	Data Gap
West Gulf Coastal Plain Small Stream/River Forest	Data Gap
West Gulf Coastal Plain Wet Hardwood Flatwoods	Data Gap

Problems Faced

Unknown	Threat: Source:

Data Gaps/Research Needs

Conduct status survey.

Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

More information is needed before a monitoring strategy can be developed.

Comments

Found in a wide variety of habitats, usually near water. Favored habitats include brushland and open woodlands, field edges, riparian grasslands, swamps, and marshes. Dens are in abandoned burrows made by other mammals, rock crevice, brushpile, stump hollow, or space among tree roots; one individual may use multiple dens. Tolerant of close proximity to humans.

Natureserve 2005, Sasse and others 2004, Sealander and Heidt1990. Hall, E. Raymond. 1981.

2007: S rank changed from S2 to S3.

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Myotis austroriparius

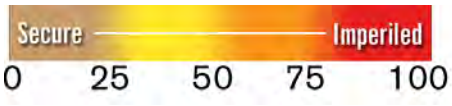
Southeastern Bat

Class: Mammalia

Order: Chiroptera

Family: Vespertilionidae

Priority Score: **24** out of 100



Population Trend: Decreasing

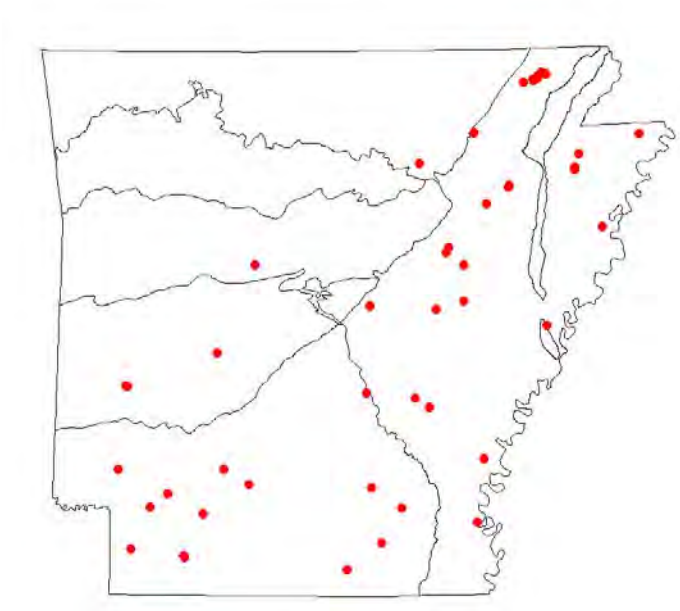


Global Rank: G4 — Apparently secure species

State Rank: S3 — Vulnerable in Arkansas

Distribution

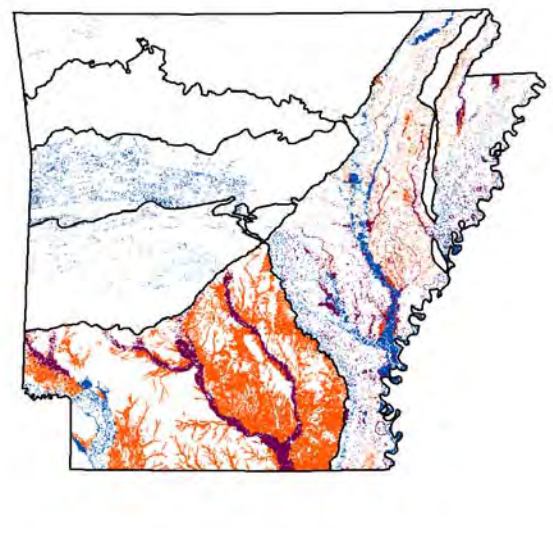
Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☑
- Boston Mountains ☐
- Arkansas Valley ☑
- Ouachita Mountains ☑
- South Central Plains ☑
- Mississippi Alluvial Plain ☑
- Mississippi Valley Loess Plain ☑

Habitat Map





Habitats	Weight
Lower Mississippi Flatwoods Woodland and Forest	Optimal
Lower Mississippi Flatwoods Woodland and Forest	Marginal
Lower Mississippi River Bottomland Depression	Optimal
Lower Mississippi River High Bottomland Forest	Suitable
Lower Mississippi River Low Bottomland Forest	Optimal
Lower Mississippi River Riparian Forest	Suitable
West Gulf Coastal Plain Large River Floodplain Forest	Optimal
West Gulf Coastal Plain Mesic Hardwood Forest	Suitable
West Gulf Coastal Plain Red River Floodplain Forest	Suitable
West Gulf Coastal Plain Small Stream/River Forest	Marginal
West Gulf Coastal Plain Wet Hardwood Flatwoods	Marginal

Problems Faced

Fragmentation of habitat.	Threat: Habitat fragmentation Source: Conversion of riparian forest
Loss of habitat.	Threat: Habitat destruction or conversion Source: Conversion of riparian forest
White-nose Syndrome (in mine-hibernating populations).	Threat: Extraordinary predation/parasitism/disease Source: Parasites/pathogens
Wind power development.	Threat: Collision with man-made structures Source: Commercial/industrial development

Data Gaps/Research Needs

Address data gaps identified by national white-nose syndrome plan.
Determine presence of white-nose syndrome or the fungus that causes it in hibernacula.
Determine roosting ecology.

Conservation Actions

	Importance	Category
Encourage landowners to leave roost trees.	Low	Habitat Protection
Implement conservation actions recommended by national white-nose syndrome plan.	Low	Threat Abatement
Restore bottomland hardwoods.	High	Habitat Restoration/Improvement

Monitoring Strategies

Monitor impacts of white-nose syndrome on populations.
More information is needed before a monitoring strategy can be developed.

Comments

General Description: A bat with dull, somewhat woolly pelage, gray to orange or russet above, tan to white below; hairs have little contrast between tip and base; hairs between the toes extend to or beyond the claw tips; calcar is unkeeled; forearm length is 36-41 mm, ear averages 15 mm, foot averages 10 mm.

(ANHI 2003, Baker and Ward 1967, Benz and others 1997, Crump 2003, Crump 2003A, 2003C, 2003D, 2003H, Davis and others 1955, Foster and others 1978, Graves and Harvey 1974, Harvey and others 1991, Heidt and others 1996, Hofmann and others 1999, LaVal 1970, McAllister and others 1995, McDaniel and Gardner 1977, Mumford and Cope 1964, NatureServe 2005, Odegard 2003, ONHI 2003, Sasse and others 2004, Saugey and others 1993, Saugey 1989, Sealander 1956, Sealander and Heidt 1990, Steward 1988, Steward 1986).

2007: S rank changed from S2? To S3.

Additional information on the distribution and habitat use of this species in the state has been obtained through mist net surveys in eastern and southern Arkansas, highlighting the importance of habitat connectivity (Medlin Jr. and Risch 2008, Medlin and others 2010). The known distribution of this species by county has been expanded by several studies (Fokidis and others 2005, Medlin and others 2006, Tumlison and Robison 2010).

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Myotis grisescens

Gray Bat

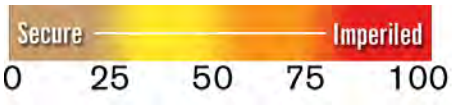


Class: Mammalia

Order: Chiroptera

Family: Vespertilionidae

Priority Score: **16** out of 100



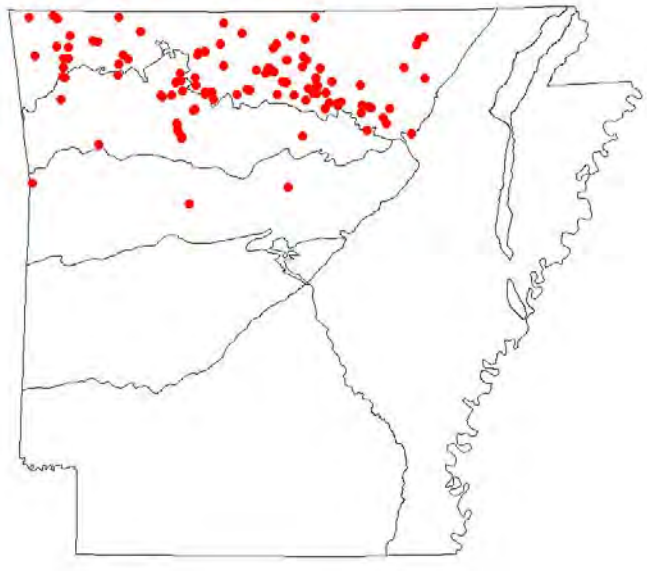
Population Trend: Increasing

Global Rank: G4 — Apparently secure species

State Rank: S2S3 — Imperiled species in Arkansas (uncertain rank)

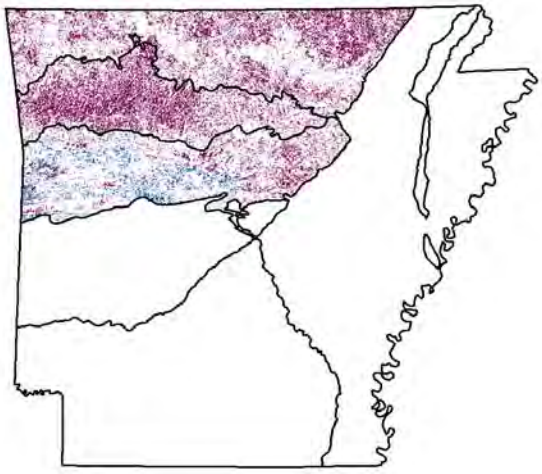
Distribution

Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☑
- Boston Mountains ☑
- Arkansas Valley ☑
- Ouachita Mountains ☐
- South Central Plains ☐
- Mississippi Alluvial Plain ☐
- Mississippi Valley Loess Plain ☐



Habitat Map



Habitats

	Weight
Caves, Mines, Sinkholes and other Karst Features	Optimal
Ozark-Ouachita Large Floodplain	Suitable
Ozark-Ouachita Riparian	Suitable

Problems Faced

	Threat: Hydrological alteration Source: Dam
	Threat: Habitat disturbance Source: Recreation
White-nose Syndrome.	Threat: Extraordinary predation/parasitism/disease Source: Parasites/pathogens
Wind power development.	Threat: Collision with man-made structures Source: Commercial/industrial development

Data Gaps/Research Needs

Address data gaps identified by national white-nose syndrome plan.
Determine migration routes.
Determine presence of white-nose syndrome or the fungus that causes it in hibernacula.

Myotis grisescens
Gray Bat

Conservation Actions

	Importance	Category
Implement conservation actions recommended by national white-nose syndrome plan.	High	Threat Abatement
Protect caves used by this species.	Medium	Habitat Protection

Monitoring Strategies

Continue monitoring caves in accordance with U.S. Fish and Wildlife Service recovery plan.
Monitor impacts of white-nose syndrome on populations.

Comments

A bat with unicolored dorsal fur (gray after the mid-summer molt, at other times sometimes chestnut brown or russet); paler below, with hairs darker basally; wing membrane (gray) connects to the foot at the ankle; calcar is unkeeled; total length 80-105 mm; forearm length 40-46 mm; ear length 14-16 mm; tail length 33-45 mm; hind foot 9-12 mm; mass 7-16 g (usually 8-10 g). wingspread 275-300. Distinct sagittal crest on skull.

Natureserve 2005, Sasse and others 2004, Sealander and Heidt, 1990)

2007: S Rank changed from S2 to S2S3.

An evaluation of the population trends of gray bat in the western portion of its range found that 79% of colonies were stable or increasing, and 9 of 14 actions required by the recovery plan in this region were entirely or partially completed. The dramatic decline in gray bat populations that led to its listing as endangered in 1976 may have halted, and gray bat populations appeared to be recovering (Sasse and others 2007). Pesticides, which were thought to be one of the reasons for the original decline, seem to still be present in gray bats in the state (Sasse 2005). Several counties have been added to the known distribution of this species in Arkansas (Sasse and Saugey 2008).

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Myotis leibii

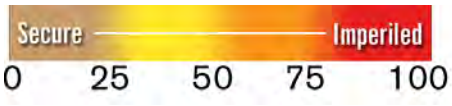
Eastern Small-Footed Bat

Class: Mammalia

Order: Chiroptera

Family: Vespertilionidae

Priority Score: **27** out of 100



Population Trend: Unknown

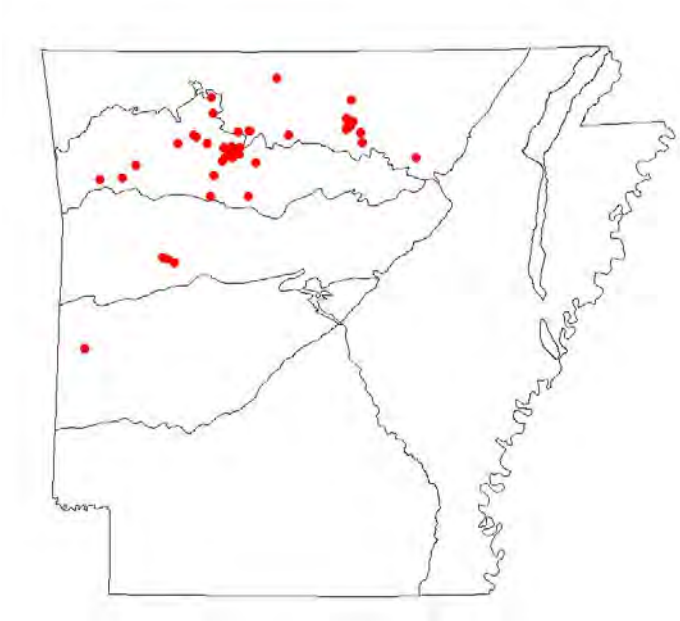


Global Rank: G4 — Apparently secure species

State Rank: S1 — Critically imperiled in Arkansas

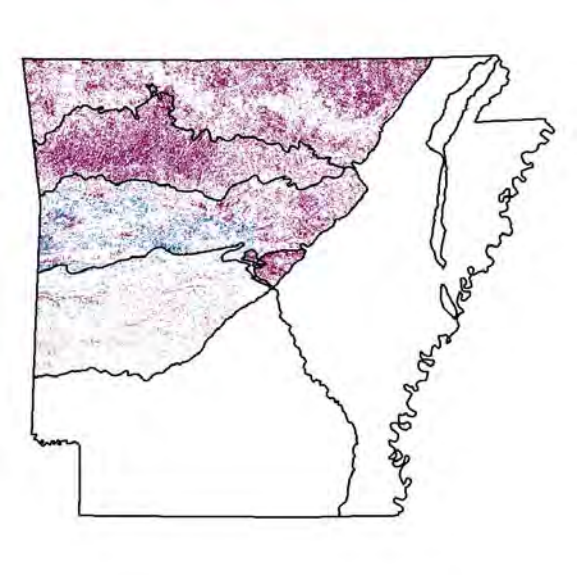
Distribution

Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☑
- Boston Mountains ☑
- Arkansas Valley ☑
- Ouachita Mountains ☑
- South Central Plains ☐
- Mississippi Alluvial Plain ☐
- Mississippi Valley Loess Plain ☐



Habitat Map



Habitats	Weight
Caves, Mines & Karst Habitat	Optimal
Ozark-Ouachita Cliff and Talus	Optimal
Ozark-Ouachita Dry Oak and Pine Woodland	Suitable
Ozark-Ouachita Mesic Hardwood Forest	Suitable
Ozark-Ouachita Riparian	Suitable

Problems Faced

White-nose Syndrome.	Threat: Extraordinary predation/parasitism/disease Source: Parasites/pathogens
Wind power development.	Threat: Collision with man-made structures Source: Commercial/industrial development

Data Gaps/Research Needs

Address data gaps identified by national white-nose syndrome plan.
Conduct surveys needed at caves that may be used during the fall swarming period.
Determine distribution by surveying for this species near exposed rock bluffs.
Determine presence of white-nose syndrome or the fungus that causes it in hibernacula.

Conservation Actions

	Importance	Category
Coordinate with the Arkansas Highway and Transportation Department to avoid disturbance of bridge roosting colonies.	Medium	Threat Abatement
Implement conservation actions recommended by national white-nose syndrome plan.	High	Threat Abatement
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

Monitor impacts of white-nose syndrome on populations.
Monitor status of bridge-roosting colonies.

Comments

This is a very small bat with tiny feet and a dark mask and dark ears. The tragus is long and pointed, and the tail reaches the edge of the interfemoral membrane. There are no prominent chin or nose flaps. The dorsal pelage is pale yellowish brown to golden brown. The ears are black, and the face has a black "mask." The belly hair varies from pale buff to whitish. The bases of the hairs on the back are blackish; wing and tail membranes are very dark brown. The base of the interfemoral membrane and under surfaces of wing membranes are sparsely furred. The calcar has a definitive keel. Sexes are similar; females have two mammae. Size is very small, with total length 72 to 84 mm, tail 30 to 39 mm, hind foot 6 to 8 mm, forearm 30-36 mm, and wingspread 212 to 248 mm; adult mass is 3 to 8 g. These bats generally roost in exposed cliff faces during the summer, but are known to roost in crevices between concrete guard rails on bridges. Status survey citation.

Ozark localities include several caves, utilized primarily as hibernacula (ANHI 2003, Crump 2003, Crump 2003A, 2003C, 2003D, 2003H, Davis and Lidicker 1955, Erdle and Hobson 2001, Harvey and others 1991, LaVal and LaVal 1980, McDaniel and Gardner 1977, McDaniel and others 1982, NatureServe 2005, Odegard 2003, ONHI 2003, Pitts and others 1996, Sasse and others 2004, Saugey and others 1993, Saugey and others 1989, Sealander and Heidt 1990, Wilhide and others 1998). 2007: No change in G or S Rank.

The known distribution of this species has been greatly expanded to include the entire Ozark and Ouachita regions (Sasse and others 2013).

Taxa Association Team and Peer Reviewers

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Myotis lucifugus

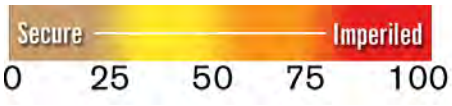
Little Brown Bat

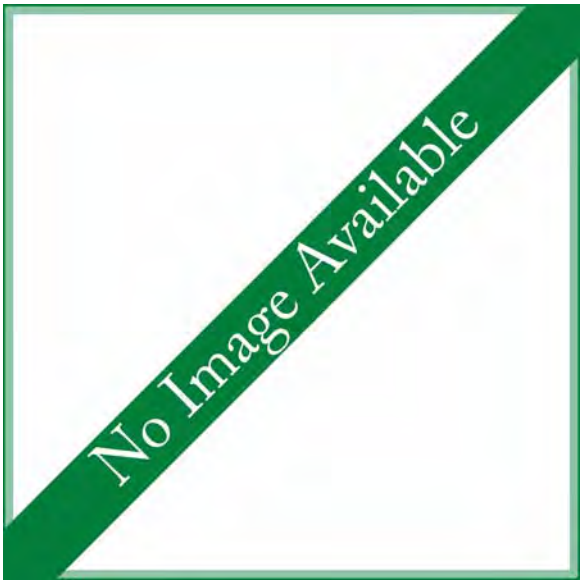
Class: Mammalia

Order: Chiroptera

Family: Vespertilionidae

Priority Score: **33** out of 100





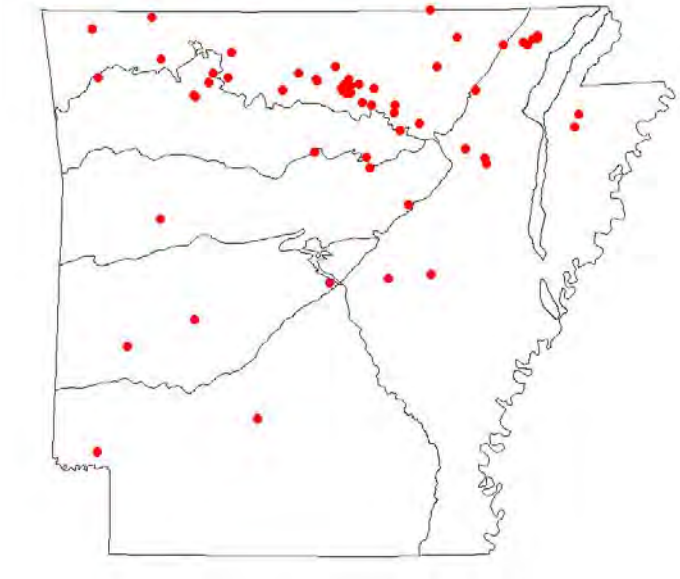
Population Trend: Decreasing

Global Rank: G3 — Vulnerable species

State Rank: S3 — Vulnerable in Arkansas

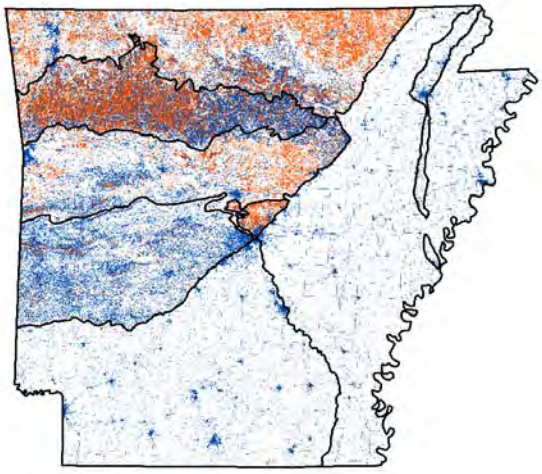
Distribution

Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☑
- Boston Mountains ☑
- Arkansas Valley ☑
- Ouachita Mountains ☑
- South Central Plains ☑
- Mississippi Alluvial Plain ☑
- Mississippi Valley Loess Plain ☑



Habitat Map



Habitats

	Weight
Caves, Mines, Sinkholes and other Karst Features	Optimal
Ozark-Ouachita Cliff and Talus	Marginal
Ozark-Ouachita Pine-Oak Forest/Woodland	Suitable
Urban/Suburban	Suitable

Problems Faced

Human disturbance of bats in caves in winter.	Threat: Habitat disturbance Source: Recreation
White-nose Syndrome.	Threat: Extraordinary predation/parasitism/disease Source: Parasites/pathogens
Wind power development.	Threat: Collision with man-made structures Source: Commercial/industrial development

Data Gaps/Research Needs

Address data gaps identified by national white-nose syndrome plan.
Determine presence of white-nose syndrome or the fungus that causes it in hibernacula.
Determine summer habitat use.

Myotis lucifugus
Little Brown Bat

Conservation Actions

	Importance	Category
Implement conservation actions recommended by national white-nose syndrome plan.	High	Threat Abatement
Protect hibernacula.	High	Habitat Protection

Monitoring Strategies

Monitor impacts of white-nose syndrome on populations.
Monitor winter cave hibernacula.

Comments

This is a medium-sized brown bat that weighs between 5-12 grams. In the winter it hibernates in caves and in the summer roosts in forest trees and commonly in buildings (Sealander and Heidt 1990; Fletcher and others 1991). Though most winter hibernacula are found in the Ozarks, it has been known to winter in mines in the Ouachitas and during the summer can sometimes be found in forested areas far from known wintering sites (Fokidis and others 2005, Medlin Jr. and others 2006, Sasse and Saugey 2008, Sasse and others 2011).

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Myotis septentrionalis

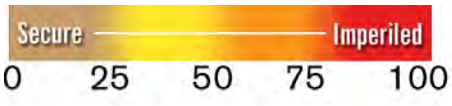
Northern Long-eared Bat

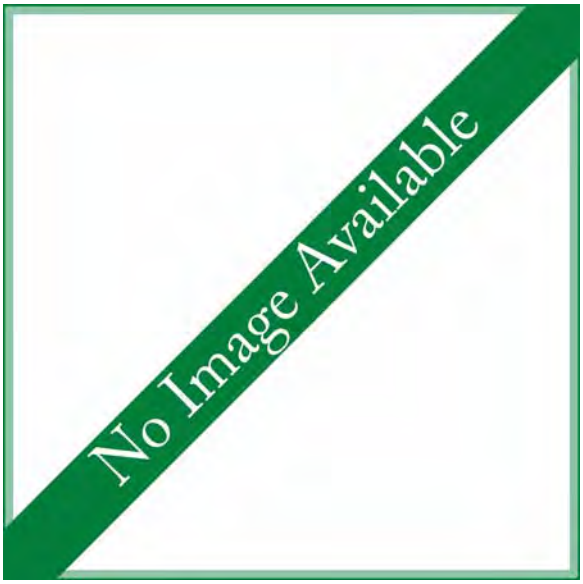
Class: Mammalia

Order: Chiroptera

Family: Vespertilionidae

Priority Score: **63** out of 100





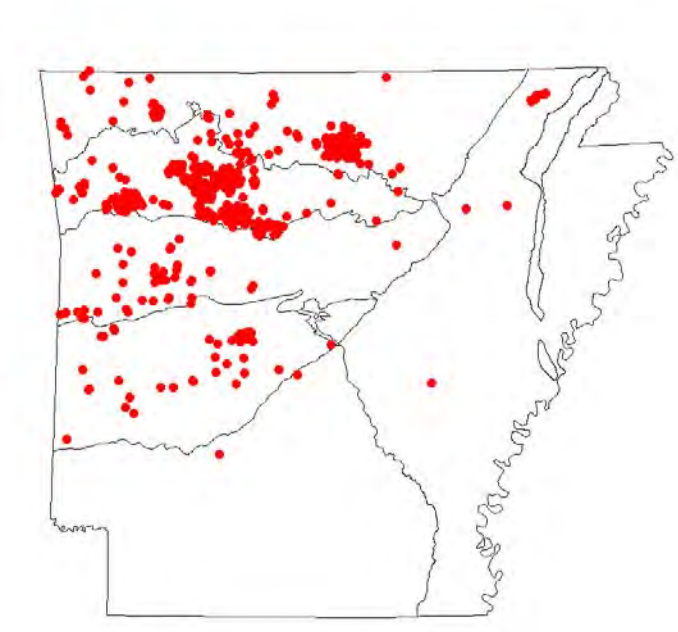
Population Trend: Unknown

Global Rank: G1G2 — Critically imperiled (uncertain rank)

State Rank: S1S2 — Critically imperiled in Arkansas (uncertain rank)

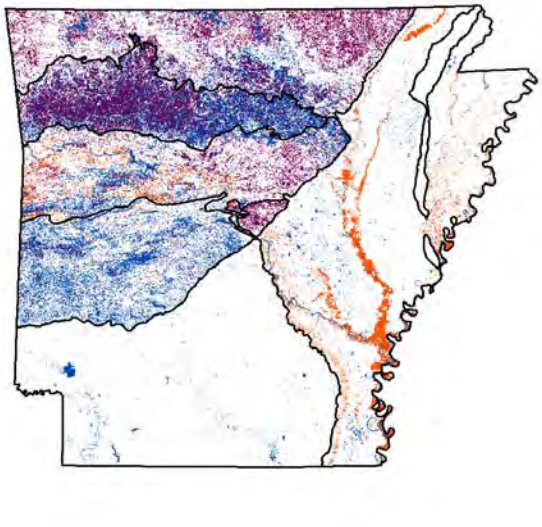
Distribution

Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☑
- Boston Mountains ☑
- Arkansas Valley ☑
- Ouachita Mountains ☑
- South Central Plains ☑
- Mississippi Alluvial Plain ☑
- Mississippi Valley Loess Plain ☐



Habitat Map



Habitats

	Weight
Caves, Mines, Sinkholes and other Karst Features	Optimal
Lower Mississippi River Riparian Forest	Marginal
Ozark-Ouachita Pine-Oak Forest	Suitable
Ozark-Ouachita Pine-Oak Forest/Woodland	Suitable
Ozark-Ouachita Riparian	Marginal
Ponds, Lakes, and Water Holes	Suitable

Problems Faced

White-nose Syndrome.	Threat: Extraordinary predation/parasitism/disease Source: Parasites/pathogens

Data Gaps/Research Needs

Address data gaps identified by national white-nose syndrome plan.
Determine presence of white-nose syndrome or the fungus that causes it in hibernacula.
Determine roosting ecology in bottomland forests.
Determine spring and fall migration patterns.
Develop appropriate summer monitoring strategies.

Conservation Actions

	Importance	Category
Implement conservation actions recommended by national white-nose syndrome plan.	High	Threat Abatement

Monitoring Strategies

Monitor impacts of white-nose syndrome on populations.

Monitor summer distribution and abundance using mist-net surveys.

Monitor winter populations at accessible sites.

Comments

The northern long-eared bat has been a common insectivorous bat in much of eastern North America, including Arkansas, which is located near the southwestern edge of its range. The species is predominantly found in the Ozarks and Ouachitas, though they have been observed in bottomland hardwood forests of northeastern Arkansas (Sealander and Heidt 1990, Fokidis and others 2005, Medlin Jr. and others 2006, Sasse and others 2014). This species hibernates in caves in winter and generally roosts in trees during summer months, though one Arkansas maternity colony was found in a private house (Grippo and Massa 2000, Jackson 2004, Perry and Thill 2007, Perry et al. 2008).

Taxa Association Team and Peer Reviewers

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Myotis sodalis

Indiana Bat

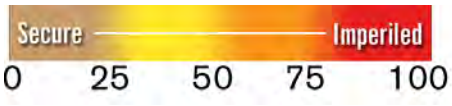


Class: Mammalia

Order: Chiroptera

Family: Vespertilionidae

Priority Score: **62** out of 100



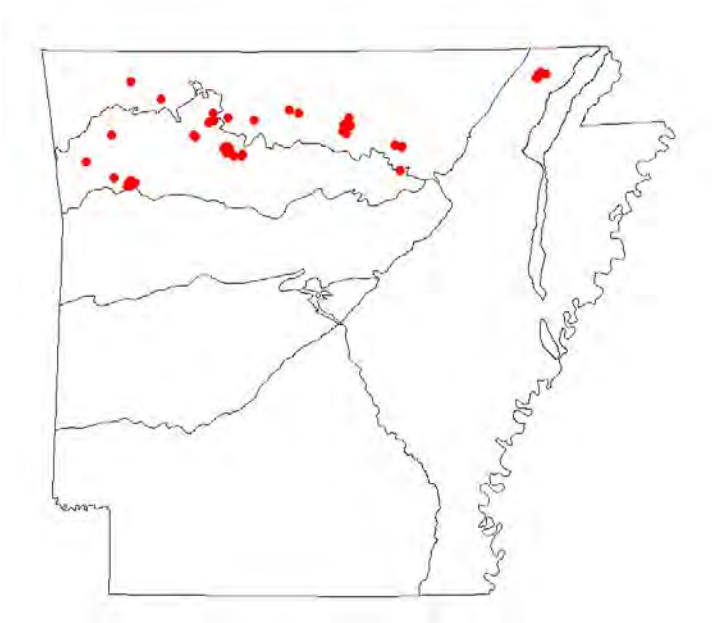
Population Trend: Decreasing

Global Rank: G2 — Imperiled species

State Rank: S1 — Critically imperiled in Arkansas

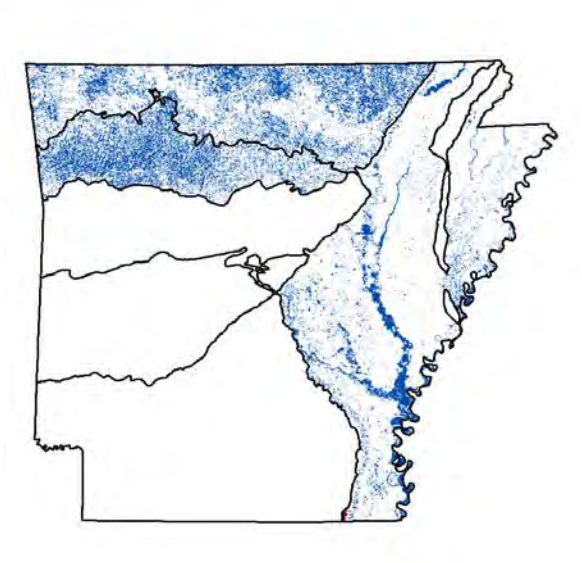
Distribution

Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☑
- Boston Mountains ☑
- Arkansas Valley ☐
- Ouachita Mountains ☐
- South Central Plains ☐
- Mississippi Alluvial Plain ☑
- Mississippi Valley Loess Plain ☐



Habitat Map



Habitats

	Weight
Caves, Mines, Sinkholes and other Karst Features	Optimal
Ozark-Ouachita Cliff and Talus	Marginal
Ozark-Ouachita Dry Oak and Pine Woodland	Optimal
Ozark-Ouachita Dry-Mesic Oak Forest/Woodland	Suitable
Ozark-Ouachita Mesic Hardwood Forest	Suitable
Ozark-Ouachita Riparian	Suitable
Ponds, Lakes, and Water Holes	Suitable

Problems Faced

Human disturbance of bats in caves during winter.	Threat: Habitat disturbance Source: Recreation
White-nose Syndrome.	Threat: Extraordinary predation/parasitism/disease Source: Parasites/pathogens
Wind power development.	Threat: Collision with man-made structures Source: Commercial/industrial development

Data Gaps/Research Needs

Address data gaps identified by national white-nose syndrome plan.
Determine if additional maternity colonies are present, especially in the southern Ozarks.
Determine impacts of habitat management near hibernacula.
Determine migration patterns of female Indiana bats in spring and fall.
Determine presence of white-nose syndrome or the fungus that causes it in hibernacula.

Conservation Actions

	Importance	Category
Implement conservation actions recommended by national white-nose syndrome plan.	High	Threat Abatement
Protect hibernacula.	High	Habitat Protection

Monitoring Strategies

Monitor impacts of white-nose syndrome on populations.
Monitor in accordance with U.S. Fish and Wildlife Service recovery plan.

Comments

General Description: Pelage very fine and fluffy, dull grayish chestnut above (hair tips slightly glossy; basal two-thirds blackish, followed by a grayish band and cinnamon tip), pinkish white underparts; membranes and ears blackish-brown; total length 75-102 mm; tail length 27-44 mm; wingspread 240-267 mm; length of head and body 41-49 mm; ear 10-15 mm, does not extend past end of nose when laid forward; forearm 36-41 mm; calcar obviously keeled (not always evident in dried study skins); hind foot small, 7-11 mm, hairs do not extend beyond toes; mass 5-11 g; greatest length of skull 14.2-15.0 mm, usually greater than 14.5 mm; length of maxillary toothrow 5.2-5.6 mm; complete sagittal crest usually present in adults;

Federally & State Endangered species. Ozark caves serve as hibernacula. No known maternity sites in Arkansas. (ANHI 2003, Baker and Ward 1967, Benz and others 1997, Black 1936, Black 1934, Brack and LaVal 1985, Brack 1983, Brady 1983, Britzke and others 2003, Callahan 1993, Callahan et al 1997, Carter 2003, Clark and others 1987, Clark and others 1987, Clark 1981, Clark and Harvey 1997, Clark and Harvey 1996, Clark and Harvey 1986, Cope and Humphrey 1977, Cope and others 1973, Cope and others 1991, Crump 2003, Crump 2003A, 2003C, 2003D, 2003H, Engel 1976, Fletcher 1985, Foster and others 1978, Gardner and others 1996, Gardner and others 1991, Gardner and others 1989, Gardner and others 1990, Gardner and Garner 1990, Graening and others 2001, Graves and Harvey 1974, Guthrie 1933, Hall 1962, Harvey 1975, Harvey 1991, Harvey 1984, Harvey 1987, Harvey 1996, Harvey 1997, Harvey 1975a, Harvey 1991, Harvey 1994, Harvey 1980, Harvey 1991, Harvey 1980, Harvey and Clark 1997, Harvey and others 1979, Harvey and others 1991, Harvey and McDaniel 1986, Heidt and others 1996, Heidt and others 1987, Humphrey 1978, Humphrey and others 1977, Humphrey and Cope 1977, Johnson and others 1998, Kiser and Elliot 1996, Kurta and others 1992, Kurta and others 1993, Kurta and Kennedy 2002, LaVal and LaVal 1980, MacGregor and others 1999, Martin 2001, Martin and others 2000, McDaniel and Gardner 1977, Menzel and others 2001, Mumford and Cope 1964, Myers 1964, NatureServe 2005, Odegard 2003, ONHI 2003, Pitts and others 1996, Sasse and others 2004, Saugey and others 1989, Sealander 1956, Sealander 1960, Sealander and Heidt 1990, Sealander and Young 1955, Steward 1988, Thomson 1982, Tumlison 2001, Wilhide and others 1998).

2007: S Rank changed to S1.

The known distribution of this species was expanded following the discovery of a maternity colony of this species in a bottomland hardwood forest (Brandebura and others 2006, Brandebura and others 2011).

Taxa Association Team and Peer Reviewers

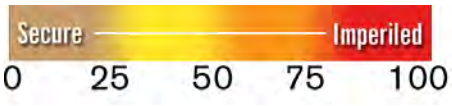
AGFC Mr. Blake Sasse, UALR Dr. Bob Sikes, UAM Dr. Don White, UALR Dr. Gary Heidt, Mr. J. D. Wilhide, HSU Dr. Renn Tumlison, ATU Dr. Tom Nupp, ASU Dr. Thomas Risch, USFS Mr. David Saugey, USFS Dr. Roger Perry, SAU Mr. Matthew Connior, ASU Mr. Stephen Brandenbura

Notiosorex crawfordi

Crawford's Gray Shrew

Class: Mammalia
Order: Soricomorpha
Family: Soricidae

Priority Score: **19** out of 100



Population Trend: Unknown

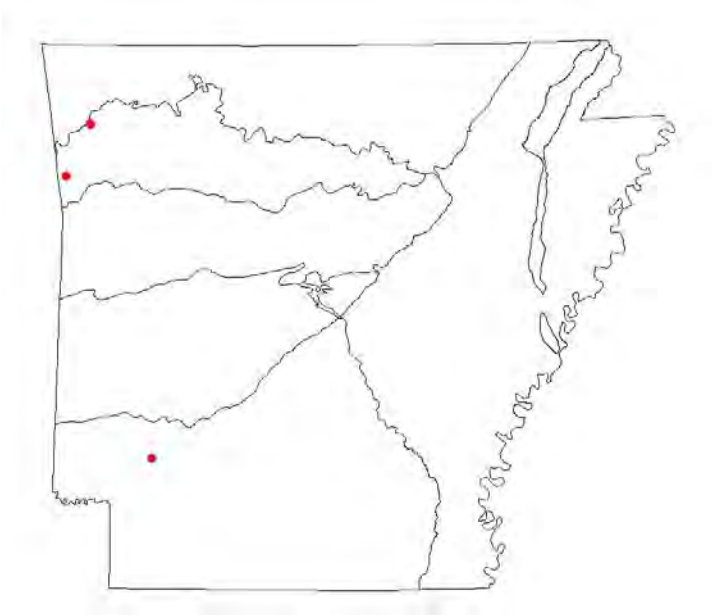
Global Rank: G5 — Secure

State Rank: S2 — Imperiled in Arkansas



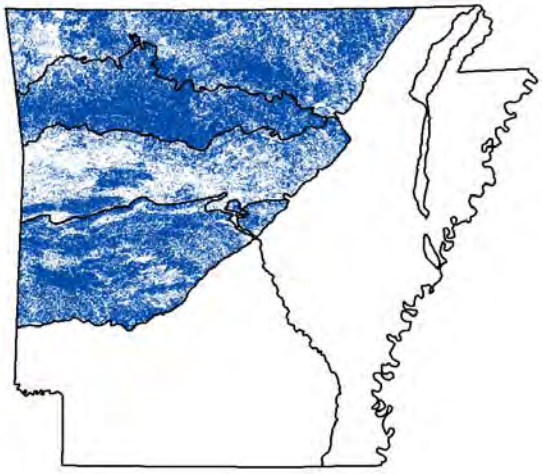
Distribution

Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☑
- Boston Mountains ☑
- Arkansas Valley ☑
- Ouachita Mountains ☑
- South Central Plains ☑
- Mississippi Alluvial Plain ☐
- Mississippi Valley Loess Plain ☐



Habitat Map



Habitats

Habitats	Weight
Interior Highlands Calcareous Glade and Barrens	Suitable
Interior Highlands Dry Acidic Glade and Barrens	Suitable
Ozark-Ouachita Cliff and Talus	Suitable
Ozark-Ouachita Pine/Bluestem Woodland	Suitable
Ozark-Ouachita Prairie and Woodland	Suitable
West Gulf Coastal Plain Calcareous Prairie and Woodland	Suitable

Problems Faced

Unknown

Threat:
Source:

Data Gaps/Research Needs

Additional information about habitat relationships is needed.

Conservation Actions

Conservation Actions	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Notiosorex crawfordi
Crawford's Gray Shrew

Monitoring Strategies

More information is needed before a monitoring strategy can be developed.

Comments

More commonly found in western United States. 2007: S Rank changed from S1? to S2.

(Natureserve 2005, Sasse and others 2004, Sealander and Heidt 1990)

Name revised from Desert Shrew.

Only a few specimens from Miller, Sebastian, and Ouachita counties have been collected in Arkansas in recent years, and a status survey indicates that they are rare even in good habitat in western Arkansas (Thomas 2005, Connior and others 2012).

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Reithrodontomys humulis

Eastern Harvest Mouse

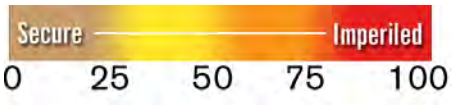


Class: Mammalia

Order: Rodentia

Family: Cricetidae

Priority Score: **19** out of 100



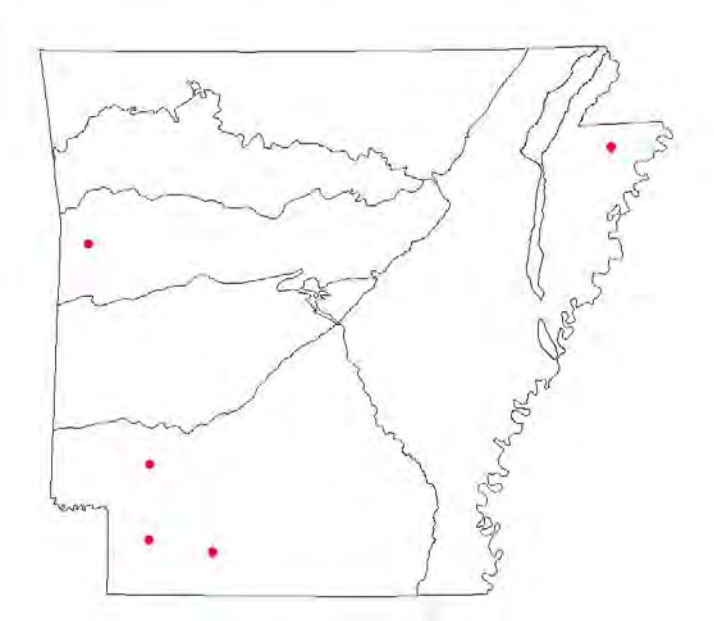
Population Trend: Unknown

Global Rank: G5 — Secure

State Rank: S2 — Imperiled in Arkansas

Distribution

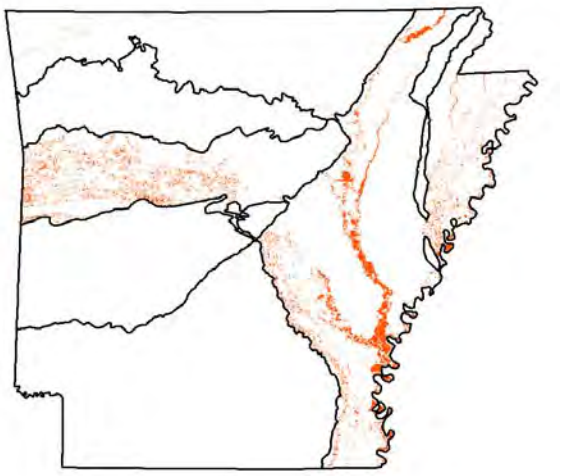
Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☑
- Boston Mountains ☐
- Arkansas Valley ☑
- Ouachita Mountains ☐
- South Central Plains ☑
- Mississippi Alluvial Plain ☑
- Mississippi Valley Loess Plain ☑

Habitat Map





Habitats

	Weight
Lower Mississippi River Dune Woodland, Pond, and Forest	Marginal
Lower Mississippi River High Bottomland Forest	Marginal
Ozark-Ouachita Prairie and Woodland	Suitable

Problems Faced

Unknown	Threat: Source:

Data Gaps/Research Needs

Conduct status survey.

Determine habitat use relationships.

Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

More information is needed before a monitoring strategy can be developed.

Comments

Prefers old fields, marshes, and wet meadows. Climbs among herbaceous vegetation. Nests are placed in tangled vegetation under debris or above ground. (Natureserve 2005, Sasse and others 2004, Sealander and Heidt 1990)

2007: S Rank changed from S1? To S2.

A few additional specimens of this species have been located in recent years (Connior and others 2011, Connior and others 2012).

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Reithrodontomys megalotis

Western Harvest Mouse

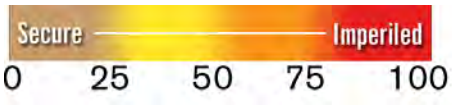


Class: Mammalia

Order: Rodentia

Family: Cricetidae

Priority Score: **15** out of 100



Population Trend: Unknown

Global Rank: G5 — Secure

State Rank: S3 — Vulnerable in Arkansas

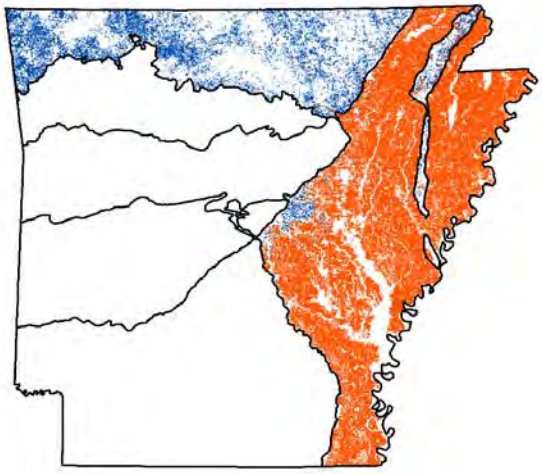
Distribution

Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☑
- Boston Mountains ☐
- Arkansas Valley ☐
- Ouachita Mountains ☐
- South Central Plain ☐
- Mississippi Alluvial Plain ☑
- Mississippi Valley Loess Plain ☑



Habitat Map



Habitats

	Weight
Crop Land	Marginal
Pasture Land	Suitable

Problems Faced

Unknown.

Threat:
Source:

Data Gaps/Research Needs

Conduct status survey.

Conservation Actions

	Importance	Category
Restore native warm season grasses and forbs.	Low	Habitat Restoration/Improvement

Monitoring Strategies

More information is needed before a monitoring strategy can be developed.

Comments

Habitats include old fields, meadows, weedy roadsides, agricultural areas, grassy situations within pine-oak forest, and riparian borders. Prefers dense vegetative cover. Also may be found in shrubby, arid regions.

(Natureserve 2005, Sasse and others 2004, Sealander and Heidt 1990)

2007: Status changed from S3S4 to S3.

A museum specimen was collected in Sharp county in 1987, but only recently reported on is the first record of this species in the Ozark highland ecosystem (Connior and others 2012).

Taxa Association Team and Peer Reviewers

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Reithrodontomys montanus

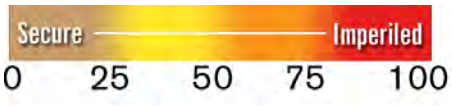
Plains Harvest Mouse

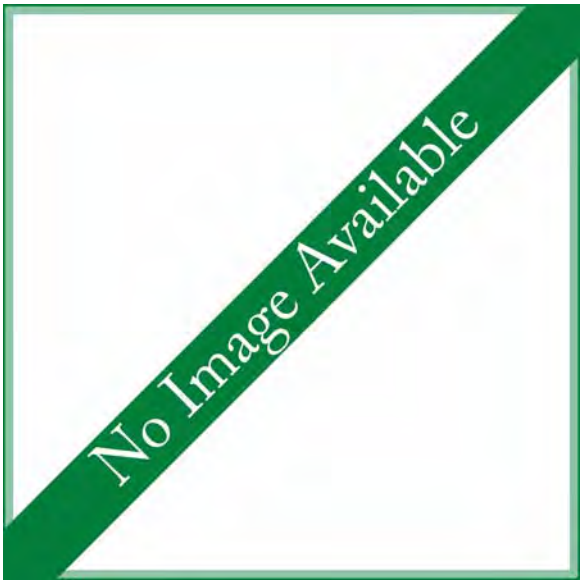
Class: Mammalia

Order: Rodentia

Family: Cricetidae

Priority Score: **23** out of 100





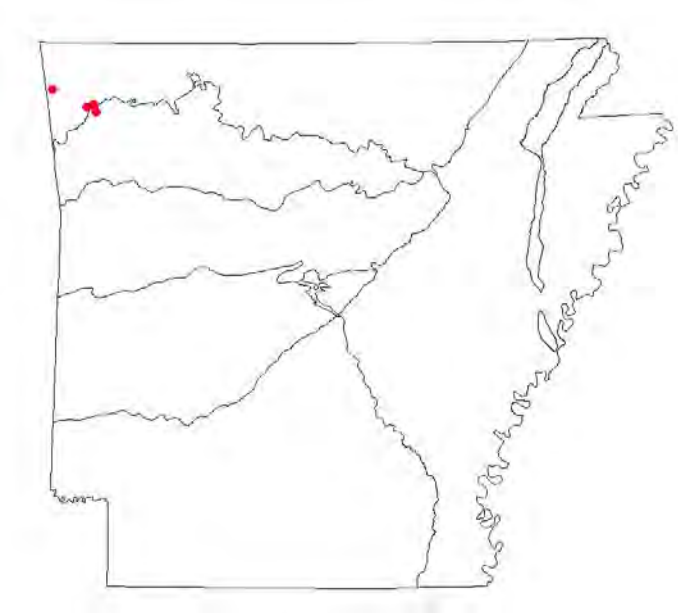
Population Trend: Unknown

Global Rank: G5 — Secure

State Rank: S1 — Critically imperiled in Arkansas

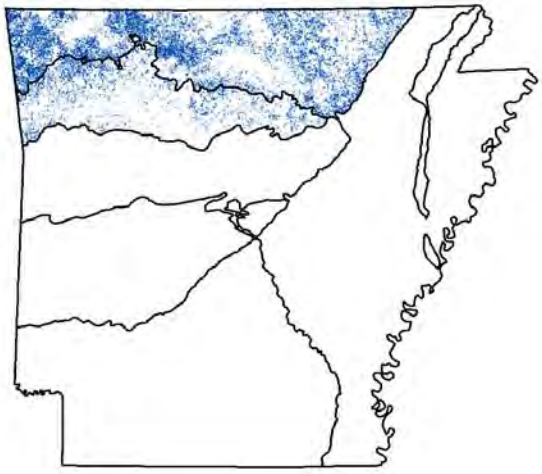
Distribution

Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☑
- Boston Mountains ☑
- Arkansas Valley ☐
- Ouachita Mountains ☐
- South Central Plains ☐
- Mississippi Alluvial Plain ☐
- Mississippi Valley Loess Plain ☐



Habitat Map



Habitats

	Weight
Ozark-Ouachita Dry Oak and Pine Woodland	Marginal
Pasture Land	Suitable

Problems Faced

Invasive non-native grasses.	Threat: Habitat destruction or conversion Source: Exotic species
Urbanization and habitat loss.	Threat: Habitat destruction or conversion Source: Urban development

Data Gaps/Research Needs

Determine if species is still present in Arkansas.

Conservation Actions

	Importance	Category
Encourage conservation easements on open land.	Medium	Habitat Restoration/Improvement
Restore native warm season grasses and forbs.	Medium	Habitat Restoration/Improvement

Monitoring Strategies

More information is needed before a monitoring strategy can be developed.

Comments

Occupies areas with less than 50 percent bare soil; weedy situations. Old hayfields, highway medians, cultivated fields (wheat, sorghum), grazed riparian woodland. May nest in grass on or above ground, in underground burrow, beneath rock in stony pasture, under log or discarded lumber, or in other object on or near ground.

(Natureserve 2005, Sasse and others 2004, Sealander and Heidt 1990)

2007: S Rank changed from S1? to S1.

Several specimens were recently captured in cool-season grass habitat at the Pea Ridge National Military Park in Benton county (Reddin 2014).

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Sorex longirostris

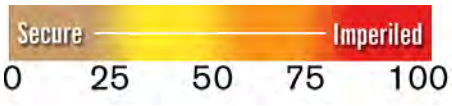
Southeastern Shrew

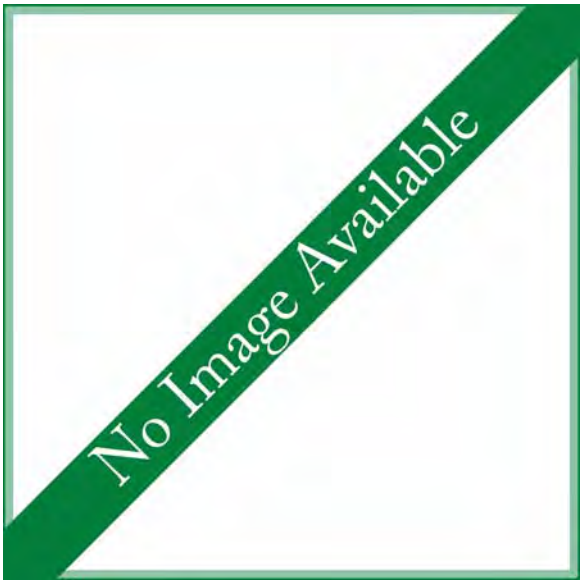
Class: Mammalia

Order: Soricomorpha

Family: Soricidae

Priority Score: **19** **out of 100**





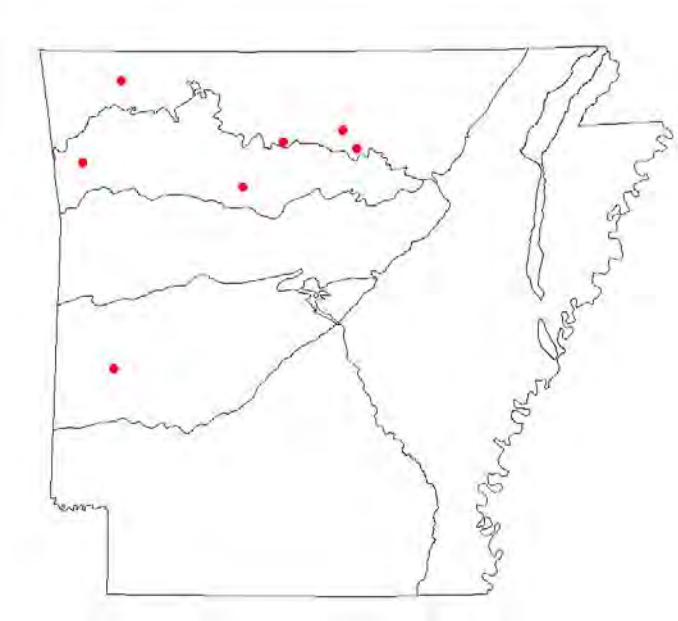
Population Trend: Unknown

Global Rank: G5 — Secure

State Rank: S2 — Imperiled in Arkansas

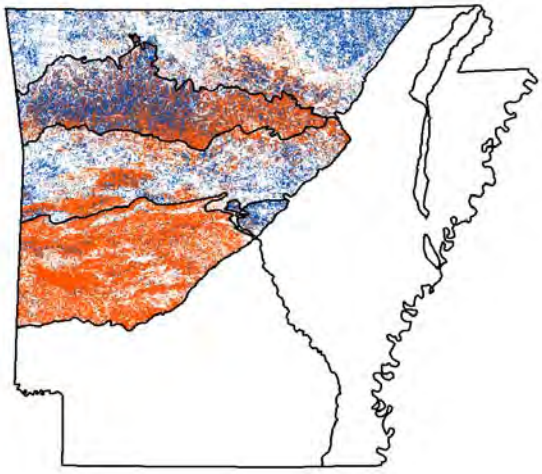
Distribution

Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☑
- Boston Mountains ☑
- Arkansas Valley ☑
- Ouachita Mountains ☑
- South Central Plains ☐
- Mississippi Alluvial Plain ☐
- Mississippi Valley Loess Plain ☐



Habitat Map



Habitats	Weight
Caves, Mines, Sinkholes and other Karst Features	Marginal
Ouachita Montane Oak Forest	Suitable
Ouachita Mountain Forested Seep	Marginal
Ozark-Ouachita Mesic Hardwood Forest	Suitable
Ozark-Ouachita Pine/Bluestem Woodland	Marginal
Ozark-Ouachita Pine-Oak Forest/Woodland	Marginal
Ozark-Ouachita Prairie and Woodland	Suitable
Ozark-Ouachita Riparian	Suitable

Problems Faced

Unknown.

Threat:
Source:

Data Gaps/Research Needs

Records of this species in the state are sparse.

Conservation Actions	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Sorex longirostris
Southeastern Shrew

Monitoring Strategies

Continue to opportunistically compile records of collections in the state.

Comments

A smallish shrew with a sharply pointed snout, beady eyes, and small ears nearly hidden in the fine soft pelage; pelage brown above, cinnamon brown or ochraceous tawny below; five small unicuspidate teeth behind the upper incisors (the fifth is minute, the fourth generally is larger than [less commonly equal to] the third, and both of these are smaller than the first and second; tips of teeth are dark chestnut; feet are delicate, with slender weak claws; condylobasal length of skull 13.8-15.5 mm.

(Natureserve 2005, Sasse and others 2004, Sealander and Heidt 1990)

2007: S Rank changed from S2? to S2.

A status survey for this species was performed from 2007-2009, and after completing 17,983 trap nights at 329 locations with only 2 shrew captures, concluded that the species is rare in the state (Mikel and others 2010). It has also been recently collected from Pope County (Showen 2006).

Taxa Association Team and Peer Reviewers

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Spilogale putorius

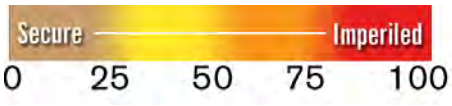
Eastern Spotted Skunk

Class: Mammalia

Order: Carnivora

Family: Mephitidae

Priority Score: **21** out of 100





Population Trend: Unknown

Global Rank: G4 — Apparently secure species

State Rank: S2S3 — Imperiled species in Arkansas (uncertain rank)

Distribution

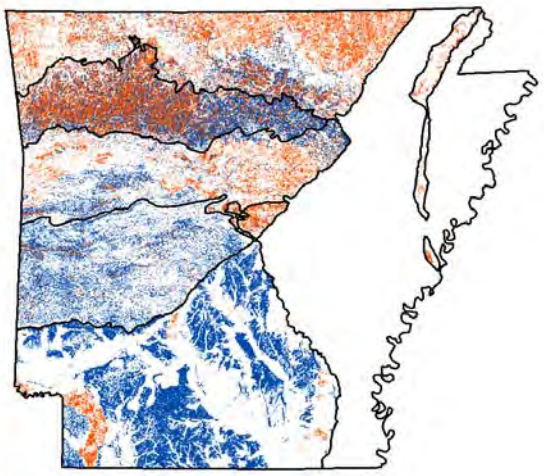
Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☑
- Boston Mountains ☑
- Arkansas Valley ☑
- Ouachita Mountains ☑
- South Central Plains ☑
- Mississippi Alluvial Plain ☐
- Mississippi Valley Loess Plain ☑

Habitat Map





Habitats	Weight
Crop Land	Marginal
Ozark-Ouachita Cliff and Talus	Marginal
Ozark-Ouachita Dry Oak and Pine Woodland	Suitable
Ozark-Ouachita Dry-Mesic Oak Forest/Woodland	Suitable
Ozark-Ouachita Mesic Hardwood Forest	Marginal
Ozark-Ouachita Pine-Oak Forest/Woodland - Woodland Condition	Suitable

Problems Faced

High avian and terrestrial predation rates.	Threat: Extraordinary predation/parasitism/disease Source: Predation

Data Gaps/Research Needs

Determine habitat use relationships in the Ozarks.

Determine home range in the Ozarks.

Conservation Actions	Importance	Category
Manage shortleaf pine forests to provide a mixture of young stands with a woody vegetative understory and closed canopy.	Medium	Habitat Restoration/Improvement

Spilogale putorius
Eastern Spotted Skunk

Monitoring Strategies

Monitor harvest of spotted skunk in fur dealer reports.

Comments

Prefers forested areas or habitats with significant cover. Also open and brushy areas, rocky canyons and outcrops in woodlands and prairies. When inactive or bearing young, occupies den in burrow abandoned by other mammal, under brushpile, in hollow log or tree, in rock crevice, under building, or in similar protected site. Occasionally reported in Arkansas fur sales records. Possibly in decline.

(ANHI 2003, Crump 2003, Crump 2003A, 2003C, 2003D, 2003H, Heidt and others 1996, NatureServe 2005, Odegard 2003, ONHI 2003, Peck and others 1985, Perry In Process, Sasse and others 2004, Sealander 1956, Sealander and Heidt 1990, Steward 1988).

2007: S Rank changed from S4 to S2S3.

A major study of the home range, habitat use, denning habits, and survival of this species was conducted in the Ouachitas and found that spotted skunks tend to prefer early successional forest habitats, probably due to high predation rates that can occur in more open areas (Hackett and others 2007; Lesmeister and others 2008a and 2008b; Lesmeister and others 2009, Lesmeister and others 2010, Lesmeister and others 2013).

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Synaptomys cooperi

Southern Bog Lemming

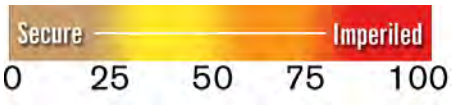


Class: Mammalia

Order: Rodentia

Family: Muridae

Priority Score: **19** out of 100



Population Trend: Unknown

Global Rank: G5 — Secure

State Rank: S2 — Imperiled in Arkansas

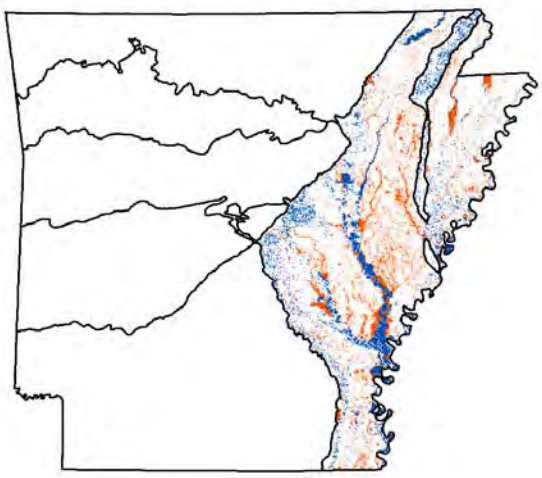
Distribution

Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☐
- Boston Mountains ☐
- Arkansas Valley ☐
- Ouachita Mountains ☐
- South Central Plain ☐
- Mississippi Alluvial Plain ☑
- Mississippi Valley Loess Plain ☑



Habitat Map



Habitats

	Weight
Lower Mississippi Flatwoods Woodland and Forest	Marginal
Lower Mississippi River Bottomland Depression	Suitable
Lower Mississippi River High Bottomland Forest	Marginal
Lower Mississippi River Low Bottomland Forest	Marginal
Lower Mississippi River Riparian Forest	Suitable
Lower Mississippi River Riparian Forest	Suitable
Pasture Land	Suitable

Problems Faced

Habitat loss and conversion.	Threat: Habitat destruction or conversion Source: Agricultural practices

Data Gaps/Research Needs

Confirm museum specimen identification.

Determine effects of isolation on genetic diversity.

Determine habitat use relationships.

Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

More information is needed before a monitoring strategy can be developed.

Comments

Prefers boggy habitat but also common in marshes, meadows, and upland forests with thick humus layer (especially when conditions not hot and dry); areas with intermixture of herbaceous/shrubby vegetation. Occupies burrow systems usually 6-12 inches deep and surface runways (e.g., beneath sphagnum and among roots of shrubs). Young are born in nests placed on the surface in grassy vegetation or in underground burrows.

(Natureserve 2005, Sasse and others 2004, Sealander and Heidt 1990)

2007: S Rank changed from S2S3 to S2.

Taxa Association Team and Peer Reviewers

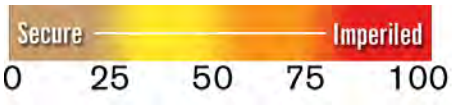
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Taxidea taxus

American Badger

Class: Mammalia
Order: Carnivora
Family: Mustelidae

Priority Score: **16** out of 100





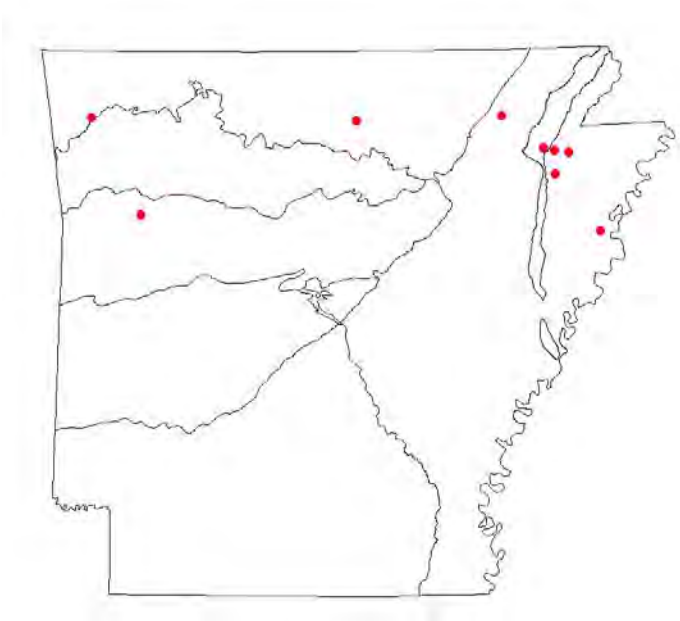
Population Trend: Increasing

Global Rank: G5 — Secure

State Rank: S1S2 — Critically imperiled in Arkansas (uncertain rank)

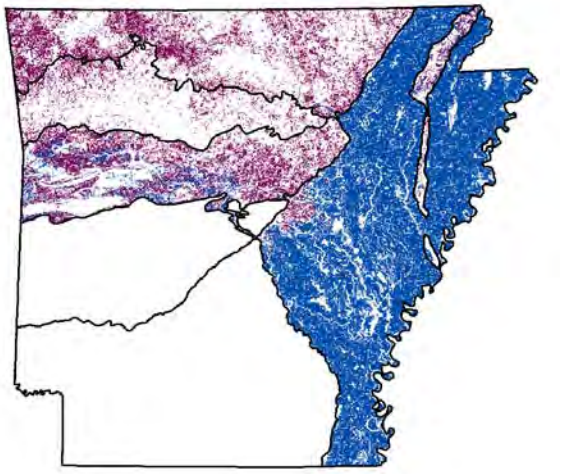
Distribution

Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☑
- Boston Mountains ☑
- Arkansas Valley ☑
- Ouachita Mountains ☐
- South Central Plains ☐
- Mississippi Alluvial Plain ☑
- Mississippi Valley Loess Plain ☑



Habitat Map



Habitats	Weight
Crop Land	Suitable
Ozark-Ouachita Riparian	Suitable
Pasture Land	Optimal

Problems Faced

Unknown.

Threat:
Source:

Conservation Actions	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

More information is needed before a monitoring strategy can be developed.

Taxidea taxus
American Badger

Comments

A heavy-bodied, short-legged mammal with long fore claws, long fur (longest on the sides), and a short bushy tail; upperparts are yellowish gray to reddish brown, with a white middorsal stripe extending from the snout to the neck or shoulders in the north and usually to the rump in the south; black patches are present on the face and cheeks; underparts are buffy, except for the whitish chin, throat, and mid-ventral region; feet are dark brown to black; head and body length 42-72 cm, tail length 10-15.5 cm, mass 4-12 kg. Rarely encountered in northern Arkansas. Recent records may indicate that a population has been established in Arkansas.

(Natureserve 2005, Sasse and others 2004, Sealander and Heidt 1990)

2007: S Rank changed from SA (accidental) to S1S2.

A recent review of the status of this species in Arkansas found that it was expanding in the northeastern portion of the state along Crowley's Ridge (Tumlison and others 2012).

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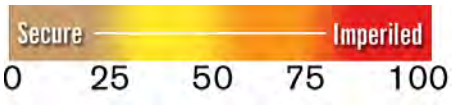
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Alasmidonta marginata

Elktoe

Class: Bivalvia
Order: Unionoida
Family: Unionidae

Priority Score: 19 out of 100



Population Trend: Unknown



Global Rank: G4 — Apparently secure species

State Rank: S3 — Vulnerable in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- [x] Ozark Highlands
- [x] Boston Mountains
- [x] Arkansas Valley
- [x] Ouachita Mountains
- [x] South Central Plains
- [x] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains

Suitable Substrate gravel/cobble

Description

Shell elongate, triangular, inflated, and relatively thin. Anterior end rounded, posterior end sharply angled, ending in a blunt, squared point. Posterior ridge sharply angled and prominent, posterior

slope broad, flat, and covered with fine ridges. Ventral margin straight to slightly curved. Umbos large, located near the center of the shell, and elevated above the hinge line. Beak sculpture of three or four heavy, double-looped ridges. Shell smooth and dull. Periostracum yellowish green or bright green with numerous rays and dark green spots present. Posterior slope often lighter than rest of shell. Length to four inches (10.2cm). Pseudocardinal teeth thin and elongate; one in right, occasionally two in the left. Lateral teeth reduced to a thickened swelling along the hinge line. Beak cavity moderately deep. Nacre bluish white, occasionally with salmon near the beaks.

Host Fish

Rockbass, White Sucker, Northern Hogsucker, Warmouth, Shorthead Redhorse,

Ecobasins

Arkansas Valley - Arkansas River
Boston Mountains - Arkansas River
Boston Mountains - White River
Mississippi River Alluvial Plain - White River
Ouachita Mountains - Ouachita River
Ozark Highlands - Arkansas River
Ozark Highlands - White River
South Central Plains - Ouachita River

Habitats	Weight
Natural Glide: Headwater	Suitable
Natural Pool: Headwater	Marginal
Natural Run: Headwater - Medium - Large	Optimal

Problems Faced

Threat: Habitat destruction
Source: Forestry activities

Threat: Habitat destruction
Source: Resource extraction

Threat: Habitat destruction
Source: Urban development

Threat: Nutrient loading
Source: Confined animal operations

Threat: Nutrient loading
Source: Grazing/Browsing

Threat: Nutrient loading
Source: Urban development

Threat: Sedimentation
Source: Channel alteration

Threat: Sedimentation
Source: Grazing/Browsing

Threat: Sedimentation
Source: Road construction

Data Gaps/Research Needs

Conduct status survey.

Conservation Actions

	Importance	Category
Manage watershed, addressing physical, chemical, biological and land use components, to restore or sustain aquatic life.	Medium	Threat Abatement
Restore or enhance riparian buffers.	High	Habitat Protection

Monitoring Strategies

Monitor occurrence in ongoing river surveys.

Comments

Widespread but rare. Rangewide population status of the elktoe mussel is not known. (AFMC 2004a, AFMC 2004b, AFMC 2004c, AFMC 2005, AGFC 2003, AGFC 1991-1999, AHTD 1984, AHTD 1994, ANHI 2003, Bates and Dennis 1983, Branson 1983, Burns and McDonnell 1992a, Clark 1987, Crump 2003, Cummings and Mayer 1992, Davidson and others 2000, Gordon 1980, 1980a, 1985, Gordon and Brown 1980, Gordon and others 1979, 1980, Harris 1992a, 1996, 1997b, 1999, 1999a, Harris and Doster 1992, Harris and Gordon 1985, 1990, Harris and Milam 2002, Johnson 1980, Meek and Clark 1912, Oesch 1995, ONHI 2003, Rust 1993, Stoeckel and others 1996, 2000, Turgeon and others 1988, 1998, USDA FS 1999, Wheeler 1918, Williams & others 1993).

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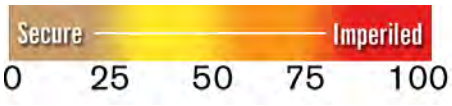
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Alasmidonta viridis

Slippershell Mussel

Class: Bivalvia
Order: Unionoida
Family: Unionidae

Priority Score: 31 out of 100



Population Trend: Decreasing

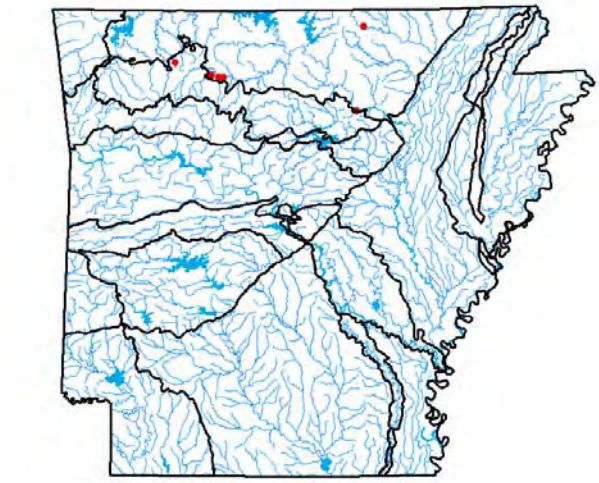


Global Rank: G4G5 — Apparently secure (uncertain rank)

State Rank: S1 — Critically imperiled in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- [x] Ozark Highlands
- [ ] Boston Mountains
- [ ] Arkansas Valley
- [ ] Ouachita Mountains
- [ ] South Central Plains
- [ ] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains

Suitable Substrate gravel

Description

Shell small (usually about an inch), somewhat inflated, thin in young individuals to moderately thick in adults. Anterior end rounded, posterior end squared or truncated. Posterior ridge high and rounded,

posterior slope flattened. Ventral margin straight or slightly arched. Umbos full and elevated above the hinge line. Beak sculpture of three or four elevated ridges or loops. Shell smooth to rough and yellowish green with numerous wavy green rays, particularly on the posterior half of the shell. Length to 1.5 inches (3.8 cm). Pseudocardinal teeth triangular; two in the left valve, one in the right. Lateral teeth poorly developed, generally appearing as a slight swelling along the hinge line. Beak cavity moderately deep. Nacre white, iridescent on the posterior third of the shell.

Host Fish

Mottled Sculpin, Banded Sculpin, Johnny Darter

Ecobasins

Ozark Highlands - White River

Habitats

	Weight
Natural Riffle: Headwater	Suitable
Natural Run: Headwater	Optimal

Problems Faced

Threat: Habitat destruction
Source: Grazing/Browsing

Threat: Habitat destruction
Source: Recreation

Threat: Habitat destruction
Source: Road construction

Threat: Nutrient loading
Source: Confined animal operations

Threat: Nutrient loading
Source: Grazing/Browsing

Threat: Sedimentation
Source: Forestry activities

Threat: Sedimentation
Source: Grazing/Browsing

Threat: Sedimentation
Source: Recreation

Threat: Sedimentation
Source: Road construction

Data Gaps/Research Needs

Conduct additional population surveys.

Conduct life history study.

Determine habitat preferences and availability.

Determine host fish suitability and availability.

Conservation Actions

	Importance	Category
Augment populations in suitable habitat.	Low	Population Management
Establish populations in suitable habitat.	High	Population Management
Manage watershed, addressing physical, chemical, biological and land use components, to restore or sustain aquatic life.	Medium	Threat Abatement
Restore or enhance riparian buffers.	Medium	Habitat Protection

Monitoring Strategies

Additional information is needed before a monitoring strategy can be determined.

Comments

Ristricted range and extremely rare. Since 1996, few specimens have been recorded (AFMC 2004a, 2004b, 2004c, 2005, Harris 1996).

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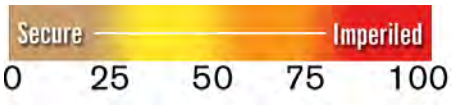
AGFC Mr. Bill Posey, USFWS-ES Mr. Chris Davidson, ASU Dr. John Harris, AHTD Mr. Josh Seagraves, AHTD Mr. Ben Thesing

Arcidens wheeleri

Ouachita Rock Pocketbook

Class: Bivalvia
Order: Unionoida
Family: Unionidae

Priority Score: **80** **out of 100**



Population Trend: Unknown



Global Rank: G1 — Critically imperiled species

State Rank: S1 — Critically imperiled in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- ☐ Ozark Highlands
- ☐ Boston Mountains
- ☐ Arkansas Valley
- ☐ Ouachita Mountains
- ☑ South Central Plains
- ☐ Mississippi Alluvial Plain
- ☐ Mississippi Valley Loess Plains

Suitable Substrate gravel/cobble/sand

Description

Shell subcircular to subovate to subquadrate in profile, truncated posteriorly, moderately inflated, up to 4.4 inches long, 3.4 inches high, and 2.4 inches wide, moderately heavy, somewhat thickened

anteriorly, up 0.24 inches thick, and half as thick posteriorly. Outer shell layer is chestnut-brown to black with a silky luster, and appears to slightly iridescent when wet. Umbo is prominent. Posterior half of shell is sculptured by irregular, oblique ridges that are sometimes crossed by smaller ridges or sometimes indistinct. Beak sculpturing is very restricted, rarely intact. Nacre is usually salmon-colored above the pallial line, white to light blue below. Hinge teeth well developed.

Host Fish

Green Sunfish, Bluegill, Smallmouth Bass, Bleeding Shiner, River Carpsucker, Longear Sunfish, Largemouth Bass, White Crappie, Black Crappie, Emerald Shiner, Warmouth

Ecobasins

South Central Plains - Ouachita River

South Central Plains - Red River

Habitats	Weight
Natural Oxbow - connected: - Medium - Large	Optimal
Natural Pool: - Medium - Large	Suitable
Natural Run: - Medium - Large	Optimal
Natural Shoal: - Medium - Large	Marginal

Problems Faced

Threat: Habitat destruction
Source: Channel alteration

Threat: Habitat destruction
Source: Dam

Threat: Hydrological alteration
Source: Dam

Threat: Hydrological alteration
Source: Water diversion

Threat: Sedimentation
Source: Channel alteration

Threat: Sedimentation
Source: Dam

Data Gaps/Research Needs

Determine environmental stressors such as nutrient loading, toxicity to chemicals and metals, sedimentation effects, etc.

Determine habitat preferences and habitat availability.

Determine sustainable flow below dams to improve habitat.

Survey streams and rivers for unknown populations, particularly in Ouachita River sided channels and backwater habitats.

Conservation Actions

Conservation Actions	Importance	Category
Develop an outreach program.	Medium	Public Relations/Education
Implement habitat conservation plan.	High	Habitat Protection
Manage the Ouachita River watershed, addressing physical, chemical, biological and land use components, to restore or sustain aquatic life.	Medium	Threat Abatement
Propagate, augment and reintroduce species where appropriate.	High	Population Management
Protect host fish and associated habitat.	High	Population Management

Monitoring Strategies

Monitor in accordance with U.S. Fish and Wildlife Service recovery plan.

Comments

Federally-listed endangered species. Populations occur in the Kiamichi and Glover rivers in Oklahoma, and the Little River system in Oklahoma and Arkansas. The only known reproducing population, based on juveniles and gravid females, occurs in the Little River in Arkansas. This species should be considered for reintroduction to the Ouachita River as part of recovery efforts. The generic name for this species has been changed to Arcidens, based on genetic studies when compared to its closest relative, also an Arcidens species. (AFMC 2004a, 2004b, 2004c, 2005, AGFC 2003, Bouldin and others, 2013, Branson 1983, Clark 1987, Crump 2003, Crump and others 2003a, 2003c, 2003d, 2003e, 2003g, 2003q, 2003r, 2003t, Gordon 1980a, Gordon and Harris 1983, Gordon and Kraemer 1984, Harris 1999, 1999a, Harris and Gordon 1987, 1990, Harris and others 1997, Inuoe and others 2014, Johnson 1980, Mehlhop-Cifelli and Miller 1989, Posey 1997, Posey and others 1996, Seagraves 2006, Stansbery 1970, Turgeon and others 1988, 1998, USDA FS 1999, USDI FWS 1994, Vaughn and others 1993, 1996, 1997, Wheeler 1918, Williams & others 1993).

Taxa Association Team and Peer Reviewers

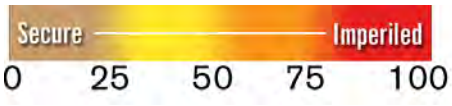
AGFC Mr. Bill Posey, USFWS-ES Mr. Chris Davidson, ASU Dr. John Harris, AHTD Mr. Josh Seagraves, AHTD Mr. Ben Thesing

Cumberlandia monodonta

Spectaclecase

Class: Bivalvia
Order: Unionoida
Family: Margaritiferidae

Priority Score: **38** **out of 100**



Population Trend: Decreasing

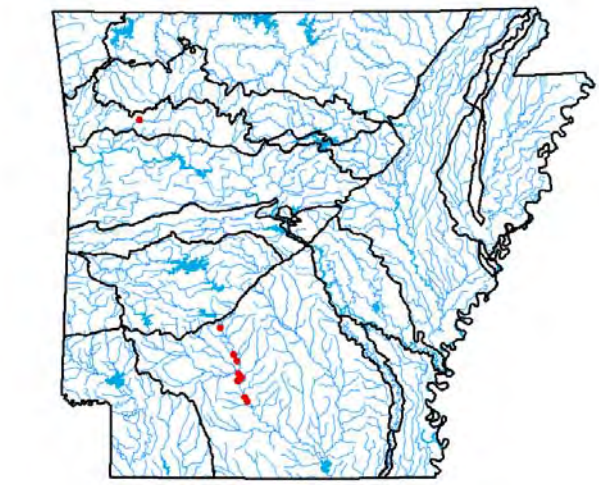


Global Rank: G3 — Vulnerable species

State Rank: S2 — Imperiled in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- ☐ Ozark Highlands
- ☑ Boston Mountains
- ☐ Arkansas Valley
- ☑ Ouachita Mountains
- ☑ South Central Plains
- ☐ Mississippi Alluvial Plain
- ☐ Mississippi Valley Loess Plains

Suitable Substrate gravel

Description

Shell oblong, elongate, and compressed. Anterior and posterior ends rounded. Ventral margin usually arched or pinched, occasionally straight. Shell thin in young, becoming thicker in older

individuals. Umbos only slightly elevated above the hinge line. Beak sculpture, when visible, of three or four heavy ridges. Surface of shell smooth to somewhat rough, brown in young shells, becoming dark brown to black and rayless with age. Length to eight inches. Pseudocardinal teeth small, tubercular; one in each valve in young individuals. Lateral teeth poorly developed or absent. Beak cavity moderately shallow. Nacre white, iridescent in young individuals and on the posterior fourth of shell in adults

Host Fish

Unknown

Ecobasins

Boston Mountains - Arkansas River

Ouachita Mountains - Ouachita River

South Central Plains - Ouachita River

Habitats	Weight
Natural Pool: Headwater - Medium - Large	Optimal
Natural Run: - Medium - Large	Optimal
Natural Shoal: - Medium - Large	Suitable

Problems Faced

Threat: Habitat destruction
Source: Channel alteration

Threat: Habitat destruction
Source: Channel maintenance

Threat: Habitat destruction
Source: Municipal/Industrial point source

Threat: Hydrological alteration
Source: Dam

Threat: Hydrological alteration
Source: Water diversion

Data Gaps/Research Needs

Conduct life history study.

Determine environmental stressors such as nutrient loading, toxicity to chemicals and metals, sedimentation effects, etc.

Determine habitat preferences and availability.

Determine host fish suitability and host fish availability.

Determine viability of species in the Ouachita River in Arkansas.

Survey streams for additional populations.

Conservation Actions

Conservation Actions	Importance	Category
Develop an outreach/education program.	Low	Public Relations/Education
Manage watershed, addressing physical, chemical, biological and land use components, to restore or sustain aquatic life.	High	Threat Abatement
Partner with other agencies to prevent loss of suitable habitat.	High	Habitat Protection
Propagate, augment and reintroduce species where appropriate.	Medium	Population Management

Monitoring Strategies

Additional information is needed before a monitoring strategy can be developed.

Comments

Federally-listed candidate species. Extremely rare, on periphery of range. Known from one relict above Lake Ouachita but known to occur downstream of Remmel Dam (Malvern, Ark.) in the Ouachita River mainstem. Surveys from 2012-2014 have detected reproducing populations in the Ouachita River below Remmel Dam. One record reported from the Mulberry River. Additional surveys in the Mulberry River have not detected additional animals. A difficult species to detect since it utilizes habitat that is not generally used by other bivalve species. Habitat preference includes sand/gravel/silt beneath overhanging boulders. Three host fish trials have not determined the host fish. (AFMC 2004a, 2004b, 2004c, 2005, AGFC 2003, Coker 1919, Crump 2003, Crump and others 2003a, 2003c, 2003d, 2003e, 2003g, 2003q, 2003r, 2003t, Cummings and Mayer 1992, Gordon 1980a, Gordon and Harris 1983, Gordon and others 1980, Harris 1999, 1999a, Harris and Gordon 1987, 1990, Harris and others 1997, K. Inuoe, pers. Comm., Johnson 1980, ORVET 2003, Posey and others 1996, Stoeckel and others 1996, Turgeon and others 1988, 1998, USDA FS 1999, USFWS 2004, Wheeler 1918, Williams & others 1993).

Taxa Association Team and Peer Reviewers

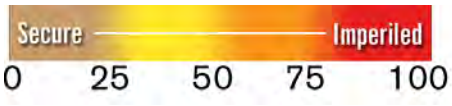
AGFC Mr. Bill Posey, USFWS-ES Mr. Chris Davidson, ASU Dr. John Harris, AHTD Mr. Josh Seagraves, AHTD Mr. Ben Thesing

Cyprogenia aberti

Western Fanshell

Class: Bivalvia
Order: Unionoida
Family: Unionidae

Priority Score: **43** out of 100



Population Trend: Decreasing

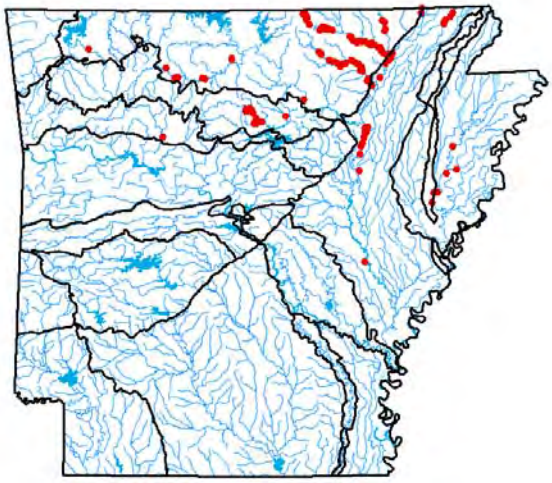


Global Rank: G2G3Q — Imperiled (uncertain rank) questionable taxonomy

State Rank: S3 — Vulnerable in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- [x] Ozark Highlands
- [x] Boston Mountains
- [ ] Arkansas Valley
- [ ] Ouachita Mountains
- [ ] South Central Plains
- [x] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains

Suitable Substrate gravel/sand

Description

Shell rounded, solid, and moderately inflated. Anterior margin rounded, posterior margin bluntly rounded or truncated. Ventral margin broadly rounded. Umbos not elevated above the hinge line.

Beak sculpture, if visible, of a few weak ridges. Growth lines appear as distinct elevated ridges. Numerous pustules usually concentrated in the center but occasionally covering the entire surface of the shell. Periostracum usually greenish yellow, with a pattern of dark green rays made up of numerous smaller broken lines or dots. Length to three inches (7.6 cm). Pseudocardinal teeth relatively large and serrated; two in the left valve, one in the right. Lateral teeth roughened, straight to slightly curved, heavy and very short. Interdentum wide. Beak cavity shallow to moderately deep. Nacre white, iridescent posteriorly.

Host Fish

Fantail Darter, Logperch, Slenderhead Darter

Ecobasins

Boston Mountains - Arkansas River
Boston Mountains - White River
Mississippi River Alluvial Plain - St. Francis River
Mississippi River Alluvial Plain - White River
Ozark Highlands - White River

Habitats	Weight
Natural Glide: Headwater	Optimal
Natural Pool: Headwater - Medium - Large	Suitable
Natural Riffle: Headwater	Optimal
Natural Run: Headwater - Medium - Large	Optimal
Natural Shoal: - Medium - Large	Suitable

Problems Faced

Threat: Habitat destruction Source: Dam
Threat: Habitat destruction Source: Grazing/Browsing
Threat: Habitat destruction Source: Resource extraction
Threat: Nutrient loading Source: Confined animal operations
Threat: Nutrient loading Source: Grazing/Browsing
Threat: Sedimentation Source: Forestry activities
Threat: Sedimentation Source: Road construction

Data Gaps/Research Needs

Conduct life history study.

Continue genetic studies to determine taxonomy of the different groups.

Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.	High	Data Gap

Monitoring Strategies

Additional information is needed before a monitoring strategy can be developed.

Comments

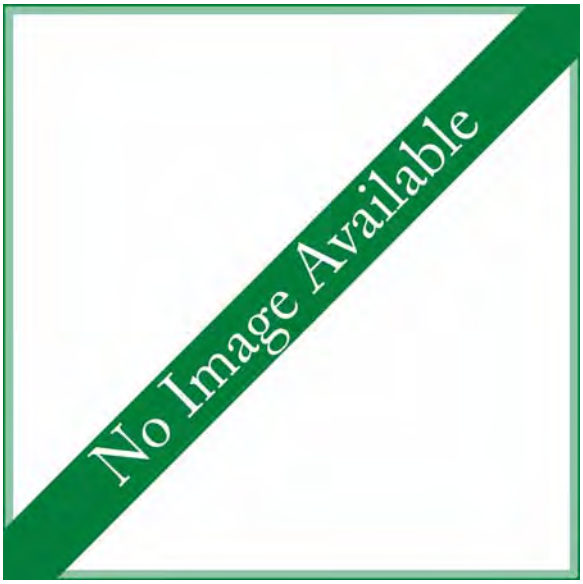
Ongoing taxonomic work indicates that this complex may be comprised of more than one species, possibly up to three. Widespread, rare to locally common. The western fanshell may be declining across its range (AFMC 2004a, 2004b, 2004c, 2005, AGFC 2003, Ahlstedt and Jenkinson 1987, 1991, AHTD 1984, 1987, 1989, 1994, ANHI 2003, Bates and Dennis 1983, Branson 1984, Burns and McDonnell 1992a, Call 1895, Christian 1995, Clark 1987, Crump 2003, Crump and others 2003a, 2003c, 2003d, 2003e, 2003g, 2003q, 2003r, 2003t, Davidson 1997, Davidson and Gosse 2001, Davidson and others 2000, Eckert 2003, Ecological Consultants 1984, Gordon 1980, 1980a, 1982, Gordon and Brown 1980, Gordon and Harris 1983, Gordon and others 1980, Harris 1987, 1996, 1999, 1999a, Harris and Gordon 1985, 1988, 1990, Harris and Milam 2002, 2002a, Harris and others 1997, Jenkinson and Ahlstedt 1987, 1994, Johnson 1980, Mather 1990, Meek and Clark 1912, Miller and Harris 1987, Oesch 1995, ONHI 2003, Posey 1997, Roe and Chong 2014, Rust 1993, Stansbery 1970, Stansbery and Stein 1982, Stein and Stansbery 1980, Stoeckel and others 2000, Turgeon and others 1988, 1998, USDA FS 1999, Wheeler 1918, Williams & others 1993).

Taxa Association Team and Peer Reviewers

AGFC Mr. Bill Posey, USFWS-ES Mr. Chris Davidson, ASU Dr. John Harris, AHTD Mr. Josh Seagraves, AHTD Mr. Ben Thesing

Cyprogenia sp. cf aberti

"Ouachita" Fanshell

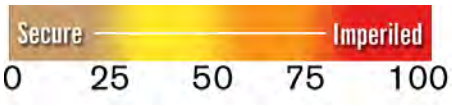


Class: Bivalva

Order: Unionoida

Family: Unionidae

Priority Score: **19** **out of 100**



Population Trend: Decreasing

Global Rank: GNR — Not yet ranked

State Rank: S3 — Vulnerable in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- ☐ Ozark Highlands
- ☐ Boston Mountains
- ☐ Arkansas Valley
- ☑ Ouachita Mountains
- ☑ South Central Plains
- ☐ Mississippi Alluvial Plain
- ☐ Mississippi Valley Loess Plains

Suitable Substrate gravel/sand

Description

Shell rounded, solid, and moderately inflated. Anterior margin rounded, posterior margin bluntly rounded or truncated. Ventral margin broadly rounded. Umbos not elevated above the hinge line.

Beak sculpture, if visible, of a few weak ridges. Growth lines appear as distinct elevated ridges. Numerous pustules usually concentrated in the center but occasionally covering the entire surface of the shell. Periostracum usually greenish yellow, with a pattern of dark green rays made up of numerous smaller broken lines or dots. Length to three inches (7.6 cm). Pseudocardinal teeth relatively large and serrated; two in the left valve, one in the right. Lateral teeth roughened, straight to slightly curved, heavy and very short. Interdentum wide. Beak cavity shallow to moderately deep. Nacre white, iridescent posteriorly.

Host Fish

Logperch, Orangebelly Darter

Ecobasins

Ouachita Mountains - Ouachita River

South Central Plains - Ouachita River

Habitats	Weight
Natural Glide: Headwater	Optimal
Natural Pool: Headwater - Medium	Suitable
Natural Riffle: Headwater	Optimal
Natural Run: Headwater - Medium - Large	Optimal
Natural Shoal: - Medium - Large	Suitable

Problems Faced

Threat: Habitat destruction
Source: Dam

Threat: Habitat destruction
Source: Grazing/Browsing

Threat: Habitat destruction
Source: Resource extraction

Threat: Nutrient loading
Source: Confined animal operations

Threat: Nutrient loading
Source: Grazing/Browsing

Threat: Sedimentation
Source: Forestry activities

Threat: Sedimentation
Source: Road construction

Conservation Actions	Importance	Category
More data are needed to determine conservation actions.	High	Data Gap

Monitoring Strategies

Additional information is needed before a monitoring strategy can be developed.

Cyprogenia sp. cf aberti
"Ouachita" Fanshell

Comments

Ongoing taxonomic work indicates that this complex may be comprised of more than one species, possibly up to three. Widespread, rare to locally common. The western fanshell may be declining across its range (AFMC 2004a, 2004b, 2004c, 2005, AGFC 2003, Ahlstedt and Jenkinson 1987, 1991, AHTD 1984, 1987, 1989, 1994, ANHI 2003, Bates and Dennis 1983, Branson 1984, Burns and McDonnell 1992a, Call 1895, Christian 1995, Clark 1987, Crump 2003, Crump and others 2003a, 2003c, 2003d, 2003e, 2003g, 2003q, 2003r, 2003t, Davidson 1997, Davidson and Gosse 2001, Davidson and others 2000, Ecological Consultants 1984, Gordon 1980, 1980a, 1982, Gordon and Brown 1980, Gordon and Harris 1983, Gordon and others 1980, Harris 1987, 1996, 1999, 1999a, Harris and Gordon 1985, 1988, 1990, Harris and Milam 2002, 2002a, Harris and others 1997, Jenkinson and Ahlstedt 1987, 1994, Johnson 1980, Mather 1990, Meek and Clark 1912, Miller and Harris 1987, Oesch 1995, ONHI 2003, Posey 1997, Rust 1993, Stansbery 1970, Stansbery and Stein 1982, Stein and Stansbery 1980, Stoeckel and others 2000, Turgeon and others 1988, 1998, USDA FS 1999, Wheeler 1918, Williams & others 1993).

Taxa Association Team and Peer Reviewers

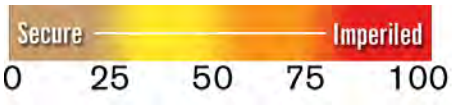
AGFC Mr. Bill Posey, USFWS-ES Mr. Chris Davidson, ASU Dr. John Harris, AHTD Mr. Josh Seagraves, AHTD Mr. Ben Thesing

Epioblasma florentina curtisii

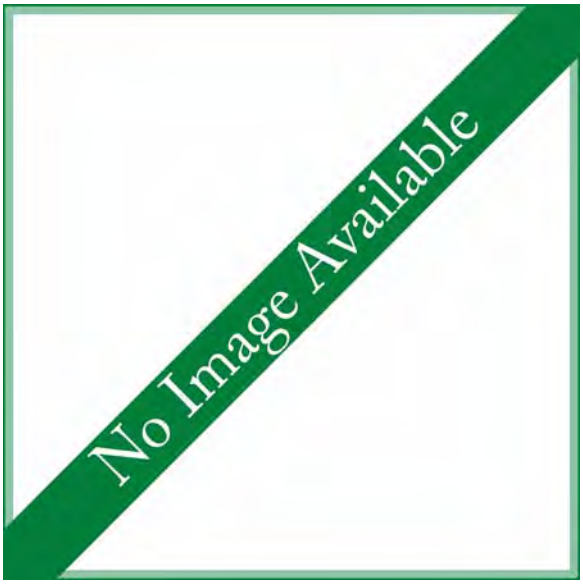
Curtis Pearlymussel

Class: Bivalvia
Order: Unionoida
Family: Unionidae

Priority Score: 100 out of 100



Population Trend: Decreasing



Global Rank: G1T1 — Critically imperiled subspecies

State Rank: S1 — Critically imperiled in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- [x] Ozark Highlands
- [ ] Boston Mountains
- [ ] Arkansas Valley
- [ ] Ouachita Mountains
- [ ] South Central Plains
- [ ] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains

Suitable Substrate gravel

Description

Shell small (less than 1.5 inches), yellowish brown to brown, sometimes with fine evenly spaced rays over most of its length. Beak broad and low and beak sculpture usually eroded away. Males oval in

shape, with the anterior end smoothly rounded, and the posterior end bluntly pointed and biangular. Female smoothly rounded anteriorly and broadly rounded and inflated posteriorly, posterior edge serrated. Nacre white to whitish-blue, hinge line broadly curved. Cardinal teeth high, triangular and divergent.

Host Fish

Rainbow Darter

Ecobasins

Ozark Highlands - White River

Habitats	Weight
Natural Riffle: Headwater	Suitable
Natural Run: Headwater	Optimal

Problems Faced

Threat: Habitat destruction
Source: Grazing/Browsing

Threat: Habitat destruction
Source: Recreation

Threat: Nutrient loading
Source: Confined animal operations

Threat: Nutrient loading
Source: Grazing/Browsing

Threat: Nutrient loading
Source: Urban development

Data Gaps/Research Needs

Continue searching for species using eDNA technology.

Conservation Actions	Importance	Category
Develop an outreach program.	Medium	Public Relations/Education
Find females and propagate juveniles for release.	High	Population Management
Protect habitat from recreational uses.	Medium	Habitat Protection
Protect host fish and associated habitat.	High	Habitat Protection
Protect or enhance riparian buffer.	High	Habitat Restoration/Improvement

Monitoring Strategies

Survey in accordance with U.S. Fish and Wildlife Service recovery plan.

Comments

Historically known from the Spring Rivers in Arkansas. Reported from South Fork Spring River in early
1980s. A 2007 Status Assessment conducted throughout its range yielded no live or dead individuals. The last live specimen was found in the Little Black River in Missouri in 1993. (AFMC 2004a, 2004b, 2004c, 2005, Bruendeman and others 2001, Harris and others 2007)

Taxa Association Team and Peer Reviewers

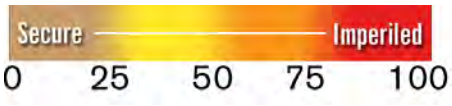
AGFC Mr. Bill Posey, USFWS-ES Mr. Chris Davidson, ASU Dr. John Harris, AHTD Mr. Josh Seagraves, AHTD Mr. Ben Thesing

Epioblasma triquetra

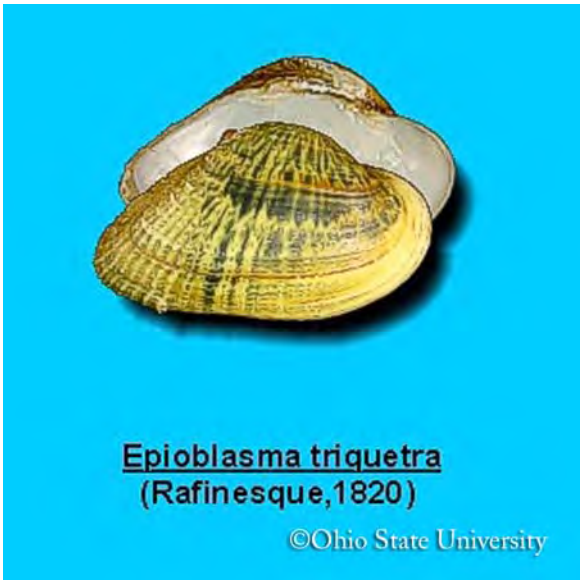
Snuffbox

Class: Bivalvia
Order: Unionoida
Family: Unionidae

Priority Score: **43** **out of 100**



Population Trend: Decreasing



Global Rank: G3 — Vulnerable species

State Rank: S1 — Critically imperiled in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- [x] Ozark Highlands
- [ ] Boston Mountains
- [ ] Arkansas Valley
- [ ] Ouachita Mountains
- [ ] South Central Plains
- [ ] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains

Suitable Substrate gravel

Description

Shell small, fairly solid, triangular (males) to somewhat elongate (females) and inflated (particularly in females). Anterior end rounded, posterior end truncated in males, expanded in females. Dorsal and

ventral margins straight to slightly curved. Posterior ridge sharply angled, posterior slope wide, expanded, and ribbed (especially in females). Umbos swollen and slightly elevated above the hinge line. Beak sculpture of three or four faint, double-looped bars. Periostracum yellow or yellowish green, with numerous dark green rays, blotches or chevron-shaped markings. Length to 2.5 inches (6.4 cm). Pseudocardinal teeth elevated, roughened, relatively thin and compressed; two in the left valve, two in the right, with the front one being thinner and much smaller. Lateral teeth very short, slightly curved, serrated, and elevated. Beak cavity fairly deep. Nacre pearly white, iridescent posteriorly.

Host Fish

Banded Sculpin, Logperch

Ecobasins

Ozark Highlands - White River

Habitats	Weight
Natural Riffle: Headwater - Small - Medium	Suitable
Natural Run: Headwater - Small - Medium	Optimal

Problems Faced

Threat: Habitat destruction
Source: Grazing/Browsing

Threat: Habitat destruction
Source: Recreation

Threat: Nutrient loading
Source: Confined animal operations

Threat: Nutrient loading
Source: Grazing/Browsing

Threat: Nutrient loading
Source: Urban development

Data Gaps/Research Needs

Conduct genetic research to address taxonomic questions.

Conduct status survey.

Conduct survey for additional populations.

Determine environmental stressors such as nutrient loading, toxicity to chemicals and metals, sedimentation effects, etc.

Conservation Actions

Conservation Actions	Importance	Category
Develop an outreach program.	Medium	Public Relations/Education
Propagate, augment and reintroduce species where appropriate.	High	Population Management
Protect habitat from recreational uses.	Medium	Habitat Protection
Protect host fish and associated habitat.	High	Habitat Restoration/Improvement
Protect or enhance riparian buffer.	High	Habitat Restoration/Improvement

Monitoring Strategies

Additional information is needed before a monitoring strategy can be developed.

Comments

Appears to be a viable population in the Spring River, and one live individual has been found in the Buffalo River. Relict shells have been found in the Kings and Strawberry rivers. Widespread distribution in North America but declining rangewide and is thought to exist in 40 percent of its former range (AFMC 2004a, 2004b, 2004c, 2005, Matthews 2007, Roe 2002).

Taxa Association Team and Peer Reviewers

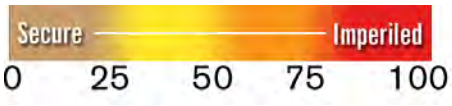
AGFC Mr. Bill Posey, USFWS-ES Mr. Chris Davidson, ASU Dr. John Harris, AHTD Mr. Josh Seagraves, AHTD Mr. Ben Thesing

Epioblasma turgidula

Turgid Blossom

Class: Bivalvia
Order: Unionoida
Family: Unionidae

Priority Score: 100 out of 100



Population Trend: Decreasing



Global Rank: GX — Presumed extinct

State Rank: SX — Presumed extinct

Distribution

Occurrence Records



Ecoregions where the species occurs:

- [x] Ozark Highlands
- [ ] Boston Mountains
- [ ] Arkansas Valley
- [ ] Ouachita Mountains
- [ ] South Central Plains
- [ ] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains

Suitable Substrate gravel

Description

Shell small, elliptical, ovate, or obovate in shape (maximum length 40 mm). Anterior end of shell rounded; posterior end of male shells pointed, while females are broadly rounded. Shell yellowish

green covered with numerous fine green rays evenly distributed over the shell surface. Nacre bluish-white.

Host Fish

Unknown

Ecobasins

Ozark Highlands - White River

Habitats	Weight
Natural Riffle: Headwater	Data Gap
Natural Run: Headwater	Data Gap

Problems Faced

Threat: Habitat destruction
Source: Grazing/Browsing

Threat: Habitat destruction
Source: Recreation

Threat: Nutrient loading
Source: Confined animal operations

Threat: Nutrient loading
Source: Grazing/Browsing

Threat: Nutrient loading
Source: Recreation

Data Gaps/Research Needs

Continue searching for species using eDNA technology.

Conservation Actions	Importance	Category
Develop an outreach program.	Medium	Public Relations/Education
Develop and implement habitat conservation plan.	Medium	Habitat Restoration/Improvement
Propagate, augment and reintroduce species where appropriate.	Medium	Population Management
Protect habitat from recreational uses.	Medium	Habitat Protection
Protect or enhance riparian buffer.	Medium	Habitat Protection

Monitoring Strategies

Survey in accordance with U.S. Fish and Wildlife Service recovery plan.

Comments

Possibly extinct, but exhaustive surveys have not been conducted in Arkansas (AFMC 2004a, 2004b, 2004c, 2005, USFW 1985).

Taxa Association Team and Peer Reviewers

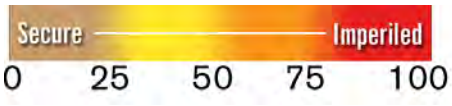
AGFC Mr. Bill Posey, USFWS-ES Mr. Chris Davidson, ASU Dr. John Harris, AHTD Mr. Josh Seagraves, AHTD Mr. Ben Thesing

Fusconaia ozarkensis

Ozark Pigtoe

Class: Bivalvia
Order: Unionoida
Family: Unionidae

Priority Score: **23** out of 100



Population Trend: Unknown

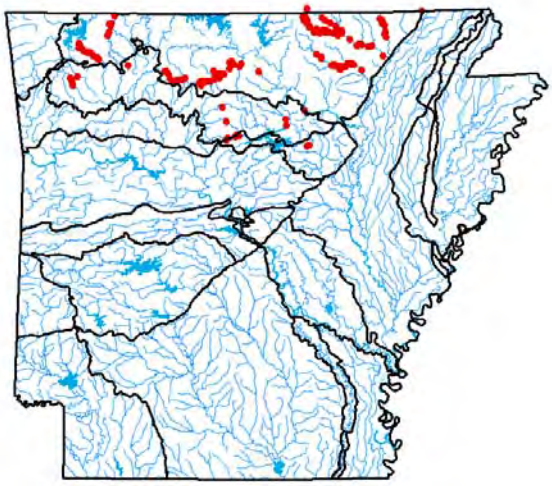


Global Rank: G3G4 — Vulnerable (uncertain rank)

State Rank: S3 — Vulnerable in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- [x] Ozark Highlands
- [ ] Boston Mountains
- [ ] Arkansas Valley
- [ ] Ouachita Mountains
- [ ] South Central Plains
- [ ] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains

Suitable Substrate gravel/cobble

Description

Shell quadrate; dorsal margin straight or slightly curved; ventral margin gently convex to straight but may be concave; anterior end uniformly rounded; posterior margin with two angles. Shells thick, not

inflated, posterior ridge not prominent. Shell color tan with faint green rays in young individuals, becoming red-brown to black in older individuals. Left valve with two erect, triangular, striated pseudocardinals; lateral teeth nearly straight, relatively short and striated; right valve has one erect, stout, striated pseudocardinal; single lateral tooth is heavy, broad, striated; nacre white to blue-white, often tinged with pink.

Host Fish

Unknown

Ecobasins

Ozark Highlands - White River

Habitats	Weight
Natural Glide: Headwater	Suitable
Natural Pool: Headwater - Medium - Large	Suitable
Natural Riffle: Headwater	Optimal
Natural Run: Headwater - Medium - Large	Optimal
Natural Shoal: - Medium - Large	Suitable

Problems Faced

Threat: Habitat destruction
Source: Channel alteration

Threat: Habitat destruction
Source: Channel maintenance

Threat: Habitat destruction
Source: Dam

Threat: Hydrological alteration
Source: Dam

Threat: Nutrient loading
Source: Confined animal operations

Threat: Nutrient loading
Source: Grazing/Browsing

Data Gaps/Research Needs

Conduct genetic and life history studies to determine the taxonomic relationships of Fusconaia and Pleurobema.

Conduct status survey.

Conduct survey for additional populations.

Conservation Actions	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

Additional information is needed before a monitoring strategy can be developed.

Comments

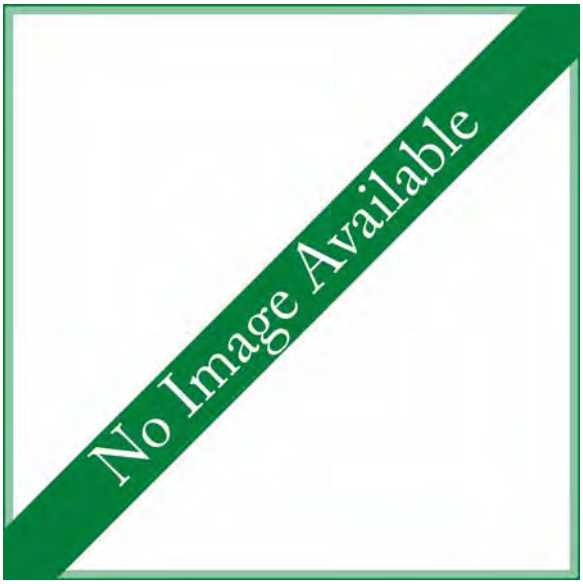
Recognized form is widespread across Ozark Mountains in Arkansas and Missouri. Genetic uncertainty has resulted in uncertain distributional information. Genetic analysis will help determine phylogeography of species in Arkansas (AFMC 2004a, 2004b, 2004c, 2005).

Taxa Association Team and Peer Reviewers

AGFC Mr. Bill Posey, USFWS-ES Mr. Chris Davidson, ASU Dr. John Harris, AHTD Mr. Josh Seagraves, AHTD Mr. Ben Thesing

Fusconaia sp. cf. flava

"Elongate" Pigtoe

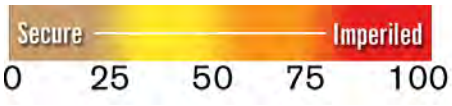


Class: Bivalva

Order: Unionoida

Family: Unionidae

Priority Score: **29** **out of 100**



Population Trend: Decreasing

Global Rank: GNR — Not yet ranked

State Rank: S1 — Critically imperiled in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- [x] Ozark Highlands
- [x] Boston Mountains
- [ ] Arkansas Valley
- [ ] Ouachita Mountains
- [ ] South Central Plains
- [ ] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains

Suitable Substrate gravel

Description

Valves thin to moderately thick, strong; shell thin to moderately inflated, outline quadrate to elongate; beaks low, turned forward. Posterior ridge indistinct; sulcus absent on disc. Periostracum has a

satiny or cloth-like sheen; fine green rays may be present, especially in young specimens. Pseudocardinal and lateral teeth well developed and solid; narrow interdentum; beak cavity moderately deep to deep. Nacre usually white. The species is most closely related to Fusconaia flava; however, it most closely resembles the Ozark pigtoe (Fusconaia ozarkensis) and is thought to occur only in Arkansas River tributaries in Arkansas, Kansas, Missouri and Oklahoma.

Host Fish

Unknown

Ecobasins

Boston Mountains - Arkansas River

Ozark Highlands - Arkansas River

Habitats	Weight
Natural Glide: Headwater	Suitable
Natural Pool: Headwater - Medium - Large	Optimal
Natural Riffle: Headwater	Optimal
Natural Run: Headwater - Medium - Large	Optimal
Natural Shoal: - Medium - Large	Suitable

Problems Faced

Threat: Nutrient loading
Source: Confined animal operations

Threat: Nutrient loading
Source: Grazing/Browsing

Threat: Nutrient loading
Source: Municipal/Industrial point source

Threat: Nutrient loading
Source: Urban development

Threat: Sedimentation
Source: Grazing/Browsing

Threat: Sedimentation
Source: Road construction

Threat: Sedimentation
Source: Urban development

Data Gaps/Research Needs

Conduct genetic research to determine phylogenetic relationships.
Conduct life history study.
Determine environmental stressors such as nutrient loading, toxicity to chemicals and metals, sedimentation effects, etc.
Determine habitat preferences and availability.
Determine host fish availability.

Conservation Actions

	Importance	Category
Develop an outreach program.	Medium	Public Relations/Education
Manage watershed, addressing physical, chemical, biological and land use components, to restore or sustain aquatic life.	High	Threat Abatement
Propagate, augment and reintroduce species where appropriate.	Low	Population Management
Protect host fish and associated habitat.	Medium	Habitat Protection
Reduce cattle access to the Illinois River.	Medium	Habitat Protection

Monitoring Strategies

Continue to monitor occurrence in ongoing river surveys.

Comments

This species was recognized by Hayes (2010) from the Illinois River based on genetic sampling. However, more samples are needed before a formal taxonomic change can be recommended.

Taxa Association Team and Peer Reviewers

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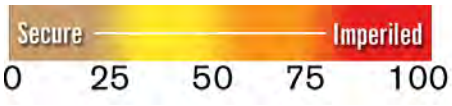
Lampsilis abrupta

Pink Mucket



Class: Bivalvia
Order: Unionoida
Family: Unionidae

Priority Score: **46** **out of 100**



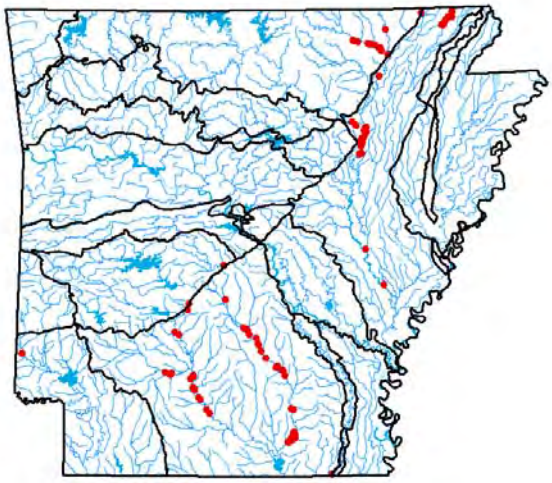
Population Trend: Unknown

Global Rank: G2 — Imperiled species

State Rank: S2 — Imperiled in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- [x] Ozark Highlands
- [ ] Boston Mountains
- [ ] Arkansas Valley
- [ ] Ouachita Mountains
- [x] South Central Plains
- [x] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains

Suitable Substrate sand/gravel

Description

Shell round to elliptical, solid, and inflated. Anterior end rounded, posterior end bluntly pointed in males, truncated in females. Dorsal margin straight, ventral margin straight to slightly curved. Umbos

turned forward and elevated above the hinge line. Beak sculpture, if visible, of three or four double-looped ridges. Shell smooth, yellow or yellowish green and rayless or with faint green rays. Length to four inches (10.2 cm). Pseudocardinal teeth triangular, thick, divergent; two in the left valve, one in the right, occasionally with a smaller tubercular tooth in front. Lateral teeth short, heavy, and relatively thick. Beak cavity deep. Nacre pink or white, iridescent posteriorly.

Host Fish

Smallmouth Bass, Largemouth Bass, Spotted Bass

Ecobasins

Mississippi River Alluvial Plain - White River

Ozark Highlands - White River

South Central Plains - Ouachita River

South Central Plains - Red River

Habitats	Weight
Natural Pool: - Medium - Large	Suitable
Natural Run: - Medium - Large	Optimal
Natural Shoal: - Medium - Large	Suitable

Problems Faced

Threat: Habitat destruction
Source: Channel alteration

Threat: Habitat destruction
Source: Channel maintenance

Threat: Habitat destruction
Source: Dam

Threat: Hydrological alteration
Source: Dam

Threat: Hydrological alteration
Source: Water diversion

Threat: Sedimentation
Source: Agricultural practices

Threat: Sedimentation
Source: Channel alteration

Threat: Sedimentation
Source: Channel maintenance

Threat: Sedimentation
Source: Dam

Threat: Sedimentation
Source: Forestry activities

Threat: Sedimentation
Source: Road construction

Data Gaps/Research Needs

Conduct genetic testing to determine species in Arkansas.
Conduct status survey.
Determine environmental stressors such as nutrient loading, toxicity to chemicals and metals, sedimentation effects, etc.
Determine host fish.

Conservation Actions

	Importance	Category
Avoid dredging White and Ouachita river beds and channel.	High	Habitat Protection
Develop an outreach program.	Medium	Public Relations/Education
Manage watershed, addressing physical, chemical, biological and land use components, to restore or sustain aquatic life.	Medium	Threat Abatement
Propagate, augment and reintroduce species where appropriate.	Medium	Population Management
Protect host fish and associated habitat.	Medium	Habitat Protection

Monitoring Strategies

Survey in accordance with U.S. Fish and Wildlife Service recovery plan.

Comments

Federally-listed endangered species. Taxonomic concerns are due to similarity of appearance with another species. May also be two separate species in Arkansas. Historically widespread but rarely common. The lack of recruitment and the difficulty with which it is found makes the species difficult to determine its status in Arkansas. In 2014, the USFWS and AGFC released 1,000 two-year old Pink mucket mussels into the Saline River in Ashley County. (AFMC 2004a, 2004b, 2004c, 2005, AGFC 2003, AHTD 1984, ANHI 2003, Bates and Dennis 1983, Christian 1995, Clark 1987, Coker 1919, Crump 2003, Crump and others 2003a, 2003c, 2003d, 2003e, 2003g, 2003q, 2003r, 2003t, Cummings and Mayer 1992, Davidson 1997, Gordon 1980a, 1982, Gordon and Harris 1983, Gordon and others 1980, Harris 1989d, 1990c, 1995, 1997c, 1999, 1999a, 2002, Harris and Gordon 1987, 1990, Harris and Milam 2002, 2002a, Harris and others 1997, Johnson 1980, Miller and Harris 1987, Oesch 1995, ONHI 2003, Posey 1997, Rust 1993, Stansbery 1970, Turgeon and others 1988, 1998, USDA FS 1999, Wheeler 1918, Williams & others 1993).

Taxa Association Team and Peer Reviewers

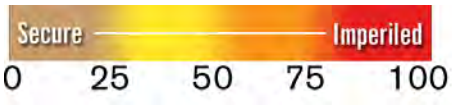
AGFC Mr. Bill Posey, USFWS-ES Mr. Chris Davidson, ASU Dr. John Harris, AHTD Mr. Josh Seagraves, AHTD Mr. Ben Thesing

Lampsilis ornata

Southern Pocketbook

Class: Bivalvia
Order: Unionoida
Family: Unionidae

Priority Score: 19 out of 100



Population Trend: Unknown

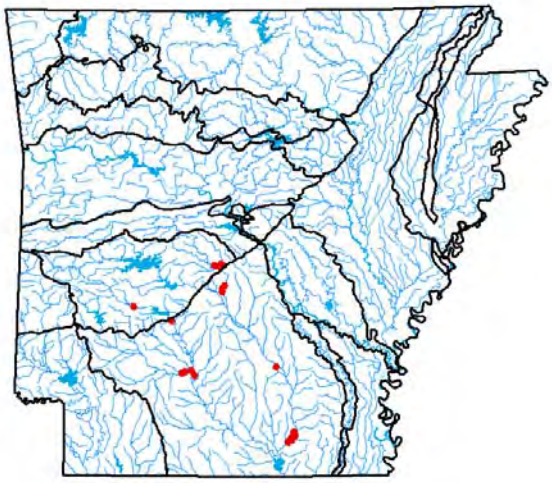


Global Rank: G5 — Secure

State Rank: S2 — Imperiled in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- ☐ Ozark Highlands
- ☐ Boston Mountains
- ☐ Arkansas Valley
- ☑ Ouachita Mountains
- ☑ South Central Plains
- ☐ Mississippi Alluvial Plain
- ☐ Mississippi Valley Loess Plains

Suitable Substrate gravel

Description

Shell inflated, subsolid, the male irregularly ovate or rhomboid, the female obovate, with a high, decided posterior ridge; beaks high and full. Shell tawny or greenish-yellow, showing a few greenish

rays. Two pseudocardinals in left valve, and two small remote laterals; right valve with two subcompressed, triangular pseudocardinals, and one high lateral truncated behind; nacre white.

Host Fish

Largemouth Bass

Ecobasins

Ouachita Mountains - Ouachita River

Habitats	Weight
Natural Oxbow - connected: - Medium - Large	Marginal
Natural Pool: Headwater - Medium - Large	Suitable
Natural Riffle: Headwater	Suitable
Natural Run: Headwater - Medium - Large	Optimal
Natural Shoal: - Medium - Large	Marginal

Problems Faced

Threat: Nutrient loading
Source:

Threat: Nutrient loading
Source:

Threat: Nutrient loading
Source:

Data Gaps/Research Needs

Conduct distribution surveys.

Conduct genetic study to determine extent of population in Arkansas.

Determine habitat preferences and availability.

Determine host fish suitability and availability.

Conservation Actions	Importance	Category
Manage watershed, addressing physical, chemical, biological and land use components, to restore or sustain aquatic life.	Medium	Threat Abatement

Monitoring Strategies

Additional information is needed before a monitoring strategy can be developed.

Comments

Peripheral. Scattered distribution. Low density in the Ouachita Mountain portion of its range. The Southern Pocketbook has only been confirmed from the Saline River in Arkansas. Although this species is not considered to be very threatened rangewide, the small number of occurrences known from Arkansas seems to indicate that this species is rare (AFMC 2004a, 2004b, 2004c, 2005, AGFC 2003, ANHI 2003, Crump 2003, Crump and others 2003a, 2003c, 2003d, 2003e, 2003g, 2003q, 2003r, 2003t, Gordon and Harris 1983, Harris 1999, Harris and Gordon 1987, Harris and others 1997, Johnson 1980, Turgeon and others 1988, 1998, USDA FS 1999, Williams & others 1993).

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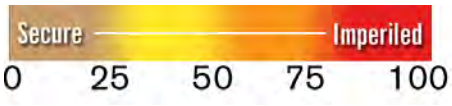
Lampsilis powellii

Arkansas Fatmucket



Class: Bivalvia
Order: Unionoida
Family: Unionidae

Priority Score: **57** **out of 100**



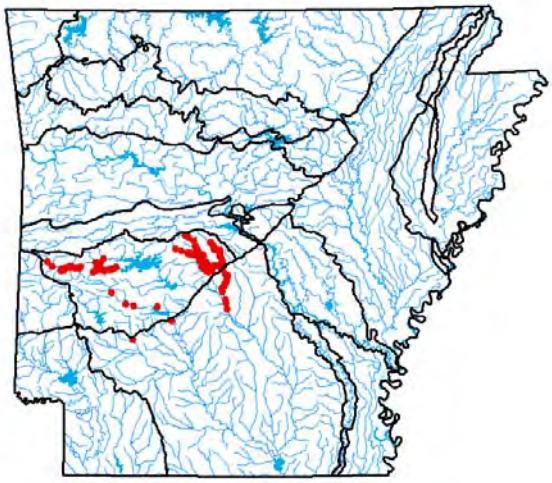
Population Trend: Decreasing

Global Rank: G2 — Imperiled species

State Rank: S2 — Imperiled in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- ☐ Ozark Highlands
- ☐ Boston Mountains
- ☐ Arkansas Valley
- ☑ Ouachita Mountains
- ☑ South Central Plains
- ☐ Mississippi Alluvial Plain
- ☐ Mississippi Valley Loess Plains

Suitable Substrate gravel/sand

Description

Shell oblong to quadrate and slightly to moderately inflated, with thin to moderately thick valves. Shell color is yellow to tan and color rays are always absent. Nacre and both pseudocardinal and lateral

teeth are thin but well developed. Maximum length is about six inches.

Host Fish

Spotted Bass, Largemouth Bass

Ecobasins

Ouachita Mountains - Ouachita River

South Central Plains - Ouachita River

Habitats	Weight
Natural Pool: Headwater - Medium - Large	Suitable
Natural Riffle: Headwater	Marginal
Natural Run: Headwater - Medium - Large	Suitable
Natural Shoal: - Medium - Large	Marginal
Natural Side channel: - Medium - Large	Optimal

Problems Faced

Threat: Nutrient loading
Source: Confined animal operations

Threat: Nutrient loading
Source: Grazing/Browsing

Threat: Nutrient loading
Source: Recreation

Threat: Nutrient loading
Source: Urban development

Threat: Sedimentation
Source: Grazing/Browsing

Threat: Sedimentation
Source: Road construction

Threat: Sedimentation
Source: Urban development

Data Gaps/Research Needs

Determine environmental stressors such as nutrient loading, toxicity to chemicals and metals, sedimentation effects, etc.

Determine habitat preferences and availability.

Determine host fish availability.

Conservation Actions

	Importance	Category
Develop an outreach program.	Medium	Public Relations/Education
Implement a Safe Harbor agreement.	High	Habitat Protection
Manage watershed, addressing physical, chemical, biological and land use components, to restore or sustain aquatic life with emphasis in the Saline and Ouachita Rivers.	High	Threat Abatement
Propagate, augment and reintroduce species where appropriate.	High	Population Management
Protect host fish and associated habitat.	Medium	Habitat Protection

Monitoring Strategies

Survey in accordance with U.S. Fish and Wildlife Service recovery plan.

Comments

Federally-listed threatened species. Ouachita River drainage endemic. Main populations are in the Forks of the Saline, South Fork Ouachita and upper Ouachita rivers. Restricted distribution and relatively common in preferred habitat, its population sizes appear small; however, its frequency of capture may be decreasing. Host fish availability was conducted in 2004. Propagating and releasing juveniles is a high priority in the Ouachita and Caddo rivers where the species has become difficult to locate.(AFMC 2004a, 2004b, 2004c, 2005, AGFC 2003, AHTD 1989, 1994, ANHI 2003, Branson 1984, Brown and Brown 1989, Burns and McDonnell 1992, 1992a, Crump 2003, Crump and others 2003a, 2003c, 2003d, 2003e, 2003g, 2003q, 2003r, 2003t, Davidson and Gosse 2001, Gordon and Harris 1983, 1985, Harris 1989c, 1991a, 1994a, 1999, 1999a, Harris and Gordon 1987, 1988, 1990, Harris and others 1992, 1997, Johnson 1980, Scott 2004, Turgeon and others 1988, 1998, Turner and others 2000, USDA FS 1999, USDI FWS 1990, 1992, Williams & others 1993).

Taxa Association Team and Peer Reviewers

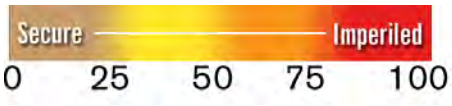
AGFC Mr. Bill Posey, USFWS-ES Mr. Chris Davidson, ASU Dr. John Harris, AHTD Mr. Josh Seagraves, AHTD Mr. Ben Thesing

Lampsilis rafinesqueana

Neosho Mucket

Class: Bivalvia
Order: Unionoida
Family: Unionidae

Priority Score: **62** **out of 100**




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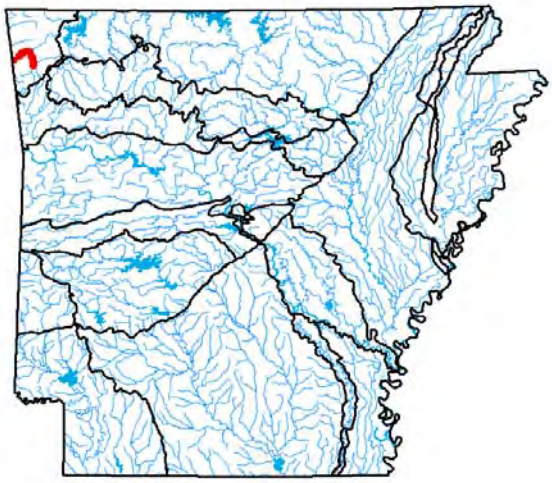
Population Trend: Decreasing

Global Rank: G2 — Imperiled species

State Rank: S1 — Critically imperiled in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- [x] Ozark Highlands
- [x] Boston Mountains
- [ ] Arkansas Valley
- [ ] Ouachita Mountains
- [ ] South Central Plains
- [ ] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains

Suitable Substrate gravel

Description

Shell oblong, dorsal line gently rounded, ventral line straight to gently curved; anterior end uniformly rounded, posterior end truncated above and at the posterior ridge which usually gives it a biangulate

appearance; compressed; relatively strong although thin; beaks low; shell light brown and has a dull, waxy luster; green rays cover surface; left valve has two stout, divergent, striated, triangular pseudocardinal teeth; the two lateral teeth are short, stout and slightly curved; right valve has a tall, triangular to columnar, striated pseudocardinal, a low, lamellar tooth can be seen anteriorly; right lateral tooth is short, stout and slightly curved. Nacre is bluish-white to white, slightly iridescent posteriorly.

Host Fish

Largemouth Bass, Smallmouth Bass

Ecobasins

Boston Mountains - Arkansas River

Ozark Highlands - Arkansas River

Habitats	Weight
Natural Glide: Headwater	Suitable
Natural Pool: Headwater - Medium - Large	Optimal
Natural Riffle: Headwater	Optimal
Natural Run: Headwater - Medium - Large	Optimal
Natural Shoal: - Medium - Large	Suitable

Problems Faced

Threat: Nutrient loading
Source: Confined animal operations

Threat: Nutrient loading
Source: Grazing/Browsing

Threat: Nutrient loading
Source: Municipal/Industrial point source

Threat: Nutrient loading
Source: Urban development

Threat: Sedimentation
Source: Grazing/Browsing

Threat: Sedimentation
Source: Road construction

Threat: Sedimentation
Source: Urban development

Data Gaps/Research Needs

Conduct life history study.
Determine environmental stressors such as nutrient loading, toxicity to chemicals and metals, sedimentation effects, etc.
Determine genetic structure among extant populations across the range.
Determine habitat preferences and availability,
Determine host fish availability.

Conservation Actions

	Importance	Category
Develop an outreach program.	Medium	Public Relations/Education
Manage watershed, addressing physical, chemical, biological and land use components, to restore or sustain aquatic life.	High	Threat Abatement
Propagate, augment and reintroduce species where appropriate.	Low	Population Management
Protect host fish and associated habitat.	Medium	Habitat Protection
Reduce cattle access to the Illinois River.	High	Habitat Protection

Monitoring Strategies

Continue to monitor occurrence in ongoing river surveys.

Comments

Federally-listed endangered species. Endemic to Arkansas River drainage streams in Arkansas, Oklahoma, Kansas and Missouri. Most imperiled in Kansas streams where it has been lost in several stream segments. Propagation and augmentation efforts are showing signs of success in Kansas streams. Genetic research to determine phylogenetic relationships was completed in 2004 and confirmed the Neosho Mucket as a valid species. (AFMC 2004a, 2004b, 2004c, 2005, Chris Barnhart, personal communication 2005, USFWS 2013).

Taxa Association Team and Peer Reviewers

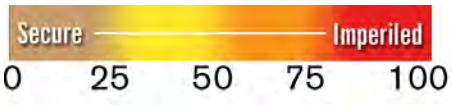
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Lampsilis sp. A cf hydiana

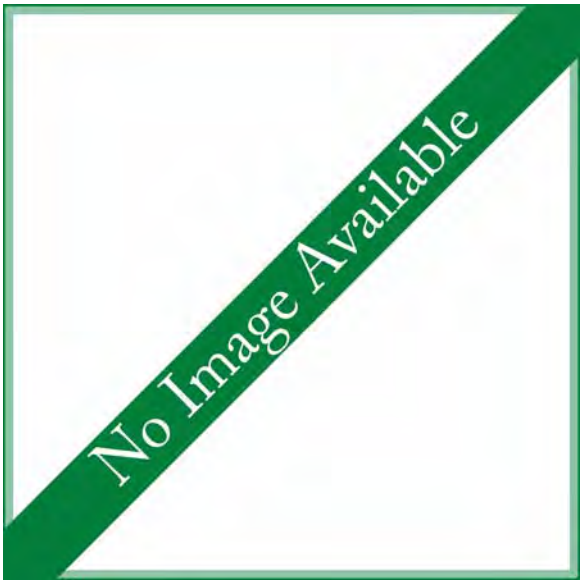
"Arkoma" Fatmucket

Class: Bivalva
Order: Unionoida
Family: Unionidae

Priority Score: **15** **out of 100**



Population Trend: Unknown



Global Rank: GNR — Not yet ranked

State Rank: S3 — Vulnerable in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- ☐ Ozark Highlands
- ☐ Boston Mountains
- ☑ Arkansas Valley
- ☑ Ouachita Mountains
- ☐ South Central Plains
- ☐ Mississippi Alluvial Plain
- ☐ Mississippi Valley Loess Plains

Suitable Substrate unknown

Description

Currently undescribed.

Host Fish

Lampsilis sp. A cf hydiana
"Arkoma" Fatmucket

Unknown

Ecobasins

Arkansas Valley - Arkansas River

Ouachita Mountains - Arkansas River

Habitats	Weight
Natural Pool: - Small - Medium	Data Gap
Natural Riffle: - Small - Medium	Data Gap
Natural Run: - Small - Medium	Data Gap

Problems Faced

Threat: Sedimentation
Source: Resource extraction

Data Gaps/Research Needs

Conduct life history study.

Describe species and determine distribution.

Determine habitat preferences.

Determine host fish suitability and availability.

Identify threats and sources of threats.

Conservation Actions	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

Additional information is needed before a monitoring strategy can be developed.

Comments

This is an undescribed species that was historically treated as Lampsilis hydiana. Future work will develop global and state rankings and needs for this species (AFMC 2004a, 2004b, 2004c, 2005, Harris and others 2004).

Taxa Association Team and Peer Reviewers

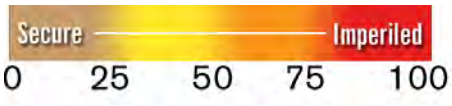
AGFC Mr. Bill Posey, USFWS-ES Mr. Chris Davidson, ASU Dr. John Harris, AHTD Mr. Josh Seagraves, AHTD Mr. Ben Thesing

Lampsilis sp. B cf hydiana

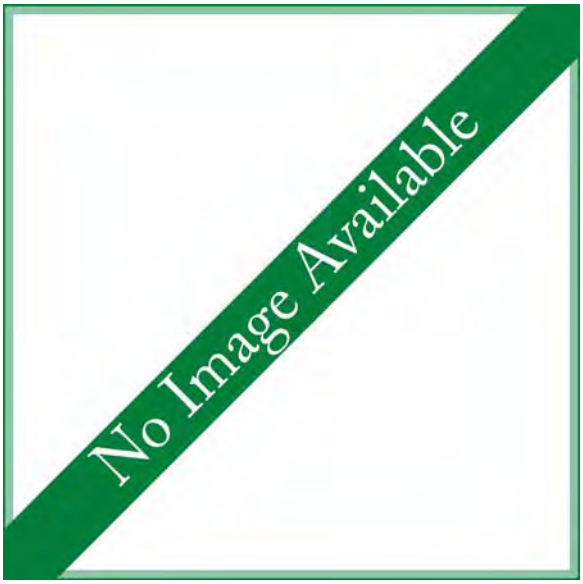
"Red River" Mucket

Class: Bivalva
Order: Unionoida
Family: Unionidae

Priority Score: 19 out of 100



Population Trend: Unknown



Global Rank: GNR — Not yet ranked

State Rank: S2 — Imperiled in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- ☐ Ozark Highlands
- ☐ Boston Mountains
- ☐ Arkansas Valley
- ☐ Ouachita Mountains
- ☑ South Central Plains
- ☐ Mississippi Alluvial Plain
- ☐ Mississippi Valley Loess Plains

Suitable Substrate unknown

Description

Currently undescribed.

Host Fish

Lampsilis sp. B cf hydiana
"Red River" Mucket

Unknown

Ecobasins

South Central Plains - Red River

Habitats	Weight
Natural Pool: - Medium	Suitable
Natural Riffle:	Data Gap
Natural Run:	Data Gap

Problems Faced

Threat:
Source:

Data Gaps/Research Needs

Conduct life history study.

Determine distribution.

Determine habitat preferences.

Determine host fish suitability and availability.

Identify threats and sources of threats.

Conservation Actions	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

Additional information is needed before a monitoring strategy can be developed.

Comments

This is an undescribed species that was historically treated as Lampsilis hydiana. Future work will develop global rankings. State ranks have been developed. (AFMC 2004a, 2004b, 2004c, 2005, Harris and others 2004; Harris and Posey 2015).

Taxa Association Team and Peer Reviewers

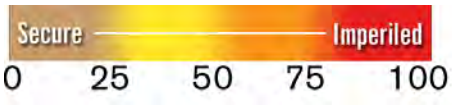
AGFC Mr. Bill Posey, USFWS-ES Mr. Chris Davidson, ASU Dr. John Harris, AHTD Mr. Josh Seagraves, AHTD Mr. Ben Thesing

Lampsilis streckeri

Speckled Pocketbook

Class: Bivalvia
Order: Unionoida
Family: Unionidae

Priority Score: **80** **out of 100**





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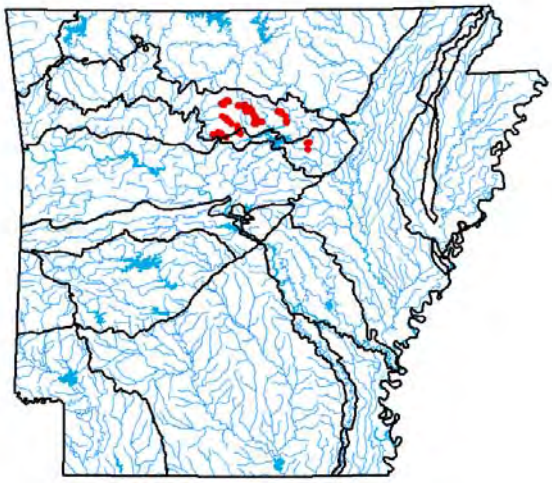
Population Trend: Stable

Global Rank: G1Q — Critically imperiled (questionable taxonomy)

State Rank: S1 — Critically imperiled in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- ☐ Ozark Highlands
- ☑ Boston Mountains
- ☐ Arkansas Valley
- ☐ Ouachita Mountains
- ☐ South Central Plains
- ☐ Mississippi Alluvial Plain
- ☐ Mississippi Valley Loess Plains

Suitable Substrate gravel

Description

Shell oblong to quadrate, moderately inflated with thin to moderately thick valves. Pseudocardinal and lateral teeth are thin but well developed. Shell color ranges from yellow to green to tan, with

numerous thin, broken rays and flecks extending from the umbo to the posterior margin. Nacre grayish to iridescent, and maximum length is about four inches.

Host Fish

Green Sunfish, Bluegill, Longear Sunfish, Redear Sunfish, Spotted Sunfish, Smallmouth Bass, Spotted Bass, Largemouth Bass

Ecobasins

Boston Mountains - White River

Habitats	Weight
Natural Glide: Headwater	Suitable
Natural Pool: Headwater - Medium - Large	Optimal
Natural Riffle: Headwater	Suitable
Natural Run: Headwater - Medium - Large	Optimal
Natural Shoal: - Medium - Large	Suitable

Problems Faced

Threat: Habitat destruction
Source: Dam

Threat: Habitat destruction
Source: Grazing/Browsing

Threat: Habitat destruction
Source: Resource extraction

Threat: Nutrient loading
Source: Confined animal operations

Threat: Nutrient loading
Source: Grazing/Browsing

Threat: Sedimentation
Source: Forestry activities

Threat: Sedimentation
Source: Grazing/Browsing

Threat: Sedimentation
Source: Resource extraction

Threat: Sedimentation
Source: Road construction

Data Gaps/Research Needs

Conduct status survey.

Survey for additional populations.

Conservation Actions

Conservation Actions	Importance	Category
Develop an outreach program.	Medium	Public Relations/Education
Implement Safe Harbor Agreement.	High	Habitat Restoration/Improvement
Manage watershed, addressing physical, chemical, biological and land use components, to restore or sustain aquatic life in the Little Red River basin.	High	Threat Abatement
Propagate, augment or reintroduce species where appropriate.	Low	Population Management
Protect and enhance riparian buffers.	High	Habitat Protection
Protect host fish andassociated habitat.	Medium	Habitat Protection

Monitoring Strategies

Survey in accordance with U.S. Fish and Wildlife Service recovery plan.

Comments

Federally-listed endangered species. Endemic to Little Red River. Previously thought to only remain in Middle Fork Little Red River, but recent surveys found small populations in all forks (AFMC 2004a, 2004b, 2004c, 2005). Genetic research has confirmed the validity of this species (Harris and others 2004). The species has also been discovered in Big Creek, a tributary occurring downstream of Greers Ferry Dam.

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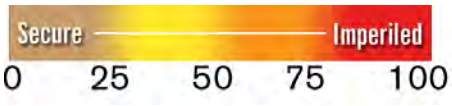
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Leptodea leptodon

Scaleshell

Class: Bivalvia
Order: Unionoida
Family: Unionidae

Priority Score: **76** **out of 100**




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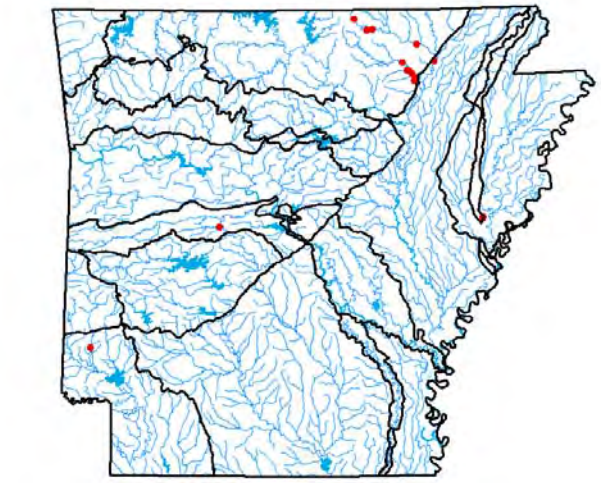
Population Trend: Decreasing

Global Rank: G1G2 — Critically imperiled (uncertain rank)

State Rank: S2 — Imperiled in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- [x] Ozark Highlands
- [ ] Boston Mountains
- [ ] Arkansas Valley
- [x] Ouachita Mountains
- [x] South Central Plains
- [x] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains

Suitable Substrate gravel/sand

Description

Shell relatively small, elongate, thin, and compressed. Anterior end rounded, posterior end pointed. Dorsal margin straight, ventral margin straight to broadly curved. Umbos small and low, about even

with the hinge line. Beak sculpture, if visible, of four or five double-looped ridges. Shell smooth, yellowish green or brown, with numerous faint green rays. Length to 4 inches (10.2 cm). Pseudocardinal teeth reduced to a small thickened ridge. Lateral teeth moderately long; two low, indistinct lateral teeth in left valve, one fine tooth in the right. Beak cavity very shallow or absent. Nacre pinkish white or light purple and highly iridescent.

Host Fish

Freshwater Drum

Ecobasins

Mississippi River Alluvial Plain - St. Francis River

Ouachita Mountains - Arkansas River

Ozark Highlands - White River

South Central Plains - Ouachita River

South Central Plains - Red River

Habitats	Weight
Natural Glide: Headwater	Optimal
Natural Riffle: Headwater	Optimal
Natural Run: Headwater - Medium - Large	Optimal
Natural Shoal: - Medium - Large	Suitable

Problems Faced

Threat: Habitat destruction
Source: Dam

Threat: Habitat destruction
Source: Grazing/Browsing

Threat: Habitat destruction
Source: Resource extraction

Threat: Nutrient loading
Source: Confined animal operations

Threat: Nutrient loading
Source: Grazing/Browsing

Threat: Sedimentation
Source: Forestry activities

Threat: Sedimentation
Source: Road construction

Data Gaps/Research Needs

Conduct status surveys.

Determine environmental stressors such as nutrient loading, toxicity to chemicals and metals, sedimentation effects, etc.

Conservation Actions

Conservation Actions	Importance	Category
Develop an outreach program.	Medium	Public Relations/Education
Develop and implement a habitat conservation plan.	High	Habitat Restoration/Improvement
Propagate, augment and reintroduce species where appropriate.	High	Population Management
Protect host fish and associated habitat.	High	Habitat Restoration/Improvement

Monitoring Strategies

Survey in accordance with U.S. Fish and Wildlife Service recovery plan.

Comments

Federally-listed endangered species. Poorly known, difficult to detect and extremely rare. Occurs in Arkansas, but distribution and densities not well understood. Scaleshell is found with increasing difficulty. Those found have been so rare that they do not appear to be members of viable populations. There has been no evidence of recent reproduction (AFMC 2004a, 2004b, 2004c, 2005, AGFC 2003, AHTD 1984, ANHI 2003, Bates and Dennis 1983, Branson 1984, Clark 1985, 1987, Crump 2003, Crump and others 2003a, 2003c, 2003d, 2003e, 2003g, 2003q, 2003r, 2003t, Cummings and Mayer 1992, Davidson and others 1997, Gordon 1980, 1980a, 1985, Gordon and others 1980, Harris 1992b, 1999, 1999a, 2002, Harris and Gordon 1987, 1990, Harris and Milam 2002, 2002a, Harris and others 1997, Jenkinson and Ahlstedt 1987, Johnson 1980, Mehlhop-Cifelli and Miller 1989, Oesch 1995, ONHI 2003, Stansbery 1970, Stoeckel and Mole 2002, Szymanski 1998, Turgeon and others 1988, 1998, USDA FS 1999, USDI FWS 1998, Vaughn 1996, Vaughn and Spooner 2000, Vaughn and others 1996, Wheeler 1918, Williams & others 1993).

A life history study was conducted by Barnhart and others in 1998, and a status assessment was completed in 2013 (Bouldin and others).

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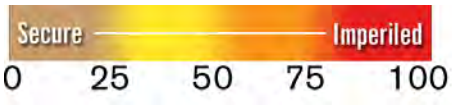
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Margaritifera hembeli

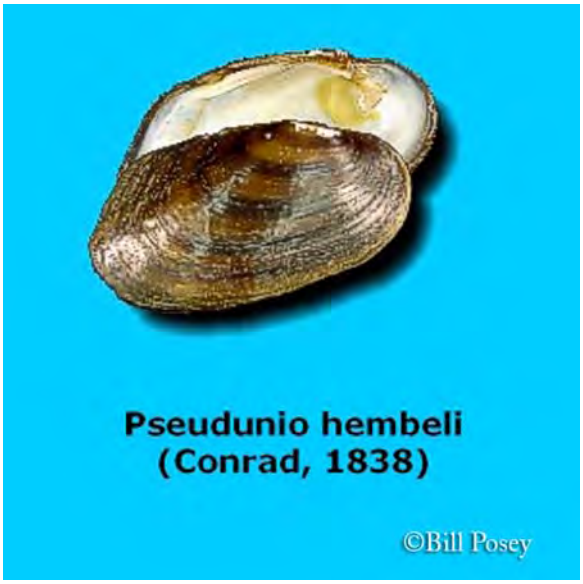
Louisiana Pearlshell

Class: Bivalvia
Order: Unionoida
Family: Margaritiferidae

Priority Score: **65** **out of 100**



Population Trend: Unknown



Global Rank: G1 — Critically imperiled species

State Rank: SU — Presumed extirpated in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- ☐ Ozark Highlands
- ☐ Boston Mountains
- ☐ Arkansas Valley
- ☐ Ouachita Mountains
- ☑ South Central Plains
- ☐ Mississippi Alluvial Plain
- ☐ Mississippi Valley Loess Plains

Suitable Substrate ?

Description

Shell oblong, obovate to subrhomboid, sometimes a little arcuate, subsolid to solid, inequilateral; beaks moderately full, their sculpture not seen; posterior ridge low, rounded or somewhat doubled;

Shell brownish or blackish; left valve with two low, stumpy, rough pseudocardinals and two remote, feeble laterals; right valve with one pseudocardinal and behind it a vestige of a second with one lateral; nacre whitish or lurid purplish with numerous pits.

Host Fish

Striped Shiner, Redfin Shiner, Golden Shiner

Ecobasins

South Central Plains - Red River

Habitats	Weight
Natural Run: Headwater	Optimal

Problems Faced

Threat: Nutrient loading
Source: Grazing/Browsing

Threat: Nutrient loading
Source: Urban development

Data Gaps/Research Needs

Conduct distribution surveys.

Determine habitat preferences.

Determine problems faced and sources of problems faced.

Conservation Actions	Importance	Category
More data is needed to determine conservation actions.	High	Data Gap

Monitoring Strategies

Additional information is needed before a monitoring strategy can be developed.

Comments

Prefers water quality low in nutrients and is often found in runs along cobble banks in small streams. Only one record in Arkansas from Dorcheat Bayou (Columbia County). (AFMC 2004a, 2004b, 2004c, 2005, Paul Johnson personal communication 2005, Smith 2001).

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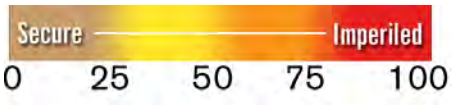
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Obovaria olivaria

Hickorynut

Class: Bivalvia
Order: Unionoida
Family: Unionidae

Priority Score: 19 out of 100



Population Trend: Unknown



Global Rank: G4 — Apparently secure species

State Rank: S3 — Vulnerable in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- [x] Ozark Highlands
- [ ] Boston Mountains
- [ ] Arkansas Valley
- [ ] Ouachita Mountains
- [x] South Central Plains
- [x] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains

Suitable Substrate sand/gravel

Description

Shell oval or oblong, thick, solid, and inflated. Anterior and posterior ends broadly rounded. Umbos slightly elevated above the hinge line, rounded, curved inward, and directed forward. Beak sculpture

of four or five delicate, double-looped bars, usually evident only in very small shells. Shell smooth, olive green or yellowish brown, faintly rayed in young shells, becoming dark brown in old individuals. Length to four inches (10.2 cm). Pseudocardinal teeth triangular, relatively small, widely divergent, and horizontal. Lateral teeth straight to slightly curved, wide, heavy, and fairly long. Interdentum narrow. Beak cavity shallow. Nacre white, iridescent posteriorly.

Host Fish

Shovelnose Sturgeon

Ecobasins

Mississippi River Alluvial Plain - St. Francis River

Mississippi River Alluvial Plain - White River

Ozark Highlands - White River

Habitats

	Weight
Natural Pool: - Medium - Large	Suitable
Natural Run: - Medium - Large	Optimal
Natural Shoal: - Medium - Large	Optimal

Problems Faced

Threat: Biological alteration
Source: Commercial harvest

Threat: Habitat destruction
Source: Channel alteration

Threat: Habitat destruction
Source: Channel maintenance

Threat: Habitat destruction
Source: Dam

Threat: Habitat destruction
Source: Water diversion

Threat: Sedimentation
Source: Agricultural practices

Threat: Sedimentation
Source: Channel maintenance

Threat: Sedimentation
Source: Road construction

Data Gaps/Research Needs

Conduct life history study.

Conduct status survey.

Conservation Actions

	Importance	Category
Maintain stable populations of host fish (sturgeon) in the White and Black rivers.	High	Habitat Protection
Manage watershed, addressing physical, chemical, biological and land use components, to restore or sustain aquatic life.	High	Threat Abatement

Monitoring Strategies

Continue to monitor occurrence in ongoing river surveys.

Comments

Widely distributed in the White River drainage but never comprises a large percentage of a community (AFMC 2004a, 2004b, 2004c, 2005).

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Obovaria sp. cf arkansasensi

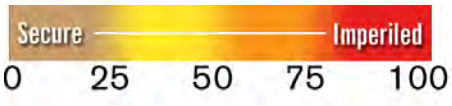
"White" Hickorynut

Class: Bivalvia

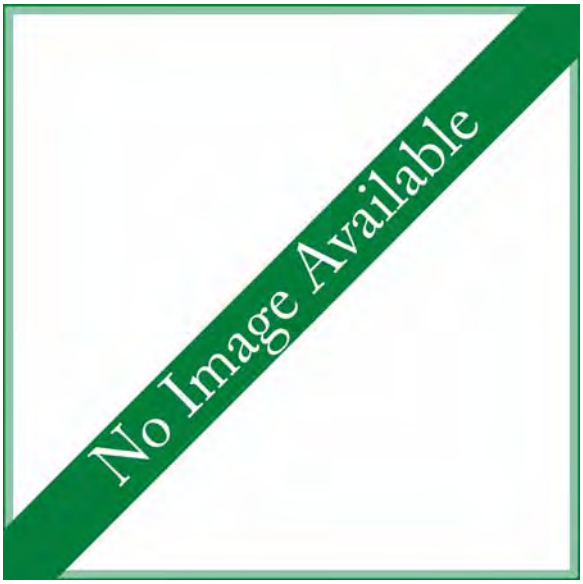
Order: Unionoida

Family: Unionidae

Priority Score: 19 **out of 100**



Population Trend: Unknown



Global Rank: GNR — Not yet ranked

State Rank: S2 — Imperiled in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- [x] Ozark Highlands
- [x] Boston Mountains
- [ ] Arkansas Valley
- [ ] Ouachita Mountains
- [ ] South Central Plains
- [ ] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains

Suitable Substrate gravel/sand

Description

Shell ovate, smooth, rounded before and below, nearly straight from the beak to post-point, umbonal ridge low, beaks not high, sculpture not seen; nacre bluish-white; teeth double in left, single in right

valve; cardinals stout, erect; laterals not very large.

Host Fish

Unknown

Ecobasins

Boston Mountains - White River

Ozark Highlands - White River

Habitats	Weight
Natural Pool: Headwater	Suitable
Natural Run: Headwater	Suitable
Natural Shoal: Headwater	Suitable

Problems Faced

Threat: Habitat destruction
Source: Dam

Threat: Habitat destruction
Source: Grazing/Browsing

Threat: Habitat destruction
Source: Resource extraction

Threat: Nutrient loading
Source: Confined animal operations

Threat: Nutrient loading
Source: Grazing

Threat: Sedimentation
Source: Forestry activities

Threat: Sedimentation
Source: Grazing/Browsing

Threat: Sedimentation
Source: Resource extraction

Threat: Sedimentation
Source: Road construction

Data Gaps/Research Needs

Compare taxonomic relationship of southern hickorynut in Ouachita River watershed to those in other watersheds.

Conduct life history study.

Conduct status survey.

Conservation Actions

	Importance	Category
Manage watershed, addressing physical, chemical, biological and land use components, to restore or sustain aquatic life.	High	Threat Abatement

Monitoring Strategies

Additional information is needed before a monitoring strategy can be developed.

Comments

Known from two sites in the Little Red River Basin. Other records from the White River drainage may represent this taxon, but genetic confirmation is needed if extant populations can be found (AFMC 2015).

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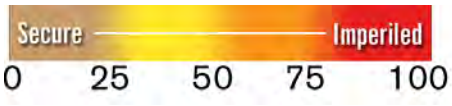
Obovaria sp. cf arkansasensis
"White" Hickorynut

Pleurobema cordatum

Ohio Pigtoe

Class: Bivalvia
Order: Unionoida
Family: Unionidae

Priority Score: 19 out of 100



Population Trend: Unknown



Global Rank: G4 — Apparently secure species

State Rank: S3 — Vulnerable in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- [x] Ozark Highlands
- [ ] Boston Mountains
- [ ] Arkansas Valley
- [ ] Ouachita Mountains
- [x] South Central Plains
- [x] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains

Suitable Substrate ?

Description

Shell moderately thick, triangular, and moderately inflated. Anterior end rounded, posterior end bluntly pointed. Dorsal margin straight, ventral margin curved anteriorly, straight posteriorly. Umbos

moderately high and projecting forward. Beak sculpture of two or three elevated ridges. Shell smooth, a broad shallow sulcus present in front of the posterior ridge. Periostracum dark brown or chestnut, juveniles often lighter and marked with green rays, particularly near the beaks. Length to four inches (10.2 cm). Pseudocardinal teeth well developed; two in the left valve, one in the right. Lateral teeth straight to slightly curved. Beak cavity very deep. Nacre variable, usually white, occasionally pink or rose-colored in some individuals.

Host Fish

Bluegill, Rosefin Shiner

Ecobasins

Mississippi River Alluvial Plain - St. Francis River

Mississippi River Alluvial Plain - White River

Ozark Highlands - White River

South Central Plains - Ouachita River

Habitats	Weight
Natural Run: - Medium - Large	Optimal
Natural Shoal: - Medium - Large	Suitable

Problems Faced

Threat: Habitat destruction
Source: Channel alteration

Threat: Habitat destruction
Source: Channel maintenance

Threat: Habitat destruction
Source: Dam

Threat: Hydrological alteration
Source: Dam

Threat: Nutrient loading
Source: Confined animal operations

Threat: Nutrient loading
Source: Grazing/Browsing

Data Gaps/Research Needs

Conduct genetic analysis of Pleurobema to determine if P. cordatum is present in Arkansas. Review distribution and abundance based on taxonomic status.

Determine habitat preferences.

Determine host fish and host fish availability.

Determine if species is extirpated from the state.

Determine problems faced and sources of problems faced.

Conservation Actions

	Importance	Category
Manage watershed, addressing physical, chemical, biological and land use components, to restore or sustain aquatic life.	Medium	Threat Abatement

Monitoring Strategies

Additional information is needed before a monitoring strategy can be developed.

Comments

May be multiple species. True Ohio pigtoe is a large river obligate. Some Arkansas P. cordatum records may be based on misidentifications of Round Pigtoe (P. sintoxia) or Pyramid Pigtoe (P. rubrum), investigation ongoing (AFMC 2004a, 2004b, 2004c, 2005, AGFC 2003, Ahlstedt and Jenkinson 1987, 1991, AHTD 1989, 1994, ANHI 2003, Bates and Dennis 1983, Branson 1973, 1983, Christian 1995, Clark 1985, 1987, Coker 1919, Crump 2003, Crump and others 2003a, 2003c, 2003d, 2003e, 2003g, 2003q, 2003r, 2003t, Cummings and Mayer 1992, Davidson and others 1997, Ecological Consultants 1984, Gordon 1980, 1980a, 1982, Gordon and Brown 1980, Gordon and others 1979, 1980, Harris 1991d, 1992a, 1994b, 1996, 1997c, 1999, 1999a, 2001, 2002, Harris and Gordon 1988, 1990, Harris and Milam 2002, Jenkinson and Ahlstedt 1987, Johnson 1980, Meek and Clark 1912, Mehlhop-Cifelli and Miller 1989, Miller and Harris 1987, Oesch 1995, ONHI 2003, Posey 1997, Rust 1993, Stansbery and Stein 1982, Stein and Stansbery 1980, Turgeon and others 1988, 1998, USDA FS 1999, Vaughn and others 1997, Wheeler 1918, White 1977, Williams & others 1993).

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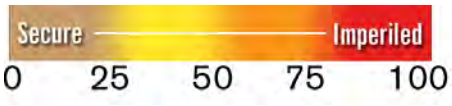
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Pleurobema riddellii

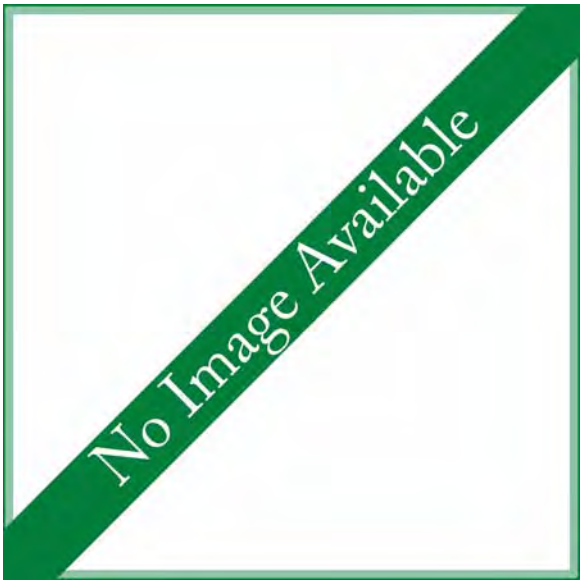
Texas Pigtoe

Class: Bivalva
Order: Unionoida
Family: Unionidae

Priority Score: **65** **out of 100**



Population Trend: Stable

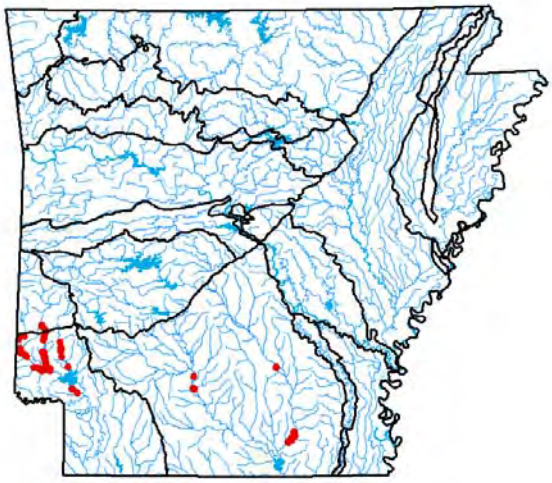


Global Rank: G1G2 — Critically imperiled (uncertain rank)

State Rank: S1 — Critically imperiled in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- ☐ Ozark Highlands
- ☐ Boston Mountains
- ☐ Arkansas Valley
- ☐ Ouachita Mountains
- ☑ South Central Plains
- ☐ Mississippi Alluvial Plain
- ☐ Mississippi Valley Loess Plains

Suitable Substrate gravel/sand

Description

Shell triangular to rounded, short, inflated, solid. Umbos high and full above the hinge line; anterior end almost evenly rounded. Sulcus absent, disc flat to slightly convex; posterior ridge usually

rounded. Periostracum brown, greenish-brown, tan. Beak cavities moderately deep. Nacre bluish-white but becoming iridescent posteriorly.

Host Fish

Unknown

Ecobasins

Mississippi River Alluvial Plain (Bayou Bartholomew) - Ouachita River

South Central Plains - Ouachita River

South Central Plains - Red River

Habitats	Weight
Natural Pool: - Medium - Large	Optimal
Natural Riffle: - Medium	Marginal
Natural Run: - Medium - Large	Optimal
Natural Shoal: - Medium - Large	Marginal

Problems Faced

Threat: Habitat destruction
Source: Channel alteration

Threat: Habitat destruction
Source: Channel maintenance

Threat: Habitat destruction
Source: Dam

Threat: Hydrological alteration
Source: Dam

Threat: Nutrient loading
Source: Confined animal operations

Threat: Nutrient loading
Source: Grazing/Browsing

Data Gaps/Research Needs

Conduct genetic analysis of Pleurobema to determine geographic extent of P. riddellii in Arkansas. Review distribution and abundance based on taxonomic status.

Conduct life history study.

Conservation Actions	Importance	Category
Manage watershed, addressing physical, chemical, biological and land use components, to restore or sustain aquatic life.	Medium	Threat Abatement

Monitoring Strategies

Continue to monitor occurrence in ongoing river surveys.

Comments

The species has been confirmed in the Little, Cossatot, Saline and Rolling Fork rivers. However, a morphologically similar species occurs in the Ouachita drainage that may be a different distinct species. (Turgeon and others 1988, Hayes 2010, Bouldin and others 2013).

Taxa Association Team and Peer Reviewers

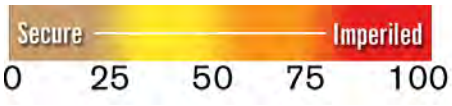
AGFC Mr. Bill Posey, USFWS-ES Mr. Chris Davidson, ASU Dr. John Harris, AHTD Mr. Josh Seagraves, AHTD Mr. Ben Thesing

Pleurobema rubrum

Pyramid Pigtoe

Class: Bivalvia
Order: Unionoida
Family: Unionidae

Priority Score: **38** out of 100



Population Trend: Stable



Global Rank: G2G3 — Imperiled (uncertain rank)

State Rank: S2 — Imperiled in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- [x] Ozark Highlands
- [x] Boston Mountains
- [x] Arkansas Valley
- [x] Ouachita Mountains
- [x] South Central Plains
- [x] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains

Suitable Substrate gravel/sand

Description

Shell thick, triangular and elongate, and moderately inflated. Anterior end rounded, posterior end rounded to bluntly pointed. Dorsal and ventral margins curved. Umbos high, projected forward, and

anterior to rest of shell. Shell smooth or satin-like. Shallow sulcus present. Periostracum brown or chestnut, with faint green rays on the umbos. Length to four inches (10.2 cm). Pseudocardinal teeth well developed; two in the left valve, one in the right. Lateral teeth straight or slightly curved. Beak cavity moderately deep. Nacre pink or rose-colored in most individuals, occasionally white.

Host Fish

Unknown

Ecobasins

Arkansas Valley - Arkansas River

Boston Mountains - Arkansas River

Mississippi River Alluvial Plain - White River

Mississippi River Alluvial Plain (Bayou Bartholomew) - Ouachita River

Mississippi Valley Loess Plains - St. Francis River

Ouachita Mountains - Ouachita River

Ozark Highlands - White River

South Central Plains - Ouachita River

South Central Plains - Red River

Habitats	Weight
Natural Pool: Headwater - Medium - Large	Optimal
Natural Riffle: Headwater	Marginal
Natural Run: Headwater - Medium - Large	Optimal
Natural Shoal: - Medium - Large	Marginal

Problems Faced

Threat: Habitat destruction
Source: Channel alteration

Threat: Habitat destruction
Source: Channel maintenance

Threat: Habitat destruction
Source: Dam

Threat: Hydrological alteration
Source: Dam

Threat: Nutrient loading
Source: Confined animal operations

Threat: Nutrient loading
Source: Grazing/Browsing

Data Gaps/Research Needs

Conduct genetic analysis of Pleurobema to determine if P. rubrum is present in Arkansas. Review distribution and abundance based on taxonomic status.

Conduct life history study.

Conservation Actions

	Importance	Category
Manage watershed, addressing physical, chemical, biological and land use components, to restore or sustain aquatic life.	Medium	Threat Abatement

Monitoring Strategies

Continue to monitor occurrence in ongoing river surveys.

Comments

Extremely abundant in the lower Ouachita and lower Saline. Upper Ouachita and upper Saline rivers populations are peripheral. Known to occur in the lower St. Francis River (AFMC 2004a, 2004b, 2004c, 2005, AGFC 2003, AHTD 1989, Ahlstedt and Jenkinson 1987, 1991, ANHI 2003, Branson 1983, Christian 1995, Clark 1987, Coker 1919, Crump 2003, Crump and others 2003a, 2003c, 2003d, 2003e, 2003g, 2003q, 2003r, 2003t, Cummings and Mayer 1992, Davidson 1997, Davidson and Gosse 2001, Gordon 1980a, Gordon and others 1980, Harris 1986, 1989b, 1999, 1999a, 2001, 2002a, Harris and Gordon 1985, 1987, Harris and Milam 2002, 2002a, Harris and others 1997, Jenkinson 1989, Jenkinson and Ahlstedt 1987, 1994, Johnson 1980, Miller and Harris 1987, ONHI 2003, Posey 1997, Stansbery 1970, Stansbery and Stein 1982, Stein and Stansbery 1980, Turgeon and others 1988, 1998, USDA FS 1999, Vaughn 1996, Wheeler 1918, Williams & others 1993).

Taxa Association Team and Peer Reviewers

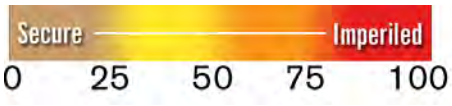
AGFC Mr. Bill Posey, USFWS-ES Mr. Chris Davidson, ASU Dr. John Harris, AHTD Mr. Josh Seagraves, AHTD Mr. Ben Thesing

Pleurobema sintoxia

Round Pigtoe

Class: Bivalva
Order: Unionoida
Family: Unionidae

Priority Score: 17 out of 100



Population Trend: Stable

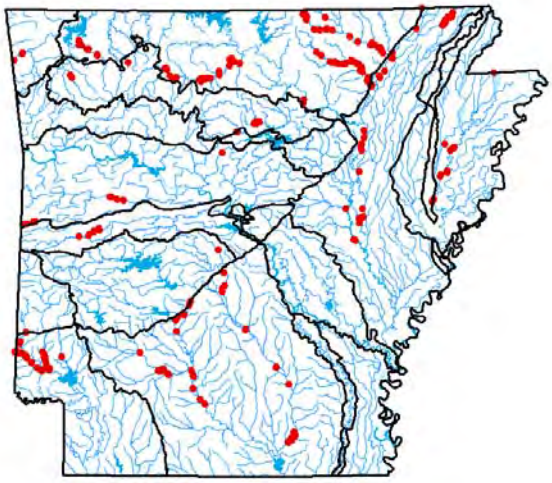


Global Rank: G4G5 — Apparently secure (uncertain rank)

State Rank: S3 — Vulnerable in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- [x] Ozark Highlands
- [x] Boston Mountains
- [x] Arkansas Valley
- [x] Ouachita Mountains
- [x] South Central Plains
- [x] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains

Suitable Substrate gravel/sand

Description

Shell moderately thick, round, and compressed (medium-sized rivers) to inflated (large rivers). Anterior end rounded, posterior end rounded to bluntly pointed. Dorsal margin straight to slightly

curved, ventral margin usually curved. Umbos low and only slightly elevated above the hinge line. Beak sculpture of two or three elevated ridges on the umbo. Shell smooth. Periostracum greenish brown, light brown, or reddish brown in juveniles, becoming chestnut or dark brown in adults, with faint green rays visible near the beaks in some shells. Length to 4 inches (10.2 cm). Pseudocardinal teeth well developed; two in the left valve, one in the right. Lateral teeth straight. Beak cavity shallow (medium-sized rivers) to moderately deep (large rivers). Nacre variable from white to pink or rose-colored.

Host Fish

Spotfin Shiner, Northern Redbelly Dace, Bluntnose Minnow, Bluegill, Southern Redbelly Dace

Ecobasins

Arkansas Valley - Arkansas River

Mississippi River Alluvial Plain - White River

Mississippi Valley Loess Plains - St. Francis River

Ouachita Mountains - Ouachita River

South Central Plains - Ouachita River

South Central Plains - Red River

Habitats

	Weight
Natural Pool: Headwater - Medium - Large	Optimal
Natural Run: - Medium - Large	Optimal
Natural Shoal: - Medium - Large	Marginal

Problems Faced

Threat: Habitat destruction
Source: Channel alteration

Threat: Habitat destruction
Source: Channel maintenance

Threat: Habitat destruction
Source: Dam

Threat: Hydrological alteration
Source: Dam

Threat: Nutrient loading
Source: Confined animal operations

Threat: Nutrient loading
Source: Grazing/Browsing

Data Gaps/Research Needs

Conduct genetic analysis of Pleurobema to determine geographic extent of P. sintoxia in Arkansas. Review distribution and abundance based on taxonomic status.

Conservation Actions

	Importance	Category
Manage watershed, addressing physical, chemical, biological and land use components, to restore or sustain aquatic life.	Medium	Threat Abatement

Monitoring Strategies

Continue to monitor occurrence in ongoing river surveys.

Comments

Common but rarely abundant in streams where it is known to exist (AFMC 2015).

Taxa Association Team and Peer Reviewers

AGFC Mr. Bill Posey, USFWS-ES Mr. Chris Davidson, ASU Dr. John Harris, AHTD Mr. Josh Seagraves, AHTD Mr. Ben Thesing

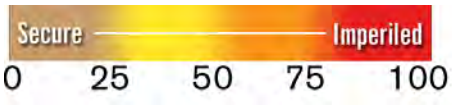
Potamilus alatus

Pink Heelsplitter



Class: Bivalvia
Order: Unionoida
Family: Unionidae

Priority Score: **23** **out of 100**



Population Trend: Unknown

Global Rank: G5 — Secure

State Rank: S1 — Critically imperiled in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- ☐ Ozark Highlands
- ☐ Boston Mountains
- ☐ Arkansas Valley
- ☐ Ouachita Mountains
- ☐ South Central Plains
- ☑ Mississippi Alluvial Plain
- ☐ Mississippi Valley Loess Plains

Suitable Substrate sand/silt

Description

Shell large, elongate, laterally compressed and somewhat rectangular, thin in young shells to moderately thick in older individuals. Anterior end rounded, posterior end bluntly squared or

truncated. Umbos flattened and only slightly elevated above the hinge line. Beak sculpture of three or four concentric ridges, visible only in small shells. Large wing present posterior to the umbos. Shell smooth, dark green or brown, becoming black in old individuals. Young shells typically marked with dark green rays that become fainter with age. Length to eight inches (20.3 cm). Pseudocardinal teeth small, roughened, thin and divergent; two in the left valve, two in the right. Lateral teeth long, thin, and straight to slightly curved. Beak cavity shallow. Nacre usually purple or pinkish purple, rarely white; highly iridescent.

Host Fish

Freshwater Drum

Ecobasins

Mississippi River Alluvial Plain - St. Francis River

Habitats	Weight
Natural Run: - Medium - Large	Optimal
Natural Shoal: - Medium - Large	Suitable

Problems Faced

Threat: Habitat destruction
Source: Agricultural practices

Threat: Habitat destruction
Source: Channel alteration

Threat: Habitat destruction
Source: Channel maintenance

Threat: Habitat destruction
Source: Water diversion

Threat: Hydrological alteration
Source: Channel alteration

Threat: Hydrological alteration
Source: Water diversion

Threat: Sedimentation
Source: Agricultural practices

Threat: Sedimentation
Source: Channel maintenance

Threat: Sedimentation
Source: Road construction

Data Gaps/Research Needs

Determine extent of species' range.

Conservation Actions	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

Additional information is needed before a monitoring strategy can be developed.

Comments

Large river species rarely collected twice in Arkansas. Most individuals have been collected from the Mississippi River or adjacent backwaters. (AFMC 2004a, 2004b, 2004c, 2005, 2015).

Taxa Association Team and Peer Reviewers

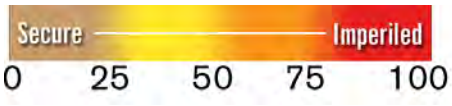
AGFC Mr. Bill Posey, USFWS-ES Mr. Chris Davidson, ASU Dr. John Harris, AHTD Mr. Josh Seagraves, AHTD Mr. Ben Thesing

Potamilus capax

Fat Pocketbook

Class: Bivalvia
Order: Unionoida
Family: Unionidae

Priority Score: **46** **out of 100**



Population Trend: Stable



Global Rank: G2 — Imperiled species

State Rank: S2 — Imperiled in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- ☐ Ozark Highlands
- ☐ Boston Mountains
- ☐ Arkansas Valley
- ☐ Ouachita Mountains
- ☐ South Central Plains
- ☑ Mississippi Alluvial Plain
- ☐ Mississippi Valley Loess Plains

Suitable Substrate sand/clay/gravel

Description

Shell round to somewhat oblong, greatly inflated, and thin (young) to moderately thick (adults). Anterior and posterior ends rounded. Umbos greatly inflated, elevated, and turned inward. Beak

sculpture of a few faint ridges, visible only in young shells. Small posterior wing present in young mussels. Surface usually smooth and very shiny. Periostracum rayless, yellow, yellowish tan, or olive, becoming dark brown in older individuals. Length to five inches (12.7 cm). Pseudocardinal teeth thin, compressed, and elevated; two in each valve. Lateral teeth thin and greatly curved; two in the left valve, one in the right. Hinge line S-shaped. Beak cavity very deep. Nacre white, sometimes tinged with pink or salmon.

Host Fish

Freshwater Drum

Ecobasins

Mississippi River Alluvial Plain - St. Francis River

Mississippi River Alluvial Plain - White River

Habitats	Weight
Natural Glide: Headwater	Marginal
Natural Pool: Headwater - Medium - Large	Suitable
Natural Riffle: Headwater	Marginal
Natural Run: Headwater - Medium - Large	Optimal
Natural Shoal: - Medium - Large	Marginal

Problems Faced

Threat: Habitat destruction
Source: Agricultural practices

Threat: Habitat destruction
Source: Channel alteration

Threat: Habitat destruction
Source: Channel maintenance

Threat: Habitat destruction
Source: Water diversion

Threat: Hydrological alteration
Source: Channel alteration

Threat: Hydrological alteration
Source: Water diversion

Threat: Sedimentation
Source: Agricultural practices

Threat: Sedimentation
Source: Channel maintenance

Threat: Sedimentation
Source: Road construction

Data Gaps/Research Needs

Determine environmental stressors such as nutrient loading, toxicity to chemicals and metals, sedimentation effects, etc.
Implement research components discussed at outlined in meeting with AGFC, CoE, AHTD and FWS. Plan includes additional surveys, long term monitoring and Programmatic BA for both AHTD and CoE.

Conservation Actions

	Importance	Category
Develop an outreach program.	Low	Public Relations/Education
Develop refugium for species in a river or ditch that will not be maintained for flood control.	High	Habitat Protection
Propagate, augment and reintroduce species where appropriate.	Low	Population Management
Protect host fish and associated habitat.	Medium	Habitat Restoration/Improvement

Monitoring Strategies

Proceed with monitoring plan outlined in meeting with AGFC, CoE, AHTD and FWS. Implement research components discussed at that meeting. Plan includes additional surveys, long term monitoring and Programmatic BA for both AHTD and CoE.

Comments

Federally-listed endangered species. Often found in drainage ditches flowing into the St. Francis River. Populations have been found in the Mississippi and Ohio rivers. (AFMC 2004a, 2004b, 2004c, 2005).

Taxa Association Team and Peer Reviewers

AGFC Mr. Bill Posey, USFWS-ES Mr. Chris Davidson, ASU Dr. John Harris, AHTD Mr. Josh Seagraves, AHTD Mr. Ben Thesing

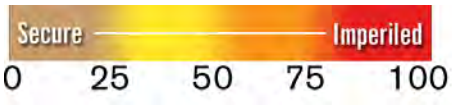
Ptychobranchus occidentalis

Ouachita Kidneyshell



Class: Bivalvia
Order: Unionoida
Family: Unionidae

Priority Score: 23 out of 100



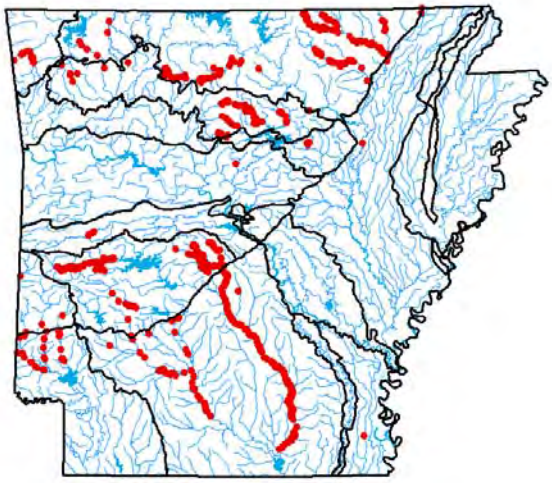
Population Trend: Unknown

Global Rank: G3G4 — Vulnerable (uncertain rank)

State Rank: S3 — Vulnerable in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- [x] Ozark Highlands
- [x] Boston Mountains
- [ ] Arkansas Valley
- [x] Ouachita Mountains
- [x] South Central Plains
- [x] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains

Suitable Substrate gravel/sand

Description

Shell elongate, compressed with thick to moderately thick valves. Nacre white, pseudocardinal teeth are small and postlike, and the lateral teeth are well developed but short. Shell color yellow to tan to

brown with very fine, wavy green rays over most of the shell. Maximum length six inches.

Host Fish

Greenside Darter, Rainbow Darter, Yoke Darter, Orangethroat Darter

Ecobasins

Boston Mountains - White River
Mississippi River Alluvial Plain - White River
Mississippi River Alluvial Plain (Lake Chicot) - Mississippi River
Ouachita Mountains - Arkansas River
Ouachita Mountains - Ouachita River
Ouachita Mountains - Red River
Ozark Highlands - Arkansas River
Ozark Highlands - White River
South Central Plains - Ouachita River
South Central Plains - Red River

Habitats

	Weight
Natural Glide: Headwater	Optimal
Natural Pool: - Medium - Large	Suitable
Natural Riffle: Headwater - Medium	Optimal
Natural Run: Headwater - Medium - Large	Optimal
Natural Shoal: - Medium - Large	Suitable

Problems Faced

Threat: Habitat destruction Source: Channel alteration
Threat: Habitat destruction Source: Channel maintenance
Threat: Habitat destruction Source: Dam
Threat: Hydrological alteration Source: Dam
Threat: Nutrient loading Source: Confined animal operations
Threat: Nutrient loading Source: Grazing

Data Gaps/Research Needs

Conduct additional genetic analysis of Ouachita River and Red River populations.

Conduct life history study.

Review taxonomic status based on results of Roe 2013.

Conservation Actions

	Importance	Category
Maintain stability of riffle/run habitats in medium-sized rivers.	Medium	Habitat Protection

Monitoring Strategies

Additional information is needed before a monitoring strategy can be developed.

Comments

Common in the upper Ouachita River. May be two different species, one in the Ouachita, Red, and Arkansas river drainages with another in the White River drainage. In recent years, this species has been found in reduced numbers (AFMC 2004a, 2004b, 2004c, 2005, AGFC 2003, AHTD 1984, 1989, 1994, ANHI 2003, Bates and Dennis 1983, Branson 1973, 1984, Burns and McDonnell 1992, 1992a, Call 1895, Clark 1987, Coker 1919, Crump 2003, Crump and others 2003a, 2003c, 2003d, 2003e, 2003g, 2003q, 2003r, 2003t, Cummings and Mayer 1992, Davidson 1997, Davidson and Gosse 2001, Davidson and others 1997, 2000, Gordon 1980, 1980a, 1982, Gordon and Brown 1980, Gordon and others 1979, 1980, Harris 1991a, 1991b, 1992a, 1993, 1994a, 1996, 1997b, 1999, 1999a, 2001, 2002, Harris and Doster 1992, Harris and Gordon 1988, 1990, Harris and Milam 2002, Harris and others 1997, Johnson 1980, Meek and Clark 1912, Mehlhop-Cifelli and Miller 1989, Miller and Harris 1987, Oesch 1995, ONHI 2003, Posey 1997, Rust 1993, Stansbery and Stein 1982, Stoeckel and others 2000, Turgeon and others 1988, 1998, Vaughn 1996, Vaughn and others 1993, 1996, 1997, Vaughn and Spooner 2000, USDA FS 1999, Warren 1991, Wheeler 1918, Williams & others 1993.).

Taxa Association Team and Peer Reviewers

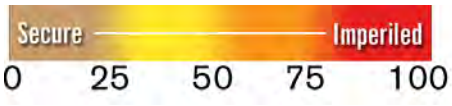
AGFC Mr. Bill Posey, USFWS-ES Mr. Chris Davidson, ASU Dr. John Harris, AHTD Mr. Josh Seagraves, AHTD Mr. Ben Thesing

Quadrula apiculata

Southern Mapleleaf

Class: Bivalvia
Order: Unionoida
Family: Unionidae

Priority Score: **15** **out of 100**



Population Trend: Unknown



Global Rank: G5 — Secure

State Rank: S3 — Vulnerable in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- ☐ Ozark Highlands
- ☐ Boston Mountains
- ☐ Arkansas Valley
- ☐ Ouachita Mountains
- ☑ South Central Plains
- ☑ Mississippi Alluvial Plain
- ☐ Mississippi Valley Loess Plains

Suitable Substrate gravel/cobble/sand

Description

Shell subrhomboid, rather short, slightly inequilateral, subsolid to solid; beaks high, moderately full; posterior ridge well developed, narrowly rounded, angled or showing a tendency to be double, ending

in a point or feeble biangulation at the base; anterior end rounded, sometimes obliquely truncated above, surface covered with fine, close pustules, which are often laid down in zigzag patterns; epidermis greenish in young shells, ashy-brown in old ones. Pseudocardinals, radial, somewhat split; lateral of right valve double; beak cavities moderately deep, nacre white.

Host Fish

Unknown

Ecobasins

Mississippi River Alluvial Plain - St. Francis River
Mississippi River Alluvial Plain - White River
Mississippi River Alluvial Plain (Bayou Bartholomew) - Ouachita River
South Central Plains - Ouachita River
South Central Plains - Red River

Habitats

	Weight
Natural Pool: Headwater - Medium - Large	Suitable
Natural Run: Headwater - Medium - Large	Optimal
Natural Shoal: - Medium - Large	Suitable

Problems Faced

Threat: Habitat destruction Source: Channel alteration
Threat: Habitat destruction Source: Channel maintenance
Threat: Habitat destruction Source: Dam
Threat: Hydrological alteration Source: Dam
Threat: Sedimentation Source: Agricultural practices
Threat: Sedimentation Source: Channel maintenance
Threat: Sedimentation Source: Forestry activities
Threat: Sedimentation Source: Road construction

Data Gaps/Research Needs

Conduct genetic analysis of Quadrula to determine if species is present in state. Reanalyze distribution and abundance of species based on results of genetic work.

Conduct life history study.

Conservation Actions

	Importance	Category
Manage watershed, addressing physical, chemical, biological and land use components, to restore or sustain aquatic life.	Medium	Threat Abatement

Monitoring Strategies

Additional information is needed before a monitoring strategy can be developed.

Comments

Often confused with Quadrula quadrula (mapleleaf) because of similarity of appearance. First recognized in Arkansas in 1996 (AFMC 2004a, 2004b, 2004c, 2005, Posey and others 1996).

Taxa Association Team and Peer Reviewers

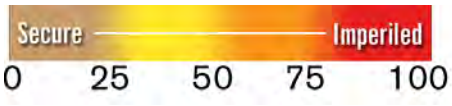
AGFC Mr. Bill Posey, USFWS-ES Mr. Chris Davidson, ASU Dr. John Harris, AHTD Mr. Josh Seagraves, AHTD Mr. Ben Thesing

Quadrula cylindrica cylindrica

Rabbitsfoot

Class: Bivalvia
Order: Unionoida
Family: Unionidae

Priority Score: **52** **out of 100**



Population Trend: Decreasing

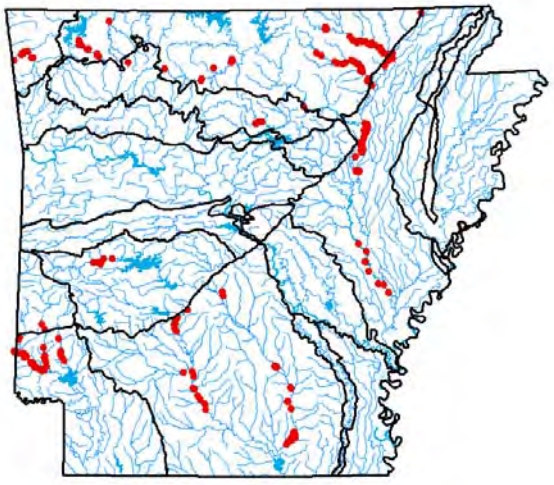


Global Rank: G3G4T3 — Vulnerable (vulnerable subspecies)

State Rank: S3 — Vulnerable in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- [x] Ozark Highlands
- [x] Boston Mountains
- [ ] Arkansas Valley
- [x] Ouachita Mountains
- [x] South Central Plains
- [x] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains

Suitable Substrate gravel/sand

Description

Shell rectangular, elongate (about three times as long as high), thick, and compressed to moderately inflated. Anterior end rounded, posterior end squared or truncated. Dorsal and ventral margins

parallel. Umbos low, only slightly elevated above the hinge line. Beak sculpture consists of two rows of knobs or ridges that continue down the lateral surface of the shell. Surface of the shell usually rough, with numerous tubercles on the anterior end and a series of large pustules or knobs along the posterior ridge. Periostracum green or light brown (darker in older shells) with yellow zigzag or chevron-shaped markings on the shell. Length to five inches (12.7 cm). Pseudocardinal teeth serrated and well developed; two in the left valve, one in the right. Lateral teeth very long and straight; two in the left valve, one in the right. Beak cavity deep. Nacre pearly white, iridescent posteriorly.

Host Fish

Whitefin Shiner, Spottail Shiner, Bigeye Chub

Ecobasins

Boston Mountains - White River
Mississippi River Alluvial Plain - White River
Ouachita Mountains - Ouachita River
Ouachita Mountains - Red River
Ozark Highlands - Arkansas River
Ozark Highlands - White River
South Central Plains - Ouachita River
South Central Plains - Red River

Habitats

	Weight
Natural Glide: Headwater	Marginal
Natural Pool: - Medium - Large	Suitable
Natural Riffle: Headwater	Suitable
Natural Run: Headwater - Medium - Large	Optimal
Natural Slough: - Medium - Large	Marginal

Problems Faced

Threat: Habitat destruction
Source: Channel alteration

Threat: Habitat destruction
Source: Channel maintenance

Threat: Habitat destruction
Source: Dam

Threat: Habitat destruction
Source: Resource extraction

Threat: Habitat destruction
Source: Water diversion

Threat: Nutrient loading
Source: Confined animal operations

Threat: Nutrient loading
Source: Grazing/Browsing

Threat: Sedimentation
Source: Agricultural practices

Threat: Sedimentation
Source: Channel alteration

Threat: Sedimentation
Source: Channel maintenance

Threat: Sedimentation
Source: Dam

Threat: Sedimentation
Source: Forestry activities

Threat: Sedimentation
Source: Grazing/Browsing

Threat: Sedimentation
Source: Resource extraction

Threat: Sedimentation
Source: Road construction

Data Gaps/Research Needs

Conduct status survey.

Conservation Actions

	Importance	Category
Ensure stability and availability of fish hosts in populations in the Black and Ouachita rivers.	Medium	Habitat Protection

Monitoring Strategies

Continue to monitor occurrence in ongoing river surveys.

Comments

This species was federally listed as threatened in 2013. Widespread but uncommon and is declining in small/medium streams. The life history is now better understood, and host fish have been identified for three different populations, two of which occur in the Black/Spring River and Little River (Fobian 2007).

(AFMC 2004a, 2004b, 2004c, 2005, AGFC 2003, ANHI 2003, Bates and Dennis 1983, Branson 1973, 1982, Call 1895, Christian 1995, Clark 1985, 1987, Crump 2003, Crump and others 2003a, 2003c, 2003d, 2003e, 2003g, 2003q, 2003r, 2003t, Cummings and Mayer 1992, Davidson 1997, Ecological Consultants 1984, Gordon 1980a, 1982, Gordon and Brown 1980, Gordon and others 1979, 1980, Harris 1987, 1992a, 1996, 1997b, 1997c, 1999, 1999a, Harris and Gordon 1987, 1988, Harris and Milam 2002, 2002a, Harris and others 1997, Johnson 1980, Kraemer and Gordon, Meek and Clark 1912, Miller and Harris 1987, Oesch 1995, ONHI 2003, Posey 1997, Rust 1993, Stansbery 1970, Stansbery and Stein 1982, Stein and Stansbery 1980, Turgeon and others 1988, 1998, Vaughn 1996, Vaughn and others 1997, Vaughn and Spooner 2000, USDA FS 1999, Wheeler 1918, Williams & others 1993).

Taxa Association Team and Peer Reviewers

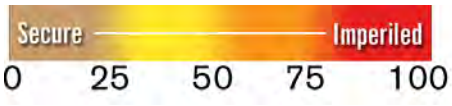
AGFC Mr. Bill Posey, USFWS-ES Mr. Chris Davidson, ASU Dr. John Harris, AHTD Mr. Josh Seagraves, AHTD Mr. Ben Thesing

Quadrula fragosa

Winged Mapleleaf

Class: Bivalvia
Order: Unionoida
Family: Unionidae

Priority Score: **80** out of 100



Population Trend: Unknown



Global Rank: G1 — Critically imperiled species

State Rank: S1 — Critically imperiled in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- ☐ Ozark Highlands
- ☐ Boston Mountains
- ☐ Arkansas Valley
- ☐ Ouachita Mountains
- ☑ South Central Plains
- ☐ Mississippi Alluvial Plain
- ☐ Mississippi Valley Loess Plains

Suitable Substrate gravel

Description

Shell quadrate or square, thick, and moderately inflated. Anterior end rounded, posterior end squared or truncated. Dorsal margin straight, ventral margin curved in the anterior half, arched posteriorly. A

pronounced wing present posterior to the umbo, with radiating rows of pustules or ridges. Umbos small and elevated above the hinge line. Beak sculpture of two rows of raised bumps or nodules that continue downward on the surface of the shell, separated by a furrow or sulcus. Periostracum variable, from yellowish green to light brown with faint rays in small shells, becoming greenish brown, chestnut, or dark brown in larger individuals. Length to four inches (10.2 cm). Pseudocardinal teeth well developed, serrated; two in the left valve, one in the right. Lateral teeth striated, fairly long, and straight; two in the left valve, one in the right. Beak cavity very deep. Nacre pearly white, iridescent posteriorly.

Host Fish

Channel Catfish, Blue Catfish

Ecobasins

South Central Plains - Ouachita River

Habitats	Weight
Natural Pool: - Medium - Large	Suitable
Natural Run: - Medium - Large	Optimal
Natural Shoal: - Medium - Large	Suitable

Problems Faced

Threat: Habitat destruction
Source: Channel alteration

Threat: Habitat destruction
Source: Channel maintenance

Threat: Habitat destruction
Source: Dam

Threat: Hydrological alteration
Source: Dam

Threat: Sedimentation
Source: Agricultural practices

Threat: Sedimentation
Source: Channel maintenance

Threat: Sedimentation
Source: Forestry activities

Threat: Sedimentation
Source: Road construction

Data Gaps/Research Needs

Conduct life history study.
Conduct status survey.
Determine environmental stressors such as nutrient loading, toxicity to chemicals and metals, sedimentation effects, etc.
Population estimates needed in additional Saline and Ouachita River beds.

Conservation Actions

	Importance	Category
Develop an outreach program.	Medium	Public Relations/Education
Maintain stability of Ouachita River and Saline River beds known to be occupied by species.	High	Habitat Protection
Propagate, augment and reintroduce species where appropriate.	Low	Population Management

Monitoring Strategies

Survey in accordance with U.S. Fish and Wildlife Service recovery plan.

Comments

Federally-listed endangered. Originally found in the Ouachita River in 1994. Populations were discovered so recently that it is difficult to determine trends, but the low numbers of individuals and limited distribution indicate that the populations are in a precarious viability position. There is some evidence of recruitment in the Ouachita River near Camden, Ark. Recent surveys indicates populations in the lower Saline River. Other confirmed populations include the St. Croix River, Wisconsin, Bourbeuse River, Missouri, Cossatot River in Arkansas and Little River in Arkansas and Oklahoma. (AFMC 2004a, 2004b, 2004c, 2005, AGFC 2003, ANHI 2003, Clark 1987, Coker 1919, Crump 2003, Crump and others 2003a, 2003c, 2003d, 2003e, 2003g, 2003q, 2003r, 2003t, Cummings and Mayer 1992, Davidson 1997, Davidson and Clem 2004, Harris 1999, 1999a, Harris and others 1997, Mehlhop-Cifelli and Miller 1989, ONHI 2003, Posey and others 1996, Turgeon and others 1988, 1998, USDA FS 1999, Williams & others 1993).

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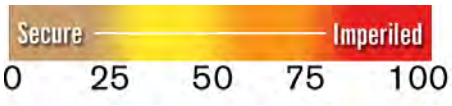
AGFC Mr. Bill Posey, USFWS-ES Mr. Chris Davidson, ASU Dr. John Harris, AHTD Mr. Josh Seagraves, AHTD Mr. Ben Thesing

Quadrula nobilis

Gulf Mapleleaf

Class: Bivalvia
Order: Unionoida
Family: Unionidae

Priority Score: 19 out of 100



Population Trend: Unknown

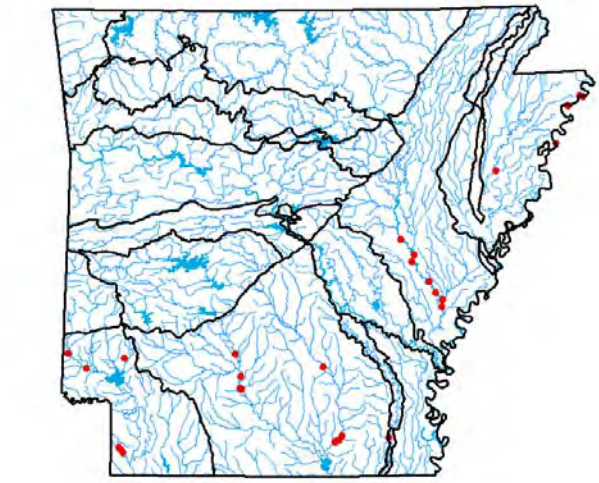


Global Rank: G4 — Apparently secure species

State Rank: S3 — Vulnerable in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- [ ] Ozark Highlands
- [x] Boston Mountains
- [ ] Arkansas Valley
- [ ] Ouachita Mountains
- [x] South Central Plains
- [x] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains

Suitable Substrate

Description

Host Fish

Quadrula nobilis
Gulf Mapleleaf

Channel Catfish, Flathead Catfish

Ecobasins

Boston Mountains - Arkansas River

Mississippi River Alluvial Plain - St. Francis River

South Central Plains - Ouachita River

South Central Plains - Red River

Habitats	Weight
Natural Glide: - Small - Medium - Large	Suitable
Natural Pool: - Small - Medium - Large	Suitable
Natural Riffle: - Small - Medium - Large	Suitable
Natural Run: - Small - Medium - Large	Optimal

Problems Faced

Threat:
Source:

Data Gaps/Research Needs

Conduct genetic analysis of Quadrula to determine if species is present in state. Reanalyze distribution and population numbers.

Conduct life history study.

Determine habitat preferences.

Determine problems faced and sources of problems faced.

Conservation Actions	Importance	Category
Manage watershed, addressing physical, chemical, biological and land use components, to restore or sustain aquatic life.	Medium	Threat Abatement

Monitoring Strategies

More information is needed before a monitoring strategy can be developed.

Comments

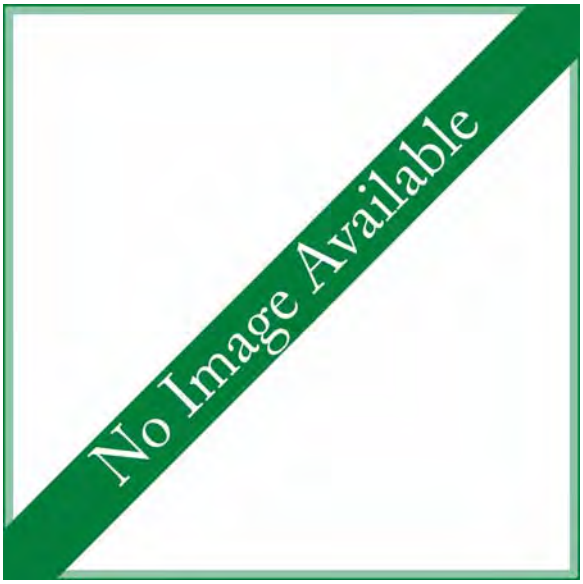
Taxonomic confusion exists with this species. Only recently recognized in Arkansas (AFMC 2004a, 2004b, 2004c, 2005).

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Quadrula refulgens

Purple Pimpleback

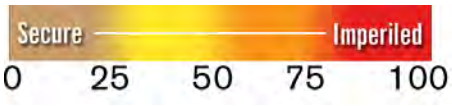


Class: Bivalvia

Order: Unionoida

Family: Unionidae

Priority Score: **31** **out of 100**



Population Trend: Stable

Global Rank: G3G4 — Vulnerable (uncertain rank)

State Rank: S1 — Critically imperiled in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- ☐ Ozark Highlands
- ☐ Boston Mountains
- ☐ Arkansas Valley
- ☐ Ouachita Mountains
- ☑ South Central Plains
- ☐ Mississippi Alluvial Plain
- ☐ Mississippi Valley Loess Plains

Suitable Substrate gravel/sand

Description

Shell subelliptical, subcompressed to slightly inflated, somewhat inequilateral;Umbos elevated but not inflated; anterior end rounded Periostracum reddish-chestnut;pseudocardinals triangular, ragged,

two in the left valve and three in the right; lateral in the right valve single or double; beak cavities deep. Nacre purple or violet, iridescent posteriorly in some specimens, white in others with some purple in the beak cavity.

Host Fish

Unknown

Ecobasins

Mississippi River Alluvial Plain (Lake Chicot) - Mississippi River

Habitats

	Weight
Natural Pool: - Medium	Marginal
Natural Run: - Medium	Optimal

Problems Faced

Threat: Habitat destruction
Source: Channel alteration

Threat: Habitat destruction
Source: Channel maintenance

Threat: Habitat destruction
Source: Dam

Threat: Hydrological alteration
Source: Dam

Threat: Nutrient loading
Source: Agricultural practices

Data Gaps/Research Needs

Conduct genetic analysis of Quadrula to determine species extent.

Conduct life history study.

Survey additional localities in Southeast Arkansas to determine species' geographic extent.

Conservation Actions

	Importance	Category
Manage watershed, addressing physical, chemical, biological and land use components, to restore or sustain aquatic life.	Medium	Threat Abatement

Monitoring Strategies

Continue to monitor occurrence in ongoing river surveys.

Comments

Only one specimen confirmed in Arkansas but likely others have been undetected due to similarity of appearance with Pimpleback (Quadrula pustulosa). (Turgeon and others 1998, Harris and others 2010)

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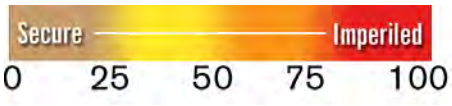
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Simpsonaias ambigua

Salamander Mussel

Class: Bivalvia
Order: Unionoida
Family: Unionidae

Priority Score: **34** **out of 100**



Population Trend: Unknown



Global Rank: G3 — Vulnerable species

State Rank: S1 — Critically imperiled in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- [x] Ozark Highlands
- [x] Boston Mountains
- [ ] Arkansas Valley
- [ ] Ouachita Mountains
- [ ] South Central Plains
- [x] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains

Suitable Substrate ?

Description

Shell small, thin, elongate elliptical or oval, and compressed (male) to slightly inflated posteriorly (female). Anterior and posterior ends rounded. Posterior ridge rounded. Dorsal and ventral margins

straight, parallel. Umbos slightly elevated above the hinge line. Beak sculpture of three or four double-looped bars. Shell smooth, dull, yellowish tan to dark brown, and rayless. Length to two inches (5.1 cm). Pseudocardinal teeth very small, low, rounded; one in each valve. Lateral teeth absent. Beak cavity shallow. Nacre bluish white, occasionally tinged with salmon near the beaks, iridescent on the posterior half.

Host Fish

Mudpuppy Salamander

Ecobasins

Boston Mountains - White River

Mississippi River Alluvial Plain - White River

Ozark Highlands - White River

Habitats

	Weight
Natural :	Data Gap

Problems Faced

Threat:
Source:

Data Gaps/Research Needs

Conduct genetic studies to determine if populations differ between streams.

Conduct life history study.

Determine habitat preferences.

Determine problems faced and sources of problems faced.

Survey Spring River for occurrences.

Conservation Actions

	Importance	Category
Protect Spring River populations and ensure adequate host populations (mudpuppy).	High	Habitat Protection

Monitoring Strategies

Additional information is needed before a monitoring strategy can be developed.

Comments

Restricted and rare in Arkansas (AFMC 2004a, 2004b, 2004c, 2005). Habitat preference is silt/sand beneath large rocks.

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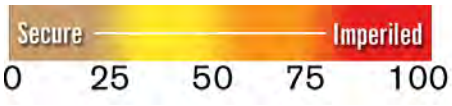
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Toxolasma lividum

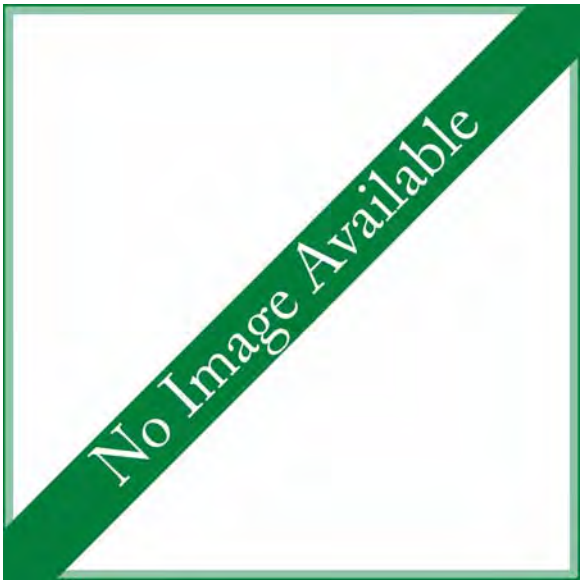
Purple Lilliput

Class: Bivalvia
Order: Unionoida
Family: Unionidae

Priority Score: **33** **out of 100**



Population Trend: Decreasing

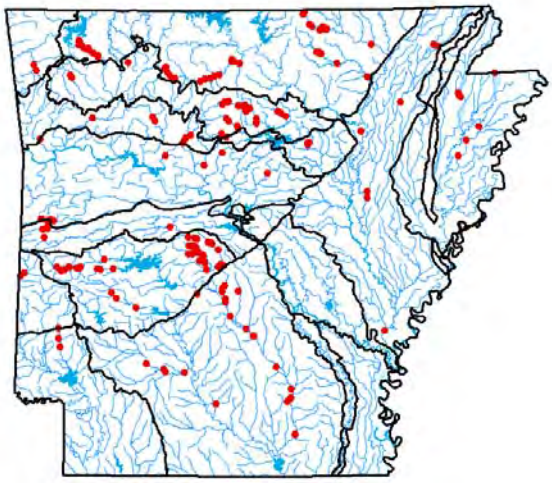


Global Rank: G3Q — Vulnerable (questionable taxonomy)

State Rank: S3 — Vulnerable in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- [x] Ozark Highlands
- [x] Boston Mountains
- [x] Arkansas Valley
- [x] Ouachita Mountains
- [x] South Central Plains
- [x] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains

Suitable Substrate gravel/cobble

Description

Shell small, rounded to somewhat oblong, relatively solid, and inflated. Anterior end rounded, posterior end bluntly pointed (males) or truncated (females). Umbos inflated and slightly elevated

above the hinge line. Beak sculpture of three or four heavy bars. Periostracum tan or dark green to dark brown, becoming black in older shells. Length to one inch (2.5,cm). Pseudocardinal teeth well developed, elevated and serrated; two in the left valve, one in the right. Lateral teeth straight to slightly curved; two in the left valve, one in the right. Beak cavity variable from very shallow to moderately deep. Nacre purple, usually lighter near the ventral margin, and iridescent.

Host Fish

Green Sunfish, Longear Sunfish

Ecobasins

Arkansas Valley - Arkansas River
Boston Mountains - Arkansas River
Boston Mountains - White River
Mississippi River Alluvial Plain - St. Francis River
Mississippi River Alluvial Plain - White River
Ouachita Mountains - Arkansas River
Ouachita Mountains - Ouachita River
Ouachita Mountains - Red River
Ozark Highlands - Arkansas River
Ozark Highlands - White River
South Central Plains - Ouachita River

Habitats

	Weight
Natural Pool: Headwater - Small - Medium	Suitable
Natural Run: Headwater - Small - Medium	Optimal

Problems Faced

Threat: Habitat destruction
Source: Dam

Threat: Habitat destruction
Source: Grazing/Browsing

Threat: Habitat destruction
Source: Resource extraction

Threat: Nutrient loading
Source: Confined animal operations

Threat: Nutrient loading
Source: Grazing/Browsing

Threat: Sedimentation
Source: Forestry activities

Threat: Sedimentation
Source: Grazing/Browsing

Threat: Sedimentation
Source: Resource extraction

Threat: Sedimentation
Source: Road construction

Data Gaps/Research Needs

Conduct genetic analysis and comparison of White River and Ouachita River watershed populations.

Conduct life history study.

Conduct status survey.

Conservation Actions

	Importance	Category
Manage watershed, addressing physical, chemical, biological and land use components, to restore or sustain aquatic life.	Medium	Threat Abatement

Monitoring Strategies

Continue to monitor occurrence in ongoing river surveys.

Comments

Widespread but uncommon, usually found in the headwaters to medium rivers. Population numbers appear to be very low (AFMC 2004a, 2004b, 2004c, 2005, AGFC 2003, ANHI 2003, Bates and Dennis 1983, Branson 1984, Brown and Brown 1989, Burns and McDonnell 1992a, Crump 2003, Crump and others 2003a, 2003c, 2003d, 2003e, 2003g, 2003q, 2003r, 2003t, Cummings and Mayer 1992, Davidson 1997, Davidson and others 2000, Ecological Consultants 1984, Gordon 1980, 1980a, 1982, Gordon and Brown 1980, Gordon and others 1979, 1980, Harris 1991d, 1992b, 1994b, 1996, 1997b, 1999, 1999a, Harris and Gordon 1988, 1990, Harris and Milam 2002, Harris and others 1997, Jenkinson and Ahlstedt 1987, Johnson 1980, Meek and Clark 1912, Oesch 1995, ONHI 2003, Posey 1997, Rust 1993, Stansbery 1970, Turgeon and others 1988, 1998, Wheeler 1918, Williams & others 1993).

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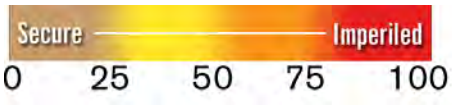
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Toxolasma parvum

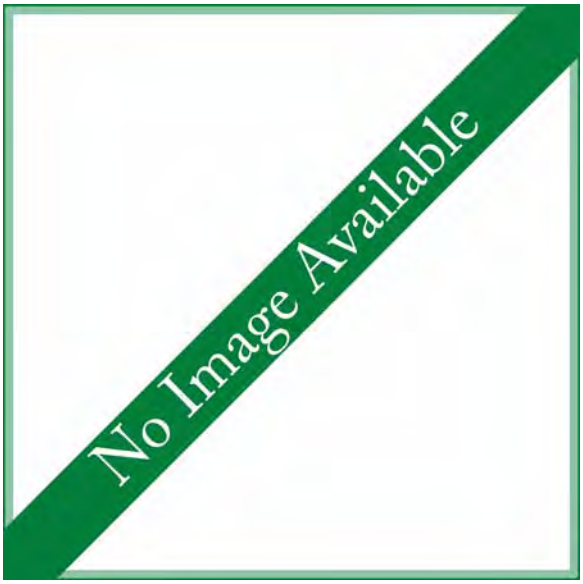
Lilliput

Class: Bivalvia
Order: Unionoida
Family: Unionidae

Priority Score: 19 out of 100



Population Trend: Decreasing



Global Rank: G5 — Secure

State Rank: S3 — Vulnerable in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- [x] Ozark Highlands
- [x] Boston Mountains
- [x] Arkansas Valley
- [x] Ouachita Mountains
- [x] South Central Plains
- [x] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains

Suitable Substrate gravel/cobble

Description

Shell small, elliptical or cylindrical, relatively solid, and inflated. Anterior and posterior ends rounded. Umbos inflated and slightly elevated above the hinge line. Beak sculpture consists of five or six

distinct angled ridges. Surface of the shell with a clothlike texture, dark green, brown, or dark brown and rayless. Length to 1.5 inches (3.8 cm). Pseudocardinal teeth thin, elevated, compressed, and serrated; two in the left valve, one or two in the right. Lateral teeth long, thin and straight; two in the left valve, one in the right. Beak cavity moderately deep. Nacre silvery or bluish white and highly iridescent.

Host Fish

Green Sunfish, Warmouth, Orange Spotted Sunfish, Bluegill, White Crappie

Ecobasins

Arkansas Valley - Arkansas River
Boston Mountains - White River
Mississippi River Alluvial Plain - St. Francis River
Mississippi River Alluvial Plain - White River
Ouachita Mountains - Arkansas River
Ouachita Mountains - Ouachita River
Ouachita Mountains - Red River
Ozark Highlands - Arkansas River
Ozark Highlands - White River
South Central Plains - Ouachita River
South Central Plains - Red River

Habitats

	Weight
Natural Pool: Headwater - Small - Medium	Suitable
Natural Run: Headwater - Small - Medium	Optimal

Problems Faced

Threat: Habitat destruction
Source: Dam

Threat: Habitat destruction
Source: Grazing/Browsing

Threat: Habitat destruction
Source: Resource extraction

Threat: Nutrient loading
Source: Confined animal operations

Threat: Nutrient loading
Source: Grazing/Browsing

Threat: Sedimentation
Source: Forestry activities

Threat: Sedimentation
Source: Grazing/Browsing

Threat: Sedimentation
Source: Resource extraction

Threat: Sedimentation
Source: Road construction

Data Gaps/Research Needs

Conduct genetic analysis and comparison of White River, Arkansas River and Ouachita River watershed populations.

Conduct life history study.

Conduct status survey.

Conservation Actions

	Importance	Category
Manage watershed, addressing physical, chemical, biological and land use components, to restore or sustain aquatic life.	Medium	Threat Abatement

Monitoring Strategies

Continue to monitor occurrence in ongoing river surveys.

Comments

Widespread but uncommon, usually found in backwaters and headwaters. Population numbers are unknown. (AFMC 2015)

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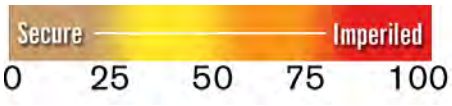
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Toxolasma texasiense

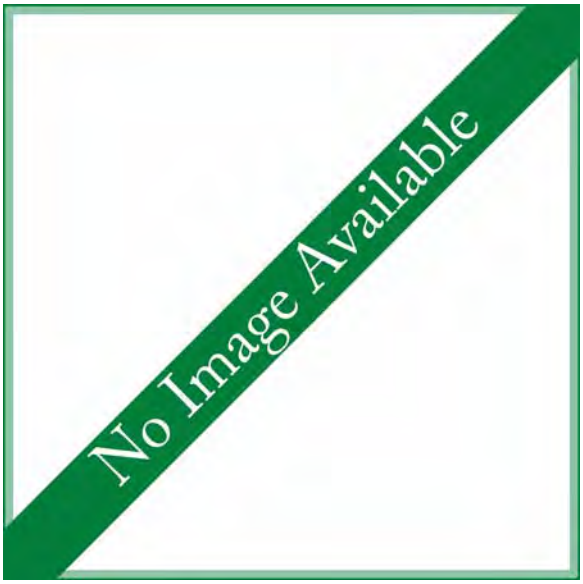
Texas Lilliput

Class: Bivalvia
Order: Unionoida
Family: Unionidae

Priority Score: **19** **out of 100**



Population Trend: Unknown



Global Rank: G4 — Apparently secure species

State Rank: S3 — Vulnerable in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- ☐ Ozark Highlands
- ☐ Boston Mountains
- ☐ Arkansas Valley
- ☑ Ouachita Mountains
- ☑ South Central Plains
- ☑ Mississippi Alluvial Plain
- ☐ Mississippi Valley Loess Plains

Suitable Substrate sand/silt

Description

Shell elongate, thin to relatively solid, and moderately inflated. Anterior end rounded, posterior end pointed (males) or truncated (females). Umbos even with or only slightly elevated above the hinge

line. Beak sculpture of five or six strong angular ridges. Periostracum greenish brown to black with clothlike texture. Length to 2.5 inches (6.4 cm). Pseudocardinal teeth relatively thin and compressed, elevated and serrated; two in the left valve, one in the right. Lateral teeth long, straight or curved; two in the left valve, one in the right. Beak cavity shallow. Nacre white, occasionally tinged with salmon in the beak cavity and center of the shell.

Host Fish

Bluegill, Warmouth

Ecobasins

Mississippi River Alluvial Plain - White River

Ouachita Mountains - Ouachita River

South Central Plains - Ouachita River

South Central Plains - Red River

Habitats	Weight
Man-made Littoral: - Small - Large	Suitable
Man-made Pelagic: - Small - Large	Marginal
Natural Other: - Medium - Large	Data Gap
Natural Oxbow - connected: - Medium - Large	Suitable
Natural Oxbow - disconnected:	Suitable
Natural Side channel: - Medium - Large	Suitable
Natural Slough: - Medium - Large	Suitable

Problems Faced

Threat: Biological alteration
Source: Exotic species

Threat: Biological alteration
Source: Predation

Threat: Habitat destruction
Source: Channel alteration

Threat: Habitat destruction
Source: Channel maintenance

Data Gaps/Research Needs

Conduct life history study.

Conduct status surveys.

Determine genetic relationships of populations from different streams.

Conservation Actions

Importance	Category
Medium	Threat Abatement

Manage watershed, addressing physical, chemical, biological and land use components, to restore or sustain aquatic life.

Monitoring Strategies

Continue to monitor occurrence in ongoing river surveys.

Comments

Species is probably more common than is shown by its State Rank. Often found in small, turbid streams with extremely soft substrates and along banks in larger stream which may lead to the species being overlooked during general mussel surveys (AFMC 2004a, 2004b, 2004c, 2005).

Taxa Association Team and Peer Reviewers

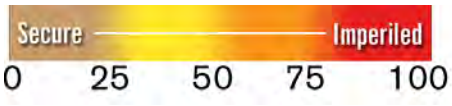
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Truncilla donaciformis

Fawnsfoot

Class: Bivalvia
Order: Unionoida
Family: Unionidae

Priority Score: **15** **out of 100**



Population Trend: Unknown



Global Rank: G5 — Secure

State Rank: S3 — Vulnerable in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- ☐ Ozark Highlands
- ☐ Boston Mountains
- ☑ Arkansas Valley
- ☑ Ouachita Mountains
- ☑ South Central Plains
- ☑ Mississippi Alluvial Plain
- ☐ Mississippi Valley Loess Plains

Suitable Substrate sand/gravel

Description

Shell small, elongate, somewhat oblong, relatively thin, and compressed to moderately inflated. Anterior end rounded, posterior end pointed, ventral margin smoothly rounded. Umbos full, centrally

located, and slightly elevated above the hinge line. Beak sculpture of five or six double-looped bars. Periostracum variable from yellow to greenish brown, with numerous dark green rays made up of many smaller broken, V-shaped or zigzag lines. Length to two inches (5.1 cm). Pseudocardinal teeth small, roughened, and elevated; two in the left valve, one in the right. Lateral teeth thin, relatively long, and straight to slightly curved. Beak cavity moderately shallow. Nacre white, iridescent posteriorly.

Host Fish

Freshwater Drum, Sauger

Ecobasins

Arkansas Valley - Arkansas River

Mississippi River Alluvial Plain - St. Francis River

Mississippi River Alluvial Plain - White River

Ouachita Mountains - Arkansas River

South Central Plains - Ouachita River

South Central Plains - Red River

Habitats	Weight
Natural Pool: - Medium - Large	Optimal
Natural Run: - Medium - Large	Optimal

Problems Faced

Threat: Habitat destruction
Source: Dam

Threat: Habitat destruction
Source: Grazing/Browsing

Threat: Habitat destruction
Source: Resource extraction

Threat: Sedimentation
Source: Agricultural practices

Threat: Sedimentation
Source: Dam

Threat: Sedimentation
Source: Forestry activities

Threat: Sedimentation
Source: Resource extraction

Threat: Sedimentation
Source: Road construction

Data Gaps/Research Needs

Conduct life history study.

Conduct status survey.

Conservation Actions

	Importance	Category
More data needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

Continue to monitor occurrence in ongoing river surveys.

Comments

Widespread but uncommon. Small size may result in it being overlooked during general mussel surveys (AFMC 2004a, 2004b, 2004c, 2005).

Taxa Association Team and Peer Reviewers

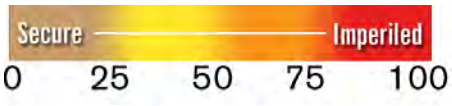
AGFC Mr. Bill Posey, USFWS-ES Mr. Chris Davidson, ASU Dr. John Harris, AHTD Mr. Josh Seagraves, AHTD Mr. Ben Thesing

Uniomerus declivis

Tapered Pondhorn

Class: Bivalvia
Order: Unionoida
Family: Unionidae

Priority Score: **19** **out of 100**



Population Trend: Unknown

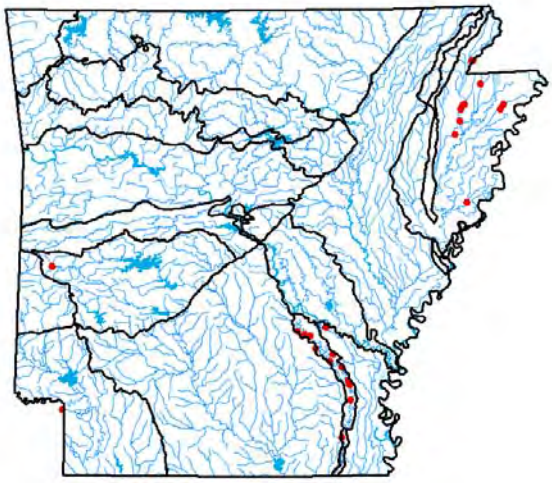

©Bill Posey

Global Rank: G5Q — Secure (questionable taxonomy)

State Rank: S2 — Imperiled in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- ☐ Ozark Highlands
- ☐ Boston Mountains
- ☐ Arkansas Valley
- ☐ Ouachita Mountains
- ☑ South Central Plains
- ☑ Mississippi Alluvial Plain
- ☐ Mississippi Valley Loess Plains

Suitable Substrate silt/sand/gravel

Description

Shell elliptical, elongate, and compressed to moderately inflated. Anterior end rounded and posterior end acutely pointed. Dorsal and ventral margins both straight. Umbos low, approximately even with

hingeline. Two shallow grooves present on posterior slope, giving rise to a short ridge. Posterior ridge prominent. Coloration yellowish brown, green, brown to black; rays generally absent. Pseudocardinal teeth small and thin; lateral teeth relatively thin, short and straight to slightly curved. Beak cavity shallow. Nacre white to occasionally salmon tinged. Maximum length to approximately six inches (15 cm).

Host Fish

Unknown

Ecobasins

Mississippi River Alluvial Plain - St. Francis River

Mississippi River Alluvial Plain (Bayou Bartholomew) - Ouachita River

South Central Plains - Red River

Habitats	Weight
Natural Riffle: Headwater - Small	Suitable
Natural Run: Headwater - Small	Suitable

Problems Faced

Threat:
Source:

Data Gaps/Research Needs

Conduct life history study.

Determine habitat preferences.

Determine problems faced and sources of problems faced.

Conservation Actions	Importance	Category
Manage watershed, addressing physical, chemical, biological and land use components, to restore or sustain aquatic life.	Medium	Threat Abatement

Monitoring Strategies

Additional information is needed before a monitoring strategy can be developed.

Comments

Species is probably more common than is shown by its State Rank. Often found in small, turbid streams with extremely soft substrates and along banks in larger stream which may lead to the species being overlooked during general mussel surveys (AFMC 2004a, 2004b, 2004c, 2005).

Taxa Association Team and Peer Reviewers

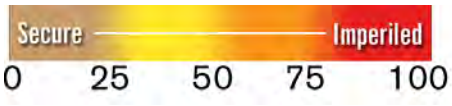
AGFC Mr. Bill Posey, USFWS-ES Mr. Chris Davidson, ASU Dr. John Harris, AHTD Mr. Josh Seagraves, AHTD Mr. Ben Thesing

Uniomerus tetralasmus

Pondhorn

Class: Bivalvia
Order: Unionoida
Family: Unionidae

Priority Score: 19 out of 100



Population Trend: Unknown



Global Rank: G5 — Secure

State Rank: S2 — Imperiled in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- ☐ Ozark Highlands
- ☑ Boston Mountains
- ☐ Arkansas Valley
- ☑ Ouachita Mountains
- ☑ South Central Plains
- ☑ Mississippi Alluvial Plain
- ☐ Mississippi Valley Loess Plains

Suitable Substrate gravel/sand

Description

Shell relatively thin, elongate, and compressed to moderately inflated. Anterior end rounded, posterior end bluntly or sharply pointed. Dorsal margin straight, ventral margin straight, rarely curved.

Umbos low, approximately even with the hinge line. Beak sculpture of four or five concentric ridges. Two shallow grooves present on the posterior slope, giving rise to a short ridge. Surface smooth and shiny in small shells, becoming rougher and dull in older individuals. Periostracum greenish or yellowish brown in young individuals, adults dark brown to black and rayless. Length to five inches (12.7 cm). Pseudocardinal teeth small and thin; two in the left valve, one in the right. Lateral teeth relatively thin, short, and straight to slightly curved. Beak cavity shallow. Nacre white, occasionally with a tinge of salmon.

Host Fish

Golden Shiner

Ecobasins

Boston Mountains - White River
Mississippi River Alluvial Plain - St. Francis River
Mississippi River Alluvial Plain - White River
Mississippi River Alluvial Plain (Lake Chicot) - Mississippi River
Ouachita Mountains - Ouachita River
South Central Plains - Ouachita River
South Central Plains - Red River

Habitats

Habitats	Weight
Man-made Littoral: - Small	Optimal
Man-made Pelagic: - Small	Marginal
Natural Other: - Medium - Large	Data Gap
Natural Oxbow - connected: - Medium - Large	Optimal
Natural Pool: Headwater - Medium - Large	Optimal
Natural Side channel: - Medium - Large	Optimal
Natural Slough: - Medium - Large	Optimal

Problems Faced

Threat: Habitat destruction Source: Grazing/Browsing
Threat: Habitat destruction Source: Resource extraction
Threat: Habitat destruction Source: Water diversion
Threat: Sedimentation Source: Agricultural practices
Threat: Sedimentation Source: Forestry activities
Threat: Sedimentation Source: Resource extraction

Uniomerus tetralasmus
Pondhorn

Data Gaps/Research Needs

Conduct life history study.

Conservation Actions

	Importance	Category
Manage watershed, addressing physical, chemical, biological and land use components, to restore or sustain aquatic life.	Medium	Threat Abatement

Monitoring Strategies

Continue to monitor occurrence in ongoing river surveys.

Comments

Species is probably more common than is shown by its State Rank. Often found in small, turbid streams with extremely soft substrates, in ponds and lakes, and along banks in larger stream which may lead to the species being overlooked during general mussel surveys (AFMC 2004a, 2004b, 2004c, 2005).

Taxa Association Team and Peer Reviewers

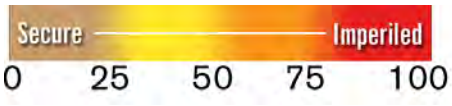
AGFC Mr. Bill Posey, USFWS-ES Mr. Chris Davidson, ASU Dr. John Harris, AHTD Mr. Josh Seagraves, AHTD Mr. Ben Thesing

Venustaconcha ellipsiformis

Ellipse

Class: Bivalvia
Order: Unionoida
Family: Unionidae

Priority Score: **23** **out of 100**



Population Trend: Unknown

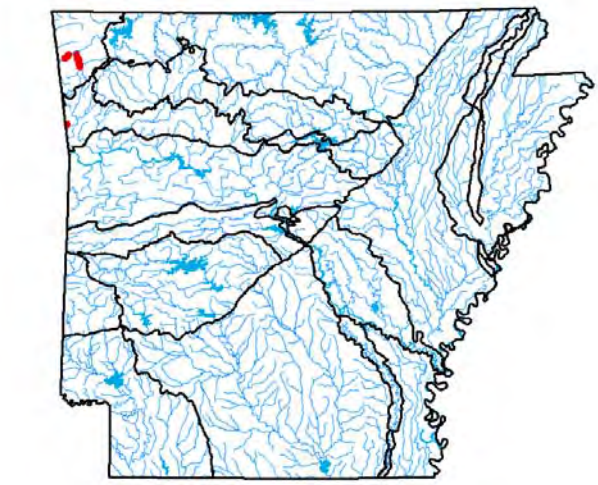


Global Rank: G4 — Apparently secure species

State Rank: S2 — Imperiled in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- [x] Ozark Highlands
- [x] Boston Mountains
- [ ] Arkansas Valley
- [ ] Ouachita Mountains
- [ ] South Central Plains
- [ ] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains

Suitable Substrate gravel/cobble

Description

Shell small, solid, elliptical, and compressed. Anterior end rounded, posterior end bluntly pointed. Ventral margin straight to slightly curved. Umbos only slightly elevated above the hinge line. Beak

sculpture of three or four very fine, double-looped ridges. Shell usually smooth, with a few wrinkles or folds on the posterior half in older shells. Periostracum green or greenish yellow with numerous dark green rays, becoming wavy on the posterior half of the shell. Length to three inches (7.6 cm). Pseudocardinal teeth triangular, heavy, roughened, and divergent; two in the left valve, one in the right (occasionally with a thin, ridgelike tooth in front). Lateral teeth relatively short, thick, and straight to slightly curved. Beak cavity shallow. Nacre white, iridescent posteriorly.

Host Fish

Mottled Sculpin, Slimy Sculpin, Brook Stickleback, Rainbow Darter, Iowa Darter, Johnny Darter, Logperch, Blackside Darter, Greenside Darter, Orangethroat Darter, Redfin Darter, Cardinal Shiner, Yoke Darter

Ecobasins

Boston Mountains - Arkansas River

Ozark Highlands - Arkansas River

Habitats	Weight
Natural Glide: Headwater	Suitable
Natural Pool: Headwater - Medium - Large	Suitable
Natural Riffle: Headwater - Medium - Large	Suitable
Natural Run: Headwater - Medium - Large	Optimal
Natural Shoal: - Medium - Large	Suitable

Problems Faced

Threat: Habitat destruction
Source: Dam

Threat: Habitat destruction
Source: Grazing/Browsing

Threat: Habitat destruction
Source: Resource extraction

Threat: Nutrient loading
Source: Confined animal operations

Threat: Nutrient loading
Source: Grazing/Browsing

Threat: Sedimentation
Source: Forestry activities

Threat: Sedimentation
Source: Grazing/Browsing

Threat: Sedimentation
Source: Resource extraction

Threat: Sedimentation
Source: Road construction

Data Gaps/Research Needs

Conduct life history study.

Conduct status survey.

Determine genetic relationship to Venustaconcha pleasii.

Conservation Actions

	Importance	Category
Manage watershed, addressing physical, chemical, biological and land use components, to restore or sustain aquatic life.	Medium	Threat Abatement

Monitoring Strategies

Continue to monitor occurrence in ongoing river surveys.

Comments

Only known from Illinois River and Lee Creek in Arkansas (Arkansas River drainages). (AFMC 2004a, 2004b, 2004c, 2005).

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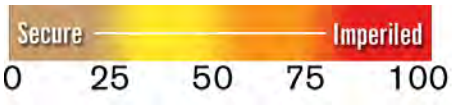
Venustaconcha pleasii

Bleedingtooth Mussel



Class: Bivalvia
Order: Unionoida
Family: Unionidae

Priority Score: **23** **out of 100**



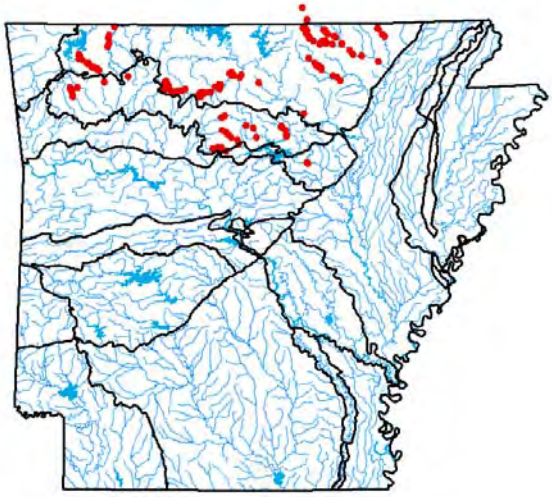
Population Trend: Unknown

Global Rank: G3G4 — Vulnerable (uncertain rank)

State Rank: S3 — Vulnerable in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- [x] Ozark Highlands
- [x] Boston Mountains
- [x] Arkansas Valley
- [ ] Ouachita Mountains
- [ ] South Central Plains
- [ ] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains

Suitable Substrate cobble/gravel

Description

Similar to Venustaconcha ellipsiformis

Host Fish

Venustaconcha pleasii
Bleedingtooth Mussel

Greenside Darter, Rainbow Darter, Yoke Darter

Ecobasins

Boston Mountains - White River

Mississippi River Alluvial Plain - St. Francis River

Ozark Highlands - White River

Habitats	Weight
Natural Glide: Headwater	Suitable
Natural Pool: Headwater - Medium - Large	Suitable
Natural Riffle: Headwater - Medium - Large	Suitable
Natural Run: Headwater - Medium - Large	Optimal
Natural Shoal: - Medium - Large	Suitable

Problems Faced

Threat: Habitat destruction
Source: Dam

Threat: Habitat destruction
Source: Grazing/Browsing

Threat: Habitat destruction
Source: Resource extraction

Threat: Nutrient loading
Source: Confined animal operations

Threat: Nutrient loading
Source: Grazing/Browsing

Threat: Sedimentation
Source: Forestry activities

Threat: Sedimentation
Source: Grazing/Browsing

Threat: Sedimentation
Source: Resource extraction

Threat: Sedimentation
Source: Road construction

Data Gaps/Research Needs

Conduct life history study.

Conduct status survey.

Conservation Actions	Importance	Category
Manage watershed, addressing physical, chemical, biological and land use components, to restore or sustain aquatic life.	Medium	Threat Abatement

Monitoring Strategies

Additional information is needed before a monitoring strategy can be developed.

Comments

Widespread in the White River drainage but seldom common (AFMC 2004a, 2004b, 2004c, 2005).

Taxa Association Team and Peer Reviewers

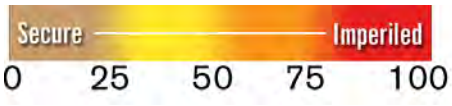
AGFC Mr. Bill Posey, USFWS-ES Mr. Chris Davidson, ASU Dr. John Harris, AHTD Mr. Josh Seagraves, AHTD Mr. Ben Thesing

Villosa iris

Rainbow

Class: Bivalvia
Order: Unionoida
Family: Unionidae

Priority Score: **15** out of 100



Population Trend: Unknown

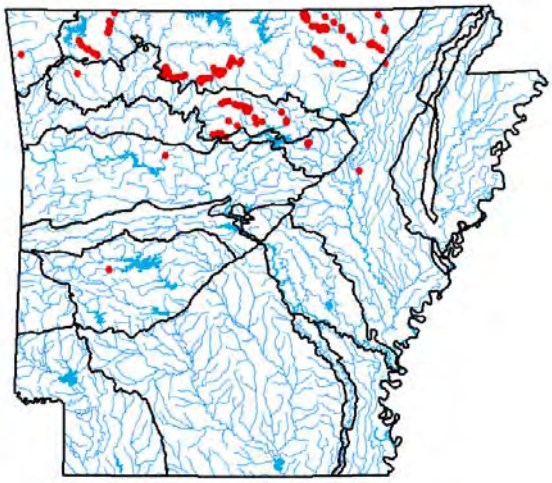


Global Rank: G5Q — Secure (questionable taxonomy)

State Rank: S3 — Vulnerable in Arkansas

Distribution

Occurrence Records



Ecoregions where the species occurs:

- [x] Ozark Highlands
- [x] Boston Mountains
- [ ] Arkansas Valley
- [ ] Ouachita Mountains
- [ ] South Central Plains
- [x] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains

Suitable Substrate cobble/gravel

Description

Shell small, elongate, relatively thin, and compressed (males) to moderately inflated (females). Anterior end rounded, posterior end rounded (females) to bluntly pointed (males). Umbos even with

or slightly elevated above hinge line. Beak sculpture of four to six distinct, double-looped bars. Periostracum yellow or greenish yellow, with dark green rays, often interrupted. Length to three inches (7.6 cm). Pseudocardinal teeth small, triangular, and somewhat divergent; two in the left valve, one in the right. Lateral teeth long, thin, and straight to slightly curved. Beak cavity shallow. Nacre silvery white and highly iridescent on the posterior half, giving this species its common name.

Host Fish

Streamline Chub, Greenside Darter, Rainbow Darter, Bluebreast Darter, Green Sunfish, Striped Shiner, Smallmouth Bass, Largemouth Bass, Yellow Perch, Rock Bass, Mosquito Fish, Suwannee Bass, Spotted Bass

Ecobasins

Boston Mountains - White River

Mississippi River Alluvial Plain - White River

Ozark Highlands - White River

Habitats

	Weight
Natural Glide: Headwater	Suitable
Natural Pool: Headwater - Medium - Large	Optimal
Natural Riffle: Headwater	Suitable
Natural Run: Headwater - Medium - Large	Optimal
Natural Shoal: - Medium - Large	Marginal

Problems Faced

Threat: Habitat destruction
Source: Dam

Threat: Habitat destruction
Source: Grazing/Browsing

Threat: Habitat destruction
Source: Resource extraction

Threat: Nutrient loading
Source: Confined animal operations

Threat: Nutrient loading
Source: Grazing/Browsing

Threat: Sedimentation
Source: Forestry activities

Threat: Sedimentation
Source: Grazing

Threat: Sedimentation
Source: Resource extraction

Threat: Sedimentation
Source: Road construction

Data Gaps/Research Needs

Research taxonomic relationship of two forms. Describe species, if necessary.

Review distribution and abundance based on taxonomic status or revision.

Conservation Actions

	Importance	Category
Manage watershed, addressing physical, chemical, biological and land use components, to restore or sustain aquatic life.	Medium	Threat Abatement

Monitoring Strategies

Additional information is needed before a monitoring strategy can be developed.

Comments

The status of this species is unclear due to taxonomic uncertainty. There appear to be two phylogenetic units in Arkansas (AFMC 2004a, 2004b, 2004c, 2005, AGFC 2003, AHTD 1984, ANHI 2003, Bates and Dennis 1983, Branson 1984, Clark 1987, Coker 1919, Crump 2003, Crump and others 2003a, 2003c, 2003d, 2003e, 2003g, 2003q, 2003r, 2003t, Cummings and Mayer 1992, Davidson and others 1997, Ecological Consultants 1984, Gordon 1980a, Gordon and others 1980, Harris 1991b, 1992a, 1993, 1996, 1999, Harris and Christian 2004, Harris and Gordon 1990, Harris and Milam 2002, Johnson 1980, Meek and Clark 1912, Oesch 1995, ONHI 2003, Rust 1993, Turgeon and others 1988, 1998, Vaughn 1996, Vaughn and Spooner 2000, USDA FS 1999, Warren 1991, Williams & others 1993).

Taxa Association Team and Peer Reviewers

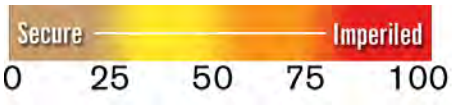
AGFC Mr. Bill Posey, USFWS-ES Mr. Chris Davidson, ASU Dr. John Harris, AHTD Mr. Josh Seagraves, AHTD Mr. Ben Thesing

Villosa sp. cf lienosa

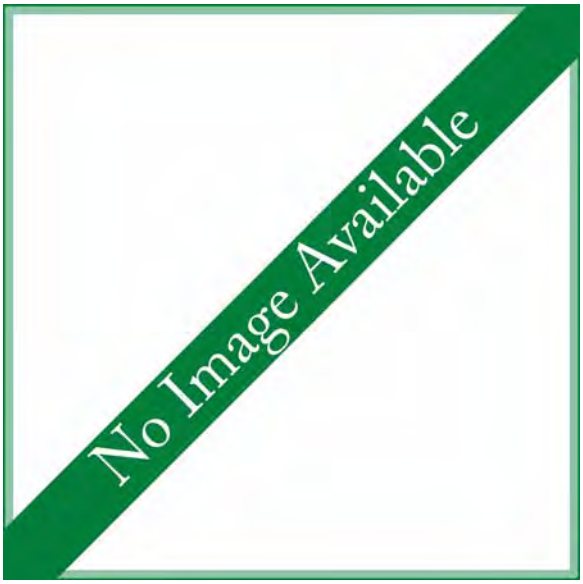
Little Spectaclecase group

Class: Bivalvia
Order: Unionoida
Family: Unionidae

Priority Score: 17 out of 100



Population Trend: Unknown



Global Rank: G5 — Secure

State Rank: S2S3 — Imperiled species in Arkansas (uncertain rank)

Distribution

Occurrence Records



Ecoregions where the species occurs:

- [x] Ozark Highlands
- [x] Boston Mountains
- [x] Arkansas Valley
- [x] Ouachita Mountains
- [x] South Central Plains
- [x] Mississippi Alluvial Plain
- [ ] Mississippi Valley Loess Plains

Suitable Substrate gravel/sand

Description

Generally for all three taxonomic entities, shell small, slightly elongate, thin to moderately thick, compressed in males and inflated in females. Anterior end rounded, posterior end bluntly pointed

(males) or truncated (females). Dorsal margin straight, ventral margin straight to slightly curved. Umbos elevated above the hinge line. Beak sculpture of four to seven distinct, double-looped bars. Periostracum green to dark brown, with green rays (often obscure). Length to 2.5 inches (6.4 cm). Pseudocardinal teeth relatively small and compressed; two in the left valve, one in the right, with a smaller tooth present anteriorly in some shells. Lateral teeth elongate, thin, and straight. Nacre white or bluish white, occasionally tinged with salmon, iridescent posteriorly.

Host Fish

Brown Bullhead, Channel Catfish, Bluegill, Largemouth Bass

Ecobasins

Arkansas Valley - Arkansas River
Boston Mountains - Arkansas River
Boston Mountains - White River
Mississippi River Alluvial Plain - St. Francis River
Mississippi River Alluvial Plain - White River
Ouachita Mountains - Arkansas River
Ouachita Mountains - Ouachita River
Ouachita Mountains - Red River
Ozark Highlands - Arkansas River
Ozark Highlands - White River
South Central Plains - Ouachita River

Habitats

	Weight
Natural Pool: Headwater - Medium - Large	Optimal
Natural Riffle: Headwater	Suitable
Natural Run: Headwater - Medium - Large	Suitable
Natural Shoal: - Medium - Large	Suitable
Natural Side channel: - Medium - Large	Suitable

Villosa sp. cf lienosa
Little Spectaclecase group

Problems Faced

Threat: Habitat destruction
Source: Grazing/Browsing

Threat: Habitat destruction
Source: Resource extraction

Threat: Nutrient loading
Source: Confined animal operations

Threat: Nutrient loading
Source: Grazing/Browsing

Threat: Nutrient loading
Source: Urban development

Threat: Sedimentation
Source: Forestry activities

Threat: Sedimentation
Source: Grazing/Browsing

Threat: Sedimentation
Source: Road construction

Data Gaps/Research Needs

Conduct life history study.

Conservation Actions

	Importance	Category
Manage watershed, addressing physical, chemical, biological and land use components, to restore or sustain aquatic life.	Medium	Threat Abatement

Monitoring Strategies

More information is needed before a monitoring strategy can be developed.

Comments

Widespread but uncommon. Found in habitats not usually surveyed during general mussel surveys. Three taxonomic units may occur in Arkansas with “forms” inhabiting the Red River Basin, Ouachita River Basin and the combined Arkansas, White and St. Francis drainages. (AFMC 2004a, 2004b, 2004c, 2005, G.T. Waters pers. Comm.)

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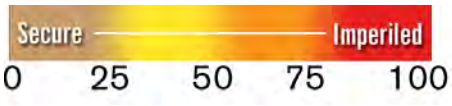
AGFC Mr. Bill Posey, USFWS-ES Mr. Chris Davidson, ASU Dr. John Harris, AHTD Mr. Josh Seagraves, AHTD Mr. Ben Thesing

Carphophis amoenus

Common Wormsnake

Class: Reptilia
Order: Serpentes
Family: Colubridae

Priority Score: **19** out of 100





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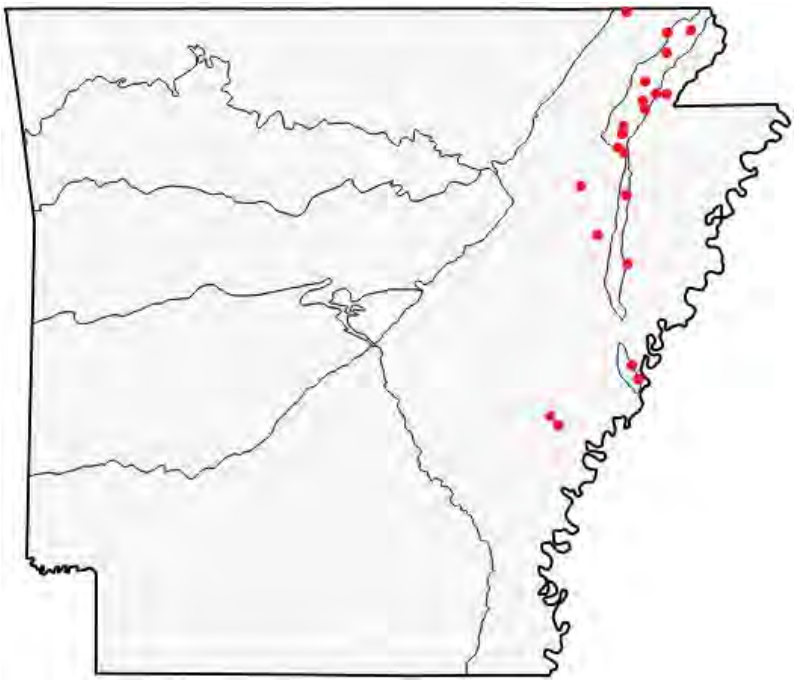
Population Trend: Unknown

Global Rank: G5 — Secure

State Rank: S2 — Imperiled in Arkansas

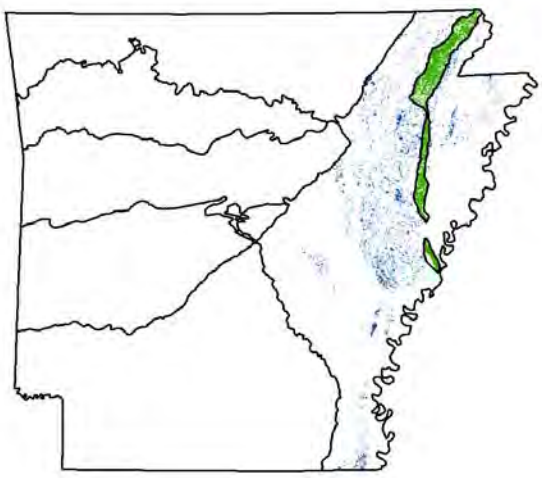
Distribution

Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☐
- Boston Mountains ☐
- Arkansas Valley ☐
- Ouachita Mountains ☐
- South Central Plains ☐
- Mississippi Alluvial Plain ☑
- Mississippi Valley Loess Plain ☑



Habitat Map



Habitats

	Weight
Crowley's Ridge Loess Slope Forest	Obligate
Lower Mississippi Flatwoods Woodland and Forest	Suitable

Problems Faced

KNOWN PROBLEM: Habitat loss due to conversion to agriculture.	Threat: Habitat destruction or conversion Source: Agricultural practices
KNOWN PROBLEM: Habitat loss due to forestry practices.	Threat: Habitat destruction or conversion Source: Forestry activities

Data Gaps/Research Needs

Genetic analyses comparing Arkansas populations with populations east of the Mississippi River and the Western worm snake.

Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.		

Monitoring Strategies

More information is needed to develop a monitoring strategy.

Comments

Trauth and others (2004) summarized the literature and biology of this snake. In April 2005, two new geographic distribution records were collected in Loess Slope Forest habitat within St. Francis National Forest, south of the Mariana gap in Lee and Phillips counties. Thus, confirming the presence of this species in the southern portion of Crowley's Ridge.

Taxa Association Team and Peer Reviewers

AGFC Kelly Irwin, UCA Don Shepard, Kory Roberts

Crotalus atrox

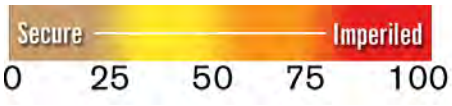
Western Diamond-backed Rattlesnak

Class: Reptilia

Order: Serpentes

Family: Viperidae

Priority Score: 17 out of 100





©Kelly Irwin

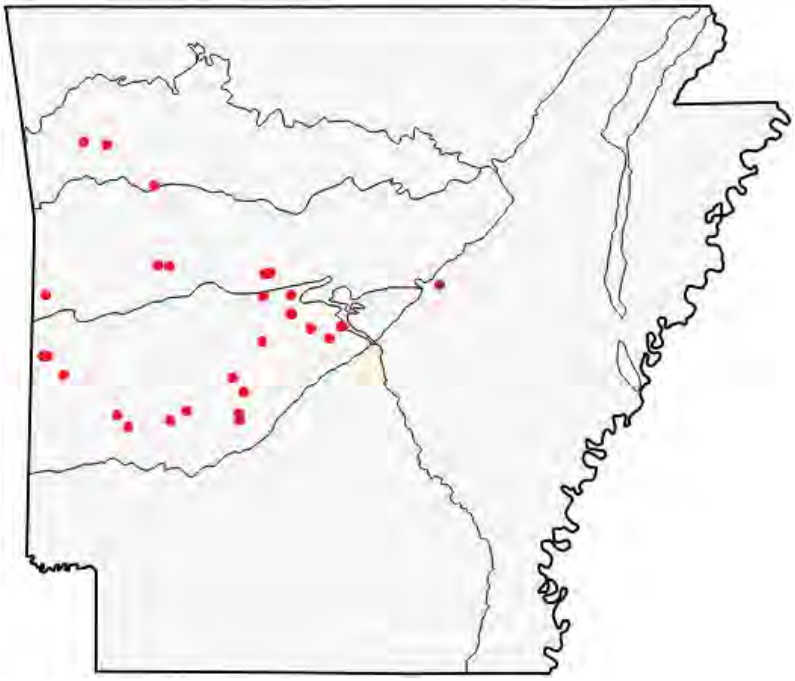
Population Trend: Unknown

Global Rank: G5 — Secure

State Rank: S2S3 — Imperiled species in Arkansas (uncertain rank)

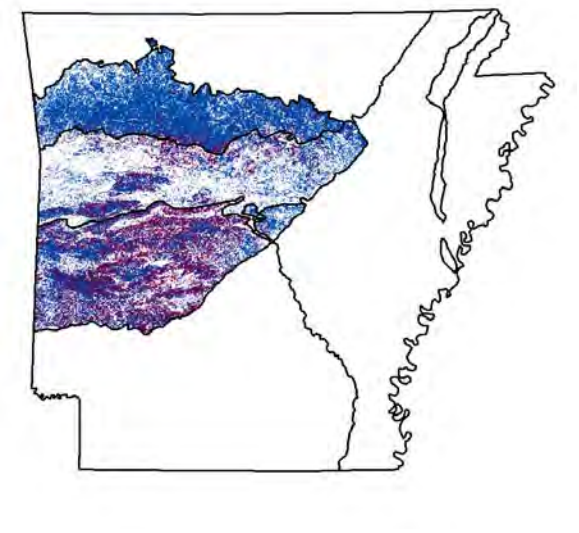
Distribution

Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☐
- Boston Mountains ☑
- Arkansas Valley ☑
- Ouachita Mountains ☑
- South Central Plains ☐
- Mississippi Alluvial Plain ☐
- Mississippi Valley Loess Plain ☐



Habitat Map



Habitats

	Weight
Interior Highlands Dry Acidic Glade and Barrens	Optimal
Ouachita Montane Oak Forest	Suitable
Ozark-Ouachita Cliff and Talus	Optimal
Ozark-Ouachita Dry Oak and Pine Woodland	Suitable
Ozark-Ouachita Pine/Bluestem Woodland	Optimal
Ozark-Ouachita Pine-Oak Forest/Woodland	Suitable

Problems Faced

POTENTIAL PROBLEM: Habitat fragmentation.	Threat: Habitat fragmentation Source: Forestry activities
POTENTIAL PROBLEM: Habitat modification.	Threat: Habitat destruction or conversion Source: Forestry activities
POTENTIAL PROBLEM: Habitat modification.	Threat: Alteration of natural fire regimes Source: Forestry activities

Data Gaps/Research Needs

Further distribution and abundance survey work needed.

Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

More information is needed to develop a monitoring strategy.

Comments

The Ouachita Mountains harbor the easternmost population for the species. A few records are known from the western Boston Mountains of northern Crawford and Franklin counties. Populations of this large snake species have suffered from landscape level habitat modification and wanton slaughter at historical den sites.

(ANHI 2003, Albritton 1981, Ball 1980, Bonati 1980, Crump 2003, Crump et al. 2003A, 2003C, 2003D, 2003F, 2003P, Dellinger and Black 1938, Dowling 1957, Ernst 1992, Fitch 1985, Fitch and Pisani 1993, Klauber 1956, Martin 1981, Minton and Minton 1948, Ortenburger 1929, Parker 1947, Perkins 1928, Perkins and Lentz 1932, Schuier et al. 1972, Schwardt 1938, Stone 1904, Strecker 1924, Trauth et al. 2004, Trauth 1986b, Trauth and Cochran 1992, USDA FS 1999, Vance 1987, Wilson 1995)

Taxa Association Team and Peer Reviewers

AGFC Kelly Irwin, UCA Don Shepard, Kory Roberts

Crotaphytus collaris

Eastern Collared Lizard

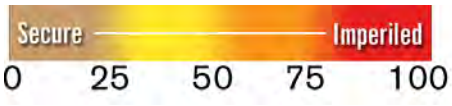


Class: Reptilia

Order: Lacertilia

Family: Crotaphytidae

Priority Score: **24** out of 100



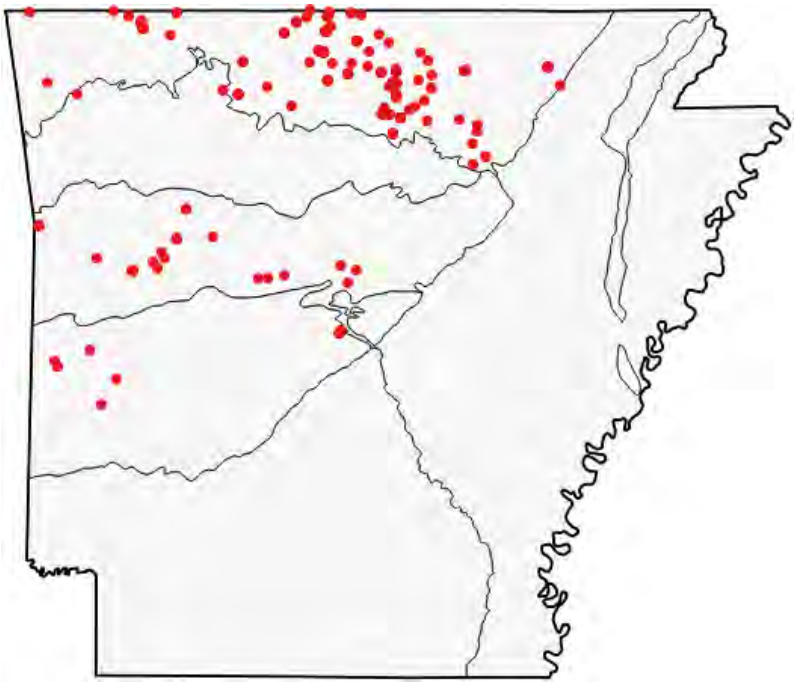
Population Trend: Decreasing

Global Rank: G5 — Secure

State Rank: S2 — Imperiled in Arkansas

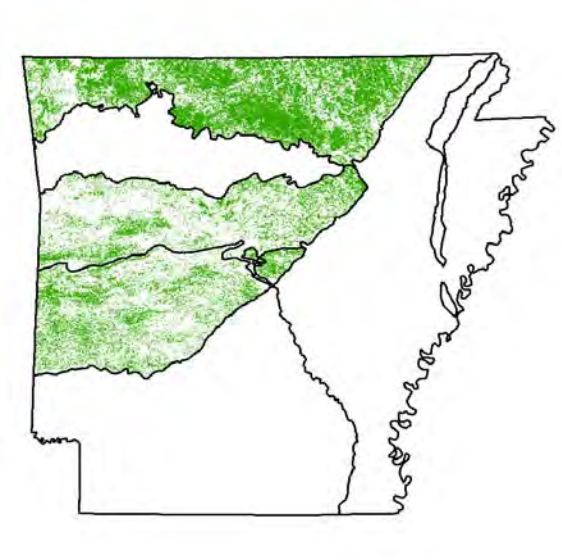
Distribution

Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☑
- Boston Mountains ☐
- Arkansas Valley ☑
- Ouachita Mountains ☑
- South Central Plains ☐
- Mississippi Alluvial Plain ☐
- Mississippi Valley Loess Plain ☐



Habitat Map



Habitats

	Weight
Interior Highlands Calcareous Glade and Barrens	Obligate
Interior Highlands Dry Acidic Glade and Barrens	Obligate
Ozark-Ouachita Cliff and Talus	Obligate

Problems Faced

KNOWN PROBLEM: Loss of habitat due to forestry practices.	Threat: Habitat destruction or conversion Source: Forestry activities
KNOWN PROBLEM: Loss of suitable glade habitat due to fire suppression.	Threat: Habitat destruction or conversion Source: Fire suppression
POTENTIAL PROBLEM: Commercial collection.	Threat: Extraordinary predation/parasitism/disease Source: Excessive non-commercial harvest or collection

Data Gaps/Research Needs

Further distribution and abundance survey work needed.

Conservation Actions

	Importance	Category
Conduct controlled burns.	High	Fire Management
Restore glade habitat.	High	Habitat Restoration/Improvement

Crotaphytus collaris
Eastern Collared Lizard

Monitoring Strategies

Conduct long-term demographic surveys at known and restored sites.

Comments

Uncommon and widely scatterd in the Ouachita Mountains. Ozark Highlands populations more abundant and are obligates in glade habitats. These populations are most prevelant along the White River Valley within the Springfield Plateau. Some populations could be susceptible to collection pressure (pet trade, scientific collectors, scientific supply houses, etc.). (ANHI 2003, Bonati 1980, Brewster and others 2013, 2014, Crump 2003, Crump and others 2003A, 2003C, Collins 1991, Conant and Collins 1998, Crump 2003, Crump and others 2003A, 2003C, 2003D, 2003F, 2003P, Dellinger and Black 1938, Dowling 1957, Grimsley 2012, Hurter and Strecker 1909, Hutchison and others 1999, McAllister 1980a, McAllister 1983, McAllister 1985b, McAllister and others, 1985, McAllister and Trauth 1982, McAllister and Trauth 1985, McGuire 1996, ONHI 2003, Schuier and others 1972, Schwardt 1938, Trauth and others 2004, Trauth 1974, Trauth 1978, Trauth 1979, Trauth 1989a, Trauth 2011, USDA FS 1999, Wilson 1995)

Taxa Association Team and Peer Reviewers

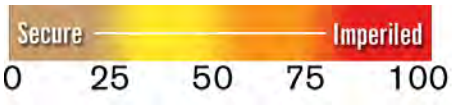
AGFC Kelly Irwin, UCA Don Shepard, Kory Roberts, UA Casey Brewster, UCA Matt Gifford

Deirochelys reticularia

Chicken Turtle

Class: Chelonia
Order: Cryptodeira
Family: Emydidae

Priority Score: **19** out of 100




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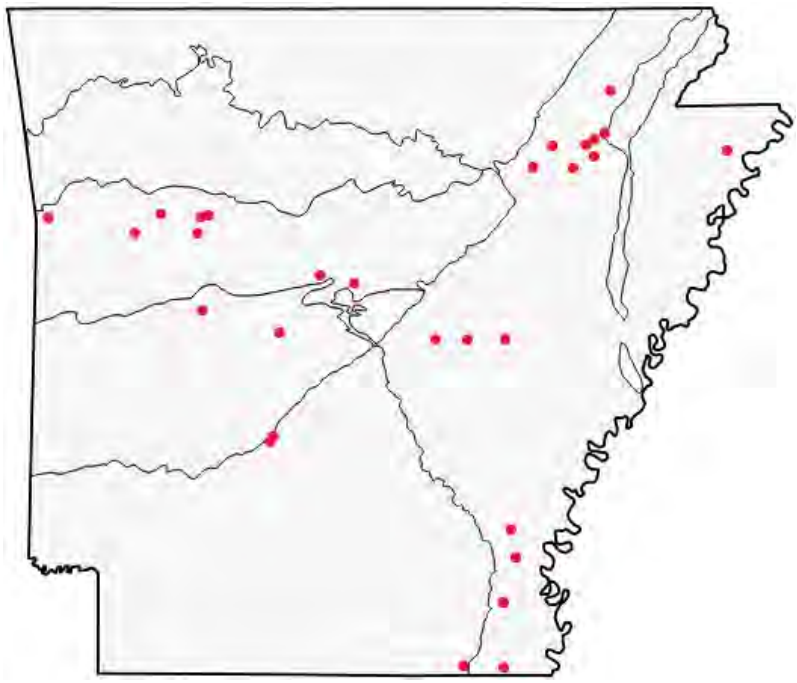
Population Trend: Unknown

Global Rank: G5 — Secure

State Rank: S2 — Imperiled in Arkansas

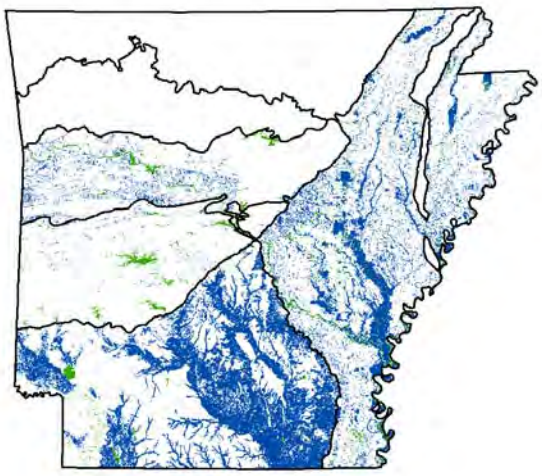
Distribution

Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☐
- Boston Mountains ☐
- Arkansas Valley ☑
- Ouachita Mountains ☑
- South Central Plains ☑
- Mississippi Alluvial Plain ☑
- Mississippi Valley Loess Plain ☐



Habitat Map



Habitats	Weight
Lower Mississippi Alluvial Plain Grand Prairie	Suitable
Lower Mississippi Flatwoods Woodland and Forest	Suitable
Lower Mississippi River Bottomland Depression	Suitable
Lower Mississippi River High Bottomland Forest	Suitable
Lower Mississippi River Low Bottomland Forest	Suitable
Ponds, Lakes, and Water Holes	Obligate
West Gulf Coastal Plain Large River Floodplain Forest	Suitable
West Gulf Coastal Plain Seepage Swamp and Baygall	Optimal
West Gulf Coastal Plain Small Stream/River Forest	Suitable
West Gulf Coastal Plain Wet Hardwood Flatwoods	Suitable

Problems Faced

KNOWN PROBLEM: Commercial collection.	Threat: Resource depletion Source: Commercial harvest
KNOWN PROBLEM: Loss of swamps and other wetlands.	Threat: Habitat destruction Source: Agricultural practices
POTENTIAL PROBLEM: Wetland loss.	Threat: Habitat destruction Source: Forestry activities

Deirochelys reticularia
Chicken Turtle

Data Gaps/Research Needs

Further distribution and abundance survey work needed.

Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

More information is needed to develop a monitoring strategy.

Comments

Trauth et al. (2004) summarized the literature and biology of this species. The recent work of Dinkelacker and Hilzinger focused primarily on demography and reproduction of a central Arkansas population. As of March 2015, a SWG funded project was underway to survey AGFC wildlife management areas throughout the potential range of this species, with the goal of discovering previously undocumented populations. It should be emphasized that chicken turtles are not always readily captured in what appears to be suitable habitat, even though animals may be locally present. (Dinkelacker and Hilzinger 2009, 2014)

Taxa Association Team and Peer Reviewers

AGFC Kelly Irwin, UCA Don Shepard, Kory Roberts

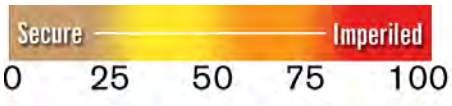
Liodytes rigida

Glossy Swampsnake



Class: Reptilia
Order: Serpentes
Family: Colubridae

Priority Score: **15** out of 100



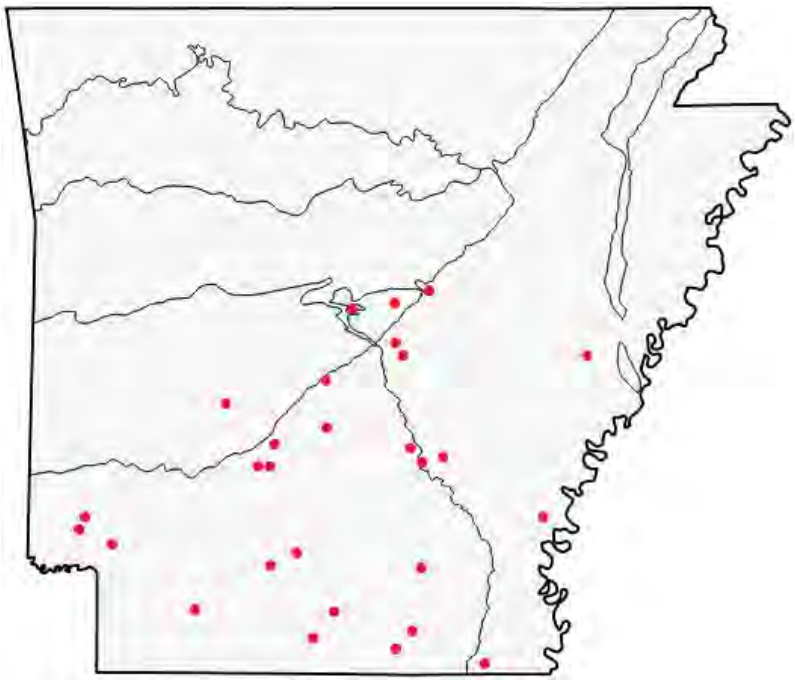
Population Trend: Unknown

Global Rank: G5 — Secure

State Rank: S3 — Vulnerable in Arkansas

Distribution

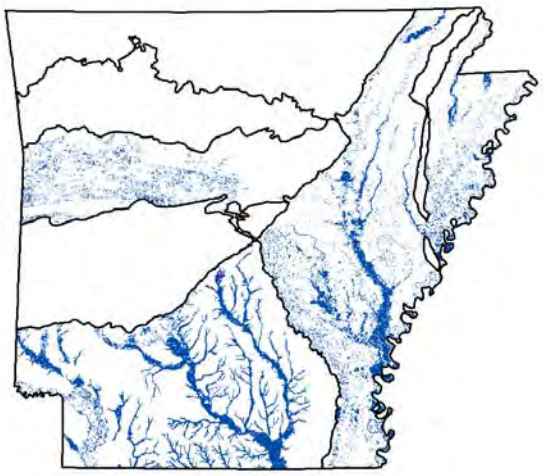
Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☐
- Boston Mountains ☐
- Arkansas Valley ☑
- Ouachita Mountains ☐
- South Central Plains ☑
- Mississippi Alluvial Plain ☑
- Mississippi Valley Loess Plain ☐

Habitat Map





Habitats

	Weight
Lower Mississippi River Bottomland Depression	Suitable
Lower Mississippi River Low Bottomland Forest	Suitable
Lower Mississippi River Riparian Forest	Suitable
Ozark-Ouachita Large Floodplain	Suitable
West Gulf Coastal Plain Large River Floodplain Forest	Suitable
West Gulf Coastal Plain Red River Floodplain Forest	Suitable
West Gulf Coastal Plain Small Stream/River Forest	Suitable

Problems Faced

POTENTIAL PROBLEM: Wetland habitat loss.	Threat: Habitat destruction Source: Forestry activities
POTENTIAL PROBLEM: Wetland habitat loss.	Threat: Habitat destruction Source: Agricultural practices

Data Gaps/Research Needs

Further distribution and abundance survey work needed.

Liodytes rigida
Glossy Swampsnake

Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

More information is needed to develop a monitoring strategy.

Comments

Trauth and others (2004) summarized the biology and literature of this species.

McVay and Carstens (2013) resurrected the genus Liodytes for some species in the genus Regina and proposed changes to the common name.

Taxa Association Team and Peer Reviewers

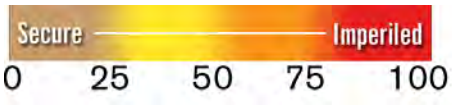
AGFC Kelly Irwin, UCA Don Shepard, Kory Roberts

Micrurus tener

Texas Coralsnake

Class: Reptilia
Order: Serpentes
Family: Elapidae

Priority Score: **19** out of 100




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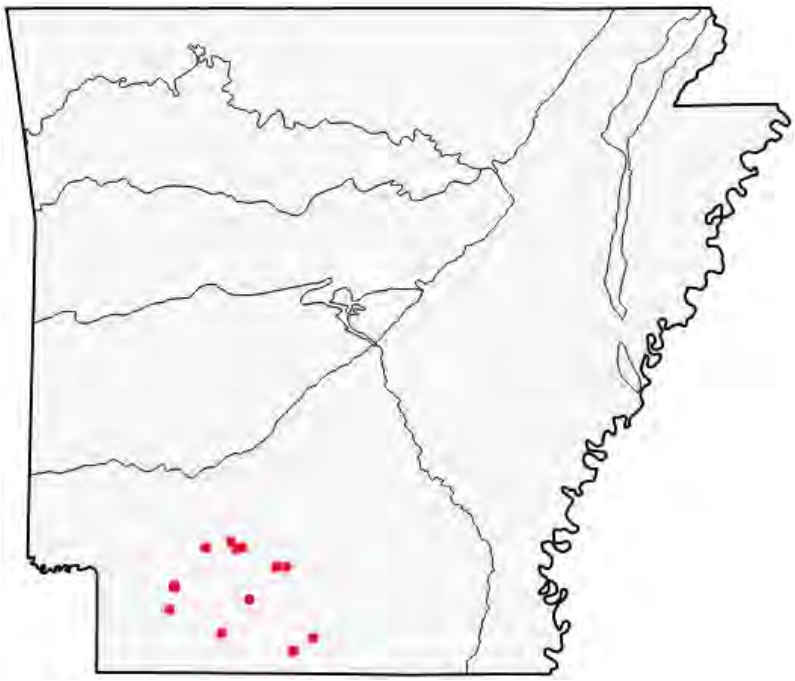
Population Trend: Unknown

Global Rank: G5 — Secure

State Rank: S2 — Imperiled in Arkansas

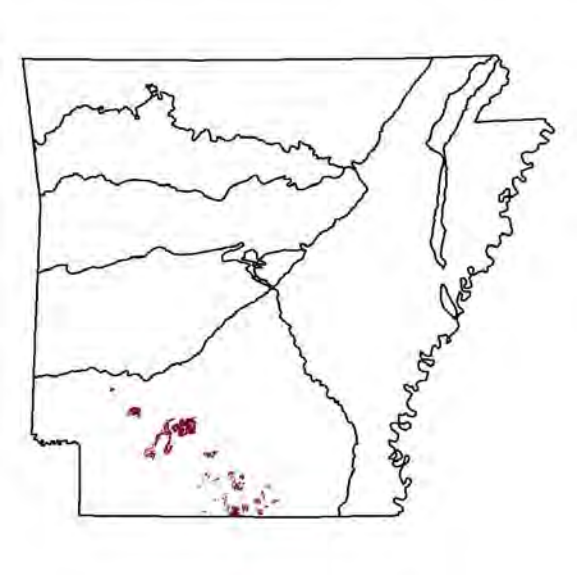
Distribution

Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☐
- Boston Mountains ☐
- Arkansas Valley ☐
- Ouachita Mountains ☐
- South Central Plains ☑
- Mississippi Alluvial Plain ☐
- Mississippi Valley Loess Plain ☐



Habitat Map



Habitats

	Weight
West Gulf Coastal Plain Pine-Hardwood Forest	Optimal
West Gulf Coastal Plain Sandhill Oak and Shortleaf Pine Forest and Woodland	Optimal

Problems Faced

POTENTIAL PROBLEM: Habitat modification.	Threat: Altered composition/structure Source: Forestry activities

Data Gaps/Research Needs

Further distribution and abundance survey work needed.

Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

More information is needed to develop a monitoring strategy.

Comments

Trauth and others (2004) summarized the biology and literature of this species. Several individuals have been reported from the environs of White Oak Lake State Park during the past decade.

Taxa Association Team and Peer Reviewers

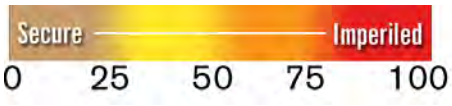
AGFC Kelly Irwin, UCA Don Shepard, Kory Roberts

Ophisaurus attenuatus

Slender Glass Lizard

Class: Reptilia
Order: Lacertilia
Family: Anguidae

Priority Score: **15** out of 100





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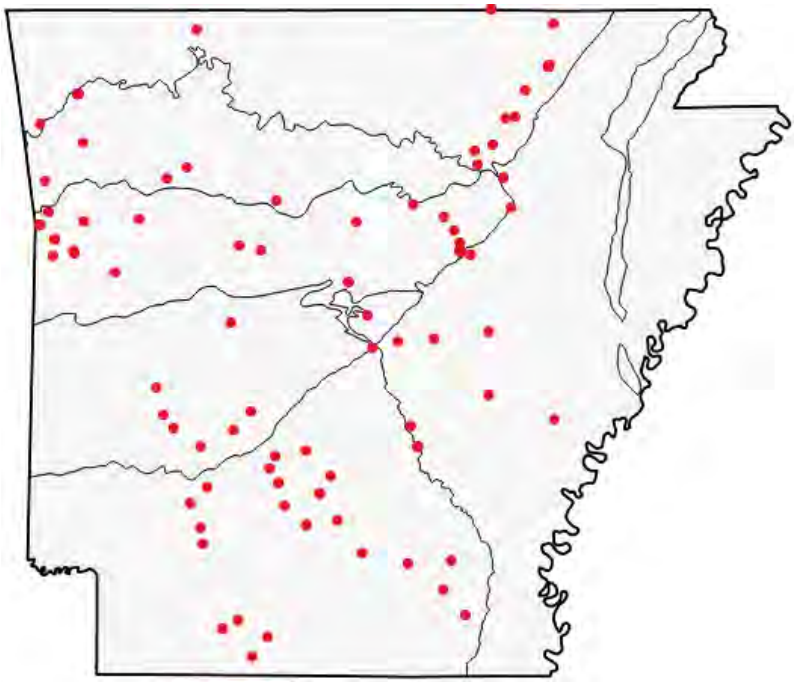
Population Trend: Unknown

Global Rank: G5 — Secure

State Rank: S3 — Vulnerable in Arkansas

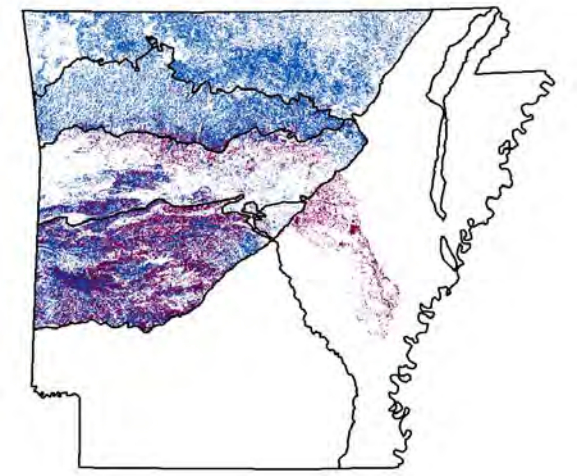
Distribution

Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☑
- Boston Mountains ☑
- Arkansas Valley ☑
- Ouachita Mountains ☑
- South Central Plains ☑
- Mississippi Alluvial Plain ☑
- Mississippi Valley Loess Plain ☐



Habitat Map



Habitats

Habitats	Weight
Interior Highlands Calcareous Glade and Barrens	Suitable
Interior Highlands Dry Acidic Glade and Barrens	Suitable
Lower Mississippi Alluvial Plain Grand Prairie	Optimal
Ozark-Ouachita Pine/Bluestem Woodland	Optimal
Ozark-Ouachita Prairie and Woodland	Optimal
West Gulf Coastal Plain Calcareous Prairie and Woodland	Optimal

Problems Faced

KNOWN PROBLEM: Lack of pine savanna habitat.	Threat: Habitat destruction or conversion Source: Fire suppression
POTENTIAL PROBLEM: Habitat loss.	Threat: Habitat destruction or conversion Source: Agricultural practices
POTENTIAL PROBLEM: The influence of the introduced fire ant (Solenopsis invicta) threatens the nesting success of this and many other egg laying reptiles in Arkansas.	Threat: Biological alteration Source: Exotic species

Data Gaps/Research Needs

Further distribution and abundance survey work needed.

Ophisaurus attenuatus
Slender Glass Lizard

Conservation Actions

	Importance	Category
Restore savanna habitat.	Medium	Fire Management

Monitoring Strategies

More information is needed to develop a monitoring strategy.

Comments

Trauth and others (2004) summarized the biology and literature of this species.

Taxa Association Team and Peer Reviewers

AGFC Kelly Irwin, UCA Don Shepard, Kory Roberts

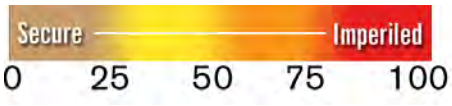
Plestiodon obsoletus

Great Plains Skink



Class: Reptilia
Order: Lacertilia
Family: Scincidae

Priority Score: **23** out of 100



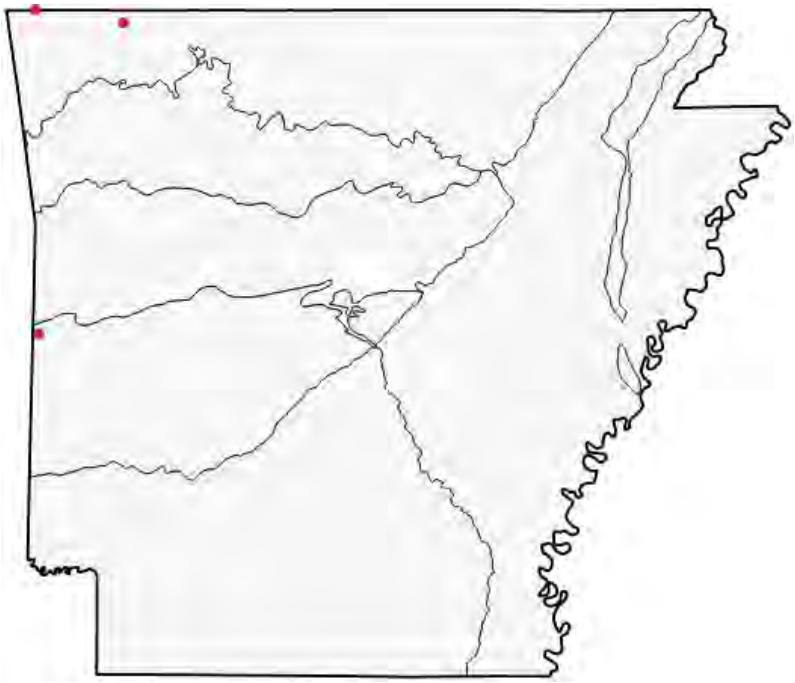
Population Trend: Unknown

Global Rank: G5 — Secure

State Rank: S1 — Critically imperiled in Arkansas

Distribution

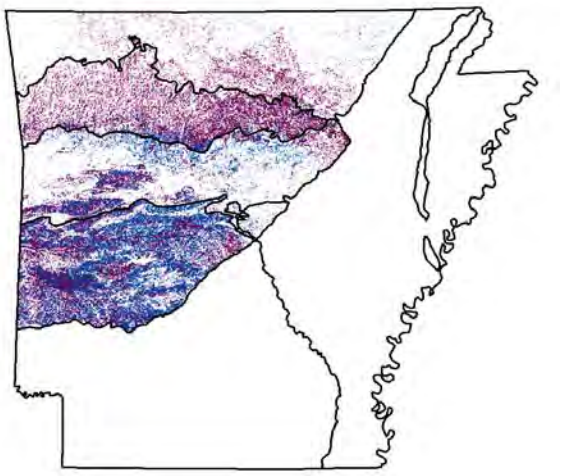
Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☑
- Boston Mountains ☑
- Arkansas Valley ☑
- Ouachita Mountains ☑
- South Central Plains ☐
- Mississippi Alluvial Plain ☐
- Mississippi Valley Loess Plain ☐

Habitat Map





Habitats

	Weight
Interior Highlands Dry Acidic Glade and Barrens	Optimal
Ouachita Pine/Bluestem Woodland and Guild Habitat	Suitable
Ozark-Ouachita Prairie and Woodland	Optimal

Problems Faced

POTENTIAL PROBLEM: Habitat loss.	Threat: Habitat destruction or conversion Source: Fire suppression

Data Gaps/Research Needs

Further distribution and abundance survey work needed.

Conservation Actions

	Importance	Category
Conduct controlled burns.	High	Fire Management
Restore prairies.	High	Habitat Restoration/Improvement

Monitoring Strategies

More information is needed to develop a monitoring strategy.

Comments

There are few voucher records from the state. In 2005, K. Irwin observed several live animals exhibited at Queen Wilhelmina State Park; they were purportedly collected on Black Fork Mountain in northwest Polk County. The rarity of specimens may be due to lack of collection efforts in appropriate habitat. However, the distribution within Arkansas remains poorly understood.

(ANHI 2003, Collins 1993, Crump 2003, Crump et al. 2003A, 2003C, 2003D, 2003F, 2003P, Fitch 1955, Johnson 1987, Robison and Douglas 1979, Trauth et al. 2004, USDA FS 1999, Webb 1970, Wilson 1995)

Taxa Association Team and Peer Reviewers

AGFC Kelly Irwin, UCA Don Shepard, Kory Roberts

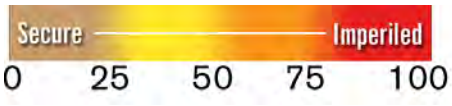
Plestiodon septentrionalis

Prairie Skink



Class: Reptilia
Order: Lacertilia
Family: Scincidae

Priority Score: **19** out of 100



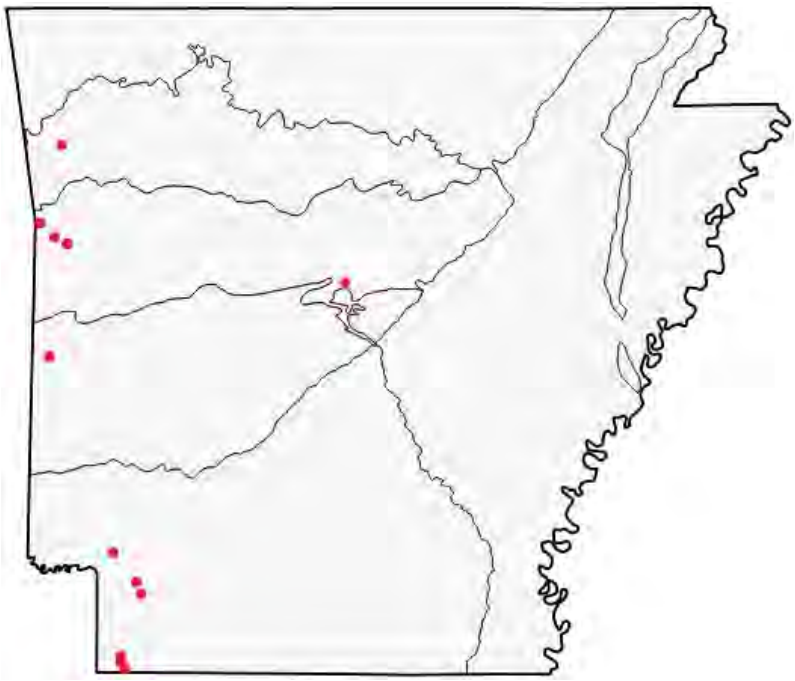
Population Trend: Unknown

Global Rank: G5 — Secure

State Rank: S2 — Imperiled in Arkansas

Distribution

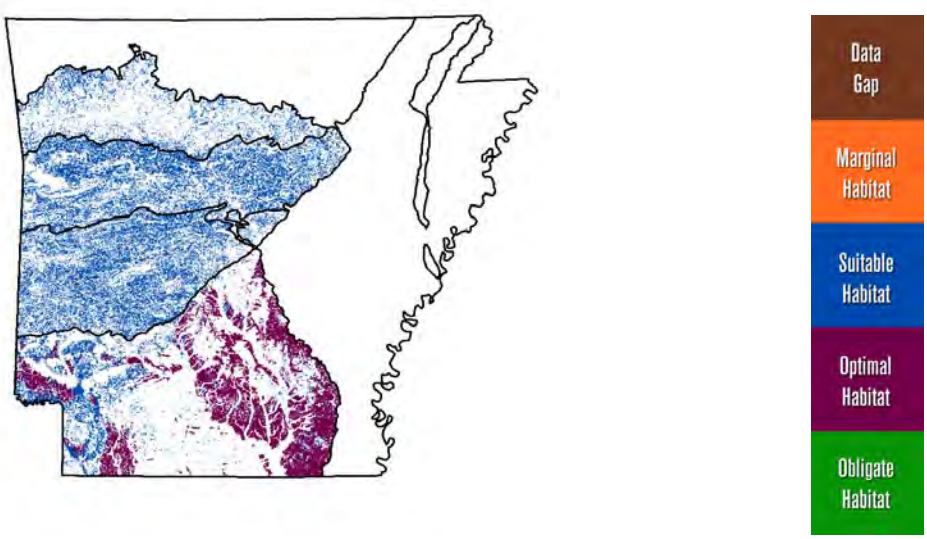
Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☐
- Boston Mountains ☑
- Arkansas Valley ☑
- Ouachita Mountains ☑
- South Central Plains ☑
- Mississippi Alluvial Plain ☐
- Mississippi Valley Loess Plain ☐

Habitat Map



Habitats

Habitats	Weight
Ouachita Pine/Bluestem Woodland and Guild Habitat	Suitable
Ozark-Ouachita Prairie and Woodland	Optimal
Pasture Land	Suitable
West Gulf Coastal Plain Pine-Hardwood Flatwoods	Optimal
West Gulf Coastal Plain Red River Floodplain Forest	Suitable

Problems Faced

POTENTIAL PROBLEM: Habitat loss.	Threat: Habitat destruction or conversion Source: Fire suppression
POTENTIAL PROBLEM: Habitat loss.	Threat: Habitat destruction or conversion Source: Agricultural practices

Data Gaps/Research Needs

Further distribution and abundance survey work needed.

Conservation Actions

	Importance	Category
Conduct controlled burns.	Medium	Fire Management
Restore prairies.	Medium	Fire Management
Restore prairies.	Medium	Habitat Restoration/Improvement

Monitoring Strategies

More information is needed to develop a monitoring strategy.

Comments

Trauth and others (2004) mapped the range of this species from a few counties along the western border of the state. However, two specimens of this uncommon lizard have been collected in Faulkner County since the publication of Trauth and others (2004).

(ANHI 2003, Collins 1993, Crump 2003, Crump et al. 2003a, 2003c, 2003d, 2003f, 2003p, Johnson 2000, McAllister 1987a, ONHI 2003, Trauth et al. 2004, USDA FS 1999, Webb 1970, Wilson 1995)

Taxa Association Team and Peer Reviewers

AGFC Kelly Irwin, UCA Don Shepard, Kory Roberts

Regina grahamii

Graham's Crayfish Snake

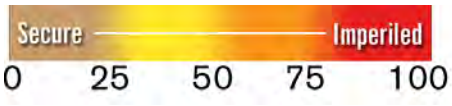


Class: Reptilia

Order: Serpentes

Family: Colubridae

Priority Score: **19** out of 100



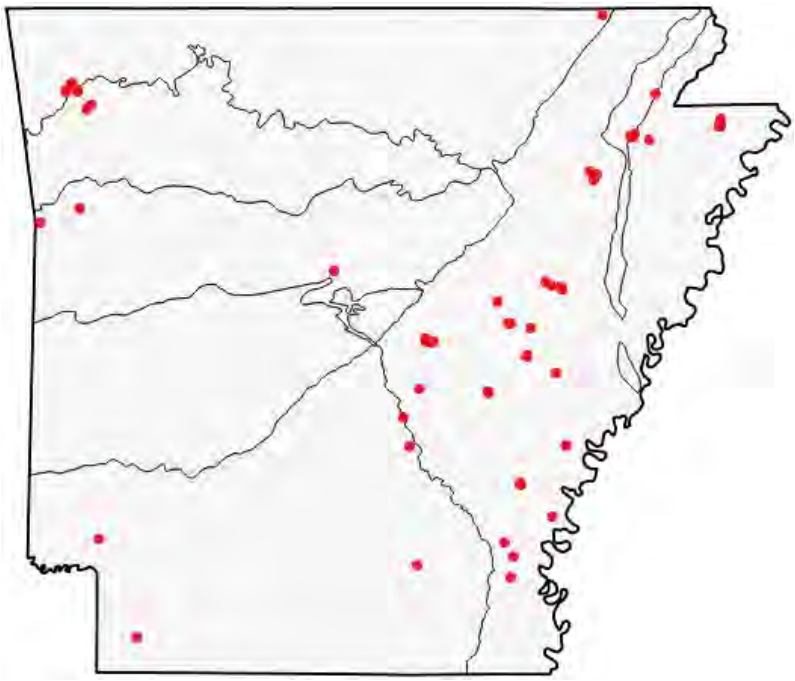
Population Trend: Unknown

Global Rank: G5 — Secure

State Rank: S2 — Imperiled in Arkansas

Distribution

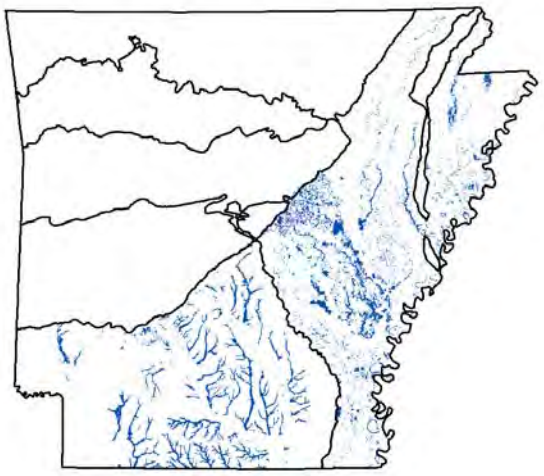
Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☐
- Boston Mountains ☑
- Arkansas Valley ☑
- Ouachita Mountains ☐
- South Central Plains ☑
- Mississippi Alluvial Plain ☑
- Mississippi Valley Loess Plain ☐

Habitat Map





Habitats

	Weight
Lower Mississippi Alluvial Plain Grand Prairie	Suitable
Lower Mississippi River Low Bottomland Forest	Suitable
Ozark-Ouachita Prairie and Woodland	Optimal
West Gulf Coastal Plain Small Stream/River Forest	Suitable

Problems Faced

POTENTIAL PROBLEM: Wetland habitat loss.	Threat: Habitat destruction Source: Agricultural practices
POTENTIAL PROBLEM: Wetland habitat loss.	Threat: Habitat destruction Source: Forestry activities

Data Gaps/Research Needs

Further distribution and abundance survey work needed.

Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

More information is needed to develop a monitoring strategy.

Regina grahamii
Graham's Crayfish Snake

Comments

Trauth and others (2004) summarized the biology and literature of this species. Populations of this species are potentially more numerous than the S-rank status would suggest. Hence, distribution and abundance surveys are needed to corroborate this observation.

Taxa Association Team and Peer Reviewers

AGFC Kelly Irwin, UCA Don Shepard, Kory Roberts

Regina septemvittata

Queensnake

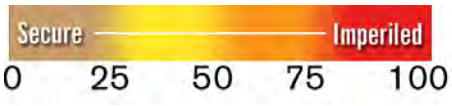


Class: Reptilia

Order: Serpentes

Family: Colubridae

Priority Score: **29** out of 100



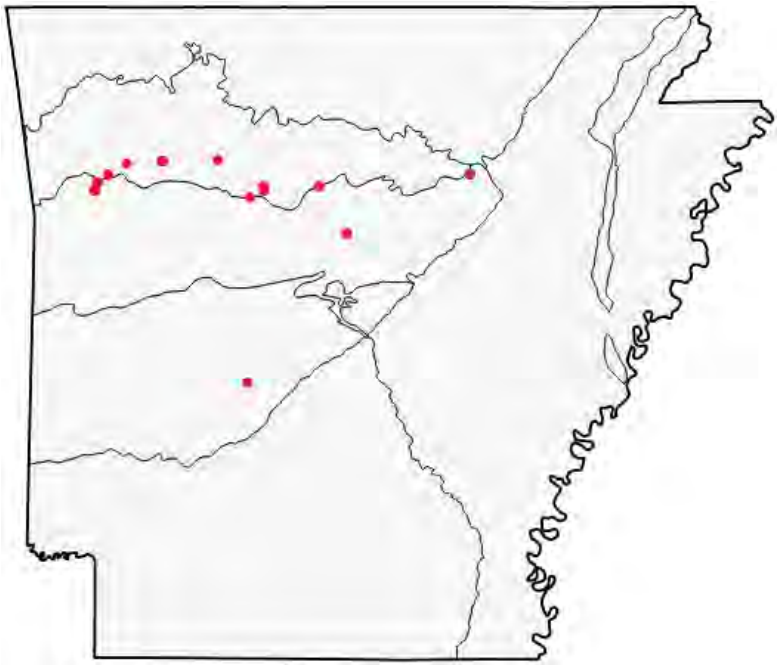
Population Trend: Decreasing

Global Rank: G5 — Secure

State Rank: S1 — Critically imperiled in Arkansas

Distribution

Element Occurrence Records



Ecoregions where the species occurs:

- ☐ Ozark Highlands
- ☑ Boston Mountains
- ☑ Arkansas Valley
- ☐ Ouachita Mountains
- ☐ South Central Plains
- ☐ Mississippi Alluvial Plain
- ☐ Mississippi Valley Loess Plains



Terrestrial Habitats





Ecobasins where this species occurs

Ecobasins

Arkansas Valley - Arkansas River
Arkansas Valley - White River
Boston Mountains - Arkansas River
Boston Mountains - White River

Terrestrial Habitats

Ozark-Ouachita Riparian	Optimal

Aquatic Habitats

Natural Riffle: - Small - Medium	Optimal
Natural Run: - Small - Medium	Suitable
Natural Shoal: - Small - Medium	Optimal

Problems Faced

Threat: Habitat destruction
Source: Conversion of riparian forest

Threat: Habitat destruction
Source: Resource extraction

Threat: Hydrological alteration
Source: Resource extraction

Threat: Sedimentation
Source: Agricultural practices

Threat: Sedimentation
Source: Forestry activities

Data Gaps/Research Needs

Further distribution and abundance survey work needed.

Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

More information is needed to develop a monitoring strategy.

Comments

Trauth and others (2004) summarized the biology and literature of this species. The allopatric Arkansas population represents the only population of this snake found west of the Mississippi River. This population warrants further investigation of its genetic and morphological characters, which could show it to be a distinct species. The historic record for Garland County is questionable, since this species has not been found in any other Ouachita Mountain streams.

Taxa Team and Peer Reviewers

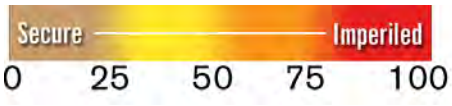
AGFC Kelly Irwin, UCA Don Shepard

Sonora semiannulata

Ground Snake

Class: Reptilia
Order: Serpentes
Family: Colubridae

Priority Score: **23** out of 100




©Kelly Irwin

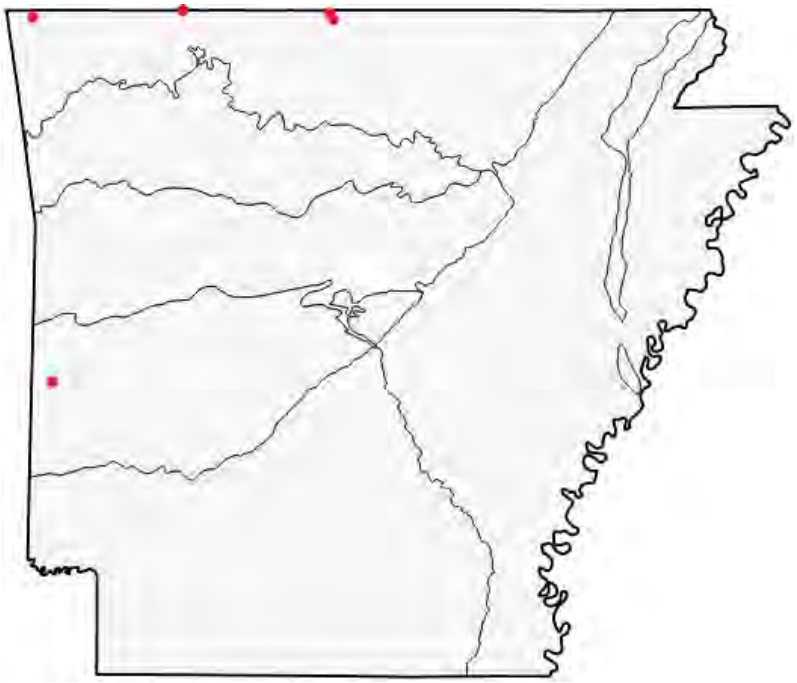
Population Trend: Unknown

Global Rank: G5 — Secure

State Rank: S1 — Critically imperiled in Arkansas

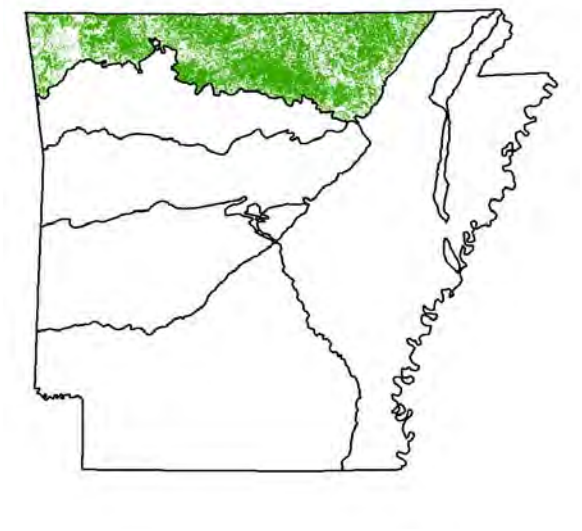
Distribution

Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☑
- Boston Mountains ☐
- Arkansas Valley ☐
- Ouachita Mountains ☐
- South Central Plains ☐
- Mississippi Alluvial Plain ☐
- Mississippi Valley Loess Plain ☐



Habitat Map



Habitats

	Weight
Interior Highlands Calcareous Glade and Barrens	Obligate
Interior Highlands Dry Acidic Glade and Barrens	Obligate
Ozark-Ouachita Cliff and Talus	Obligate

Problems Faced

POTENTIAL PROBLEM: Loss of glade habitat, fire suppression.	Threat: Habitat destruction or conversion Source: Fire suppression

Data Gaps/Research Needs

Further distribution and abundance survey work needed.

Conservation Actions

	Importance	Category
More data are needed to determine conservation actions.	Medium	Data Gap

Monitoring Strategies

More information is needed to develop a monitoring strategy.

Comments

Trauth and others (2004) summarized the biology and literature of this species. In April 2005, three new geographic distribution records were collected in Carroll, Marion, and Polk counties.These represent the first records for the state since 1958. This species is an excellent indicator of Ozarkian glade habitat. Loss of glades in the Ozark Highlands is the result of fire suppression which historically maintained these open habitats.

Taxa Association Team and Peer Reviewers

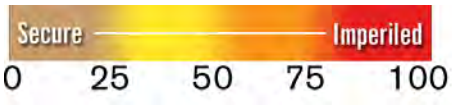
AGFC Kelly Irwin, UCA Don Shepard, Kory Roberts

Terrapene ornata

Ornate Box Turtle

Class: Chelonia
Order: Cryptodeira
Family: Emydidae

Priority Score: **19** out of 100





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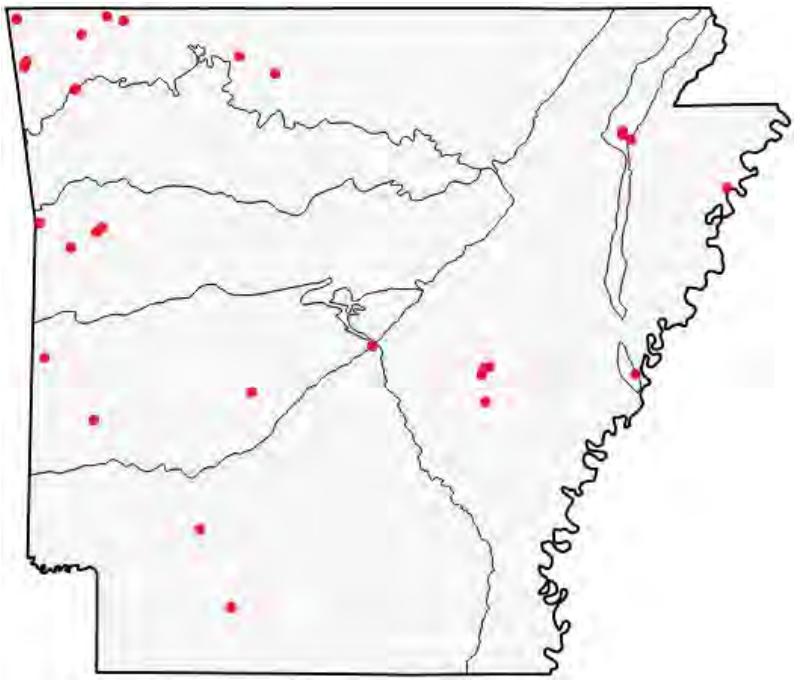
Population Trend: Unknown

Global Rank: G5 — Secure

State Rank: S2 — Imperiled in Arkansas

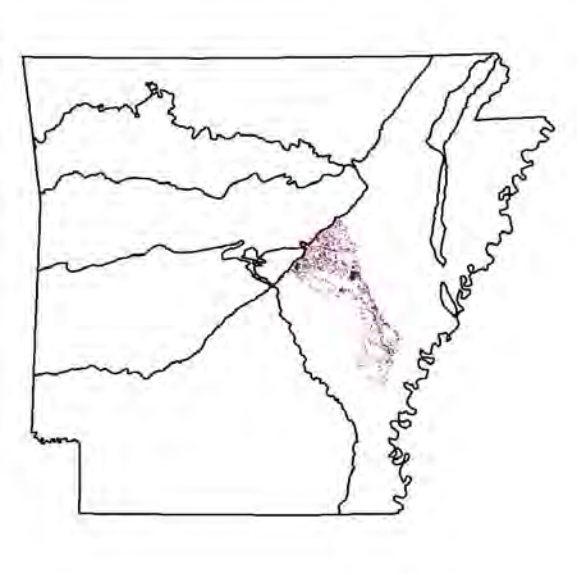
Distribution

Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☑
- Boston Mountains ☑
- Arkansas Valley ☑
- Ouachita Mountains ☐
- South Central Plains ☐
- Mississippi Alluvial Plain ☑
- Mississippi Valley Loess Plain ☐



Habitat Map



Habitats

	Weight
Lower Mississippi Alluvial Plain Grand Prairie	Optimal
Ozark-Ouachita Prairie and Woodland	Optimal

Problems Faced

POTENTIAL PROBLEM: Habitat destruction.	Threat: Habitat destruction or conversion Source: Agricultural practices
POTENTIAL PROBLEM: Habitat destruction.	Threat: Habitat destruction or conversion Source: Fire suppression

Data Gaps/Research Needs

Further distribution and abundance survey work needed.

Conservation Actions

	Importance	Category
Conduct controlled burns.	Medium	Fire Management
Restore prairies.	Medium	Habitat Restoration/Improvement

Monitoring Strategies

More information is needed to develop a monitoring strategy.

Comments

Trauth and others (2004) summarized the biology and literature of this species. A turtle of open grassland habitats, it was historically found in the "Grand Prairie" of east-central Arkansas, which has since been converted to intensive agricultural crop production (Gann and Tumlison 2004).

Taxa Association Team and Peer Reviewers

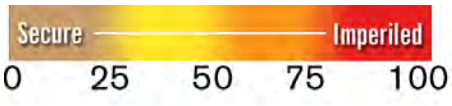
AGFC Kelly Irwin, UCA Don Shepard, Kory Roberts

Tropidoclonion lineatum

Lined Snake

Class: Reptilia
Order: Squamata
Family: Natricidae

Priority Score: **23** out of 100





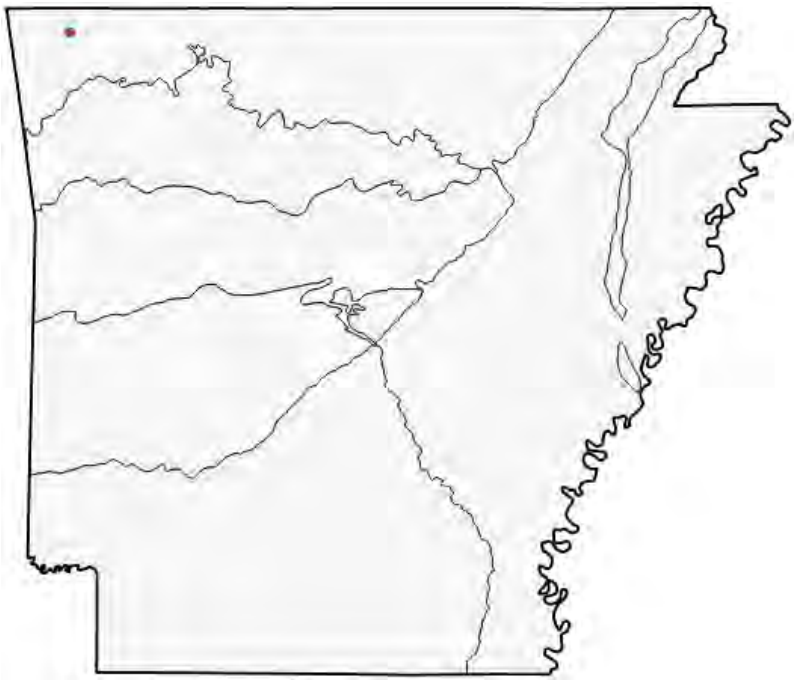
Population Trend: Unknown

Global Rank: G5 — Secure

State Rank: S1 — Critically imperiled in Arkansas

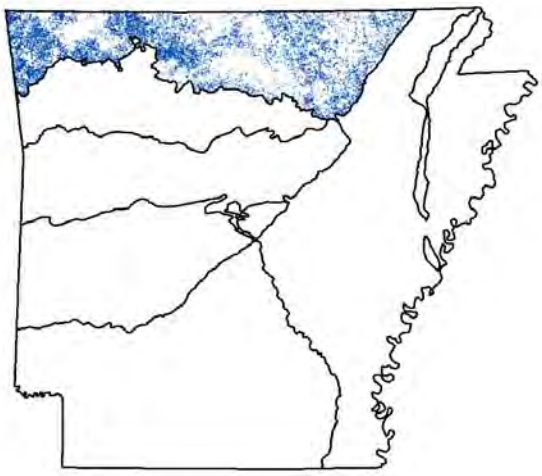
Distribution

Occurrence Records



Ecoregions where the species occurs:

- Ozark Highlands ☑
- Boston Mountains ☐
- Arkansas Valley ☐
- Ouachita Mountains ☐
- South Central Plains ☐
- Mississippi Alluvial Plain ☐
- Mississippi Valley Loess Plain ☐



Habitat Map



Habitats

	Weight
Ozark-Ouachita Prairie and Woodland	Optimal
Pasture Land	Suitable

Problems Faced

POTENTIAL PROBLEM: Habitat loss.	Threat: Habitat destruction or conversion Source: Urban development
POTENTIAL PROBLEM: Habitat loss.	Threat: Habitat destruction or conversion Source: Fire suppression

Data Gaps/Research Needs

Further distribution and abundance survey work needed.

Conservation Actions

	Importance	Category
Restore prairie habitat.	High	Habitat Restoration/Improvement
Use prescribed fire to improve prairie habitat.	High	Habitat Restoration/Improvement

Monitoring Strategies

More information is needed to develop a monitoring strategy.

Comments

This small, prairie dwelling snake was recently discovered in the Bentonville area in a housing development. A major threat is continued loss of prairie remnant habitat due to ongoing development.

(Collins 1993, Johnson 2000)

Taxa Association Team and Peer Reviewers

AGFC Kelly Irwin, UCA Don Shepard, Kory Roberts

Section 3. The Ecoregions of Arkansas

The Ecoregions of Arkansas

Ecoregions denote areas of general similarity in ecosystems and in the type, quality, and quantity of environmental resources. They are designed to serve as a spatial framework for the research, assessment, management and monitoring of ecosystems and ecosystem components.

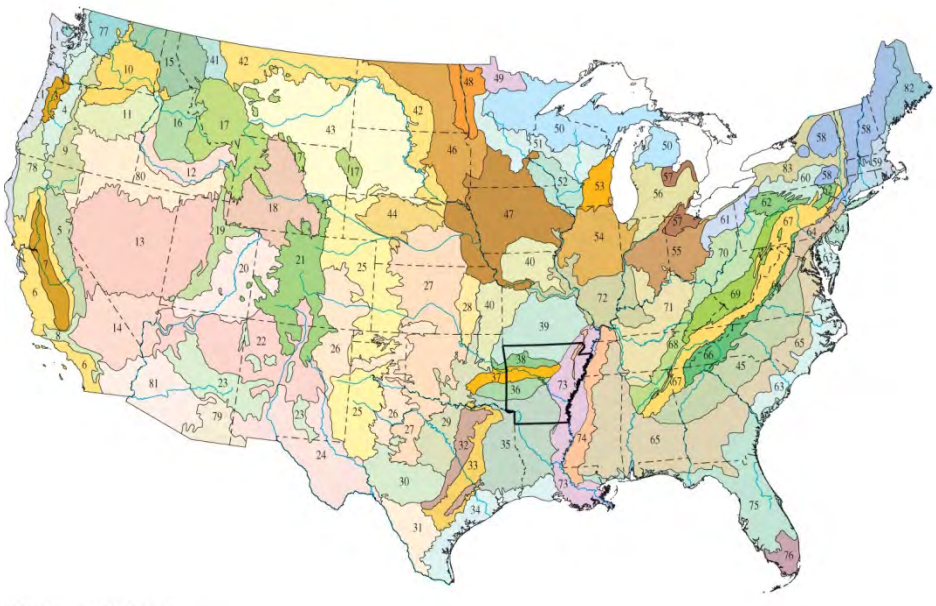
Ecoregions are general purpose regions that are critical for structuring and implementing ecosystem management strategies across federal agencies, state agencies, and nongovernment organizations that are responsible for different types of resources in the same geographical areas.

A Roman numeral hierarchical scheme has been adopted for different levels of ecological regions. Level I is the coarsest level, dividing North America into 15 ecological regions. Level II divides the continent into 52 regions. At level III, the continental United States (Figure 3.1) contains 104 ecoregions and the conterminous United States has 84 ecoregions (U.S. Environmental Protection Agency [USEPA], 2003). Level IV ecoregions are further subdivisions of level III ecoregions.

In Arkansas (Figure 3.2), there are seven level III ecoregions and 32 level IV ecoregions. Arkansas' ecological diversity is strongly related to regional physiography, geology, soil, climate and land use. Elevated karst plateaus, folded mountains, agricultural valleys, forested uplands, and bottomland forests occur. Fire-maintained prairie was once extensive in several parts of the state (adapted from Woods and others 2004).

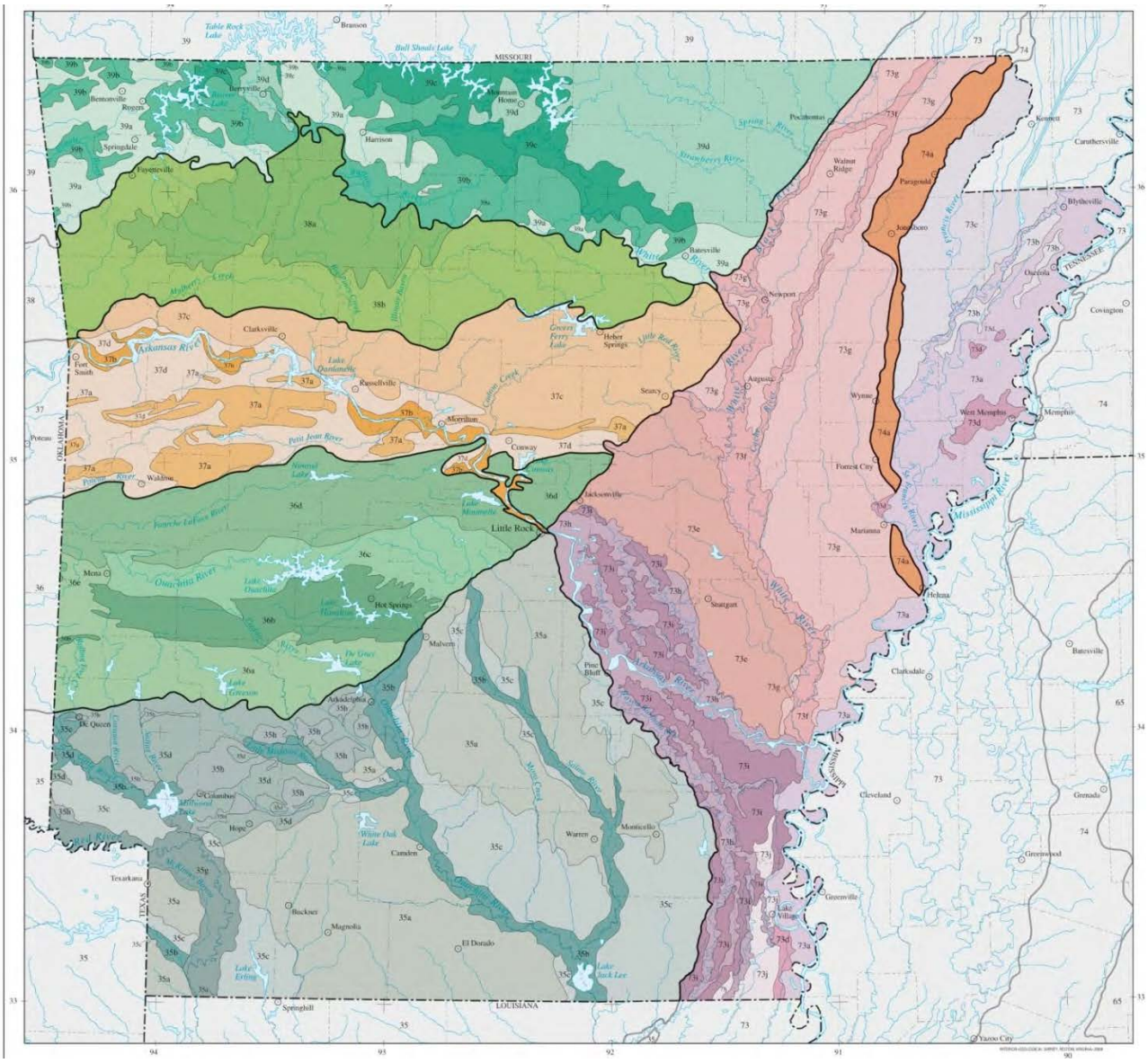
Ecoregional Assessments have been completed by The Nature Conservancy for land covered by five of the seven ecoregions. The assessments are available on the Arkansas Wildlife Action Plan website (www.wildlifearkansas.com).

Figure 3.1. Level III ecoregions in the United States.



Map Source: USEPA, 2003

Figure 3.2. Level III and IV ecoregions in Arkansas (Woods and others 2004).



35 SouthCcntrall'lains
35a TcrtiaryUplands
35b Floodplains and Low Tcrmccs
35c Pleistocene Fluvial Terraces
35d Cretaceous Dissected Uplands
35g Red River Bottomlands
35h BlacklandPrairic

36 Ouach itaMountains
36a AthensPlmeau
36b Central Mountain Ranges
36c Central Hills. Ridges, and Valleys
36d Fourche Mountains

36c Wcstem Ouachitas

37 ArlutnsasVallcy
37a Scattered High Ridges and Mountains
37b Arkansas River Floodplain
37c ArkansasValley Hills
37d ArkansasVallcyPbins

38 Hoston Mountains
38a Upper Boston Mountuins
38b Lower Boston Mountains

39 Ozark Highlands
39a Springfield Plateau
39b Dissected Springfield Plateau-Elk River Hills
39c White River Hills
39d Central Plateau

Level III ccorcgion
Level II Y ecoregion
County boundary
State boundary

SCALE 1:1000000

Alhcrsf'4u31Area Projection
Stam.Jardpar llcl,33 35'N and35 45'N

73 MississippiAilm'ial l'lain
73a Northern Holocene Meander Bells
73b Northern Pleistocene Valley Trains
73c St. Francis Lowlands
73d Northern Backswamps
73c GrandPrairic
73f Western Lowlands Holocene Meander Belt
73g Western Lowlands Pleistocene V< lleyTrains
73h Arkansas/Ou11chita River Holocene Meander Belts
73i Arkansas/Ouachita River Backswamps
73j Macon Ridge

74 Mississippi Valley Loess l'lains
74a BlufTHills

Conservation priority based on evaluation of species of greatest conservation need (SGCN)

Arkansas determined which ecoregions have more species of greatest conservation concern and/or more greatly imperiled species. Ecoregion Scores (Figure 3.3) equal the sum of all Species Priority Scores within an ecoregion. A higher score implies more species of greatest conservation need and/or species with a greater need for conservation (Table 3.1).

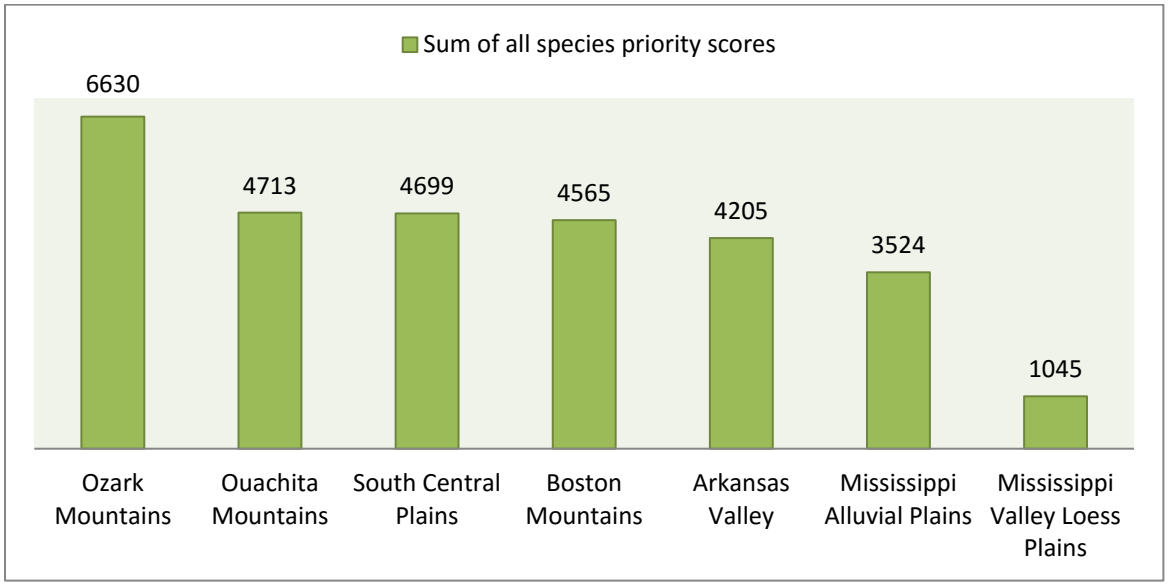


Figure 3.3. Sum of species priority scores by ecoregion.

Table 3.1. Average SPS (Species Priority Score) and number of SGCN in each ecoregion. A greater number of SGCN are affected by conservation actions in ecoregions with higher scores. A higher average SPS means that the ecoregion's species are in greater need of conservation actions.

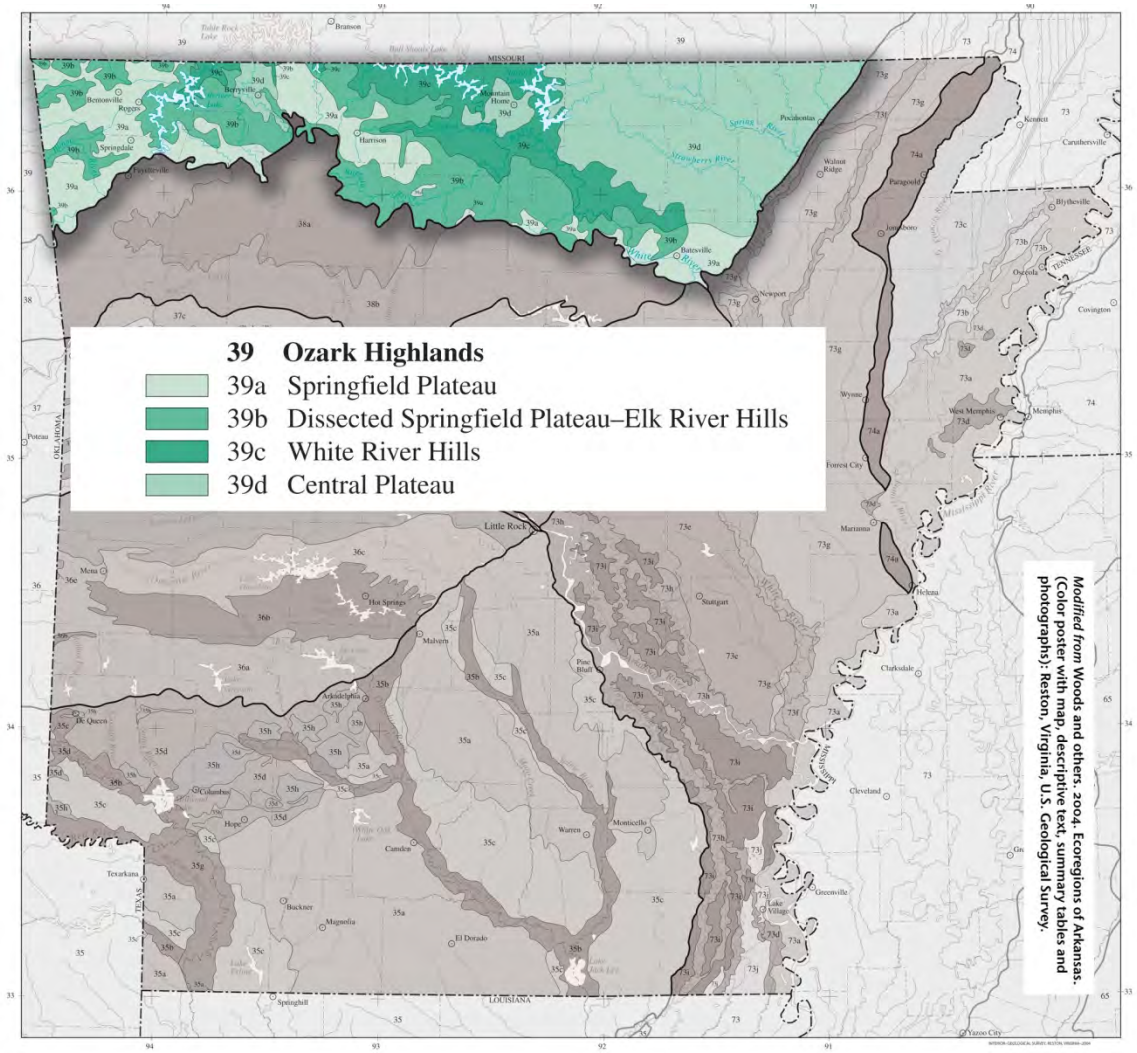
Ecoregion	Total SGCN	Average Priority Score
Ozark Mountains	218	30
South Central Plains	170	28
Ouachita Mountains	164	29
Boston Mountains	160	29
Arkansas Valley	161	26
Mississippi Alluvial Plain	146	24
Mississippi Valley Loess Plains	51	20

Ozark Highlands (Ecoregion 39)

The Ozarks formed as the Ouachita Mountains weighted down the edge of the North American continent, flexing the crust of the Arkoma Basin upward; younger sedimentary layers then eroded away, exposing the older, Paleozoic rocks that dominate the area. Ecoregion 39 is composed of the Springfield and Salem plateaus and largely underlain by highly soluble and fractured limestone and dolomite.

It is level to highly dissected, partly forested and rich in karst features. Caves, sink- holes and underground drainage occur, heavily influencing surficial water availability and water temperature. Clear, cold, perennial, spring-fed streams are common and typically have gravelly substrates; in addition, many small dry valleys occur.

Figure 3.4. Ozark Highlands Ecoregion.





Ozark Highlands - Springfield Plateau

Ecoregion 39 is not as mountainous as Ecoregions 36 or 38, but is higher and more rugged than Ecoregion 73. Habitat diversity and species richness is high. Soils are often cherty and have developed from carbonate rocks or interbedded chert, sandstone and shale; mesic Ultisols, Alfisols and Mollisols are common. Soil order mosaic, soil temperature regime and lithology are all distinct from nearby Ecoregions 36, 37, 38, and 73.

Potential natural vegetation is mostly oak–hickory forest. Open forest dominates rugged areas and pastureland and hayland are common on nearly level sites. Shortleaf pine grows on steep, cherty escarpments and on shallow soils derived from sandstone; it becomes more common in Ecoregions 35, 36 and the southern portion of Ecoregion 38. Glades dominated by grass and eastern redcedar are found on shallow, droughty soils especially over dolomite.

Primary land uses are logging, housing, recreation and, especially, poultry and livestock farming. Water quality in the Ozark Highlands (39) is different from the other ecoregions in Arkansas and is strongly influenced by lithology and land use practices. Alkalinity, total dissolved solids and total hardness values are relatively high, reflecting the influence of Ecoregion 39’s distinctive limestone and dolomite. Fecal coliform and nitrite-nitrate values are elevated downstream of

improved pastureland that is intensively grazed by cattle and fields where animal wastes from confined poultry and hog operations have been applied. Parts of Ecoregion 39 are experiencing rapid population growth along with associated habitat alteration and water pollution. Fish communities characteristically have a preponderance of sensitive species and are usually dominated by a diverse minnow community along with sunfishes and darters.

Springfield Plateau

39a. The nearly level to rolling Springfield Plateau is underlain by cherty limestone of the Mississippian Boone Formation; it is less rugged and wooded than Ecoregions 38, 39b and 39c and lacks the Ordovician dolomite and limestone of Ecoregions 39c and 39d. Karst features, such as sinkholes and caves, are common. Cold, perennial, spring-fed streams occur.

Upland potential natural vegetation is primarily oak–hickory and also oak–hickory– pine forests; savannas and tall grass prairies also occurred and were maintained by fire. Today, most of the forest and almost all of the prairies have been replaced by agriculture or expanding residential areas. Poultry, cattle and hog farming are primary land uses; pastureland and hayland are common. Application of poultry litter to agricultural fields is a non-point source that can impair water quality. Total suspended solids and turbidity values in streams are usually low, but total dissolved solids and hardness values are high.

Dissected Springfield Plateau–Elk River Hills

39b. The Dissected Springfield Plateau–Elk River Hills are underlain by cherty limestone of the Mississippian Boone Formation and contain many karst features. Cold, perennial, spring-fed streams occur. Ecoregion 39b is more rugged and wooded than the lithologically similar Springfield Plateau (39a) and the lithologically dissimilar Central Plateau (39d).

Potential natural vegetation is oak–hickory and oak–hickory–pine forests. Shortleaf pine grows on the thin, cherty soils of steep slopes and is more common than in Ecoregion 39a, 39c and 39d. Scattered limestone glades occur, but are less extensive than on the dolomites of the lithologically distinct Ecoregion 39c.

Today, Ecoregion 39b remains dominated by forest and woodland. Logging, livestock farming, woodland grazing, recreation, quarrying and housing are primary land uses.

White River Hills

39c. The forested White River Hills ecoregion is a highly dissected portion of the Salem Plateau that is underlain by cherty Ordovician dolomite and limestone. Soils are usually thin, rocky, steep and nonarable. Flat land is uncommon except along the White River. Ecoregion 39c is lithologically unlike another highly dissected portion of the Ozarks, Ecoregion 39b, where Mississippian cherty limestone of the Boone Formation predominates. Clear, cold, perennial,

spring-fed streams are common, but dry valleys occur.

Potential natural vegetation is oak–hickory forest, oak–hickory–pine forest and cedar glades. Glades are more extensive than elsewhere in Arkansas and occur on thin, droughty soils derived from carbonates. Pine is most common on steep, thin, cherty soils. Ecoregion 39c includes Table Rock, Bull Shoals, Norfork and Beaver lakes. Turbidity and total suspended solids are usually low in its streams and rivers, but total dissolved solids and hardness values are high.

Central Plateau

39d. The Central Plateau is an undulating to hilly portion of the Salem Plateau that is dominated by agriculture. Ecoregion 39d is largely underlain by cherty Ordovician dolomite and limestone; it is lithologically distinct from another slightly dissected part of the Ozarks, the Springfield Plateau (39a). Karst features occur. The Central Plateau (39d) is less rugged and wooded than Ecoregions 38, 39b and 39c.

Natural vegetation is oak–hickory forest, oak–hickory–pine forest (often on soils derived from sandstone), barrens (on thin soils) and scattered cedar glades (on shallow, rocky, droughty soils from dolomite or limestone).

Today, pastureland, hayland and housing are common, but remnant forests and savannas occur in steeper areas. Turbidity, total suspended solids, total dissolved solids and hardness values are often higher than in Ecoregions 39a and 39c (adapted from Woods and others 2004).

Ozark Highlands Ecoregion:

Species of Greatest Conservation Need (SGCN)

Of the 377 SGCN, 218 occur in the Ozark Highlands ecoregion (Table 3.2).

Table 3.2. All species of greatest conservation need (SGCN) in the Ozark Highlands ranked by priority score.

Priority Score	Common Name	*Scientific Name*	Taxa Association
100	Curtis Pearlymussel	*Epioblasma florentina curtisii*	Mussel
100	Turgid Blossom	*Epioblasma turgidula*	Mussel
80	Winter Stonefly	*Allocapnia warreni*	Insect
80	Foushee Cavesnail	*Amnicola cora*	Invertebrate - other
80	Benton County Cave Crayfish	*Cambarus aculabrum*	Crayfish
80	Hell Creek Cave Crayfish	*Cambarus zophonastes*	Crayfish
80	Ozark Big-eared Bat	*Corynorhinus townsendii*	Mammal
80	Sulphur Springs Diving Beetle	*Heterosternuta sulphuria*	Insect
80	Isopod	*Lirceus bidentatus*	Invertebrate - other

80	Ozark Pyrg	*Marstonia ozarkensis*	Invertebrate - other
80	Ground Beetle	*Rhadine ozarkensis*	Insect
80	Thicklipped Pebblesnail	*Somatogyrus crassilabris*	Invertebrate - other
76	Scaleshell	*Leptodea leptodon*	Mussel
71	Ozark Hellbender	*Cryptobranchus alleganiensis bishopi*	Amphibian
65	Cave Obligate Pseudoscorpion	*Apochthonius titanicus*	Invertebrate - other
65	Cave Obligate Harvestman	*Crosbyella distincta*	Invertebrate - other
65	Cave Obligate Harvestman	*Crosbyella roeweri*	Invertebrate - other
65	Calico Rock Oval	*Patera clenchi*	Invertebrate - other
65	Cave Obligate Millipede	*Trigenotyla parca*	Invertebrate - other
65	Arkansas Wedge	*Xolotrema occidentale*	Invertebrate - other
63	Northern Long-eared Bat	*Myotis septentrionalis*	Mammal
62	Neosho Mucket	*Lampsilis rafinesqueana*	Mussel
62	Indiana Bat	*Myotis sodalis*	Mammal
57	Ozark Pocket Gopher	*Geomys bursarius ozarkensis*	Mammal
52	Rabbitsfoot	*Quadrula cylindrica cylindrica*	Mussel
50	Arkansas Agapetus Caddisfly	*Agapetus medicus*	Insect
50	Winter Stonefly	*Allocapnia jeanae*	Insect
50	Contorted Ochrotrichian Microcaddisfly	*Ochrotrichia contorta*	Insect
50	Coldwater Crayfish	*Orconectes eupunctus*	Crayfish
50	Cave Obligate Springtail	*Schaefferia alabamensis*	Invertebrate - other
46	Predaceous Diving Beetle	*Heterosternuta phoebeae*	Insect
46	Pink Mucket	*Lampsilis abrupta*	Mussel
46	Mammoth Spring Crayfish	*Orconectes marchandi*	Crayfish
43	Piping Plover	*Charadrius melodus*	Bird
43	Western Fanshell	*Cyprogenia aberti*	Mussel
43	Snuffbox	*Epioblasma triquetra*	Mussel
43	Ozark Cavefish	*Troglichthys rosae*	Fish
42	Amphipod	*Bactrurus pseudomucronatus*	Invertebrate - other
42	Cave Obligate Planarian	*Dendrocoelopsis americana*	Invertebrate - other
42	American Burying Beetle	*Nicrophorus americanus*	Insect
38	Linda's Roadside-Skipper	*Amblyscirtes linda*	Insect
38	Isopod	*Caecidotea dimorpha*	Invertebrate - other
38	Bat Cave Isopod	*Caecidotea macropropoda*	Invertebrate - other
38	Crystal Darter	*Crystallaria asprella*	Fish
38	Arkansas Darter	*Etheostoma cragini*	Fish
38	Stargazing Darter	*Percina uranidea*	Fish
38	Pyramid Pigtoe	*Pleurobema rubrum*	Mussel
34	Swamp Metalmark	*Calephelis muticum*	Insect
34	Bristly Cave Crayfish	*Cambarus setosus*	Crayfish
34	White Liptooth	*Daedalochila peregrina*	Invertebrate - other
34	Williams' Crayfish	*Orconectes williamsi*	Crayfish
34	Salamander Mussel	*Simpsonaias ambigua*	Mussel

34	Ozark Emerald	*Somatochlora ozarkensis*	Insect
33	Western Sand Darter	*Ammocrypta clara*	Fish
33	Henslow's Sparrow	*Ammodramus henslowii*	Bird
33	Sprague's Pipit	*Anthus spragueii*	Bird
33	Little Brown Bat	*Myotis lucifugus*	Mammal
33	Ozark Shiner	*Notropis ozarcanus*	Fish
33	Bachman's Sparrow	*Peucaea aestivalis*	Bird
33	Purple Lilliput	*Toxolasma lividum*	Mussel
32	Prairie Mole Cricket	*Gryllotalpa major*	Insect
32	Ozark Snaketail Dragonfly	*Ophiogomphus westfalli*	Insect
31	Slippershell Mussel	*Alasmidonta viridis*	Mussel
30	Isopod	*Caecidotea steevesi*	Invertebrate - other
30	Isopod	*Lirceus bicuspidatus*	Invertebrate - other
30	Giant Prairie Robberfly	*Microstylum morosum*	Insect
30	Meek's Short Pointed Crayfish	*Orconectes meeki brevis*	Crayfish
30	Ozark Swallowtail	*Papilio joanae*	Insect
29	Buff-breasted Sandpiper	*Calidris subruficollis*	Bird
29	Rafinesque's Big-Eared Bat	*Corynorhinus rafinesquii*	Mammal
29	Mottled Duskywing	*Erynnis martialis*	Insect
29	Strawberry River Darter	*Etheostoma fragi*	Fish
29	Least Darter	*Etheostoma microperca*	Fish
29	Rusty Blackbird	*Euphagus carolinus*	Bird
29	"Elongate" Pigtoe	*Fusconaia sp. cf. flava*	Mussel
29	Meske's Skipper	*Hesperia meskei*	Insect
29	Silver Redhorse	*Moxostoma anisurum*	Fish
29	Bewick's Wren	*Thryomanes bewickii*	Bird
27	Lace-winged Roadside-Skipper	*Amblyscirtes aesculapius*	Insect
27	Isopod	*Caecidotea ancyla*	Invertebrate - other
27	Isopod	*Caecidotea salemensis*	Invertebrate - other
27	Hubbs' Crayfish	*Cambarus hubbsi*	Crayfish
27	Appalachian Azure	*Celastrina neglectamajor*	Insect
27	Baltimore Checkerspot	*Euphydryas phaeton ozarkae*	Insect
27	Land Snail	*Gastrocopta rogersensis*	Invertebrate - other
27	Eastern Small-Footed Bat	*Myotis leibii*	Mammal
27	Midget Crayfish	*Orconectes nana*	Crayfish
27	Longnose Darter	*Percina nasuta*	Fish
27	Shelled Cave Springtail	*Pseudosinella testa*	Invertebrate - other
27	Southern Cavefish	*Typhlichthys subterraneus*	Fish
25	Giant Stag Beetle	*Lucanus elaphus*	Insect
25	Springtail	*Pygmarrhopalites clarus*	Invertebrate - other
25	Diana	*Speyeria diana*	Insect
24	American Eel	*Anguilla rostrata*	Fish
24	Ruddy Turnstone	*Arenaria interpres*	Bird
24	Smith's Longspur	*Calcarius pictus*	Bird

24	Common Nighthawk	*Chordeiles minor*	Bird
24	Eastern Collared Lizard	*Crotaphytus collaris*	Reptile
24	Migrant Loggerhead Shrike	*Lanius ludovicianus*	Bird
24	Southeastern Bat	*Myotis austroriparius*	Mammal
24	Yellow-crowned Night-Heron	*Nyctanassa violacea*	Bird
24	Black-bellied Plover	*Pluvialis squatarola*	Bird
24	Paddlefish	*Polyodon spathula*	Fish
24	American Woodcock	*Scolopax minor*	Bird
24	Cerulean Warbler	*Setophaga cerulea*	Bird
23	Lace Bug	*Acalypta susanae*	Insect
23	American Bittern	*Botaurus lentiginosus*	Bird
23	Isopod	*Caecidotea stiladactyla*	Invertebrate - other
23	Northern Metalmark	*Calephelis borealis*	Insect
23	Dusky Azure	*Celastrina nigra*	Insect
23	Outis Skipper	*Cogia outis*	Insect
23	Blue Sucker	*Cycleptus elongatus*	Fish
23	Bluntface Shiner	*Cyprinella camura*	Fish
23	Spotfin Shiner	*Cyprinella spiloptera*	Fish
23	Beetle	*Derops divalis*	Insect
23	Willow Flycatcher	*Empidonax traillii*	Bird
23	Oklahoma Salamander	*Eurycea tynerensis*	Amphibian
23	Ozark Pigtoe	*Fusconaia ozarkensis*	Mussel
23	Crawfish Frog	*Lithobates areolatus*	Amphibian
23	Sabine Shiner	*Notropis sabinae*	Fish
23	Neosho Midget Crayfish	*Orconectes macrus*	Crayfish
23	Great Plains Skink	*Plestiodon obsoletus*	Reptile
23	Yehl Skipper	*Poanes yehl*	Insect
23	Purple Gallinule	*Porphyrio martinicus*	Bird
23	Byssus Skipper	*Problema byssus*	Insect
23	Ozark Pseudactium	*Pseudactium ursum*	Insect
23	Ouachita Kidneyshell	*Ptychobranchus occidentalis*	Mussel
23	Plains Harvest Mouse	*Reithrodontomys montanus*	Mammal
23	Western Groundsnake	*Sonora semiannulata*	Reptile
23	Ozark Cave Amphipod	*Stygobromus ozarkensis*	Invertebrate - other
23	Pseudoscorpion	*Tartarocreagris ozarkensis*	Invertebrate - other
23	Lined Snake	*Tropidoclonion lineatum*	Reptile
23	Ellipse	*Venustaconcha ellipsiformis*	Mussel
23	Bleedingtooth Mussel	*Venustaconcha pleasii*	Mussel
21	Le Conte's Sparrow	*Ammodramus leconteii*	Bird
21	Bell's Roadside-Skipper	*Amblyscirtes belli*	Insect
21	Golden-banded Skipper	*Autochton cellus*	Insect
21	Scrubland Tiger Beetle	*Cicindela obsoleta*	Insect
21	Sedge Wren	*Cistothorus platensis*	Bird
21	Black-tailed Jackrabbit	*Lepus californicus*	Mammal

21	Eastern Spotted Skunk	*Spilogale putorius*	Mammal
20	Gapped Ringed Crayfish	*Orconectes neglectus*	Crayfish
19	Sharp-shinned Hawk	*Accipiter striatus*	Bird
19	Elktoe	*Alasmidonta marginata*	Mussel
19	Ringed Salamander	*Ambystoma annulatum*	Amphibian
19	Grasshopper Sparrow	*Ammodramus savannarum*	Bird
19	American Black Duck	*Anas rubripes*	Bird
19	Anhinga	*Anhinga anhinga*	Bird
19	Eastern Whip-poor-will	*Antrostomus vociferus*	Bird
19	Sanderling	*Calidris alba*	Bird
19	Dunlin	*Calidris alpina*	Bird
19	Stilt Sandpiper	*Calidris himantopus*	Bird
19	Chimney Swift	*Chaetura pelagica*	Bird
19	Yellow-billed Cuckoo	*Coccyzus americanus*	Bird
19	Northern Bobwhite	*Colinus virginianus*	Bird
19	Tricolored Heron	*Egretta tricolor*	Bird
19	Autumn Darter	*Etheostoma autumnale*	Fish
19	Sunburst Darter	*Etheostoma mihileze*	Fish
19	Current Darter	*Etheostoma uniporum*	Fish
19	Grotto Salamander "northern clade"	*Eurycea spelaea northern*	Amphibian
19	Grotto Salamander "western clade"	*Eurycea spelaea western*	Amphibian
19	American Kestrel	*Falco sparverius*	Bird
19	Common Gallinule	*Gallinula galeata*	Bird
19	Purple Finch	*Haemorhous purpureus*	Bird
19	Leonard's Skipper	*Hesperia leonardus*	Insect
19	Cobweb Skipper	*Hesperia metea*	Insect
19	Ouachita Diving Beetle	*Heterosternuta ouachita*	Insect
19	Mooneye	*Hiodon tergisus*	Fish
19	Wood Thrush	*Hylocichla mustelina*	Bird
19	Least Bittern	*Ixobrychus exilis*	Bird
19	American Brook Lamprey	*Lethenteron appendix*	Fish
19	Short-billed Dowitcher	*Limnodromus griseus*	Bird
19	Swainson's Warbler	*Limnothlypis swainsonii*	Bird
19	Pealip Redhorse	*Moxostoma pisolabrum*	Fish
19	Striped Mullet	*Mugil cephalus*	Fish
19	Redspot Chub	*Nocomis asper*	Fish
19	Crawford's Gray Shrew	*Notiosorex crawfordi*	Mammal
19	Channel Shiner	*Notropis wickliffi*	Fish
19	Black-crowned Night-Heron	*Nycticorax nycticorax*	Bird
19	Hickorynut	*Obovaria olivaria*	Mussel
19	"White" Hickorynut	*Obovaria sp. cf arkansasensis*	Mussel
19	Small-eyed Mold Beetle	*Ouachitychus parvoculus*	Insect
19	Gilt Darter	*Percina evides*	Fish
19	Slenderhead Darter	*Percina phoxocephala*	Fish

19	Ohio Pigtoe	*Pleurobema cordatum*	Mussel
19	Gray Comma	*Polygonia progne*	Insect
19	Boreal Chorus Frog	*Pseudacris maculata*	Amphibian
19	Eastern Harvest Mouse	*Reithrodontomys humulis*	Mammal
19	Oak Hairstreak	*Satyrium favonius ontario*	Insect
19	Eastern Spadefoot	*Scaphiopus holbrookii*	Amphibian
19	Hurter's Spadefoot	*Scaphiopus hurterii*	Amphibian
19	Southeastern Shrew	*Sorex longirostris*	Mammal
19	Ornate Box Turtle	*Terrapene ornata*	Reptile
19	Lilliput	*Toxolasma parvum*	Mussel
19	Bell's Vireo	*Vireo bellii*	Bird
17	Highfin Carpsucker	*Carpiodes velifer*	Fish
17	Trumpeter Swan	*Cygnus buccinator*	Bird
17	Round Pigtoe	*Pleurobema sintoxia*	Mussel
17	Little Spectaclecase group	*Villosa sp. cf lienosa*	Mussel
16	Gray Bat	*Myotis grisescens*	Mammal
16	American Badger	*Taxidea taxus*	Mammal
15	Eastern Tiger Salamander	*Ambystoma tigrinum*	Amphibian
15	Gorgone Checkerspot	*Chlosyne gorgone*	Insect
15	Cow Path Tiger Beetle	*Cicindela purpurea*	Insect
15	Monarch	*Danaus plexippus*	Insect
15	Lake Chubsucker	*Erimyzon sucetta*	Fish
15	Highland Darter	*Etheostoma teddyroosevelt*	Fish
15	Grotto Salamander "eastern clade"	*Eurycea spelaea eastern*	Amphibian
15	Least Brook Lamprey	*Lampetra aepyptera*	Fish
15	Wood Frog	*Lithobates sylvaticus*	Amphibian
15	Shoal Chub	*Macrhybopsis hyostoma*	Fish
15	Long-tailed Weasel	*Mustela frenata*	Mammal
15	Slender Glass Lizard	*Ophisaurus attenuatus*	Reptile
15	Saddleback Darter	*Percina vigil*	Fish
15	American Golden-Plover	*Pluvialis dominica*	Bird
15	Western Harvest Mouse	*Reithrodontomys megalotis*	Mammal
15	Rainbow	*Villosa iris*	Mussel
13	Twelve-spotted Tiger Beetle	*Cicindela duodecimguttata*	Insect

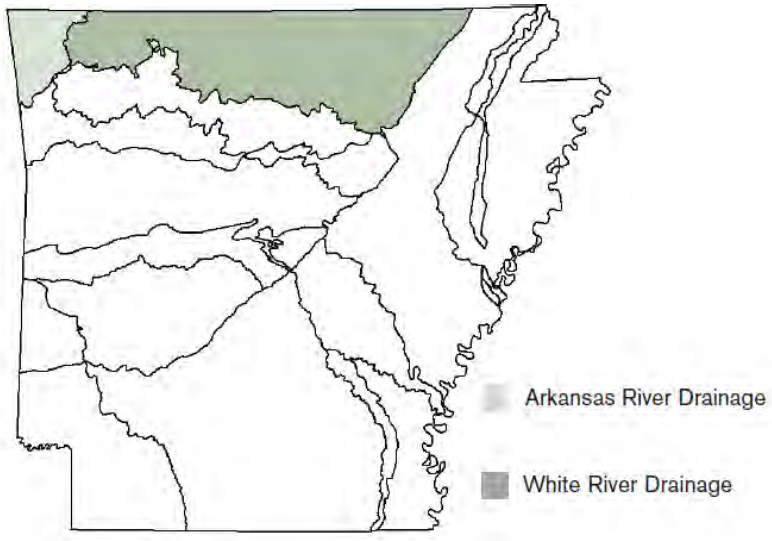
Habitats that occur in the Ozark Highlands

Of the 37 terrestrial habitats in Arkansas, 19 occur in the Ozark Highlands ecoregion (Table 3.3). Of 18 ecobasins in Arkansas, two occur in the Ozark Highlands ecoregion (Figure 3.5). These associations are described in the Section 4. Terrestrial Habitats and Section 5. Aquatic Habitats.

Table 3.3. Terrestrial Habitats in the Ozark Highlands.

Habitat Name
Caves, Mines, Sinkholes, and other Karst Habitat
Crop Land
Cultivated Forest
Herbaceous Wetland
Interior Highlands Calcareous Glade and Barrens
Interior Highlands Dry Acidic Glade and Barrens
Mud Flats
Ozark-Ouachita Cliff and Talus
Ozark-Ouachita Forested Seep
Ozark-Ouachita Dry Oak and Pine Woodland
Ozark-Ouachita Dry-Mesic Oak Forest
Ozark-Ouachita Mesic Hardwood Forest
Ozark-Ouachita Pine-Oak Forest/Woodland
Ozark-Ouachita Prairie and Woodland
Ozark-Ouachita Riparian
Pasture Land
Ponds, Lakes, and Water Holes
Ozark-Ouachita Large Floodplain
Urban/Suburban

Figure 3.5. Ecobasin Distribution in the Ozark Highlands.



Problems faced by Species of Greatest Conservation Need (SGCN)

Taxa association teams listed problems faced by SGCN individually in the Species Reports. A summary of the problems faced by SGCN in the Ozark Highlands is presented below. Each problem has a score which is a sum of all Species Priority Scores associated with species for

which this problem was assigned. A higher score implies a higher quantity of SGCN and/or more greatly imperiled species associated with problems listed here.

Table 3.4. Problems faced by SGCN in the Ozark Highlands Ecoregion.

Problem Faced	Score
Urban development	3875
Grazing/Browsing	2720
Forestry activities	1912
Dam	1880
Agricultural practices	1878
Road construction	1800
Confined animal operations	1596
Resource extraction	1515
Recreation	1028
Municipal/Industrial point source	830
Channel alteration	734
Fire suppression	652
Channel maintenance	508
Parasites/pathogens	495
Water diversion	447
Conversion of riparian forest	427
Commercial/industrial development	403
Exotic species	402
Non-point source pollution	196
Predation	139
Excessive groundwater withdrawal	112
Excessive non-commercial harvest or collection	108
Management of/for certain species	103
Restricted range in Arkansas	57
Grazing	57
Interspecific competiton	48
Commercial harvest	43
Unknown	33

Conservation actions needed in the Ozark Highlands

Below are scores of conservation actions recommended by the taxa association teams for SGCN within the Ozark Highlands (Figure 3.6). The score associated with the conservation action category is the sum of all priority scores associated with species for which a conservation action has been assigned, weighted by the importance of the conservation action category to the species. A higher score implies a higher quantity of SGCN and/or more greatly imperiled species would be affected by actions within this conservation action category.

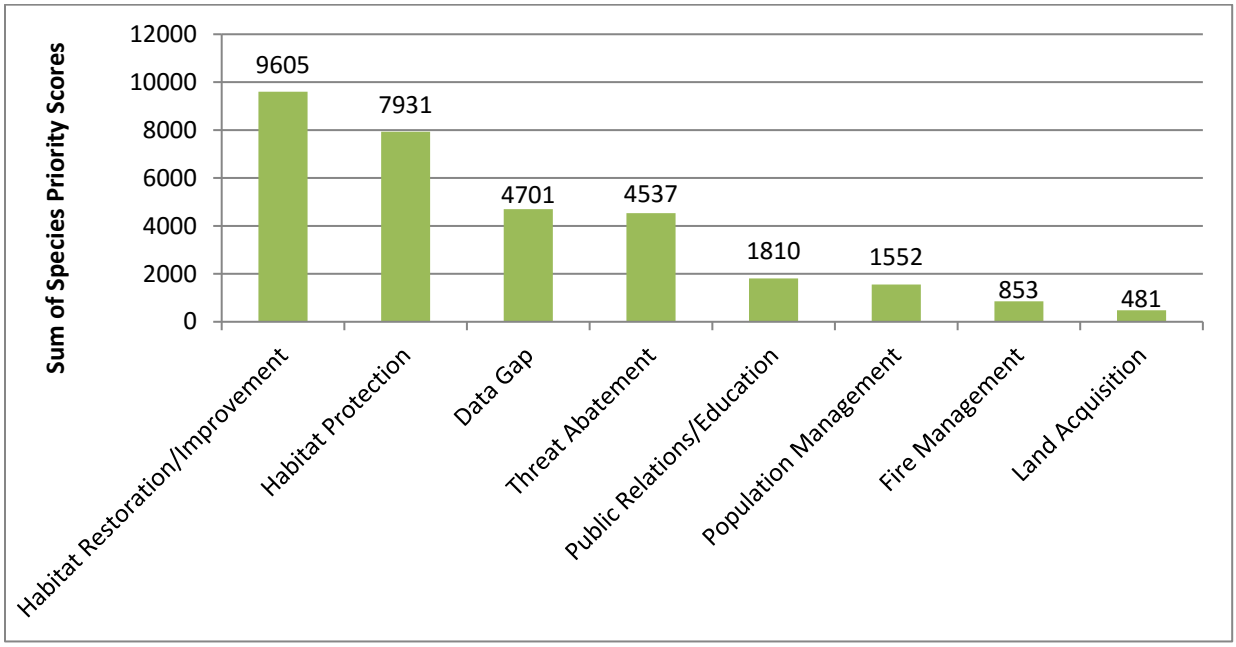


Figure 3.6. Conservation action categories recommended for the Ozark Highlands.

Boston Mountains (Ecoregion 38)

Ecoregion 38 is mountainous, forested and underlain by Pennsylvanian sandstone, shale and siltstone. It is one of the Ozark Plateaus; some folding and faulting has occurred but, in general, strata are much less deformed than in the Ouachita Mountains (36). Maximum elevations are higher, soils have a warmer temperature regime and carbonate rocks are much less extensive than in the Ozark Highlands (39). Physiography is distinct from the Arkansas Valley (37).

Upland soils are mostly Ultisols that developed under oak–hickory and oak–hickory– pine forests. Today, forests are still widespread; northern red oak, southern red oak, white oak and hickories usually dominate the uplands, but shortleaf pine grows on drier, south- and west-facing slopes underlain by sandstone.

Figure 3.7. Boston Mountains Ecoregion.

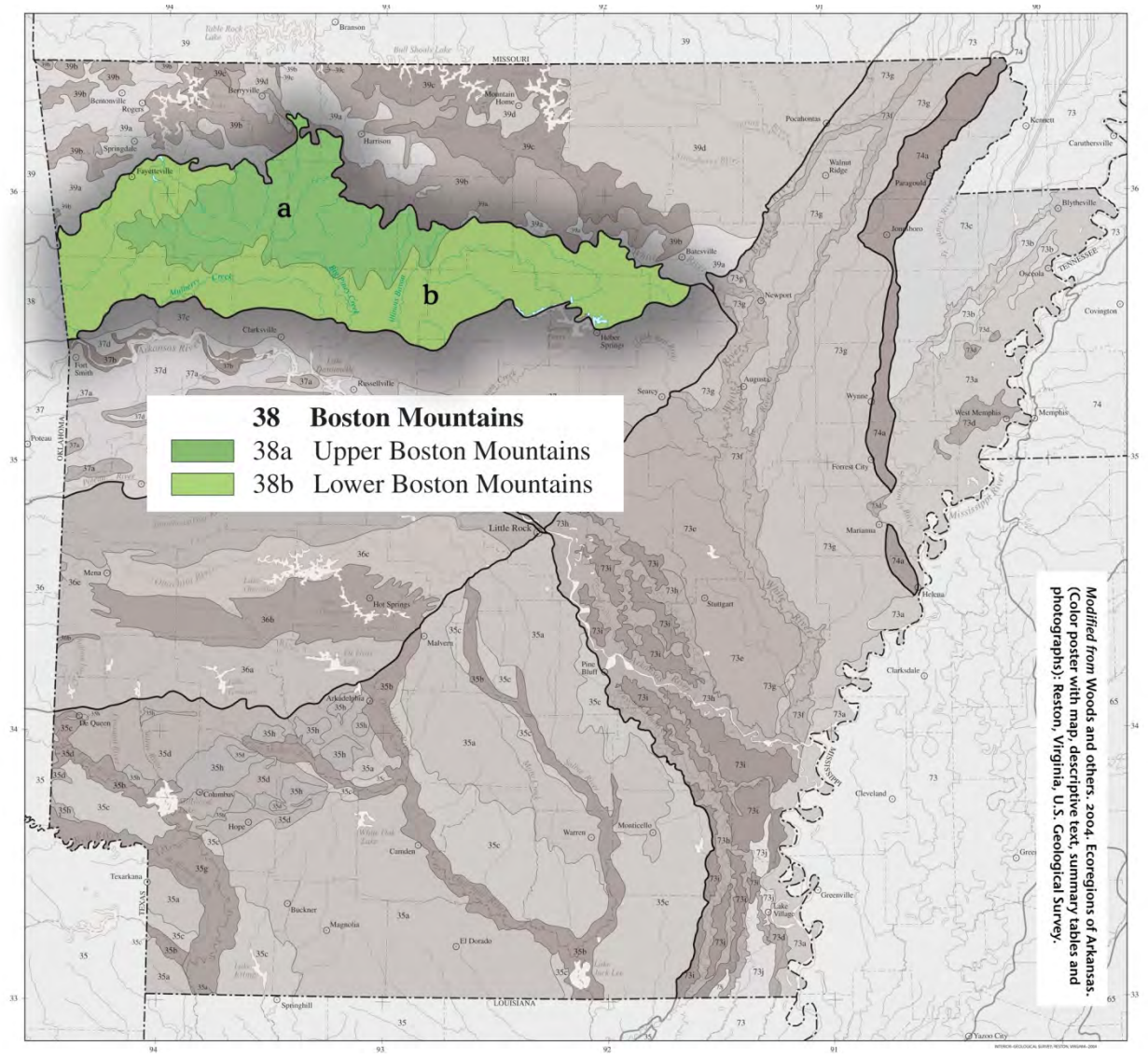




Photo by Tom Foti, AHNC

Upper Boston Mountains

Pastureland or hayland occur on nearly level ridgetops, benches and valley floors. Population density is low; recreation, logging and livestock farming are the primary land uses.

Water quality in streams is generally exceptional; biochemical, nutrient and mineral water quality parameter concentrations all tend to be very low. Fish communities are mostly composed of sensitive species; a diverse, often darter-dominated community occurs along with nearly equal proportions of minnows and sunfishes. During low flows, streams in both Ecoregions 38 and 36 usually run clear but, during high flow conditions, turbidity in Ecoregion 38 tends to be greater than in Ecoregion 36. Summer flow in many small streams is limited or nonexistent but isolated, enduring pools may occur.

Upper Boston Mountains

38a. The Upper Boston Mountains ecoregion is generally higher and more moist than the Lower Boston Mountains (38b); elevations vary from 1,900 to 2,800 feet. Potential natural vegetation is oak–hickory forest. Characteristically, the forests of the Upper Boston Mountains (38a) are more closed and contain far less pine than those of the Lower Boston Mountains (38b). North-facing slopes support mesic forests. Ecoregion 38a is underlain by Pennsylvanian sandstone, shale and siltstone that contrasts with the limestone and dolomite that dominates Ozark Highlands (39).

Water quality in streams reflects geology, soils and land use and is typically exceptional; mineral, nutrient and solid concentrations as well as turbidity all tend to be very low. During the summer, many streams do not flow.

Lower Boston Mountains

38b. The Lower Boston Mountains ecoregion is a mosaic of woodland, forest and savanna that contrasts with the denser, more moist and closed forests of the Upper Boston Mountains (38a). Potential natural vegetation is oak–hickory– pine and oak–hickory forests; pine is much more common than in Ecoregions 38a or 39. Shortleaf pine is especially widespread on drier, south- and west-facing slopes un- derlain by sandstone. Both precipitation and forest density decrease toward the west, where oak–pine woodland or savanna become common.

Ecoregion 38b is underlain by Pennsylvanian sandstone, shale and siltstone; it is lithologically distinct from the limestone- and dolomite-dominated Ozark High- lands (39).

Overall, water quality is quite similar to Ecoregion 38a, which, although generally higher, has similar lithology and land uses (adapted from Woods and others 2004).

Boston Mountain Ecoregion:

Species of Greatest Conservation Need (SGCN)

Of the 377 SGCN, 160 occur in the Boston Mountains ecoregion (Table 3.5).

Table 3.5. Species of greatest conservation need (SGCN) in the Boston Mountains ranked by priority score.

Priority Score	Common Name	Scientific Name	Taxa Association
100	Yellowcheek Darter	*Etheostoma moorei*	Fish
80	Bowed Snowfly	*Allocapnia oribata*	Insect
80	Ozark Big-eared Bat	*Corynorhinus townsendii ingens*	Mammal
80	Speckled Pocketbook	*Lampsilis streckeri*	Mussel
80	Ground Beetle	*Rhadine ozarkensis*	Insect
65	Cave Obligate Pseudoscorpion	*Apochthonius diabolus*	Invertebrate - other
65	Cave Obligate Harvestman	*Crosbyella distincta*	Invertebrate - other
65	Cave Obligate Harvestman	*Crosbyella roeweri*	Invertebrate - other
65	Nearctic Paduniellan Caddisfly	*Paduniella nearctica*	Insect
65	Cave Obligate Millipede	*Trigenotyla parca*	Invertebrate - other
63	Northern Long-eared Bat	*Myotis septentrionalis*	Mammal
62	Boston Mountains Crayfish	*Cambarus causeyi*	Crayfish
62	Neosho Mucket	*Lampsilis rafinesqueana*	Mussel
62	Indiana Bat	*Myotis sodalis*	Mammal
52	Rabbitsfoot	*Quadrula cylindrica cylindrica*	Mussel
50	Winter Stonefly	*Allocapnia jeanae*	Insect
50	Winter Stonefly	*Allocapnia ozarkana*	Insect
50	Springtail	*Pseudosinella dubia*	Invertebrate - other
50	Cave Obligate Springtail	*Schaefferia alabamensis*	Invertebrate - other

46	Predaceous Diving Beetle	*Heterosternuta phoebeae*	Insect
43	Piping Plover	*Charadrius melodus*	Bird
43	Western Fanshell	*Cyprogenia aberti*	Mussel
42	Isopod	*Caecidotea oculata*	Invertebrate - other
42	Cave Obligate Isopod	*Caecidotea simulator*	Invertebrate - other
42	Cave Obligate Planarian	*Dendrocoelopsis americana*	Invertebrate - other
38	Linda's Roadside-Skipper	*Amblyscirtes linda*	Insect
38	Isopod	*Caecidotea dimorpha*	Invertebrate - other
38	Bat Cave Isopod	*Caecidotea macropropoda*	Invertebrate - other
38	Spectaclecase	*Cumberlandia monodonta*	Mussel
38	Pyramid Pigtoe	*Pleurobema rubrum*	Mussel
34	Swamp Metalmark	*Calephelis muticum*	Insect
34	Williams' Crayfish	*Orconectes williamsi*	Crayfish
34	Salamander Mussel	*Simpsonaias ambigua*	Mussel
34	Ozark Emerald	*Somatochlora ozarkensis*	Insect
33	Henslow's Sparrow	*Ammodramus henslowii*	Bird
33	Little Brown Bat	*Myotis lucifugus*	Mammal
33	Ozark Shiner	*Notropis ozarcanus*	Fish
33	Bachman's Sparrow	*Peucaea aestivalis*	Bird
33	Purple Lilliput	*Toxolasma lividum*	Mussel
30	Mayfly	*Dannella provonshai*	Insect
30	Isopod	*Lirceus bicuspidatus*	Invertebrate - other
30	Ozark Swallowtail	*Papilio joanae*	Insect
29	Mottled Duskywing	*Erynnis martialis*	Insect
29	Rusty Blackbird	*Euphagus carolinus*	Bird
29	"Elongate" Pigtoe	*Fusconaia sp. cf. flava*	Mussel
29	Queensnake	*Regina septemvittata*	Reptile
29	Bewick's Wren	*Thryomanes bewickii*	Bird
27	Lace-winged Roadside-Skipper	*Amblyscirtes aesculapius*	Insect
27	Carolina Roadside-Skipper	*Amblyscirtes carolina*	Insect
27	Isopod	*Caecidotea ancyla*	Invertebrate - other
27	Hubbs' Crayfish	*Cambarus hubbsi*	Crayfish
27	Appalachian Azure	*Celastrina neglectamajor*	Insect
27	Baltimore Checkerspot	*Euphydryas phaeton ozarkae*	Insect
27	Ozark Clubtail Dragonfly	*Gomphus ozarkensis*	Insect
27	Eastern Small-Footed Bat	*Myotis leibii*	Mammal
27	Midget Crayfish	*Orconectes nana*	Crayfish
27	Longnose Darter	*Percina nasuta*	Fish
27	Shelled Cave Springtail	*Pseudosinella testa*	Invertebrate - other
25	Tiger Beetle	*Cicindela lepida*	Insect
25	Giant Stag Beetle	*Lucanus elaphus*	Insect
25	Springtail	*Pygmarrhopalites clarus*	Invertebrate - other
25	Diana	*Speyeria diana*	Insect
24	American Eel	*Anguilla rostrata*	Fish
24	Common Nighthawk	*Chordeiles minor*	Bird
24	Migrant Loggerhead Shrike	*Lanius ludovicianus*	Bird

24	Yellow-crowned Night-Heron	*Nyctanassa violacea*	Bird
24	Black-bellied Plover	*Pluvialis squatarola*	Bird
24	Paddlefish	*Polyodon spathula*	Fish
24	American Woodcock	*Scolopax minor*	Bird
24	Cerulean Warbler	*Setophaga cerulea*	Bird
23	American Bittern	*Botaurus lentiginosus*	Bird
23	Isopod	*Caecidotea stiladactyla*	Invertebrate - other
23	Northern Metalmark	*Calephelis borealis*	Insect
23	Dusky Azure	*Celastrina nigra*	Insect
23	Outis Skipper	*Cogia outis*	Insect
23	Bluntface Shiner	*Cyprinella camura*	Fish
23	Beetle	*Derops divalis*	Insect
23	Willow Flycatcher	*Empidonax traillii*	Bird
23	Oklahoma Salamander	*Eurycea tynerensis*	Amphibian
23	Pseudoscorpion	*Hesperochernes occidentalis*	Invertebrate - other
23	Crawfish Frog	*Lithobates areolatus*	Amphibian
23	Great Plains Skink	*Plestiodon obsoletus*	Reptile
23	Yehl Skipper	*Poanes yehl*	Insect
23	Byssus Skipper	*Problema byssus*	Insect
23	Ozark Pseudactium	*Pseudactium ursum*	Insect
23	Ouachita Kidneyshell	*Ptychobranchus occidentalis*	Mussel
23	Plains Harvest Mouse	*Reithrodontomys montanus*	Mammal
23	Ground Beetle	*Scaphinotus inflectus*	Insect
23	Ozark Cave Amphipod	*Stygobromus ozarkensis*	Invertebrate - other
23	Pseudoscorpion	*Tartarocreagris ozarkensis*	Invertebrate - other
23	Ellipse	*Venustaconcha ellipsiformis*	Mussel
23	Bleedingtooth Mussel	*Venustaconcha pleasii*	Mussel
21	Le Conte's Sparrow	*Ammodramus leconteii*	Bird
21	Bell's Roadside-Skipper	*Amblyscirtes belli*	Insect
21	Golden-banded Skipper	*Autochton cellus*	Insect
21	Woodland Tiger Beetle	*Cicindela unipunctata*	Insect
21	Sedge Wren	*Cistothorus platensis*	Bird
21	Eastern Spotted Skunk	*Spilogale putorius*	Mammal
19	Sharp-shinned Hawk	*Accipiter striatus*	Bird
19	Elktoe	*Alasmidonta marginata*	Mussel
19	Ringed Salamander	*Ambystoma annulatum*	Amphibian
19	Brown Bullhead	*Ameiurus nebulosus*	Fish
19	Grasshopper Sparrow	*Ammodramus savannarum*	Bird
19	Anhinga	*Anhinga anhinga*	Bird
19	Eastern Whip-poor-will	*Antrostomus vociferus*	Bird
19	Sanderling	*Calidris alba*	Bird
19	Dunlin	*Calidris alpina*	Bird
19	Stilt Sandpiper	*Calidris himantopus*	Bird
19	Chimney Swift	*Chaetura pelagica*	Bird
19	Yellow-billed Cuckoo	*Coccyzus americanus*	Bird
19	Northern Bobwhite	*Colinus virginianus*	Bird
19	Tricolored Heron	*Egretta tricolor*	Bird

19	Autumn Darter	*Etheostoma autumnale*	Fish
19	Sunburst Darter	*Etheostoma mihileze*	Fish
19	American Kestrel	*Falco sparverius*	Bird
19	Common Gallinule	*Gallinula galeata*	Bird
19	Purple Finch	*Haemorhous purpureus*	Bird
19	Four-toed Salamander	*Hemidactylium scutatum*	Amphibian
19	Leonard's Skipper	*Hesperia leonardus*	Insect
19	Cobweb Skipper	*Hesperia metea*	Insect
19	Ouachita Diving Beetle	*Heterosternuta ouachita*	Insect
19	Wood Thrush	*Hylocichla mustelina*	Bird
19	Least Bittern	*Ixobrychus exilis*	Bird
19	American Brook Lamprey	*Lethenteron appendix*	Fish
19	Short-billed Dowitcher	*Limnodromus griseus*	Bird
19	Swainson's Warbler	*Limnothlypis swainsonii*	Bird
19	Crawford's Gray Shrew	*Notiosorex crawfordi*	Mammal
19	Black-crowned Night-Heron	*Nycticorax nycticorax*	Bird
19	"White" Hickorynut	*Obovaria sp. cf arkansasensis*	Mussel
19	Small-eyed Mold Beetle	*Ouachitychus parvoculus*	Insect
19	Gilt Darter	*Percina evides*	Fish
19	Prairie Skink	*Plestiodon septentrionalis*	Reptile
19	Gray Comma	*Polygonia progne*	Insect
19	Gulf Mapleleaf	*Quadrula nobilis*	Mussel
19	Graham's Crayfish Snake	*Regina grahamii*	Reptile
19	Oak Hairstreak	*Satyrium favonius ontario*	Insect
19	Hurter's Spadefoot	*Scaphiopus hurterii*	Amphibian
19	Southeastern Shrew	*Sorex longirostris*	Mammal
19	Ornate Box Turtle	*Terrapene ornata*	Reptile
19	Lilliput	*Toxolasma parvum*	Mussel
19	Pondhorn	*Uniomerus tetralasmus*	Mussel
19	Bell's Vireo	*Vireo bellii*	Bird
17	Highfin Carpsucker	*Carpiodes velifer*	Fish
17	Beach-dune Tiger Beetle	*Cicindela hirticollis*	Insect
17	Sandy Stream Tiger Beetle	*Cicindela macra*	Insect
17	Western Diamond-backed	*Crotalus atrox*	Reptile
17	Trumpeter Swan	*Cygnus buccinator*	Bird
17	Round Pigtoe	*Pleurobema sintoxia*	Mussel
17	Little Spectaclecase group	*Villosa sp. cf lienosa*	Mussel
16	Gray Bat	*Myotis grisescens*	Mammal
16	American Badger	*Taxidea taxus*	Mammal
15	Gorgone Checkerspot	*Chlosyne gorgone*	Insect
15	Monarch	*Danaus plexippus*	Insect
15	Highland Darter	*Etheostoma teddyroosevelt*	Fish
15	Wood Frog	*Lithobates sylvaticus*	Amphibian
15	Long-tailed Weasel	*Mustela frenata*	Mammal
15	Slender Glass Lizard	*Ophisaurus attenuatus*	Reptile
15	American Golden-Plover	*Pluvialis dominica*	Bird

15	Rainbow	*Villosa iris*	Mussel
13	Twelve-spotted Tiger Beetle	*Cicindela duodecimguttata*	Insect

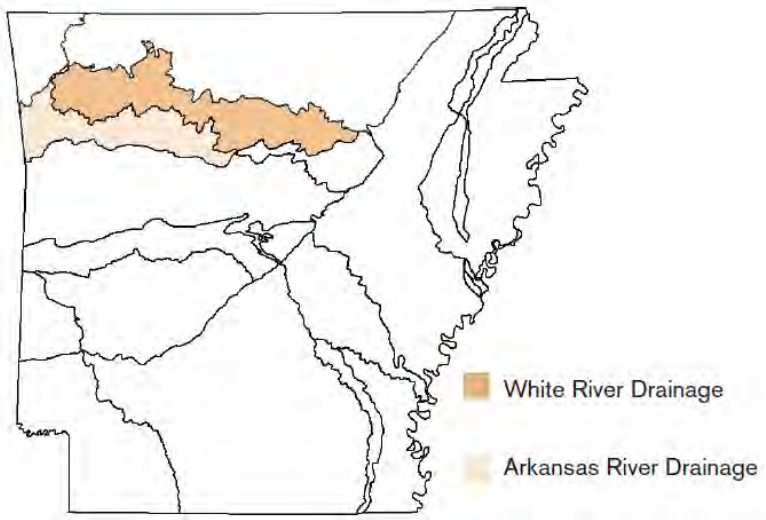
Habitats that occur in the Boston Mountains

Of the 37 terrestrial habitats in Arkansas, 19 occur in the Boston Mountains ecoregion (Table 3.6). Of 18 ecobasins in Arkansas, two occur in the Boston Mountains (Figure 3.8). These associations are described in the Section 4. Terrestrial Habitatsand Section 5. Aquatic Habitats.

Table 3.6. Terrestrial Habitats in the Boston Mountains.

Habitat Name
Caves, Mines, Sinkholes, and other Karst Habitat
Crop Land
Cultivated Forest
Herbaceous Wetland
Interior Highlands Calcareous Glade and Barrens
Interior Highlands Dry Acidic Glade and Barrens
Mud Flats
Ozark-Ouachita Cliff and Talus
Ozark-Ouachita Dry Oak and Pine Woodland
Ozark-Ouachita Dry-Mesic Oak Forest
Ozark-Ouachita Forested Seep
Ozark-Ouachita Large Floodplain
Ozark-Ouachita Mesic Hardwood Forest
Ozark-Ouachita Pine/Bluestem Woodland
Ozark-Ouachita Pine-Oak Forest/ Woodland
Ozark-Ouachita Riparian
Pasture Land
Ponds, Lakes, and Water Holes
Urban/Suburban

Figure 3.8. Ecobasin distribution in the Boston Mountains.



Problems faced by Species of Greatest Conservation Need (SGCN)

A summary of the problems faced by SGCN in the Boston Mountains is presented below. Each problem has a score which is a sum of all Species Priority Scores associated with species for which this problem was assigned. A higher score implies a higher quantity of SGCN and/or more greatly imperiled species associated with problems listed here.

Table 3.7. Problems faced by SGCN in the Boston Mountains Ecoregion.

Problem faced	Score
Urban development	2433
Forestry activities	1733
Grazing/Browsing	1630
Agricultural practices	1561
Dam	1555
Resource extraction	1547
Road construction	793
Confined animal operations	616
Municipal/Industrial point source	586
Fire suppression	452
Channel alteration	410
Parasites/pathogens	400
Recreation	379
Channel maintenance	369
Water diversion	342

Conversion of riparian forest	333
Commercial/industrial development	286
Exotic species	283
Non-point source pollution	131
Excessive groundwater withdrawal	121
Predation	97
Grazing	57
Management of/for certain species	46
Interspecific competiton	29
Excessive non-commercial harvest or collection	27
Commercial harvest	24

Conservation actions needed in the Boston Mountains

Below are scores of conservation actions recommended by the taxa association teams for SGCN within the Ozark Highlands (Figure 3.9). The score associated with the conservation action category is the sum of all priority scores associated with species for which a conservation action has been assigned, weighted by the importance of the conservation action category to the species. A higher score implies a higher quantity of SGCN and/or more greatly imperiled species would be affected by actions within this conservation action category.

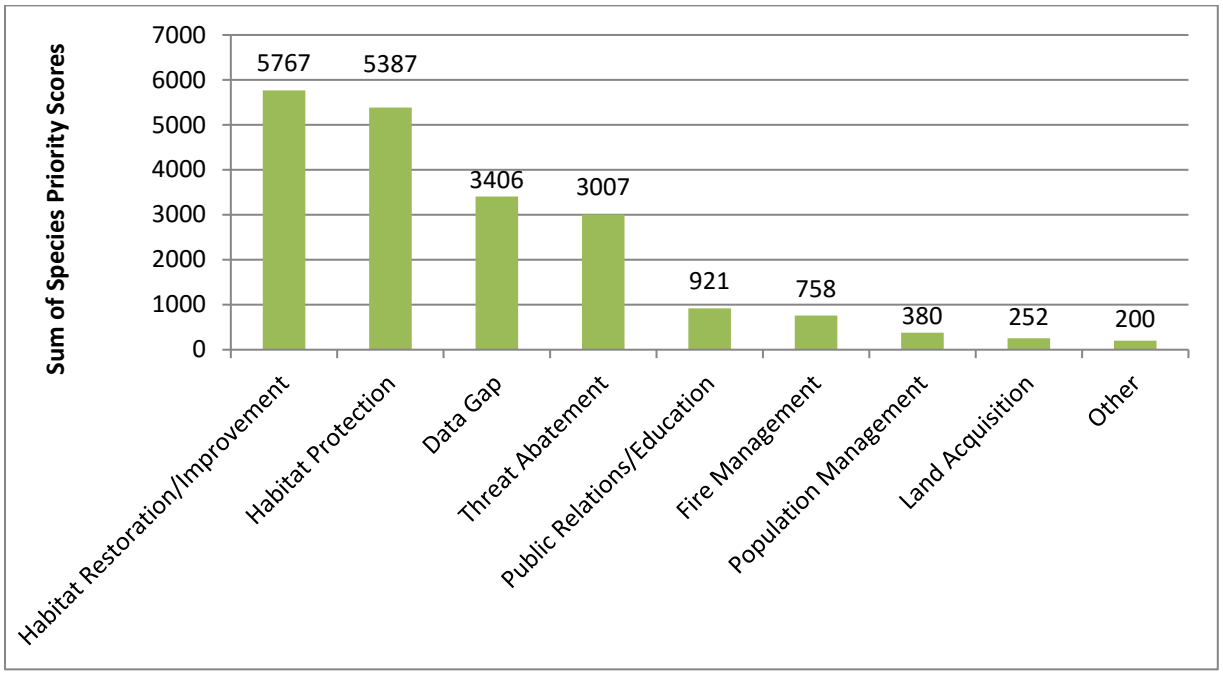


Figure 3.9. Conservation action categories recommended for the Boston Mountains.

Arkansas Valley (Ecoregion 37)

Ecoregion 37 is a synclinal and alluvial valley lying between the Ozark Highlands (39) and the Ouachita Mountains (36). The Arkansas Valley (37) is, characteristically, diverse and transitional. It generally coincides with the Arkoma Basin, an oil and gas province, that developed as sand and mud were deposited in a depression north of the rising Ouachita Mountains during the Mississippian and Pennsylvanian eras.

The Arkansas Valley (37) contains plains, hills, floodplains, terraces and scattered mountains. It is largely underlain by interbedded Pennsylvanian sandstone, shale and siltstone.

Figure 3.10. Arkansas Valley Ecoregion.

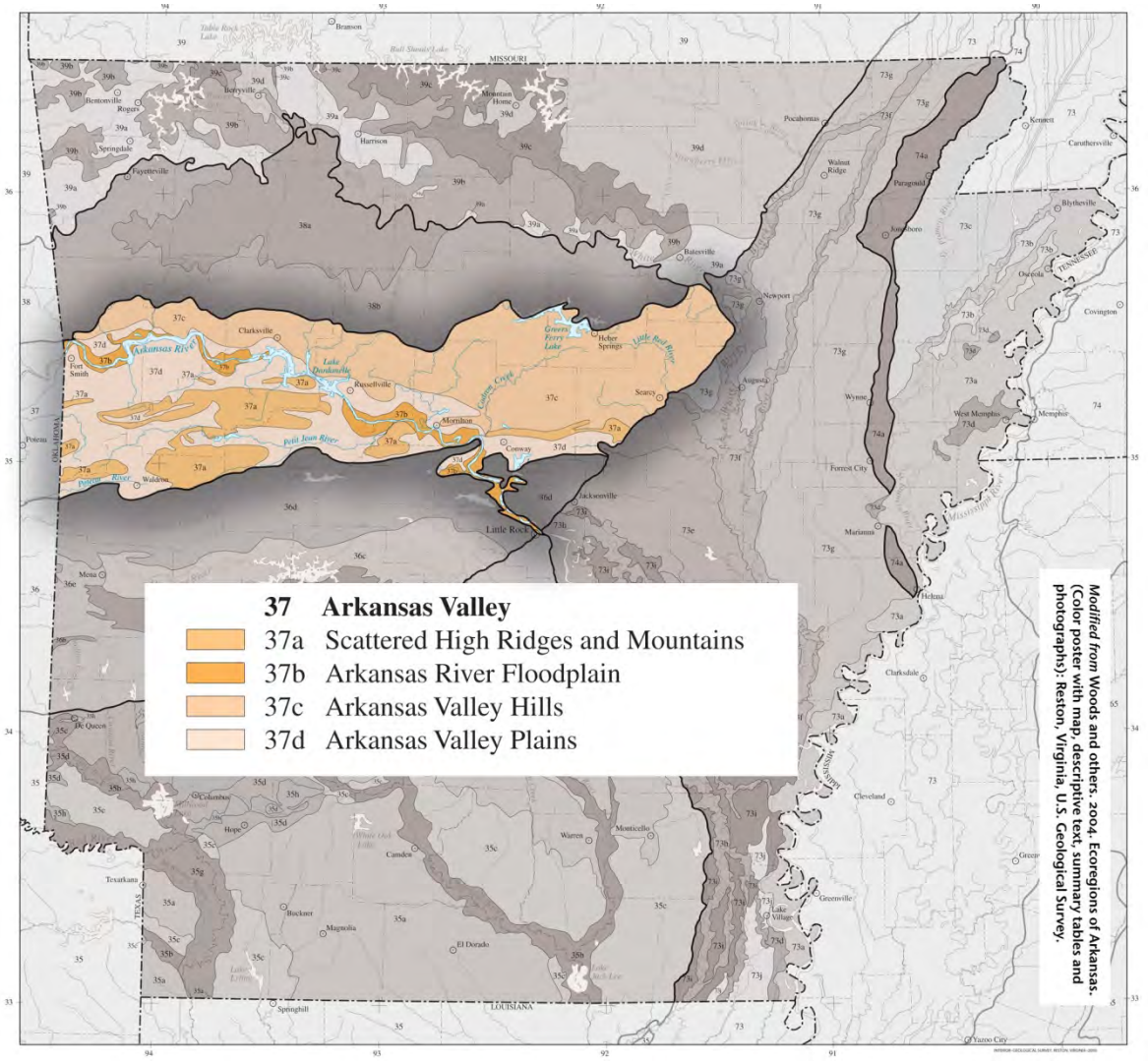




Photo by MAWPT

Prior to the 19th century, uplands were dominated by a mix of forest, woodland, savanna and prairie whereas floodplains and lower terraces were covered by bottomland deciduous forest. Today, less rugged upland areas have been cleared for pastureland or hayland. Poultry and livestock farming are important land uses.

Water quality is generally good and influenced more by land use activities than by soils or geology; average stream gradients and dissolved oxygen levels are lower in the Arkansas Valley (37) than in the Ouachita Mountains (36) or Ozark Highlands (39), whereas turbidity, total suspended solids, total organic carbon, total phosphorus and biochemical oxygen demand values are typically higher. The Arkansas River is continuously turbid. Summer flow in smaller streams is typically limited or nonexistent.

Fish communities characteristically contain a substantial proportion of sensitive species; a sunfish and minnow-dominated community exists along with substantial proportions of darters and catfishes (particularly madtoms).

Scattered High Ridges and Mountains

37a. The Scattered High Ridges and Mountains ecoregion is more rugged and wooded than Ecoregions 37b, 37c, or 37d. Ecoregion 37a is characteristically covered by savannas, open woodlands, or forests dominated or codominated by upland oaks, hickory and shortleaf pine; loblolly pine occurs but is not native. It is underlain by Pennsylvanian sandstone and shale; calcareous rocks such as those that dominate the Ozark Highlands (39) are absent.

Nutrient and mineral values (including turbidity and hardness) in streams are slightly higher than in other parts of the Arkansas Valley (37). Magazine Mountain, the highest point in Arkansas at

2,753 feet, is distinguished by diverse habitats. Its flat top is covered with xeric, stunted woodlands. Mesic sites also occur and may contain beech–maple forests.

Arkansas River Floodplain

37b. The Arkansas River Floodplain is characteristically veneered with Holocene alluvium and includes natural levees, meander scars, oxbow lakes, point bars, swales and backswamps. It is lithologically and physiographically distinct from the surrounding uplands of the Arkansas Valley (37). Mollisols, Entisols, Alfisols and Inceptisols are common; the soil mosaic sharply contrasts with nearby, higher elevation ecoregions where Ultisols developed under upland oaks, hickory and pine.

Potential natural vegetation is southern floodplain forest. Bottomland oaks including bur oak, American sycamore, sweetgum, willows, eastern cottonwood, green ash, pecan, hackberry and elm were once extensive. They have been widely cleared for pastureland, hayland and cropland. However, some forest remains in frequently flooded or poorly-drained areas. In Arkansas, bur oak is most dominant in Ecoregion 37b.

Arkansas Valley Hills

37c. The Arkansas Valley Hills are underlain by Pennsylvanian sandstone and shale and are lithologically distinct from Ecoregions 37b and 39. Ecoregion 37c is more hilly than the Arkansas Valley Plains (37d) and less rugged than Ecoregions 36, 37a and 38. Ultisols are common and support a potential natural vegetation of oak– hickory forest or oak–hickory–pine forest; both soils and natural vegetation contrast with those of Ecoregion 37b.

Today, pastureland is extensive, but rugged areas are wooded; overall, trees are much less extensive than in neighboring Ecoregions 36d, 37a and 38 but more widespread than in Ecoregions 37b and 37d. Poultry operations, livestock farming and logging are important land uses.

Arkansas Valley Plains

37d. The Arkansas Valley Plains are in the rainshadow of the Fourche Mountains and were once covered by a distinctive mosaic of prairie, savanna and woodland. Ecoregion 37d is mostly undulating but a few hills and ridges occur.

Westward, Ecoregion 37d becomes flatter, drier, more open and has fewer topographic fire barriers. Prior to the 19th century, frequently burned western areas had extensive prairie on droughty soils; scattered pine–oak savanna also occurred. Elsewhere, potential natural vegetation is primarily oak–hickory forest or oak–hickory– pine forest.

Today, pastureland and hayland are extensive but remnants of prairie, particularly the Cherokee Prairie near Fort Smith and woodland occur. Poultry and livestock farming are primary land

uses. Cropland agriculture in the Arkansas Valley Plains (37d) is less important than in Ecoregion 37b and wooded areas are not as extensive as in more rugged Ecoregions 36, 37a, 37c and 38. Stream turbidity generally remains low except during storm events (adapted from Woods and others 2004).

Arkansas Valley Ecoregion:

Species of Greatest Conservation Need (SGCN)

Of the 377 SGCN, 161 occur in the Arkansas Valley ecoregion (Table 3.8).

Table 3.8. Species of greatest conservation need (SGCN) in the Arkansas Valley ranked by priority score.

Priority Score	Common Name	Scientific Name	Taxa Association
80	Magazine Mountain Mold Beetle	*Arianops sandersoni*	Insect
80	Magazine Mountain Shagreen	*Inflectarius magazinensis*	Invertebrate - other
80	Magazine Stripetail	*Isoperla szczytkoi*	Insect
80	Striate Supercoil	*Paravitrea aulacogyra*	Invertebrate - other
80	Microcaddisfly	*Paucicalcaria ozarkensis*	Insect
65	Nearctic Paduniellan Caddisfly	*Paduniella nearctica*	Insect
65	Mayfly	*Paraleptophlebia calcarica*	Insect
65	Calico Rock Oval	*Patera clenchi*	Invertebrate - other
65	Elevated Spring Amphipod	*Stygobromus elatus*	Invertebrate - other
63	Northern Long-eared Bat	*Myotis septentrionalis*	Mammal
62	Boston Mountains Crayfish	*Cambarus causeyi*	Crayfish
52	Alabama Shad	*Alosa alabamae*	Fish
50	Arogos Skipper	*Atrytone arogos iowa*	Insect
50	Arkansas River Shiner	*Notropis girardi*	Fish
43	Piping Plover	*Charadrius melodus*	Bird
42	Hubricht's Long-tailed Amphipod	*Allocrangonyx hubrichti*	Invertebrate - other
42	Texas Frosted Elfin	*Callophrys irus hadros*	Insect
42	American Burying Beetle	*Nicrophorus americanus*	Insect
38	Isopod	*Caecidotea dimorpha*	Invertebrate - other
38	Pyramid Pigtoe	*Pleurobema rubrum*	Mussel
33	Henslow's Sparrow	*Ammodramus henslowii*	Bird
33	Sprague's Pipit	*Anthus spragueii*	Bird
33	Little Brown Bat	*Myotis lucifugus*	Mammal
33	Bachman's Sparrow	*Peucaea aestivalis*	Bird
33	King Rail	*Rallus elegans*	Bird
33	Purple Lilliput	*Toxolasma lividum*	Mussel
32	Dukes' Skipper	*Euphyes dukesi*	Insect
32	Prairie Mole Cricket	*Gryllotalpa major*	Insect
31	Interior Least Tern	*Sternula antillarum athalassos*	Bird

30	Isopod	*Lirceus bicuspidatus*	Invertebrate - other
29	Buff-breasted Sandpiper	*Calidris subruficollis*	Bird
29	Rafinesque's Big-Eared Bat	*Corynorhinus rafinesquii*	Mammal
29	Mottled Duskywing	*Erynnis martialis*	Insect
29	Rusty Blackbird	*Euphagus carolinus*	Bird
29	Meske's Skipper	*Hesperia meskei*	Insect
29	Queensnake	*Regina septemvittata*	Reptile
29	Bewick's Wren	*Thryomanes bewickii*	Bird
27	Lace-winged Roadside-Skipper	*Amblyscirtes aesculapius*	Insect
27	Alligator Gar	*Atractosteus spatula*	Fish
27	Plains Minnow	*Hybognathus placitus*	Fish
27	Eastern Small-Footed Bat	*Myotis leibii*	Mammal
27	Longnose Darter	*Percina nasuta*	Fish
27	King's Hairstreak	*Satyrium kingi*	Insect
25	Tiger Beetle	*Cicindela lepida*	Insect
25	Giant Stag Beetle	*Lucanus elaphus*	Insect
25	Diana	*Speyeria diana*	Insect
24	American Eel	*Anguilla rostrata*	Fish
24	Ruddy Turnstone	*Arenaria interpres*	Bird
24	Smith's Longspur	*Calcarius pictus*	Bird
24	Common Nighthawk	*Chordeiles minor*	Bird
24	Eastern Collared Lizard	*Crotaphytus collaris*	Reptile
24	Migrant Loggerhead Shrike	*Lanius ludovicianus*	Bird
24	Southeastern Bat	*Myotis austroriparius*	Mammal
24	Yellow-crowned Night-Heron	*Nyctanassa violacea*	Bird
24	Black-bellied Plover	*Pluvialis squatarola*	Bird
24	Paddlefish	*Polyodon spathula*	Fish
24	American Woodcock	*Scolopax minor*	Bird
24	Cerulean Warbler	*Setophaga cerulea*	Bird
23	Lace Bug	*Acalypta susanae*	Insect
23	Rufous-crowned Sparrow	*Aimophila ruficeps*	Bird
23	American Bittern	*Botaurus lentiginosus*	Bird
23	Northern Metalmark	*Calephelis borealis*	Insect
23	Outis Skipper	*Cogia outis*	Insect
23	Blue Sucker	*Cycleptus elongatus*	Fish
23	Bluntface Shiner	*Cyprinella camura*	Fish
23	Beetle	*Derops divalis*	Insect
23	Willow Flycatcher	*Empidonax traillii*	Bird
23	Oklahoma Salamander	*Eurycea tynerensis*	Amphibian
23	Crawfish Frog	*Lithobates areolatus*	Amphibian
23	Suckermouth Minnow	*Phenacobius mirabilis*	Fish
23	Great Plains Skink	*Plestiodon obsoletus*	Reptile
23	Yehl Skipper	*Poanes yehl*	Insect
23	Purple Gallinule	*Porphyrio martinicus*	Bird
23	Byssus Skipper	*Problema byssus*	Insect
23	Ouachita Pseudactium	*Pseudactium magazinensis*	Insect

23	Ground Beetle	*Scaphinotus parisiana*	Insect
23	Plains Spadefoot	*Spea bombifrons*	Amphibian
23	Bleedingtooth Mussel	*Venustaconcha pleasii*	Mussel
21	Le Conte's Sparrow	*Ammodramus leconteii*	Bird
21	Bell's Roadside-Skipper	*Amblyscirtes belli*	Insect
21	Ant-like Tiger Beetle	*Cicindela cursitans*	Insect
21	Woodland Tiger Beetle	*Cicindela unipunctata*	Insect
21	Sedge Wren	*Cistothorus platensis*	Bird
21	Black-tailed Jackrabbit	*Lepus californicus*	Mammal
21	Eastern Spotted Skunk	*Spilogale putorius*	Mammal
21	Red Milkweed Beetle	*Tetraopes quinquemaculatus*	Insect
21	Texas Milkweed Beetle	*Tetraopes texanus*	Insect
19	Lace Bug	*Acalypta lillianus*	Insect
19	Sharp-shinned Hawk	*Accipiter striatus*	Bird
19	Elktoe	*Alasmidonta marginata*	Mussel
19	Ringed Salamander	*Ambystoma annulatum*	Amphibian
19	Brown Bullhead	*Ameiurus nebulosus*	Fish
19	Grasshopper Sparrow	*Ammodramus savannarum*	Bird
19	American Black Duck	*Anas rubripes*	Bird
19	Anhinga	*Anhinga anhinga*	Bird
19	Eastern Whip-poor-will	*Antrostomus vociferus*	Bird
19	Sanderling	*Calidris alba*	Bird
19	Dunlin	*Calidris alpina*	Bird
19	Stilt Sandpiper	*Calidris himantopus*	Bird
19	Chimney Swift	*Chaetura pelagica*	Bird
19	Yellow-billed Cuckoo	*Coccyzus americanus*	Bird
19	Northern Bobwhite	*Colinus virginianus*	Bird
19	Chicken Turtle	*Deirochelys reticularia*	Reptile
19	Tricolored Heron	*Egretta tricolor*	Bird
19	Autumn Darter	*Etheostoma autumnale*	Fish
19	Sunburst Darter	*Etheostoma mihileze*	Fish
19	Dion Skipper	*Euphyes dion*	Insect
19	American Kestrel	*Falco sparverius*	Bird
19	Common Gallinule	*Gallinula galeata*	Bird
19	Great Plains Narrowmouth Toad	*Gastrophryne olivacea*	Amphibian
19	Purple Finch	*Haemorhous purpureus*	Bird
19	Leonard's Skipper	*Hesperia leonardus*	Insect
19	Cobweb Skipper	*Hesperia metea*	Insect
19	Goldeye	*Hiodon alosoides*	Fish
19	Mooneye	*Hiodon tergisus*	Fish
19	Wood Thrush	*Hylocichla mustelina*	Bird
19	Least Bittern	*Ixobrychus exilis*	Bird
19	Short-billed Dowitcher	*Limnodromus griseus*	Bird
19	Swainson's Warbler	*Limnothlypis swainsonii*	Bird
19	Pealip Redhorse	*Moxostoma pisolabrum*	Fish
19	Striped Mullet	*Mugil cephalus*	Fish
19	Crawford's Gray Shrew	*Notiosorex crawfordi*	Mammal

19	Black-crowned Night-Heron	*Nycticorax nycticorax*	Bird
19	Small-eyed Mold Beetle	*Ouachitychus parvoculus*	Insect
19	Slenderhead Darter	*Percina phoxocephala*	Fish
19	Prairie Skink	*Plestiodon septentrionalis*	Reptile
19	Gray Comma	*Polygonia progne*	Insect
19	Bismark Burrowing Crayfish	*Procambarus parasimulans*	Crayfish
19	Strecker's Chorus Frog	*Pseudacris streckeri*	Amphibian
19	Graham's Crayfish Snake	*Regina grahamii*	Reptile
19	Eastern Harvest Mouse	*Reithrodontomys humulis*	Mammal
19	Oak Hairstreak	*Satyrium favonius ontario*	Insect
19	Hurter's Spadefoot	*Scaphiopus hurterii*	Amphibian
19	Southeastern Shrew	*Sorex longirostris*	Mammal
19	Ornate Box Turtle	*Terrapene ornata*	Reptile
19	Lilliput	*Toxolasma parvum*	Mussel
19	Bell's Vireo	*Vireo bellii*	Bird
17	Highfin Carpsucker	*Carpiodes velifer*	Fish
17	Big Sand Tiger Beetle	*Cicindela formosa pigmentosignata*	Insect
17	Beach-dune Tiger Beetle	*Cicindela hirticollis*	Insect
17	Sandy Stream Tiger Beetle	*Cicindela macra*	Insect
17	Western Diamond-backed	*Crotalus atrox*	Reptile
17	Trumpeter Swan	*Cygnus buccinator*	Bird
17	Round Pigtoe	*Pleurobema sintoxia*	Mussel
17	Little Spectaclecase group	*Villosa sp. cf lienosa*	Mussel
16	Gray Bat	*Myotis grisescens*	Mammal
16	American Badger	*Taxidea taxus*	Mammal
15	Gorgone Checkerspot	*Chlosyne gorgone*	Insect
15	Monarch	*Danaus plexippus*	Insect
15	Lake Chubsucker	*Erimyzon sucetta*	Fish
15	Highland Darter	*Etheostoma teddyroosevelt*	Fish
15	Bird-voiced Treefrog	*Hyla avivoca*	Amphibian
15	"Arkoma" Fatmucket	*Lampsilis sp. A cf hydiana*	Mussel
15	Glossy Swampsnake	*Liodytes rigida*	Reptile
15	Shoal Chub	*Macrhybopsis hyostoma*	Fish
15	Long-tailed Weasel	*Mustela frenata*	Mammal
15	Slender Glass Lizard	*Ophisaurus attenuatus*	Reptile
15	Saddleback Darter	*Percina vigil*	Fish
15	American Golden-Plover	*Pluvialis dominica*	Bird
15	Fawnsfoot	*Truncilla donaciformis*	Mussel
13	Twelve-spotted Tiger Beetle	*Cicindela duodecimguttata*	Insect

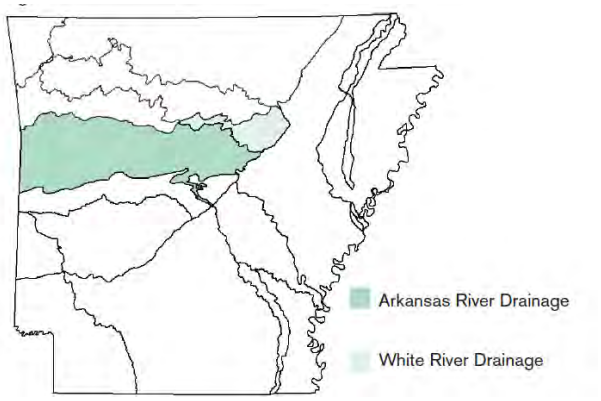
Habitats that occur in the Arkansas Valley

Of the 37 terrestrial habitats in Arkansas, 20 occur in the Arkansas Valley ecoregion (Table 3.10). Of 18 ecobasins in Arkansas, two occur in the Arkansas Valley ecoregion (Figure 3.11). These associations are described in the Section 4. Terrestrial Habitats and Section 5. Aquatic Habitats.

Table 3.10. Terrestrial Habitats in the Arkansas Valley.

Habitat Name
Caves, Mines, Sinkholes, and other Karst Habitat
Crop Land
Cultivated Forest
Herbaceous Wetland
Interior Highlands Dry Acidic Glade and Barrens
Mud Flats
Ouachita Montane Oak Forest
Ozark-Ouachita Cliff and Talus
Ozark-Ouachita Dry Oak and Pine Woodland
Ozark-Ouachita Dry-Mesic Oak Forest
Ozark-Ouachita Forested Seep
Ozark-Ouachita Large Floodplain
Ozark-Ouachita Mesic Hardwood Forest
Ozark-Ouachita Prairie and Woodland
Ozark-Ouachita Pine/Bluestem Woodland
Ozark-Ouachita Pine-Oak Forest/Woodland
Ozark-Ouachita Riparian
Pasture Land
Ponds, Lakes, and Water Holes
Urban/Suburban

Figure 3.11. Ecobasin Distribution in the Arkansas Valley.



Problems faced by Species of Greatest Conservation Need (SGCN)

A summary of the problems faced by SGCN in the Arkansas Valley is presented below. Each problem has a score which is a sum of all Species Priority Scores associated with species for which this problem was assigned. A higher score implies a higher quantity of SGCN and/or more greatly imperiled species associated with problems listed here.

Table 3.11. Problems faced by SGCN in the Arkansas Valley.

Problem faced	Score
Agricultural practices	1895
Forestry activities	1815
Dam	1237
Urban development	1092
Grazing/Browsing	722
Resource extraction	688
Fire suppression	654
Recreation	516
Conversion of riparian forest	427
Water diversion	339
Road construction	326
Channel alteration	315
Commercial/industrial development	303
Confined animal operations	270
Channel maintenance	267
Parasites/pathogens	266
Exotic species	234
Predation	170
Municipal/Industrial point source	152
Commercial harvest	150
Excessive groundwater withdrawal	140
Management of/for certain species	103
Non-point source pollution	82
Unknown	52
Interspecific competiton	48
Excessive non-commercial harvest or collection	24

Conservation actions needed in the Arkansas Valley

Below are scores of conservation actions recommended by the taxa association teams for SGCN within the Arkansas Valley (Figure 3.12). The score associated with the conservation action category is the sum of all priority scores associated with species for which a conservation action has been assigned, weighted by the importance of the conservation action category to the species. A higher score implies a higher quantity of SGCN and/or more greatly imperiled species would be affected by actions within this conservation action category.

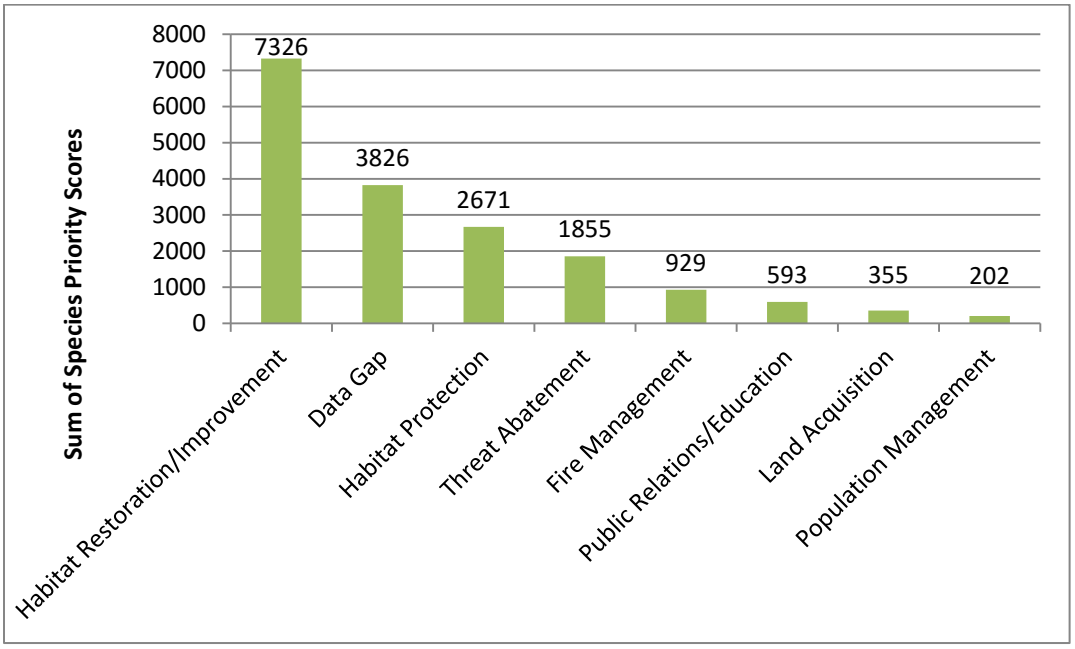


Figure 3.12. Conservation action categories recommended for the Arkansas Valley.

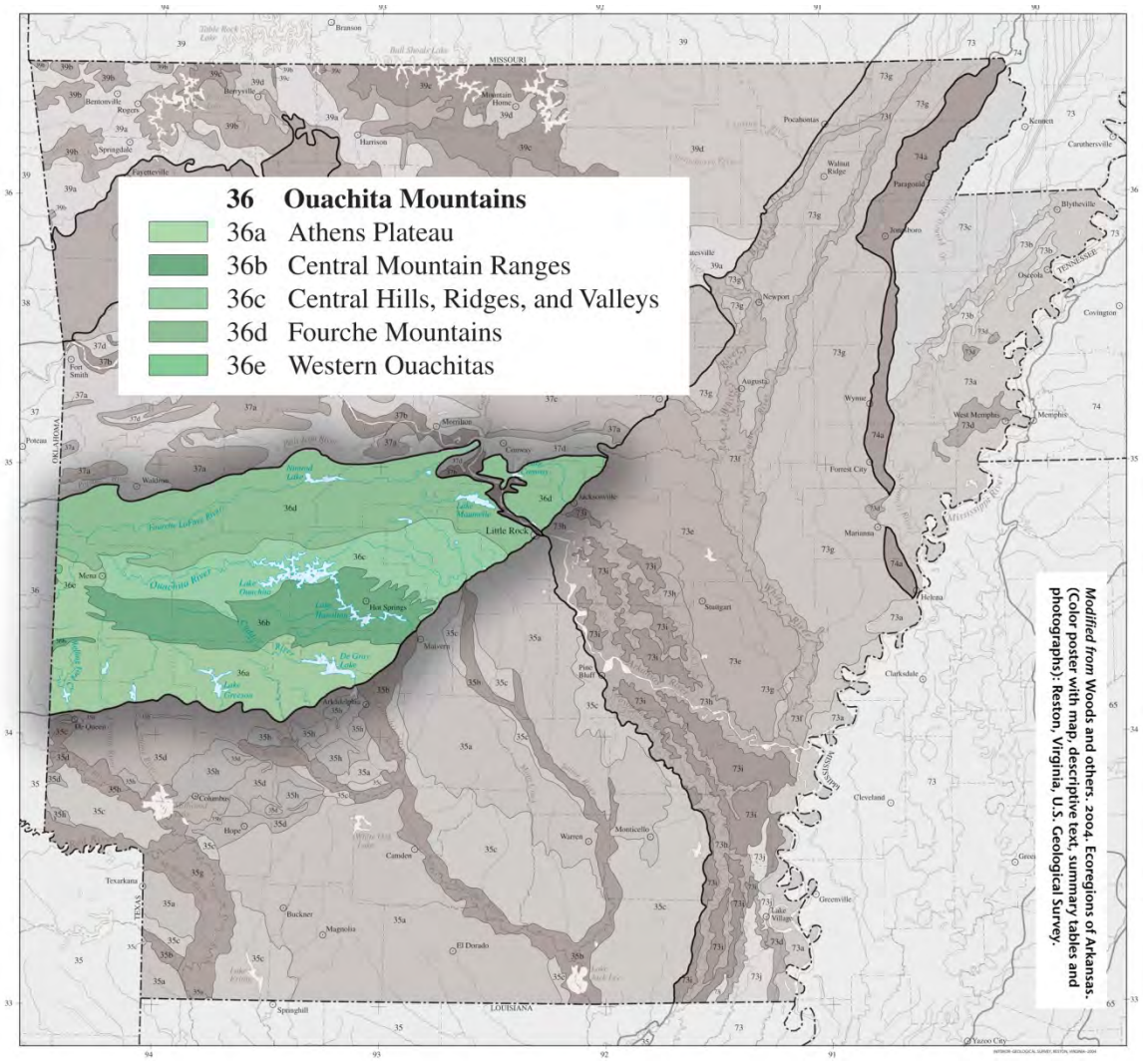
Ouachita Mountains (Ecoregion 36)

The Ouachitas are made up of ridges, hills and valleys formed by the erosion of folded and faulted Paleozoic sandstone, shale and chert, known locally as novaculite. They are a continuation of the Appalachians, formed during the late Paleozoic Era when an ocean closed and continents collided, causing marine sediments to be folded, faulted and thrust northward. The Ouachitas are structurally different from the Boston Mountains (38), more folded and rugged than the lithologically distinct Ozark Highlands (39) and physiographically unlike the Arkansas Valley (37), South Central Plains (35) and Mississippi Alluvial Plain (73).

Potential natural vegetation is oak–hickory–pine forest; it contrasts with the oak– hickory forest

that dominates Ecoregion 39 and the northern part of Ecoregion 38. Today, loblolly pine and shortleaf pine grow in a distinctive mix of thermic Ultisols and Inceptisols.

Figure 3.13. Ouachita Mountains Ecoregion.





Athens Plateau - Ouachita Mountains

Logging and recreation are major land uses and pastureland and hayland are found in broader valleys.

Regional water quality is influenced by lithology, soil composition and land use activities. In most reaches, water quality is exceptional; typically, total phosphorus, turbidity, total suspended solids and biological oxygen demand values are lower whereas dissolved oxygen levels are higher than in Ecoregions 35, 37 and 73. Water hardness varies by level IV ecoregion; Ecoregions 36d and 36e tend to have the lowest hardness values while progressively higher values occur in Ecoregions 36a, 36b and 36c. Stream substrates are made up of gravel, cobbles, boulders, or bedrock; they contrast with the fine-grained substrates of lower gradient streams in Ecoregions 35 and 73.

The fish community is dominated by sensitive species; minnows and sunfish along with darters and bass are common.

Athens Plateau

36a. The low ridges and hills of the Athens Plateau are widely underlain by shale in contrast to other parts of Ecoregion 36. Rocks are less resistant to erosion than in higher, more rugged Ecoregions 36b, 36d and 36e but are more resistant than the unconsolidated rocks of the coastal

plain in Ecoregion 35.

Ouachita Mountains Ecoregion

Today, pine plantations are widespread; they are far more extensive than in the more rugged parts of Ecoregion 36 in Arkansas. Pastureland and hayland also occur. Cattle and broiler chickens are important farm products. Water quality values are distinct from Ecoregion 36c.

Central Mountain Ranges

36b. The Central Mountain Ranges are dominated by east-west trending ridges that are characteristically steep and rugged and underlain by resistant sandstone and novaculite (chert). Igneous intrusions occur along with associated hot springs. Rock outcrops and shallow, stony soils are widespread. Novaculite glades occur.

Potential natural vegetation is oak–hickory– pine forest. Perennial springs and seeps are common and support diverse vegetation. Constricted valleys between ridges have waterfalls and rapids. The surface waters of Ecoregion 36b have very low nutrient, mineral and biochemical water quality parameter concentrations and turbidity. Logging is not nearly as common as in the less rugged Athens Plateau (36a).

Central Hills, Ridges and Valleys

36c. The Central Hills, Ridges and Valleys ecoregion is lower, less rugged and more open than neighboring Ecoregions 36b and 36d. Ecoregion 36c is underlain by folded and faulted sandstone, shale and novaculite (chert); the lithologic mosaic is distinct from the Athens Plateau (36a).

Its forests are codominated by loblolly pine–shortleaf pine and upland oak–hickory–pine forest types. Pastureland is also common, much more so than in Ecoregions 36b and 36d.

Fourche Mountains

36d. The Fourche Mountains are the archetypal Ouachita Mountains. Ecoregion 36d is composed of long, east-west trending, forested ridges composed of sandstone. Intervening valleys are cut into shale. Ridges are longer, habitat continuity is greater, the lithologic mosaic is different and the topographic orientation is more consistent than in other parts of the Ouachita Mountains (36).

Differences in moisture and temperature between north- and south-facing slopes significantly influence native plant communities; they are products of the prevailing topographic trend. Forests on steep, north-facing slopes are more mesic than on southern aspects; grassy woodlands are found on steepest, south-facing slopes.

Pastureland and hayland are restricted to a few broad valleys. Logging is not nearly as intensive as in the commercial pine plantations of the less rugged Athens Plateau.

Nutrient, mineral and biochemical water quality parameter concentrations are low in the surface waters of Ecoregion 36d but turbidity can be higher than in other mountainous parts of the Ouachitas.

Western Ouachitas

36e. The Western Ouachitas ecoregion is composed of mountains, hills and narrow valleys. In Arkansas, Ecoregion 36e is confined to Round Mountain in western Polk County, where it is underlain by sandstone and shale; novaculite (chert) is absent in contrast to the Central Mountain Ranges (36b). Ridgetop elevations exceed 2,300 feet in Arkansas; both elevation and precipitation decrease westward into Oklahoma. Ecoregion 36e in Arkansas is higher and more rugged than the lithologically distinct Athens Plateau (36a).

Today, pine and upland oak–hickory–pine forest types codominate. Ecoregion 36e in Arkansas and Oklahoma contains, perhaps, the greatest concentration of critically-imperiled and imperiled species in mid-North America (adapted from Woods and others 2004).

Ouachita Mountains Ecoregion:

Species of Greatest Conservation Need (SGCN)

Of the 377 SGCN, 164 occur in the Ouachita Mountains Ecoregion (Table 3.12).

Table 3.12. Species of greatest conservation need (SGCN) in the Ouachita Mountains ranked by priority score. A higher priority score indicates a greater need for actions to conserve the species.

Priority Score	Common Name	Scientific Name	Taxa Association
80	Caddo Madtom	*Noturus taylori*	Fish
80	Irons Fork Burrowing Crayfish	*Procambarus reimeri*	Crayfish
76	Scaleshell	*Leptodea leptodon*	Mussel
65	Caddo Sallfly	*Alloperla caddo*	Insect
65	Ouachita Spiketail	*Cordulegaster talaria*	Insect
65	Saline Burrowing Crayfish	*Fallicambarus strawni*	Crayfish
65	Rattlesnake-Master Borer Moth	*Papaipema eryngii*	Insect
65	Mountain Cave Amphipod	*Stygobromus montanus*	Invertebrate - other
63	Northern Long-eared Bat	*Myotis septentrionalis*	Mammal
62	Leopard Darter	*Percina pantherina*	Fish
57	Arkansas Fatmucket	*Lampsilis powellii*	Mussel
57	Microcaddisfly	*Ochrotrichia robisoni*	Insect

52	Alabama Shad	*Alosa alabamae*	Fish
52	Rabbitsfoot	*Quadrula cylindrica cylindrica*	Mussel
50	Arkansas Agapetus Caddisfly	*Agapetus medicus*	Insect
50	Kiamichi Slimy Salamander	*Plethodon kiamichi*	Amphibian
50	Sequoyah Slimy Salamander	*Plethodon sequoyah*	Amphibian
50	Ouachita Needlefly	*Zealeuctra wachita*	Invertebrate - other
46	Paleback Darter	*Etheostoma pallididorsum*	Fish
46	Ouachita Burrowing Crayfish	*Fallicambarus harpi*	Crayfish
46	Daisy Burrowing Crayfish	*Fallicambarus jeanae*	Crayfish
46	Ouachita Madtom	*Noturus lachneri*	Fish
46	Ouachita Darter	*Percina brucethompsoni*	Fish
46	Caddo Mountain Salamander	*Plethodon caddoensis*	Amphibian
46	Fourche Mountain Salamander	*Plethodon fourchensis*	Amphibian
46	Rich Mountain Slitmouth	*Stenotrema pilsbryi*	Invertebrate - other
43	Piping Plover	*Charadrius melodus*	Bird
43	"Ouachita" Fanshell	*Cyprogenia sp. cf aberti*	Mussel
43	Red-cockaded Woodpecker	*Picoides borealis*	Bird
42	Texas Frosted Elfin	*Callophrys irus hadros*	Insect
42	American Burying Beetle	*Nicrophorus americanus*	Insect
38	Linda's Roadside-Skipper	*Amblyscirtes linda*	Insect
38	Crystal Darter	*Crystallaria asprella*	Fish
38	Spectaclecase	*Cumberlandia monodonta*	Mussel
38	Stargazing Darter	*Percina uranidea*	Fish
38	Rich Mountain Salamander	*Plethodon ouachitae*	Amphibian
38	Pyramid Pigtoe	*Pleurobema rubrum*	Mussel
38	Indiana Phlox Moth	*Schinia indiana*	Insect
34	Ozark Emerald	*Somatochlora ozarkensis*	Insect
34	Ouachita Slitmouth	*Stenotrema unciferum*	Invertebrate - other
33	Sprague's Pipit	*Anthus spragueii*	Bird
33	Little Brown Bat	*Myotis lucifugus*	Mammal
33	Kiamichi Shiner	*Notropis ortenburgeri*	Fish
33	Peppered Shiner	*Notropis perpallidus*	Fish
33	Bachman's Sparrow	*Peucaea aestivalis*	Bird
33	Purple Lilliput	*Toxolasma lividum*	Mussel
32	Ozark Snaketail Dragonfly	*Ophiogomphus westfalli*	Insect
30	Isopod	*Lirceus bicuspidatus*	Invertebrate - other
30	Ouachita Mountain Crayfish	*Procambarus tenuis*	Crayfish
29	Buff-breasted Sandpiper	*Calidris subruficollis*	Bird
29	Rafinesque's Big-Eared Bat	*Corynorhinus rafinesquii*	Mammal
29	Mottled Duskywing	*Erynnis martialis*	Insect
29	Rusty Blackbird	*Euphagus carolinus*	Bird
29	Meske's Skipper	*Hesperia meskei*	Insect
29	Bewick's Wren	*Thryomanes bewickii*	Bird
27	Lace-winged Roadside-Skipper	*Amblyscirtes aesculapius*	Insect
27	Appalachian Azure	*Celastrina neglectamajor*	Insect
27	Ozark Clubtail Dragonfly	*Gomphus ozarkensis*	Insect
27	Ouachita Shiner	*Lythrurus snelsoni*	Fish

27	Eastern Small-Footed Bat	*Myotis leibii*	Mammal
27	Rocky Shiner	*Notropis suttkusi*	Fish
27	Mena Crayfish	*Orconectes menae*	Crayfish
27	Longnose Darter	*Percina nasuta*	Fish
25	Giant Stag Beetle	*Lucanus elaphus*	Insect
25	Diana	*Speyeria diana*	Insect
24	American Eel	*Anguilla rostrata*	Fish
24	Ruddy Turnstone	*Arenaria interpres*	Bird
24	Smith's Longspur	*Calcarius pictus*	Bird
24	Common Nighthawk	*Chordeiles minor*	Bird
24	Eastern Collared Lizard	*Crotaphytus collaris*	Reptile
24	Migrant Loggerhead Shrike	*Lanius ludovicianus*	Bird
24	Southeastern Bat	*Myotis austroriparius*	Mammal
24	Yellow-crowned Night-Heron	*Nyctanassa violacea*	Bird
24	Black-bellied Plover	*Pluvialis squatarola*	Bird
24	Paddlefish	*Polyodon spathula*	Fish
24	American Woodcock	*Scolopax minor*	Bird
24	Cerulean Warbler	*Setophaga cerulea*	Bird
23	Millipede	*Abacion wilhelminae*	Invertebrate - other
23	Rufous-crowned Sparrow	*Aimophila ruficeps*	Bird
23	Copeland's Mold Beetle	*Arianops copelandi*	Insect
23	American Bittern	*Botaurus lentiginosus*	Bird
23	Isopod	*Caecidotea fonticulus*	Invertebrate - other
23	Northern Metalmark	*Calephelis borealis*	Insect
23	Blue Sucker	*Cycleptus elongatus*	Fish
23	Beetle	*Derops divalis*	Insect
23	Willow Flycatcher	*Empidonax traillii*	Bird
23	Ouachita Streambed Salamander	*Eurycea subfluvicola*	Amphibian
23	Lowland Topminnow	*Fundulus blairae*	Fish
23	Crawfish Frog	*Lithobates areolatus*	Amphibian
23	Ouachita Shore Bug	*Pentacora ouachita*	Insect
23	Suckermouth Minnow	*Phenacobius mirabilis*	Fish
23	Great Plains Skink	*Plestiodon obsoletus*	Reptile
23	Yehl Skipper	*Poanes yehl*	Insect
23	Purple Gallinule	*Porphyrio martinicus*	Bird
23	Byssus Skipper	*Problema byssus*	Insect
23	Ouachita Pseudactium	*Pseudactium magazinensis*	Insect
23	Ouachita Kidneyshell	*Ptychobranchus occidentalis*	Mussel
21	Le Conte's Sparrow	*Ammodramus leconteii*	Bird
21	Bell's Roadside-Skipper	*Amblyscirtes belli*	Insect
21	Golden-banded Skipper	*Autochton cellus*	Insect
21	Sedge Wren	*Cistothorus platensis*	Bird
21	Eastern Spotted Skunk	*Spilogale putorius*	Mammal
19	Sharp-shinned Hawk	*Accipiter striatus*	Bird
19	Elktoe	*Alasmidonta marginata*	Mussel
19	Ringed Salamander	*Ambystoma annulatum*	Amphibian
19	Brown Bullhead	*Ameiurus nebulosus*	Fish

19	Grasshopper Sparrow	*Ammodramus savannarum*	Bird
19	Anhinga	*Anhinga anhinga*	Bird
19	Eastern Whip-poor-will	*Antrostomus vociferus*	Bird
19	Sanderling	*Calidris alba*	Bird
19	Dunlin	*Calidris alpina*	Bird
19	Stilt Sandpiper	*Calidris himantopus*	Bird
19	Chimney Swift	*Chaetura pelagica*	Bird
19	Yellow-billed Cuckoo	*Coccyzus americanus*	Bird
19	Northern Bobwhite	*Colinus virginianus*	Bird
19	Chicken Turtle	*Deirochelys reticularia*	Reptile
19	Six-banded Longhorn Beetle	*Dryobius sexnotatus*	Insect
19	Beaded Darter	*Etheostoma clinton*	Fish
19	Dion Skipper	*Euphyes dion*	Insect
19	American Kestrel	*Falco sparverius*	Bird
19	Purple Finch	*Haemorhous purpureus*	Bird
19	Four-toed Salamander	*Hemidactylium scutatum*	Amphibian
19	Leonard's Skipper	*Hesperia leonardus*	Insect
19	Cobweb Skipper	*Hesperia metea*	Insect
19	Ouachita Diving Beetle	*Heterosternuta ouachita*	Insect
19	Wood Thrush	*Hylocichla mustelina*	Bird
19	Least Bittern	*Ixobrychus exilis*	Bird
19	Southern Pocketbook	*Lampsilis ornata*	Mussel
19	Short-billed Dowitcher	*Limnodromus griseus*	Bird
19	Swainson's Warbler	*Limnothlypis swainsonii*	Bird
19	Redspot Chub	*Nocomis asper*	Fish
19	Crawford's Gray Shrew	*Notiosorex crawfordi*	Mammal
19	Black-crowned Night-Heron	*Nycticorax nycticorax*	Bird
19	Redspotted Stream Crayfish	*Orconectes acares*	Crayfish
19	Little River Creek Crayfish	*Orconectes leptogonopodus*	Crayfish
19	Small-eyed Mold Beetle	*Ouachitychus parvoculus*	Insect
19	Prairie Skink	*Plestiodon septentrionalis*	Reptile
19	Gray Comma	*Polygonia progne*	Insect
19	Bismark Burrowing Crayfish	*Procambarus parasimulans*	Crayfish
19	Oak Hairstreak	*Satyrium favonius ontario*	Insect
19	Hurter's Spadefoot	*Scaphiopus hurterii*	Amphibian
19	Southeastern Shrew	*Sorex longirostris*	Mammal
19	Lilliput	*Toxolasma parvum*	Mussel
19	Texas Lilliput	*Toxolasma texasiense*	Mussel
19	Pondhorn	*Uniomerus tetralasmus*	Mussel
19	Bell's Vireo	*Vireo bellii*	Bird
17	Sandy Stream Tiger Beetle	*Cicindela macra*	Insect
17	Western Diamond-backed	*Crotalus atrox*	Reptile
17	Trumpeter Swan	*Cygnus buccinator*	Bird
17	Earthworm	*Diplocardia meansi*	Invertebrate - other
17	Round Pigtoe	*Pleurobema sintoxia*	Mussel
17	Little Spectaclecase group	*Villosa sp. cf lienosa*	Mussel

15	Mole Salamander	*Ambystoma talpoideum*	Amphibian
15	Gorgone Checkerspot	*Chlosyne gorgone*	Insect
15	Monarch	*Danaus plexippus*	Insect
15	Bird-voiced Treefrog	*Hyla avivoca*	Amphibian
15	"Arkoma" Fatmucket	*Lampsilis sp. A cf hydiana*	Mussel
15	Long-tailed Weasel	*Mustela frenata*	Mammal
15	Slender Glass Lizard	*Ophisaurus attenuatus*	Reptile
15	Saddleback Darter	*Percina vigil*	Fish
15	American Golden-Plover	*Pluvialis dominica*	Bird
15	Broad-winged Skipper	*Poanes viator*	Insect
15	Fawnsfoot	*Truncilla donaciformis*	Mussel
13	Twelve-spotted Tiger Beetle	*Cicindela duodecimguttata*	Insect

Habitats that occur in the Ouachita Mountains

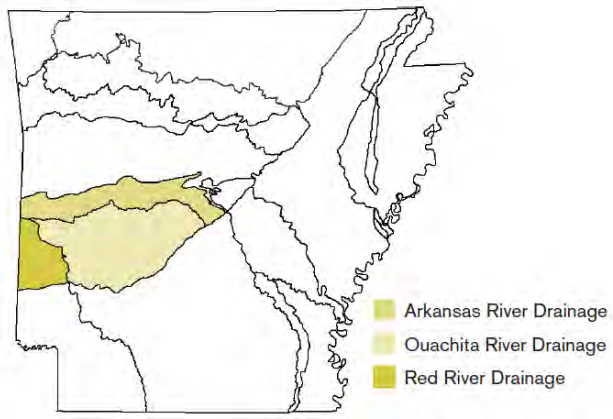
Of the 37 terrestrial habitats in Arkansas, 20 occur in the Ouachita Mountains ecoregion (Table 3.13). Of 18 ecobasins in Arkansas, three occur in the Ouachita Mountains ecoregion (Figure 3.14). These associations are described in the Section 4. Terrestrial Habitats and Section 5. Aquatic Habitats.

Table 3.13. Terrestrial Habitats in the Ouachita Mountains.

Habitat Name

Caves, Mines, Sinkholes, and other Karst Habitat
Crop Land
Cultivated Forest
Herbaceous Wetland
Interior Highlands Calcareous Glade and Barrens
Interior Highlands Dry Acidic Glade and Barrens
Mud Flats
Ouachita Montane Oak Forest
Ozark-Ouachita Cliff and Talus
Ozark-Ouachita Dry Oak and Pine Woodland
Ozark-Ouachita Dry-Mesic Oak Forest
Ozark-Ouachita Forested Seep
Ozark-Ouachita Large Floodplain
Ozark-Ouachita Mesic Hardwood Forest
Ozark-Ouachita Pine/Bluestem Woodland
Ozark-Ouachita Pine-Oak Forest/ Woodland
Ozark-Ouachita Riparian
Pasture Land
Ponds, Lakes, and Water Holes
Urban/Suburban

Figure 3.14. Ecobasin Distribution in the Ouachita Mountains.



Problems faced by Species of Greatest Conservation Need (SGCN)

A summary of the problems faced by SGCN in the Ouachita Mountains is presented below. Each problem has a score which is a sum of all Species Priority Scores associated with species for which this problem was assigned. A higher score implies a higher quantity of SGCN and/or more greatly imperiled species associated with problems listed here.

Table 3.20. Problems faced by SGCN in the Ouachita Mountains.

Problem faced	Score
Forestry activities	2749
Dam	1755
Agricultural practices	1564
Road construction	1507
Resource extraction	1339
Grazing/Browsing	1217
Urban development	921
Fire suppression	702
Municipal/Industrial point source	597
Conversion of riparian forest	572
Water diversion	526
Confined animal operations	514
Channel alteration	477
Channel maintenance	378
Recreation	270
Parasites/pathogens	250
Predation	247
Exotic species	234
Commercial/industrial development	232

Management of/for certain species	168
Non-point source pollution	135
Unknown	52
Excessive non-commercial harvest or collection	50
Commercial harvest	43
Excessive groundwater withdrawal	40
Interspecific competiton	29

Conservation actions needed in the Ouachita Mountains

Below are categories of conservation actions recommended by the taxa association teams for SGCN within the Ouachita Mountains (Figure 3.15). The score associated with the conservation action category is the sum of all priority scores associated with species for which a conservation action has been assigned, weighted by the importance of the conservation action category to the species. A higher score implies a higher quantity of SGCN and/or more greatly imperiled species would be affected by actions within this conservation action category.

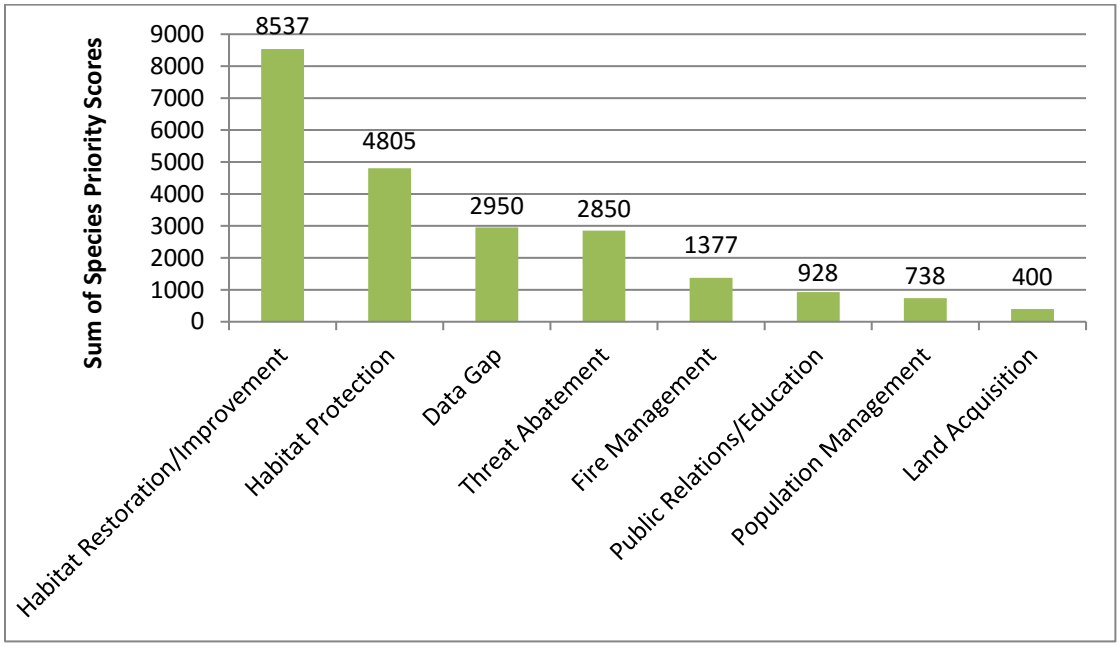


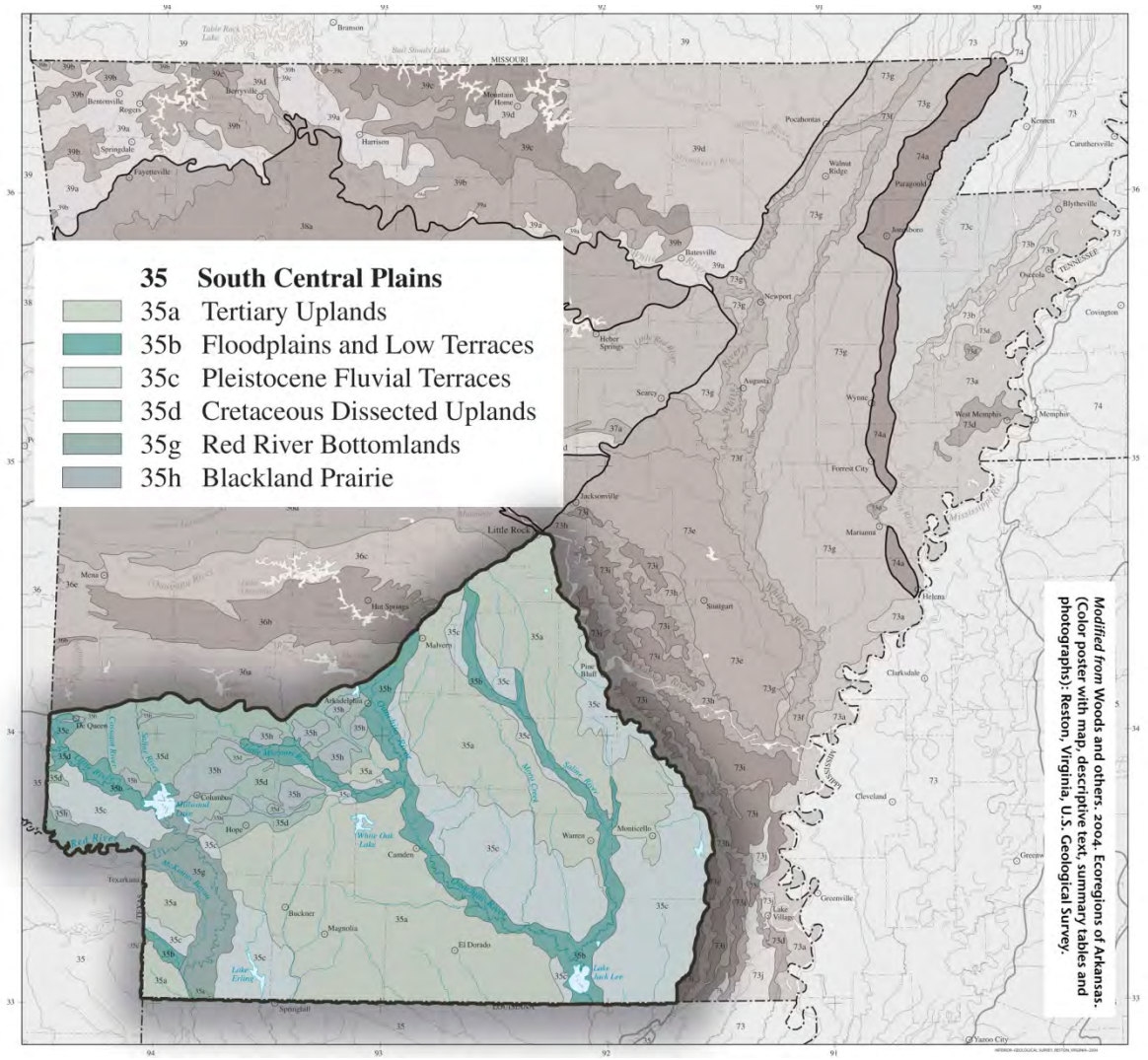
Figure 3.15. Conservation action categories recommended for the Ouachita Mountains.

South Central Plains (Ecoregion 35)

Ecoregion 35 is composed of rolling plains that are broken by nearly flat fluvial terraces, bottomlands, sandy low hills and low cuestas; its terrain is unlike the much more rugged Ouachita Mountains (36) or the flatter, less dissected Mississippi Alluvial Plain (73). Uplands are underlain by poorly-consolidated, Tertiary- through Cretaceous-age, coastal plain deposits and marginal marine sediments (laid down as the Gulf of Mexico opened and North America's southern continental margin subsided). Bottomlands and terraces are veneered with Quaternary alluvium or windblown silt deposits (loess). The lithologic mosaic is distinct from the Paleozoic rocks of Ecoregion 36 and the strictly Quaternary deposits of Ecoregion 73.

Potential natural vegetation is oak–hickory–pine forest on uplands and southern floodplain forest on bottomlands. Today, more than 75 percent of Ecoregion 35 remains wooded.

Figure 3.16. South Central Plains Ecoregion.





South Central Plains - Blackland Prairie

Extensive commercial loblolly pine–shortleaf pine plantations occur. Lumber and pulpwood production, livestock grazing and crawfish farming are major land uses.

Cropland dominates the drained bottomlands of the Red River. Turbidity and total suspended solid concentrations are usually low except in the Red River. Summer flow in many small streams is limited or nonexistent but enduring pools may occur. Fish communities typically have a limited proportion of sensitive species; sunfishes are dominant and darters and minnows are common.

Tertiary Uplands

35a. The rolling Tertiary Uplands are dominated by commercial pine plantations that have replaced the native oak– hickory–pine forest. Ecoregion 35a is underlain by poorly-consolidated Tertiary sand, silt and gravel; it lacks the Cretaceous, often calcareous rocks of Ecoregion 35d and the extensive Quaternary alluvium of Ecoregions 35b, 35g and 73.

Extensive forests dominated by loblolly and shortleaf pines grow on loamy, well- drained, thermic Ultisols; scattered, stunted, sandhill woodlands also occur.

Waters tend to be stained by organics, thus lowering water clarity and increasing total organic carbon and biochemical oxygen demand levels. Most streams have a sandy substrate and a forest canopy. Many do not flow during the summer or early fall. However, in sandhills, spring-fed, perennial streams occur; here, total dissolved solids, total suspended solids, alkalinity and hardness values are lower than elsewhere in Ecoregion 35. Water quality in forested basins is

better than in pastureland. Oil production has lowered stream quality in the south.

Floodplains and Low Terraces

35b. The Floodplains and Low Terraces ecoregion is nearly level, veneered by Holocene alluvium and contains natural levees, swales, oxbow lakes and meander scars. Longitudinal channel gradients are low and are less than in the Ouachita Mountains (36). Large parts of Ecoregion 35b are frequently flooded.

Forested wetlands are characteristic, but pastureland also occurs. Cropland is far less common than in the Red River Bottomlands (35g). Potential natural vegetation is southern floodplain forest as in the Mississippi Alluvial Plain (73); it is unlike the oak–hickory–pine forest of the higher, better drained and lithologically distinct Tertiary Uplands (35a) and Cretaceous Dissected Uplands (35d).

Pleistocene Fluvial Terraces

35c. The Pleistocene Fluvial Terraces are nearly level, poorly-drained, periodically wet, underlain by Pleistocene unconsolidated terrace deposits and covered by pine flatwoods. Loblolly pine and oaks are common and are adapted to the prevailing hydroxeric regime; pastureland and hayland are less extensive.

A vertical sequence of terraces occurs. The lowest terrace is nearly flat, clayey and has extensive hardwood wetlands. Higher terraces become progressively older and more dissected; they are dominated by pine flatwoods, pine savanna, or prairie; flatwood wetlands are less extensive than on the lowest terrace. The midlevel terrace is veneered with windblown silt deposits (loess). Streams tend to be mildly acidic and stained by organic matter. They have more suspended solids, greater turbidity and higher hardness values than Ecoregion 35a.

Cretaceous Dissected Uplands

35d. The nearly level to hilly Cretaceous Dissected Uplands ecoregion has a greater drainage density than other parts of Ecoregion 35. Ecoregion 35a is underlain by Cretaceous sandy, clayey, or gravelly deposits that are often calcareous; it is lithologically distinct from the Tertiary noncalcareous deposits of Ecoregion 35a, the Quaternary alluvium of Ecoregions 35b, 35g and 73 and the chalks and marls of Ecoregion 35h.

Native vegetation is largely oak–hickory–pine forest. Today, woods and pastureland are common. Water quality in forested watersheds tends to be good and is better than in pastureland. Streams generally have lower total dissolved solids values and much lower total organic carbon values than Ecoregions 35a and 35c, although turbidity, total suspended solids and hardness values are slightly higher. Longitudinal stream gradients and Ouachita Mountain influences are greater than in Ecoregions 35a or 35c.

Red River Bottomlands

35g. The nearly flat Red River Bottomlands ecoregion is veneered with Holocene alluvium and has been widely cleared and drained for agriculture. It contains floodplains, low terraces, oxbow lakes, meander scars, backswamps, natural levees and the meandering Red River.

Potential natural vegetation is southern floodplain forest; it is unlike the oak–hickory–pine forest of higher, better drained and lithologically distinct Ecoregions 35a and 35d. Western species, such as bur oak and Durand oak, were native to Ecoregion

35g but were typically absent from the Mississippi Alluvial Plain (73). The natural forest of Ecoregion 35g has been largely replaced by agriculture. Today, cropland is more extensive than in other parts of Ecoregion 35 in Arkansas. The Red River is almost continuously turbid; suspended sediment concentrations are usually much higher than in the Saline or Ouachita rivers of Ecoregion 35b due to land cover, land use and upstream lithology differences.

Blackland Prairie

35h. The level to rolling Blackland Prairie characteristically has dark soils derived from underlying Cretaceous marl, chalk and limestone.

Prairie was common or dominant during and shortly after the Hypsithermal Period in the middle of the Holocene Epoch. By the late 18th century, Ecoregion 35h was a mosaic of woodland, savanna and prairies, containing species that were found nowhere else in Arkansas. Today, hayland and, especially, pastureland dominate; pastureland is more common than elsewhere in Arkansas' South Central Plains (35). Only a few prairie remnants still occur and are mostly limited to the thin, droughty soils of cuesta scarps (adapted from Woods and others 2004).

South Central Plains Ecoregion: Species of Greatest Conservation Need (SGCN)

Of the 377 SGCN, 170 occur in the South Central Plains ecoregion (Table 3.21).

Table 3.21. Species of greatest conservation need (SGCN) in the South Central Plains ranked by priority score. A higher priority score indicates a greater need for actions to conserve the species.

Priority Score	Common Name	Scientific Name	Taxa Association
80	Ouachita Rock Pocketbook	*Arcidens wheeleri*	Mussel
80	Slenderwrist Burrowing Crayfish	*Fallicambarus petilicarpus*	Crayfish
80	Winged Mapleleaf	*Quadrula fragosa*	Mussel
80	Channelled Pebblesnail	*Somatogyrus wheeleri*	Invertebrate - other
76	Scaleshell	*Leptodea leptodon*	Mussel
65	Saline Burrowing Crayfish	*Fallicambarus strawni*	Crayfish
65	Louisiana Pearlshell	*Margaritifera hembeli*	Mussel

65	Rattlesnake-Master Borer Moth	*Papaipema eryngii*	Insect
65	Texas Pigtoe	*Pleurobema riddellii*	Mussel
63	Northern Long-eared Bat	*Myotis septentrionalis*	Mammal
62	Leopard Darter	*Percina pantherina*	Fish
57	Arkansas Fatmucket	*Lampsilis powellii*	Mussel
52	Alabama Shad	*Alosa alabamae*	Fish
52	Rabbitsfoot	*Quadrula cylindrica cylindrica*	Mussel
50	Bayou Bodcau Crayfish	*Bouchardina robisoni*	Crayfish
50	Jefferson County Crayfish	*Fallicambarus gilpini*	Crayfish
50	Stonefly	*Leuctra paleo*	Insect
46	Blair's Fencing Crayfish	*Faxonella blairi*	Crayfish
46	Pink Mucket	*Lampsilis abrupta*	Mussel
46	Ouachita Darter	*Percina brucethompsoni*	Fish
43	Piping Plover	*Charadrius melodus*	Bird
43	"Ouachita" Fanshell	*Cyprogenia sp. cf aberti*	Mussel
43	Red-cockaded Woodpecker	*Picoides borealis*	Bird
42	Texas Frosted Elfin	*Callophrys irus hadros*	Insect
42	American Burying Beetle	*Nicrophorus americanus*	Insect
38	Crystal Darter	*Crystallaria asprella*	Fish
38	Spectaclecase	*Cumberlandia monodonta*	Mussel
38	Stargazing Darter	*Percina uranidea*	Fish
38	Pyramid Pigtoe	*Pleurobema rubrum*	Mussel
38	Regal Burrowing Crayfish	*Procambarus regalis*	Crayfish
33	Western Sand Darter	*Ammocrypta clara*	Fish
33	Henslow's Sparrow	*Ammodramus henslowii*	Bird
33	Sprague's Pipit	*Anthus spragueii*	Bird
33	Little Brown Bat	*Myotis lucifugus*	Mammal
33	Peppered Shiner	*Notropis perpallidus*	Fish
33	Bachman's Sparrow	*Peucaea aestivalis*	Bird
33	Bluehead Shiner	*Pteronotropis hubbsi*	Fish
33	King Rail	*Rallus elegans*	Bird
33	Purple Lilliput	*Toxolasma lividum*	Mussel
32	Dukes' Skipper	*Euphyes dukesi*	Insect
32	Pine Hills Digger	*Fallicambarus dissitus*	Crayfish
31	Interior Least Tern	*Sternula antillarum athalassos*	Bird
30	Giant Prairie Robberfly	*Microstylum morosum*	Insect
30	Purple Pimpleback	*Quadrula refulgens*	Mussel
29	Buff-breasted Sandpiper	*Calidris subruficollis*	Bird
29	Rafinesque's Big-Eared Bat	*Corynorhinus rafinesquii*	Mammal
29	Swallow-tailed Kite	*Elanoides forficatus*	Bird
29	Mottled Duskywing	*Erynnis martialis*	Insect
29	Rusty Blackbird	*Euphagus carolinus*	Bird
29	Meske's Skipper	*Hesperia meskei*	Insect
29	Bewick's Wren	*Thryomanes bewickii*	Bird
27	Lace-winged Roadside-Skipper	*Amblyscirtes aesculapius*	Insect
27	Alligator Gar	*Atractosteus spatula*	Fish
27	Appalachian Azure	*Celastrina neglectamajor*	Insect
27	Ozark Clubtail Dragonfly	*Gomphus ozarkensis*	Insect
27	Plains Minnow	*Hybognathus placitus*	Fish
27	Ouachita Shiner	*Lythrurus snelsoni*	Fish
27	Georgia Satyr	*Neonympha areolatus*	Insect

27	Red River Shiner	*Notropis bairdi*	Fish
27	Brown Madtom	*Noturus phaeus*	Fish
27	Louisiana Slimy Salamander	*Plethodon kisatchie*	Amphibian
27	King's Hairstreak	*Satyrium kingi*	Insect
25	Tiger Beetle	*Cicindela lepida*	Insect
25	Giant Stag Beetle	*Lucanus elaphus*	Insect
25	Diana	*Speyeria diana*	Insect
24	American Eel	*Anguilla rostrata*	Fish
24	Ruddy Turnstone	*Arenaria interpres*	Bird
24	Smith's Longspur	*Calcarius pictus*	Bird
24	Common Nighthawk	*Chordeiles minor*	Bird
24	Migrant Loggerhead Shrike	*Lanius ludovicianus*	Bird
24	Southeastern Bat	*Myotis austroriparius*	Mammal
24	Yellow-crowned Night-Heron	*Nyctanassa violacea*	Bird
24	Black-bellied Plover	*Pluvialis squatarola*	Bird
24	Paddlefish	*Polyodon spathula*	Fish
24	American Woodcock	*Scolopax minor*	Bird
24	Cerulean Warbler	*Setophaga cerulea*	Bird
23	American Bittern	*Botaurus lentiginosus*	Bird
23	Northern Metalmark	*Calephelis borealis*	Insect
23	Dusky Azure	*Celastrina nigra*	Insect
23	Outis Skipper	*Cogia outis*	Insect
23	Blue Sucker	*Cycleptus elongatus*	Fish
23	Spotted Dusky Salamander	*Desmognathus conanti*	Amphibian
23	Willow Flycatcher	*Empidonax traillii*	Bird
23	Lowland Topminnow	*Fundulus blairae*	Fish
23	Squirrel Treefrog	*Hyla squirella*	Amphibian
23	Crawfish Frog	*Lithobates areolatus*	Amphibian
23	Chub Shiner	*Notropis potteri*	Fish
23	Yehl Skipper	*Poanes yehl*	Insect
23	Purple Gallinule	*Porphyrio martinicus*	Bird
23	Byssus Skipper	*Problema byssus*	Insect
23	Ouachita Kidneyshell	*Ptychobranchus occidentalis*	Mussel
23	Anthophorid Bee	*Tetraloniella albata*	Insect
21	Le Conte's Sparrow	*Ammodramus leconteii*	Bird
21	Bell's Roadside-Skipper	*Amblyscirtes belli*	Insect
21	Sedge Wren	*Cistothorus platensis*	Bird
21	Eastern Spotted Skunk	*Spilogale putorius*	Mammal
21	Texas Milkweed Beetle	*Tetraopes texanus*	Insect
19	Sharp-shinned Hawk	*Accipiter striatus*	Bird
19	Elktoe	*Alasmidonta marginata*	Mussel
19	Brown Bullhead	*Ameiurus nebulosus*	Fish
19	Grasshopper Sparrow	*Ammodramus savannarum*	Bird
19	American Black Duck	*Anas rubripes*	Bird
19	Anhinga	*Anhinga anhinga*	Bird
19	Eastern Whip-poor-will	*Antrostomus vociferus*	Bird

19	Sanderling	*Calidris alba*	Bird
19	Dunlin	*Calidris alpina*	Bird
19	Stilt Sandpiper	*Calidris himantopus*	Bird
19	Chimney Swift	*Chaetura pelagica*	Bird
19	Yellow-billed Cuckoo	*Coccyzus americanus*	Bird
19	Northern Bobwhite	*Colinus virginianus*	Bird
19	Chicken Turtle	*Deirochelys reticularia*	Reptile
19	Tricolored Heron	*Egretta tricolor*	Bird
19	Dion Skipper	*Euphyes dion*	Insect
19	American Kestrel	*Falco sparverius*	Bird
19	Common Gallinule	*Gallinula galeata*	Bird
19	Purple Finch	*Haemorhous purpureus*	Bird
19	Leonard's Skipper	*Hesperia leonardus*	Insect
19	Cobweb Skipper	*Hesperia metea*	Insect
19	Goldeye	*Hiodon alosoides*	Fish
19	Mooneye	*Hiodon tergisus*	Fish
19	Wood Thrush	*Hylocichla mustelina*	Bird
19	Least Bittern	*Ixobrychus exilis*	Bird
19	Southern Pocketbook	*Lampsilis ornata*	Mussel
19	"Red River" Mucket	*Lampsilis sp. B cf hydiana*	Mussel
19	American Brook Lamprey	*Lethenteron appendix*	Fish
19	Short-billed Dowitcher	*Limnodromus griseus*	Bird
19	Swainson's Warbler	*Limnothlypis swainsonii*	Bird
19	Texas Coralsnake	*Micrurus tener*	Reptile
19	Striped Mullet	*Mugil cephalus*	Fish
19	Crawford's Gray Shrew	*Notiosorex crawfordi*	Mammal
19	Blackspot Shiner	*Notropis atrocaudalis*	Fish
19	Black-crowned Night-Heron	*Nycticorax nycticorax*	Bird
19	Hickorynut	*Obovaria olivaria*	Mussel
19	Slenderhead Darter	*Percina phoxocephala*	Fish
19	Prairie Skink	*Plestiodon septentrionalis*	Reptile
19	Ohio Pigtoe	*Pleurobema cordatum*	Mussel
19	Bismark Burrowing Crayfish	*Procambarus parasimulans*	Crayfish
19	Gulf Mapleleaf	*Quadrula nobilis*	Mussel
19	Graham's Crayfish Snake	*Regina grahamii*	Reptile
19	Eastern Harvest Mouse	*Reithrodontomys humulis*	Mammal
19	Oak Hairstreak	*Satyrium favonius ontario*	Insect
19	Hurter's Spadefoot	*Scaphiopus hurterii*	Amphibian
19	Lilliput	*Toxolasma parvum*	Mussel
19	Texas Lilliput	*Toxolasma texasiense*	Mussel
19	Tapered Pondhorn	*Uniomerus declivis*	Mussel
19	Pondhorn	*Uniomerus tetralasmus*	Mussel
19	Bell's Vireo	*Vireo bellii*	Bird
17	Highfin Carpsucker	*Carpiodes velifer*	Fish
17	Beach-dune Tiger Beetle	*Cicindela hirticollis*	Insect
17	Trumpeter Swan	*Cygnus buccinator*	Bird

17	Goldstripe Darter	*Etheostoma parvipinne*	Fish
17	Round Pigtoe	*Pleurobema sintoxia*	Mussel
17	Little Spectaclecase group	*Villosa sp. cf lienosa*	Mussel
15	Mole Salamander	*Ambystoma talpoideum*	Amphibian
15	Gorgone Checkerspot	*Chlosyne gorgone*	Insect
15	Monarch	*Danaus plexippus*	Insect
15	Lake Chubsucker	*Erimyzon sucetta*	Fish
15	Swamp Darter	*Etheostoma fusiforme*	Fish
15	Dwarf Salamander	*Eurycea quadridigitata*	Amphibian
15	Bird-voiced Treefrog	*Hyla avivoca*	Amphibian
15	Glossy Swampsnake	*Liodytes rigida*	Reptile
15	Shoal Chub	*Macrhybopsis hyostoma*	Fish
15	Long-tailed Weasel	*Mustela frenata*	Mammal
15	Slender Glass Lizard	*Ophisaurus attenuatus*	Reptile
15	Saddleback Darter	*Percina vigil*	Fish
15	American Golden-Plover	*Pluvialis dominica*	Bird
15	Broad-winged Skipper	*Poanes viator*	Insect
15	Southern Mapleleaf	*Quadrula apiculata*	Mussel
15	Fawnsfoot	*Truncilla donaciformis*	Mussel
11	Winter Stonefly	*Allocapnia malverna*	Insect

Habitats that occur in the South Central Plains

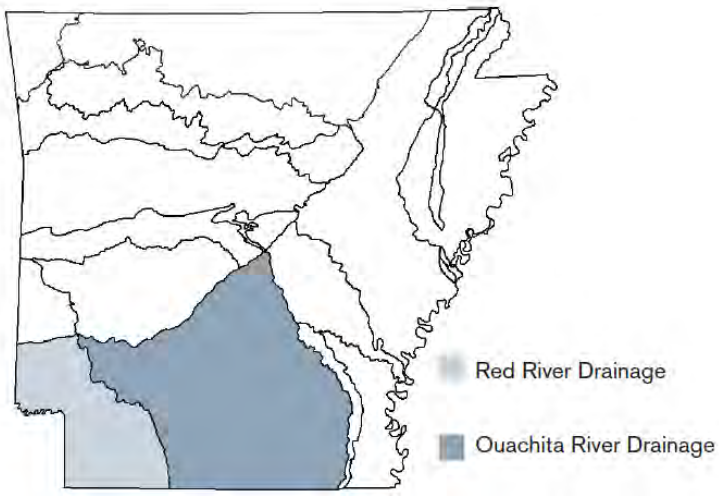
Of the 37 terrestrial habitats in Arkansas, 17 occur in the South Central Plains ecoregion (Table 3.22). Of 18 ecobasins in Arkansas, two occur in the South Central Plains ecoregion (Figure 3.17). These associations are described in the Section 4. Terrestrial Habitats and Section 5. Aquatic Habitats.

Table 3.22. Terrestrial Habitats in the South Central Plains.

Habitat Name
Crop Land
Cultivated Forest
Herbaceous Wetland
Lower Mississippi Alluvial Plain Grand Prairie
Mud Flats
Pasture Land
Ponds, Lakes, and Water Holes
Urban/Suburban
West Gulf Coastal Plain Calcareous Prairie and Woodland
West Gulf Coastal Plain Pine-Hardwood Flatwoods
West Gulf Coastal Plain Large River Floodplain Forest
West Gulf Coastal Plain Pine-Hardwood Forest/Woodland

West Gulf Coastal Plain Red River Floodplain Forest
West Gulf Coastal Plain Sandhill Oak and Shortleaf Pine Forest/Woodland
West Gulf Coastal Plain Seepage Swamp and Baygall
West Gulf Coastal Plain Small Stream/River Forest
West Gulf Coastal Plain Wet Hardwood Flatwoods

Figure 3.17. Ecobasin Distribution in the South Central Plains.



Problems faced by Species of Greatest Conservation Need (SGCN)

A summary of the problems faced by SGCN in the South Central Plains is presented below. Each problem has a score which is a sum of all Species Priority Scores associated with species for which this problem was assigned. A higher score implies a higher quantity of SGCN and/or more greatly imperiled species associated with problems listed here.

Table 3.23. Problems faced by SGCN in the South Central Plains Ecoregion.

Problem faced	Score
Agricultural practices	2157
Dam	1783
Forestry activities	1536
Grazing/Browsing	1025
Channel alteration	993
Resource extraction	941

Channel maintenance	895
Urban development	646
Water diversion	643
Road construction	629
Confined animal operations	549
Fire suppression	450
Conversion of riparian forest	434
Parasites/pathogens	286
Exotic species	280
Recreation	257
Commercial/industrial development	237
Predation	198
Commercial harvest	115
Non-point source pollution	105
Unknown	86
Management of/for certain species	74
Municipal/Industrial point source	69
Crossbreeding	48
Interspecific competiton	48

Conservation actions needed in the South Central Plains

Below are categories of conservation actions recommended by the taxa association teams for SGCN within the South Central Plains (Figure 3.18). The score associated with the conservation action category is the sum of all priority scores associated with species for which a conservation action has been assigned, weighted by the importance of the conservation action category to the species. A higher score implies a higher quantity of SGCN and/or more greatly imperiled species would be affected by actions within this conservation action category.

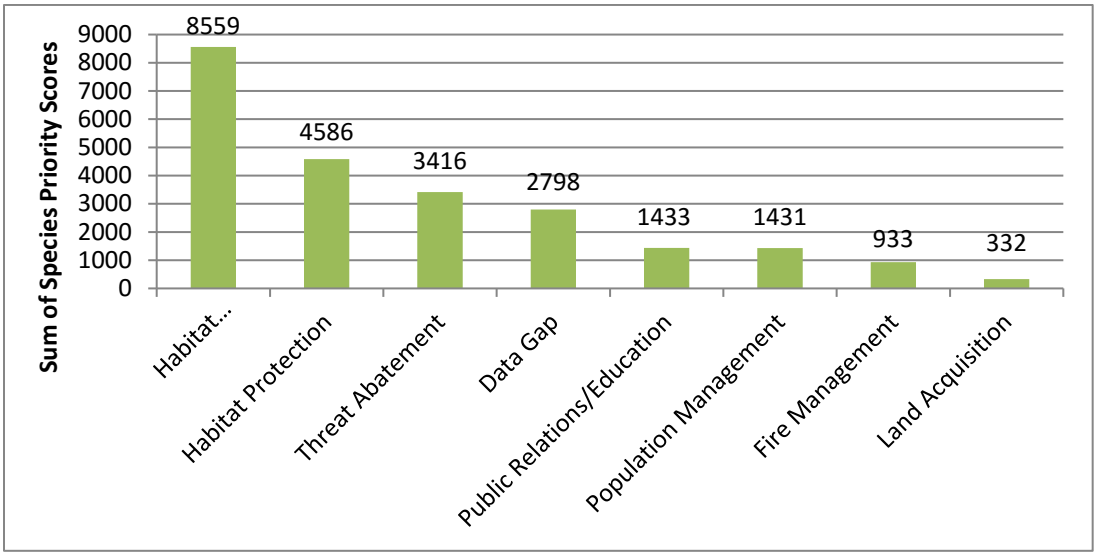


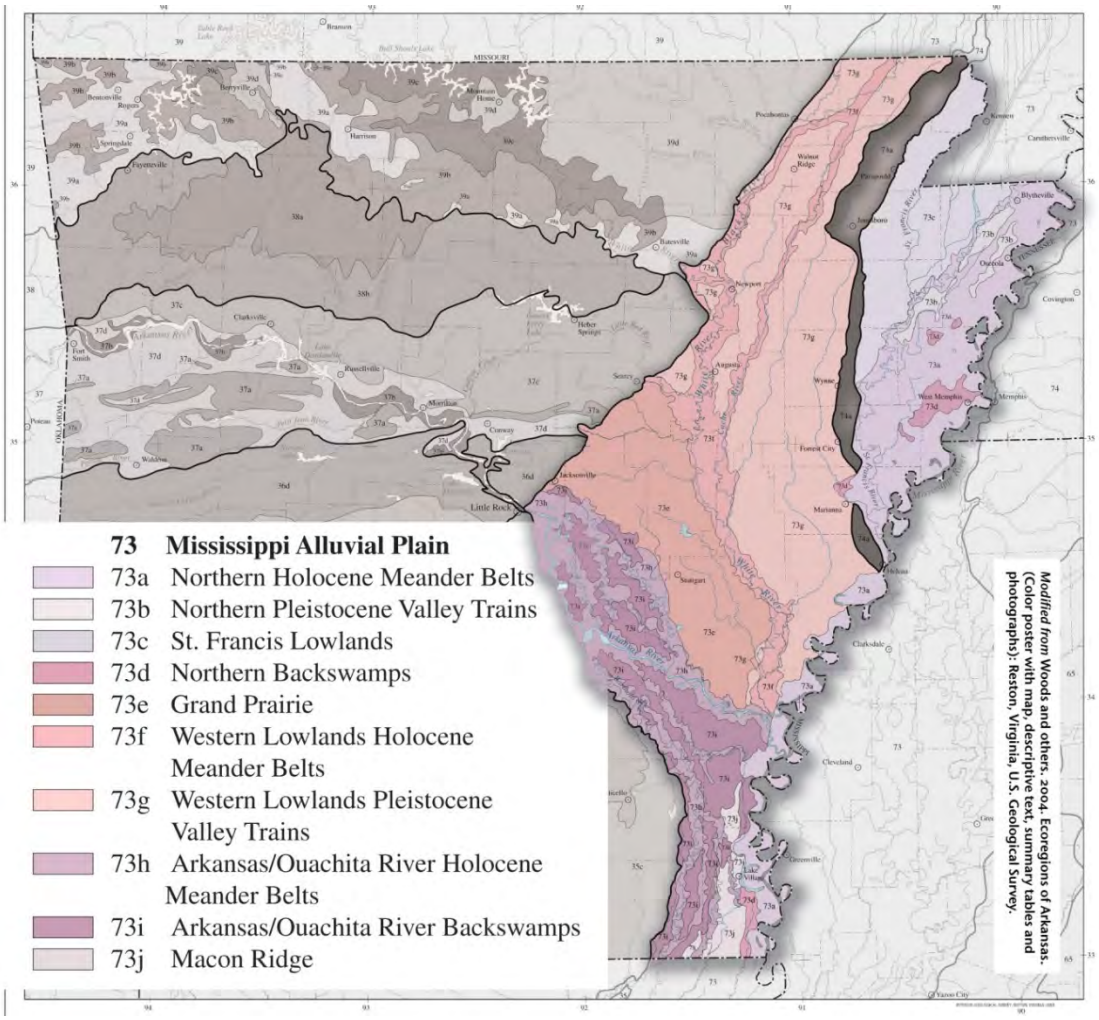
Figure 3.18. Conservation action categories recommended for the South Central Plains.

Mississippi Alluvial Plain (Ecoregion 73)

The Mississippi Alluvial Plain (73) extends along the Mississippi River from the confluence of the Ohio and Mississippi rivers southward to the Gulf of Mexico; temperatures and annual average precipitation increase toward the south. Ecoregion 73 is a broad, nearly level, agriculturally-dominated alluvial plain. It is veneered by Quaternary alluvium, loess, glacial outwash and lacustrine deposits. River terraces, swales and levees provide limited relief, but overall, the Mississippi Alluvial Plain (73) is flatter than neighboring ecoregions in Arkansas, including the South Central Plains (35).

Nearly flat, clayey, poorly-drained soils are widespread and characteristic. Streams and rivers have very low gradients and fine-grained substrates. Many reaches have ill-defined stream channels.

Figure 3.19. Mississippi Alluvial Plain Ecoregion.



Ecoregion 73 provides important habitat for fish and wildlife and includes the largest continuous system of wetlands in North America. It is also a major bird migration corridor used in fall and spring migrations.

Potential natural vegetation is largely southern floodplain forest and is unlike the oak–hickory and oak–hickory–pine forests that dominate uplands to the west in Ecoregions 35, 36, 37, 38 and 39; loblolly pine, so common in the South Central Plains (35), is not native to most forests in the Arkansas portion of Ecoregion 73.

The Mississippi Alluvial Plain (73) has been widely cleared and drained for cultiva- tion; this widespread loss or degradation of forest and wetland habitat has impacted wildlife and reduced bird populations.

Presently, most of the northern and central sections of Ecoregion 73, including Arkansas, are in cropland and receive heavy treatments of insecticides and herbicides; soybeans, cotton and rice are the major crops and aquaculture is also important. Agricultural runoff containing fertilizers, herbicides, pesticides and livestock waste have degraded surficial water quality.

Concentrations of total suspended solids, total dissolved solids, total phosphorus, ammonia nitrogen, sulfates, turbidity, biological oxygen demand, chlorophyll a and fecal coliform are high in the rivers, streams and ditches of Ecoregion 73; they are often much greater than elsewhere in Arkansas, increase with increasing watershed size and are greatest during the spring, high-flow season.

Fish communities in least altered streams typically have an insignificant proportion of sensitive species; sunfishes are dominant followed by minnows. Man-made flood control levees typically flank the Mississippi River and, in effect, separate the river and its adjoining habitat from the remainder of its natural hydrologic system; in so doing, they interfere with sediment transfer within Ecoregion 73 and have reduced available habitat for many species.

Between the levees that parallel the Mississippi River is a corridor known as the “batture lands”. Batture lands are hydrologically linked to the Mississippi River, flood-prone and contain remnant habitat for “big river” species (e.g., pallid sturgeon) as well as river-front plant communities; they are too narrow to map as a separate level IV ecoregion.

Earthquakes in the early nineteenth century offset river courses in Ecoregion 73. Small to medium size earthquakes still occur frequently; their shocks are magnified by the alluvial plain’s unconsolidated deposits, creating regional land management issues.

Northern Holocene Meander Belts

73a. The Northern Holocene Meander Belts ecoregion is a flat to nearly flat floodplain containing the meander belts of the present and past courses of the Mississippi River. Point bars, natural levees, swales and abandoned channels marked by meander scars and oxbow lakes are common and characteristic.

Ecoregion 73a tends to be slightly lower in elevation than adjacent ecoregions. Its abandoned channel network is more extensive than in the Southern Holocene Meander Belts (73k) of Louisiana. Ecoregion 73a is underlain by Holocene alluvium; it lacks the Pleistocene glacial outwash deposits of Ecoregion 73b. Soils on natural levees are relatively coarse-textured, well-drained and higher than those on levee back slopes and point bars; they grade to very heavy, poorly-drained clays in aban- doned channels and swales. Overall, soils are not as sandy as the Northern Pleistocene Valley Trains (73b) and are finer and have more organic matter than the Arkansas/Ouachita River Holocene Meander Belts (73h).

Natural vegetation varies with site characteristics. Younger sandy soils have fewer oaks and more sugarberry, elm, ash, pecan, cottonwood and sycamore than Ecoregion73d.

Widespread draining of wetlands and removal of bottomland forests for cropland has occurred. Soybeans, cotton, corn, sorghum, wheat and rice are the main crops. Catfish farms are increasingly common and contribute to the already large agricultural base.

Northern Pleistocene Valley Trains

73b. The Northern Pleistocene Valley Trains ecoregion is a flat to irregular alluvial plain composed of sandy to gravelly glacial outwash overlain by alluvium; sand sheets, widespread in the St. Francis Lowlands (73c), are absent. The Pleistocene outwash deposits of Ecoregion 73b are usually coarser and better drained than the alluvial deposits of Ecoregions 73a, 73d and 73f. They were transported to Arkansas by the Mississippi River and its tributaries and have been subsequently eroded, reduced in size and fragmented by laterally migrating channels or buried by thick sediments.

Ecoregion 73b has little local relief or stream incision. Elevations tend to be slightly higher than adjacent parts of Ecoregions 73a and 73d.

Cropland is extensive and has largely replaced the original forests; soybeans are the main crop and cotton is also produced. The few remaining forests are dominated by species typical of higher bottomlands such as Nuttall oak, willow oak, swamp chestnut oak, sugarberry and green ash. There are more lowland oaks in Ecoregion 73b than in Ecoregions 73a and 73d.

St. Francis Lowlands

73c. The St. Francis Lowlands ecoregion is flat to irregular and has many relict channels. Ecoregion 73c is mainly composed of late-Wisconsinan age glacial outwash deposits and, in contrast to Ecoregion 73b, is partly covered by undulating sand sheets.

“Sand blows” and “sunk lands” occur and have been attributed to the New Madrid earthquakes of 1811-12 (~ magnitude 8). Loess, which veneers older outwash deposits in Ecoregion 73g, is absent. Topography, lithology and hydrology vary over short distances and natural vegetation varies with site characteristics.

Cropland is extensive and has largely replaced the original forests; soybeans, corn, and cotton are the most common crops but wheat, sorghum and rice are also produced.

Although the streams of the St. Francis Lowlands (73c) have been extensively channelized, water quality tends to be better than in the less channelized areas of Ecoregion 73g because of a lack of loess veneer in Ecoregion 73c.

Northern Backswamps

73d. The Northern Backswamps ecoregion is made up of low-lying overflow areas on floodplains and includes poorly-drained flats and swales. Water often collects in its marshes, swamps, oxbow lakes, ponds and low gradient streams.

Soils developed from clayey alluvium including overbank and slack-water deposits; they commonly have a high shrink-swell potential and are locally rich in organic material. Water levels are seasonally variable.

Native vegetation in the wettest areas is generally dominated by bald cypress–water tupelo forest; slightly higher and better drained sites have overcup oak–water hickory forest and the highest, best-drained areas support Nuttall oak forest. Today, bottomland forest, cropland, farmed wetlands, pastureland and catfish farms occur.

Backswamps are important areas for capturing excess nutrients from local waters and for storing water during heavy rain events.

Grand Prairie

73e. The Grand Prairie ecoregion is a broad, loess-covered terrace formerly dominated by tall grass prairie and now primarily used as cropland. It is typically almost level. However, incised perennial and intermittent streams occur and a narrow belt of low hills is found in the east.

Prior to the 19th century, flatter areas with slowly to very slowly permeable soils (often containing fragipans) supported Arkansas’ largest prairie. They were generally bounded by open

woodland or savanna. In all, about 400,000 acres of prairie grasses and forbs occurred in Ecoregion 73e and were a sharp contrast to the bottomland forests that once dominated other parts of the Mississippi Alluvial Plain (73). Low hills were covered by upland deciduous forest containing white oak, black oak and southern red oak. Drier ridges were dominated by post oak. Narrow floodplains had bottomland hardwood forests.

Cropland has now largely replaced the native vegetation. In the process, some prairie species have been extirpated from the ecoregion (e.g., greater prairie chicken); others have been sharply reduced in population and restricted to a few prairie remnants.

Distinctively, rice is the main crop; soybeans, cotton, corn and wheat are also grown. Rice fields provide habitat and forage for large numbers and many species of waterfowl; duck and goose hunting occurs.



Western Lowlands Holocene Meander Belts

Western Lowlands Holocene Meander Belts

73f. The Western Lowlands Holocene Meander Belts ecoregion is a flat to nearly flat floodplain containing the meander belts of the present and past courses of the White, Black and Cache rivers. Its meander belts are narrower than the Northern Holocene Meander Belts (73a), but point bars, natural levees, swales and abandoned channels are common in both regions.

Soils on natural levees are relatively coarse-textured, well-drained and higher than those on levee back slopes and point bars; they grade to heavy, poorly-drained clays in abandoned channels and swales.

Natural vegetation varies with site characteristics. Today, Ecoregion 73f contains some of the most extensive remaining tracts of native bottomland hardwood forest in the Mississippi Alluvial Plain (73). Cropland also occurs.

Flood control levees are less developed and riverine processes are more natural and dynamic than in Ecoregion 73a. Backwater flooding in the White River occurs well upstream of its confluence with the higher Mississippi River; as a result, riparian and natural levee communities are less common and oak-dominated communities are more widespread than in Ecoregion 73a.

Wetlands in the Cache-lower White River systems have been designated as one of only nineteen “Wetlands of International Importance” in the United States by the Ramsar Convention on Wetlands.

Regulation of White River flow, in combination with the downcutting of the Mississippi River for navigation (and related wing levees and cutoffs), have altered flood regimes on the lower White River, thereby increasing stream bank instability and bottomland forest mortality in Ecoregion 73f.

Most streams and rivers in Ecoregion 73f are fed by the Ozark Highlands and Boston Mountains; sediment load is generally less than in the Mississippi River.

Western Lowlands Pleistocene Valley Trains

73g. The terraces of the Western Lowlands Pleistocene Valley Trains are largely composed of Pleistocene glacial outwash that was transported to Arkansas by the Mississippi River and deposited by braided streams. Physiography is widely muted by windblown silt deposits (loess), sand sheets, or sand dunes; loess and sand sheets are more widespread than in the Northern Pleistocene Valley Trains (73b) and St. Francis Lowlands (73c).

Many interdunal depressions called “sandponds” occur and are either in contact with the water table or have a perched aquifer. Elevations are higher than adjacent parts of the Northern Holocene Meander Belts (73a) and Western Lowlands Holocene Meander Belts (73f); consequently, uplands are rarely if ever flooded.

Native plant communities are different from more frequently inundated ecoregions; for example, post oak and loblolly pine are native to Ecoregion 73g but are absent from lower, overflow areas. Sandpond forest communities are generally dominated by overcup oak, water hickory, willow oak and pin oak; understory in a few sandponds may include pondberry (*Lindera melissifolia*), federally listed as endangered.

Today, cropland is extensive and the main crops are soybeans and cotton. Commer cial crawfish, baitfish and catfish farms are common. The Western Lowlands Pleistocene Valley Trains (73g) ecoregion is a wintering ground for waterfowl. Duck hunting is widespread.

Arkansas/Ouachita River Holocene Meander Belts

73h. The Arkansas/Ouachita River Holocene Meander Belts ecoregion is a flat to nearly flat floodplain containing the meander belts of the present and past courses of the lower Arkansas and Ouachita rivers. Point bars, natural levees, swales and abandoned channels, marked by meander scars and oxbow lakes, are common and characteristic. Soils on natural levees are relatively coarse-textured, well-drained and higher than those on levee back slopes and point bars; they grade to heavy, poorly- drained clays in abandoned channels and swales. Overall, soils have less organic matter than in the Northern Holocene Meander Belts (73a).



Arkansas/Ouachita River Holocene Meander Belts

The modern, active Arkansas River meander belt comprises only a small portion of Ecoregion

73h. The rest of Ecoregion 73h contains small streams flowing in abandoned courses of the Arkansas River. These small streams are usually underfit relative to the older channels, higher than the adjacent Arkansas/Ouachita River Backswamps (73i) and have small watersheds. Bayou Bartholomew inhabits the longest section of abandoned channels. It flows against the edge of and receives drainage from the South Central Plains (35); habitat diversity is sufficient for Bayou Bartholomew to be one of the most species-rich streams in North America. The pink mucket and the fat pocketbook mussels, both federally listed as endangered, have been collected from the Bayou.

Within an abandoned course, bald cypress and water tupelo often grow in the modern stream channel adjacent to a strip of wet bottomland hardwood forest dominated by overcup oak and water hickory. In the rest of Ecoregion 73h, cropland and pastureland are widespread; soybeans, rice and wheat are the main crops.

Arkansas/Ouachita River Backswamps

73i. The flats, swales and natural levees of the Arkansas/Ouachita River Backswamps ecoregion include the slackwater areas along the Arkansas and Ouachita rivers, where water often collects into marshes, swamps, oxbow lakes, ponds and sloughs. Ecoregion 73i, in contrast to the Northern Backswamps (73d), is widely veneered with natural levee deposits. Soils derived from these natural levee deposits are coarser and are not as poorly drained as the clayey soils of the Northern Backswamps (73d). As a result, willow oak and water oak are native instead of species adapted to wetter overflow conditions.

Drainage canals and ditches are common. This artificial drainage, together with the sandy veneer of natural levee deposits, help explain why Ecoregion 73i is more easily and widely farmed than the Northern Backswamps (73d). Rice, cotton and soybeans are important crops but forests and forested wetlands also occur.

Macon Ridge

73j. Macon Ridge is underlain almost entirely by Pleistocene glacial outwash deposits that were transported to Arkansas by the Mississippi River and deposited by braided streams. It is veneered by windblown silt deposits (i.e. loess) like Ecoregions 73e, 73g and 74a. Soils are influenced by loess and contrast with the alluvial soils of Ecoregions 73a and 73h.

Macon Ridge (73j) is a continuation of the Western Lowlands Pleistocene Valley Trains (73g) but is better drained and supports drier plant communities. Its eastern edge is 20 to 30 feet above the adjacent, lithologically and physiographically distinct, Northern Holocene Meander Belts (73a).

The western side of Macon Ridge (73j) is lower than the eastern side and is about the same elevation as the lithologically and physiographically distinct Arkansas/ Ouachita River Holocene Meander Belts (73h).

Native forest types range from those of better drained bottomlands dominated by willow oak, water oak and swamp chestnut oak to upland hardwood forests dominated by white oak, southern red oak and post oak. Prairies and loblolly pine- dominated areas may also have occurred on Macon Ridge (73j).

Today, Ecoregion 73j is a mosaic of pastureland, forest and cropland. Soybeans, cotton and oats are major crops (adapted from Woods and others 2004).

Mississippi Alluvial Plain Ecoregion: Species of Greatest Conservation Need (SGCN)

Of the 377 SGCN, 146 occur in the Mississippi Alluvial Plain ecoregion (Table 3.24).

Table 3.24. Species of greatest conservation need (SGCN) in the Mississippi Alluvial Plain ranked by priority score. A higher priority score indicates a greater need for actions to conserve the species.

Priority Score	Common Name	Scientific Name	Taxa Association
76	Scaleshell	*Leptodea leptodon*	Mussel
63	Northern Long-eared Bat	*Myotis septentrionalis*	Mammal
62	Indiana Bat	*Myotis sodalis*	Mammal
52	Alabama Shad	*Alosa alabamae*	Fish
52	Rabbitsfoot	*Quadrula cylindrica cylindrica*	Mussel
48	Pallid Sturgeon	*Scaphirhynchus albus*	Fish
46	Pink Mucket	*Lampsilis abrupta*	Mussel
46	Fat Pocketbook	*Potamilus capax*	Mussel
43	Piping Plover	*Charadrius melodus*	Bird
43	Western Fanshell	*Cyprogenia aberti*	Mussel
43	Sicklefin Chub	*Macrhybopsis meeki*	Fish
43	Red-cockaded Woodpecker	*Picoides borealis*	Bird
43	Illinois Chorus Frog	*Pseudacris illinoensis*	Amphibian
38	Crystal Darter	*Crystallaria asprella*	Fish
38	Stargazing Darter	*Percina uranidea*	Fish
38	Pyramid Pigtoe	*Pleurobema rubrum*	Mussel
34	Salamander Mussel	*Simpsonaias ambigua*	Mussel
33	Western Sand Darter	*Ammocrypta clara*	Fish
33	Henslow's Sparrow	*Ammodramus henslowii*	Bird

33	Sprague's Pipit	*Anthus spragueii*	Bird
33	Little Brown Bat	*Myotis lucifugus*	Mammal
33	Bluehead Shiner	*Pteronotropis hubbsi*	Fish
33	King Rail	*Rallus elegans*	Bird
33	Purple Lilliput	*Toxolasma lividum*	Mussel
32	Dukes' Skipper	*Euphyes dukesi*	Insect
32	Prairie Mole Cricket	*Gryllotalpa major*	Insect
31	Interior Least Tern	*Sternula antillarum athalassos*	Bird
29	Buff-breasted Sandpiper	*Calidris subruficollis*	Bird
29	Rafinesque's Big-Eared Bat	*Corynorhinus rafinesquii*	Mammal
29	Swallow-tailed Kite	*Elanoides forficatus*	Bird
29	Rusty Blackbird	*Euphagus carolinus*	Bird
29	Silver Redhorse	*Moxostoma anisurum*	Fish
29	Stonecat	*Noturus flavus*	Fish
29	Bewick's Wren	*Thryomanes bewickii*	Bird
27	Lake Sturgeon	*Acipenser fulvescens*	Fish
27	Lace-winged Roadside-Skipper	*Amblyscirtes aesculapius*	Insect
27	Alligator Gar	*Atractosteus spatula*	Fish
27	Plains Minnow	*Hybognathus placitus*	Fish
25	Tiger Beetle	*Cicindela lepida*	Insect
25	Giant Stag Beetle	*Lucanus elaphus*	Insect
25	Diana	*Speyeria diana*	Insect
24	American Eel	*Anguilla rostrata*	Fish
24	Ruddy Turnstone	*Arenaria interpres*	Bird
24	Smith's Longspur	*Calcarius pictus*	Bird
24	Common Nighthawk	*Chordeiles minor*	Bird
24	Migrant Loggerhead Shrike	*Lanius ludovicianus*	Bird
24	Southeastern Bat	*Myotis austroriparius*	Mammal
24	Yellow-crowned Night-Heron	*Nyctanassa violacea*	Bird
24	Black-bellied Plover	*Pluvialis squatarola*	Bird
24	Paddlefish	*Polyodon spathula*	Fish
24	American Woodcock	*Scolopax minor*	Bird
24	Cerulean Warbler	*Setophaga cerulea*	Bird
23	American Bittern	*Botaurus lentiginosus*	Bird
23	Blue Sucker	*Cycleptus elongatus*	Fish
23	Willow Flycatcher	*Empidonax traillii*	Bird
23	Crawfish Frog	*Lithobates areolatus*	Amphibian
23	Sabine Shiner	*Notropis sabinae*	Fish
23	Suckermouth Minnow	*Phenacobius mirabilis*	Fish
23	Flathead Chub	*Platygobio gracilis*	Fish
23	Yehl Skipper	*Poanes yehl*	Insect
23	Purple Gallinule	*Porphyrio martinicus*	Bird

23	Pink Heelsplitter	*Potamilus alatus*	Mussel
23	Ouachita Kidneyshell	*Ptychobranchus occidentalis*	Mussel
23	Central Mudminnow	*Umbra limi*	Fish
21	Le Conte's Sparrow	*Ammodramus leconteii*	Bird
21	Golden-banded Skipper	*Autochton cellus*	Insect
21	Ant-like Tiger Beetle	*Cicindela cursitans*	Insect
21	Woodland Tiger Beetle	*Cicindela unipunctata*	Insect
21	Sedge Wren	*Cistothorus platensis*	Bird
21	Red Milkweed Beetle	*Tetraopes quinquemaculatus*	Insect
19	Sharp-shinned Hawk	*Accipiter striatus*	Bird
19	Elktoe	*Alasmidonta marginata*	Mussel
19	Brown Bullhead	*Ameiurus nebulosus*	Fish
19	Grasshopper Sparrow	*Ammodramus savannarum*	Bird
19	American Black Duck	*Anas rubripes*	Bird
19	Anhinga	*Anhinga anhinga*	Bird
19	Eastern Whip-poor-will	*Antrostomus vociferus*	Bird
19	Sanderling	*Calidris alba*	Bird
19	Dunlin	*Calidris alpina*	Bird
19	Stilt Sandpiper	*Calidris himantopus*	Bird
19	Common Wormsnake	*Carphophis amoenus*	Reptile
19	Chimney Swift	*Chaetura pelagica*	Bird
19	Yellow-billed Cuckoo	*Coccyzus americanus*	Bird
19	Northern Bobwhite	*Colinus virginianus*	Bird
19	Chicken Turtle	*Deirochelys reticularia*	Reptile
19	Six-banded Longhorn Beetle	*Dryobius sexnotatus*	Insect
19	Tricolored Heron	*Egretta tricolor*	Bird
19	Dion Skipper	*Euphyes dion*	Insect
19	American Kestrel	*Falco sparverius*	Bird
19	Common Gallinule	*Gallinula galeata*	Bird
19	Purple Finch	*Haemorhous purpureus*	Bird
19	Goldeye	*Hiodon alosoides*	Fish
19	Mooneye	*Hiodon tergisus*	Fish
19	Wood Thrush	*Hylocichla mustelina*	Bird
19	Least Bittern	*Ixobrychus exilis*	Bird
19	American Brook Lamprey	*Lethenteron appendix*	Fish
19	Short-billed Dowitcher	*Limnodromus griseus*	Bird
19	Swainson's Warbler	*Limnothlypis swainsonii*	Bird
19	Pealip Redhorse	*Moxostoma pisolabrum*	Fish
19	Striped Mullet	*Mugil cephalus*	Fish
19	Channel Shiner	*Notropis wickliffi*	Fish
19	Black-crowned Night-Heron	*Nycticorax nycticorax*	Bird
19	Hickorynut	*Obovaria olivaria*	Mussel
19	Gilt Darter	*Percina evides*	Fish

19	Ohio Pigtoe	*Pleurobema cordatum*	Mussel
19	Gray Comma	*Polygonia progne*	Insect
19	Gulf Mapleleaf	*Quadrula nobilis*	Mussel
19	Graham's Crayfish Snake	*Regina grahamii*	Reptile
19	Eastern Harvest Mouse	*Reithrodontomys humulis*	Mammal
19	Oak Hairstreak	*Satyrium favonius ontario*	Insect
19	Eastern Spadefoot	*Scaphiopus holbrookii*	Amphibian
19	Southern Bog Lemming	*Synaptomys cooperi*	Mammal
19	Ornate Box Turtle	*Terrapene ornata*	Reptile
19	Lilliput	*Toxolasma parvum*	Mussel
19	Texas Lilliput	*Toxolasma texasiense*	Mussel
19	Tapered Pondhorn	*Uniomerus declivis*	Mussel
19	Pondhorn	*Uniomerus tetralasmus*	Mussel
19	Bell's Vireo	*Vireo bellii*	Bird
17	Highfin Carpsucker	*Carpiodes velifer*	Fish
17	Beach-dune Tiger Beetle	*Cicindela hirticollis*	Insect
17	Trumpeter Swan	*Cygnus buccinator*	Bird
17	Goldstripe Darter	*Etheostoma parvipinne*	Fish
17	Round Pigtoe	*Pleurobema sintoxia*	Mussel
17	Little Spectaclecase group	*Villosa sp. cf lienosa*	Mussel
16	American Badger	*Taxidea taxus*	Mammal
15	Mole Salamander	*Ambystoma talpoideum*	Amphibian
15	Gorgone Checkerspot	*Chlosyne gorgone*	Insect
15	Monarch	*Danaus plexippus*	Insect
15	Lake Chubsucker	*Erimyzon sucetta*	Fish
15	Swamp Darter	*Etheostoma fusiforme*	Fish
15	Dwarf Salamander	*Eurycea quadridigitata*	Amphibian
15	Bird-voiced Treefrog	*Hyla avivoca*	Amphibian
15	Glossy Swampsnake	*Liodytes rigida*	Reptile
15	Shoal Chub	*Macrhybopsis hyostoma*	Fish
15	Long-tailed Weasel	*Mustela frenata*	Mammal
15	Slender Glass Lizard	*Ophisaurus attenuatus*	Reptile
15	Saddleback Darter	*Percina vigil*	Fish
15	American Golden-Plover	*Pluvialis dominica*	Bird
15	Broad-winged Skipper	*Poanes viator*	Insect
15	Southern Mapleleaf	*Quadrula apiculata*	Mussel
15	Western Harvest Mouse	*Reithrodontomys megalotis*	Mammal
15	Fawnsfoot	*Truncilla donaciformis*	Mussel
15	Rainbow	*Villosa iris*	Mussel
13	Twelve-spotted Tiger Beetle	*Cicindela duodecimguttata*	Insect
11	Winter Stonefly	*Allocapnia malverna*	Insect
11	Bronze Copper	*Lycaena hyllus*	Insect

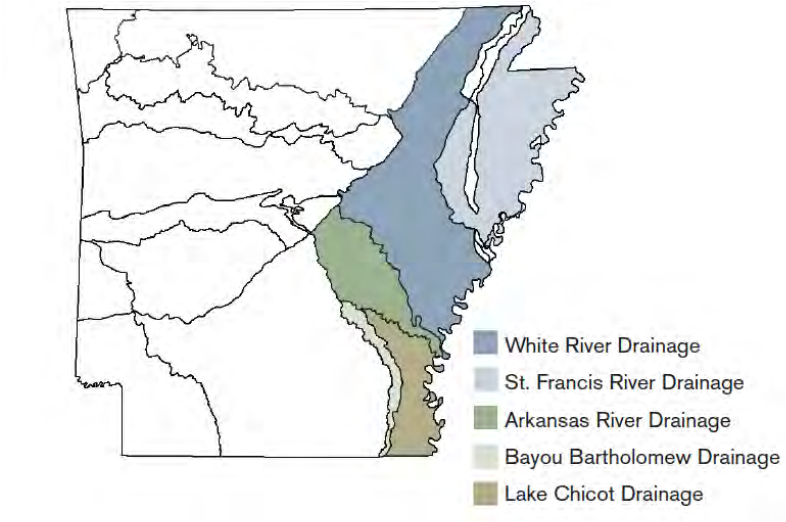
Habitats that occur in the Mississippi Alluvial Plain

Of the 37 terrestrial habitats in Arkansas, 14 occur in the Mississippi Alluvial Plain ecoregion (Table 3.25). Of 18 ecobasins in Arkansas, five occur in the Mississippi Alluvial Plain ecoregion (Figure 3.20). These associations are described in the Section 4. Terrestrial Habitats and Section 5. Aquatic Habitats.

Table 3.25. Terrestrial Habitats in the Mississippi Alluvial Plain.

Habitat Name
Crop Land
Cultivated Forest
Herbaceous Wetland
Lower Mississippi Alluvial Plain Grand Prairie
Lower Mississippi Flatwoods Woodland and Forest
Lower Mississippi River Bottomland Depression
Lower Mississippi River Dune, Pond, Woodland and Forest
Lower Mississippi River High Bottomland Forest
Lower Mississippi River Low Bottomland Forest
Lower Mississippi River Riparian Forest
Mud Flats
Pasture Land
Ponds, Lakes, and Water Holes
Urban/Suburban

Figure 3.20. Ecobasin Distribution in the Mississippi Alluvial Plain.



Problems faced by Species of Greatest Conservation Need (SGCN)

A summary of the problems faced by SGCN in the Mississippi Alluvial Plain is presented below. Each problem has a score which is a sum of all Species Priority Scores associated with species for which this problem was assigned. A higher score implies a higher quantity of SGCN and/or more greatly imperiled species associated with problems listed here.

Table 3.26. Problems faced by SGCN in the Mississippi Alluvial Plain Ecoregion.

Problem faced	Score
Agricultural practices	2157
Dam	1783
Forestry activities	1536
Grazing/Browsing	1063
Channel alteration	993
Resource extraction	941
Channel maintenance	895
Urban development	646
Water diversion	643
Road construction	629
Confined animal operations	549
Fire suppression	450
Conversion of riparian forest	434
Parasites/pathogens	286
Exotic species	280
Recreation	257
Commercial/industrial development	237
Predation	198
Commercial harvest	115
Non-point source pollution	105
Unknown	86
Management of/for certain species	74
Municipal/Industrial point source	69
Crossbreeding	48
Interspecific competiton	48
Incidental take	27
Excessive groundwater withdrawal	21

Conservation Actions needed in the Mississippi Alluvial Plain

Below are categories of conservation actions recommended by the taxa association teams for SGCN in the Mississippi Alluvial Plain (Figure 3.21). The score associated with the conservation action category is the sum of all priority scores associated with species for which a conservation action has been assigned, weighted by the importance of the conservation action category to the species. A higher score implies a higher quantity of SGCN and/or more greatly imperiled species would be affected by actions within this conservation action category.

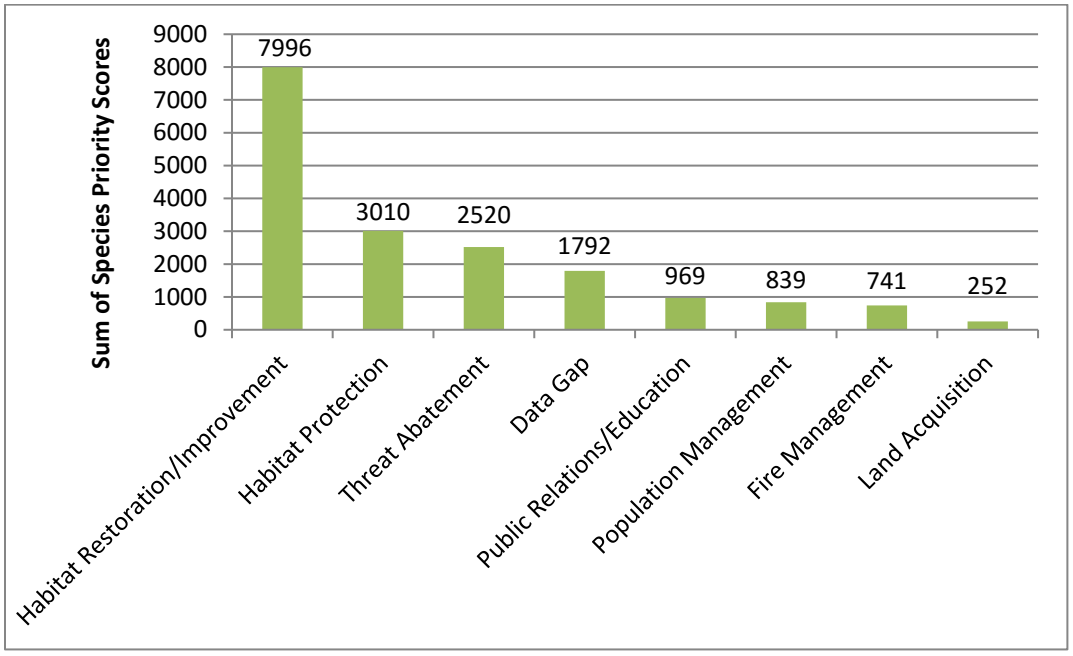


Figure 3.21. Conservation action categories recommended for the Mississippi Alluvial Plain.

Mississippi Valley Loess Plains (Ecoregion 74)

Ecoregion 74 stretches from the Ohio River in western Kentucky all the way to Louisiana. It is characteristically veneered with windblown silt deposits (loess) and underlain by erosion-prone, unconsolidated coastal plain sediments; loess is thicker than in the Southeastern Plains (65). Western areas, including Arkansas, have hills, ridges and bluffs, but further east in Mississippi and Tennessee, the topography becomes flatter. Overall, irregular plains are common.

Ecoregion 74 is lithologically and physiographically distinct from the Ouachita Mountains (36), Boston Mountains (38), Ozark Highlands (39), Interior Plateau (71) and Interior River Valleys and Hills (72).

Figure 3.22. Mississippi Valley Loess Plains Ecoregion.

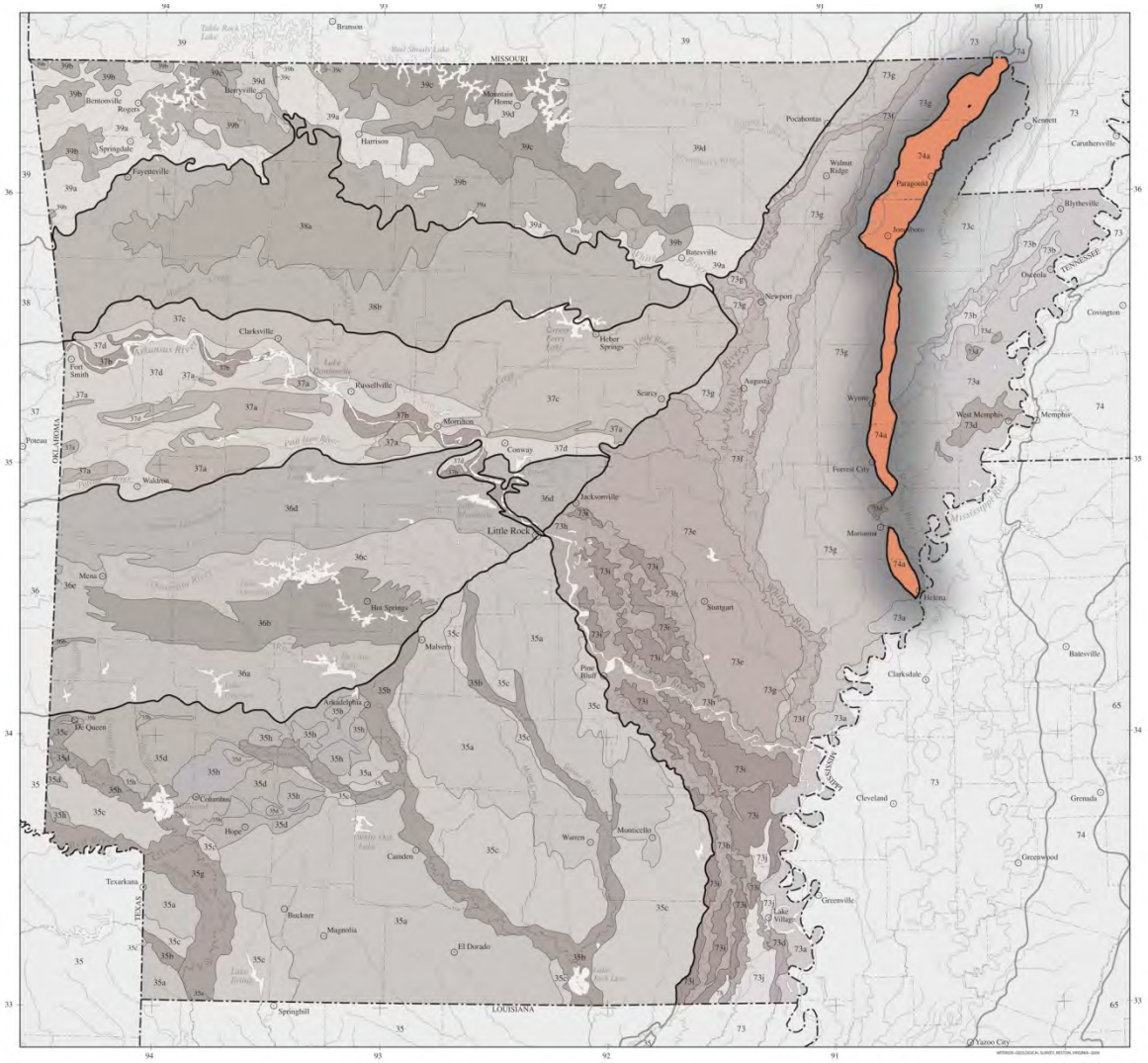




Photo by Tom Foti, AHNC

Mississippi Valley Loess Plains - Crowley's Ridge

Potential natural vegetation is primarily oak–hickory forest or oak–hickory–pine forest and is unlike the southern floodplain forests of the Mississippi Alluvial Plain (73). Streams tend to have gentler gradients and more silty substrates than in the Southeastern Plains (65).

Crowley's Ridge

74a. Crowley's Ridge, the only portion of the Bluff Hills ecoregion in Arkansas, is a disjunct series of loess-capped hills surrounded by the lower, flatter Mississippi Alluvial Plain (73). Crowley's Ridge, with elevations of up to 500 feet, is of sufficient height to have trapped wind-blown silt during the Pleistocene Epoch. It was formed by the aggregation of loess and the subsequent erosion by streams.

The loess is subject to vertical sloughing when wet. Spring-fed streams and seep areas occur on the lower slopes and in basal areas where Tertiary sands and gravels that were never removed by the Mississippi River are exposed.

Soils are generally well-drained; they are generally more loamy than those found in the surrounding Northern Pleistocene Valley Trains (73b) and St. Francis Lowlands (73c).

Wooded land and pastureland are common; only limited cropland is found in Ecoregion 74a. Post oak–blackjack oak forest, southern red oak–white oak forest and beech–maple forest occur. Undisturbed ravine vegetation can be rich in mesophytes, such as beech and sugar maple. Oaks still dominate most of these mesophytic communities. The forests of the Bluff Hills (74a) are usually classified as oak–beech. They are related to the beech–maple cove forests of the Appalachian Mountains; like the Appalachian cove forests, tulip poplar dominates early successional communities, at least in the southern ridge. In Arkansas, tulip poplar is native only to the Bluff Hills (74a). Shortleaf pine grows on the sandier soils of the northern ridge (adapted from Woods and others 2004).

Mississippi Valley Loess Plains: Species of Greatest Conservation Need (SGCN)

Of the 377 SGCN, 51 occur in the Mississippi Valley Loess Plains ecoregion (Table 3.27).

Table 3.27. Species of greatest conservation need (SGCN) in the Mississippi Valley Loess Plains ranked by priority score. A higher priority score indicates a greater need for actions to conserve the species.

Priority Score	Common Name	Scientific Name	Taxa Association
33	Henslow's Sparrow	*Ammodramus henslowii*	Bird
33	Little Brown Bat	*Myotis lucifugus*	Mammal
29	Rafinesque's Big-Eared Bat	*Corynorhinus rafinesquii*	Mammal
29	Rusty Blackbird	*Euphagus carolinus*	Bird
29	Bewick's Wren	*Thryomanes bewickii*	Bird
25	Giant Stag Beetle	*Lucanus elaphus*	Insect
24	Common Nighthawk	*Chordeiles minor*	Bird
24	Migrant Loggerhead Shrike	*Lanius ludovicianus*	Bird
24	Southeastern Bat	*Myotis austroriparius*	Mammal
24	Yellow-crowned Night-Heron	*Nyctanassa violacea*	Bird
24	American Woodcock	*Scolopax minor*	Bird
24	Cerulean Warbler	*Setophaga cerulea*	Bird
23	American Bittern	*Botaurus lentiginosus*	Bird
23	Spotted Dusky Salamander	*Desmognathus conanti*	Amphibian
23	Willow Flycatcher	*Empidonax traillii*	Bird
23	Crawfish Frog	*Lithobates areolatus*	Amphibian
21	Le Conte's Sparrow	*Ammodramus leconteii*	Bird
21	Sedge Wren	*Cistothorus platensis*	Bird
21	Eastern Spotted Skunk	*Spilogale putorius*	Mammal
19	Sharp-shinned Hawk	*Accipiter striatus*	Bird
19	Brown Bullhead	*Ameiurus nebulosus*	Fish
19	Grasshopper Sparrow	*Ammodramus savannarum*	Bird
19	Eastern Whip-poor-will	*Antrostomus vociferus*	Bird
19	Dunlin	*Calidris alpina*	Bird
19	Stilt Sandpiper	*Calidris himantopus*	Bird
19	Common Wormsnake	*Carphophis amoenus*	Reptile
19	Chimney Swift	*Chaetura pelagica*	Bird
19	Yellow-billed Cuckoo	*Coccyzus americanus*	Bird
19	Northern Bobwhite	*Colinus virginianus*	Bird
19	American Kestrel	*Falco sparverius*	Bird
19	Purple Finch	*Haemorhous purpureus*	Bird
19	Wood Thrush	*Hylocichla mustelina*	Bird

19	Least Bittern	*Ixobrychus exilis*	Bird
19	Short-billed Dowitcher	*Limnodromus griseus*	Bird
19	Swainson's Warbler	*Limnothlypis swainsonii*	Bird
19	Black-crowned Night-Heron	*Nycticorax nycticorax*	Bird
19	Eastern Harvest Mouse	*Reithrodontomys humulis*	Mammal
19	Eastern Spadefoot	*Scaphiopus holbrookii*	Amphibian
19	Southern Bog Lemming	*Synaptomys cooperi*	Mammal
19	Bell's Vireo	*Vireo bellii*	Bird
17	Sandy Stream Tiger Beetle	*Cicindela macra*	Insect
17	Trumpeter Swan	*Cygnus buccinator*	Bird
17	Goldstripe Darter	*Etheostoma parvipinne*	Fish
16	American Badger	*Taxidea taxus*	Mammal
15	Mole Salamander	*Ambystoma talpoideum*	Amphibian
15	Cow Path Tiger Beetle	*Cicindela purpurea*	Insect
15	Monarch	*Danaus plexippus*	Insect
15	Long-tailed Weasel	*Mustela frenata*	Mammal
15	American Golden-Plover	*Pluvialis dominica*	Bird
15	Western Harvest Mouse	*Reithrodontomys megalotis*	Mammal
11	Bronze Copper	*Lycaena hyllus*	Insect

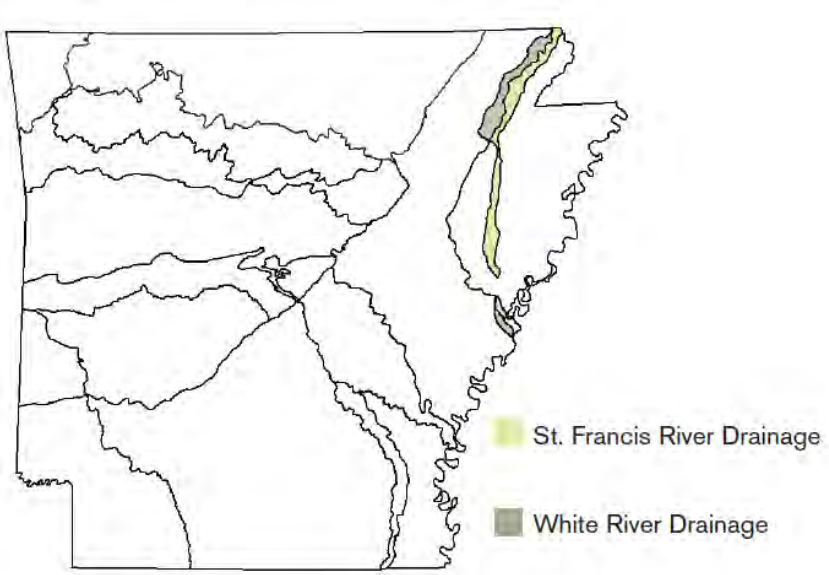
Habitats that occur in the Mississippi Valley Loess Plains

Of the 37 terrestrial habitats in Arkansas, 7 occur in the Mississippi Valley Loess Plains (Table 3.28). Of 18 ecobasins in Arkansas, three occur in the Mississippi Valley Loess Plains ecoregion (Figure 3.23). These associations are described in the Section 4. Terrestrial Habitatsand Section 5. Aquatic Habitats.

Table 3.28. Terrestrial Habitats in the Mississippi River Loess Plains.

Habitat Name
Crop Land
Cultivated Forest
Crowley’s Ridge Loess Slope Forest
Mud Flats
Pasture Land
Ponds, Lakes, and Water Holes
Urban/Suburban

Figure 3.23. Ecobasin distribution in the Mississippi River Loess Plains.



Problems faced by Species of Greatest Conservation Need (SGCN)

A summary of the problems faced by SGCN in the Mississippi Valley Loess Plains is presented below. Each problem has a score which is a sum of all Species Priority Scores associated with species for which this problem was assigned. A higher score implies a higher quantity of SGCN and/or more greatly imperiled species associated with problems listed here.

Table 3.29. Problems faced by SGCN in the Mississippi River Valley Loess Plains.

Problem faced	Score
Agricultural practices	1049
Forestry activities	691
Urban development	334
Conversion of riparian forest	270
Fire suppression	257
Parasites/pathogens	161
Exotic species	109
Water diversion	104
Commercial/industrial development	103
Dam	97
Predation	97

Recreation	93
Resource extraction	84
Non-point source pollution	67
Grazing/Browsing	61
Confined animal operations	43
Road construction	43
Municipal/Industrial point source	38
Interspecific competiton	29
Excessive groundwater withdrawal	21
Channel alteration	19
Management of/for certain species	17

Conservation actions needed in the Mississippi Valley Loess Plains

Below are categories of conservation actions recommended by the taxa association teams for SGCN in the Mississippi Valley Loess (Figure 3.24). The score associated with the conservation action category is the sum of all priority scores associated with species for which a conservation action has been assigned, weighted by the importance of the conservation action category to the species. A higher score implies a higher quantity of SGCN and/or more greatly imperiled species would be affected by actions within this conservation action category.

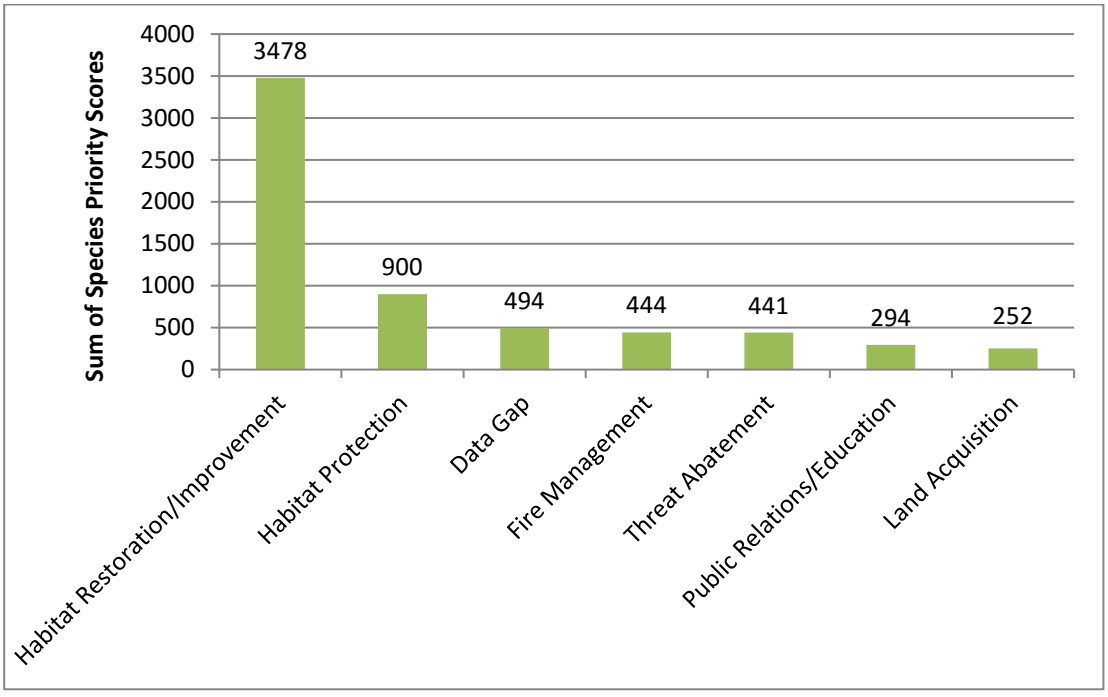


Figure 3.24. Conservation action categories recommended for the Mississippi Valley Loess Plains.

Section 4. Terrestrial Habitats

Components of Terrestrial Habitat Reports

Definition

The terrestrial habitat team described the terrestrial habitats of Arkansas in 38 types in Table 4.1. Thirty of 37 terrestrial habitat types in Arkansas were adapted from definitions provided by NatureServe (2005). The remaining seven habitat types (marked with an asterisk) were created for this project by the terrestrial habitat team.

Ranking

The Habitat Score (Table 4.1) of each terrestrial habitat is a sum of all Species Priority Scores associated with species for which this habitat is associated. A higher score implies a higher quantity of Species of Greatest Conservation Need (SGCN) and/or more greatly imperiled species occurred in the habitats listed below.

Table 4.1. Terrestrial Habitat Scores.

Habitat Name	Sum of Species Priority Scores
Caves, Mines, Sinkholes and other Karst Features	6925
Ozark-Ouachita Prairie and Woodland	3952
Ozark-Ouachita Riparian	3778
Ozark-Ouachita Mesic Hardwood Forest	2586
Ozark-Ouachita Dry Oak and Pine Woodland	2226
West Gulf Coastal Plain Calcareous Prairie and Woodland	1733
Pasture Land	1716
Ozark-Ouachita Pine-Oak Forest/Woodland	1650
Ozark-Ouachita Large Floodplain	1551
Lower Mississippi Alluvial Plain Grand Prairie	1515
Ozark-Ouachita Cliff and Talus	1503
West Gulf Coastal Plain Large River Floodplain Forest	1213
Lower Mississippi River High Bottomland Forest	1177
West Gulf Coastal Plain Small Stream/River Forest	1170
Lower Mississippi River Riparian Forest	1138
Ponds, Lakes, and Water Holes	1093
Ozark-Ouachita Dry-Mesic Oak Forest/Woodland	1070
Ozark-Ouachita Forested Seep	1055
Lower Mississippi Flatwoods Woodland and Forest	1053
Lower Mississippi River Low Bottomland Forest	1034
West Gulf Coastal Plain Red River Floodplain Forest	926

Interior Highlands Dry Acidic Glade and Barrens	905
Crop Land	876
Ozark-Ouachita Pine-Bluestem Woodland	872
Mud Flats	769
Herbaceous Wetland	738
Interior Highlands Calcareous Glade and Barrens	735
West Gulf Coastal Plain Pine-Hardwood Flatwoods	702
West Gulf Coastal Plain Seepage Swamp and Baygall	646
Ouachita Montane Oak Forest	625
Crowley's Ridge Loess Slope Forest	605
West Gulf Coastal Plain Pine-Hardwood Forest/Woodland	581
Lower Mississippi River Bottomland Depression	564
West Gulf Coastal Plain Wet Hardwood Flatwoods	450
West Gulf Coastal Plain Sandhill Oak and Shortleaf Pine	421
Urban/Suburban	403
Cultivated Forest	262
Lower Mississippi River Dune Woodland, Pond, and Forest	229

Key Factors

Each terrestrial habitat type is assigned “Key Factors” which describe those conditions most critical for maintaining the ecological function and viability of associated species. Key Factors (table 4.2) are ecological attributes deemed critical to the long-term integrity of a given habitat. The terrestrial habitat team determined the importance (weight) of the Key Factor to the overall habitat integrity.

Table 4.2. Key Factors.

Fire Regime
No-Activity Protection Zone
Canopy Closure
Composition
Percent Total Herbaceous Ground Coverage
Cave/Mine Accessibility
Disturbance Policy
Spatial Ecology
Remoteness
Recharge Area

Indicators of Terrestrial Habitat Condition

One or more measurable “Indicators” (Table 4.3) are identified for each Key Factor. The Indicator scoring criteria requires that habitat and/or population parameters of all species of conservation concern be expressed in terms that can be quantified, measured, monitored and influenced. This step also requires that each assumption, assertion and decision be supported by the best science available, including all known literature and expert opinion.

Table 4.3. Indicators of Terrestrial Habitat Condition.

Road density
Spatial extent of buffer
Canopy closure
Percent total herbaceous ground coverage
Exotic forbs and grasses
Exotic shrubs and woody vines
Broomsedge imbalance
Loblolly pine presence
Exotic forbs and grasses
Exotic forbs and grasses
Oak dominance
Red oak/Overcup oak ratio Cottonwood decline
Sugarberry increase
Oak component
Loblolly encroachment
Percent herbaceous groundcover w/minimal woody plants
Shortleaf pine decline
Percent total herbaceous ground coverage
Patch size
Patch proximity
Average block size
Number of blocks
Fire seasonality/intensity
Fire frequency
Road proximity
Percent urban/impervious
Percent forested
Percent pastureland
Point source pollution
Unpaved road density

Ratings for Indicators

For each Indicator, the terrestrial habitat team determined and weighted a range of measurements to assess the relative health of associated Key Factors, which in turn reflect the integrity of the associated habitat:

Poor Level: Rapid declines and/or extirpations imminent.
Fair Level: Gradual, long-term declines and/or extirpations possible.
Good Level: Populations are expected to remain stable indefinitely.
Very Good Level: Populations robust; increases in abundance possible.

Conservation Actions

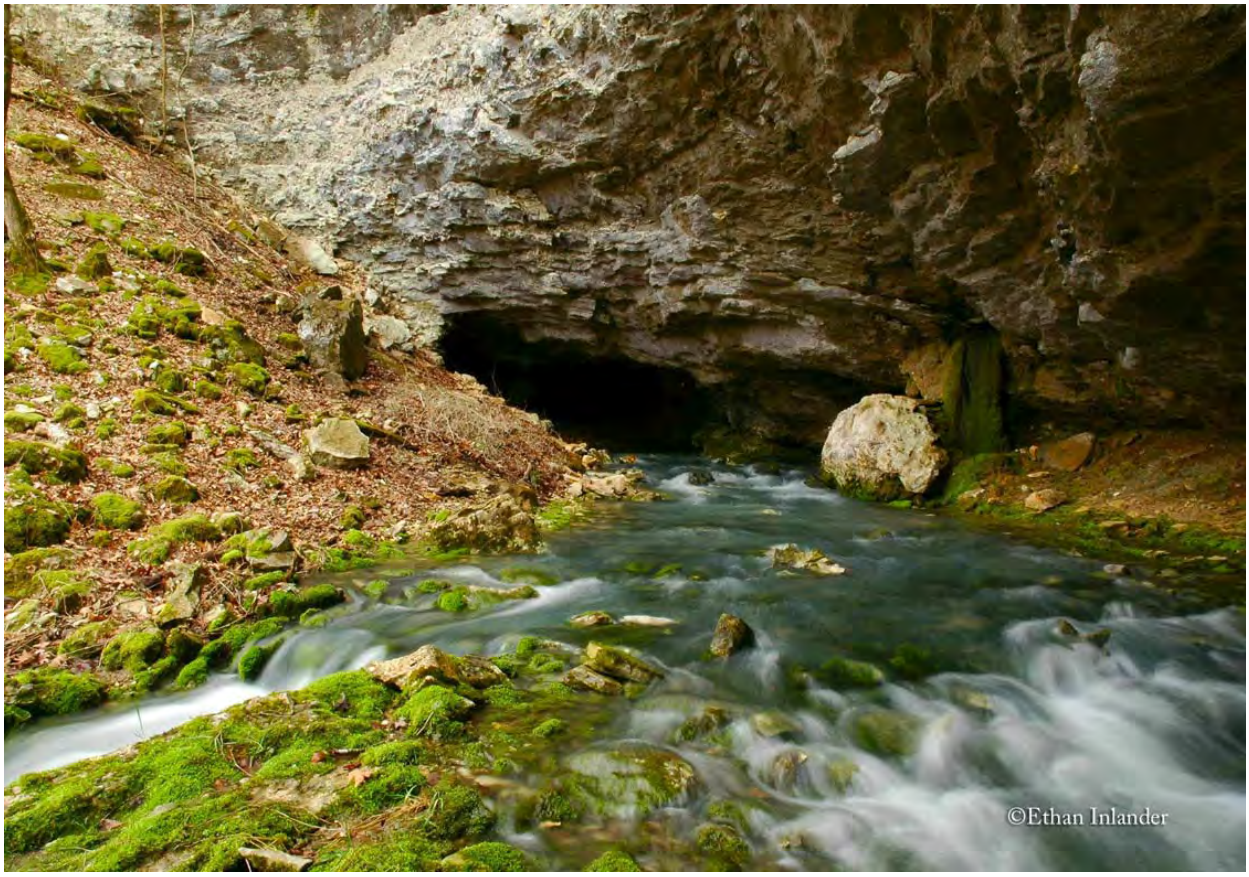
Conservation actions propose to manage and conserve the identified habitats as determined by the Indicator thresholds. The threshold for viability of the species is defined for each habitat at the ‘Good’ level. Conservation actions were formulated for each habitat that call for bringing each Indicator’s current status up to or above the ‘Good’ threshold. Using this methodology, 383 measurable conservation actions were formulated for the 38 habitat types using specific, quantified objectives for each Indicator.

Current Status and Monitoring

In addition to species-specific monitoring strategies presented in Section 2, Arkansas’ habitat monitoring strategy consists of measuring indicators in the field. In developing the AWAP, we determined one area of weakness is that information on current status, trends and effort to attain goals is lacking. Developing a cost- effective methodology for monitoring status, coordinated with adjacent states and in-state partners, public and stakeholders will be a priority for the near future of AWAP efforts.

Terrestrial Habitat Report

Habitat Name Caves, Mines, Sinkholes and other Karst Features



Ecoregions where the habitat occurs:

Ozark Highlands	Boston Mountains	Mississippi Valley Loess Plains	Arkansas Valley
☑	☑	☐	☑

Ouachita Mountains	South Central Plains	Mississippi Alluvial Plain
☑	☐	☐

Description

Karst is a landscape underlain by limestone that has been eroded by dissolution, producing ridges, towers, fissures, sinkholes, and other characteristic landforms. Caves refer to naturally occurring underground cavities, chambers, or series of chambers, especially ones with an opening in the side of a hill or mountain. Mines refer to man-made underground cavities, chambers, or series of chambers, especially ones with an opening in the side of a hill or mountain.

Species associated with this habitat type (and the weight or importance of the habitat to each species)

Caves, Mines, Sinkholes and other Karst Features

include:
Hubricht's Long-tailed Amphipod (Allocrangonyx hubrichti) Weight: Obligate
Foushee Cavesnail (Amnicola cora) Weight: Obligate
Cave Obligate Pseudoscorpion (Apochthonius diabolus) Weight: Obligate
Cave Obligate Pseudoscorpion (Apochthonius titanicus) Weight: Obligate
Amphipod (Bactrurus pseudomucronatus) Weight: Obligate
Isopod (Caecidotea ancyla) Weight: Obligate
Isopod (Caecidotea dimorpha) Weight: Obligate
Bat Cave Isopod (Caecidotea macropropoda) Weight: Obligate
Isopod (Caecidotea oculata) Weight: Obligate
Isopod (Caecidotea salemensis) Weight: Obligate
Cave Obligate Isopod (Caecidotea simulator) Weight: Obligate
Isopod (Caecidotea steevesi) Weight: Obligate
Isopod (Caecidotea stiladactyla) Weight: Obligate
Benton County Cave Crayfish (Cambarus aculabrum) Weight: Obligate
Bristly Cave Crayfish (Cambarus setosus) Weight: Obligate
Hell Creek Cave Crayfish (Cambarus zophonastes) Weight: Obligate
Cave Obligate Harvestman (Crosbyella distincta) Weight: Obligate
Cave Obligate Harvestman (Crosbyella roeweri) Weight: Obligate
Grotto Salamander "eastern clade" (Eurycea spelaea eastern) Weight: Obligate
Grotto Salamander "northern clade" (Eurycea spelaea northern) Weight: Obligate
Grotto Salamander "western clade" (Eurycea spelaea western) Weight: Obligate
Pseudoscorpion (Hesperochernes occidentalis) Weight: Obligate
Isopod (Lirceus bidentatus) Weight: Obligate
Springtail (Pseudosinella dubia) Weight: Obligate
Shelled Cave Springtail (Pseudosinella testa) Weight: Obligate
Springtail (Pygmarrhopalites clarus) Weight: Obligate
Cave Obligate Springtail (Schaefferia alabamensis) Weight: Obligate
Ozark Cave Amphipod (Stygobromus ozarkensis) Weight: Obligate
Cave Obligate Millipede (Trigenotyla parca) Weight: Obligate
Ozark Cavefish (Troglichthys rosae) Weight: Obligate
Southern Cavefish (Typhlichthys subterraneus) Weight: Obligate
Ringed Salamander (Ambystoma annulatum) Weight: Optimal
Eastern Tiger Salamander (Ambystoma tigrinum) Weight: Optimal
Ozark Big-eared Bat (Corynorhinus townsendii ingens) Weight: Optimal
Cave Obligate Planarian (Dendrocoelopsis americana) Weight: Optimal
Four-toed Salamander (Hemidactylium scutatum) Weight: Optimal
Isopod (Lirceus bicuspidatus) Weight: Optimal
Wood Frog (Lithobates sylvaticus) Weight: Optimal
Gray Bat (Myotis grisescens) Weight: Optimal
Little Brown Bat (Myotis lucifugus) Weight: Optimal
Northern Long-eared Bat (Myotis septentrionalis) Weight: Optimal
Indiana Bat (Myotis sodalis) Weight: Optimal
Ground Beetle (Rhadine ozarkensis) Weight: Optimal
Caddo Mountain Salamander (Plethodon caddoensis) Weight: Suitable
Southeastern Shrew (Sorex longirostris) Weight: Marginal

Habitat Team

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Habitat Priority Score: 6925

Caves, Mines, Sinkholes and other Karst Features

Key Factor Name Cave/Mine Accessibility

Key Factor Description: Percent of caves/mines housing species of greatest conservation need that are closed to disturbance.

Key Factor Weight: Medium

Indicator Name:	Road Proximity
Indicator Description:	Distance to nearest public road from cave entrance.
Poor Level:	<.25 mile
Fair Level:	.25-.5 mile
Good Level:	0.5-1 mile
Very Good Level:	>1 mile
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore the distance from the nearest public road to cave entrance to .5 more or more.
Monitoring Strategy:	Monitor distance to nearest public road from cave entrance.
Indicator Name:	Percent gated or fenced caves/mines
Indicator Description:	The percent of known caves and mines that have been successfuly gated.
Poor Level:	<20
Fair Level:	20-40
Good Level:	40-60
Very Good Level:	>60
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Build or maintain gates in 40 percent or more of the caves and mines known to have ecologically sensitive biota.
Monitoring Strategy:	Monitor percent of known caves and mines that have been successfuly gated.

Key Factor Name Recharge area

Key Factor Description: The surface and sub-surface hydrologic area contributing water and the compounds (nutrients/sediments/pollutants) water carries to the cave system.

Key Factor Weight: High

Indicator Name: Point source pollution

Indicator Description: Number of Point Source Pollution permits per square mile in the recharge area.

Poor Level: 0.465-0.297

Fair Level: 0.296-0.184

Good Level: 0.183-0.036

Very Good Level: <0.036

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Maintain or reduce the number of Point Source Pollution permits to .183 or fewer per square mile in the recharge area.

Monitoring Strategy: Monitor number of Point Source Pollution permits per square mile in the recharge area.

Indicator Name: Percent Forested

Indicator Description: Percent total land cover in the recharge area that is forested.

Poor Level: <25

Fair Level: 25-50

Good Level: 50-75

Very Good Level: >75

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Maintain or, where necessary, restore the total land cover in the recharge area that is forested to 50 percent or more.

Monitoring Strategy: Monitor percent total land cover in the recharge area that is forested.

Key Factor Name Recharge area

Indicator Name:	Unpaved road density
Indicator Description:	Miles of unpaved road per square mile of recharge area.
Poor Level:	>2 miles
Fair Level:	1-2 miles
Good Level:	0.5-1 mile
Very Good Level:	<0.5 mile
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore the miles of unpaved road per square mile of recharge area to one or less.
Monitoring Strategy:	Monitor miles of unpaved road per square mile of recharge area.
Indicator Name:	Percent Urban/impervious
Indicator Description:	The percent of total land cover in the recharge area that is urban/impervious.
Poor Level:	>25
Fair Level:	15-25
Good Level:	5-15
Very Good Level:	<5
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore the total land cover in the recharge area that is urban/impervious to 15 percent or less.
Monitoring Strategy:	Monitor percent total land cover in the recharge area that is urban/impervious.

Key Factor Name Recharge area

Indicator Name:	Percent pasture land
Indicator Description:	Percent total land cover in the recharge area that is pasture land.
Poor Level:	>75
Fair Level:	50-75
Good Level:	25-50
Very Good Level:	<25
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore the total land cover in the recharge area that is pasture land to 50 percent or less.
Monitoring Strategy:	Monitor percent total land cover in the recharge area that is pasture land.

Habitat Name Crop Land



Ecoregions where the habitat occurs:

Ozark Highlands	Boston Mountains	Mississippi Valley Loess Plains	Arkansas Valley
☑	☑	☑	☑

Ouachita Mountains	South Central Plains	Mississippi Alluvial Plain
☑	☑	☑

Description

This type includes cultivated fields or aquaculture ponds, often many acres in size, managed specifically for a single crop. Occasional edges around the perimeter provide some habitat diversity.

Species associated with this habitat type (and the weight or importance of the habitat to each species) include:
American Black Duck (Anas rubripes) Weight: Suitable
Trumpeter Swan (Cygnus buccinator) Weight: Suitable
Migrant Loggerhead Shrike (Lanius ludovicianus) Weight: Suitable
Short-billed Dowitcher (Limnodromus griseus) Weight: Suitable
American Golden-Plover (Pluvialis dominica) Weight: Suitable

Crop Land

American Badger (Taxidea taxus) Weight: Suitable
Grasshopper Sparrow (Ammodramus savannarum) Weight: Marginal
Sprague's Pipit (Anthus spragueii) Weight: Marginal
Ruddy Turnstone (Arenaria interpres) Weight: Marginal
Smith's Longspur (Calcarius pictus) Weight: Marginal
Sanderling (Calidris alba) Weight: Marginal
Dunlin (Calidris alpina) Weight: Marginal
Stilt Sandpiper (Calidris himantopus) Weight: Marginal
Buff-breasted Sandpiper (Calidris subruficollis) Weight: Marginal
Piping Plover (Charadrius melodus) Weight: Marginal
Common Nighthawk (Chordeiles minor) Weight: Marginal
Northern Bobwhite (Colinus virginianus) Weight: Marginal
Rusty Blackbird (Euphagus carolinus) Weight: Marginal
Ozark Pocket Gopher (Geomys bursarius ozarkensis) Weight: Marginal
Least Bittern (Ixobrychus exilis) Weight: Marginal
Black-tailed Jackrabbit (Lepus californicus) Weight: Marginal
Black-crowned Night-Heron (Nycticorax nycticorax) Weight: Marginal
Black-bellied Plover (Pluvialis squatarola) Weight: Marginal
Purple Gallinule (Porphyrio martinicus) Weight: Marginal
Illinois Chorus Frog (Pseudacris illinoensis) Weight: Marginal
Strecker's Chorus Frog (Pseudacris streckeri) Weight: Marginal
King Rail (Rallus elegans) Weight: Marginal
Western Harvest Mouse (Reithrodontomys megalotis) Weight: Marginal
Eastern Spadefoot (Scaphiopus holbrookii) Weight: Marginal
Hurter's Spadefoot (Scaphiopus hurterii) Weight: Marginal
American Woodcock (Scolopax minor) Weight: Marginal
Eastern Spotted Skunk (Spilogale putorius) Weight: Marginal
Long-tailed Weasel (Mustela frenata) Weight: Data Gap

Habitat Team

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Habitat Priority Score: 876

Crop Land

Key Factor Name Fire Regime

Key Factor Description: Fire Return Interval and Seasonality, including landscape-scale fire in surrounding/adjacent habitats to prevent woody encroachment and allow for distribution and dispersal of obligate species

Key Factor Weight: Medium

Indicator Name: Fire Seasonality/Intensity

Indicator Description: The percent of areas burned during either March/April or Aug/Sept, or from leaf-expansion to leaf-fall, depending on project-level goals. In some but not all cases, seasonality is an accurate surrogate for intensity. Since intensity goals will vary from burn to burn it is difficult to "pre-quantify" ideal intensity objectives at a forest-wide scale. It is presumed that restoration, maintenance, fuel-reduction and other prescribed fire goals will be considered at the project level when planning burn intensity.

Poor Level: <25

Fair Level: 25-50

Good Level: 51-75

Very Good Level: >75

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: When burning, burn during either March/April or August/September, or from leaf-expansion to leaf-fall, depending on project-level goals.

Monitoring Strategy: Monitor percent of burned areas burned during either March/April or Aug/Sept, or from leaf-expansion to leaf-fall, depending on project-level goals. In some but not all cases, seasonality is an accurate surrogate for intensity. Since intensity goals will vary from burn to burn it is difficult to "pre-quantify" ideal intensity objectives at a forest-wide scale. It is presumed that restoration, maintenance, fuel-reduction and other prescribed fire goals will be considered at the project level when planning burn intensity.

Key Factor Name Remoteness

Key Factor Description: Mean density of roads (miles per square mile) within this community type at the landscape scale.

Key Factor Weight: Medium

Indicator Name: Road Density

Indicator Description: Average number of road miles per square mile across all known occurrences of this target.

Poor Level: >2 miles

Fair Level: 1-2 miles

Good Level: 0.5-1 mile

Very Good Level: <0.5 mile

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Maintain or, where necessary, restore the average number of road miles per square mile to one or less across all known occurrences of this target.

Monitoring Strategy: Monitor average number of road miles per square mile across all known occurrences of this target.

Habitat Name Crowley's Ridge Loess Slope Forest



Ecoregions where the habitat occurs:

Ozark Highlands ☐	Boston Mountains ☐	Mississippi Valley Loess Plains ☑	Arkansas Valley ☐
Ouachita Mountains ☐	South Central Plains ☐	Mississippi Alluvial Plain ☐	

Description

This system of upland forests is confined to a series of narrow ridges on Crowley's Ridge. This vegetation is very distinctive from that of the adjacent alluvial plain, and may represent the only forested terrain in a largely agricultural landscape. The ridges themselves also contrast sharply with the adjacent alluvial plain. It is a remnant loess-capped features rising from 100-200 feet above the alluvial plain surface. These are generally mesic and dry-mesic forests that occupy narrow, "finger" ridges and slopes in a highly dissected landscape. In many cases, these slopes and ravines provide habitat for plant species that are rare or absent from other parts of the alluvial plain (e.g., Liriodendron tulipifera). In the ravines and slopes, canopies are dominated by Fagus grandifolia, Quercus alba, and Liriodendron tulipifera, with many associates. Forests on the ridgetops are dominated by Quercus alba, Quercus rubra, Quercus falcata, Quercus stellata, Carya texana, Pinus echinata and Quercus velutina.

Crowley's Ridge Loess Slope Forest

(adapted from NatureServe 2005)

Species associated with this habitat type (and the weight or importance of the habitat to each species) include:
Common Wormsnake (Carphophis amoenus) Weight: Obligate
Yellow-billed Cuckoo (Coccyzus americanus) Weight: Optimal
Spotted Dusky Salamander (Desmognathus conanti) Weight: Optimal
Mole Salamander (Ambystoma talpoideum) Weight: Suitable
Eastern Whip-poor-will (Antrostomus vociferus) Weight: Suitable
Chimney Swift (Chaetura pelagica) Weight: Suitable
Monarch (Danaus plexippus) Weight: Suitable
Purple Finch (Haemorhous purpureus) Weight: Suitable
Wood Thrush (Hylocichla mustelina) Weight: Suitable
Swainson's Warbler (Limnothlypis swainsonii) Weight: Suitable
Bronze Copper (Lycaena hyllus) Weight: Suitable
Eastern Spadefoot (Scaphiopus holbrookii) Weight: Suitable
American Woodcock (Scolopax minor) Weight: Suitable
Sharp-shinned Hawk (Accipiter striatus) Weight: Marginal
Cerulean Warbler (Setophaga cerulea) Weight: Marginal
Long-tailed Weasel (Mustela frenata) Weight: Data Gap

Habitat Team

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Habitat Priority Score: 605

Key Factor Name Fire Regime

Key Factor Description: Fire Return Interval and Seasonality, including landscape-scale fire in surrounding/adjacent habitats to prevent woody encroachment and allow for distribution and dispersal of obligate species

Key Factor Weight: Medium

Indicator Name: Fire Frequency

Indicator Description: Average percent of all known occurrences burned per 3-7 year interval.

Poor Level: <25

Fair Level: 25-50

Good Level: 51-75

Very Good Level: >75

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Burn at least 51 percent of the spatial extent of all known occurrences of this habitat type every 3-7 years.

Monitoring Strategy: Monitor average percent of all known occurrences burned per 3-7 year interval.

Key Factor Name Fire Regime

Indicator Name:	Fire Seasonality/Intensity
Indicator Description:	The percent of areas burned during either March/April or Aug/Sept, or from leaf-expansion to leaf-fall, depending on project-level goals. In some but not all cases, seasonality is an accurate surrogate for intensity. Since intensity goals will vary from burn to burn it is difficult to "pre-quantify" ideal intensity objectives at a forest-wide scale. It is presumed that restoration, maintenance, fuel-reduction and other prescribed fire goals will be considered at the project level when planning burn intensity.
Poor Level:	<25
Fair Level:	25-50
Good Level:	51-75
Very Good Level:	>75
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	When burning, burn during either March/April or August/September, or from leaf-expansion to leaf-fall, depending on project-level goals.
Monitoring Strategy:	Monitor percent of burned areas burned during either March/April or Aug/Sept, or from leaf-expansion to leaf-fall, depending on project-level goals. In some but not all cases, seasonality is an accurate surrogate for intensity. Since intensity goals will vary from burn to burn it is difficult to "pre-quantify" ideal intensity objectives at a forest-wide scale. It is presumed that restoration, maintenance, fuel-reduction and other prescribed fire goals will be considered at the project level when planning burn intensity.

Key Factor Name Remoteness

Key Factor Description: Mean density of roads (miles per square mile) within this community type at the landscape scale.

Key Factor Weight: Medium

Indicator Name: Road Density

Indicator Description: Average number of road miles per square mile across all known occurrences of this target.

Poor Level: >2 miles

Fair Level: 1-2 miles

Good Level: 0.5-1 mile

Very Good Level: <0.5 mile

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Maintain or, where necessary, restore the average number of road miles per square mile to one or less across all known occurrences of this target.

Monitoring Strategy: Monitor average number of road miles per square mile across all known occurrences of this target.

Key Factor Name Spatial Ecology

Key Factor Description: The relative spatial abundance, proximity, distribution, and arrangement of this habitat type on the landscape.

Key Factor Weight: Medium

Indicator Name: Number of Blocks

Indicator Description: Total number of blocks statewide

Poor Level: 0-1

Fair Level: 2

Good Level: 3

Very Good Level: >3

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Maintain or, where necessary, restore number of blocks to three or more. (Block is defined by the minimum convex polygon bounded by known occurrences of this habitat type in which the median patch size is above the fair level for patch size, and in which each of the patches score fair or better on the patch proximity threshold.)

Monitoring Strategy: Monitor total number of blocks statewide.

Indicator Name: Patch Proximity

Indicator Description: Median nearest distance between patches.

Poor Level: >4 miles

Fair Level: 2-4 miles

Good Level: 1-2 miles

Very Good Level: <1 mile

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Maintain or, where necessary, restore the median nearest distance between patches of this habitat type to two miles or less.

Monitoring Strategy: Monitor median nearest distance between patches.

Key Factor Name Spatial Ecology

Indicator Name:	Patch Size
Indicator Description:	Average patch size across all known occurrences (acres)
Poor Level:	<250 acres
Fair Level:	250-500 acres
Good Level:	501-1,000 acres
Very Good Level:	>1,000 acres
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore the average patch size of this habitat type to 501 acres or more across all known occurrences.
Monitoring Strategy:	Monitor average patch size across all known occurrences (acres).
Indicator Name:	Average Block Size
Indicator Description:	Block is defined by the minimum convex polygon bounded by known occurrences of this habitat type in which the median patch size is above the fair level for patch size, and in which each of the patches score fair or better on the patch proximity threshold.
Poor Level:	<2,500 acres
Fair Level:	2,500-5,000 acres
Good Level:	5,001-10,000 acres
Very Good Level:	>10000 acres
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore average block size to 5,001 acres or more. (Block is defined by the minimum convex polygon bounded by known occurrences of this habitat type in which the median patch size is above the fair level for patch size, and in which each of the patches score fair or better on the patch proximity threshold.)
Monitoring Strategy:	Monitor block size.

Habitat Name Cultivated Forest



Ecoregions where the habitat occurs:

Ozark Highlands ☑	Boston Mountains ☑	Mississippi Valley Loess Plains ☑	Arkansas Valley ☑
Ouachita Mountains ☑	South Central Plains ☑	Mississippi Alluvial Plain ☑	

Description

This type includes plantations primarily composed of pine with regularly spaced trees planted for commercial production and subject to periodic silvicultural maintenance. This habitat type is extensive in Arkansas and is used by many species of conservation concern. Key factors and Indicators have often been derived in relationship to species of concern that use this habitat. In some cases, this habitat replaces native terrestrial habitats and may be of conservation concern from that standpoint.

Species associated with this habitat type (and the weight or importance of the habitat to each species) include:
Sharp-shinned Hawk (Accipiter striatus) Weight: Suitable
Eastern Whip-poor-will (Antrostomus vociferus) Weight: Suitable

Cultivated Forest

Purple Finch (Haemorhous purpureus) Weight: Suitable
Cobweb Skipper (Hesperia metea) Weight: Suitable
Yellow-billed Cuckoo (Coccyzus americanus) Weight: Marginal
Northern Bobwhite (Colinus virginianus) Weight: Marginal
Wood Thrush (Hylocichla mustelina) Weight: Marginal
Swainson's Warbler (Limnothlypis swainsonii) Weight: Marginal
Bachman's Sparrow (Peucaea aestivalis) Weight: Marginal
Long-tailed Weasel (Mustela frenata) Weight: Data Gap

Habitat Team

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Habitat Priority Score: 262

Cultivated Forest

Key Factor Name Composition

Key Factor Description: The diversity, species richness, and relative abundance of vegetative elements in this habitat type.

Key Factor Weight: Medium

Indicator Name: Bedding or Hipping

Indicator Description: The percent area where raised beds are created for tree planting

Poor Level: >20

Fair Level: 10-19

Good Level: 5-9

Very Good Level: <5

Current_Status:

Indicator Weight: High

Conservation Action: Maintain or, where necessary restore, the percentage of bedded or hipped areas to nine percent or less.

Monitoring Strategy: Monitor percent of area where raised beds are created for tree planting.

Indicator Name: Invasive shrubs and woody vines

Indicator Description: The percent of ground cover in non-native woody species

Poor Level: >20

Fair Level: 10-20

Good Level: 5-9

Very Good Level: <5

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Maintain or, where necessary, restore the percent of groundcover in invasive woody species to nine percent or less.

Monitoring Strategy: Monitor the percent of ground cover in non-native woody species.

Key Factor Name Composition

Indicator Name:	Exotic Forbs and Grasses
Indicator Description:	The percent of ground cover in non-native herbaceous species
Poor Level:	>20
Fair Level:	10-20
Good Level:	5-9
Very Good Level:	<5
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore the percent of groundcover in non-native herbaceous vegetation to nine percent or less.
Monitoring Strategy:	Monitor the percent of ground cover in non-native herbaceous species.

Key Factor Name Fire Regime

Key Factor Description: Fire Return Interval and Seasonality, including landscape-scale fire in surrounding/adjacent habitats to prevent woody encroachment and allow for distribution and dispersal of obligate species

Key Factor Weight: Medium

Indicator Name: Fire Seasonality/Intensity

Indicator Description: The percent of areas burned during either March/April or Aug/Sept, or from leaf-expansion to leaf-fall, depending on project-level goals. In some but not all cases, seasonality is an accurate surrogate for intensity. Since intensity goals will vary from burn to burn it is difficult to "pre-quantify" ideal intensity objectives at a forest-wide scale. It is presumed that restoration, maintenance, fuel-reduction and other prescribed fire goals will be considered at the project level when planning burn intensity.

Poor Level: <25

Fair Level: 25-50

Good Level: 51-75

Very Good Level: >75

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: When burning, burn during either March/April or August/September, or from leaf-expansion to leaf-fall, depending on project-level goals.

Monitoring Strategy: Monitor percent of burned areas burned during either March/April or Aug/Sept, or from leaf-expansion to leaf-fall, depending on project-level goals. In some but not all cases, seasonality is an accurate surrogate for intensity. Since intensity goals will vary from burn to burn it is difficult to "pre-quantify" ideal intensity objectives at a forest-wide scale. It is presumed that restoration, maintenance, fuel-reduction and other prescribed fire goals will be considered at the project level when planning burn intensity.

Key Factor Name Fire Regime

Indicator Name:	Fire Frequency
Indicator Description:	Average percent of all known occurrences burned per 3-5 year interval.
Poor Level:	<25
Fair Level:	25-50
Good Level:	51-75
Very Good Level:	>75
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Burn at least 51 percent of the spatial extent of all known occurrences of this habitat type every 3-5 years.
Monitoring Strategy:	Monitor average percent of all known occurrences burned per 3-5 year interval.

Key Factor Name Remoteness

Key Factor Description: Mean density of roads (miles per square mile) within this community type at the landscape scale.

Key Factor Weight: Medium

Indicator Name: Road Density

Indicator Description: Average number of road miles per square mile across all known occurrences of this target.

Poor Level: >2 miles

Fair Level: 1-2 miles

Good Level: 0.5-1 mile

Very Good Level: <0.5 mile

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Maintain or, where necessary, restore the average number of road miles per square mile to one or less across all known occurrences of this target.

Monitoring Strategy: Monitor average number of road miles per square mile across all known occurrences of this target.

Key Factor Name Spatial Ecology

Key Factor Description: The relative spatial abundance, proximity, distribution and arrangement of this habitat type on the landscape.

Key Factor Weight: Medium

Indicator Name:	Patch Proximity
Indicator Description:	Median nearest distance between patches.
Poor Level:	>4 miles
Fair Level:	2-4 miles
Good Level:	1-2 miles
Very Good Level:	<1 mile
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore the median nearest distance between patches of this habitat type to two miles or less.
Monitoring Strategy:	Monitor median nearest distance between patches.
Indicator Name:	Patch Size
Indicator Description:	Average patch size across all known occurrences (acres)
Poor Level:	<250 acres
Fair Level:	250-500 acres
Good Level:	501-1,000 acres
Very Good Level:	>1,000 acres
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore the average patch size of this habitat type to 501 acres or more across all known occurrences.
Monitoring Strategy:	Monitor average patch size across all known occurrences (acres).

Key Factor Name Spatial Ecology

Indicator Name:	Number of Blocks
Indicator Description:	Total number of blocks statewide
Poor Level:	0-1
Fair Level:	2
Good Level:	3
Very Good Level:	>3
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore number of blocks to three or more. (Block is defined by the minimum convex polygon bounded by known occurrences of this habitat type in which the median patch size is above the fair level for patch size, and in which each of the patches score fair or better on the patch proximity threshold.)
Monitoring Strategy:	Monitor total number of blocks statewide.
Indicator Name:	Average Block Size
Indicator Description:	Block is defined by the minimum convex polygon bounded by known occurrences of this habitat type in which the median patch size is above the fair level for patch size, and in which each of the patches score fair or better on the patch proximity threshold.
Poor Level:	<2,499 acres
Fair Level:	2,500-5,000 acres
Good Level:	5,001-10,000 acres
Very Good Level:	>10,000 acres
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore average block size to 5,001 acres or more. (Block is defined by the minimum convex polygon bounded by known occurrences of this habitat type in which the median patch size is above the fair level for patch size, and in which each of the patches score fair or better on the patch proximity threshold.)
Monitoring Strategy:	Monitor block size.

Habitat Name Herbaceous Wetland



Ecoregions where the habitat occurs:

Ozark Highlands ☑	Boston Mountains ☑	Mississippi Valley Loess Plains ☑	Arkansas Valley ☑
Ouachita Mountains ☑	South Central Plains ☑	Mississippi Alluvial Plain ☑	

Description

This system represents semipermanently flooded to saturated depressional areas. They are typically created by changes in channels of meandering streams or other depressions, or by anthroprogenic activity. These may occur both within and outside the frequently flooded bottoms where the river flows. Vegetation typically includes Typha latifolia, Juncus spp and Scirpus spp. This broad habitat type includes wetlands across Arkansas in both the Interior Highlands and the Coastal Plain/Mississippi River Alluvial Plain that have a substantial cover of emergent herbaceous vegetation (>25%), with limited cover of woody shrubs (<25% of vegetated cover) and no or only scattered trees. Natural types occur in depressions within prairies, in active or abandoned beaver ponds, on the margins of oxbow lakes, in sinkhole and upland depression ponds, and where forested wetlands have been deforested by catastrophic fire, winds or other natural processes. Semi-Natural and Ruderal types occur within or on

the margins of constructed reservoirs or in areas where drainage has been blocked or forest cover has been removed by anthropogenic activity. Vegetation zones often exist, typically related to water depth, characterized by such species (from deepest to shallowest) as cattail, spike rush, prairie cordgrass, gammagrass and switchgrass. Southern wild rice is common or abundant in some areas. Mudflats occur when water levels drop, and "moist soil" species such as smartweed may become abundant. Alligatorweed may become abundant to the south, and a variety of sedges, along with water primrose, arrowhead and needle-rush are common.
These habitats are important to reptiles, amphibians and of special concern, secretive marsh birds such as rails, gallinules and bitterns, along with herons and egrets. During wet months the habitats host dabbling
ducks.

Species associated with this habitat type (and the weight or importance of the habitat to each species)
include:

American Bittern (Botaurus lentiginosus) Weight: Optimal
Sedge Wren (Cistothorus platensis) Weight: Optimal
Trumpeter Swan (Cygnus buccinator) Weight: Optimal
Dion Skipper (Euphyes dion) Weight: Optimal
Dukes' Skipper (Euphyes dukesi) Weight: Optimal
Common Gallinule (Gallinula galeata) Weight: Optimal
Least Bittern (Ixobrychus exilis) Weight: Optimal
Black-crowned Night-Heron (Nycticorax nycticorax) Weight: Optimal
Purple Gallinule (Porphyrio martinicus) Weight: Optimal
King Rail (Rallus elegans) Weight: Optimal
Tricolored Heron (Egretta tricolor) Weight: Suitable
Bronze Copper (Lycaena hyllus) Weight: Suitable
Swamp Metalmark (Calephelis muticum) Weight: Data Gap

Habitat Team

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Habitat Priority Score: 738

Key Factor Name Composition

Key Factor Description: The diversity, species richness, and relative abundance of vegetative elements in this habitat type.

Key Factor Weight: Medium

Indicator Name: Invasive shrubs and woody vines

Indicator Description: The percent of ground cover in non-native woody species

Poor Level: >20

Fair Level: 10-20

Good Level: 5-9

Very Good Level: <5

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Maintain or, where necessary, restore the percent of groundcover in invasive woody species to nine percent or less.

Monitoring Strategy: Monitor the percent of ground cover in non-native herbaceous species.

Indicator Name: Exotic Forbs and Grasses

Indicator Description: The percent of ground cover in non-native herbaceous species

Poor Level: >20

Fair Level: 10-20

Good Level: 5-9

Very Good Level: <5

Current_Status: Data Gap

Indicator Weight: High

Conservation Action: Maintain or, where necessary, restore the percent of groundcover in non-native herbaceous vegetation to nine percent or less.

Monitoring Strategy:

Key Factor Name Fire Regime

Key Factor Description: Fire Return Interval and Seasonality, including landscape-scale fire in surrounding/adjacent habitats to prevent woody encroachment and allow for distribution and dispersal of obligate species.

Key Factor Weight: Medium

Indicator Name: Fire Seasonality/ Intensity

Indicator Description: The percent of areas burned during either March/April or Aug/Sept, or from leaf-expansion to leaf-fall, depending on project-level goals. In some but not all cases, seasonality is an accurate surrogate for intensity. Since intensity goals will vary from burn to burn it is difficult to "pre-quantify" ideal intensity objectives at a forest-wide scale. It is presumed that restoration, maintenance, fuel-reduction and other prescribed fire goals will be considered at the project level when planning burn intensity.

Poor Level: <25

Fair Level: 25-50

Good Level: 51-75

Very Good Level: >75

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: When burning, burn during either March/April or August/September, or from leaf-expansion to leaf-fall, depending on project-level goals.

Monitoring Strategy: Monitor percent of burned areas burned during either March/April or Aug/Sept., or from leaf-expansion to leaf-fall, depending on project-level goals. In some, but not all cases, seasonality is an accurate surrogate for intensity. Since intensity goals will vary from burn to burn, it is difficult to "pre-quantify" ideal intensity objectives at a forest-wide scale. It is presumed that restoration, maintenance, fuel-reduction and other prescribed fire goals will be considered at the project level when planning burn intensity.

Key Factor Name Fire Regime

Indicator Name:	Fire frequency
Indicator Description:	Average percent of all known occurrences plus 100 meter buffer burned per 5-100 year interval.
Poor Level:	<25
Fair Level:	25-50
Good Level:	51-75
Very Good Level:	>75
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Burn at least 51 percent of the spatial extent plus 100 meter buffer of all known occurrences of this habitat type every 2-5 years.
Monitoring Strategy:	Monitor the average percent of all known occurrences plus 100 meter buffer burned per 2-10 year interval.

Key Factor Name Remoteness

Key Factor Description: Mean density of roads (miles per square mile) within this community type at the landscape scale.

Key Factor Weight: Medium

Indicator Name: Road Density

Indicator Description: Average number of road miles per square mile across all known occurrences of this target.

Poor Level: > 2 miles

Fair Level: 1-2 miles

Good Level: 0.5-1 mile

Very Good Level: <0.5 mile

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Maintain or, where necessary, restore the average number of road miles per square mile to one or less across all known occurrences of this target.

Monitoring Strategy: Monitor average number of road miles per square mile across all known occurrences of this target.

Key Factor Name Spatial Ecology

Key Factor Description: The relative spatial abundance, proximity, distribution, and arrangement of this habitat type on the landscape.

Key Factor Weight: Medium

Indicator Name: Average Block Size

Indicator Description: Block is defined by the minimum convex polygon bounded by known occurrences of this habitat type in which the median patch size is above the fair level for patch size, and in which each of the patches score fair or better on the patch proximity threshold.

Poor Level: <1,000 acres

Fair Level: 1,000-2,000 acres

Good Level: 2,000-4,000 acres

Very Good Level: >4,000 acres

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Maintain or, where necessary, restore average block size to 2,000 acres or more. (Block is defined by the minimum convex polygon bounded by known occurrences of this habitat type in which the median patch size is above the fair level for patch size, and in which each of the patches score fair or better on the patch proximity threshold.)

Monitoring Strategy: Monitor block size.

Key Factor Name Spatial Ecology

Indicator Name:	Number of Blocks
Indicator Description:	Total number of blocks statewide
Poor Level:	0-1
Fair Level:	2
Good Level:	3
Very Good Level:	>3
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore number of blocks to three or more. (Block is defined by the minimum convex polygon bounded by known occurrences of this habitat type in which the median patch size is above the fair level for patch size, and in which each of the patches score fair or better on the patch proximity threshold.)
Monitoring Strategy:	Monitor total number of blocks statewide.
Indicator Name:	Patch Size
Indicator Description:	Width of buffer (meters)
Poor Level:	<100 meters of buffer
Fair Level:	100-250 meters of buffer
Good Level:	251-400 meters of buffer
Very Good Level:	>400 meters of buffer
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain, or where necessary, buffer known occurrences of this habitat type with a minimum of 251 meters of adjacent but dissimilar habitats.
Monitoring Strategy:	Monitor width of buffer (meters).

Key Factor Name Spatial Ecology

Indicator Name:	Patch Proximity
Indicator Description:	Median nearest distance between patches.
Poor Level:	>3200 meters
Fair Level:	1601-3200 meters
Good Level:	800-1600 meters
Very Good Level:	<800 meters
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore the average distance between patches to 1,600 meters or less.
Monitoring Strategy:	Monitor median nearest distance between patches.
Indicator Name:	Patch Size
Indicator Description:	Area of patch
Poor Level:	<0.5 ha
Fair Level:	0.5 ha
Good Level:	1.0 ha
Very Good Level:	>2.0 ha
Current_Status:	
Indicator Weight:	Medium
Conservation Action:	Maintain, or where possible, enlarge known occurrences of this habitat to 0.1 ha.
Monitoring Strategy:	Monitor width of buffers (meters).

Habitat Name Interior Highlands Calcareous Glade and Barrens



Ecoregions where the habitat occurs:

Ozark Highlands	Boston Mountains	Mississippi Valley Loess Plains	Arkansas Valley
☑	☑	☐	☐

Ouachita Mountains	South Central Plains	Mississippi Alluvial Plain
☑	☐	☐

Description

This system is found along moderate to steep slopes and steep valleys on primarily southerly to westerly facing slopes. Limestone, dolomite or shale bedrock typify this system with shallow, moderately to well-drained soils interspersed with rocks. These soils often dry out during the summer and autumn, and then become saturated during the winter and spring. Schizachyrium scoparium dominates this system and is commonly associated with Andropogon gerardii, Bouteloua curtipendula, and calcium-loving plant species. Stunted woodlands primarily dominated by Quercus muehlenbergii interspersed with Juniperus virginiana occur on variable-depth-to-bedrock soils. Fire is the primary natural dynamic, and prescribed fires help manage this system by restricting woody growth and maintaining the more open glade structure.These systems are usually small, isolated, and/or disjunct and are often embedded in a larger habitat matrix. These systems rely heavily on surrounding and/or adjacent habitats for landscape scale

functions and processes such as fire. (adapted from Natureserve 2005)

Species associated with this habitat type (and the weight or importance of the habitat to each species) include:
Eastern Collared Lizard (Crotaphytus collaris) Weight: Obligate
Western Groundsnake (Sonora semiannulata) Weight: Obligate
Northern Metalmark (Calephelis borealis) Weight: Optimal
Scrubland Tiger Beetle (Cicindela obsoleta) Weight: Optimal
Baltimore Checkerspot (Euphydryas phaeton ozarkae) Weight: Optimal
Common Nighthawk (Chordeiles minor) Weight: Suitable
Outis Skipper (Cogia outis) Weight: Suitable
Monarch (Danaus plexippus) Weight: Suitable
Purple Finch (Haemorhous purpureus) Weight: Suitable
Cobweb Skipper (Hesperia metea) Weight: Suitable
Crawford's Gray Shrew (Notiosorex crawfordi) Weight: Suitable
Slender Glass Lizard (Ophisaurus attenuatus) Weight: Suitable
Diana (Speyeria diana) Weight: Suitable
Eastern Whip-poor-will (Antrostomus vociferus) Weight: Marginal
Long-tailed Weasel (Mustela frenata) Weight: Data Gap
Bewick's Wren (Thryomanes bewickii) Weight: Data Gap

Habitat Team

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Habitat Priority Score: 735

Key Factor Name Composition

Key Factor Description: The diversity, species richness, and relative abundance of vegetative elements in this habitat type.

Key Factor Weight: Low

Indicator Name: Exotic Forbs and Grasses

Indicator Description: The percent of ground cover in non-native herbaceous species

Poor Level: >20

Fair Level: 10-20

Good Level: 5-9

Very Good Level: <5

Current_Status: Data Gap

Indicator Weight: High

Conservation Action: Maintain or, where necessary, restore the percent of groundcover in non-native herbaceous vegetation to nine percent or less.

Monitoring Strategy: Monitor the percent of ground cover in non-native herbaceous species.

Indicator Name: Invasive shrubs and woody vines

Indicator Description: The percent of ground cover in non-native woody species

Poor Level: >20

Fair Level: 10-20

Good Level: 5-9

Very Good Level: <5

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Maintain or, where necessary, restore the percent of groundcover in invasive woody species to nine percent or less.

Monitoring Strategy: Monitor the percent of ground cover in non-native woody species.

Key Factor Name Fire Regime

Key Factor Description: Fire Return Interval and Seasonality, including landscape-scale fire in surrounding/adjacent habitats to prevent woody encroachment and allow for distribution and dispersal of obligate species

Key Factor Weight: Medium

Indicator Name: Fire Seasonality/Intensity

Indicator Description: The percent of areas burned during either March/April or Aug/Sept, or from leaf-expansion to leaf-fall, depending on project-level goals. In some but not all cases, seasonality is an accurate surrogate for intensity. Since intensity goals will vary from burn to burn it is difficult to "pre-quantify" ideal intensity objectives at a forest-wide scale. It is presumed that restoration, maintenance, fuel-reduction and other prescribed fire goals will be considered at the project level when planning burn intensity.

Poor Level: <25

Fair Level: 25-50

Good Level: 51-75

Very Good Level: >75

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: When burning, burn during either March/April or August/September, or from leaf-expansion to leaf-fall, depending on project-level goals.

Monitoring Strategy: Monitor percent of burned areas burned during either March/April or Aug/Sept, or from leaf-expansion to leaf-fall, depending on project-level goals. In some but not all cases, seasonality is an accurate surrogate for intensity. Since intensity goals will vary from burn to burn it is difficult to "pre-quantify" ideal intensity objectives at a forest-wide scale. It is presumed that restoration, maintenance, fuel-reduction and other prescribed fire goals will be considered at the project level when planning burn intensity.

Key Factor Name Fire Regime

Indicator Name:	Fire Frequency
Indicator Description:	Average percent of all known occurrences plus 100 meter buffer burned per 3-5 year interval.
Poor Level:	<25
Fair Level:	25-50
Good Level:	51-75
Very Good Level:	>75
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Burn at least 51 percent of the spatial extent plus 100 meter buffer of all known occurrences of this habitat type every 3-5 years.
Monitoring Strategy:	Monitor average percent of all known occurrences plus 100 meter buffer burned per 3-5 year interval.

Key Factor Name Remoteness

Key Factor Description: Mean density of roads (miles per square mile) within this community type at the landscape scale.

Key Factor Weight: Medium

Indicator Name: Road Density

Indicator Description: Average number of road miles per square mile across all known occurrences of this target.

Poor Level: >2 miles

Fair Level: 1-2 miles

Good Level: 0.5-1 mile

Very Good Level: <0.5 mile

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Maintain or, where necessary, restore the average number of road miles per square mile to one or less across all known occurrences of this target.

Monitoring Strategy: Monitor average number of road miles per square mile across all known occurrences of this target.

Key Factor Name Spatial Ecology

Key Factor Description: The relative spatial abundance, proximity, distribution, and arrangement of this habitat type on the landscape.

Key Factor Weight: Medium

Indicator Name: Average Block Size

Indicator Description: Block is defined by the minimum convex polygon bounded by known occurrences of this habitat type in which the median patch size is above the fair level for patch size, and in which each of the patches score fair or better on the patch proximity threshold.

Poor Level: <500 acres

Fair Level: 500-1,000 acres

Good Level: 1,001-2,000 acres

Very Good Level: >2,000 acres

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Maintain or, where necessary, restore average block size to 1,001 acres or more. (Block is defined by the minimum convex polygon bounded by known occurrences of this habitat type in which the median patch size is above the fair level for patch size, and in which each of the patches score fair or better on the patch proximity threshold.)

Monitoring Strategy: Monitor block size.

Key Factor Name Spatial Ecology

Indicator Name:	Patch Proximity
Indicator Description:	Median nearest distance between patches.
Poor Level:	>2.5 miles
Fair Level:	1-2.5 miles
Good Level:	0.5-1 mile
Very Good Level:	<0.5 mile
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore the median nearest distance between patches of this habitat type to one mile or less.
Monitoring Strategy:	Monitor median nearest distance between patches.
Indicator Name:	Number of Blocks
Indicator Description:	Total number of blocks statewide
Poor Level:	0-1
Fair Level:	2
Good Level:	3
Very Good Level:	>3
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore number of blocks to three or more. (Block is defined by the minimum convex polygon bounded by known occurrences of this habitat type in which the median patch size is above the fair level for patch size, and in which each of the patches score fair or better on the patch proximity threshold.)
Monitoring Strategy:	Monitor total number of blocks statewide.

Key Factor Name Spatial Ecology

Indicator Name:	Patch Size
Indicator Description:	Average patch size across all known occurrences (acres)
Poor Level:	<10 acres
Fair Level:	10-30 acres
Good Level:	31-100 acres
Very Good Level:	>100 acres
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore the average patch size of this habitat type to 31 acres or more across all known occurrences.
Monitoring Strategy:	Monitor average patch size across all known occurrences (acres).

Habitat Name Interior Highlands Dry Acidic Glade and Barrens



Ecoregions where the habitat occurs:

Ozark Highlands	Boston Mountains	Mississippi Valley Loess Plains	Arkansas Valley
☑	☑	☐	☑

Ouachita Mountains	South Central Plains	Mississippi Alluvial Plain
☑	☐	☐

Description

This system occurs along moderate to steep slopes or valley walls of rivers along most aspects. Parent material includes chert, shale and/or sandstone bedrock with well- to excessively well-drained, shallow soils interspersed with rock and boulders. These soils are typically dry during the summer and autumn, becoming saturated during the spring and winter. Grasses such as Schizachyrium scoparium and Sorghastrum nutans dominate this system with stunted oak species Quercus stellata, Quercus marilandica and shrub species such as Vaccinium spp. Occurring on variable depth soils. This system is influenced by drought and infrequent to occasional fires. Prescribed fires help manage this system by maintaining an open glade structure.
EMBEDDED: These systems are usually small, isolated, and/or disjunct and are often "embedded" in a larger habitat matrix. These systems rely heavily on surrounding and/or adjacent habitats for landscape

scale functions and processes such as fire. (adapted from NatureServe 2005)

Species associated with this habitat type (and the weight or importance of the habitat to each species) include:
Eastern Collared Lizard (Crotaphytus collaris) Weight: Obligate
Western Groundsnake (Sonora semiannulata) Weight: Obligate
Northern Metalmark (Calephelis borealis) Weight: Optimal
Western Diamond-backed Rattlesnake (Crotalus atrox) Weight: Optimal
Baltimore Checkerspot (Euphydryas phaeton ozarkae) Weight: Optimal
Great Plains Skink (Plestiodon obsoletus) Weight: Optimal
Rufous-crowned Sparrow (Aimophila ruficeps) Weight: Suitable
Common Nighthawk (Chordeiles minor) Weight: Suitable
Outis Skipper (Cogia outis) Weight: Suitable
Northern Bobwhite (Colinus virginianus) Weight: Suitable
Monarch (Danaus plexippus) Weight: Suitable
Purple Finch (Haemorhous purpureus) Weight: Suitable
Cobweb Skipper (Hesperia metea) Weight: Suitable
Crawford's Gray Shrew (Notiosorex crawfordi) Weight: Suitable
Slender Glass Lizard (Ophisaurus attenuatus) Weight: Suitable
Diana (Speyeria diana) Weight: Suitable
Eastern Whip-poor-will (Antrostomus vociferus) Weight: Marginal
Bewick's Wren (Thryomanes bewickii) Weight: Marginal
Long-tailed Weasel (Mustela frenata) Weight: Data Gap

Habitat Team

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Habitat Priority Score: 905

Key Factor Name Composition

Key Factor Description: The diversity, species richness, and relative abundance of vegetative elements in this habitat type.

Key Factor Weight: Low

Indicator Name: Invasive shrubs and woody vines

Indicator Description: The percent of ground cover in non-native woody species

Poor Level: >20

Fair Level: 10-20

Good Level: 5-9

Very Good Level: <5

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Maintain or, where necessary, restore the percent of groundcover in invasive woody species to nine percent or less.

Monitoring Strategy: Monitor the percent of ground cover in non-native woody species.

Indicator Name: Exotic Forbs and Grasses

Indicator Description: The percent of ground cover in non-native herbaceous species

Poor Level: >20

Fair Level: 10-20

Good Level: 5-9

Very Good Level: <5

Current_Status: Data Gap

Indicator Weight: High

Conservation Action: Maintain or, where necessary, restore the percent of groundcover in non-native herbaceous vegetation to nine percent or less.

Monitoring Strategy: Monitor the percent of ground cover in non-native herbaceous species.

Key Factor Name Fire Regime

Key Factor Description: Fire Return Interval and Seasonality, including landscape-scale fire in surrounding/adjacent habitats to prevent woody encroachment and allow for distribution and dispersal of obligate species

Key Factor Weight: High

Indicator Name: Fire Seasonality/Intensity

Indicator Description: The percent of areas burned during either March/April or Aug/Sept, or from leaf-expansion to leaf-fall, depending on project-level goals. In some but not all cases, seasonality is an accurate surrogate for intensity. Since intensity goals will vary from burn to burn it is difficult to "pre-quantify" ideal intensity objectives at a forest-wide scale. It is presumed that restoration, maintenance, fuel-reduction and other prescribed fire goals will be considered at the project level when planning burn intensity.

Poor Level: <25

Fair Level: 25-50

Good Level: 51-75

Very Good Level: >75

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: When burning, burn during either March/April or August/September, or from leaf-expansion to leaf-fall, depending on project-level goals.

Monitoring Strategy: Monitor percent of burned areas burned during either March/April or Aug/Sept, or from leaf-expansion to leaf-fall, depending on project-level goals. In some but not all cases, seasonality is an accurate surrogate for intensity. Since intensity goals will vary from burn to burn it is difficult to "pre-quantify" ideal intensity objectives at a forest-wide scale. It is presumed that restoration, maintenance, fuel-reduction and other prescribed fire goals will be considered at the project level when planning burn intensity.

Key Factor Name Fire Regime

Indicator Name:	Fire Frequency
Indicator Description:	Average percent of all known occurrences plus 100 meter buffer burned per 3-5 year interval.
Poor Level:	<25
Fair Level:	25-50
Good Level:	51-75
Very Good Level:	>75
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Burn at least 51 percent of the spatial extent plus 100 meter buffer of all known occurrences of this habitat type every 3-5 years.
Monitoring Strategy:	Monitor average percent of all known occurrences plus 100 meter buffer burned per 3-5 year interval.

Key Factor Name Remoteness

Key Factor Description: Mean density of roads (miles per square mile) within this community type at the landscape scale.

Key Factor Weight: Medium

Indicator Name: Road Density

Indicator Description: Average number of road miles per square mile across all known occurrences of this target.

Poor Level: >2 miles

Fair Level: 1-2 miles

Good Level: 0.5-1 mile

Very Good Level: <0.5 mile

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Maintain or, where necessary, restore the average number of road miles per square mile to one or less across all known occurrences of this target.

Monitoring Strategy: Monitor average number of road miles per square mile across all known occurrences of this target.

Key Factor Name Spatial Ecology

Key Factor Description: The relative spatial abundance, proximity, distribution, and arrangement of this habitat type on the landscape.The relative spatial abundance, proximity, distribution, and arrangement of this habitat type on the landscape.

Key Factor Weight: Medium

Indicator Name: Average Block Size

Indicator Description: Block is defined by the minimum convex polygon bounded by known occurrences of this habitat type in which the median patch size is above the fair level for patch size, and in which each of the patches score fair or better on the patch proximity threshold.

Poor Level: <250 acres

Fair Level: 250-500 acres

Good Level: 501-1,000 acres

Very Good Level: >1,000 acres

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Maintain or, where necessary, restore average block size to 501 acres or more. (Block is defined by the minimum convex polygon bounded by known occurrences of this habitat type in which the median patch size is above the fair level for patch size, and in which each of the patches score fair or better on the patch proximity threshold.)

Monitoring Strategy: Monitor block size.

Key Factor Name Spatial Ecology

Indicator Name:	Patch Proximity
Indicator Description:	Median nearest distance between patches.
Poor Level:	>2.5 miles
Fair Level:	1-2.5 miles
Good Level:	0.5-1 mile
Very Good Level:	<0.5 mile
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore the median nearest distance between patches of this habitat type to one mile or less.
Monitoring Strategy:	Monitor median nearest distance between patches.
Indicator Name:	Patch Size
Indicator Description:	Average patch size across all known occurrences (acres)
Poor Level:	<5 acres
Fair Level:	5-10 acres
Good Level:	10-30 acres
Very Good Level:	>30 acres
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore the average patch size of this habitat type to 10 acres or more across all known occurrences.
Monitoring Strategy:	Monitor average patch size across all known occurrences (acres).

Key Factor Name Spatial Ecology

Indicator Name:	Number of Blocks
Indicator Description:	Total number of blocks statewide
Poor Level:	0-1
Fair Level:	2
Good Level:	3
Very Good Level:	>3
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore number of blocks to three or more. (Block is defined by the minimum convex polygon bounded by known occurrences of this habitat type in which the median patch size is above the fair level for patch size, and in which each of the patches score fair or better on the patch proximity threshold.)
Monitoring Strategy:	Monitor total number of blocks statewide.

Habitat Name Lower Mississippi Alluvial Plain Grand Prairie



Ecoregions where the habitat occurs:

Ozark Highlands	Boston Mountains	Mississippi Valley Loess Plains	Arkansas Valley
☐	☐	☐	☐

Ouachita Mountains	South Central Plains	Mississippi Alluvial Plain
☐	☑	☑

Description

This system of prairies and woodlands occurs on the oldest substantial land surfaces in the Mississippi River Alluvial Valley and the highest land surface in the river-deposited portions of the Mississippi Alluvial Plain ecoregion. It occupies a very flat region up to 20 miles wide and 60 miles long bounded by present day rivers, especially the Arkansas and White, which are much lower in elevation than the Grand Prairie terrace. This terrace is covered with thin soils underlain by deep layers of impervious clay. The surface soils have been considered to be loess by some sources but are more likely silts and silty clays (T. Foti pers. comm.). Although productive, these soils are droughty due to the impervious clay subsoils. The combination of droughty soils, very flat topography, and the lack of major stream corridors in the region create conditions suitable to the ignition and spread of fires. Almost annual fires would have been necessary to maintain these prairies, and anthropogenic influences have been critical for probably

5,000 years. The vegetation includes both wet and dry prairies as well as "slashes" dominated by Fraxinus pennsylvanica and Crataegus spp. (adapted from NatureServe 2005)

Species associated with this habitat type (and the weight or importance of the habitat to each species) include:
Prairie Mole Cricket (Gryllotalpa major) Weight: Obligate
Le Conte's Sparrow (Ammodramus leconteii) Weight: Optimal
Common Nighthawk (Chordeiles minor) Weight: Optimal
Sedge Wren (Cistothorus platensis) Weight: Optimal
Northern Bobwhite (Colinus virginianus) Weight: Optimal
Monarch (Danaus plexippus) Weight: Optimal
Migrant Loggerhead Shrike (Lanius ludovicianus) Weight: Optimal
Slender Glass Lizard (Ophisaurus attenuatus) Weight: Optimal
King Rail (Rallus elegans) Weight: Optimal
Ornate Box Turtle (Terrapene ornata) Weight: Optimal
Red Milkweed Beetle (Tetraopes quinquemaculatus) Weight: Optimal
Henslow's Sparrow (Ammodramus henslowii) Weight: Suitable
Grasshopper Sparrow (Ammodramus savannarum) Weight: Suitable
American Black Duck (Anas rubripes) Weight: Suitable
Chicken Turtle (Deirochelys reticularia) Weight: Suitable
Tricolored Heron (Egretta tricolor) Weight: Suitable
Willow Flycatcher (Empidonax traillii) Weight: Suitable
American Kestrel (Falco sparverius) Weight: Suitable
Purple Finch (Haemorhous purpureus) Weight: Suitable
Yellow-crowned Night-Heron (Nyctanassa violacea) Weight: Suitable
Black-crowned Night-Heron (Nycticorax nycticorax) Weight: Suitable
American Golden-Plover (Pluvialis dominica) Weight: Suitable
Graham's Crayfish Snake (Regina grahamii) Weight: Suitable
Eastern Spadefoot (Scaphiopus holbrookii) Weight: Suitable
American Woodcock (Scolopax minor) Weight: Suitable
Bell's Vireo (Vireo bellii) Weight: Suitable
Sprague's Pipit (Anthus spragueii) Weight: Marginal
American Bittern (Botaurus lentiginosus) Weight: Marginal
Smith's Longspur (Calcarius pictus) Weight: Marginal
Buff-breasted Sandpiper (Calidris subruficollis) Weight: Marginal
Yellow-billed Cuckoo (Coccyzus americanus) Weight: Marginal
Long-tailed Weasel (Mustela frenata) Weight: Data Gap

Habitat Team

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Habitat Priority Score: 1515

Key Factor Name Composition

Key Factor Description: The diversity, species richness, and relative abundance of vegetative elements in this habitat type.

Key Factor Weight: Medium

Indicator Name: Exotic Forbs and Grasses

Indicator Description: The percent of ground cover in non-native herbaceous species

Poor Level: >20

Fair Level: 10-20

Good Level: 5-9

Very Good Level: <5

Current_Status: Data Gap

Indicator Weight: High

Conservation Action: Maintain or, where necessary, restore the percent of groundcover in non-native herbaceous vegetation to nine percent or less.

Monitoring Strategy: Monitor the percent of ground cover in non-native herbaceous species.

Indicator Name: Invasive shrubs and woody vines

Indicator Description: The percent of ground cover in non-native woody species

Poor Level: >20

Fair Level: 10-20

Good Level: 5-9

Very Good Level: <5

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Maintain or, where necessary, restore the percent of groundcover in invasive woody species to nine percent or less.

Monitoring Strategy: Monitor the percent of ground cover in non-native woody species.

Key Factor Name Composition

Indicator Name:	Broomsedge imbalance
Indicator Description:	The percent broomsedge coverage among ground vegetation
Poor Level:	>20
Fair Level:	10-20
Good Level:	5-9
Very Good Level:	<5
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore the percent broomsedge coverage among ground vegetation to nine percent or less.
Monitoring Strategy:	Monitor percent of broomsedge coverage among ground vegetation.

Key Factor Name Fire Regime

Key Factor Description: Fire Return Interval and Seasonality, including landscape-scale fire in surrounding/adjacent habitats to prevent woody encroachment and allow for distribution and dispersal of obligate species

Key Factor Weight: Medium

Indicator Name: Fire Seasonality/Intensity

Indicator Description: The percent of areas burned during either March/April or Aug/Sept, or from leaf-expansion to leaf-fall, depending on project-level goals. In some but not all cases, seasonality is an accurate surrogate for intensity. Since intensity goals will vary from burn to burn it is difficult to "pre-quantify" ideal intensity objectives at a forest-wide scale. It is presumed that restoration, maintenance, fuel-reduction and other prescribed fire goals will be considered at the project level when planning burn intensity.

Poor Level: <25

Fair Level: 25-50

Good Level: 51-75

Very Good Level: >75

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: When burning, burn during either March/April or August/September, or from leaf-expansion to leaf-fall, depending on project-level goals.

Monitoring Strategy: Monitor percent of burned areas burned during either March/April or Aug/Sept, or from leaf-expansion to leaf-fall, depending on project-level goals. In some but not all cases, seasonality is an accurate surrogate for intensity. Since intensity goals will vary from burn to burn it is difficult to "pre-quantify" ideal intensity objectives at a forest-wide scale. It is presumed that restoration, maintenance, fuel-reduction and other prescribed fire goals will be considered at the project level when planning burn intensity.

Key Factor Name Fire Regime

Indicator Name:	Fire Frequency
Indicator Description:	Average percent of all known occurrences plus 100 meter buffer burned per 2-4 year interval.
Poor Level:	<25
Fair Level:	25-50
Good Level:	51-75
Very Good Level:	>75
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Burn at least 51 percent of the spatial extent plus 100 meter buffer of all known occurrences of this habitat type every 2-4 years.
Monitoring Strategy:	Monitor average percent of all known occurrences plus 100 meter buffer burned per 2-4 year interval.

Key Factor Name Remoteness

Key Factor Description: Mean density of roads (miles per square mile) within this community type at the landscape scale.

Key Factor Weight: Medium

Indicator Name: Road Density

Indicator Description: Average number of road miles per square mile across all known occurrences of this target.

Poor Level: >2 miles

Fair Level: 1-2 miles

Good Level: 0.5-1 mile

Very Good Level: <0.5 mile

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Maintain or, where necessary, restore the average number of road miles per square mile to one or less across all known occurrences of this target.

Monitoring Strategy: Monitor average number of road miles per square mile across all known occurrences of this target.

Key Factor Name Spatial Ecology

Key Factor Description: The relative spatial abundance, proximity, distribution, and arrangement of this habitat type on the landscape.

Key Factor Weight: Medium

Indicator Name: Average Block Size

Indicator Description: Block is defined by the minimum convex polygon bounded by known occurrences of this habitat type in which the median patch size is above the fair level for patch size, and in which each of the patches score fair or better on the patch proximity threshold.

Poor Level: <1,000 acres

Fair Level: 1,000-2,499 acres

Good Level: 2,500-5,000 acres

Very Good Level: >5,000 acres

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Maintain or, where necessary, restore average block size to 2,500 acres or more. (Block is defined by the minimum convex polygon bounded by known occurrences of this habitat type in which the median patch size is above the fair level for patch size, and in which each of the patches score fair or better on the patch proximity threshold.)

Monitoring Strategy: Monitor block size.

Key Factor Name Spatial Ecology

Indicator Name:	Patch Proximity
Indicator Description:	Median nearest distance between patches.
Poor Level:	>2.5 miles
Fair Level:	1-2.5 miles
Good Level:	0.5-1 mile
Very Good Level:	<0.5 mile
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore the median nearest distance between patches of this habitat type to one mile or less.
Monitoring Strategy:	Monitor median nearest distance between patches.
Indicator Name:	Patch Size
Indicator Description:	Average patch size across all known occurrences (acres)
Poor Level:	<100 acres
Fair Level:	100-249 acres
Good Level:	250-500 acres
Very Good Level:	>500 acres
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore the average patch size of this habitat type to 250 acres or more across all known occurrences.
Monitoring Strategy:	Monitor average patch size across all known occurrences (acres).

Key Factor Name Spatial Ecology

Indicator Name:	Number of Blocks
Indicator Description:	Total number of blocks statewide
Poor Level:	0-1
Fair Level:	2
Good Level:	3
Very Good Level:	>3
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore number of blocks to three or more. (Block is defined by the minimum convex polygon bounded by known occurrences of this habitat type in which the median patch size is above the fair level for patch size, and in which each of the patches score fair or better on the patch proximity threshold.)
Monitoring Strategy:	Monitor total number of blocks statewide.

Habitat Name Lower Mississippi Flatwoods Woodland and Forest



Ecoregions where the habitat occurs:

Ozark Highlands	Boston Mountains	Mississippi Valley Loess Plains	Arkansas Valley
☐	☐	☐	☐

Ouachita Mountains	South Central Plains	Mississippi Alluvial Plain
☐	☐	☑

Description

This system is composed of forests, prairies and woodlands on Pleistocene terraces in the Mississippi Alluvial Plain ecoregion. It occurs primarily west of Crowley's Ridge on Pleistocene glacial outwash deposits in Arkansas and Missouri, and on Macon Ridge in Louisiana and Arkansas. The sites are above modern floodplains, but have poor internal drainage and are flat with poor runoff, leading to very wet conditions in winter and spring. They also often have a claypan that restricts both internal drainage and, later in the year, water availability. Therefore they are very wet in the winter/spring and very dry in the summer, a moisture regime termed hydroxeric. Because of this moisture regime, the communities are variable, ranging from willow oak flats to post oak flats to prairies. In the 1940s, the Arkansas Game and Fish Commission produced a wildlife habitat map of Arkansas in which these sites were classified as "terrace hardwood forests". These communities have a large variety of upland and lowland tree

species, ranging from post oak to overcup oak in a small area. Such species diversity may be explained by regeneration of species with dramatically different moisture tolerances on the same site in dry and wet years on these hydroxeric sites. Because the sites are above current floodplains and susceptible to being drained, they have been cleared at an even greater rate than nearby floodplain forests. (adapted from NatureServe 2005)

Species associated with this habitat type (and the weight or importance of the habitat to each species) include:
Yellow-billed Cuckoo (Coccyzus americanus) Weight: Optimal
Southeastern Bat (Myotis austroriparius) Weight: Optimal
American Black Duck (Anas rubripes) Weight: Suitable
Eastern Whip-poor-will (Antrostomus vociferus) Weight: Suitable
Common Wormsnake (Carphophis amoenus) Weight: Suitable
Chimney Swift (Chaetura pelagica) Weight: Suitable
Monarch (Danaus plexippus) Weight: Suitable
Chicken Turtle (Deirochelys reticularia) Weight: Suitable
Swallow-tailed Kite (Elanoides forficatus) Weight: Suitable
Rusty Blackbird (Euphagus carolinus) Weight: Suitable
Dukes' Skipper (Euphyes dukesi) Weight: Suitable
Purple Finch (Haemorhous purpureus) Weight: Suitable
Meske's Skipper (Hesperia meskei) Weight: Suitable
Bronze Copper (Lycaena hyllus) Weight: Suitable
Gray Comma (Polygonia progne) Weight: Suitable
Eastern Spadefoot (Scaphiopus holbrookii) Weight: Suitable
American Woodcock (Scolopax minor) Weight: Suitable
Diana (Speyeria diana) Weight: Suitable
Sharp-shinned Hawk (Accipiter striatus) Weight: Marginal
Northern Bobwhite (Colinus virginianus) Weight: Marginal
Tricolored Heron (Egretta tricolor) Weight: Marginal
Wood Thrush (Hylocichla mustelina) Weight: Marginal
Swainson's Warbler (Limnothlypis swainsonii) Weight: Marginal
Southeastern Bat (Myotis austroriparius) Weight: Marginal
Yellow-crowned Night-Heron (Nyctanassa violacea) Weight: Marginal
Black-crowned Night-Heron (Nycticorax nycticorax) Weight: Marginal
Cerulean Warbler (Setophaga cerulea) Weight: Marginal
Southern Bog Lemming (Synaptomys cooperi) Weight: Marginal
Bewick's Wren (Thryomanes bewickii) Weight: Marginal
Long-tailed Weasel (Mustela frenata) Weight: Data Gap
Illinois Chorus Frog (Pseudacris illinoensis) Weight: Data Gap

Habitat Team

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Habitat Priority Score: 1053

Key Factor Name Composition

Key Factor Description: The diversity, species richness, and relative abundance of vegetative elements in this habitat type.

Key Factor Weight: Medium

Indicator Name:	Invasive shrubs and woody vines
Indicator Description:	The percent of ground cover in non-native woody species
Poor Level:	>20
Fair Level:	10-20
Good Level:	5-9
Very Good Level:	<5
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore the percent of groundcover in invasive woody species to nine percent or less.
Monitoring Strategy:	Monitor the percent of ground cover in non-native woody species.
Indicator Name:	Loblolly pine presence
Indicator Description:	The percent of loblolly crown cover among dominant canopy trees
Poor Level:	>20
Fair Level:	10-20%
Good Level:	5-9%
Very Good Level:	<5
Current_Status:	Data Gap
Indicator Weight:	High
Conservation Action:	Maintain or, where necessary, restore the total percentage of loblolly crown cover among dominant canopy trees to nine percent or less.
Monitoring Strategy:	Monitor percent of loblolly crown cover among dominant canopy trees.

Key Factor Name Composition

Indicator Name:	Exotic Forbs and Grasses
Indicator Description:	The percent of ground cover in non-native herbaceous species
Poor Level:	>20
Fair Level:	10-20
Good Level:	5-9
Very Good Level:	<5
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore the percent of groundcover in non-native herbaceous vegetation to nine percent or less.
Monitoring Strategy:	Monitor the percent of ground cover in non-native herbaceous species.

Key Factor Name Fire Regime

Key Factor Description: Fire Return Interval and Seasonality, including landscape-scale fire in surrounding/adjacent habitats to prevent woody encroachment and allow for distribution and dispersal of obligate species

Key Factor Weight: Medium

Indicator Name: Fire Frequency

Indicator Description: Average percent of all known occurrences burned per 3-7 year interval.

Poor Level: <25

Fair Level: 25-50

Good Level: 51-75

Very Good Level: >75

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Burn at least 51 percent of the spatial extent of all known occurrences of this habitat type every 3-7 years.

Monitoring Strategy: Monitor average percent of all known occurrences burned per 3-7 year interval.

Key Factor Name Fire Regime

Indicator Name:	Fire Seasonality/Intensity
Indicator Description:	The percent of areas burned during either March/April or Aug/Sept, or from leaf-expansion to leaf-fall, depending on project-level goals. In some but not all cases, seasonality is an accurate surrogate for intensity. Since intensity goals will vary from burn to burn it is difficult to "pre-quantify" ideal intensity objectives at a forest-wide scale. It is presumed that restoration, maintenance, fuel-reduction and other prescribed fire goals will be considered at the project level when planning burn intensity.
Poor Level:	<25
Fair Level:	25-50
Good Level:	51-75
Very Good Level:	>75
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	When burning, burn during either March/April or August/September, or from leaf-expansion to leaf-fall, depending on project-level goals.
Monitoring Strategy:	Monitor percent of burned areas burned during either March/April or Aug/Sept, or from leaf-expansion to leaf-fall, depending on project-level goals. In some but not all cases, seasonality is an accurate surrogate for intensity. Since intensity goals will vary from burn to burn it is difficult to "pre-quantify" ideal intensity objectives at a forest-wide scale. It is presumed that restoration, maintenance, fuel-reduction and other prescribed fire goals will be considered at the project level when planning burn intensity.

Key Factor Name Remoteness

Key Factor Description: Mean density of roads (miles per square mile) within this community type at the landscape scale.

Key Factor Weight: Medium

Indicator Name: Road Density

Indicator Description: Average number of road miles per square mile across all known occurrences of this target.

Poor Level: >2 miles

Fair Level: 1-2 miles

Good Level: 0.5-1 mile

Very Good Level: <0.5 mile

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Maintain or, where necessary, restore the average number of road miles per square mile to one or less across all known occurrences of this target.

Monitoring Strategy: Monitor average number of road miles per square mile across all known occurrences of this target.

Key Factor Name Spatial Ecology

Key Factor Description: The relative spatial abundance, proximity, distribution, and arrangement of this habitat type on the landscape.

Key Factor Weight: Medium

Indicator Name: Number of Blocks

Indicator Description: Total number of blocks statewide

Poor Level: 0-1

Fair Level: 2

Good Level: 3

Very Good Level: >3

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Maintain or, where necessary, restore number of blocks to three or more. (Block is defined by the minimum convex polygon bounded by known occurrences of this habitat type in which the median patch size is above the fair level for patch size, and in which each of the patches score fair or better on the patch proximity threshold.)

Monitoring Strategy: Monitor total number of blocks statewide.

Indicator Name: Patch Proximity

Indicator Description: Median nearest distance between patches.

Poor Level: >4 miles

Fair Level: 2-4 miles

Good Level: 1-2 miles

Very Good Level: <1 mile

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Maintain or, where necessary, restore the median nearest distance between patches of this habitat type to two miles or less.

Monitoring Strategy: Monitor median nearest distance between patches.

Key Factor Name Spatial Ecology

Indicator Name:	Patch Size
Indicator Description:	Average patch size across all known occurrences (acres)
Poor Level:	<250 acres
Fair Level:	250-500 acres
Good Level:	501-1,000 acres
Very Good Level:	>1,000 acres
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore the average patch size of this habitat type to 501 acres or more across all known occurrences.
Monitoring Strategy:	Monitor average patch size across all known occurrences (acres).
Indicator Name:	Average Block Size
Indicator Description:	Block is defined by the minimum convex polygon bounded by known occurrences of this habitat type in which the median patch size is above the fair level for patch size, and in which each of the patches score fair or better on the patch proximity threshold.
Poor Level:	<2,499 acres
Fair Level:	2,500-5,000 acres
Good Level:	5,001-10000 acres
Very Good Level:	>10000 acres
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore average block size to 5,001 acres or more. (Block is defined by the minimum convex polygon bounded by known occurrences of this habitat type in which the median patch size is above the fair level for patch size, and in which each of the patches score fair or better on the patch proximity threshold.)
Monitoring Strategy:	Monitor block size.

Habitat Name Lower Mississippi River Bottomland Depression



Ecoregions where the habitat occurs:

Ozark Highlands ☐	Boston Mountains ☐	Mississippi Valley Loess Plains ☐	Arkansas Valley ☐
Ouachita Mountains ☐	South Central Plains ☐	Mississippi Alluvial Plain ☑	

Description

This system represents semipermanently flooded to saturated depressional areas. They are typically created by changes in channels of meandering streams and depending on time since abandonment by the river, character may vary from large oxbow swamps to small saturated swales. These may occur both within and outside the frequently flooded bottoms where the river flows. Vegetation ranges from cypress-tupelo swamp to Quercus lyrata forest.

(adapted from NatureServe 2005)

Species associated with this habitat type (and the weight or importance of the habitat to each species) include:

Rafinesque's Big-Eared Bat (Corynorhinus rafinesquii) Weight: Optimal
Southeastern Bat (Myotis austroriparius) Weight: Optimal
American Black Duck (Anas rubripes) Weight: Suitable
Chimney Swift (Chaetura pelagica) Weight: Suitable
Chicken Turtle (Deirochelys reticularia) Weight: Suitable
Tricolored Heron (Egretta tricolor) Weight: Suitable
Purple Finch (Haemorhous purpureus) Weight: Suitable
Glossy Swampsnake (Liodytes rigida) Weight: Suitable
Yellow-crowned Night-Heron (Nyctanassa violacea) Weight: Suitable
Black-crowned Night-Heron (Nycticorax nycticorax) Weight: Suitable
Southern Bog Lemming (Synaptomys cooperi) Weight: Suitable
Sharp-shinned Hawk (Accipiter striatus) Weight: Marginal
Yellow-billed Cuckoo (Coccyzus americanus) Weight: Marginal
American Woodcock (Scolopax minor) Weight: Marginal
Lincoln Underwing (Catocala lincolnana) Weight: Data Gap

Habitat Team

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Habitat Priority Score: 564

Key Factor Name Composition

Key Factor Description: The diversity, species richness, and relative abundance of vegetative elements in this habitat type.

Key Factor Weight: Medium

Indicator Name: Exotic Forbs and Grasses

Indicator Description: The percent of ground cover in non-native herbaceous species

Poor Level: >20

Fair Level: 10-20

Good Level: 5-9

Very Good Level: <5

Current_Status: Data Gap

Indicator Weight: High

Conservation Action: Maintain or, where necessary, restore the percent of groundcover in non-native herbaceous vegetation to nine percent or less.

Monitoring Strategy: Monitor the percent of ground cover in non-native herbaceous species.

Indicator Name: Invasive shrubs and woody vines

Indicator Description: The percent of ground cover in non-native woody species

Poor Level: >20

Fair Level: 10-20

Good Level: 5-9

Very Good Level: <5

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Maintain or, where necessary, restore the percent of groundcover in invasive woody species to nine percent or less.

Monitoring Strategy: Monitor the percent of ground cover in non-native woody species.

Key Factor Name Fire Regime

Key Factor Description: Fire Return Interval and Seasonality, including landscape-scale fire in surrounding/adjacent habitats to prevent woody encroachment and allow for distribution and dispersal of obligate species

Key Factor Weight: Medium

Indicator Name: Fire Seasonality/Intensity

Indicator Description: The percent of areas burned during either March/April or Aug/Sept, or from leaf-expansion to leaf-fall, depending on project-level goals. In some but not all cases, seasonality is an accurate surrogate for intensity. Since intensity goals will vary from burn to burn it is difficult to "pre-quantify" ideal intensity objectives at a forest-wide scale. It is presumed that restoration, maintenance, fuel-reduction and other prescribed fire goals will be considered at the project level when planning burn intensity.

Poor Level: <25

Fair Level: 25-50

Good Level: 51-75

Very Good Level: >75

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: When burning, burn during either March/April or August/September, or from leaf-expansion to leaf-fall, depending on project-level goals.

Monitoring Strategy: Monitor percent of burned areas burned during either March/April or Aug/Sept, or from leaf-expansion to leaf-fall, depending on project-level goals. In some but not all cases, seasonality is an accurate surrogate for intensity. Since intensity goals will vary from burn to burn it is difficult to "pre-quantify" ideal intensity objectives at a forest-wide scale. It is presumed that restoration, maintenance, fuel-reduction and other prescribed fire goals will be considered at the project level when planning burn intensity.

Key Factor Name Fire Regime

Indicator Name:	Fire Frequency
Indicator Description:	Average percent of all known occurrences plus 100 meter buffer burned per 5-100 year interval.
Poor Level:	<25
Fair Level:	25-50
Good Level:	51-75
Very Good Level:	>75
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Burn at least 51 percent of the spatial extent plus 100 meter buffer of all known occurrences of this habitat type every 5-100 years.
Monitoring Strategy:	Monitor average percent of all known occurrences plus 100 meter buffer burned per 5-100 year interval.

Key Factor Name Remoteness

Key Factor Description: Mean density of roads (miles per square mile) within this community type at the landscape scale.

Key Factor Weight: Medium

Indicator Name: Road Density

Indicator Description: Average number of road miles per square mile across all known occurrences of this target.

Poor Level: >2 miles

Fair Level: 1-2 miles

Good Level: 0.5-1 mile

Very Good Level: <0.5 mile

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Maintain or, where necessary, restore the average number of road miles per square mile to one or less across all known occurrences of this target.

Monitoring Strategy: Monitor average number of road miles per square mile across all known occurrences of this target.

Key Factor Name Spatial Ecology

Key Factor Description: The relative spatial abundance, proximity, distribution, and arrangement of this habitat type on the landscape.

Key Factor Weight: Medium

Indicator Name:	Patch Size
Indicator Description:	Width of buffer (meters)
Poor Level:	<100 meters of buffer
Fair Level:	100-250 meters of buffer
Good Level:	251-400 meters of buffer
Very Good Level:	>400 meters of buffer
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or ,where necessary, buffer known occurrences of this habitat type with a minimum of 251 meters of adjacent but dissimilar habitats.
Monitoring Strategy:	Monitor width of buffer (meters).
Indicator Name:	Number of Blocks
Indicator Description:	Total number of blocks statewide
Poor Level:	0-1
Fair Level:	2
Good Level:	3
Very Good Level:	>3
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore number of blocks to three or more. (Block is defined by the minimum convex polygon bounded by known occurrences of this habitat type in which the median patch size is above the fair level for patch size, and in which each of the patches score fair or better on the patch proximity threshold.)
Monitoring Strategy:	Monitor total number of blocks statewide.

Key Factor Name Spatial Ecology

Indicator Name:	Average Block Size
Indicator Description:	Block is defined by the minimum convex polygon bounded by known occurrences of this habitat type in which the median patch size is above the fair level for patch size, and in which each of the patches score fair or better on the patch proximity threshold.
Poor Level:	<1,000 acres
Fair Level:	1,000-2,000 acres
Good Level:	2,000-4,000 acres
Very Good Level:	>4,000 acres
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore average block size to 2,000 acres or more. (Block is defined by the minimum convex polygon bounded by known occurrences of this habitat type in which the median patch size is above the fair level for patch size, and in which each of the patches score fair or better on the patch proximity threshold.)
Monitoring Strategy:	Monitor block size.
Indicator Name:	Patch Proximity
Indicator Description:	Median nearest distance between patches.
Poor Level:	>3200 meters
Fair Level:	1601-3200 meters
Good Level:	800-1600 meters
Very Good Level:	<800 meters
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, resotre the average distance between patches to 1,600 meters or less.
Monitoring Strategy:	Monitor median nearest distance between patches.

Habitat Name Lower Mississippi River Dune Woodland, Pond, and Forest



Ecoregions where the habitat occurs:

Ozark Highlands	Boston Mountains	Mississippi Valley Loess Plains	Arkansas Valley
☐	☐	☐	☐

Ouachita Mountains	South Central Plains	Mississippi Alluvial Plain
☐	☐	☑

Description

This system represents the vegetation of sand dunes and related eolian features. These Pleistocene dunes were overlooked or unrecognized until the late 1970s (Saucier 1978). This fact coupled with long periods of weathering and human disturbance, as well as proximity to a terrace mapped as "prairie" in General Land Office records, has led to considerable confusion regarding this type (T. Foti pers. comm.). These dunes are near Crowley's Ridge and the Black and White rivers, above the normal flood level of the Mississippi. Examples in Missouri occur amidst a series of low-lying, anastamosing channels that have helped to protect them from extensive alteration more typical in Arkansas where the uplands have been largely cleared. The uppermost portions of the dunes support a xeric community similar to sandhills of the South Central Plains, but are outside the natural range of some species in that

ecoregion. Instead the dunes support very open Quercus stellata woodlands with Schizachyrium scoparium and abundant lichen cover (presumably Cladonia spp.), along with Opuntia sp. Less edaphically extreme slopes support more closed-canopied forests in which Quercus stellata is still important, along with Quercus falcata and possibly other species. In many instances, distinctive wetlands are also present. Called "sand ponds" in Arkansas, these depressions have silty bottoms and perched water tables. The margin of these ponds are rimmed by Quercus phellos and have Quercus lyrata.
(adapted from NatureServe 2005)

Species associated with this habitat type (and the weight or importance of the habitat to each species) include:
Chimney Swift (Chaetura pelagica) Weight: Suitable
Purple Finch (Haemorhous purpureus) Weight: Suitable
Sharp-shinned Hawk (Accipiter striatus) Weight: Marginal
Common Nighthawk (Chordeiles minor) Weight: Marginal
Yellow-billed Cuckoo (Coccyzus americanus) Weight: Marginal
Northern Bobwhite (Colinus virginianus) Weight: Marginal
Rafinesque's Big-Eared Bat (Corynorhinus rafinesquii) Weight: Marginal
Eastern Harvest Mouse (Reithrodontomys humulis) Weight: Marginal
American Woodcock (Scolopax minor) Weight: Marginal
Long-tailed Weasel (Mustela frenata) Weight: Data Gap

Habitat Team

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Habitat Priority Score: 229

Key Factor Name Composition

Key Factor Description: The diversity, species richness, and relative abundance of vegetative elements in this habitat type.

Key Factor Weight: Medium

Indicator Name: Invasive shrubs and woody vines

Indicator Description: The percent of ground cover in non-native woody species

Poor Level: >20

Fair Level: 10-20

Good Level: 5-9

Very Good Level: <5

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Maintain or, where necessary, restore the percent of groundcover in invasive woody species to nine percent or less.

Monitoring Strategy: Monitor the percent of ground cover in non-native woody species.

Indicator Name: Exotic Forbs and Grasses

Indicator Description: The percent of ground cover in non-native herbaceous species

Poor Level: >20

Fair Level: 10-20

Good Level: 5-9

Very Good Level: <5

Current_Status: Data Gap

Indicator Weight: High

Conservation Action: Maintain or, where necessary, restore the percent of groundcover in non-native herbaceous vegetation to nine percent or less.

Monitoring Strategy: Monitor the percent of ground cover in non-native herbaceous species.

Key Factor Name Fire Regime

Key Factor Description: Fire Return Interval and Seasonality, including landscape-scale fire in surrounding/adjacent habitats to prevent woody encroachment and allow for distribution and dispersal of obligate species

Key Factor Weight: Medium

Indicator Name: Fire Seasonality/Intensity

Indicator Description: The percent of areas burned during either March/April or Aug/Sept, or from leaf-expansion to leaf-fall, depending on project-level goals. In some but not all cases, seasonality is an accurate surrogate for intensity. Since intensity goals will vary from burn to burn it is difficult to "pre-quantify" ideal intensity objectives at a forest-wide scale. It is presumed that restoration, maintenance, fuel-reduction and other prescribed fire goals will be considered at the project level when planning burn intensity.

Poor Level: <25

Fair Level: 25-50

Good Level: 51-75

Very Good Level: >75

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: When burning, burn during either March/April or August/September, or from leaf-expansion to leaf-fall, depending on project-level goals.

Monitoring Strategy: Monitor percent of burned areas burned during either March/April or Aug/Sept, or from leaf-expansion to leaf-fall, depending on project-level goals. In some but not all cases, seasonality is an accurate surrogate for intensity. Since intensity goals will vary from burn to burn it is difficult to "pre-quantify" ideal intensity objectives at a forest-wide scale. It is presumed that restoration, maintenance, fuel-reduction and other prescribed fire goals will be considered at the project level when planning burn intensity.

Key Factor Name Fire Regime

Indicator Name:	Fire Frequency
Indicator Description:	Average percent of all known occurrences burned per 3-5 year interval.
Poor Level:	<25
Fair Level:	25-50
Good Level:	51-75
Very Good Level:	>75
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Burn at least 51 percent of the spatial extent of all known occurrences of this habitat type every 3-5 years.
Monitoring Strategy:	Monitor average percent of all known occurrences burned per 3-5 year interval.

Key Factor Name Remoteness

Key Factor Description: Mean density of roads (miles per square mile) within this community type at the landscape scale.

Key Factor Weight: Medium

Indicator Name: Road Density

Indicator Description: Average number of road miles per square mile across all known occurrences of this target.

Poor Level: >2 miles

Fair Level: 1-2 miles

Good Level: 0.5-1 mile

Very Good Level: <0.5 mile

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Maintain or, where necessary, restore the average number of road miles per square mile to one or less across all known occurrences of this target.

Monitoring Strategy: Monitor average number of road miles per square mile across all known occurrences of this target.

Key Factor Name Spatial Ecology

Key Factor Description: The relative spatial abundance, proximity, distribution, and arrangement of this habitat type on the landscape.

Key Factor Weight: Medium

Indicator Name:	Number of Blocks
Indicator Description:	Total number of blocks statewide
Poor Level:	0-1
Fair Level:	2
Good Level:	3
Very Good Level:	>3
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore number of blocks to three or more. (Block is defined by the minimum convex polygon bounded by known occurrences of this habitat type in which the median patch size is above the fair level for patch size, and in which each of the patches score fair or better on the patch proximity threshold.)
Monitoring Strategy:	Monitor total number of blocks statewide.
Indicator Name:	Patch Size
Indicator Description:	Average patch size across all known occurrences (acres)
Poor Level:	<10 acres
Fair Level:	10-30 acres
Good Level:	31-100 acres
Very Good Level:	>100 acres
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore the average patch size of this habitat type to 31 acres or more across all known occurrences.
Monitoring Strategy:	Monitor average patch size across all known occurrences (acres).

Key Factor Name Spatial Ecology

Indicator Name:	Patch Proximity
Indicator Description:	Median nearest distance between patches.
Poor Level:	>2.5 miles
Fair Level:	1-2.5 miles
Good Level:	0.5-1 mile
Very Good Level:	<0.5 mile
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore the median nearest distance between patches of this habitat type to one mile or less.
Monitoring Strategy:	Monitor median nearest distance between patches.
Indicator Name:	Average Block Size
Indicator Description:	Block is defined by the minimum convex polygon bounded by known occurrences of this habitat type in which the median patch size is above the fair level for patch size, and in which each of the patches score fair or better on the patch proximity threshold.
Poor Level:	<500 acres
Fair Level:	500-1,000 acres
Good Level:	1,001-2,000 acres
Very Good Level:	>2,000 acres
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore average block size to 1,001 acres or more. (Block is defined by the minimum convex polygon bounded by known occurrences of this habitat type in which the median patch size is above the fair level for patch size, and in which each of the patches score fair or better on the patch proximity threshold.)
Monitoring Strategy:	Monitor block size.

Habitat Name Lower Mississippi River High Bottomland Forest



Ecoregions where the habitat occurs:

Ozark Highlands ☐	Boston Mountains ☐	Mississippi Valley Loess Plains ☐	Arkansas Valley ☐
Ouachita Mountains ☐	South Central Plains ☐	Mississippi Alluvial Plain ☑	

Description

High Bottomlands are often temporarily flooded on older Holocene point bars and natural levees, with flooding less frequent than every 5 years. Wetland functions are primarily driven by precipitation, are classed as hardwood flats in a hydrogeomorphic classification (Klimas and others 2004). They are flooded less frequently than adjacent riparian floodplains or low floodplains. These floodplains are of particular conservation interest because they have been cleared to a greater extent than riparian or low floodplains because of the reduced flooding of these sites. Also, flood control levees protect many of these sites and with protection from levees almost all sites are cleared. Thus most wetlands remaining in large bottomland areas are riparian or low bottomlands, and the species, communities and other characteristics of high bottomlands have been essentially lost. Forests are often dominated by species such as Quercus pagoda and Quercus michauxii. Wildlife agency partners generally would like to see

this distinction recognized. Because many of these sites are adjacent to uplands or non-flooded hydro-xeric flatwoods, both of which have a relatively high fire frequency, and high floodplains are relatively dry, they have a higher typical fire frequency than lower bottomlands.

(adapted from NatureServe 2005)

Species associated with this habitat type (and the weight or importance of the habitat to each species) include:
Yellow-billed Cuckoo (Coccyzus americanus) Weight: Optimal
Rafinesque's Big-Eared Bat (Corynorhinus rafinesquii) Weight: Optimal
Wood Thrush (Hylocichla mustelina) Weight: Optimal
Sharp-shinned Hawk (Accipiter striatus) Weight: Suitable
Lace-winged Roadside-Skipper (Amblyscirtes aesculapius) Weight: Suitable
Mole Salamander (Ambystoma talpoideum) Weight: Suitable
American Black Duck (Anas rubripes) Weight: Suitable
Eastern Whip-poor-will (Antrostomus vociferus) Weight: Suitable
Chimney Swift (Chaetura pelagica) Weight: Suitable
Woodland Tiger Beetle (Cicindela unipunctata) Weight: Suitable
Chicken Turtle (Deirochelys reticularia) Weight: Suitable
Six-banded Longhorn Beetle (Dryobius sexnotatus) Weight: Suitable
Swallow-tailed Kite (Elanoides forficatus) Weight: Suitable
Rusty Blackbird (Euphagus carolinus) Weight: Suitable
Dukes' Skipper (Euphyes dukesi) Weight: Suitable
Purple Finch (Haemorhous purpureus) Weight: Suitable
Swainson's Warbler (Limnothlypis swainsonii) Weight: Suitable
Giant Stag Beetle (Lucanus elaphus) Weight: Suitable
Bronze Copper (Lycaena hyllus) Weight: Suitable
Southeastern Bat (Myotis austroriparius) Weight: Suitable
Gray Comma (Polygonia progne) Weight: Suitable
Oak Hairstreak (Satyrium favonius ontario) Weight: Suitable
American Woodcock (Scolopax minor) Weight: Suitable
Tricolored Heron (Egretta tricolor) Weight: Marginal
Yellow-crowned Night-Heron (Nyctanassa violacea) Weight: Marginal
Black-crowned Night-Heron (Nycticorax nycticorax) Weight: Marginal
Eastern Harvest Mouse (Reithrodontomys humulis) Weight: Marginal
Cerulean Warbler (Setophaga cerulea) Weight: Marginal
Southern Bog Lemming (Synaptomys cooperi) Weight: Marginal
Long-tailed Weasel (Mustela frenata) Weight: Data Gap

Habitat Team

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Habitat Priority Score: 1177

Key Factor Name Composition

Key Factor Description: The diversity, species richness, and relative abundance of vegetative elements in this habitat type.

Key Factor Weight: Medium

Indicator Name: Oak Dominance

Indicator Description: The percent of oak stems among dominant canopy trees

Poor Level: <12 or >72

Fair Level: 13-24 or 61-72

Good Level: 25-36 or 49-60

Very Good Level: 37-48

Current_Status: Data Gap

Indicator Weight: High

Conservation Action: Maintain or, where necessary, restore the percent of oak stems among dominant canopy trees to 25-60 percent.

Monitoring Strategy: Monitor percent oak stems among dominant canopy trees.

Key Factor Name Fire Regime

Key Factor Description: Fire Return Interval and Seasonality, including landscape-scale fire in surrounding/adjacent habitats to prevent woody encroachment and allow for distribution and dispersal of obligate species

Key Factor Weight: Medium

Indicator Name: Fire Frequency

Indicator Description: Average percent of all known occurrences burned per 3-7 year interval.

Poor Level: <25

Fair Level: 25-50

Good Level: 51-75

Very Good Level: >75

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Burn at least 51 percent of the spatial extent of all known occurrences of this habitat type every 3-7 years.

Monitoring Strategy: Monitor average percent of all known occurrences burned per 3-7 year interval.

Key Factor Name Fire Regime

Indicator Name:	Fire Seasonality/Intensity
Indicator Description:	The percent of areas burned during either March/April or Aug/Sept, or from leaf-expansion to leaf-fall, depending on project-level goals. In some but not all cases, seasonality is an accurate surrogate for intensity. Since intensity goals will vary from burn to burn it is difficult to "pre-quantify" ideal intensity objectives at a forest-wide scale. It is presumed that restoration, maintenance, fuel-reduction and other prescribed fire goals will be considered at the project level when planning burn intensity.
Poor Level:	<25
Fair Level:	25-50
Good Level:	51-75
Very Good Level:	>75
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	When burning, burn during either March/April or August/September, or from leaf-expansion to leaf-fall, depending on project-level goals.
Monitoring Strategy:	Monitor percent of burned areas burned during either March/April or Aug/Sept, or from leaf-expansion to leaf-fall, depending on project-level goals. In some but not all cases, seasonality is an accurate surrogate for intensity. Since intensity goals will vary from burn to burn it is difficult to "pre-quantify" ideal intensity objectives at a forest-wide scale. It is presumed that restoration, maintenance, fuel-reduction and other prescribed fire goals will be considered at the project level when planning burn intensity.

Key Factor Name Remoteness

Key Factor Description: Mean density of roads (miles per square mile) within this community type at the landscape scale.

Key Factor Weight: Medium

Indicator Name: Road Density

Indicator Description: Average number of road miles per square mile across all known occurrences of this target.

Poor Level: >2 miles

Fair Level: 1-2 miles

Good Level: 0.5-1 mile

Very Good Level: <0.5 mile

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Maintain or, where necessary, restore the average number of road miles per square mile to one or less across all known occurrences of this target.

Monitoring Strategy: Monitor average number of road miles per square mile across all known occurrences of this target.

Key Factor Name Spatial Ecology

Key Factor Description: The relative spatial abundance, proximity, distribution, and arrangement of this habitat type on the landscape.

Key Factor Weight: Medium

Indicator Name: Patch Proximity

Indicator Description: Median nearest distance between patches.

Poor Level: >4 miles

Fair Level: 2-4 miles

Good Level: 1-2 miles

Very Good Level: <1 mile

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Maintain or, where necessary, restore the median nearest distance between patches of this habitat type to two miles or less.

Monitoring Strategy: Monitor median nearest distance between patches.

Indicator Name: Number of Blocks

Indicator Description: Total number of blocks statewide

Poor Level: 0-1

Fair Level: 2

Good Level: 3

Very Good Level: >3

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Maintain or, where necessary, restore number of blocks to three or more. (Block is defined by the minimum convex polygon bounded by known occurrences of this habitat type in which the median patch size is above the fair level for patch size, and in which each of the patches score fair or better on the patch proximity threshold.)

Monitoring Strategy: Monitor total number of blocks statewide.

Key Factor Name Spatial Ecology

Indicator Name:	Average Block Size
Indicator Description:	Block is defined by the minimum convex polygon bounded by known occurrences of this habitat type in which the median patch size is above the fair level for patch size, and in which each of the patches score fair or better on the patch proximity threshold.
Poor Level:	<2,499 acres
Fair Level:	2,500-5,000 acres
Good Level:	5,001-10,000 acres
Very Good Level:	>10,000 acres
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore average block size to 5,001 acres or more. (Block is defined by the minimum convex polygon bounded by known occurrences of this habitat type in which the median patch size is above the fair level for patch size, and in which each of the patches score fair or better on the patch proximity threshold.)
Monitoring Strategy:	Monitor block size.
Indicator Name:	Patch Size
Indicator Description:	Average patch size across all known occurrences (acres)
Poor Level:	<250 acres
Fair Level:	250-500 acres
Good Level:	501-1,000 acres
Very Good Level:	>1,000 acres
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore the average patch size of this habitat type to 501 acres or more across all known occurrences.
Monitoring Strategy:	Monitor average patch size across all known occurrences (acres).

Habitat Name Lower Mississippi River Low Bottomland Forest



Ecoregions where the habitat occurs:

Ozark Highlands	Boston Mountains	Mississippi Valley Loess Plains	Arkansas Valley
☐	☐	☐	☐

Ouachita Mountains	South Central Plains	Mississippi Alluvial Plain
☐	☐	☑

Description

Low Bottomlands are usually seasonally flooded in backswamps, with flooding more frequent than every 5 years, usually more frequently than every two years, generally by still water that may be impounded behind natural levees, and are classed as Low Gradient Riverine Backwater wetlands in hydrogeomorphic classifications (Klimas and others 2004). Low bottomlands occur along the Mississippi River and its tributaries in the Mississippi Alluvial Plain Ecoregion. Prolonged flooding dominates this system, and its duration is greater that in the adjacent Mississippi River Riparian Forest. Quercus lyrata is the characteristic dominant species. Soils are clayey with poor internal drainage.
Changes in soils and vegetation of this system are much slower than in the adjacent Mississippi River Riparian forest. Historically, regeneration was through small treefall gaps or large tornado tracks. (adapted from NatureServe 2005)

Lower Mississippi River Low Bottomland Forest

Species associated with this habitat type (and the weight or importance of the habitat to each species) include:
Eastern Whip-poor-will (Antrostomus vociferus) Weight: Optimal
Rafinesque's Big-Eared Bat (Corynorhinus rafinesquii) Weight: Optimal
Bird-voiced Treefrog (Hyla avivoca) Weight: Optimal
Squirrel Treefrog (Hyla squirella) Weight: Optimal
Southeastern Bat (Myotis austroriparius) Weight: Optimal
Mole Salamander (Ambystoma talpoideum) Weight: Suitable
American Black Duck (Anas rubripes) Weight: Suitable
Chimney Swift (Chaetura pelagica) Weight: Suitable
Yellow-billed Cuckoo (Coccyzus americanus) Weight: Suitable
Chicken Turtle (Deirochelys reticularia) Weight: Suitable
Tricolored Heron (Egretta tricolor) Weight: Suitable
Swallow-tailed Kite (Elanoides forficatus) Weight: Suitable
Rusty Blackbird (Euphagus carolinus) Weight: Suitable
Purple Finch (Haemorhous purpureus) Weight: Suitable
Wood Thrush (Hylocichla mustelina) Weight: Suitable
Glossy Swampsnake (Liodytes rigida) Weight: Suitable
Giant Stag Beetle (Lucanus elaphus) Weight: Suitable
Yellow-crowned Night-Heron (Nyctanassa violacea) Weight: Suitable
Graham's Crayfish Snake (Regina grahamii) Weight: Suitable
American Woodcock (Scolopax minor) Weight: Suitable
Sharp-shinned Hawk (Accipiter striatus) Weight: Marginal
Black-crowned Night-Heron (Nycticorax nycticorax) Weight: Marginal
Cerulean Warbler (Setophaga cerulea) Weight: Marginal
Southern Bog Lemming (Synaptomys cooperi) Weight: Marginal
Long-tailed Weasel (Mustela frenata) Weight: Data Gap

Habitat Team

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Habitat Priority Score: 1034

Key Factor Name Composition

Key Factor Description: The diversity, species richness, and relative abundance of vegetative elements in this habitat type.

Key Factor Weight: Medium

Indicator Name:	Oak Dominance
Indicator Description:	The percent of oak stems among dominant canopy trees
Poor Level:	<12 or >72
Fair Level:	13-24 or 61-72
Good Level:	25-36 or 49-60
Very Good Level:	37-48
Current_Status:	Data Gap
Indicator Weight:	High
Conservation Action:	Maintain or, where necessary, restore the percent of oak stems among dominant canopy trees to 25-60 percent.
Monitoring Strategy:	Monitor percent oak stems among dominant canopy trees.
Indicator Name:	Red Oak/Overcup Oak Ratio
Indicator Description:	Relative amount of Red Oak to Overcup Oak in terms of basal area
Poor Level:	1:2
Fair Level:	1:1.5
Good Level:	1:1
Very Good Level:	1.5:1
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore the relative amount of Red Oak to Overcup Oak (measured in basal area) to a ratio of 1.1 or higher.
Monitoring Strategy:	Monitor relative amount of Red Oak to Overcup Oak in terms of basal area.

Key Factor Name Fire Regime

Key Factor Description: Fire Return Interval and Seasonality, including landscape-scale fire in surrounding/adjacent habitats to prevent woody encroachment and allow for distribution and dispersal of obligate species

Key Factor Weight: Medium

Indicator Name: Fire Seasonality/Intensity

Indicator Description: The percent of areas burned during either March/April or Aug/Sept, or from leaf-expansion to leaf-fall, depending on project-level goals. In some but not all cases, seasonality is an accurate surrogate for intensity. Since intensity goals will vary from burn to burn it is difficult to "pre-quantify" ideal intensity objectives at a forest-wide scale. It is presumed that restoration, maintenance, fuel-reduction and other prescribed fire goals will be considered at the project level when planning burn intensity.

Poor Level: <25

Fair Level: 25-50

Good Level: 51-75

Very Good Level: >75

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: When burning, burn during either March/April or August/September, or from leaf-expansion to leaf-fall, depending on project-level goals.

Monitoring Strategy: Monitor percent of burned areas burned during either March/April or Aug/Sept, or from leaf-expansion to leaf-fall, depending on project-level goals. In some but not all cases, seasonality is an accurate surrogate for intensity. Since intensity goals will vary from burn to burn it is difficult to "pre-quantify" ideal intensity objectives at a forest-wide scale. It is presumed that restoration, maintenance, fuel-reduction and other prescribed fire goals will be considered at the project level when planning burn intensity.

Key Factor Name Fire Regime

Indicator Name:	Fire Frequency
Indicator Description:	Average percent of all known occurrences burned per 15-30 year interval.
Poor Level:	<25
Fair Level:	25-50
Good Level:	51-75
Very Good Level:	>75
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Burn at least 51 percent of the spatial extent of all known occurrences of this habitat type every 15-30 years.
Monitoring Strategy:	Monitor average percent of all known occurrences burned per 15-30 year interval.

Key Factor Name Remoteness

Key Factor Description: Mean density of roads (miles per square mile) within this community type at the landscape scale.

Key Factor Weight: Medium

Indicator Name: Road Density

Indicator Description: Average number of road miles per square mile across all known occurrences of this target.

Poor Level: >2 miles

Fair Level: 1-2 miles

Good Level: 0.5-1 mile

Very Good Level: <0.5 mile

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Maintain or, where necessary, restore the average number of road miles per square mile to one or less across all known occurrences of this target.

Monitoring Strategy: Monitor average number of road miles per square mile across all known occurrences of this target.

Key Factor Name Spatial Ecology

Key Factor Description: The relative spatial abundance, proximity, distribution, and arrangement of this habitat type on the landscape.

Key Factor Weight: Medium

Indicator Name:	Patch Size
Indicator Description:	Average patch size across all known occurrences (acres)
Poor Level:	<500 acres
Fair Level:	500-1,000 acres
Good Level:	1,001-2,000 acres
Very Good Level:	>2,000 acres
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore the average patch size of this habitat type to 1,001 acres or more across all known occurrences.
Monitoring Strategy:	Monitor average patch size across all known occurrences (acres).
Indicator Name:	Number of Blocks
Indicator Description:	Total number of blocks statewide
Poor Level:	0-1
Fair Level:	2
Good Level:	3
Very Good Level:	>3
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore number of blocks to three or more. (Block is defined by the minimum convex polygon bounded by known occurrences of this habitat type in which the median patch size is above the fair level for patch size, and in which each of the patches score fair or better on the patch proximity threshold.)
Monitoring Strategy:	Monitor total number of blocks statewide.

Key Factor Name Spatial Ecology

Indicator Name:	Average Block Size
Indicator Description:	Block is defined by the minimum convex polygon bounded by known occurrences of this habitat type in which the median patch size is above the fair level for patch size, and in which each of the patches score fair or better on the patch proximity threshold.
Poor Level:	<5,000 acres
Fair Level:	5,000-10,000 acres
Good Level:	10,000-20,000 acres
Very Good Level:	>20,000 acres
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore average block size to 10,000 acres or more. (Block is defined by the minimum convex polygon bounded by known occurrences of this habitat type in which the median patch size is above the fair level for patch size, and in which each of the patches score fair or better on the patch proximity threshold.)
Monitoring Strategy:	Monitor block size.
Indicator Name:	Patch Proximity
Indicator Description:	Median nearest distance between patches.
Poor Level:	>4 miles
Fair Level:	2-4 miles
Good Level:	1-2 miles
Very Good Level:	<1 mile
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore the median nearest distance between patches of this habitat type to two miles or less.
Monitoring Strategy:	Monitor median nearest distance between patches.

Habitat Name Lower Mississippi River Riparian Forest



Ecoregions where the habitat occurs:

Ozark Highlands ☐	Boston Mountains ☐	Mississippi Valley Loess Plains ☐	Arkansas Valley ☐
Ouachita Mountains ☐	South Central Plains ☐	Mississippi Alluvial Plain ☑	

Description

This system is composed of riverfront associations, generally temporarily (but rarely seasonally) flooded on point bars and natural levees adjacent to the river that formed them, with flooding more frequent than every 5 years, by flowing water directly from the stream. They occur along the lower Mississippi River and its tributaries. They are classed as Low Gradient Riverine Overbank wetlands in a hydrogeomorphic classification (Klimas and others 2004). Flooding is of lower duration than on adjacent backswamps, where water is impounded behind riverfront natural levees. Flooding is of longer duration than on high bottomlands that are typically temporarily flooded. Soils are typically sandier than those of low bottomlands. Giant cane (Arundinaria gigantea) is a common understory in these forests on natural levees and higher point bars, and may become dominant after thinning or removal of overstory. Willow and cottonwood sandbars may have an open-canopy (woodland-type) structure.

Lower Mississippi River Riparian Forest

Often on sites with rapid soil deposition and therefore with rapid development of vegetation from low diversity willow and cottonwood dominated communities to more diverse communities dominated by Platanus occidentalis, Carya illinoensis, Celtis laevigata, Fraxinus pennsylvanica or Quercus texana. Historically, regeneration was through small treefall gaps and influenced by river dynamics. (adapted from NatureServe 2005)

Species associated with this habitat type (and the weight or importance of the habitat to each species) include:
Eastern Whip-poor-will (Antrostomus vociferus) Weight: Optimal
Rafinesque's Big-Eared Bat (Corynorhinus rafinesquii) Weight: Optimal
Swainson's Warbler (Limnothlypis swainsonii) Weight: Optimal
Winter Stonefly (Allocapnia malverna) Weight: Suitable
Lace-winged Roadside-Skipper (Amblyscirtes aesculapius) Weight: Suitable
Mole Salamander (Ambystoma talpoideum) Weight: Suitable
American Black Duck (Anas rubripes) Weight: Suitable
Anhinga (Anhinga anhinga) Weight: Suitable
Chimney Swift (Chaetura pelagica) Weight: Suitable
Chimney Swift (Chaetura pelagica) Weight: Suitable
Yellow-billed Cuckoo (Coccyzus americanus) Weight: Suitable
Swallow-tailed Kite (Elanoides forficatus) Weight: Suitable
Rusty Blackbird (Euphagus carolinus) Weight: Suitable
Purple Finch (Haemorhous purpureus) Weight: Suitable
Wood Thrush (Hylocichla mustelina) Weight: Suitable
Glossy Swampsnake (Liodytes rigida) Weight: Suitable
Bronze Copper (Lycaena hyllus) Weight: Suitable
Southeastern Bat (Myotis austroriparius) Weight: Suitable
Yellow-crowned Night-Heron (Nyctanassa violacea) Weight: Suitable
Broad-winged Skipper (Poanes viator) Weight: Suitable
American Woodcock (Scolopax minor) Weight: Suitable
Southern Bog Lemming (Synaptomys cooperi) Weight: Suitable
Southern Bog Lemming (Synaptomys cooperi) Weight: Suitable
Tricolored Heron (Egretta tricolor) Weight: Marginal
Willow Flycatcher (Empidonax traillii) Weight: Marginal
Northern Long-eared Bat (Myotis septentrionalis) Weight: Marginal
Black-crowned Night-Heron (Nycticorax nycticorax) Weight: Marginal
Cerulean Warbler (Setophaga cerulea) Weight: Marginal
Long-tailed Weasel (Mustela frenata) Weight: Data Gap

Habitat Team

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Habitat Priority Score: 1138

Key Factor Name Composition

Key Factor Description: The diversity, species richness, and relative abundance of vegetative elements in this habitat type.

Key Factor Weight: Medium

Indicator Name: Cottonwood Decline

Indicator Description: The percent of cottonwood basal area lost within a 30 year period.

Poor Level: >50

Fair Level: 30-50

Good Level: 15-29

Very Good Level: <15

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Maintain or, where necessary, restore the percent of cottonwood basal area lost within a 30 year period to 29 percent or less.

Monitoring Strategy: Monitor percent of cottonwood basal area lost within a 30 year period.

Indicator Name: Sugarberry increase

Indicator Description: Percent increase in sugarberry basal area over a 30 year period in a defined area.

Poor Level: >50

Fair Level: 30-50

Good Level: 15-29

Very Good Level: <15

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Maintain or, where necessary, restore the percent increase in sugarberry basal area over a 30 year period in a defined area to 29 percent or less.

Monitoring Strategy: Monitor percent increase in sugarberry basal area over a 30 year period in a defined area.

Key Factor Name Fire Regime

Key Factor Description: Fire Return Interval and Seasonality, including landscape-scale fire in surrounding/adjacent habitats to prevent woody encroachment and allow for distribution and dispersal of obligate species

Key Factor Weight: Medium

Indicator Name: Fire Frequency

Indicator Description: Average percent of all known occurrences burned per 5-7 year interval.

Poor Level: <25

Fair Level: 25-50

Good Level: 51-75

Very Good Level: >75

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Burn at least 51 percent of the spatial extent of all known occurrences of this habitat type every 5-7 years.

Monitoring Strategy: Monitor average percent of all known occurrences burned per 5-7 year interval.

Key Factor Name Fire Regime

Indicator Name:	Fire Seasonality/Intensity
Indicator Description:	The percent of areas burned during either March/April or Aug/Sept, or from leaf-expansion to leaf-fall, depending on project-level goals. In some but not all cases, seasonality is an accurate surrogate for intensity. Since intensity goals will vary from burn to burn it is difficult to "pre-quantify" ideal intensity objectives at a forest-wide scale. It is presumed that restoration, maintenance, fuel-reduction and other prescribed fire goals will be considered at the project level when planning burn intensity.
Poor Level:	<25
Fair Level:	25-50
Good Level:	51-75
Very Good Level:	>75
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	When burning, burn during either March/April or August/September, or from leaf-expansion to leaf-fall, depending on project-level goals.
Monitoring Strategy:	Monitor percent of burned areas burned during either March/April or Aug/Sept, or from leaf-expansion to leaf-fall, depending on project-level goals. In some but not all cases, seasonality is an accurate surrogate for intensity. Since intensity goals will vary from burn to burn it is difficult to "pre-quantify" ideal intensity objectives at a forest-wide scale. It is presumed that restoration, maintenance, fuel-reduction and other prescribed fire goals will be considered at the project level when planning burn intensity.

Key Factor Name Remoteness

Key Factor Description: Mean density of roads (miles per square mile) within this community type at the landscape scale.

Key Factor Weight: Medium

Indicator Name: Road Density

Indicator Description: Average number of road miles per square mile across all known occurrences of this target.

Poor Level: >2 miles

Fair Level: 1-2 miles

Good Level: 0.5-1 mile

Very Good Level: <0.5 mile

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Maintain or, where necessary, restore the average number of road miles per square mile to one or less across all known occurrences of this target.

Monitoring Strategy: Monitor average number of road miles per square mile across all known occurrences of this target.

Key Factor Name Spatial Ecology

Key Factor Description: The relative spatial abundance, proximity, distribution, and arrangement of this habitat type on the landscape.

Key Factor Weight: Medium

Indicator Name:	Patch Size
Indicator Description:	Average patch size across all known occurrences (acres)
Poor Level:	<500 acres
Fair Level:	500-1,000 acres
Good Level:	1,001-2,000 acres
Very Good Level:	>2,000 acres
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore the average patch size of this habitat type to 1,001 acres or more across all known occurrences.
Monitoring Strategy:	Monitor average patch size across all known occurrences (acres).
Indicator Name:	Patch Proximity
Indicator Description:	Median nearest distance between patches.
Poor Level:	>4 miles
Fair Level:	2-4 miles
Good Level:	1-2 miles
Very Good Level:	<1 mile
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore the median nearest distance between patches of this habitat type to two miles or less.
Monitoring Strategy:	Monitor median nearest distance between patches.

Key Factor Name Spatial Ecology

Indicator Name:	Number of Blocks
Indicator Description:	Total number of blocks statewide
Poor Level:	0-1
Fair Level:	2
Good Level:	3
Very Good Level:	>3
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore number of blocks to three or more. (Block is defined by the minimum convex polygon bounded by known occurrences of this habitat type in which the median patch size is above the fair level for patch size, and in which each of the patches score fair or better on the patch proximity threshold.)
Monitoring Strategy:	Monitor total number of blocks statewide.
Indicator Name:	Average Block Size
Indicator Description:	Block is defined by the minimum convex polygon bounded by known occurrences of this habitat type in which the median patch size is above the fair level for patch size, and in which each of the patches score fair or better on the patch proximity threshold.
Poor Level:	<5,000 acres
Fair Level:	5,000-10,000 acres
Good Level:	10,000-20,000 acres
Very Good Level:	>20,000 acres
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore average block size to 10,000 acres or more. (Block is defined by the minimum convex polygon bounded by known occurrences of this habitat type in which the median patch size is above the fair level for patch size, and in which each of the patches score fair or better on the patch proximity threshold.)
Monitoring Strategy:	Monitor block size.

Habitat Name Ouachita Montane Oak Forest



Ecoregions where the habitat occurs:

Ozark Highlands ☐	Boston Mountains ☐	Mississippi Valley Loess Plains ☐	Arkansas Valley ☑
Ouachita Mountains ☑	South Central Plains ☐	Mississippi Alluvial Plain ☐	

Description

This system represents hardwood forests of the highest elevations of the Ouachita Mountains, including Mount Magazine. Vegetation consists of either forests or open woodlands dominated by Quercus alba or Quercus stellata. Canopy trees are often stunted due to the effects of ice, wind and cold conditions, in combination with fog, shallow soils over rock, and periodic severe drought. Some stands form almost impenetrable thickets.
EMBEDDED: These systems are usually small, isolated, and/or disjunct and are often "embedded" in a larger habitat matrix. These systems rely heavily on surrounding and/or adjacent habitats for landscape scale functions and processes such as fire.
(adapted from NatureServe 2005)

Ouachita Montane Oak Forest

Species associated with this habitat type (and the weight or importance of the habitat to each species) include:
Eastern Whip-poor-will (Antrostomus vociferus) Weight: Optimal
Fourche Mountain Salamander (Plethodon fourchensis) Weight: Optimal
Kiamichi Slimy Salamander (Plethodon kiamichi) Weight: Optimal
Rich Mountain Salamander (Plethodon ouachitae) Weight: Optimal
Yellow-billed Cuckoo (Coccyzus americanus) Weight: Suitable
Western Diamond-backed Rattlesnake (Crotalus atrox) Weight: Suitable
Purple Finch (Haemorhous purpureus) Weight: Suitable
Southeastern Shrew (Sorex longirostris) Weight: Suitable
Wood Thrush (Hylocichla mustelina) Weight: Marginal
Long-tailed Weasel (Mustela frenata) Weight: Data Gap

Habitat Team

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Habitat Priority Score: 625

Key Factor Name Composition

Key Factor Description: The diversity, species richness, and relative abundance of vegetative elements in this habitat type.

Key Factor Weight: Medium

Indicator Name:	Invasive shrubs and woody vines
Indicator Description:	The percent of ground cover in non-native woody species
Poor Level:	>20
Fair Level:	10-20
Good Level:	5-9
Very Good Level:	<5
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore the percent of groundcover in invasive woody species to nine percent or less.
Monitoring Strategy:	Monitor the percent of ground cover in non-native woody species.
Indicator Name:	Exotic Forbs and Grasses
Indicator Description:	The percent of ground cover in non-native herbaceous species
Poor Level:	>20
Fair Level:	10-20
Good Level:	5-9
Very Good Level:	<5
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore the percent of groundcover in non-native herbaceous vegetation to nine percent or less.
Monitoring Strategy:	Monitor the percent of ground cover in non-native herbaceous species.

Key Factor Name Fire Regime

Key Factor Description: Fire Return Interval and Seasonality, including landscape-scale fire in surrounding/adjacent habitats to prevent woody encroachment and allow for distribution and dispersal of obligate species

Key Factor Weight: Medium

Indicator Name: Fire Seasonality/Intensity

Indicator Description: The percent of areas burned during either March/April or Aug/Sept, or from leaf-expansion to leaf-fall, depending on project-level goals. In some but not all cases, seasonality is an accurate surrogate for intensity. Since intensity goals will vary from burn to burn it is difficult to "pre-quantify" ideal intensity objectives at a forest-wide scale. It is presumed that restoration, maintenance, fuel-reduction and other prescribed fire goals will be considered at the project level when planning burn intensity.

Poor Level: <25

Fair Level: 25-50

Good Level: 51-75

Very Good Level: >75

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: When burning, burn during either March/April or August/September, or from leaf-expansion to leaf-fall, depending on project-level goals.

Monitoring Strategy: Monitor percent of burned areas burned during either March/April or Aug/Sept, or from leaf-expansion to leaf-fall, depending on project-level goals. In some but not all cases, seasonality is an accurate surrogate for intensity. Since intensity goals will vary from burn to burn it is difficult to "pre-quantify" ideal intensity objectives at a forest-wide scale. It is presumed that restoration, maintenance, fuel-reduction and other prescribed fire goals will be considered at the project level when planning burn intensity.

Key Factor Name Fire Regime

Indicator Name:	Fire Frequency
Indicator Description:	Average percent of all known occurrences burned per 3-7 year interval
Poor Level:	<25
Fair Level:	25-50
Good Level:	51-75
Very Good Level:	>75
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Burn at least 51 percent of the spatial extent of all known occurrences of this habitat type every 3-7 years.
Monitoring Strategy:	Monitor average percent of all known occurrences burned per 3-7 year interval.

Key Factor Name Remoteness

Key Factor Description: Mean density of roads (miles per square mile) within this community type at the landscape scale.

Key Factor Weight: Medium

Indicator Name: Road Density

Indicator Description: Average number of road miles per square mile across all known occurrences of this target.

Poor Level: >2 miles

Fair Level: 1-2 miles

Good Level: 0.5-1 mile

Very Good Level: <0.5 mile

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Maintain or, where necessary, restore the average number of road miles per square mile to one or less across all known occurrences of this target.

Monitoring Strategy: Monitor average number of road miles per square mile across all known occurrences of this target.

Habitat Name Ozark-Ouachita Cliff and Talus



Ecoregions where the habitat occurs:

Ozark Highlands	Boston Mountains	Mississippi Valley Loess Plains	Arkansas Valley
☑	☑	☐	☑

Ouachita Mountains	South Central Plains	Mississippi Alluvial Plain
☑	☐	☐

Description

This system is found primarily in the Interior Highlands and is characterized by rock outcrops and talus ranging from moist to dry and is typically sparsely vegetated. However, on moister sites with more soil development several fern species and sedges (Carex spp.) can establish. Woodland species can establish, often as stunted individuals. Wind and water erosion are the major dynamics influencing this system. These communities are usually small, isolated, and/or disjunct and are embedded in a larger habitat matrix. These systems rely heavily on surrounding and/or adjacent habitats for landscape scale functions and processes such as fire. (adapted from NatureServe 2005)

Species associated with this habitat type (and the weight or importance of the habitat to each species) include:

Eastern Collared Lizard (Crotaphytus collaris) Weight: Obligate
Western Groundsnake (Sonora semiannulata) Weight: Obligate
Rich Mountain Slitmouth (Stenotrema pilsbryi) Weight: Obligate
Ozark Big-eared Bat (Corynorhinus townsendii ingens) Weight: Optimal
Western Diamond-backed Rattlesnake (Crotalus atrox) Weight: Optimal
Land Snail (Gastrocopta rogersensis) Weight: Optimal
Magazine Mountain Shagreen (Inflectarius magazinensis) Weight: Optimal
Eastern Small-Footed Bat (Myotis leibii) Weight: Optimal
Striate Supercoil (Paravitrea aulacogyra) Weight: Optimal
Migrant Loggerhead Shrike (Lanius ludovicianus) Weight: Suitable
Crawford's Gray Shrew (Notiosorex crawfordi) Weight: Suitable
Little Brown Bat (Myotis lucifugus) Weight: Marginal
Indiana Bat (Myotis sodalis) Weight: Marginal
Eastern Spotted Skunk (Spilogale putorius) Weight: Marginal

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Habitat Priority Score: 1503

Key Factor Name Composition

Key Factor Description: The diversity, species richness, and relative abundance of vegetative elements in this habitat type.

Key Factor Weight: Medium

Indicator Name: Exotic Forbs and Grasses

Indicator Description: The percent of ground cover in non-native herbaceous species

Poor Level: >20

Fair Level: 10-20

Good Level: 5-9

Very Good Level: <5

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Maintain or, where necessary, restore the percent of groundcover in non-native herbaceous vegetation to nine percent or less.

Monitoring Strategy: Monitor the percent of ground cover in non-native herbaceous species.

Indicator Name: Invasive shrubs and woody vines

Indicator Description: The percent of ground cover in non-native woody species

Poor Level: >20

Fair Level: 10-20

Good Level: 5-9

Very Good Level: <5

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Maintain or, where necessary, restore the percent of groundcover in invasive woody species to nine percent or less.

Monitoring Strategy: Monitor the percent of ground cover in non-native woody species.

Key Factor Name Fire Regime

Key Factor Description: Fire Return Interval and Seasonality, including landscape-scale fire in surrounding/adjacent habitats to prevent woody encroachment and allow for distribution and dispersal of obligate species.

Key Factor Weight: Medium

Indicator Name: Fire Frequency

Indicator Description: Average percent of all known occurrences plus 100 meter buffer burned per 3-7 year interval.

Poor Level: <25

Fair Level: 25-50

Good Level: 51-75

Very Good Level: >75

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Burn at least 51 percent of the spatial extent plus 100 meter buffer of all known occurrences of this habitat type every 3-7 years.

Monitoring Strategy: Monitor average percent of all known occurrences plus 100 meter buffer burned per 3-7 year interval.

Key Factor Name Fire Regime

Indicator Name:	Fire Seasonality/Intensity
Indicator Description:	The percent of areas burned during either March/April or Aug/Sept, or from leaf-expansion to leaf-fall, depending on project-level goals. In some but not all cases, seasonality is an accurate surrogate for intensity. Since intensity goals will vary from burn to burn it is difficult to "pre-quantify" ideal intensity objectives at a forest-wide scale. It is presumed that restoration, maintenance, fuel-reduction and other prescribed fire goals will be considered at the project level when planning burn intensity.
Poor Level:	<25
Fair Level:	25-50
Good Level:	51-75
Very Good Level:	>75
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	When burning, burn during either March/April or August/September, or from leaf-expansion to leaf-fall, depending on project-level goals.
Monitoring Strategy:	Monitor percent of burned areas burned during either March/April or Aug/Sept, or from leaf-expansion to leaf-fall, depending on project-level goals. In some but not all cases, seasonality is an accurate surrogate for intensity. Since intensity goals will vary from burn to burn it is difficult to "pre-quantify" ideal intensity objectives at a forest-wide scale. It is presumed that restoration, maintenance, fuel-reduction and other prescribed fire goals will be considered at the project level when planning burn intensity.

Key Factor Name Remoteness

Key Factor Description: Mean density of roads (miles per square mile) within this community type at the landscape scale.

Key Factor Weight: Medium

Indicator Name: Road Density

Indicator Description: Average number of road miles per square mile across all known occurrences of this target.

Poor Level: >2 miles

Fair Level: 1-2 miles

Good Level: 0.5-1 mile

Very Good Level: <0.5 mile

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Maintain or, where necessary, restore the average number of road miles per square mile to one or less across all known occurrences of this target.

Monitoring Strategy: Monitor average number of road miles per square mile across all known occurrences of this target.

Key Factor Name Spatial Ecology

Key Factor Description: The relative spatial abundance, proximity, distribution, and arrangement of this habitat type on the landscape.

Key Factor Weight: Medium

Indicator Name: Patch Size

Indicator Description: Average patch size across all known occurrences (acres)

Poor Level: <100 acres

Fair Level: 100-200 acres

Good Level: 201-400 acres

Very Good Level: >400 acres

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Maintain or, where necessary, restore the average patch size of this habitat type to 201 acres or more across all known occurrences.

Monitoring Strategy: Monitor average patch size across all known occurrences (acres).

Key Factor Name Spatial Ecology

Indicator Name:	Average Block Size
Indicator Description:	Block is defined by the minimum convex polygon bounded by known occurrences of this habitat type in which the median patch size is above the fair level for patch size, and in which each of the patches score fair or better on the patch proximity threshold.
Poor Level:	<1,000 acres
Fair Level:	1,000-5,000
Good Level:	5,001-10,000 acres
Very Good Level:	>10,000 acres
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore average block size to 5,001 acres or more. (Block is defined by the minimum convex polygon bounded by known occurrences of this habitat type in which the median patch size is above the fair level for patch size, and in which each of the patches score fair or better on the patch proximity threshold.)
Monitoring Strategy:	Monitor block size.
Indicator Name:	Number of Blocks
Indicator Description:	Total number of blocks statewide
Poor Level:	0-1
Fair Level:	2
Good Level:	3
Very Good Level:	>3
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore number of blocks to three or more. (Block is defined by the minimum convex polygon bounded by known occurrences of this habitat type in which the median patch size is above the fair level for patch size, and in which each of the patches score fair or better on the patch proximity threshold.)
Monitoring Strategy:	Monitor total number of blocks statewide.

Key Factor Name Spatial Ecology

Indicator Name:	Patch Proximity
Indicator Description:	Median nearest distance between patches.
Poor Level:	>2 miles
Fair Level:	1-2 miles
Good Level:	0.5-1 mile
Very Good Level:	<0.5 mile
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore the median nearest distance between patches of this habitat type to one mile or less.
Monitoring Strategy:	Monitor median nearest distance between patches.

Habitat Name Ozark-Ouachita Dry Oak and Pine Woodland



Ecoregions where the habitat occurs:

Ozark Highlands	Boston Mountains	Mississippi Valley Loess Plains	Arkansas Valley
☑	☑	☐	☑

Ouachita Mountains	South Central Plains	Mississippi Alluvial Plain
☑	☐	☐

Description

This system occurs along gentle to steep slopes and over bluff escarpments with southerly to westerly aspects. Parent material can range from calcareous to acidic with very shallow, well- to excessively well-drained soils. This system was historically woodland in structure, composition, and process but now includes areas of more closed canopy. Oak species such as Quercus stellata, Quercus marilandica, and Quercus muehlenbergii dominate this system with an understory of grassland species such as Schizachyrium scoparium and shrub species such as Vaccinium arboreum. Drought stress and fire are the processes influencing and maintaining this system.
(adapted from NatureServe 2005)

Species associated with this habitat type (and the weight or importance of the habitat to each species)

Ozark-Ouachita Dry Oak and Pine Woodland

include:
Bell's Roadside-Skipper (Amblyscirtes belli) Weight: Optimal
Linda's Roadside-Skipper (Amblyscirtes linda) Weight: Optimal
Eastern Whip-poor-will (Antrostomus vociferus) Weight: Optimal
Golden-banded Skipper (Autochton cellus) Weight: Optimal
Northern Metalmark (Calephelis borealis) Weight: Optimal
Northern Bobwhite (Colinus virginianus) Weight: Optimal
Baltimore Checkerspot (Euphydryas phaeton ozarkae) Weight: Optimal
Indiana Bat (Myotis sodalis) Weight: Optimal
American Burying Beetle (Nicrophorus americanus) Weight: Optimal
Kiamichi Slimy Salamander (Plethodon kiamichi) Weight: Optimal
Bewick's Wren (Thryomanes bewickii) Weight: Optimal
Texas Frosted Elfin (Callophrys irus hadros) Weight: Suitable
Outis Skipper (Cogia outis) Weight: Suitable
Ozark Big-eared Bat (Corynorhinus townsendii ingens) Weight: Suitable
Western Diamond-backed Rattlesnake (Crotalus atrox) Weight: Suitable
Monarch (Danaus plexippus) Weight: Suitable
Beetle (Derops divalis) Weight: Suitable
Purple Finch (Haemorhous purpureus) Weight: Suitable
Leonard's Skipper (Hesperia leonardus) Weight: Suitable
Meske's Skipper (Hesperia meskei) Weight: Suitable
Cobweb Skipper (Hesperia metea) Weight: Suitable
Eastern Small-Footed Bat (Myotis leibii) Weight: Suitable
Rattlesnake-Master Borer Moth (Papaipema eryngii) Weight: Suitable
Fourche Mountain Salamander (Plethodon fourchensis) Weight: Suitable
Rich Mountain Salamander (Plethodon ouachitae) Weight: Suitable
Oak Hairstreak (Satyrium favonius ontario) Weight: Suitable
Indiana Phlox Moth (Schinia indiana) Weight: Suitable
Eastern Spotted Skunk (Spilogale putorius) Weight: Suitable
Sharp-shinned Hawk (Accipiter striatus) Weight: Marginal
Common Nighthawk (Chordeiles minor) Weight: Marginal
Bachman's Sparrow (Peucaea aestivalis) Weight: Marginal
Plains Harvest Mouse (Reithrodontomys montanus) Weight: Marginal
Long-tailed Weasel (Mustela frenata) Weight: Data Gap

Habitat Team

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Habitat Priority Score: 2226

Key Factor Name Composition

Key Factor Description: The diversity, species richness, and relative abundance of vegetative elements in this habitat type.

Key Factor Weight: Medium

Indicator Name: Percent total herbaceous ground coverage

Indicator Description: Average percent total native herbaceous ground cover across all known potential occurrences. Density must be sufficient to carry growing season fire at least once every five years. Composition should include only native species.

Poor Level: <25

Fair Level: 25-40

Good Level: 41-75

Very Good Level: >75

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Maintain or, where necessary, restore the average percent total native herbaceous groundcover across all known potential occurrences to 41 percent or more.

Monitoring Strategy: Monitor average percent total native herbaceous ground cover across all known potential occurrences.

Key Factor Name Fire Regime

Key Factor Description: Fire Return Interval and Seasonality, including landscape-scale fire in surrounding/adjacent habitats to prevent woody encroachment and allow for distribution and dispersal of obligate species

Key Factor Weight: Medium

Indicator Name: Fire Seasonality/Intensity

Indicator Description: The percent of areas burned during either March/April or Aug/Sept, or from leaf-expansion to leaf-fall, depending on project-level goals. In some but not all cases, seasonality is an accurate surrogate for intensity. Since intensity goals will vary from burn to burn it is difficult to "pre-quantify" ideal intensity objectives at a forest-wide scale. It is presumed that restoration, maintenance, fuel-reduction and other prescribed fire goals will be considered at the project level when planning burn intensity.

Poor Level: <25

Fair Level: 25-50

Good Level: 51-75

Very Good Level: >75

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: When burning, burn during either March/April or August/September, or from leaf-expansion to leaf-fall, depending on project-level goals.

Monitoring Strategy: Monitor percent of burned areas burned during either March/April or Aug/Sept, or from leaf-expansion to leaf-fall, depending on project-level goals. In some but not all cases, seasonality is an accurate surrogate for intensity. Since intensity goals will vary from burn to burn it is difficult to "pre-quantify" ideal intensity objectives at a forest-wide scale. It is presumed that restoration, maintenance, fuel-reduction and other prescribed fire goals will be considered at the project level when planning burn intensity.

Key Factor Name Fire Regime

Indicator Name:	Fire Frequency
Indicator Description:	Average percent of all known occurrences burned per 3-5 year interval
Poor Level:	<25
Fair Level:	25-50
Good Level:	51-75
Very Good Level:	>75
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Burn at least 51 percent of the spatial extent of all known occurrences of this habitat type every 3-5 years.
Monitoring Strategy:	Monitor average percent of all known occurrences burned per 3-5 year interval.

Key Factor Name Remoteness

Key Factor Description: Mean density of roads (miles per square mile) within this community type at the landscape scale.

Key Factor Weight: Medium

Indicator Name: Road Density

Indicator Description: Average number of road miles per square mile across all known occurrences of this target.

Poor Level: >2 miles

Fair Level: 1-2 miles

Good Level: 0.5-1 mile

Very Good Level: <0.5 mile

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Maintain or, where necessary, restore the average number of road miles per square mile to one or less across all known occurrences of this target.

Monitoring Strategy: Monitor average number of road miles per square mile across all known occurrences of this target.

Key Factor Name Spatial Ecology

Key Factor Description: The relative spatial abundance, proximity, distribution, and arrangement of this habitat type on the landscape.

Key Factor Weight: Medium

Indicator Name: Patch Proximity

Indicator Description: Median nearest distance between patches.

Poor Level: >4 miles

Fair Level: 2-4 miles

Good Level: 1-2 miles

Very Good Level: <1 mile

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Maintain or, where necessary, restore the median nearest distance between patches of this habitat type to two miles or less.

Monitoring Strategy: Monitor median nearest distance between patches.

Key Factor Name Spatial Ecology

Indicator Name:	Average Block Size
Indicator Description:	Block is defined by the minimum convex polygon bounded by known occurrences of this habitat type in which the median patch size is above the fair level for patch size, and in which each of the patches score fair or better on the patch proximity threshold.
Poor Level:	<5,000 acres
Fair Level:	50,00-10,000 acres
Good Level:	10,000-20,000 acres
Very Good Level:	>20,000 acres
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore average block size to 10,000 acres or more. (Block is defined by the minimum convex polygon bounded by known occurrences of this habitat type in which the median patch size is above the fair level for patch size, and in which each of the patches score fair or better on the patch proximity threshold.)
Monitoring Strategy:	Monitor block size.
Indicator Name:	Number of Blocks
Indicator Description:	Total number of blocks statewide
Poor Level:	0-1
Fair Level:	2
Good Level:	3
Very Good Level:	>3
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore number of blocks to three or more. (Block is defined by the minimum convex polygon bounded by known occurrences of this habitat type in which the median patch size is above the fair level for patch size, and in which each of the patches score fair or better on the patch proximity threshold.)
Monitoring Strategy:	Monitor total number of blocks statewide.

Key Factor Name Spatial Ecology

Indicator Name:	Patch Size
Indicator Description:	Average patch size across all known occurrences (acres)
Poor Level:	<500 acres
Fair Level:	500-1,000 acres
Good Level:	1,001-2,000 acres
Very Good Level:	>2,000 acres
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore the average patch size of this habitat type to 1,001 acres or more across all known occurrences.
Monitoring Strategy:	Monitor average patch size across all known occurrences (acres).

Habitat Name Ozark-Ouachita Dry-Mesic Oak Forest/Woodland



Ecoregions where the habitat occurs:

Ozark Highlands	Boston Mountains	Mississippi Valley Loess Plains	Arkansas Valley
☑	☑	☐	☑

Ouachita Mountains	South Central Plains	Mississippi Alluvial Plain
☑	☐	☐

Description

This system is the matrix system of these regions and occurs on dry-mesic to mesic gentle to moderately steep slopes. Soils are typically moderately to well-drained and more fertile than those associated with dry-oak forest/woodlands. An open to closed canopy of oak species (Quercus rubra and Quercus alba) often associated with hickory species (Carya spp.) typify this system. Wind, drought, and fires influence this system.
(adapted from NatureServe 2005)

Species associated with this habitat type (and the weight or importance of the habitat to each species) include:
Bell's Roadside-Skipper (Amblyscirtes belli) Weight: Optimal

Eastern Whip-poor-will (Antrostomus vociferus) Weight: Optimal
Northern Metalmark (Calephelis borealis) Weight: Optimal
American Burying Beetle (Nicrophorus americanus) Weight: Optimal
Mole Salamander (Ambystoma talpoideum) Weight: Suitable
Appalachian Azure (Celastrina neglectamajor) Weight: Suitable
Dusky Azure (Celastrina nigra) Weight: Suitable
Monarch (Danaus plexippus) Weight: Suitable
Mottled Duskywing (Erynnis martialis) Weight: Suitable
Indiana Bat (Myotis sodalis) Weight: Suitable
Caddo Mountain Salamander (Plethodon caddoensis) Weight: Suitable
Kiamichi Slimy Salamander (Plethodon kiamichi) Weight: Suitable
Rich Mountain Salamander (Plethodon ouachitae) Weight: Suitable
Gray Comma (Polygonia progne) Weight: Suitable
Diana (Speyeria diana) Weight: Suitable
Eastern Spotted Skunk (Spilogale putorius) Weight: Suitable
Sharp-shinned Hawk (Accipiter striatus) Weight: Marginal

Habitat Team

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Habitat Priority Score: 1070

Key Factor Name Canopy closure

Key Factor Description: Combination of stem density, basal area and extent of canopy cover, with intermitent closure as ideal (Surrogate for Horizontal Structure).

Key Factor Weight: Medium

Indicator Name: Canopy Closure

Indicator Description: The percent of the spatial extent of all known occurrences with a percent canopy closure between 30 and 70 percent.

Poor Level: <25

Fair Level: 25-50

Good Level: 51-75

Very Good Level: >75

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Maintain or, where necessary, restore the percent of the spatial extent of all known occurrences with a canopy closure between 30 and 70 percent to 51 percent or more.

Monitoring Strategy: Monitor percent of the spatial extent of all known occurrences with a percent canopy closure between 30 and 70 percent.

Key Factor Name Composition

Key Factor Description: The diversity, species richness, and relative abundance of vegetative elements in this habitat type.

Key Factor Weight: Medium

Indicator Name:	Oak component
Indicator Description:	The percent of oak basal area among dominant canopy trees
Poor Level:	<30 or >80
Fair Level:	30-39 or 71-80
Good Level:	40-49 or 61-70
Very Good Level:	50-60
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore the percent of oak stems among dominant canopy trees to 40-70 percent.
Monitoring Strategy:	Monitor percent of oak basal area among dominant canopy trees.

Key Factor Name Fire Regime

Key Factor Description: Fire Return Interval and Seasonality, including landscape-scale fire in surrounding/adjacent habitats to prevent woody encroachment and allow for distribution and dispersal of obligate species

Key Factor Weight: Medium

Indicator Name: Fire Seasonality/Intensity

Indicator Description: The percent of areas burned during either March/April or Aug/Sept, or from leaf-expansion to leaf-fall, depending on project-level goals. In some but not all cases, seasonality is an accurate surrogate for intensity. Since intensity goals will vary from burn to burn it is difficult to "pre-quantify" ideal intensity objectives at a forest-wide scale. It is presumed that restoration, maintenance, fuel-reduction and other prescribed fire goals will be considered at the project level when planning burn intensity.

Poor Level: <25

Fair Level: 25-50

Good Level: 51-75

Very Good Level: >75

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: When burning, burn during either March/April or August/September, or from leaf-expansion to leaf-fall, depending on project-level goals.

Monitoring Strategy: Monitor percent of burned areas burned during either March/April or Aug/Sept, or from leaf-expansion to leaf-fall, depending on project-level goals. In some but not all cases, seasonality is an accurate surrogate for intensity. Since intensity goals will vary from burn to burn it is difficult to "pre-quantify" ideal intensity objectives at a forest-wide scale. It is presumed that restoration, maintenance, fuel-reduction and other prescribed fire goals will be considered at the project level when planning burn intensity.

Key Factor Name Fire Regime

Indicator Name:	Fire Frequency
Indicator Description:	Average percent of all known occurrences burned per 3-7 year interval
Poor Level:	<25
Fair Level:	25-50
Good Level:	51-75
Very Good Level:	>75
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Burn at least 51 percent of the spatial extent of all known occurrences of this habitat type every 3-7 years.
Monitoring Strategy:	Monitor average percent of all known occurrences burned per 3-7 year interval.

Key Factor Name Remoteness

Key Factor Description: Mean density of roads (miles per square mile) within this community type at the landscape scale.

Key Factor Weight: Medium

Indicator Name: Road Density

Indicator Description: Average number of road miles per square mile across all known occurrences of this target.

Poor Level: >2 miles

Fair Level: 1-2 miles

Good Level: 0.5-1 mile

Very Good Level: <0.5 mile

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Maintain or, where necessary, restore the average number of road miles per square mile to one or less across all known occurrences of this target.

Monitoring Strategy: Monitor average number of road miles per square mile across all known occurrences of this target.

Key Factor Name Spatial Ecology

Key Factor Description: The relative spatial abundance, proximity, distribution, and arrangement of this habitat type on the landscape.

Key Factor Weight: Medium

Indicator Name: Number of Blocks

Indicator Description: Total number of blocks statewide

Poor Level: 0-1

Fair Level: 2

Good Level: 3

Very Good Level: >3

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Maintain or, where necessary, restore number of blocks to three or more. (Block is defined by the minimum convex polygon bounded by known occurrences of this habitat type in which the median patch size is above the fair level for patch size, and in which each of the patches score fair or better on the patch proximity threshold.)

Monitoring Strategy: Monitor total number of blocks statewide.

Indicator Name: Patch Proximity

Indicator Description: Median nearest distance between patches.

Poor Level: >4 miles

Fair Level: 2-4 miles

Good Level: 1-2 miles

Very Good Level: <1 mile

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Maintain or, where necessary, restore the median nearest distance between patches of this habitat type to two miles or less.

Monitoring Strategy: Monitor median nearest distance between patches.

Key Factor Name Spatial Ecology

Indicator Name:	Patch Size
Indicator Description:	Average patch size across all known occurrences (acres)
Poor Level:	<500 acres
Fair Level:	500-1,000 acres
Good Level:	1,001-2,000 acres
Very Good Level:	>2,000 acres
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore the average patch size of this habitat type to 1,001 acres or more across all known occurrences.
Monitoring Strategy:	Monitor average patch size across all known occurrences (acres).
Indicator Name:	Average Block Size
Indicator Description:	Block is defined by the minimum convex polygon bounded by known occurrences of this habitat type in which the median patch size is above the fair level for patch size, and in which each of the patches score fair or better on the patch proximity threshold.
Poor Level:	<5,000 acres
Fair Level:	5,000-10,000 acres
Good Level:	10,000-20,000 acres
Very Good Level:	>20,000 acres
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore average block size to 10,000 acres or more. (Block is defined by the minimum convex polygon bounded by known occurrences of this habitat type in which the median patch size is above the fair level for patch size, and in which each of the patches score fair or better on the patch proximity threshold.)
Monitoring Strategy:	Monitor block size.

Habitat Name Ozark-Ouachita Forested Seep



Ecoregions where the habitat occurs:

Ozark Highlands	Boston Mountains	Mississippi Valley Loess Plains	Arkansas Valley
☑	☑	☑	☑

Ouachita Mountains	South Central Plains	Mississippi Alluvial Plain
☑	☐	☐

Description

This system of seeps may be found along the bottom slopes of smaller valleys where rock fractures or sandy soils allow water to seep out of the mountainsides. The soil remains saturated to very moist throughout the year. The vegetation is typically forested with highly variable canopy composition. In acid seeps, vegetation is characterized by Acer rubrum var. trilobum, Nyssa sylvatica, Liquidambar styraciflua, and Quercus alba. Other canopy species may include Fagus grandifolia and Magnolia tripetala. Canopy coverage can be moderately dense to quite open. The subcanopy is often well-developed and characteristically includes Ilex opaca var. opaca, Magnolia tripetala, Carpinus caroliniana, and Ostrya virginiana. Calcareous seeps or fens, typically in the Ozarks, may be dominated by shrubs or herbs such as Parnassia grandifolia and Carex spp. Many are less than one hectare in area, but riparian seeps are often much larger. These systems are usually small, isolated, and/or

disjunct and are embedded in a larger habitat matrix. These systems rely heavily on surrounding and/or adjacent habitats for landscape scale functions and processes such as fire.

(adapted from NatureServe 2005)

Species associated with this habitat type (and the weight or importance of the habitat to each species) include:
Four-toed Salamander (Hemidactylium scutatum) Weight: Obligate
Swamp Metalmark (Calephelis muticum) Weight: Optimal
Ouachita Spiketail (Cordulegaster talaria) Weight: Optimal
Daisy Burrowing Crayfish (Fallicambarus jeanae) Weight: Optimal
Ringed Salamander (Ambystoma annulatum) Weight: Suitable
Yellow-billed Cuckoo (Coccyzus americanus) Weight: Suitable
Ouachita Burrowing Crayfish (Fallicambarus harpi) Weight: Suitable
Saline Burrowing Crayfish (Fallicambarus strawni) Weight: Suitable
Irons Fork Burrowing Crayfish (Procambarus reimeri) Weight: Suitable
Ozark Emerald (Somatochlora ozarkensis) Weight: Suitable
Sharp-shinned Hawk (Accipiter striatus) Weight: Marginal
Ouachita Mountain Crayfish (Procambarus tenuis) Weight: Data Gap

Habitat Team

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Habitat Priority Score: 1055

Key Factor Name Composition

Key Factor Description: The diversity, species richness, and relative abundance of vegetative elements in this habitat type.

Key Factor Weight: Medium

Indicator Name:	Invasive shrubs and woody vines
Indicator Description:	The percent of ground cover in non-native woody species
Poor Level:	>20
Fair Level:	10-20
Good Level:	5-9
Very Good Level:	<5
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore the percent of groundcover in invasive woody species to nine percent or less.
Monitoring Strategy:	Monitor the percent of ground cover in non-native woody species.
Indicator Name:	Exotic Forbs and Grasses
Indicator Description:	The percent of ground cover in non-native herbaceous species
Poor Level:	>20
Fair Level:	10-20
Good Level:	5-9
Very Good Level:	<5
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore the percent of groundcover in non-native herbaceous vegetation to nine percent or less.
Monitoring Strategy:	Monitor the percent of ground cover in non-native herbaceous species.

Key Factor Name Fire Regime

Key Factor Description: Fire Return Interval and Seasonality, including landscape-scale fire in surrounding/adjacent habitats to prevent woody encroachment and allow for distribution and dispersal of obligate species

Key Factor Weight: Medium

Indicator Name: Fire Frequency

Indicator Description: Average percent of all known occurrences plus appropriate buffer burned per 5-7 year interval.

Poor Level: <25

Fair Level: 25-50

Good Level: 51-75

Very Good Level: >75

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Burn at least 51 percent of the spatial extent plus appropriate buffer of all known occurrences of this habitat type every 5-7 years.

Monitoring Strategy: Monitor average percent of all known occurrences plus appropriate buffer burned per 5-7 year interval.

Key Factor Name Fire Regime

Indicator Name:	Fire Seasonality/Intensity
Indicator Description:	The percent of areas burned during either March/April or Aug/Sept, or from leaf-expansion to leaf-fall, depending on project-level goals. In some but not all cases, seasonality is an accurate surrogate for intensity. Since intensity goals will vary from burn to burn it is difficult to "pre-quantify" ideal intensity objectives at a forest-wide scale. It is presumed that restoration, maintenance, fuel-reduction and other prescribed fire goals will be considered at the project level when planning burn intensity.
Poor Level:	<25
Fair Level:	25-50
Good Level:	51-75
Very Good Level:	>75
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	When burning, burn during either March/April or August/September, or from leaf-expansion to leaf-fall, depending on project-level goals.
Monitoring Strategy:	Monitor percent of burned areas burned during either March/April or Aug/Sept, or from leaf-expansion to leaf-fall, depending on project-level goals. In some but not all cases, seasonality is an accurate surrogate for intensity. Since intensity goals will vary from burn to burn it is difficult to "pre-quantify" ideal intensity objectives at a forest-wide scale. It is presumed that restoration, maintenance, fuel-reduction and other prescribed fire goals will be considered at the project level when planning burn intensity.

Key Factor Name No-Activity Protection Zone

Key Factor Description: 100 foot zone of no-activity by ALRMP

Key Factor Weight: Medium

Indicator Name:	Spatial extent of buffer
Indicator Description:	Spatial extent of the buffer from edge.
Poor Level:	<50 feet
Fair Level:	50-99 feet
Good Level:	>100 feet
Very Good Level:	>100 feet
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore the spatial extent of the buffer in feet from edge to 100 feet or more.
Monitoring Strategy:	Monitor spatial extent of the buffer in feet from edge.

Key Factor Name Remoteness

Key Factor Description: Mean density of roads (miles per square mile) within this community type at the landscape scale.

Key Factor Weight: Medium

Indicator Name: Road Density

Indicator Description: Average number of road miles per square mile across all known occurrences of this target.

Poor Level: >2 miles

Fair Level: 1-2 miles

Good Level: 0.5-1 mile

Very Good Level: <0.5 mile

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Maintain or, where necessary, restore the average number of road miles per square mile to one or less across all known occurrences of this target.

Monitoring Strategy: Monitor average number of road miles per square mile across all known occurrences of this target.

Key Factor Name Spatial Ecology

Key Factor Description: The relative spatial abundance, proximity, distribution, and arrangement of this habitat type on the landscape.

Key Factor Weight: Medium

Indicator Name:	Patch Proximity
Indicator Description:	Median nearest distance between patches.
Poor Level:	>1200 meters
Fair Level:	801-1200 meters
Good Level:	500-800 meters
Very Good Level:	<500 meters
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore the average distance between patches to 800 meters or less.
Monitoring Strategy:	Monitor median nearest distance between patches.
Indicator Name:	Average Block Size
Indicator Description:	Block is defined by the minimum convex polygon bounded by known occurrences of this habitat type in which the median patch size is above the fair level for patch size, and in which each of the patches score fair or better on the patch proximity threshold.
Poor Level:	<300 acres
Fair Level:	300-600 acres
Good Level:	601-1,000 acres
Very Good Level:	>1,000 acres
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore average block size to 601 acres or more. (Block is defined by the minimum convex polygon bounded by known occurrences of this habitat type in which the median patch size is above the fair level for patch size, and in which each of the patches score fair or better on the patch proximity threshold.)
Monitoring Strategy:	Monitor block size.

Key Factor Name Spatial Ecology

Indicator Name:	Number of Blocks
Indicator Description:	Total number of blocks statewide
Poor Level:	0-1
Fair Level:	2
Good Level:	3
Very Good Level:	>3
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore number of blocks to three or more. (Block is defined by the minimum convex polygon bounded by known occurrences of this habitat type in which the median patch size is above the fair level for patch size, and in which each of the patches score fair or better on the patch proximity threshold.)
Monitoring Strategy:	Monitor total number of blocks statewide.
Indicator Name:	Patch Size
Indicator Description:	Width of buffer (meters)
Poor Level:	<100 meters of buffer
Fair Level:	100-250 meters of buffer
Good Level:	251-400 meters of buffer
Very Good Level:	>400 meters of buffer
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, buffer known occurrences of the habitat type with a minimum of 251 meters of adjacent but dissimilar habitats.
Monitoring Strategy:	Monitor width of buffer (meters).

Habitat Name Ozark-Ouachita Large Floodplain



Ecoregions where the habitat occurs:

Ozark Highlands	Boston Mountains	Mississippi Valley Loess Plains	Arkansas Valley
☑	☑	☐	☑

Ouachita Mountains	South Central Plains	Mississippi Alluvial Plain
☑	☐	☐

Description

This floodplain system occurs along larger upland rivers where topography and alluvial processes have resulted in a recognizable floodplain. Many examples of this system will contain well-drained levees, terraces and stabilized bars, and some will include herbaceous sloughs and shrub wetlands resulting, in part, from beaver activity. A variety of soil types may be found within the floodplain from very well-drained gravelly substrates to very dense clays. This variety of substrates in combination with different flooding regimes creates a mix of vegetation. Most areas are inundated at some point each spring; microtopography determines how long the various habitats are inundated. Although vegetation is quite variable in this broadly defined system, examples may include Acer saccharinum, Platanus occidentalis, Liquidambar styraciflua, Betula nigra, and Quercus spp. Understory species include shrubs, such as Cephalanthus occidentalis and Arundinaria gigantea, and sedges (Carex spp.). This system likely

floods at least annually and can be altered by occasional severe floods. Impoundments and conversion to agriculture can also impact this system. An example of this habitat is the floodplain along the Buffalo River.

(adapted from NatureServe 2005)

Species associated with this habitat type (and the weight or importance of the habitat to each species) include:
Lace-winged Roadside-Skipper (Amblyscirtes aesculapius) Weight: Optimal
Carolina Roadside-Skipper (Amblyscirtes carolina) Weight: Optimal
Eastern Whip-poor-will (Antrostomus vociferus) Weight: Optimal
Sandy Stream Tiger Beetle (Cicindela macra) Weight: Optimal
Ouachita Spiketail (Cordulegaster talaria) Weight: Optimal
Rafinesque's Big-Eared Bat (Corynorhinus rafinesquii) Weight: Optimal
Bird-voiced Treefrog (Hyla avivoca) Weight: Optimal
Squirrel Treefrog (Hyla squirella) Weight: Optimal
Bell's Roadside-Skipper (Amblyscirtes belli) Weight: Suitable
Anhinga (Anhinga anhinga) Weight: Suitable
Chimney Swift (Chaetura pelagica) Weight: Suitable
Ant-like Tiger Beetle (Cicindela cursitans) Weight: Suitable
Twelve-spotted Tiger Beetle (Cicindela duodecimguttata) Weight: Suitable
Big Sand Tiger Beetle (Cicindela formosa pigmentosignata) Weight: Suitable
Beach-dune Tiger Beetle (Cicindela hirticollis) Weight: Suitable
Tiger Beetle (Cicindela lepida) Weight: Suitable
Yellow-billed Cuckoo (Coccyzus americanus) Weight: Suitable
Rusty Blackbird (Euphagus carolinus) Weight: Suitable
Dukes' Skipper (Euphyes dukesi) Weight: Suitable
Purple Finch (Haemorhous purpureus) Weight: Suitable
Wood Thrush (Hylocichla mustelina) Weight: Suitable
Glossy Swampsnake (Liodytes rigida) Weight: Suitable
Gray Bat (Myotis grisescens) Weight: Suitable
Yellow-crowned Night-Heron (Nyctanassa violacea) Weight: Suitable
Yehl Skipper (Poanes yehl) Weight: Suitable
Gray Comma (Polygonia progne) Weight: Suitable
Byssus Skipper (Problema byssus) Weight: Suitable
American Woodcock (Scolopax minor) Weight: Suitable
Tricolored Heron (Egretta tricolor) Weight: Marginal
Willow Flycatcher (Empidonax traillii) Weight: Marginal
Black-crowned Night-Heron (Nycticorax nycticorax) Weight: Marginal
Ozark Clubtail Dragonfly (Gomphus ozarkensis) Weight: Data Gap
Swainson's Warbler (Limnothlypis swainsonii) Weight: Data Gap
Long-tailed Weasel (Mustela frenata) Weight: Data Gap
Ozark Snaketail Dragonfly (Ophiogomphus westfalli) Weight: Data Gap
Ozark Emerald (Somatochlora ozarkensis) Weight: Data Gap

Habitat Team

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Habitat Priority Score: 1551

Key Factor Name Canopy Closure

Key Factor Description: Combination of stem density, basal area and extent of canopy cover, with intermittent closure as ideal.

Key Factor Weight: Medium

Indicator Name: Canopy Closure

Indicator Description: The percent of the spatial extent of all known occurrences with a percent canopy closure of greater than 80%.

Poor Level: <25

Fair Level: 25-50

Good Level: 51-75

Very Good Level: >75

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Maintain or, where necessary, restore the percent of the spatial extent of all known occurrences with a canopy closure of greater than 80 percent to 51 percent or more.

Monitoring Strategy: Monitor percent of the spatial extent of all known occurrences with a percent canopy closure of greater than 80%.

Key Factor Name Composition

Key Factor Description: The diversity, species richness, and relative abundance of vegetative elements in this habitat type.

Key Factor Weight: Medium

Indicator Name: Exotic Forbs and Grasses

Indicator Description: The percent of ground cover in non-native herbaceous species

Poor Level: >20

Fair Level: 10-20

Good Level: 5-9

Very Good Level: <5

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Maintain or, where necessary, restore the percent of groundcover in non-native herbaceous vegetation to nine percent or less.

Monitoring Strategy: Monitor the percent of ground cover in non-native herbaceous species.

Indicator Name: Invasive shrubs and woody vines

Indicator Description: The percent of ground cover in non-native woody species

Poor Level: >20

Fair Level: 10-20

Good Level: 5-9

Very Good Level: <5

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Maintain or, where necessary, restore the percent of groundcover in invasive woody species to nine percent or less.

Monitoring Strategy: Monitor the percent of ground cover in non-native woody species.

Key Factor Name Fire Regime

Key Factor Description: Fire Return Interval and Seasonality, including landscape-scale fire in surrounding/adjacent habitats to prevent woody encroachment and allow for distribution and dispersal of obligate species

Key Factor Weight: Medium

Indicator Name: Fire Seasonality/Intensity

Indicator Description: The percent of areas burned during either March/April or Aug/Sept, or from leaf-expansion to leaf-fall, depending on project-level goals. In some but not all cases, seasonality is an accurate surrogate for intensity. Since intensity goals will vary from burn to burn it is difficult to "pre-quantify" ideal intensity objectives at a forest-wide scale. It is presumed that restoration, maintenance, fuel-reduction and other prescribed fire goals will be considered at the project level when planning burn intensity.

Poor Level: <25

Fair Level: 25-50

Good Level: 51-75

Very Good Level: >75

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: When burning, burn during either March/April or August/September, or from leaf-expansion to leaf-fall, depending on project-level goals.

Monitoring Strategy: Monitor percent of burned areas burned during either March/April or Aug/Sept, or from leaf-expansion to leaf-fall, depending on project-level goals. In some but not all cases, seasonality is an accurate surrogate for intensity. Since intensity goals will vary from burn to burn it is difficult to "pre-quantify" ideal intensity objectives at a forest-wide scale. It is presumed that restoration, maintenance, fuel-reduction and other prescribed fire goals will be considered at the project level when planning burn intensity.

Key Factor Name Fire Regime

Indicator Name:	Fire Frequency
Indicator Description:	Average percent of all known occurrences burned per 5-7 year interval.
Poor Level:	<25
Fair Level:	25-50
Good Level:	51-75
Very Good Level:	>75
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Burn at least 51 percent of the spatial extent of all known occurrences of this habitat type every 5-7 years.
Monitoring Strategy:	Monitor average percent of all known occurrences burned per 5-7 year interval.

Key Factor Name Remoteness

Key Factor Description: Mean density of roads (miles per square mile) within this community type at the landscape scale.

Key Factor Weight: Medium

Indicator Name: Road Density

Indicator Description: Average number of road miles per square mile across all known occurrences of this target.

Poor Level: >2 miles

Fair Level: 1-2 miles

Good Level: 0.5-1 mile

Very Good Level: <0.5 mile

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Maintain or, where necessary, restore the average number of road miles per square mile to one or less across all known occurrences of this target.

Monitoring Strategy: Monitor average number of road miles per square mile across all known occurrences of this target.

Key Factor Name Spatial Ecology

Key Factor Description: The relative spatial abundance, proximity, distribution, and arrangement of this habitat type on the landscape.

Key Factor Weight: Medium

Indicator Name: Average Block Size

Indicator Description: Block is defined by the minimum convex polygon bounded by known occurrences of this habitat type in which the median patch size is above the fair level for patch size, and in which each of the patches score fair or better on the patch proximity threshold.

Poor Level: <500 acres

Fair Level: 500-1,000 acres

Good Level: 1,000-2,500 acres

Very Good Level: >2,500 acres

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Maintain or, where necessary, restore average block size to 1,000 acres or more. (Block is defined by the minimum convex polygon bounded by known occurrences of this habitat type in which the median patch size is above the fair level for patch size, and in which each of the patches score fair or better on the patch proximity threshold.)

Monitoring Strategy: Monitor block size.

Key Factor Name Spatial Ecology

Indicator Name:	Number of Blocks
Indicator Description:	Total number of blocks statewide
Poor Level:	<4
Fair Level:	4-7
Good Level:	7-10
Very Good Level:	>10
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore number of blocks to seven or more. (Block is defined by the minimum convex polygon bounded by known occurrences of this habitat type in which the median patch size is above the fair level for patch size, and in which each of the patches score fair or better on the patch proximity threshold.)
Monitoring Strategy:	Monitor total number of blocks statewide.
Indicator Name:	Patch Proximity
Indicator Description:	Median nearest distance between patches.
Poor Level:	>.5 mile
Fair Level:	.25-.5 miles
Good Level:	.1-.25 miles
Very Good Level:	<.1 mile
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore the median nearest distance between patches of this habitat type to .25 mile or less.
Monitoring Strategy:	Monitor median nearest distance between patches.

Key Factor Name Spatial Ecology

Indicator Name:	Patch Size
Indicator Description:	Average patch size across all known occurrences (acres)
Poor Level:	<50 acres
Fair Level:	50-100 acres
Good Level:	100-250 acres
Very Good Level:	>250 acres
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore the average patch size of this habitat type to 100 acres or more across all known occurrences.
Monitoring Strategy:	Monitor average patch size across all known occurrences (acres).

Habitat Name Ozark-Ouachita Mesic Hardwood Forest



Ecoregions where the habitat occurs:

Ozark Highlands	Boston Mountains	Mississippi Valley Loess Plains	Arkansas Valley
☑	☑	☐	☑

Ouachita Mountains	South Central Plains	Mississippi Alluvial Plain
☑	☐	☐

Description

This system is found on toeslopes, valley bottoms and north slopes. Quercus rubra increases in abundance compared to dry-mesic habitats, and Acer saccharum is sometimes a leading dominant. On more alkaline moist soils, Quercus muehlenbergii, Tilia americana, and Cercis canadensis may be common. In the Boston Mountains, mesic forests may also be common on protected slopes and terraces next to streams. Here Fagus grandifolia may be the leading dominant, with codominants of Acer saccharum, Liquidambar styraciflua, Tilia americana, Magnolia acuminata, and others. Similar habitats occur in the western Ouachita Mountains.
(adapted from NatureServe 2005)

Species associated with this habitat type (and the weight or importance of the habitat to each species)

Ozark-Ouachita Mesic Hardwood Forest

include:
Ouachita Slitmouth (Stenotrema unciferum) Weight: Obligate
Lace Bug (Acalypta susanae) Weight: Optimal
Ringed Salamander (Ambystoma annulatum) Weight: Optimal
Eastern Whip-poor-will (Antrostomus vociferus) Weight: Optimal
Yellow-billed Cuckoo (Coccyzus americanus) Weight: Optimal
Wood Thrush (Hylocichla mustelina) Weight: Optimal
Wood Frog (Lithobates sylvaticus) Weight: Optimal
American Burying Beetle (Nicrophorus americanus) Weight: Optimal
Caddo Mountain Salamander (Plethodon caddoensis) Weight: Optimal
Fourche Mountain Salamander (Plethodon fourchensis) Weight: Optimal
Kiamichi Slimy Salamander (Plethodon kiamichi) Weight: Optimal
Rich Mountain Salamander (Plethodon ouachitae) Weight: Optimal
Ground Beetle (Scaphinotus inflectus) Weight: Optimal
Ground Beetle (Scaphinotus parisiana) Weight: Optimal
Sharp-shinned Hawk (Accipiter striatus) Weight: Suitable
Mole Salamander (Ambystoma talpoideum) Weight: Suitable
Eastern Tiger Salamander (Ambystoma tigrinum) Weight: Suitable
Copeland's Mold Beetle (Arianops copelandi) Weight: Suitable
Magazine Mountain Mold Beetle (Arianops sandersoni) Weight: Suitable
Appalachian Azure (Celastrina neglectamajor) Weight: Suitable
Dusky Azure (Celastrina nigra) Weight: Suitable
Chimney Swift (Chaetura pelagica) Weight: Suitable
Woodland Tiger Beetle (Cicindela unipunctata) Weight: Suitable
Beetle (Derops divalis) Weight: Suitable
Earthworm (Diplocardia meansi) Weight: Suitable
Six-banded Longhorn Beetle (Dryobius sexnotatus) Weight: Suitable
Oklahoma Salamander (Eurycea tynerensis) Weight: Suitable
Purple Finch (Haemorhous purpureus) Weight: Suitable
Giant Stag Beetle (Lucanus elaphus) Weight: Suitable
Eastern Small-Footed Bat (Myotis leibii) Weight: Suitable
Indiana Bat (Myotis sodalis) Weight: Suitable
Small-eyed Mold Beetle (Ouachitychus parvoculus) Weight: Suitable
Gray Comma (Polygonia progne) Weight: Suitable
Ouachita Pseudactium (Pseudactium magazinensis) Weight: Suitable
Ozark Pseudactium (Pseudactium ursum) Weight: Suitable
Cerulean Warbler (Setophaga cerulea) Weight: Suitable
Southeastern Shrew (Sorex longirostris) Weight: Suitable
Diana (Speyeria diana) Weight: Suitable
Pseudoscorpion (Tartarocreagris ozarkensis) Weight: Suitable
American Woodcock (Scolopax minor) Weight: Marginal
Eastern Spotted Skunk (Spilogale putorius) Weight: Marginal
White Liptooth (Daedalochila peregrina) Weight: Data Gap
Long-tailed Weasel (Mustela frenata) Weight: Data Gap

Habitat Team

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Habitat Priority Score: 2586

Key Factor Name Canopy closure

Key Factor Description: Combination of stem density, basal area and extent of canopy cover, with intermitent closure as ideal (Surrogate for Horizontal Structure).

Key Factor Weight: Medium

Indicator Name: Canopy Closure

Indicator Description: The percent of the spatial extent of all known occurrences with a percent canopy closure of greater than 80% (BA 70 or greater).

Poor Level: <25

Fair Level: 25-50

Good Level: 51-75

Very Good Level: >75

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Maintain or, where necessary, restore the percent of the spatial extent of all known occurrences with a canopy closure of greater than 80 percent (BA 70 or greater) to 51 percent or more.

Monitoring Strategy: Monitor percent of the spatial extent of all known occurrences with a percent canopy closure of greater than 80% (BA 70 or greater).

Key Factor Name Composition

Key Factor Description: The diversity, species richness, and relative abundance of vegetative elements in this habitat type.

Key Factor Weight: Medium

Indicator Name: Exotic Forbs and Grasses

Indicator Description: The percent of ground cover in non-native herbaceous species

Poor Level: >20

Fair Level: 10-20

Good Level: 5-9

Very Good Level: <5

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Maintain or, where necessary, restore the percent of groundcover in non-native herbaceous vegetation to nine percent or less.

Monitoring Strategy: Monitor the percent of ground cover in non-native herbaceous species.

Indicator Name: Invasive shrubs and woody vines

Indicator Description: The percent of ground cover in non-native woody species

Poor Level: >20

Fair Level: 10-20

Good Level: 5-9

Very Good Level: <5

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Maintain or, where necessary, restore the percent of groundcover in invasive woody species to nine percent or less.

Monitoring Strategy: Monitor the percent of ground cover in non-native woody species.

Key Factor Name Fire Regime

Key Factor Description: Fire Return Interval and Seasonality, including landscape-scale fire in surrounding/adjacent habitats to prevent woody encroachment and allow for distribution and dispersal of obligate species

Key Factor Weight: Medium

Indicator Name: Fire Seasonality/Intensity

Indicator Description: The percent of areas burned during either March/April or Aug/Sept, or from leaf-expansion to leaf-fall, depending on project-level goals. In some but not all cases, seasonality is an accurate surrogate for intensity. Since intensity goals will vary from burn to burn it is difficult to "pre-quantify" ideal intensity objectives at a forest-wide scale. It is presumed that restoration, maintenance, fuel-reduction and other prescribed fire goals will be considered at the project level when planning burn intensity.

Poor Level: <25

Fair Level: 25-50

Good Level: 51-75

Very Good Level: >75

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: When burning, burn during either March/April or August/September, or from leaf-expansion to leaf-fall, depending on project-level goals.

Monitoring Strategy: Monitor percent of burned areas burned during either March/April or Aug/Sept, or from leaf-expansion to leaf-fall, depending on project-level goals. In some but not all cases, seasonality is an accurate surrogate for intensity. Since intensity goals will vary from burn to burn it is difficult to "pre-quantify" ideal intensity objectives at a forest-wide scale. It is presumed that restoration, maintenance, fuel-reduction and other prescribed fire goals will be considered at the project level when planning burn intensity.

Key Factor Name Fire Regime

Indicator Name:	Fire Frequency
Indicator Description:	Average percent of all known occurrences burned per 5-7 year interval
Poor Level:	<25
Fair Level:	25-50
Good Level:	51-75
Very Good Level:	>75
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Burn at least 51 percent of the spatial extent of all known occurrences of this habitat type every 5-7 years.
Monitoring Strategy:	Monitor average percent of all known occurrences burned per 5-7 year interval.

Key Factor Name Remoteness

Key Factor Description: Mean density of roads (miles per square mile) within this community type at the landscape scale.

Key Factor Weight: Medium

Indicator Name: Road Density

Indicator Description: Average number of road miles per square mile across all known occurrences of this target.

Poor Level: >2 miles

Fair Level: 1-2 miles

Good Level: 0.5-1 mile

Very Good Level: <0.5 mile

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Maintain or, where necessary, restore the average number of road miles per square mile to one or less across all known occurrences of this target.

Monitoring Strategy: Monitor average number of road miles per square mile across all known occurrences of this target.

Key Factor Name Spatial Ecology

Key Factor Description: The relative spatial abundance, proximity, distribution, and arrangement of this habitat type on the landscape.

Key Factor Weight: Medium

Indicator Name: Patch Proximity

Indicator Description: Median nearest distance between patches.

Poor Level: >4 miles

Fair Level: 2-4 miles

Good Level: 1-2 miles

Very Good Level: <1 mile

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Maintain or, where necessary, restore the median nearest distance between patches of this habitat type to two miles or less.

Monitoring Strategy: Monitor median nearest distance between patches.

Key Factor Name Spatial Ecology

Indicator Name:	Average Block Size
Indicator Description:	Block is defined by the minimum convex polygon bounded by known occurrences of this habitat type in which the median patch size is above the fair level for patch size, and in which each of the patches score fair or better on the patch proximity threshold.
Poor Level:	<2,500 acres
Fair Level:	2,500-5,000 acres
Good Level:	5,001-10,000 acres
Very Good Level:	>10,000 acres
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore average block size to 5,001 acres or more. (Block is defined by the minimum convex polygon bounded by known occurrences of this habitat type in which the median patch size is above the fair level for patch size, and in which each of the patches score fair or better on the patch proximity threshold.)
Monitoring Strategy:	Monitor block size.
Indicator Name:	Number of Blocks
Indicator Description:	Total number of blocks statewide
Poor Level:	0-1
Fair Level:	2
Good Level:	3
Very Good Level:	>3
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore number of blocks to three or more. (Block is defined by the minimum convex polygon bounded by known occurrences of this habitat type in which the median patch size is above the fair level for patch size, and in which each of the patches score fair or better on the patch proximity threshold.)
Monitoring Strategy:	Monitor total number of blocks statewide.

Key Factor Name Spatial Ecology

Indicator Name:	Patch Size
Indicator Description:	Average patch size across all known occurrences (acres)
Poor Level:	<250 acres
Fair Level:	250-500 acres
Good Level:	501-1,000 acres
Very Good Level:	>1,000 acres
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore the average patch size of this habitat type to 501 acres or more across all known occurrences.
Monitoring Strategy:	Monitor average patch size across all known occurrences (acres).

Habitat Name Ozark-Ouachita Pine-Bluestem Woodland



Ecoregions where the habitat occurs:

Ozark Highlands ☐	Boston Mountains ☑	Mississippi Valley Loess Plains ☐	Arkansas Valley ☑
Ouachita Mountains ☑	South Central Plains ☐	Mississippi Alluvial Plain ☐	

Description

This system is composed of Pinus echinata dominated woodlands with open canopy and abundant herbaceous groundcover with few hardwoods among dominant canopy trees. Fire is important to maintaining these communities. Because this system occurs in large, undissected blocks, fire is more common than in most woodland communities and the canopy is more open and the herbaceous groundcover more dense. (Foti et al. 2015)
(adapted from NatureServe 2005)

Species associated with this habitat type (and the weight or importance of the habitat to each species) include:
Red-cockaded Woodpecker (Picoides borealis) Weight: Obligate

Ozark-Ouachita Pine-Bluestem Woodland

Bell's Roadside-Skipper (Amblyscirtes belli) Weight: Optimal
Monarch (Danaus plexippus) Weight: Optimal
Diana (Speyeria diana) Weight: Optimal
Eastern Whip-poor-will (Antrostomus vociferus) Weight: Suitable
Northern Metalmark (Calephelis borealis) Weight: Suitable
Texas Frosted Elfin (Callophrys irus hadros) Weight: Suitable
Oklahoma Salamander (Eurycea tynerensis) Weight: Suitable
Leonard's Skipper (Hesperia leonardus) Weight: Suitable
Meske's Skipper (Hesperia meskei) Weight: Suitable
Cobweb Skipper (Hesperia metea) Weight: Suitable
Broad-winged Skipper (Poanes viator) Weight: Suitable
Byssus Skipper (Problema byssus) Weight: Suitable
Oak Hairstreak (Satyrium favonius ontario) Weight: Suitable
Bell's Vireo (Vireo bellii) Weight: Suitable
Sharp-shinned Hawk (Accipiter striatus) Weight: Marginal
Gorgone Checkerspot (Chlosyne gorgone) Weight: Data Gap

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Habitat Priority Score: 872

Key Factor Name Canopy closure

Key Factor Description: Combination of stem density, basal area and extent of canopy cover, with intermitent closure as ideal (Surrogate for Horizontal Structure).

Key Factor Weight: Medium

Indicator Name: Canopy Closure

Indicator Description: The percent of the spatial extent of all known occurrences with a percent canopy closure ranging between 40-60%.

Poor Level: <25

Fair Level: 25-50

Good Level: 51-75

Very Good Level: >75

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Maintain or, where necessary, restore the percent of the spatial extent of all known occurrences with a canopy closure of ranging between 40 to 60 percent to 51 percent or more.

Monitoring Strategy: Monitor percent of the spatial extent of all known occurrences with a percent canopy closure ranging between 40-60%.

Key Factor Name Composition

Key Factor Description: The diversity, species richness, and relative abundance of vegetative elements in this habitat type.

Key Factor Weight: Medium

Indicator Name: Invasive shrubs and woody vines

Indicator Description: The percent of ground cover in non-native woody species

Poor Level: >20

Fair Level: 10-20

Good Level: 5-9

Very Good Level: <5

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Maintain or, where necessary, restore the percent of groundcover in invasive woody species to nine percent or less.

Monitoring Strategy: Monitor the percent of ground cover in non-native woody species.

Indicator Name: Exotic Forbs and Grasses

Indicator Description: The percent of ground cover in non-native herbaceous species

Poor Level: >20

Fair Level: 10-20

Good Level: 5-9

Very Good Level: <5

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Maintain or, where necessary, restore the percent of groundcover in non-native herbaceous vegetation to nine percent or less.

Monitoring Strategy: Monitor the percent of ground cover in non-native herbaceous species.

Key Factor Name Fire Regime

Key Factor Description: Fire Return Interval and Seasonality, including landscape-scale fire in surrounding/adjacent habitats to prevent woody encroachment and allow for distribution and dispersal of obligate species

Key Factor Weight: Medium

Indicator Name: Fire Frequency

Indicator Description: Average percent of all known occurrences burned per 3-5 year interval.

Poor Level: <25

Fair Level: 25-50

Good Level: 51-75

Very Good Level: >75

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Burn at least 51 percent of the spatial extent of all known occurrences of this habitat type every 3-5 years.

Monitoring Strategy: Monitor average percent of all known occurrences burned per 3-5 year interval.

Key Factor Name Fire Regime

Indicator Name:	Fire Seasonality/Intensity
Indicator Description:	The percent of areas burned during either March/April or Aug/Sept, or from leaf-expansion to leaf-fall, depending on project-level goals. In some but not all cases, seasonality is an accurate surrogate for intensity. Since intensity goals will vary from burn to burn it is difficult to "pre-quantify" ideal intensity objectives at a forest-wide scale. It is presumed that restoration, maintenance, fuel-reduction and other prescribed fire goals will be considered at the project level when planning burn intensity.
Poor Level:	<25
Fair Level:	25-50
Good Level:	51-75
Very Good Level:	>75
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	When burning, burn during either March/April or August/September, or from leaf-expansion to leaf-fall, depending on project-level goals.
Monitoring Strategy:	Monitor percent of burned areas burned during either March/April or Aug/Sept, or from leaf-expansion to leaf-fall, depending on project-level goals. In some but not all cases, seasonality is an accurate surrogate for intensity. Since intensity goals will vary from burn to burn it is difficult to "pre-quantify" ideal intensity objectives at a forest-wide scale. It is presumed that restoration, maintenance, fuel-reduction and other prescribed fire goals will be considered at the project level when planning burn intensity.

Key Factor Name Percent total herbaceous ground coverage

Key Factor Description: Average percent total native herbaceous ground cover across all known potential occurrences. Density must be sufficient to carry growing season fire at least once every five years. Composition should include only native species.

Key Factor Weight: Medium

Indicator Name: Percent total herbaceous ground coverage

Indicator Description: Average percent total native herbaceous ground cover across all known potential occurrences. Density must be sufficient to carry growing season fire at least once every five years. Composition should include only native species.

Poor Level: <25

Fair Level: 25-40

Good Level: 41-75

Very Good Level: >75

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Maintain or, where necessary, restore the average percent total native herbaceous groundcover across all known potential occurrences to 41 percent or more.

Monitoring Strategy: Monitor average percent total native herbaceous ground cover across all known potential occurrences.

Key Factor Name Remoteness

Key Factor Description: Mean density of roads (miles per square mile) within this community type at the landscape scale.

Key Factor Weight: Medium

Indicator Name: Road Density

Indicator Description: Average number of road miles per square mile across all known occurrences of this target.

Poor Level: >2 miles

Fair Level: 1-2 miles

Good Level: 0.5-1 mile

Very Good Level: <0.5 mile

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Maintain or, where necessary, restore the average number of road miles per square mile to one or less across all known occurrences of this target.

Monitoring Strategy: Monitor average number of road miles per square mile across all known occurrences of this target.

Key Factor Name Spatial Ecology

Key Factor Description: The relative spatial abundance, proximity, distribution, and arrangement of this habitat type on the landscape.

Key Factor Weight: Medium

Indicator Name: Patch Size

Indicator Description: Average patch size across all known occurrences (acres)

Poor Level: <500 acres

Fair Level: 500-1,000 acres

Good Level: 1,001-2,000 acres

Very Good Level: >2,000 acres

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Maintain or, where necessary, restore the average patch size of this habitat type to 1,001 acres or more across all known occurrences.

Monitoring Strategy: Monitor average patch size across all known occurrences (acres).

Key Factor Name Spatial Ecology

Indicator Name:	Average Block Size
Indicator Description:	Block is defined by the minimum convex polygon bounded by known occurrences of this habitat type in which the median patch size is above the fair level for patch size, and in which each of the patches score fair or better on the patch proximity threshold.
Poor Level:	<5,000 acres
Fair Level:	5,000-10,000 acres
Good Level:	10,000-20,000 acres
Very Good Level:	>20,000 acres
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore average block size to 10,000 acres or more. (Block is defined by the minimum convex polygon bounded by known occurrences of this habitat type in which the median patch size is above the fair level for patch size, and in which each of the patches score fair or better on the patch proximity threshold.)
Monitoring Strategy:	Monitor block size.
Indicator Name:	Number of Blocks
Indicator Description:	Total number of blocks statewide
Poor Level:	0-1
Fair Level:	2
Good Level:	3
Very Good Level:	>3
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore number of blocks to three or more. (Block is defined by the minimum convex polygon bounded by known occurrences of this habitat type in which the median patch size is above the fair level for patch size, and in which each of the patches score fair or better on the patch proximity threshold.)
Monitoring Strategy:	Monitor total number of blocks statewide.

Key Factor Name Spatial Ecology

Indicator Name:	Patch Proximity
Indicator Description:	Median nearest distance between patches.
Poor Level:	>4 miles
Fair Level:	2-4 miles
Good Level:	1-2 miles
Very Good Level:	<1 mile
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore the median nearest distance between patches of this habitat type to two miles or less.
Monitoring Strategy:	Monitor median nearest distance between patches.

Habitat Name Ozark-Ouachita Pine-Oak Forest/Woodland



Ecoregions where the habitat occurs:

Ozark Highlands	Boston Mountains	Mississippi Valley Loess Plains	Arkansas Valley
☑	☑	☐	☑

Ouachita Mountains	South Central Plains	Mississippi Alluvial Plain
☑	☐	☐

Description

This system represents forests and woodlands in which Pinus echinata is an important or dominant component. Although examples of this system occur throughout this region, there is local variation in the extent to which they were present. For example, this system was historically prominent only in the southeastern part of the Ozark Highlands where sandstone derived soils were common (USFS 1999); being limited from other areas by inadequate winter precipitation, and non-conducive soils. In contrast, pine was "virtually ubiquitous in the historical forests of the Ouachitas" (USFS 1999). In nearly all cases (at least in the Ouachitas), Pinus echinata occurs with a variable mixture of hardwood species. The exact composition of the hardwoods is much more closely related to aspect and topographic factors than is the pine component (Dale and Ware 1999). In some examples of this system, the aggregate importance of hardwoods may be greater than pine, especially on subxeric and mesic sites (Dale and

Ware 1999).
(adapted from NatureServe 2005)

Species associated with this habitat type (and the weight or importance of the habitat to each species) include:
Red-cockaded Woodpecker (Picoides borealis) Weight: Obligate
Bell's Roadside-Skipper (Amblyscirtes belli) Weight: Optimal
Monarch (Danaus plexippus) Weight: Optimal
Diana (Speyeria diana) Weight: Optimal
Eastern Whip-poor-will (Antrostomus vociferus) Weight: Suitable
Northern Metalmark (Calephelis borealis) Weight: Suitable
Texas Frosted Elfin (Callophrys irus hadros) Weight: Suitable
Oklahoma Salamander (Eurycea tynerensis) Weight: Suitable
Leonard's Skipper (Hesperia leonardus) Weight: Suitable
Meske's Skipper (Hesperia meskei) Weight: Suitable
Cobweb Skipper (Hesperia metea) Weight: Suitable
Broad-winged Skipper (Poanes viator) Weight: Suitable
Byssus Skipper (Problema byssus) Weight: Suitable
Oak Hairstreak (Satyrium favonius ontario) Weight: Suitable
Bell's Vireo (Vireo bellii) Weight: Suitable
Sharp-shinned Hawk (Accipiter striatus) Weight: Marginal
Gorgone Checkerspot (Chlosyne gorgone) Weight: Data Gap
Little Brown Bat (Myotis lucifugus) Weight: Suitable
Northern Long-eared Bat (Myotis septentrionalis) Weight: Suitable
Caddo Mountain Salamander (Plethodon caddoensis) Weight: Suitable
Fourche Mountain Salamander (Plethodon fourchensis) Weight: Suitable
Kiamichi Slimy Salamander (Plethodon kiamichi) Weight: Suitable
Rich Mountain Salamander (Plethodon ouachitae) Weight: Suitable
Gray Comma (Polygonia progne) Weight: Suitable
Byssus Skipper (Problema byssus) Weight: Suitable
Oak Hairstreak (Satyrium favonius ontario) Weight: Suitable
Bewick's Wren (Thryomanes bewickii) Weight: Suitable
Red-cockaded Woodpecker (Picoides borealis) Weight: Marginal
Southeastern Shrew (Sorex longirostris) Weight: Marginal
Long-tailed Weasel (Mustela frenata) Weight: Data Gap

Habitat Team

ANHC Mr. Tom Foti, TNC Mr. Doug Zollner, AGFC Ms. Elizabeth Murray, Audubon Arkansas Mr. Ken Smith, Conservation Southeast Mr. Jeff Holmes, AGFC Mr. Jeff Johnston, AGFC Ms. Jane Anderson, FTN Associates Mr. Don Catenzaro

Habitat Priority Score: 1650

Key Factor Name Canopy Closure

Key Factor Description: Combination of stem density, basal area and extent of canopy cover, with intermitent closure as ideal (Surrogate for Horizontal Structure).

Key Factor Weight: Medium

Indicator Name: Canopy Closure

Indicator Description: The percent of the spatial extent of all known occurrences with a percent canopy closure of greater than 70%.

Poor Level: <25

Fair Level: 25-50

Good Level: 51-75

Very Good Level: >75

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Maintain or, where necessary, restore the percent of the spatial extent of all known occurrences with a canopy closure of greater than 70 percent to 51 percent or more.

Monitoring Strategy: Monitor percent of the spatial extent of all known occurrences with a percent canopy closure of greater than 70%.

Key Factor Name Composition

Key Factor Description: The diversity, species richness, and relative abundance of vegetative elements in this habitat type.

Key Factor Weight: Medium

Indicator Name: Loblolly encroachment

Indicator Description: The percent basal area in loblolly

Poor Level: >15%

Fair Level: 10-14%

Good Level: 5-9%

Very Good Level: <5%

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Maintain or, where necessary, restore the total percentage of land area in loblolly to nine percent or less.

Monitoring Strategy: Monitor percent basal area in loblolly.

Key Factor Name Fire Regime

Key Factor Description: Fire Return Interval and Seasonality, including landscape-scale fire in surrounding/adjacent habitats to prevent woody encroachment and allow for distribution and dispersal of obligate species

Key Factor Weight: Medium

Indicator Name: Fire Frequency

Indicator Description: Average percent of all known occurrences burned per 3-5 year interval.

Poor Level: <25

Fair Level: 25-50

Good Level: 51-75

Very Good Level: >75

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Burn at least 51 percent of the spatial extent of all known occurrences of this habitat type every 3-5 years.

Monitoring Strategy: Monitor average percent of all known occurrences burned per 3-5 year interval.

Key Factor Name Fire Regime

Indicator Name:	Fire Seasonality/Intensity
Indicator Description:	The percent of areas burned during either March/April or Aug/Sept, or from leaf-expansion to leaf-fall, depending on project-level goals. In some but not all cases, seasonality is an accurate surrogate for intensity. Since intensity goals will vary from burn to burn it is difficult to "pre-quantify" ideal intensity objectives at a forest-wide scale. It is presumed that restoration, maintenance, fuel-reduction and other prescribed fire goals will be considered at the project level when planning burn intensity.
Poor Level:	<25
Fair Level:	25-50
Good Level:	51-75
Very Good Level:	>75
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	When burning, burn during either March/April or August/September, or from leaf-expansion to leaf-fall, depending on project-level goals.
Monitoring Strategy:	Monitor percent of burned areas burned during either March/April or Aug/Sept, or from leaf-expansion to leaf-fall, depending on project-level goals. In some but not all cases, seasonality is an accurate surrogate for intensity. Since intensity goals will vary from burn to burn it is difficult to "pre-quantify" ideal intensity objectives at a forest-wide scale. It is presumed that restoration, maintenance, fuel-reduction and other prescribed fire goals will be considered at the project level when planning burn intensity.

Key Factor Name Remoteness

Key Factor Description: Mean density of roads (miles per square mile) within this community type at the landscape scale.

Key Factor Weight: Medium

Indicator Name: Road Density

Indicator Description: Average number of road miles per square mile across all known occurrences of this target.

Poor Level: >2 miles

Fair Level: 1-2 miles

Good Level: 0.5-1 mile

Very Good Level: <0.5 mile

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Maintain or, where necessary, restore the average number of road miles per square mile to one or less across all known occurrences of this target.

Monitoring Strategy: Monitor average number of road miles per square mile across all known occurrences of this target.

Key Factor Name Spatial Ecology

Key Factor Description: The relative spatial abundance, proximity, distribution, and arrangement of this habitat type on the landscape.

Key Factor Weight: Medium

Indicator Name: Average Block Size

Indicator Description: Block is defined by the minimum convex polygon bounded by known occurrences of this habitat type in which the median patch size is above the fair level for patch size, and in which each of the patches score fair or better on the patch proximity threshold.

Poor Level: <5,000 acres

Fair Level: 5,000-10,000 acres

Good Level: 10,000-20,000 acres

Very Good Level: >20,000 acres

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Maintain or, where necessary, restore average block size to 10,000 acres or more. (Block is defined by the minimum convex polygon bounded by known occurrences of this habitat type in which the median patch size is above the fair level for patch size, and in which each of the patches score fair or better on the patch proximity threshold.)

Monitoring Strategy: Monitor block size.

Key Factor Name Spatial Ecology

Indicator Name:	Patch Size
Indicator Description:	Average patch size across all known occurrences (acres)
Poor Level:	<500 acres
Fair Level:	500-1,000 acres
Good Level:	1,001-2,000 acres
Very Good Level:	>2,000 acres
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore the average patch size of this habitat type to 1,001 acres or more across all known occurrences.
Monitoring Strategy:	Monitor average patch size across all known occurrences (acres).
Indicator Name:	Number of Blocks
Indicator Description:	Total number of blocks statewide
Poor Level:	0-1
Fair Level:	2
Good Level:	3
Very Good Level:	>3
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore number of blocks to three or more. (Block is defined by the minimum convex polygon bounded by known occurrences of this habitat type in which the median patch size is above the fair level for patch size, and in which each of the patches score fair or better on the patch proximity threshold.)
Monitoring Strategy:	Monitor total number of blocks statewide.

Key Factor Name Spatial Ecology

Indicator Name:	Patch Proximity
Indicator Description:	Median nearest distance between patches.
Poor Level:	>4 miles
Fair Level:	2-4 miles
Good Level:	1-2 miles
Very Good Level:	<1 mile
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore the median nearest distance between patches of this habitat type to two miles or less.
Monitoring Strategy:	Monitor median nearest distance between patches.

Habitat Name Ozark-Ouachita Prairie and Woodland



Ecoregions where the habitat occurs:

Ozark Highlands	Boston Mountains	Mississippi Valley Loess Plains	Arkansas Valley
☑	☐	☐	☑

Ouachita Mountains	South Central Plains	Mississippi Alluvial Plain
☐	☐	☐

Description

This system of prairies and associated woodlands is found in the Arkansas Valley and Ozarks. The Arkansas Valley is characterized by broad, level to gently rolling uplands derived from shales and is much less rugged and more heavily impacted by Arkansas River erosional processes than the adjacent mountainous regions. In addition, the valley receives annual precipitation total of 2-6 inches less than the surrounding regions due to a rainshadow produced by a combination of prevailing western winds and mountain orographic effects. The shale-derived soils associated with the Arkansas Valley prairies are thin and droughty. The prairies of the Ozark Highlands occur on level to gently rolling areas underlain by limestone and chert, and soils are also thin and droughtly. The combined effect of droughty soils, reduced precipitation, and prevailing level topography create conditions highly conducive to the ignition and spread of fires. Prairies are typically dominated by Andropogon gerardii, Sorghastrum nutans,

Panicum virgatum, and Schizachyrium scoparium and a high diversity of grasses and forbs and relatively few woody plants. Woodlands cccur on gentle to steep slopes and are typically dominated by Quercus stellata and Quercus marilandica, often fairly widespread with a typical prairie herbaceous groundlayer between the trees.
(adapted from NatureServe 2005).

Species associated with this habitat type (and the weight or importance of the habitat to each species) include:

Arogos Skipper (Atrytone arogos iowa) Weight: Obligate
Prairie Mole Cricket (Gryllotalpa major) Weight: Obligate
American Burying Beetle (Nicrophorus americanus) Weight: Obligate
Lace Bug (Acalypta lillianus) Weight: Optimal
Bell's Roadside-Skipper (Amblyscirtes belli) Weight: Optimal
Eastern Tiger Salamander (Ambystoma tigrinum) Weight: Optimal
Henslow's Sparrow (Ammodramus henslowii) Weight: Optimal
Le Conte's Sparrow (Ammodramus leconteii) Weight: Optimal
Grasshopper Sparrow (Ammodramus savannarum) Weight: Optimal
Common Nighthawk (Chordeiles minor) Weight: Optimal
Northern Bobwhite (Colinus virginianus) Weight: Optimal
Monarch (Danaus plexippus) Weight: Optimal
Dion Skipper (Euphyes dion) Weight: Optimal
Great Plains Narrowmouth Toad (Gastrophryne olivacea) Weight: Optimal
Migrant Loggerhead Shrike (Lanius ludovicianus) Weight: Optimal
Crawfish Frog (Lithobates areolatus) Weight: Optimal
Giant Prairie Robberfly (Microstylum morosum) Weight: Optimal
Slender Glass Lizard (Ophisaurus attenuatus) Weight: Optimal
Great Plains Skink (Plestiodon obsoletus) Weight: Optimal
Prairie Skink (Plestiodon septentrionalis) Weight: Optimal
Byssus Skipper (Problema byssus) Weight: Optimal
Boreal Chorus Frog (Pseudacris maculata) Weight: Optimal
Strecker's Chorus Frog (Pseudacris streckeri) Weight: Optimal
Graham's Crayfish Snake (Regina grahamii) Weight: Optimal
Hurter's Spadefoot (Scaphiopus hurterii) Weight: Optimal
Plains Spadefoot (Spea bombifrons) Weight: Optimal
Diana (Speyeria diana) Weight: Optimal
Ornate Box Turtle (Terrapene ornata) Weight: Optimal
Anthophorid Bee (Tetraloniella albata) Weight: Optimal
Red Milkweed Beetle (Tetraopes quinquemaculatus) Weight: Optimal
Texas Milkweed Beetle (Tetraopes texanus) Weight: Optimal
Lined Snake (Tropidoclonion lineatum) Weight: Optimal
Bell's Vireo (Vireo bellii) Weight: Optimal
Eastern Whip-poor-will (Antrostomus vociferus) Weight: Suitable
Texas Frosted Elfin (Callophrys irus hadros) Weight: Suitable
Sedge Wren (Cistothorus platensis) Weight: Suitable
Yellow-billed Cuckoo (Coccyzus americanus) Weight: Suitable
Willow Flycatcher (Empidonax traillii) Weight: Suitable
Rusty Blackbird (Euphagus carolinus) Weight: Suitable
Oklahoma Salamander (Eurycea tynerensis) Weight: Suitable
American Kestrel (Falco sparverius) Weight: Suitable
Purple Finch (Haemorhous purpureus) Weight: Suitable

Leonard's Skipper (Hesperia leonardus) Weight: Suitable
Meske's Skipper (Hesperia meskei) Weight: Suitable
Magazine Stripetail (Isoperla szczytkoi) Weight: Suitable
Black-tailed Jackrabbit (Lepus californicus) Weight: Suitable
Crawford's Gray Shrew (Notiosorex crawfordi) Weight: Suitable
Black-crowned Night-Heron (Nycticorax nycticorax) Weight: Suitable
Rattlesnake-Master Borer Moth (Papaipema eryngii) Weight: Suitable
Mayfly (Paraleptophlebia calcarica) Weight: Suitable
Microcaddisfly (Paucicalcaria ozarkensis) Weight: Suitable
Eastern Harvest Mouse (Reithrodontomys humulis) Weight: Suitable
American Woodcock (Scolopax minor) Weight: Suitable
Southeastern Shrew (Sorex longirostris) Weight: Suitable
Bewick's Wren (Thryomanes bewickii) Weight: Suitable
Sharp-shinned Hawk (Accipiter striatus) Weight: Marginal
Sprague's Pipit (Anthus spragueii) Weight: Marginal
American Bittern (Botaurus lentiginosus) Weight: Marginal
Smith's Longspur (Calcarius pictus) Weight: Marginal
Buff-breasted Sandpiper (Calidris subruficollis) Weight: Marginal
Bachman's Sparrow (Peucaea aestivalis) Weight: Marginal
Gorgone Checkerspot (Chlosyne gorgone) Weight: Data Gap
Long-tailed Weasel (Mustela frenata) Weight: Data Gap
Yellow-crowned Night-Heron (Nyctanassa violacea) Weight: Data Gap
Ozark Swallowtail (Papilio joanae) Weight: Data Gap

Habitat Team

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Habitat Priority Score: 3952

Key Factor Name Composition

Key Factor Description: The diversity, species richness, and relative abundance of vegetative elements in this habitat type.

Key Factor Weight: Low

Indicator Name:	Invasive shrubs and woody vines
Indicator Description:	The percent of ground cover in non-native woody species
Poor Level:	>20
Fair Level:	10-20
Good Level:	5-9
Very Good Level:	<5
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore the percent of groundcover in invasive woody species to nine percent or less.
Monitoring Strategy:	Monitor the percent of ground cover in non-native woody species.
Indicator Name:	Broomsedge imbalance
Indicator Description:	The percent of broomsedge coverage among ground vegetation
Poor Level:	>20
Fair Level:	10-20
Good Level:	5-9
Very Good Level:	<5
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore the percent broomsedge coverage among ground vegetation to nine percent or less.
Monitoring Strategy:	Monitor percent of broomsedge coverage among ground vegetation.

Key Factor Name Composition

Indicator Name:	Exotic Forbs and Grasses
Indicator Description:	The percent of ground cover in non-native herbaceous species
Poor Level:	>20
Fair Level:	10-20
Good Level:	5-9
Very Good Level:	<5
Current_Status:	Data Gap
Indicator Weight:	High
Conservation Action:	Maintain or, where necessary, restore the percent of groundcover in non-native herbaceous vegetation to nine percent or less.
Monitoring Strategy:	Monitor the percent of ground cover in non-native herbaceous species.

Key Factor Name Fire Regime

Key Factor Description: Fire Return Interval and Seasonality, including landscape-scale fire in surrounding/adjacent habitats to prevent woody encroachment and allow for distribution and dispersal of obligate species

Key Factor Weight: Medium

Indicator Name: Fire Seasonality/Intensity

Indicator Description: The percent of areas burned during either March/April or Aug/Sept, or from leaf-expansion to leaf-fall, depending on project-level goals. In some but not all cases, seasonality is an accurate surrogate for intensity. Since intensity goals will vary from burn to burn it is difficult to "pre-quantify" ideal intensity objectives at a forest-wide scale. It is presumed that restoration, maintenance, fuel-reduction and other prescribed fire goals will be considered at the project level when planning burn intensity.

Poor Level: <25

Fair Level: 25-50

Good Level: 51-75

Very Good Level: >75

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: When burning, burn during either March/April or August/September, or from leaf-expansion to leaf-fall, depending on project-level goals.

Monitoring Strategy: Monitor percent of burned areas burned during either March/April or Aug/Sept, or from leaf-expansion to leaf-fall, depending on project-level goals. In some but not all cases, seasonality is an accurate surrogate for intensity. Since intensity goals will vary from burn to burn it is difficult to "pre-quantify" ideal intensity objectives at a forest-wide scale. It is presumed that restoration, maintenance, fuel-reduction and other prescribed fire goals will be considered at the project level when planning burn intensity.

Key Factor Name Fire Regime

Indicator Name:	Fire Frequency
Indicator Description:	Average percent of all known occurrences plus 100 meter buffer burned per 2-4 year interval.
Poor Level:	<25
Fair Level:	25-50
Good Level:	51-75
Very Good Level:	>75
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Burn at least 51 percent of the spatial extent plus 100 meter buffer of all known occurrences of this habitat type every 2-4 years.
Monitoring Strategy:	Monitor average percent of all known occurrences plus 100 meter buffer burned per 2-4 year interval.

Key Factor Name Remoteness

Key Factor Description: Mean density of roads (miles per square mile) within this community type at the landscape scale.

Key Factor Weight: Medium

Indicator Name: Road Density

Indicator Description: Average number of road miles per square mile across all known occurrences of this target.

Poor Level: >2 miles

Fair Level: 1-2 miles

Good Level: 0.5-1 mile

Very Good Level: <0.5 mile

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Maintain or, where necessary, restore the average number of road miles per square mile to one or less across all known occurrences of this target.

Monitoring Strategy: Monitor average number of road miles per square mile across all known occurrences of this target.

Key Factor Name Spatial Ecology

Key Factor Description: The relative spatial abundance, proximity, distribution, and arrangement of this habitat type on the landscape.

Key Factor Weight: Medium

Indicator Name: Patch Proximity

Indicator Description: Median nearest distance between patches.

Poor Level: >2.5 miles

Fair Level: 1-2.5 miles

Good Level: 0.5-1 mile

Very Good Level: <0.5 mile

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Maintain or, where necessary, restore the median nearest distance between patches of this habitat type to one mile or less.

Monitoring Strategy: Monitor median nearest distance between patches.

Indicator Name: Number of Blocks

Indicator Description: Total number of blocks statewide

Poor Level: 0-1

Fair Level: 2

Good Level: 3

Very Good Level: >3

Current_Status: Data Gap

Indicator Weight: Medium

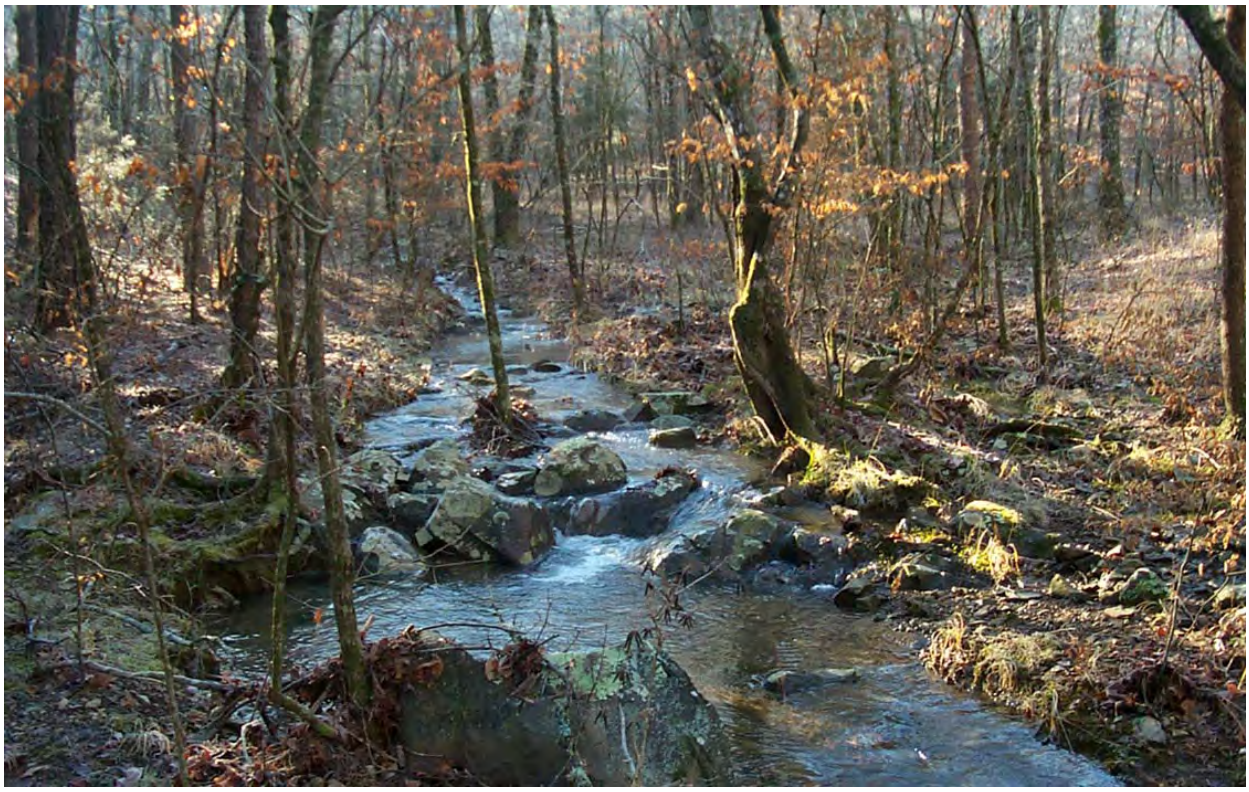
Conservation Action: Maintain or, where necessary, restore number of blocks to three or more. (Block is defined by the minimum convex polygon bounded by known occurrences of this habitat type in which the median patch size is above the fair level for patch size, and in which each of the patches score fair or better on the patch proximity threshold.)

Monitoring Strategy: Monitor total number of blocks statewide.

Key Factor Name Spatial Ecology

Indicator Name:	Average Block Size
Indicator Description:	Block is defined by the minimum convex polygon bounded by known occurrences of this habitat type in which the median patch size is above the fair level for patch size, and in which each of the patches score fair or better on the patch proximity threshold.
Poor Level:	<1,000 acres
Fair Level:	1,000-2,499 acres
Good Level:	2,500-5,000 acres
Very Good Level:	>5,000 acres
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore average block size to 2,500 acres or more. (Block is defined by the minimum convex polygon bounded by known occurrences of this habitat type in which the median patch size is above the fair level for patch size, and in which each of the patches score fair or better on the patch proximity threshold.)
Monitoring Strategy:	Monitor block size.
Indicator Name:	Patch Size
Indicator Description:	Average patch size across all known occurrences (acres)
Poor Level:	<75 acres
Fair Level:	75-149 acres
Good Level:	150-375 acres
Very Good Level:	>375 acres
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore the average patch size of this habitat type to 150 acres or more across all known occurrences.
Monitoring Strategy:	Monitor average patch size across all known occurrences (acres).

Habitat Name Ozark-Ouachita Riparian



Ecoregions where the habitat occurs:

Ozark Highlands	Boston Mountains	Mississippi Valley Loess Plains	Arkansas Valley
☑	☑	☐	☑

Ouachita Mountains	South Central Plains	Mississippi Alluvial Plain
☑	☐	☐

Description

This system is found along streams and small rivers. In contrast to larger floodplain systems, this system has little to no floodplain development and often contains cobble bars and steep banks. It is traditionally higher gradient than larger floodplains and experiences periodic, strong flooding. Canopy cover can vary within examples of this system, but typical tree species include Liquidambar styraciflua, Platanus occidentalis, Acer spp., and Quercus spp. The richness of the herbaceous layer can vary significantly, ranging from species-rich to species-poor. Likewise, the shrub layer can vary considerably, but typical species may include Lindera benzoin, Alnus serrulata and Hamamelis vernalis. Small seeps and fens can often be found within this system, especially at the headwaters of streams. These areas are typically dominated by species of sedges (Carex spp.), ferns (Osmunda spp.), and other herbaceous species such as Impatiens capensis. Flooding and scouring strongly influence this system and prevent

the floodplain development found on larger rivers.
(adapted from NatureServe 2005)

Species associated with this habitat type (and the weight or importance of the habitat to each species) include:
Ozark Pocket Gopher (Geomys bursarius ozarkensis) Weight: Obligate
Ozark Snaketail Dragonfly (Ophiogomphus westfalli) Weight: Obligate
Lace-winged Roadside-Skipper (Amblyscirtes aesculapius) Weight: Optimal
Carolina Roadside-Skipper (Amblyscirtes carolina) Weight: Optimal
Yellow-billed Cuckoo (Coccyzus americanus) Weight: Optimal
Ozark Clubtail Dragonfly (Gomphus ozarkensis) Weight: Optimal
Ouachita Diving Beetle (Heterosternuta ouachita) Weight: Optimal
Predaceous Diving Beetle (Heterosternuta phoebeae) Weight: Optimal
Sulphur Springs Diving Beetle (Heterosternuta sulphuria) Weight: Optimal
Wood Thrush (Hylocichla mustelina) Weight: Optimal
Queensnake (Regina septemvittata) Weight: Optimal
Ozark Emerald (Somatochlora ozarkensis) Weight: Optimal
Diana (Speyeria diana) Weight: Optimal
Arkansas Agapetus Caddisfly (Agapetus medicus) Weight: Suitable
Winter Stonefly (Allocapnia jeanae) Weight: Suitable
Bowed Snowfly (Allocapnia oribata) Weight: Suitable
Winter Stonefly (Allocapnia ozarkana) Weight: Suitable
Winter Stonefly (Allocapnia warreni) Weight: Suitable
Bell's Roadside-Skipper (Amblyscirtes belli) Weight: Suitable
Ringed Salamander (Ambystoma annulatum) Weight: Suitable
Mole Salamander (Ambystoma talpoideum) Weight: Suitable
Eastern Whip-poor-will (Antrostomus vociferus) Weight: Suitable
Chimney Swift (Chaetura pelagica) Weight: Suitable
Ouachita Spiketail (Cordulegaster talaria) Weight: Suitable
Ozark Big-eared Bat (Corynorhinus townsendii ingens) Weight: Suitable
Mayfly (Dannella provonshai) Weight: Suitable
Mottled Duskywing (Erynnis martialis) Weight: Suitable
Dion Skipper (Euphyes dion) Weight: Suitable
Purple Finch (Haemorhous purpureus) Weight: Suitable
Gray Bat (Myotis grisescens) Weight: Suitable
Eastern Small-Footed Bat (Myotis leibii) Weight: Suitable
Indiana Bat (Myotis sodalis) Weight: Suitable
Contorted Ochrotrichian Microcaddisfly (Ochrotrichia contorta) Weight: Suitable
Microcaddisfly (Ochrotrichia robisoni) Weight: Suitable
Nearctic Paduniellan Caddisfly (Paduniella nearctica) Weight: Suitable
Caddo Mountain Salamander (Plethodon caddoensis) Weight: Suitable
Yehl Skipper (Poanes yehl) Weight: Suitable
Gray Comma (Polygonia progne) Weight: Suitable
Byssus Skipper (Problema byssus) Weight: Suitable
American Woodcock (Scolopax minor) Weight: Suitable
Southeastern Shrew (Sorex longirostris) Weight: Suitable
American Badger (Taxidea taxus) Weight: Suitable
Boston Mountains Crayfish (Cambarus causeyi) Weight: Marginal
Swainson's Warbler (Limnothlypis swainsonii) Weight: Marginal
Northern Long-eared Bat (Myotis septentrionalis) Weight: Marginal
Yellow-crowned Night-Heron (Nyctanassa violacea) Weight: Marginal
Cerulean Warbler (Setophaga cerulea) Weight: Marginal
Long-tailed Weasel (Mustela frenata) Weight: Data Gap

Irons Fork Burrowing Crayfish (Procambarus reimeri) Weight: Data Gap

Habitat Team

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Habitat Priority Score: 3778

Key Factor Name Canopy Closure

Key Factor Description: Combination of stem density, basal area and extent of canopy cover, with intermitent closure as ideal.

Key Factor Weight: Medium

Indicator Name: Canopy Closure

Indicator Description: The percent of the spatial extent of all known occurrences with a percent canopy closure of greater than 80% (BA 60 or greater).

Poor Level: <25

Fair Level: 25-50

Good Level: 51-75

Very Good Level: >75

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Maintain or, where necessary, restore the percent of the spatial extent of all known occurrences with a canopy closure of greater than 80 percent to 51 percent or more.

Monitoring Strategy: Monitor percent of the spatial extent of all known occurrences with a percent canopy closure of greater than 80% (BA 60 or greater).

Key Factor Name Composition

Key Factor Description: The diversity, species richness, and relative abundance of vegetative elements in this habitat type.

Key Factor Weight: Medium

Indicator Name:	Invasive shrubs and woody vines
Indicator Description:	The percent of ground cover in non-native woody species
Poor Level:	>20
Fair Level:	10-20
Good Level:	5-9
Very Good Level:	<5
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore the percent of groundcover in invasive woody species to nine percent or less.
Monitoring Strategy:	Monitor the percent of ground cover in non-native woody species.
Indicator Name:	Exotic Forbs and Grasses
Indicator Description:	The percent of ground cover in non-native herbaceous species
Poor Level:	>20
Fair Level:	10-20
Good Level:	5-9
Very Good Level:	<5
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore the percent of groundcover in non-native herbaceous vegetation to nine percent or less.
Monitoring Strategy:	Monitor the percent of ground cover in non-native herbaceous species.

Key Factor Name Fire Regime

Key Factor Description: Fire Return Interval and Seasonality, including landscape-scale fire in surrounding/adjacent habitats to prevent woody encroachment and allow for distribution and dispersal of obligate species

Key Factor Weight: Medium

Indicator Name: Fire Seasonality/Intensity

Indicator Description: The percent of areas burned during either March/April or Aug/Sept, or from leaf-expansion to leaf-fall, depending on project-level goals. In some but not all cases, seasonality is an accurate surrogate for intensity. Since intensity goals will vary from burn to burn it is difficult to "pre-quantify" ideal intensity objectives at a forest-wide scale. It is presumed that restoration, maintenance, fuel-reduction and other prescribed fire goals will be considered at the project level when planning burn intensity.

Poor Level: <25

Fair Level: 25-50

Good Level: 51-75

Very Good Level: >75

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: When burning, burn during either March/April or August/September, or from leaf-expansion to leaf-fall, depending on project-level goals.

Monitoring Strategy: Monitor percent of burned areas burned during either March/April or Aug/Sept, or from leaf-expansion to leaf-fall, depending on project-level goals. In some but not all cases, seasonality is an accurate surrogate for intensity. Since intensity goals will vary from burn to burn it is difficult to "pre-quantify" ideal intensity objectives at a forest-wide scale. It is presumed that restoration, maintenance, fuel-reduction and other prescribed fire goals will be considered at the project level when planning burn intensity.

Key Factor Name Fire Regime

Indicator Name:	Fire Frequency
Indicator Description:	Average percent of all known occurrences burned per 5-7 year interval.
Poor Level:	<25
Fair Level:	25-50
Good Level:	51-75
Very Good Level:	>75
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Burn at least 51 percent of the spatial extent of all known occurrences of this habitat type every 5-7 years.
Monitoring Strategy:	Monitor average percent of all known occurrences burned per 5-7 year interval.

Key Factor Name Remoteness

Key Factor Description: Mean density of roads (miles per square mile) within this community type at the landscape scale.

Key Factor Weight: Medium

Indicator Name: Road Density

Indicator Description: Average number of road miles per square mile across all known occurrences of this target.

Poor Level: >2 miles

Fair Level: 1-2 miles

Good Level: 0.5-1 mile

Very Good Level: <0.5 mile

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Maintain or, where necessary, restore the average number of road miles per square mile to one or less across all known occurrences of this target.

Monitoring Strategy: Monitor average number of road miles per square mile across all known occurrences of this target.

Key Factor Name Spatial Ecology

Key Factor Description: The relative spatial abundance, proximity, distribution, and arrangement of this habitat type on the landscape.

Key Factor Weight: Medium

Indicator Name:	Patch Proximity
Indicator Description:	Median nearest distance between patches.
Poor Level:	>.5 miles
Fair Level:	.25-.5 miles
Good Level:	.1-.25 miles
Very Good Level:	<.1 mile
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore the median nearest distance between patches of this habitat type to .25 mile or less.
Monitoring Strategy:	Monitor median nearest distance between patches.
Indicator Name:	Patch Size
Indicator Description:	Average patch size across all known occurrences (acres)
Poor Level:	<50 acres
Fair Level:	50-100 acres
Good Level:	100-250 acres
Very Good Level:	>250 acres
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore the average patch size of this habitat type to 100 acres or more across all known occurrences.
Monitoring Strategy:	Monitor average patch size across all known occurrences (acres).

Key Factor Name Spatial Ecology

Indicator Name:	Number of Blocks
Indicator Description:	Total number of blocks statewide
Poor Level:	<4
Fair Level:	4-7
Good Level:	7-10
Very Good Level:	>10
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore number of blocks to seven or more. (Block is defined by the minimum convex polygon bounded by known occurrences of this habitat type in which the median patch size is above the fair level for patch size, and in which each of the patches score fair or better on the patch proximity threshold.)
Monitoring Strategy:	Monitor total number of blocks statewide.
Indicator Name:	Average Block Size
Indicator Description:	Block is defined by the minimum convex polygon bounded by known occurrences of this habitat type in which the median patch size is above the fair level for patch size, and in which each of the patches score fair or better on the patch proximity threshold.
Poor Level:	<500 acres
Fair Level:	500-1,000 acres
Good Level:	1,000-2,500 acres
Very Good Level:	>2,500 acres
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore average block size to 1,000 acres or more. (Block is defined by the minimum convex polygon bounded by known occurrences of this habitat type in which the median patch size is above the fair level for patch size, and in which each of the patches score fair or better on the patch proximity threshold.)
Monitoring Strategy:	Monitor block size.

Habitat Name Pasture Land



Ecoregions where the habitat occurs:

Ozark Highlands	Boston Mountains	Mississippi Valley Loess Plains	Arkansas Valley
☑	☑	☑	☑

Ouachita Mountains	South Central Plains	Mississippi Alluvial Plain
☑	☑	☑

Description

This type includes land with mixed grasses or monocultures of non-native grasses managed to support grazing domestic mammals.The type often has waterholes in association with the grassland. This type reduces the availability of more suitable habitats on the landscape for species of conservation concern.

Species associated with this habitat type (and the weight or importance of the habitat to each species) include:
Ozark Pocket Gopher (Geomys bursarius ozarkensis) Weight: Obligate
American Badger (Taxidea taxus) Weight: Optimal
Eastern Tiger Salamander (Ambystoma tigrinum) Weight: Suitable

Pasture Land

Henslow's Sparrow (Ammodramus henslowii) Weight: Suitable
Grasshopper Sparrow (Ammodramus savannarum) Weight: Suitable
Buff-breasted Sandpiper (Calidris subruficollis) Weight: Suitable
American Kestrel (Falco sparverius) Weight: Suitable
Ouachita Burrowing Crayfish (Fallicambarus harpi) Weight: Suitable
Great Plains Narrowmouth Toad (Gastrophryne olivacea) Weight: Suitable
Migrant Loggerhead Shrike (Lanius ludovicianus) Weight: Suitable
Black-tailed Jackrabbit (Lepus californicus) Weight: Suitable
Crawfish Frog (Lithobates areolatus) Weight: Suitable
Ozark Swallowtail (Papilio joanae) Weight: Suitable
Prairie Skink (Plestiodon septentrionalis) Weight: Suitable
American Golden-Plover (Pluvialis dominica) Weight: Suitable
Broad-winged Skipper (Poanes viator) Weight: Suitable
Yehl Skipper (Poanes yehl) Weight: Suitable
Illinois Chorus Frog (Pseudacris illinoensis) Weight: Suitable
Boreal Chorus Frog (Pseudacris maculata) Weight: Suitable
Strecker's Chorus Frog (Pseudacris streckeri) Weight: Suitable
Western Harvest Mouse (Reithrodontomys megalotis) Weight: Suitable
Plains Harvest Mouse (Reithrodontomys montanus) Weight: Suitable
Eastern Spadefoot (Scaphiopus holbrookii) Weight: Suitable
Hurter's Spadefoot (Scaphiopus hurterii) Weight: Suitable
Plains Spadefoot (Spea bombifrons) Weight: Suitable
Southern Bog Lemming (Synaptomys cooperi) Weight: Suitable
Bewick's Wren (Thryomanes bewickii) Weight: Suitable
Lined Snake (Tropidoclonion lineatum) Weight: Suitable
Le Conte's Sparrow (Ammodramus leconteii) Weight: Marginal
Sprague's Pipit (Anthus spragueii) Weight: Marginal
Smith's Longspur (Calcarius pictus) Weight: Marginal
Common Nighthawk (Chordeiles minor) Weight: Marginal
Northern Bobwhite (Colinus virginianus) Weight: Marginal
Monarch (Danaus plexippus) Weight: Marginal
Rusty Blackbird (Euphagus carolinus) Weight: Marginal
Purple Finch (Haemorhous purpureus) Weight: Marginal
Bronze Copper (Lycaena hyllus) Weight: Marginal
American Woodcock (Scolopax minor) Weight: Marginal
Bell's Vireo (Vireo bellii) Weight: Marginal
Long-tailed Weasel (Mustela frenata) Weight: Data Gap

Habitat Team

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Habitat Priority Score: 1716

Pasture Land

Key Factor Name Composition

Key Factor Description: The diversity, species richness, and relative abundance of vegetative elements in this habitat type.

Key Factor Weight: Medium

Indicator Name: Invasive shrubs and woody vines

Indicator Description: The percent of ground cover in non-native woody species

Poor Level: >20

Fair Level: 10-20

Good Level: 5-9

Very Good Level: <5

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Maintain or, where necessary, restore the percent of groundcover in invasive woody species to nine percent or less.

Monitoring Strategy: Monitor the percent of ground cover in non-native woody species.

Indicator Name: Exotic Forbs and Grasses

Indicator Description: The percent of ground cover in non-native herbaceous species

Poor Level: >20

Fair Level: 10-20

Good Level: 5-9

Very Good Level: <5

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Maintain or, where necessary, restore the percent of groundcover in non-native herbaceous vegetation to nine percent or less.

Monitoring Strategy: Monitor the percent of ground cover in non-native herbaceous species.

Key Factor Name Fire Regime

Key Factor Description: Fire Return Interval and Seasonality, including landscape-scale fire in surrounding/adjacent habitats to prevent woody encroachment and allow for distribution and dispersal of obligate species

Key Factor Weight: Medium

Indicator Name: Fire Frequency

Indicator Description: Average percent of all known occurrences burned per 2-4 year interval.

Poor Level: <25

Fair Level: 25-50

Good Level: 51-75

Very Good Level: >75

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Burn at least 51 percent of the spatial extent of all known occurrences of this habitat type every 2-4 years.

Monitoring Strategy: Monitor average percent of all known occurrences burned per 2-4 year interval.

Key Factor Name Fire Regime

Indicator Name:	Fire Seasonality/Intensity
Indicator Description:	The percent of areas burned during either March/April or Aug/Sept, or from leaf-expansion to leaf-fall, depending on project-level goals. In some but not all cases, seasonality is an accurate surrogate for intensity. Since intensity goals will vary from burn to burn it is difficult to "pre-quantify" ideal intensity objectives at a forest-wide scale. It is presumed that restoration, maintenance, fuel-reduction and other prescribed fire goals will be considered at the project level when planning burn intensity.
Poor Level:	<25
Fair Level:	25-50
Good Level:	51-75
Very Good Level:	>75
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	When burning, burn during either March/April or August/September, or from leaf-expansion to leaf-fall, depending on project-level goals.
Monitoring Strategy:	Monitor percent of burned areas burned during either March/April or Aug/Sept, or from leaf-expansion to leaf-fall, depending on project-level goals. In some but not all cases, seasonality is an accurate surrogate for intensity. Since intensity goals will vary from burn to burn it is difficult to "pre-quantify" ideal intensity objectives at a forest-wide scale. It is presumed that restoration, maintenance, fuel-reduction and other prescribed fire goals will be considered at the project level when planning burn intensity.

Key Factor Name Remoteness

Key Factor Description: Mean density of roads (miles per square mile) within this community type at the landscape scale.

Key Factor Weight: Medium

Indicator Name: Road Density

Indicator Description: Average number of road miles per square mile across all known occurrences of this target.

Poor Level: >2 miles

Fair Level: 1-2 miles

Good Level: 0.5-1 mile

Very Good Level: <0.5 mile

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Maintain or, where necessary, restore the average number of road miles per square mile to one or less across all known occurrences of this target.

Monitoring Strategy: Monitor average number of road miles per square mile across all known occurrences of this target.

Habitat Name Ponds, Lakes, and Water Holes



Ecoregions where the habitat occurs:

Ozark Highlands ☑	Boston Mountains ☑	Mississippi Valley Loess Plains ☑	Arkansas Valley ☑
Ouachita Mountains ☑	South Central Plains ☑	Mississippi Alluvial Plain ☑	

Description

This type includes a variety of non-flowing aquatic habitats that may be a fraction of an acre to thousands of acres in size. The larger examples occur in the mountains as Corps of Engineers impoundments. Smaller waterholes are often built for wildlife or livestock watering functions. Most of these are built by humans.
(Foti and others 2005)

Species associated with this habitat type (and the weight or importance of the habitat to each species) include:
Anhinga (Anhinga anhinga) Weight: Obligate
Trumpeter Swan (Cygnus buccinator) Weight: Obligate

Chicken Turtle (Deirochelys reticularia) Weight: Obligate
Black-crowned Night-Heron (Nycticorax nycticorax) Weight: Optimal
American Black Duck (Anas rubripes) Weight: Suitable
American Bittern (Botaurus lentiginosus) Weight: Suitable
Tricolored Heron (Egretta tricolor) Weight: Suitable
Common Gallinule (Gallinula galeata) Weight: Suitable
Northern Long-eared Bat (Myotis septentrionalis) Weight: Suitable
Indiana Bat (Myotis sodalis) Weight: Suitable
Yellow-crowned Night-Heron (Nyctanassa violacea) Weight: Suitable
American Golden-Plover (Pluvialis dominica) Weight: Suitable
Purple Gallinule (Porphyrio martinicus) Weight: Suitable
Interior Least Tern (Sternula antillarum athalassos) Weight: Suitable
Ruddy Turnstone (Arenaria interpres) Weight: Marginal
Sanderling (Calidris alba) Weight: Marginal
Dunlin (Calidris alpina) Weight: Marginal
Stilt Sandpiper (Calidris himantopus) Weight: Marginal
Piping Plover (Charadrius melodus) Weight: Marginal
Least Bittern (Ixobrychus exilis) Weight: Marginal
Short-billed Dowitcher (Limnodromus griseus) Weight: Marginal
Black-bellied Plover (Pluvialis squatarola) Weight: Marginal
King Rail (Rallus elegans) Weight: Marginal

Habitat Team

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Habitat Priority Score: 1093

Key Factor Name Spatial Ecology

Key Factor Description:

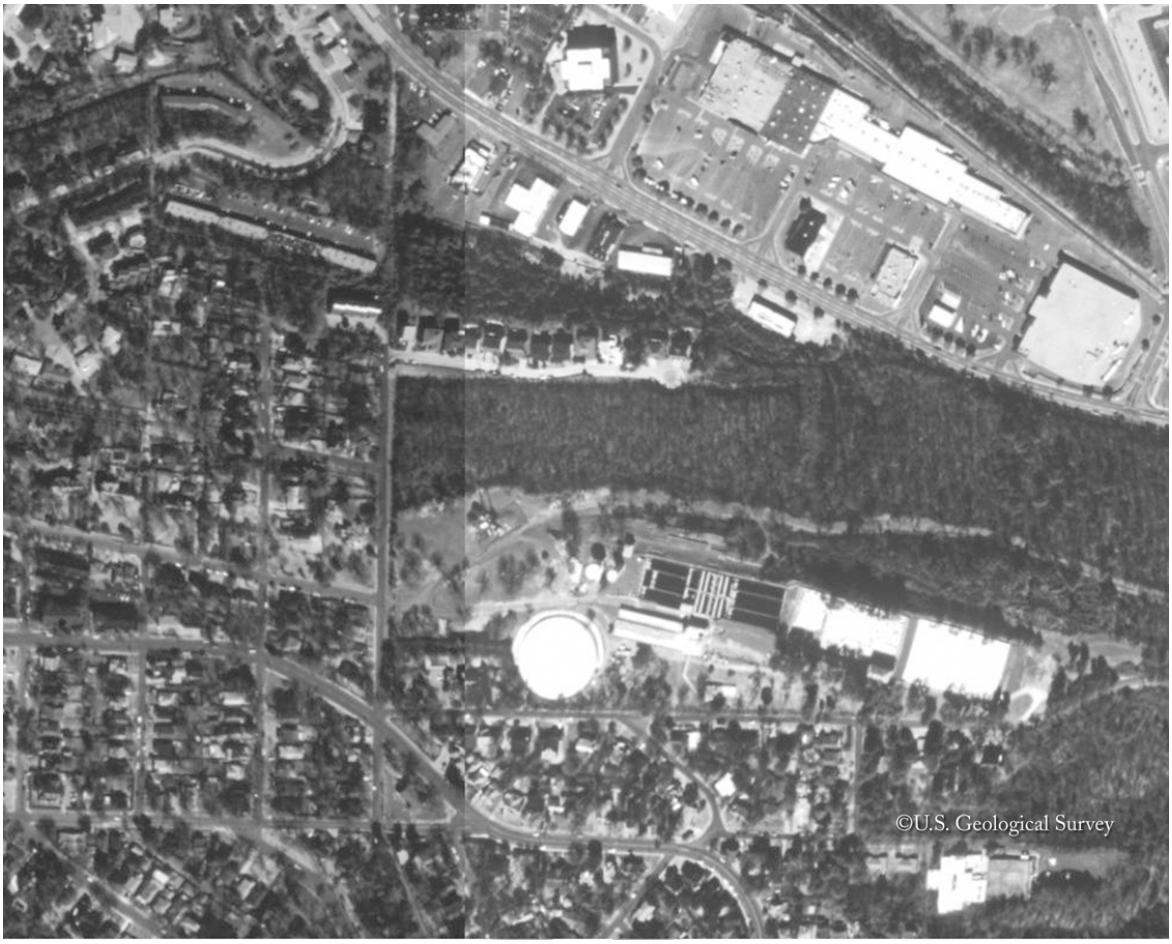
Key Factor Weight: Medium

Indicator Name:	Number of Blocks
Indicator Description:	Total number of blocks statewide
Poor Level:	0-1
Fair Level:	2
Good Level:	3
Very Good Level:	>3
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore number of blocks to three or more. (Block is defined by the minimum convex polygon bounded by known occurrences of this habitat type in which the median patch size is above the fair level for patch size, and in which each of the patches score fair or better on the patch proximity threshold.)
Monitoring Strategy:	Monitor total number of blocks statewide.
Indicator Name:	Patch Size
Indicator Description:	Width of buffer (meters)
Poor Level:	<100 meters of buffer
Fair Level:	100-250 meters of buffer
Good Level:	251-400 meters of buffer
Very Good Level:	>400 meters of buffer
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain, or where necessary, buffer known occurrences of this habitat type with a minimum of 251 meters of adjacent but dissimilar habitats.
Monitoring Strategy:	Monitor width of buffer (meters).

Key Factor Name Spatial Ecology

Indicator Name:	Patch Proximity
Indicator Description:	Median nearest distance between patches.
Poor Level:	>1200 meters
Fair Level:	801-1200 meters
Good Level:	500-800 meters
Very Good Level:	<500 meters
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, resotre the average distance between patches to 800 meters or less.
Monitoring Strategy:	Monitor median nearest distance between patches.
Indicator Name:	Average Block Size
Indicator Description:	Block is defined by the minimum convex polygon bounded by known occurrences of this habitat type in which the median patch size is above the fair level for patch size, and in which each of the patches score fair or better on the patch proximity threshold.
Poor Level:	<300 acres
Fair Level:	300-600 acres
Good Level:	601-1,000 acres
Very Good Level:	>1,000 acres
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore average block size to 601 acres or more. (Block is defined by the minimum convex polygon bounded by known occurrences of this habitat type in which the median patch size is above the fair level for patch size, and in which each of the patches score fair or better on the patch proximity threshold.)
Monitoring Strategy:	Monitor block size.

Habitat Name Urban/Suburban



Ecoregions where the habitat occurs:

Ozark Highlands ☑	Boston Mountains ☑	Mississippi Valley Loess Plains ☑	Arkansas Valley ☑
Ouachita Mountains ☑	South Central Plains ☑	Mississippi Alluvial Plain ☑	

Description

This type includes roofed structures surrounded by pavement, short grass, shrubs and open-grown trees, interspersed with parkland and commercial areas. High concentrations of exotic flora and fauna are commonly associated with this.
(Foti and others 2005)

Species associated with this habitat type (and the weight or importance of the habitat to each species) include:
Sharp-shinned Hawk (Accipiter striatus) Weight: Suitable
Chimney Swift (Chaetura pelagica) Weight: Suitable
Common Nighthawk (Chordeiles minor) Weight: Suitable

Purple Finch (Haemorhous purpureus) Weight: Suitable
Little Brown Bat (Myotis lucifugus) Weight: Suitable
American Golden-Plover (Pluvialis dominica) Weight: Suitable
Yellow-billed Cuckoo (Coccyzus americanus) Weight: Marginal
Monarch (Danaus plexippus) Weight: Marginal
American Kestrel (Falco sparverius) Weight: Marginal
Wood Thrush (Hylocichla mustelina) Weight: Marginal
Yellow-crowned Night-Heron (Nyctanassa violacea) Weight: Marginal
Black-crowned Night-Heron (Nycticorax nycticorax) Weight: Marginal
Bewick's Wren (Thryomanes bewickii) Weight: Marginal

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Habitat Priority Score: 403

Urban/Suburban

Key Factor Name Composition

Key Factor Description: The diversity, species richness, and relative abundance of vegetative elements in this habitat type.

Key Factor Weight: Medium

Indicator Name:	Forested cover
Indicator Description:	The percent of tree canopy cover.
Poor Level:	<20
Fair Level:	20-40
Good Level:	40-60
Very Good Level:	>60
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore the percent of tree canopy cover to 40 percent or higher.
Monitoring Strategy:	Monitor the percent of tree scanopy cover.
Indicator Name:	Invasive shrubs and woody vines
Indicator Description:	The percent of ground cover in non-native woody species
Poor Level:	>20
Fair Level:	10-20
Good Level:	5-9
Very Good Level:	<5
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore the percent of groundcover in invasive woody species to nine percent or less.
Monitoring Strategy:	Monitor the percent of ground cover in non-native woody species.

Habitat Name West Gulf Coastal Plain Calcareous Prairie and Woodland



Ecoregions where the habitat occurs:

Ozark Highlands	Boston Mountains	Mississippi Valley Loess Plains	Arkansas Valley
☐	☐	☐	☐

Ouachita Mountains	South Central Plains	Mississippi Alluvial Plain
☐	☑	☐

Description

The blackland prairies and woodlands of southwest Arkansas occur over relatively deep calcareous soils. This system is dominated by Schizachyrium scoparium and Soghustrum nutans and a rich herbaceous groundlayer. The woodland component is dominated by Quercus muehlenbergii and Carya illinoensis, also with a rich herbaceous groundlayer. These high-clay content, shrink-swell soils resist invasion by woody species, which combined with fire, maintains the prairie and open woodlands. (adapted from NatureServe 2005)

Species associated with this habitat type (and the weight or importance of the habitat to each species) include:
Le Conte's Sparrow (Ammodramus leconteii) Weight: Optimal
Common Nighthawk (Chordeiles minor) Weight: Optimal
Northern Bobwhite (Colinus virginianus) Weight: Optimal
Monarch (Danaus plexippus) Weight: Optimal
Dukes' Skipper (Euphyes dukesi) Weight: Optimal
Giant Prairie Robberfly (Microstylum morosum) Weight: Optimal
Slender Glass Lizard (Ophisaurus attenuatus) Weight: Optimal
Byssus Skipper (Problema byssus) Weight: Optimal
Anthophorid Bee (Tetraloniella albata) Weight: Optimal
Texas Milkweed Beetle (Tetraopes texanus) Weight: Optimal
Bell's Roadside-Skipper (Amblyscirtes belli) Weight: Suitable
Henslow's Sparrow (Ammodramus henslowii) Weight: Suitable
Grasshopper Sparrow (Ammodramus savannarum) Weight: Suitable
Northern Metalmark (Calephelis borealis) Weight: Suitable
Texas Frosted Elfin (Callophrys irus hadros) Weight: Suitable
Dusky Azure (Celastrina nigra) Weight: Suitable
Sedge Wren (Cistothorus platensis) Weight: Suitable
Outis Skipper (Cogia outis) Weight: Suitable
Willow Flycatcher (Empidonax traillii) Weight: Suitable
Purple Finch (Haemorhous purpureus) Weight: Suitable
Leonard's Skipper (Hesperia leonardus) Weight: Suitable
Meske's Skipper (Hesperia meskei) Weight: Suitable
Crawford's Gray Shrew (Notiosorex crawfordi) Weight: Suitable
Rattlesnake-Master Borer Moth (Papaipema eryngii) Weight: Suitable
Yehl Skipper (Poanes yehl) Weight: Suitable
Diana (Speyeria diana) Weight: Suitable
Red Milkweed Beetle (Tetraopes quinquemaculatus) Weight: Suitable
Bell's Vireo (Vireo bellii) Weight: Suitable
Sprague's Pipit (Anthus spragueii) Weight: Marginal
Smith's Longspur (Calcarius pictus) Weight: Marginal
Buff-breasted Sandpiper (Calidris subruficollis) Weight: Marginal
Yellow-billed Cuckoo (Coccyzus americanus) Weight: Marginal
American Woodcock (Scolopax minor) Weight: Marginal
Gorgone Checkerspot (Chlosyne gorgone) Weight: Data Gap
Long-tailed Weasel (Mustela frenata) Weight: Data Gap

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Habitat Priority Score: 1733

Key Factor Name Composition

Key Factor Description: The diversity, species richness, and relative abundance of vegetative elements in this habitat type.

Key Factor Weight: Medium

Indicator Name:	Invasive shrubs and woody vines
Indicator Description:	The percent of ground cover in non-native woody species
Poor Level:	>20
Fair Level:	10-20
Good Level:	5-9
Very Good Level:	<5
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore the percent of groundcover in invasive woody species to nine percent or less.
Monitoring Strategy:	Monitor the percent of ground cover in non-native woody species.
Indicator Name:	Exotic Forbs and Grasses
Indicator Description:	The percent of ground cover in non-native herbaceous species
Poor Level:	>20
Fair Level:	10-20
Good Level:	5-9
Very Good Level:	<5
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore the percent of groundcover in non-native herbaceous vegetation to nine percent or less.
Monitoring Strategy:	Monitor the percent of ground cover in non-native herbaceous species.

Key Factor Name Fire Regime

Key Factor Description: Fire Return Interval and Seasonality, including landscape-scale fire in surrounding/adjacent habitats to prevent woody encroachment and allow for distribution and dispersal of obligate species

Key Factor Weight: Medium

Indicator Name: Fire Seasonality/Intensity

Indicator Description: The percent of areas burned during either March/April or Aug/Sept, or from leaf-expansion to leaf-fall, depending on project-level goals. In some but not all cases, seasonality is an accurate surrogate for intensity. Since intensity goals will vary from burn to burn it is difficult to "pre-quantify" ideal intensity objectives at a forest-wide scale. It is presumed that restoration, maintenance, fuel-reduction and other prescribed fire goals will be considered at the project level when planning burn intensity.

Poor Level: <25

Fair Level: 25-50

Good Level: 51-75

Very Good Level: >75

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: When burning, burn during either March/April or August/September, or from leaf-expansion to leaf-fall, depending on project-level goals.

Monitoring Strategy: Monitor percent of burned areas burned during either March/April or Aug/Sept, or from leaf-expansion to leaf-fall, depending on project-level goals. In some but not all cases, seasonality is an accurate surrogate for intensity. Since intensity goals will vary from burn to burn it is difficult to "pre-quantify" ideal intensity objectives at a forest-wide scale. It is presumed that restoration, maintenance, fuel-reduction and other prescribed fire goals will be considered at the project level when planning burn intensity.

Key Factor Name Fire Regime

Indicator Name:	Fire Frequency
Indicator Description:	Average percent of all known occurrences plus 100 meter buffer burned per 3-5 year interval.
Poor Level:	<25
Fair Level:	25-50
Good Level:	51-75
Very Good Level:	>75
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Burn at least 51 percent of the spatial extent plus 100 meter buffer of all known occurrences of this habitat type every 3-5 years.
Monitoring Strategy:	Monitor average percent of all known occurrences plus 100 meter buffer burned per 3-5 year interval.

Key Factor Name Remoteness

Key Factor Description: Mean density of roads (miles per square mile) within this community type at the landscape scale.

Key Factor Weight: Medium

Indicator Name: Road Density

Indicator Description: Average number of road miles per square mile across all known occurrences of this target.

Poor Level: >2 miles

Fair Level: 1-2 miles

Good Level: 0.5-1 mile

Very Good Level: <0.5 mile

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Maintain or, where necessary, restore the average number of road miles per square mile to one or less across all known occurrences of this target.

Monitoring Strategy: Monitor average number of road miles per square mile across all known occurrences of this target.

Key Factor Name Spatial Ecology

Key Factor Description: The relative spatial abundance, proximity, distribution, and arrangement of this habitat type on the landscape.

Key Factor Weight: Medium

Indicator Name: Patch Size

Indicator Description: Average patch size across all known occurrences (acres)

Poor Level: <50 acres

Fair Level: 50-125 acres

Good Level: 125-250 acres

Very Good Level: >250 acres

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Maintain or, where necessary, restore the average patch size of this habitat type to 125 acres or more across all known occurrences.

Monitoring Strategy: Monitor average patch size across all known occurrences (acres).

Key Factor Name Spatial Ecology

Indicator Name:	Average Block Size
Indicator Description:	Block is defined by the minimum convex polygon bounded by known occurrences of this habitat type in which the median patch size is above the fair level for patch size, and in which each of the patches score fair or better on the patch proximity threshold.
Poor Level:	<1,000 acres
Fair Level:	1,000-2,499 acres
Good Level:	2,500-5,000 acres
Very Good Level:	>5,000 acres
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore average block size to 2,500 acres or more. (Block is defined by the minimum convex polygon bounded by known occurrences of this habitat type in which the median patch size is above the fair level for patch size, and in which each of the patches score fair or better on the patch proximity threshold.)
Monitoring Strategy:	Monitor block size.
Indicator Name:	Number of Blocks
Indicator Description:	Total number of blocks statewide
Poor Level:	0-1
Fair Level:	2
Good Level:	3
Very Good Level:	>3
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore number of blocks to three or more. (Block is defined by the minimum convex polygon bounded by known occurrences of this habitat type in which the median patch size is above the fair level for patch size, and in which each of the patches score fair or better on the patch proximity threshold.)
Monitoring Strategy:	Monitor total number of blocks statewide.

Key Factor Name Spatial Ecology

Indicator Name:	Patch Proximity
Indicator Description:	Median nearest distance between patches.
Poor Level:	>5 miles
Fair Level:	3-5 miles
Good Level:	1-2 miles
Very Good Level:	<1 mile
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore the median nearest distance between patches of this habitat type to two miles or less.
Monitoring Strategy:	Monitor median nearest distance between patches.

Habitat Name West Gulf Coastal Plain Large River Floodplain Forest



Ecoregions where the habitat occurs:

Ozark Highlands ☐	Boston Mountains ☐	Mississippi Valley Loess Plains ☐	Arkansas Valley ☐
Ouachita Mountains ☐	South Central Plains ☑	Mississippi Alluvial Plain ☐	

Description

This system represents broad bottomlands along larger rivers such as the Saline and Ouachita. Several distinct plant communities are recognized within this system that may be related to the array of different geomorphic features present within the floodplain. Some of the major geomorphic features associated with different community types include natural levees, point bars, meander scrolls, oxbows and sloughs. However, in many cases these features too small to be mapped or managed individually, and therefore contribute to an overall matrix of the habitat. Vegetation generally includes forests dominated by bottomland hardwood species and other trees tolerant of flooding and distributed according to these microsite variations.
(adapted from NatureServe 2005)

West Gulf Coastal Plain Large River Floodplain Forest

Species associated with this habitat type (and the weight or importance of the habitat to each species) include:
Crawfish Frog (Lithobates areolatus) Weight: Obligate
Eastern Whip-poor-will (Antrostomus vociferus) Weight: Optimal
Yellow-billed Cuckoo (Coccyzus americanus) Weight: Optimal
Rafinesque's Big-Eared Bat (Corynorhinus rafinesquii) Weight: Optimal
Bird-voiced Treefrog (Hyla avivoca) Weight: Optimal
Squirrel Treefrog (Hyla squirella) Weight: Optimal
Wood Thrush (Hylocichla mustelina) Weight: Optimal
Southeastern Bat (Myotis austroriparius) Weight: Optimal
American Woodcock (Scolopax minor) Weight: Optimal
Lace-winged Roadside-Skipper (Amblyscirtes aesculapius) Weight: Suitable
American Black Duck (Anas rubripes) Weight: Suitable
Anhinga (Anhinga anhinga) Weight: Suitable
Chimney Swift (Chaetura pelagica) Weight: Suitable
Chicken Turtle (Deirochelys reticularia) Weight: Suitable
Tricolored Heron (Egretta tricolor) Weight: Suitable
Swallow-tailed Kite (Elanoides forficatus) Weight: Suitable
Rusty Blackbird (Euphagus carolinus) Weight: Suitable
Dukes' Skipper (Euphyes dukesi) Weight: Suitable
Dwarf Salamander (Eurycea quadridigitata) Weight: Suitable
Purple Finch (Haemorhous purpureus) Weight: Suitable
Glossy Swampsnake (Liodytes rigida) Weight: Suitable
Yellow-crowned Night-Heron (Nyctanassa violacea) Weight: Suitable
Swainson's Warbler (Limnothlypis swainsonii) Weight: Marginal
Black-crowned Night-Heron (Nycticorax nycticorax) Weight: Marginal
Lincoln Underwing (Catocala lincolnana) Weight: Data Gap
Long-tailed Weasel (Mustela frenata) Weight: Data Gap

Habitat Team

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Habitat Priority Score: 1213

Key Factor Name Composition

Key Factor Description: The diversity, species richness, and relative abundance of vegetative elements in this habitat type.

Key Factor Weight: Medium

Indicator Name: Red Oak/Overcup Oak Ratio

Indicator Description: Relative amount of Red Oak to Overcup Oak in terms of basal area

Poor Level: 1:2

Fair Level: 1:1.5

Good Level: 1:1

Very Good Level: 1.5:1

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Maintain or, where necessary, restore the relative amount of Red Oak to Overcup Oak (measured in basal area) to a ratio of 1.1 or higher.

Monitoring Strategy: Monitor relative amount of Red Oak to Overcup Oak in terms of basal area.

Key Factor Name Fire Regime

Key Factor Description: Fire Return Interval and Seasonality, including landscape-scale fire in surrounding/adjacent habitats to prevent woody encroachment and allow for distribution and dispersal of obligate species

Key Factor Weight: Medium

Indicator Name: Fire Frequency

Indicator Description: Average percent of all known occurrences burned per 5-15 year interval.

Poor Level: <25

Fair Level: 25-50

Good Level: 51-75

Very Good Level: >75

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Burn at least 51 percent of the spatial extent of all known occurrences of this habitat type every 5-15 years.

Monitoring Strategy: Monitor average percent of all known occurrences burned per 5-15 year interval.

Key Factor Name Fire Regime

Indicator Name:	Fire Seasonality/Intensity
Indicator Description:	The percent of areas burned during either March/April or Aug/Sept, or from leaf-expansion to leaf-fall, depending on project-level goals. In some but not all cases, seasonality is an accurate surrogate for intensity. Since intensity goals will vary from burn to burn it is difficult to "pre-quantify" ideal intensity objectives at a forest-wide scale. It is presumed that restoration, maintenance, fuel-reduction and other prescribed fire goals will be considered at the project level when planning burn intensity.
Poor Level:	<25
Fair Level:	25-50
Good Level:	51-75
Very Good Level:	>75
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	When burning, burn during either March/April or August/September, or from leaf-expansion to leaf-fall, depending on project-level goals.
Monitoring Strategy:	Monitor percent of burned areas burned during either March/April or Aug/Sept, or from leaf-expansion to leaf-fall, depending on project-level goals. In some but not all cases, seasonality is an accurate surrogate for intensity. Since intensity goals will vary from burn to burn it is difficult to "pre-quantify" ideal intensity objectives at a forest-wide scale. It is presumed that restoration, maintenance, fuel-reduction and other prescribed fire goals will be considered at the project level when planning burn intensity.

Key Factor Name Remoteness

Key Factor Description: Mean density of roads (miles per square mile) within this community type at the landscape scale.

Key Factor Weight: Medium

Indicator Name: Road Density

Indicator Description: Average number of road miles per square mile across all known occurrences of this target.

Poor Level: >2 miles

Fair Level: 1-2 miles

Good Level: 0.5-1 mile

Very Good Level: <0.5 mile

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Maintain or, where necessary, restore the average number of road miles per square mile to one or less across all known occurrences of this target.

Monitoring Strategy: Monitor average number of road miles per square mile across all known occurrences of this target.

Key Factor Name Spatial Ecology

Key Factor Description: The relative spatial abundance, proximity, distribution, and arrangement of this habitat type on the landscape.

Key Factor Weight: Medium

Indicator Name: Average Block Size

Indicator Description: Block is defined by the minimum convex polygon bounded by known occurrences of this habitat type in which the median patch size is above the fair level for patch size, and in which each of the patches score fair or better on the patch proximity threshold.

Poor Level: <2,500 acres

Fair Level: 2,500-5,000 acres

Good Level: 5,001-10,000 acres

Very Good Level: >10,000 acres

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Maintain or, where necessary, restore average block size to 5,001 acres or more. (Block is defined by the minimum convex polygon bounded by known occurrences of this habitat type in which the median patch size is above the fair level for patch size, and in which each of the patches score fair or better on the patch proximity threshold.)

Monitoring Strategy: Monitor block size.

Key Factor Name Spatial Ecology

Indicator Name:	Patch Size
Indicator Description:	Average patch size across all known occurrences (acres)
Poor Level:	<250 acres
Fair Level:	250-500 acres
Good Level:	501-1,000 acres
Very Good Level:	>1,000 acres
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore the average patch size of this habitat type to 501 acres or more across all known occurrences.
Monitoring Strategy:	Monitor average patch size across all known occurrences (acres).
Indicator Name:	Patch Proximity
Indicator Description:	Median nearest distance between patches.
Poor Level:	>4 miles
Fair Level:	2-4 miles
Good Level:	1-2 miles
Very Good Level:	<1 mile
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore the median nearest distance between patches of this habitat type to two miles or less.
Monitoring Strategy:	Monitor median nearest distance between patches.

Key Factor Name Spatial Ecology

Indicator Name:	Number of Blocks
Indicator Description:	Total number of blocks statewide
Poor Level:	0-1
Fair Level:	2
Good Level:	3
Very Good Level:	>3
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore number of blocks to three or more. (Block is defined by the minimum convex polygon bounded by known occurrences of this habitat type in which the median patch size is above the fair level for patch size, and in which each of the patches score fair or better on the patch proximity threshold.)
Monitoring Strategy:	Monitor total number of blocks statewide.

Habitat Name West Gulf Coastal Plain Pine-Hardwood Flatwoods



Ecoregions where the habitat occurs:

Ozark Highlands	Boston Mountains	Mississippi Valley Loess Plains	Arkansas Valley
☐	☐	☐	☐

Ouachita Mountains	South Central Plains	Mississippi Alluvial Plain
☐	☑	☐

Description

This system represents flatwoods found on Pleistocene high terraces, typically outside the floodplain. Soils are fine-textured and hardpans may be present in the subsurface. The limited permeability of these soils contributes to shallowly perched water tables during portions of the year when precipitation is greatest and evapotranspiration is lowest. Soil moisture fluctuates widely throughout the growing season, from saturated to very dry, a condition sometimes referred to as hydroxeric moisture regime. Saturation is primarily influenced by precipitation rather than overbank flooding. Pinus taeda is codominant along with Quercus pagoda and Quercus phellos, with a graminoid-rich groundlayer. Approximately twenty percent of the system is occupied by prairie mounds with Pinus echinata, Vaccinium spp., and Symplocos tinctoria. Extremely dry seasonal conditions make fire an important natural process in the system. As a result, this system was typically a woodland, although recent fire

suppression and forest management have caused a conversion of most sites to forest. Some swales support pockets of Fraxinus caroliniana and Crataegus spp. Saline Barrens habitat is present on soils with high saline content, which are generally not conducive to woody plant growth. Thus, the vegetation forms a mosaic primarily consisting of open herbaceous or shrubby plant communities.

(adapted from NatureServe 2005)

Species associated with this habitat type (and the weight or importance of the habitat to each species) include:
Red-cockaded Woodpecker (Picoides borealis) Weight: Obligate
Henslow's Sparrow (Ammodramus henslowii) Weight: Optimal
Prairie Skink (Plestiodon septentrionalis) Weight: Optimal
Eastern Whip-poor-will (Antrostomus vociferus) Weight: Suitable
Common Nighthawk (Chordeiles minor) Weight: Suitable
Northern Bobwhite (Colinus virginianus) Weight: Suitable
Monarch (Danaus plexippus) Weight: Suitable
Purple Finch (Haemorhous purpureus) Weight: Suitable
Georgia Satyr (Neonympha areolatus) Weight: Suitable
Hurter's Spadefoot (Scaphiopus hurterii) Weight: Suitable
Diana (Speyeria diana) Weight: Suitable
Le Conte's Sparrow (Ammodramus leconteii) Weight: Marginal
Northern Bobwhite (Colinus virginianus) Weight: Marginal
Sharp-shinned Hawk (Accipiter striatus) Weight: Data Gap

Habitat Team

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Habitat Priority Score: 702

Key Factor Name Composition

Key Factor Description: The diversity, species richness, and relative abundance of vegetative elements in this habitat type.

Key Factor Weight: Medium

Indicator Name: Percent herbaceous groundcover with minimal woody plants

Indicator Description: The percent of the ground that is primarily herbaceous groundcover.

Poor Level: <60

Fair Level: 60-70

Good Level: 70-80

Very Good Level: >90

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Maintain, or where necessary, restore the percent of the groundcovered by native herbaceous vegetation to 70 percent or more.

Monitoring Strategy: Monitor the percent of the ground that is primarily herbaceous groundcover.

Key Factor Name Fire Regime

Key Factor Description: Fire Return Interval and Seasonality, including landscape-scale fire in surrounding/adjacent habitats to prevent woody encroachment and allow for distribution and dispersal of obligate species

Key Factor Weight: Medium

Indicator Name: Fire Frequency

Indicator Description: Average percent of all known occurrences burned per 3-7 year interval.

Poor Level: <25

Fair Level: 25-50

Good Level: 51-75

Very Good Level: >75

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Burn at least 51 percent of the spatial extent of all known occurrences of this habitat type every 3-7 years.

Monitoring Strategy: Monitor average percent of all known occurrences burned per 3-7 year interval.

Key Factor Name Fire Regime

Indicator Name:	Fire Seasonality/Intensity
Indicator Description:	The percent of areas burned during either March/April or Aug/Sept, or from leaf-expansion to leaf-fall, depending on project-level goals. In some but not all cases, seasonality is an accurate surrogate for intensity. Since intensity goals will vary from burn to burn it is difficult to "pre-quantify" ideal intensity objectives at a forest-wide scale. It is presumed that restoration, maintenance, fuel-reduction and other prescribed fire goals will be considered at the project level when planning burn intensity.
Poor Level:	<25
Fair Level:	25-50
Good Level:	51-75
Very Good Level:	>75
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	When burning, burn during either March/April or August/September, or from leaf-expansion to leaf-fall, depending on project-level goals.
Monitoring Strategy:	Monitor percent of burned areas burned during either March/April or Aug/Sept, or from leaf-expansion to leaf-fall, depending on project-level goals. In some but not all cases, seasonality is an accurate surrogate for intensity. Since intensity goals will vary from burn to burn it is difficult to "pre-quantify" ideal intensity objectives at a forest-wide scale. It is presumed that restoration, maintenance, fuel-reduction and other prescribed fire goals will be considered at the project level when planning burn intensity.

Key Factor Name Remoteness

Key Factor Description: Mean density of roads (miles per square mile) within this community type at the landscape scale.

Key Factor Weight: Medium

Indicator Name: Road Density

Indicator Description: Average number of road miles per square mile across all known occurrences of this target.

Poor Level: >2 miles

Fair Level: 1-2 miles

Good Level: 0.5-1 mile

Very Good Level: <0.5 mile

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Maintain or, where necessary, restore the average number of road miles per square mile to one or less across all known occurrences of this target.

Monitoring Strategy: Monitor average number of road miles per square mile across all known occurrences of this target.

Key Factor Name Spatial Ecology

Key Factor Description: The relative spatial abundance, proximity, distribution, and arrangement of this habitat type on the landscape.

Key Factor Weight: Medium

Indicator Name:	Patch Size
Indicator Description:	Average patch size across all known occurrences (acres)
Poor Level:	<250 acres
Fair Level:	250-500 acres
Good Level:	501-1,000 acres
Very Good Level:	>1,000 acres
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore the average patch size of this habitat type to 501 acres or more across all known occurrences.
Monitoring Strategy:	Monitor average patch size across all known occurrences (acres).
Indicator Name:	Patch Proximity
Indicator Description:	Median nearest distance between patches.
Poor Level:	>4 miles
Fair Level:	2-4 miles
Good Level:	1-2 miles
Very Good Level:	<1 mile
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore the median nearest distance between patches of this habitat type to two miles or less.
Monitoring Strategy:	Monitor median nearest distance between patches.

Key Factor Name Spatial Ecology

Indicator Name:	Number of Blocks
Indicator Description:	Total number of blocks statewide
Poor Level:	0-1
Fair Level:	2
Good Level:	3
Very Good Level:	>3
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore number of blocks to three or more. (Block is defined by the minimum convex polygon bounded by known occurrences of this habitat type in which the median patch size is above the fair level for patch size, and in which each of the patches score fair or better on the patch proximity threshold.)
Monitoring Strategy:	Monitor total number of blocks statewide.
Indicator Name:	Average Block Size
Indicator Description:	Block is defined by the minimum convex polygon bounded by known occurrences of this habitat type in which the median patch size is above the fair level for patch size, and in which each of the patches score fair or better on the patch proximity threshold.
Poor Level:	<2,500 acres
Fair Level:	2,500-5,000 acres
Good Level:	5,001-10,000 acres
Very Good Level:	>10,000 acres
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore average block size to 5,001 acres or more. (Block is defined by the minimum convex polygon bounded by known occurrences of this habitat type in which the median patch size is above the fair level for patch size, and in which each of the patches score fair or better on the patch proximity threshold.)
Monitoring Strategy:	Monitor block size.

Habitat Name West Gulf Coastal Plain Pine-Hardwood Forest/Woodland



Ecoregions where the habitat occurs:

Ozark Highlands	Boston Mountains	Mississippi Valley Loess Plains	Arkansas Valley
☐	☐	☐	☐

Ouachita Mountains	South Central Plains	Mississippi Alluvial Plain
☐	☑	☐

Description

This ecological system consists of forests and woodlands dominated by Pinus taeda and/or Pinus echinata in combination with a host of dry to dry-mesic site hardwood species. This type was the historical matrix (dominant vegetation type) within this region. This habitat was historically present on nearly all uplands in the region except on the most edaphically limited sites (droughty sands, calcareous clays, and shallow soil barrens/rock outcrops). Such sites are underlain by loamy to fine-textured soils of variable depths. These are upland sites on ridgetops and adjacent side slopes, with moderate fertility and moisture retention. This system has undergone major transformations since European settlement and has been largely converted to cultivated pine plantations and other human uses. In limited upland areas, especially side slopes and ravines, mesic hardwood forests occur within this matrix.These areas

were somewhat protected topographically from historically fire-prone, pine-dominated uplands. Sites are often found along slopes above perennial or intermittent streams in the region. Vegetation indicators are mesic hardwoods such as Fagus grandifolia, Quercus alba, and Ilex opaca, although scattered, large-diameter pines, often Pinus taeda, are also often present. Spring-blooming herbaceous species are typical in the understory of most examples.

(adapted from NatureServe 2005)

Species associated with this habitat type (and the weight or importance of the habitat to each species) include:
Red-cockaded Woodpecker (Picoides borealis) Weight: Obligate
Bell's Roadside-Skipper (Amblyscirtes belli) Weight: Optimal
Sequoyah Slimy Salamander (Plethodon sequoyah) Weight: Optimal
Eastern Whip-poor-will (Antrostomus vociferus) Weight: Suitable
Monarch (Danaus plexippus) Weight: Suitable
Cobweb Skipper (Hesperia metea) Weight: Suitable
Gray Comma (Polygonia progne) Weight: Suitable
King's Hairstreak (Satyrium kingi) Weight: Suitable
Sharp-shinned Hawk (Accipiter striatus) Weight: Data Gap

Habitat Team

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Habitat Priority Score: 581

Key Factor Name Canopy Closure

Key Factor Description: Combination of stem density, basal area and extent of canopy cover, with intermitent closure as ideal (Surrogate for Horizontal Structure). Data from the Ouachita Pine-Oak Forest conservation target were used as comparable, as actual data was unavailable.

Key Factor Weight: Medium

Indicator Name: Canopy Closure

Indicator Description: The percent of the spatial extent of all known occurrences with a percent canopy closure of greater than 70%.

Poor Level: <25

Fair Level: 25-50

Good Level: 51-75

Very Good Level: >75

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Maintain or, where necessary, restore the percent of the spatial extent of all known occurrences with a canopy closure of greater than 70 percent to 51 percent or more.

Monitoring Strategy: Monitor percent of the spatial extent of all known occurrences with a percent canopy closure of greater than 70%.

Key Factor Name Composition

Key Factor Description: The diversity, species richness, and relative abundance of vegetative elements in this habitat type.

Key Factor Weight: Medium

Indicator Name: Shortleaf pine decline

Indicator Description: Percent loss of shortleaf pine over 30 year period

Poor Level: >50

Fair Level: 31-50

Good Level: 15-30

Very Good Level: <15

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Maintain or, where necessary, restore the shortleaf pine loss over a 30 year period to 30 percent or less.

Monitoring Strategy: Monitor percent loss of shortleaf pine over 30 year period.

Key Factor Name Fire Regime

Key Factor Description: Fire Return Interval and Seasonality, including landscape-scale fire in surrounding/adjacent habitats to prevent woody encroachment and allow for distribution and dispersal of obligate species

Key Factor Weight: Medium

Indicator Name: Fire Frequency

Indicator Description: Average percent of all known occurrences burned per 3-7 year interval.

Poor Level: <25

Fair Level: 25-50

Good Level: 51-75

Very Good Level: >75

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Burn at least 51 percent of the spatial extent of all known occurrences of this habitat type every 3-7 years.

Monitoring Strategy: Monitor average percent of all known occurrences burned per 3-7 year interval.

Key Factor Name Fire Regime

Indicator Name:	Fire Seasonality/Intensity
Indicator Description:	The percent of areas burned during either March/April or Aug/Sept, or from leaf-expansion to leaf-fall, depending on project-level goals. In some but not all cases, seasonality is an accurate surrogate for intensity. Since intensity goals will vary from burn to burn it is difficult to "pre-quantify" ideal intensity objectives at a forest-wide scale. It is presumed that restoration, maintenance, fuel-reduction and other prescribed fire goals will be considered at the project level when planning burn intensity.
Poor Level:	<25
Fair Level:	25-50
Good Level:	51-75
Very Good Level:	>75
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	When burning, burn during either March/April or August/September, or from leaf-expansion to leaf-fall, depending on project-level goals.
Monitoring Strategy:	Monitor percent of burned areas burned during either March/April or Aug/Sept, or from leaf-expansion to leaf-fall, depending on project-level goals. In some but not all cases, seasonality is an accurate surrogate for intensity. Since intensity goals will vary from burn to burn it is difficult to "pre-quantify" ideal intensity objectives at a forest-wide scale. It is presumed that restoration, maintenance, fuel-reduction and other prescribed fire goals will be considered at the project level when planning burn intensity.

Key Factor Name Remoteness

Key Factor Description: Mean density of roads (miles per square mile) within this community type at the landscape scale.

Key Factor Weight: Medium

Indicator Name: Road Density

Indicator Description: Average number of road miles per square mile across all known occurrences of this target.

Poor Level: >2 miles

Fair Level: 1-2 miles

Good Level: 0.5-1 mile

Very Good Level: <0.5 mile

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Maintain or, where necessary, restore the average number of road miles per square mile to one or less across all known occurrences of this target.

Monitoring Strategy: Monitor average number of road miles per square mile across all known occurrences of this target.

Key Factor Name Spatial Ecology

Key Factor Description: The relative spatial abundance, proximity, distribution, and arrangement of this habitat type on the landscape.

Key Factor Weight: Medium

Indicator Name: Number of Blocks

Indicator Description: Total number of blocks statewide

Poor Level: 0-1

Fair Level: 2

Good Level: 3

Very Good Level: >3

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Maintain or, where necessary, restore number of blocks to three or more. (Block is defined by the minimum convex polygon bounded by known occurrences of this habitat type in which the median patch size is above the fair level for patch size, and in which each of the patches score fair or better on the patch proximity threshold.)

Monitoring Strategy: Monitor total number of blocks statewide.

Key Factor Name Spatial Ecology

Indicator Name:	Average Block Size
Indicator Description:	Block is defined by the minimum convex polygon bounded by known occurrences of this habitat type in which the median patch size is above the fair level for patch size, and in which each of the patches score fair or better on the patch proximity threshold.
Poor Level:	<5,000 acres
Fair Level:	5,000-10,000 acres
Good Level:	10,000-20,000 acres
Very Good Level:	>20,000 acres
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore average block size to 10,000 acres or more. (Block is defined by the minimum convex polygon bounded by known occurrences of this habitat type in which the median patch size is above the fair level for patch size, and in which each of the patches score fair or better on the patch proximity threshold.)
Monitoring Strategy:	Monitor block size.
Indicator Name:	Patch Size
Indicator Description:	Average patch size across all known occurrences (acres)
Poor Level:	<500 acres
Fair Level:	500-1,000 acres
Good Level:	1,001-2,000 acres
Very Good Level:	>2,000 acres
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore the average patch size of this habitat type to 1,001 acres or more across all known occurrences.
Monitoring Strategy:	Monitor average patch size across all known occurrences (acres).

Key Factor Name Spatial Ecology

Indicator Name:	Patch Proximity
Indicator Description:	Median nearest distance between patches.
Poor Level:	>4 miles
Fair Level:	2-4 miles
Good Level:	1-2 miles
Very Good Level:	<1 mile
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore the median nearest distance between patches of this habitat type to two miles or less.
Monitoring Strategy:	Monitor median nearest distance between patches.

Habitat Name West Gulf Coastal Plain Red River Floodplain Forest



Ecoregions where the habitat occurs:

Ozark Highlands ☐	Boston Mountains ☐	Mississippi Valley Loess Plains ☐	Arkansas Valley ☐
Ouachita Mountains ☐	South Central Plains ☑	Mississippi Alluvial Plain ☐	

Description

This system is restricted to the main stem of the Red River in southwestern Arkansas. Several distinct plant communities can be recognized within this system that may be related to the array of different geomorphic features present within the floodplain. Some of the major geomorphic features associated with different community types within the system include natural levees, point bars, meander scrolls, oxbows, and sloughs. Vegetation generally includes forests dominated by bottomland hardwood species, with sites ranging from relatively dry to cypress-tupelo swamps.This system is generally similar in concept to West Gulf Coastal Plain Large River Floodplain Forest but is distinct from it because of the difference in magnitude between the typical large rivers (Ouachita, Saline) and the Red River bottoms. Native vegetation in the Red River bottoms differs from that of the West Gulf Coastal Plain Large River Floodplain Forest in having a larger area occupied by Populus deltoides, Salix nigra and other sandy

riverfront forests. Nearly all of this habitat has been converted to row crops.

(adapted from NatureServe 2005)

Species associated with this habitat type (and the weight or importance of the habitat to each species) include:
Eastern Whip-poor-will (Antrostomus vociferus) Weight: Optimal
Yellow-billed Cuckoo (Coccyzus americanus) Weight: Optimal
Rafinesque's Big-Eared Bat (Corynorhinus rafinesquii) Weight: Optimal
Wood Thrush (Hylocichla mustelina) Weight: Optimal
Anhinga (Anhinga anhinga) Weight: Suitable
Chimney Swift (Chaetura pelagica) Weight: Suitable
Tricolored Heron (Egretta tricolor) Weight: Suitable
Swallow-tailed Kite (Elanoides forficatus) Weight: Suitable
Rusty Blackbird (Euphagus carolinus) Weight: Suitable
Dukes' Skipper (Euphyes dukesi) Weight: Suitable
Purple Finch (Haemorhous purpureus) Weight: Suitable
Glossy Swampsnake (Liodytes rigida) Weight: Suitable
Crawfish Frog (Lithobates areolatus) Weight: Suitable
Southeastern Bat (Myotis austroriparius) Weight: Suitable
Yellow-crowned Night-Heron (Nyctanassa violacea) Weight: Suitable
Prairie Skink (Plestiodon septentrionalis) Weight: Suitable
American Woodcock (Scolopax minor) Weight: Suitable
American Black Duck (Anas rubripes) Weight: Marginal
American Bittern (Botaurus lentiginosus) Weight: Marginal
Swainson's Warbler (Limnothlypis swainsonii) Weight: Marginal
Black-crowned Night-Heron (Nycticorax nycticorax) Weight: Marginal
Long-tailed Weasel (Mustela frenata) Weight: Data Gap

Habitat Team

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Habitat Priority Score: 926

Key Factor Name Composition

Key Factor Description: The diversity, species richness, and relative abundance of vegetative elements in this habitat type.

Key Factor Weight: Medium

Indicator Name: Invasive shrubs and woody vines

Indicator Description: The percent of ground cover in non-native woody species

Poor Level: >20

Fair Level: 10-20

Good Level: 5-9

Very Good Level: <5

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Maintain or, where necessary, restore the percent of groundcover in invasive woody species to nine percent or less.

Monitoring Strategy: Monitor the percent of ground cover in non-native woody species.

Indicator Name: Exotic Forbs and Grasses

Indicator Description: The percent of ground cover in non-native herbaceous species

Poor Level: >20

Fair Level: 10-20

Good Level: 5-9

Very Good Level: <5

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Maintain or, where necessary, restore the percent of groundcover in non-native herbaceous vegetation to nine percent or less.

Monitoring Strategy: Monitor the percent of ground cover in non-native herbaceous species.

Key Factor Name Fire Regime

Key Factor Description: Fire Return Interval and Seasonality, including landscape-scale fire in surrounding/adjacent habitats to prevent woody encroachment and allow for distribution and dispersal of obligate species

Key Factor Weight: Medium

Indicator Name: Fire Seasonality/Intensity

Indicator Description: The percent of areas burned during either March/April or Aug/Sept, or from leaf-expansion to leaf-fall, depending on project-level goals. In some but not all cases, seasonality is an accurate surrogate for intensity. Since intensity goals will vary from burn to burn it is difficult to "pre-quantify" ideal intensity objectives at a forest-wide scale. It is presumed that restoration, maintenance, fuel-reduction and other prescribed fire goals will be considered at the project level when planning burn intensity.

Poor Level: <25

Fair Level: 25-50

Good Level: 51-75

Very Good Level: >75

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: When burning, burn during either March/April or August/September, or from leaf-expansion to leaf-fall, depending on project-level goals.

Monitoring Strategy: Monitor percent of burned areas burned during either March/April or Aug/Sept, or from leaf-expansion to leaf-fall, depending on project-level goals. In some but not all cases, seasonality is an accurate surrogate for intensity. Since intensity goals will vary from burn to burn it is difficult to "pre-quantify" ideal intensity objectives at a forest-wide scale. It is presumed that restoration, maintenance, fuel-reduction and other prescribed fire goals will be considered at the project level when planning burn intensity.

Key Factor Name Fire Regime

Indicator Name:	Fire Frequency
Indicator Description:	Average percent of all known occurrences burned per 3-15 year interval.
Poor Level:	<25
Fair Level:	25-50
Good Level:	51-75
Very Good Level:	>75
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Burn at least 51 percent of the spatial extent of all known occurrences of this habitat type every 3-15 years.
Monitoring Strategy:	Monitor average percent of all known occurrences burned per 3-15 year interval.

Key Factor Name Remoteness

Key Factor Description: Mean density of roads (miles per square mile) within this community type at the landscape scale.

Key Factor Weight: Medium

Indicator Name: Road Density

Indicator Description: Average number of road miles per square mile across all known occurrences of this target.

Poor Level: >2 miles

Fair Level: 1-2 miles

Good Level: 0.5-1 mile

Very Good Level: <0.5 mile

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Maintain or, where necessary, restore the average number of road miles per square mile to one or less across all known occurrences of this target.

Monitoring Strategy: Monitor average number of road miles per square mile across all known occurrences of this target.

Key Factor Name Spatial Ecology

Key Factor Description: The relative spatial abundance, proximity, distribution, and arrangement of this habitat type on the landscape.

Key Factor Weight: Medium

Indicator Name: Number of Blocks

Indicator Description: Total number of blocks statewide

Poor Level: 0-1

Fair Level: 2

Good Level: 3

Very Good Level: >3

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Maintain or, where necessary, restore number of blocks to three or more. (Block is defined by the minimum convex polygon bounded by known occurrences of this habitat type in which the median patch size is above the fair level for patch size, and in which each of the patches score fair or better on the patch proximity threshold.)

Monitoring Strategy: Monitor total number of blocks statewide.

Indicator Name: Patch Proximity

Indicator Description: Median nearest distance between patches.

Poor Level: >4 miles

Fair Level: 2-4 miles

Good Level: 1-2 miles

Very Good Level: <1 mile

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Maintain or, where necessary, restore the median nearest distance between patches of this habitat type to two miles or less.

Monitoring Strategy: Monitor median nearest distance between patches.

Key Factor Name Spatial Ecology

Indicator Name:	Average Block Size
Indicator Description:	Block is defined by the minimum convex polygon bounded by known occurrences of this habitat type in which the median patch size is above the fair level for patch size, and in which each of the patches score fair or better on the patch proximity threshold.
Poor Level:	<2,500 acres
Fair Level:	2,500-5,000 acres
Good Level:	5,001-10,000 acres
Very Good Level:	>10,000 acres
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore average block size to 5,001 acres or more. (Block is defined by the minimum convex polygon bounded by known occurrences of this habitat type in which the median patch size is above the fair level for patch size, and in which each of the patches score fair or better on the patch proximity threshold.)
Monitoring Strategy:	Monitor block size.
Indicator Name:	Patch Size
Indicator Description:	Average patch size across all known occurrences (acres)
Poor Level:	<250 acres
Fair Level:	250-500 acres
Good Level:	501-1,000 acres
Very Good Level:	>1,000 acres
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore the average patch size of this habitat type to 501 acres or more across all known occurrences.
Monitoring Strategy:	Monitor average patch size across all known occurrences (acres).

Habitat Name West Gulf Coastal Plain Sandhill Oak and Shortleaf Pine Forest/Woodland



Ecoregions where the habitat occurs:

Ozark Highlands	Boston Mountains	Mississippi Valley Loess Plains	Arkansas Valley
☐	☐	☐	☐

Ouachita Mountains	South Central Plains	Mississippi Alluvial Plain
☐	☑	☐

Description

This habitat occurs on uplands underlain by deep, coarse sandy soils. These sites are typified by low fertility and moisture retention, which contribute to open tree canopies with usually <60% canopy closure. Sparse understory vegetation and patches of bare soil are indicative of this system. Vegetation indicators are species tolerant of droughty sites, especially Quercus incana and Quercus arkansana. Pinus echinata is usually present. This habitat may be essentially treeless sand barrens. Fire is a critical natural disturbance process which affects the vegetation structure and likely the species composition of communities in this system.

(adapted from NatureServe 2005)

Species associated with this habitat type (and the weight or importance of the habitat to each species) include:
Bell's Roadside-Skipper (Amblyscirtes belli) Weight: Optimal
Eastern Whip-poor-will (Antrostomus vociferus) Weight: Suitable
Texas Frosted Elfin (Callophrys irus hadros) Weight: Suitable
Mottled Duskywing (Erynnis martialis) Weight: Suitable
Meske's Skipper (Hesperia meskei) Weight: Suitable
Georgia Satyr (Neonympha areolatus) Weight: Suitable
Broad-winged Skipper (Poanes viator) Weight: Suitable
Oak Hairstreak (Satyrium favonius ontario) Weight: Suitable
Sharp-shinned Hawk (Accipiter striatus) Weight: Data Gap

Habitat Team

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Habitat Priority Score: 421

Key Factor Name Composition

Key Factor Description: The diversity, species richness, and relative abundance of vegetative elements in this habitat type.

Key Factor Weight: Medium

Indicator Name: Percent total herbaceous ground coverage

Indicator Description: Average percent total native herbaceous ground cover across all known potential occurrences. Density must be sufficient to carry growing season fire at least once every five years. Composition should include only native species.

Poor Level: <25

Fair Level: 25-40

Good Level: 41-75

Very Good Level: >75

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Maintain or, where necessary, restore the average percent total native herbaceous groundcover across all known potential occurrences to 41 percent or more.

Monitoring Strategy: Monitor average percent total native herbaceous ground cover across all known potential occurrences.

Key Factor Name Fire Regime

Key Factor Description: Fire Return Interval and Seasonality, including landscape-scale fire in surrounding/adjacent habitats to prevent woody encroachment and allow for distribution and dispersal of obligate species

Key Factor Weight: Medium

Indicator Name: Fire Seasonality/Intensity

Indicator Description: The percent of areas burned during either March/April or Aug/Sept, or from leaf-expansion to leaf-fall, depending on project-level goals. In some but not all cases, seasonality is an accurate surrogate for intensity. Since intensity goals will vary from burn to burn it is difficult to "pre-quantify" ideal intensity objectives at a forest-wide scale. It is presumed that restoration, maintenance, fuel-reduction and other prescribed fire goals will be considered at the project level when planning burn intensity.

Poor Level: <25

Fair Level: 25-50

Good Level: 51-75

Very Good Level: >75

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: When burning, burn during either March/April or August/September, or from leaf-expansion to leaf-fall, depending on project-level goals.

Monitoring Strategy: Monitor percent of burned areas burned during either March/April or Aug/Sept, or from leaf-expansion to leaf-fall, depending on project-level goals. In some but not all cases, seasonality is an accurate surrogate for intensity. Since intensity goals will vary from burn to burn it is difficult to "pre-quantify" ideal intensity objectives at a forest-wide scale. It is presumed that restoration, maintenance, fuel-reduction and other prescribed fire goals will be considered at the project level when planning burn intensity.

Key Factor Name Fire Regime

Indicator Name:	Fire Frequency
Indicator Description:	Average percent of all known occurrences plus 100 meter buffer burned per 3-5 year interval.
Poor Level:	<25
Fair Level:	25-50
Good Level:	51-75
Very Good Level:	>75
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Burn at least 51 percent of the spatial extent plus 100 meter buffer of all known occurrences of this habitat type every 3-5 years.
Monitoring Strategy:	Monitor average percent of all known occurrences plus 100 meter buffer burned per 3-5 year interval.

Key Factor Name Remoteness

Key Factor Description: Mean density of roads (miles per square mile) within this community type at the landscape scale.

Key Factor Weight: Medium

Indicator Name: Road Density

Indicator Description: Average number of road miles per square mile across all known occurrences of this target.

Poor Level: >2 miles

Fair Level: 1-2 miles

Good Level: 0.5-1 mile

Very Good Level: <0.5 mile

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Maintain or, where necessary, restore the average number of road miles per square mile to one or less across all known occurrences of this target.

Monitoring Strategy: Monitor average number of road miles per square mile across all known occurrences of this target.

Key Factor Name Spatial Ecology

Key Factor Description: The relative spatial abundance, proximity, distribution, and arrangement of this habitat type on the landscape.

Key Factor Weight: Medium

Indicator Name:	Patch Proximity
Indicator Description:	Median nearest distance between patches.
Poor Level:	>2 miles
Fair Level:	0.76-2.0 miles
Good Level:	0.5-0.75 miles
Very Good Level:	<0.5 mile
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore the median nearest distance between patches of this habitat type to 3/4 mile or less.
Monitoring Strategy:	Monitor median nearest distance between patches.
Indicator Name:	Patch Size
Indicator Description:	Average patch size across all known occurrences (acres)
Poor Level:	<2 acres
Fair Level:	2-10 acres
Good Level:	10-40 acres
Very Good Level:	>40 acres
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore the average patch size of this habitat type to 10 acres or more across all known occurrences.
Monitoring Strategy:	Monitor average patch size across all known occurrences (acres).

Key Factor Name Spatial Ecology

Indicator Name:	Average Block Size
Indicator Description:	Block is defined by the minimum convex polygon bounded by known occurrences of this habitat type in which the median patch size is above the fair level for patch size, and in which each of the patches score fair or better on the patch proximity threshold.
Poor Level:	<50 acres
Fair Level:	50-500 acres
Good Level:	501-1,000 acres
Very Good Level:	>1,000 acres
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore average block size to 501 acres or more. (Block is defined by the minimum convex polygon bounded by known occurrences of this habitat type in which the median patch size is above the fair level for patch size, and in which each of the patches score fair or better on the patch proximity threshold.)
Monitoring Strategy:	Monitor block size.
Indicator Name:	Number of Blocks
Indicator Description:	Total number of blocks statewide
Poor Level:	0-1
Fair Level:	2
Good Level:	3
Very Good Level:	>3
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore number of blocks to three or more. (Block is defined by the minimum convex polygon bounded by known occurrences of this habitat type in which the median patch size is above the fair level for patch size, and in which each of the patches score fair or better on the patch proximity threshold.)
Monitoring Strategy:	Monitor total number of blocks statewide.

Habitat Name West Gulf Coastal Plain Seepage Swamp and Baygall



Ecoregions where the habitat occurs:

Ozark Highlands	Boston Mountains	Mississippi Valley Loess Plains	Arkansas Valley
☐	☐	☐	☐

Ouachita Mountains	South Central Plains	Mississippi Alluvial Plain
☐	☑	☐

Description

This habitat consists of forested wetlands in acidic seepage zones. These wetlands may occur in poorly developed upland drainages, toe-slopes, and small headwaters stream bottoms. These environments are prone to long duration standing water, and tend to occur on highly acidic, nutrient-poor soils. The vegetation is characterized by Magnolia virginiana, Nyssa sylvatica, Nyssa biflora, and Acer rubrum. Understory vegetation consistently supports an abundance of ferns, such as Osmunda cinnamomea, Osmunda regalis var. spectabilis, and Woodwardia areolata. In some cases, particularly after severe distrubance, these wetlands may be dominated by herbaceous species. In most cases, these wetlands are embedded in uplands with deep sandy soils. When these communities are associated with streams, they tend to be low gradient, with narrow, often braided channels and diffuse drainage patterns.

West Gulf Coastal Plain Seepage Swamp and Baygall

(adapted from NatureServe 2005)

Species associated with this habitat type (and the weight or importance of the habitat to each species) include:
Rafinesque's Big-Eared Bat (Corynorhinus rafinesquii) Weight: Optimal
Chicken Turtle (Deirochelys reticularia) Weight: Optimal
Dwarf Salamander (Eurycea quadridigitata) Weight: Optimal
Bird-voiced Treefrog (Hyla avivoca) Weight: Optimal
Squirrel Treefrog (Hyla squirella) Weight: Optimal
Yellow-billed Cuckoo (Coccyzus americanus) Weight: Suitable
Dukes' Skipper (Euphyes dukesi) Weight: Suitable
Pine Hills Digger (Fallicambarus dissitus) Weight: Suitable
Jefferson County Crayfish (Fallicambarus gilpini) Weight: Suitable
Regal Burrowing Crayfish (Procambarus regalis) Weight: Suitable
Bayou Bodcau Crayfish (Bouchardina robisoni) Weight: Data Gap
Slenderwrist Burrowing Crayfish (Fallicambarus petilicarpus) Weight: Data Gap
Blair's Fencing Crayfish (Faxonella blairi) Weight: Data Gap

Habitat Team

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Habitat Priority Score: 646

Key Factor Name Composition

Key Factor Description: The diversity, species richness, and relative abundance of vegetative elements in this habitat type.

Key Factor Weight: Medium

Indicator Name: Exotic Forbs and Grasses

Indicator Description: The percent of ground cover in non-native herbaceous species

Poor Level: >20

Fair Level: 10-20

Good Level: 5-9

Very Good Level: <5

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Maintain or, where necessary, restore the percent of groundcover in non-native herbaceous vegetation to nine percent or less.

Monitoring Strategy: Monitor the percent of ground cover in non-native herbaceous species.

Indicator Name: Invasive shrubs and woody vines

Indicator Description: The percent of ground cover in non-native woody species

Poor Level: >20

Fair Level: 10-20

Good Level: 5-9

Very Good Level: <5

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Maintain or, where necessary, restore the percent of groundcover in invasive woody species to nine percent or less.

Monitoring Strategy: Monitor the percent of ground cover in non-native woody species.

Key Factor Name Fire Regime

Key Factor Description: Fire Return Interval and Seasonality, including landscape-scale fire in surrounding/adjacent habitats to prevent woody encroachment and allow for distribution and dispersal of obligate species

Key Factor Weight: Medium

Indicator Name: Fire Seasonality/Intensity

Indicator Description: The percent of areas burned during either March/April or Aug/Sept, or from leaf-expansion to leaf-fall, depending on project-level goals. In some but not all cases, seasonality is an accurate surrogate for intensity. Since intensity goals will vary from burn to burn it is difficult to "pre-quantify" ideal intensity objectives at a forest-wide scale. It is presumed that restoration, maintenance, fuel-reduction and other prescribed fire goals will be considered at the project level when planning burn intensity.

Poor Level: <25

Fair Level: 25-50

Good Level: 51-75

Very Good Level: >75

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: When burning, burn during either March/April or August/September, or from leaf-expansion to leaf-fall, depending on project-level goals.

Monitoring Strategy: Monitor percent of burned areas burned during either March/April or Aug/Sept, or from leaf-expansion to leaf-fall, depending on project-level goals. In some but not all cases, seasonality is an accurate surrogate for intensity. Since intensity goals will vary from burn to burn it is difficult to "pre-quantify" ideal intensity objectives at a forest-wide scale. It is presumed that restoration, maintenance, fuel-reduction and other prescribed fire goals will be considered at the project level when planning burn intensity.

Key Factor Name Fire Regime

Indicator Name:	Fire Frequency
Indicator Description:	Average percent of all known occurrences plus appropriate buffer burned per 3-7 year interval.
Poor Level:	<25
Fair Level:	25-50
Good Level:	51-75
Very Good Level:	>75
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Burn at least 51 percent of the spatial extent plus appropriate buffer of all known occurrences of this habitat type every 3-7 years.
Monitoring Strategy:	Monitor average percent of all known occurrences plus appropriate buffer burned per 3-7 year interval.

Key Factor Name Remoteness

Key Factor Description: Mean density of roads (miles per square mile) within this community type at the landscape scale.

Key Factor Weight: Medium

Indicator Name: Road Density

Indicator Description: Average number of road miles per square mile across all known occurrences of this target.

Poor Level: >2 miles

Fair Level: 1-2 miles

Good Level: 0.5-1 mile

Very Good Level: <0.5 mile

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Maintain or, where necessary, restore the average number of road miles per square mile to one or less across all known occurrences of this target.

Monitoring Strategy: Monitor average number of road miles per square mile across all known occurrences of this target.

Key Factor Name Spatial Ecology

Key Factor Description: The relative spatial abundance, proximity, distribution, and arrangement of this habitat type on the landscape.

Key Factor Weight: Medium

Indicator Name:	Patch Proximity
Indicator Description:	Median nearest distance between patches.
Poor Level:	>1200 meters
Fair Level:	801-1200 meters
Good Level:	500-800 meters
Very Good Level:	<500 meters
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore the average distance between patches to 800 meters or less.
Monitoring Strategy:	Monitor median nearest distance between patches.
Indicator Name:	Average Block Size
Indicator Description:	Block is defined by the minimum convex polygon bounded by known occurrences of this habitat type in which the median patch size is above the fair level for patch size, and in which each of the patches score fair or better on the patch proximity threshold.
Poor Level:	<300 acres
Fair Level:	300-600 acres
Good Level:	601-1,000 acres
Very Good Level:	>1,000 acres
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore average block size to 601 acres or more. (Block is defined by the minimum convex polygon bounded by known occurrences of this habitat type in which the median patch size is above the fair level for patch size, and in which each of the patches score fair or better on the patch proximity threshold.)
Monitoring Strategy:	Monitor block size.

Key Factor Name Spatial Ecology

Indicator Name:	Patch Size
Indicator Description:	Width of buffer (meters)
Poor Level:	<100 meters of buffer
Fair Level:	100-250 meters of buffer
Good Level:	251-400 meters of buffer
Very Good Level:	>400 meters of buffer
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain, or where necessary, buffer known occurrences of this habitat type with a minimum of 251 meters of adjacent but dissimilar habitats.
Monitoring Strategy:	Monitor width of buffer (meters).
Indicator Name:	Number of Blocks
Indicator Description:	Total number of blocks statewide
Poor Level:	0-1
Fair Level:	2
Good Level:	3
Very Good Level:	>3
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore number of blocks to three or more. (Block is defined by the minimum convex polygon bounded by known occurrences of this habitat type in which the median patch size is above the fair level for patch size, and in which each of the patches score fair or better on the patch proximity threshold.)
Monitoring Strategy:	Monitor total number of blocks statewide.

Habitat Name West Gulf Coastal Plain Small Stream/River Forest



Ecoregions where the habitat occurs:

Ozark Highlands ☐	Boston Mountains ☐	Mississippi Valley Loess Plains ☐	Arkansas Valley ☐
Ouachita Mountains ☐	South Central Plains ☑	Mississippi Alluvial Plain ☐	

Description

This is a forested habitat associated with small rivers and creeks. In contrast to West Gulf Coastal Plain Large River Floodplain Forest, examples of this habitat have fewer major geomorphic floodplain features. Those features that are present tend to be smaller and more closely intermixed with one another, resulting in less obvious vegetational zonation. Bottomland hardwood tree species are typically important and diagnostic, although mesic hardwood species are also present in areas with less inundation and with better drained soils. As a whole, flooding occurs annually, but the water table usually is well below the soil surface throughout most of the growing season. Areas impacted by beaver impoundments are also included in this system.
(adapted from NatureServe 2005)

Species associated with this habitat type (and the weight or importance of the habitat to each species) include:
Eastern Whip-poor-will (Antrostomus vociferus) Weight: Optimal
Yellow-billed Cuckoo (Coccyzus americanus) Weight: Optimal
Dwarf Salamander (Eurycea quadridigitata) Weight: Optimal
Ozark Clubtail Dragonfly (Gomphus ozarkensis) Weight: Optimal
Bird-voiced Treefrog (Hyla avivoca) Weight: Optimal
Squirrel Treefrog (Hyla squirella) Weight: Optimal
Winter Stonefly (Allocapnia malverna) Weight: Suitable
Winter Stonefly (Allocapnia ozarkana) Weight: Suitable
Lace-winged Roadside-Skipper (Amblyscirtes aesculapius) Weight: Suitable
Mole Salamander (Ambystoma talpoideum) Weight: Suitable
Chimney Swift (Chaetura pelagica) Weight: Suitable
Rafinesque's Big-Eared Bat (Corynorhinus rafinesquii) Weight: Suitable
Chicken Turtle (Deirochelys reticularia) Weight: Suitable
Mottled Duskywing (Erynnis martialis) Weight: Suitable
Dion Skipper (Euphyes dion) Weight: Suitable
Dukes' Skipper (Euphyes dukesi) Weight: Suitable
Purple Finch (Haemorhous purpureus) Weight: Suitable
Wood Thrush (Hylocichla mustelina) Weight: Suitable
Swainson's Warbler (Limnothlypis swainsonii) Weight: Suitable
Glossy Swampsnake (Liodytes rigida) Weight: Suitable
Gray Comma (Polygonia progne) Weight: Suitable
Graham's Crayfish Snake (Regina grahamii) Weight: Suitable
American Woodcock (Scolopax minor) Weight: Suitable
Southeastern Bat (Myotis austroriparius) Weight: Marginal
Yellow-crowned Night-Heron (Nyctanassa violacea) Weight: Marginal
Long-tailed Weasel (Mustela frenata) Weight: Data Gap
Yehl Skipper (Poanes yehl) Weight: Data Gap

Habitat Team

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Habitat Priority Score: 1170

Key Factor Name Canopy Closure

Key Factor Description: Combination of stem density, basal area and extent of canopy cover, with intermitent closure as ideal (Surrogate for Horizontal Structure).

Key Factor Weight: Medium

Indicator Name: Canopy Closure

Indicator Description: The percent of the spatial extent of all known occurrences with a percent canopy closure of greater than 80 percent.

Poor Level: <25

Fair Level: 25-50

Good Level: 51-75

Very Good Level: >75

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Maintain or, where necessary, restore the percent of the spatial extent of all known occurrences with a canopy closure of greater than 80 percent to 51 percent or more.

Monitoring Strategy: Monitor percent of the spatial extent of all known occurrences with a percent canopy closure of greater than 80 percent.

Key Factor Name Composition

Key Factor Description: The diversity, species richness, and relative abundance of vegetative elements in this habitat type.

Key Factor Weight: Medium

Indicator Name: Exotic Forbs and Grasses

Indicator Description: The percent of ground cover in non-native herbaceous species

Poor Level: >20

Fair Level: 10-20

Good Level: 5-9

Very Good Level: <5

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Maintain or, where necessary, restore the percent of groundcover in non-native herbaceous vegetation to nine percent or less.

Monitoring Strategy: Monitor the percent of ground cover in non-native herbaceous species.

Indicator Name: Invasive shrubs and woody vines

Indicator Description: The percent of ground cover in non-native woody species

Poor Level: >20

Fair Level: 10-20

Good Level: 5-9

Very Good Level: <5

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Maintain or, where necessary, restore the percent of groundcover in invasive woody species to nine percent or less.

Monitoring Strategy: Monitor the percent of ground cover in non-native woody species.

Key Factor Name Fire Regime

Key Factor Description: Fire Return Interval and Seasonality, including landscape-scale fire in surrounding/adjacent habitats to prevent woody encroachment and allow for distribution and dispersal of obligate species

Key Factor Weight: Medium

Indicator Name: Fire Seasonality/Intensity

Indicator Description: The percent of areas burned during either March/April or Aug/Sept, or from leaf-expansion to leaf-fall, depending on project-level goals. In some but not all cases, seasonality is an accurate surrogate for intensity. Since intensity goals will vary from burn to burn it is difficult to "pre-quantify" ideal intensity objectives at a forest-wide scale. It is presumed that restoration, maintenance, fuel-reduction and other prescribed fire goals will be considered at the project level when planning burn intensity.

Poor Level: <25

Fair Level: 25-50

Good Level: 51-75

Very Good Level: >75

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: When burning, burn during either March/April or August/September, or from leaf-expansion to leaf-fall, depending on project-level goals.

Monitoring Strategy: Monitor percent of burned areas burned during either March/April or Aug/Sept, or from leaf-expansion to leaf-fall, depending on project-level goals. In some but not all cases, seasonality is an accurate surrogate for intensity. Since intensity goals will vary from burn to burn it is difficult to "pre-quantify" ideal intensity objectives at a forest-wide scale. It is presumed that restoration, maintenance, fuel-reduction and other prescribed fire goals will be considered at the project level when planning burn intensity.

Key Factor Name Fire Regime

Indicator Name:	Fire Frequency
Indicator Description:	Average percent of all known occurrences burned per 3-7 year interval.
Poor Level:	<25
Fair Level:	25-50
Good Level:	51-75
Very Good Level:	>75
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Burn at least 51 percent of the spatial extent of all known occurrences of this habitat type every 3-7 years.
Monitoring Strategy:	Monitor average percent of all known occurrences burned per 3-7 year interval.

Key Factor Name Remoteness

Key Factor Description: Mean density of roads (miles per square mile) within this community type at the landscape scale.

Key Factor Weight: Medium

Indicator Name: Road Density

Indicator Description: Average number of road miles per square mile across all known occurrences of this target.

Poor Level: >2 miles

Fair Level: 1-2 miles

Good Level: 0.5-1 mile

Very Good Level: <0.5 mile

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Maintain or, where necessary, restore the average number of road miles per square mile to one or less across all known occurrences of this target.

Monitoring Strategy: Monitor average number of road miles per square mile across all known occurrences of this target.

Key Factor Name Spatial Ecology

Key Factor Description: The relative spatial abundance, proximity, distribution, and arrangement of this habitat type on the landscape.

Key Factor Weight: Medium

Indicator Name: Number of Blocks

Indicator Description: Total number of blocks statewide

Poor Level: <4

Fair Level: 4-7

Good Level: 7-10

Very Good Level: >10

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Maintain or, where necessary, restore number of blocks to seven or more. (Block is defined by the minimum convex polygon bounded by known occurrences of this habitat type in which the median patch size is above the fair level for patch size, and in which each of the patches score fair or better on the patch proximity threshold.)

Monitoring Strategy: Monitor total number of blocks statewide.

Key Factor Name Spatial Ecology

Indicator Name:	Average Block Size
Indicator Description:	Block is defined by the minimum convex polygon bounded by known occurrences of this habitat type in which the median patch size is above the fair level for patch size, and in which each of the patches score fair or better on the patch proximity threshold.
Poor Level:	<500 acres
Fair Level:	500-1,000 acres
Good Level:	1,000-2,500 acres
Very Good Level:	>2,500 acres
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore average block size to 1,000 acres or more. (Block is defined by the minimum convex polygon bounded by known occurrences of this habitat type in which the median patch size is above the fair level for patch size, and in which each of the patches score fair or better on the patch proximity threshold.)
Monitoring Strategy:	Monitor block size.
Indicator Name:	Patch Size
Indicator Description:	Average patch size across all known occurrences (acres)
Poor Level:	<50 acres
Fair Level:	50-100 acres
Good Level:	100-250 acres
Very Good Level:	>250 acres
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore the average patch size of this habitat type to 100 acres or more across all known occurrences.
Monitoring Strategy:	Monitor average patch size across all known occurrences (acres).

Key Factor Name Spatial Ecology

Indicator Name:	Patch Proximity
Indicator Description:	Median nearest distance between patches.
Poor Level:	>.5 mile
Fair Level:	.25-.5 miles
Good Level:	.1-.25 miles
Very Good Level:	<.1 mile
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore the median nearest distance between patches of this habitat type to .25 mile or less.
Monitoring Strategy:	Monitor median nearest distance between patches.

Habitat Name West Gulf Coastal Plain Wet Hardwood Flatwoods



Ecoregions where the habitat occurs:

Ozark Highlands	Boston Mountains	Mississippi Valley Loess Plains	Arkansas Valley
☐	☐	☐	☐

Ouachita Mountains	South Central Plains	Mississippi Alluvial Plain
☐	☑	☐

Description

These habitats are found on Pleistocene terraces usually outside the floodplains. The local landscape may be a series of ridges and swales. Vegetation composition and structure varies with elevation, soil texture and moisture, and disturbance history. Soils are fine-textured and hardpans may be present in the subsurface. The limited permeability of these soils contributes to shallowly perched water tables during portions of the year when precipitation is greatest and evapotranspiration is lowest. Soil moisture fluctuates widely throughout the growing season, from saturated to very dry, a condition sometimes referred to as hydroxeric moisture regime. Saturation is primarily influenced by precipitation rather than overbank flooding. Quercus phellos, Quercus lyrata, Quercus laurifolia, and Quercus nigra occur often with Sabal minor and a sparse groundlayer. Prairie mounds with am ore mesophytic vegetation may be present. Dry seasonal conditions make fire a natural process in the system. As a result, this system was

typically a woodland, although recent fire suppression and forest management have caused a conversion of most sites to forest. Some swales support pockets of cypress-tupelo.

(adapted from NatureServe 2005)

Species associated with this habitat type (and the weight or importance of the habitat to each species) include:
Eastern Whip-poor-will (Antrostomus vociferus) Weight: Optimal
American Woodcock (Scolopax minor) Weight: Optimal
Mole Salamander (Ambystoma talpoideum) Weight: Suitable
American Black Duck (Anas rubripes) Weight: Suitable
Yellow-billed Cuckoo (Coccyzus americanus) Weight: Suitable
Rafinesque's Big-Eared Bat (Corynorhinus rafinesquii) Weight: Suitable
Chicken Turtle (Deirochelys reticularia) Weight: Suitable
Purple Finch (Haemorhous purpureus) Weight: Suitable
Wood Thrush (Hylocichla mustelina) Weight: Suitable
Swainson's Warbler (Limnothlypis swainsonii) Weight: Marginal
Southeastern Bat (Myotis austroriparius) Weight: Marginal
Long-tailed Weasel (Mustela frenata) Weight: Data Gap

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Habitat Priority Score: 450

Key Factor Name Composition

Key Factor Description: The diversity, species richness, and relative abundance of vegetative elements in this habitat type.

Key Factor Weight: Medium

Indicator Name: Exotic Forbs and Grasses

Indicator Description: The percent of ground cover in non-native herbaceous species

Poor Level: >20

Fair Level: 10-20

Good Level: 5-9

Very Good Level: <5

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Maintain or, where necessary, restore the percent of groundcover in non-native herbaceous vegetation to nine percent or less.

Monitoring Strategy: Monitor the percent of ground cover in non-native herbaceous species.

Indicator Name: Invasive shrubs and woody vines

Indicator Description: The percent of ground cover in non-native woody species

Poor Level: >20

Fair Level: 10-20

Good Level: 5-9

Very Good Level: <5

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Maintain or, where necessary, restore the percent of groundcover in invasive woody species to nine percent or less.

Monitoring Strategy: Monitor the percent of ground cover in non-native woody species.

Key Factor Name Fire Regime

Key Factor Description: Fire Return Interval and Seasonality, including landscape-scale fire in surrounding/adjacent habitats to prevent woody encroachment and allow for distribution and dispersal of obligate species

Key Factor Weight: Medium

Indicator Name: Fire Seasonality/Intensity

Indicator Description: The percent of areas burned during either March/April or Aug/Sept, or from leaf-expansion to leaf-fall, depending on project-level goals. In some but not all cases, seasonality is an accurate surrogate for intensity. Since intensity goals will vary from burn to burn it is difficult to "pre-quantify" ideal intensity objectives at a forest-wide scale. It is presumed that restoration, maintenance, fuel-reduction and other prescribed fire goals will be considered at the project level when planning burn intensity.

Poor Level: <25

Fair Level: 25-50

Good Level: 51-75

Very Good Level: >75

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: When burning, burn during either March/April or August/September, or from leaf-expansion to leaf-fall, depending on project-level goals.

Monitoring Strategy: Monitor percent of burned areas burned during either March/April or Aug/Sept, or from leaf-expansion to leaf-fall, depending on project-level goals. In some but not all cases, seasonality is an accurate surrogate for intensity. Since intensity goals will vary from burn to burn it is difficult to "pre-quantify" ideal intensity objectives at a forest-wide scale. It is presumed that restoration, maintenance, fuel-reduction and other prescribed fire goals will be considered at the project level when planning burn intensity.

Key Factor Name Fire Regime

Indicator Name:	Fire Frequency
Indicator Description:	Average percent of all known occurrences burned per 3-7 year interval.
Poor Level:	<25
Fair Level:	25-50
Good Level:	51-75
Very Good Level:	>75
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Burn at least 51 percent of the spatial extent of all known occurrences of this habitat type every 3-7 years.
Monitoring Strategy:	Monitor average percent of all known occurrences burned per 3-7 year interval.

Key Factor Name Remoteness

Key Factor Description: Mean density of roads (miles per square mile) within this community type at the landscape scale.

Key Factor Weight: Medium

Indicator Name: Road Density

Indicator Description: Average number of road miles per square mile across all known occurrences of this target.

Poor Level: >2 miles

Fair Level: 1-2 miles

Good Level: 0.5-1 mile

Very Good Level: <0.5 mile

Current_Status: Data Gap

Indicator Weight: Medium

Conservation Action: Maintain or, where necessary, restore the average number of road miles per square mile to one or less across all known occurrences of this target.

Monitoring Strategy: Monitor average number of road miles per square mile across all known occurrences of this target.

Key Factor Name Spatial Ecology

Key Factor Description: The relative spatial abundance, proximity, distribution, and arrangement of this habitat type on the landscape.

Key Factor Weight: Medium

Indicator Name:	Patch Size
Indicator Description:	Average patch size across all known occurrences (acres)
Poor Level:	<10 acres
Fair Level:	10-30 acres
Good Level:	31-100 acres
Very Good Level:	>100 acres
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore the average patch size of this habitat type to 31 acres or more across all known occurrences.
Monitoring Strategy:	Monitor average patch size across all known occurrences (acres).
Indicator Name:	Number of Blocks
Indicator Description:	Total number of blocks statewide
Poor Level:	0-1
Fair Level:	2
Good Level:	3
Very Good Level:	>3
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore number of blocks to three or more. (Block is defined by the minimum convex polygon bounded by known occurrences of this habitat type in which the median patch size is above the fair level for patch size, and in which each of the patches score fair or better on the patch proximity threshold.)
Monitoring Strategy:	Monitor total number of blocks statewide.

Key Factor Name Spatial Ecology

Indicator Name:	Average Block Size
Indicator Description:	Block is defined by the minimum convex polygon bounded by known occurrences of this habitat type in which the median patch size is above the fair level for patch size, and in which each of the patches score fair or better on the patch proximity threshold.
Poor Level:	<500 acres
Fair Level:	500-1,000 acres
Good Level:	1,001-2,000 acres
Very Good Level:	>2,000 acres
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore average block size to 1,001 acres or more. (Block is defined by the minimum convex polygon bounded by known occurrences of this habitat type in which the median patch size is above the fair level for patch size, and in which each of the patches score fair or better on the patch proximity threshold.)
Monitoring Strategy:	Monitor block size.
Indicator Name:	Patch Proximity
Indicator Description:	Median nearest distance between patches.
Poor Level:	>2.5 miles
Fair Level:	1-2.5 miles
Good Level:	0.5-1 mile
Very Good Level:	<0.5 mile
Current_Status:	Data Gap
Indicator Weight:	Medium
Conservation Action:	Maintain or, where necessary, restore the median nearest distance between patches of this habitat type to one mile or less.
Monitoring Strategy:	Monitor median nearest distance between patches.

Section 5. Aquatic Habitats

Definition

Ecobasins are a version of the seven (level III) ecoregions (Woods and others 2004) further subdivided by six major river basins to form 18 ecobasins to describe aquatic habitats in Arkansas.

Ranking

Arkansas ranked which ecobasins have more species of greatest conservation concern and/or more greatly imperiled species. Ecoregion Scores (Table 5.1) equal the sum of all Species Priority Scores within an ecoregion. A higher score implies a larger total number of species of greatest conservation need and/or species with a greater need for conservation.

Table 5.1. Aquatic habitats ranked by priority scores.

Ecobasin	Sum of Priority Scores
Ozark Highlands - White River	2539
Ouachita Mountains - Ouachita River	1565
South Central Plains - Ouachita River	1564
South Central Plains - Red River	1515
Boston Mountains - White River	1326
Ozark Highlands - Arkansas River	1212
Mississippi River Alluvial Plain - White River	1192
Arkansas Valley - Arkansas River	1178
Boston Mountains - Arkansas River	1045
Mississippi River Alluvial Plain - St. Francis River	827
Ouachita Mountains - Red River	737
Ouachita Mountains - Arkansas River	565
Mississippi River Alluvial Plain (Lake Chicot) - Mississippi River	546
Mississippi River Alluvial Plain - Arkansas River	395
Mississippi River Alluvial Plain (Bayou Bartholomew) - Ouachita River	306
Arkansas Valley - White River	177
Mississippi Valley Loess Plains - St. Francis River	114
Mississippi Valley Loess Plains - White River	19

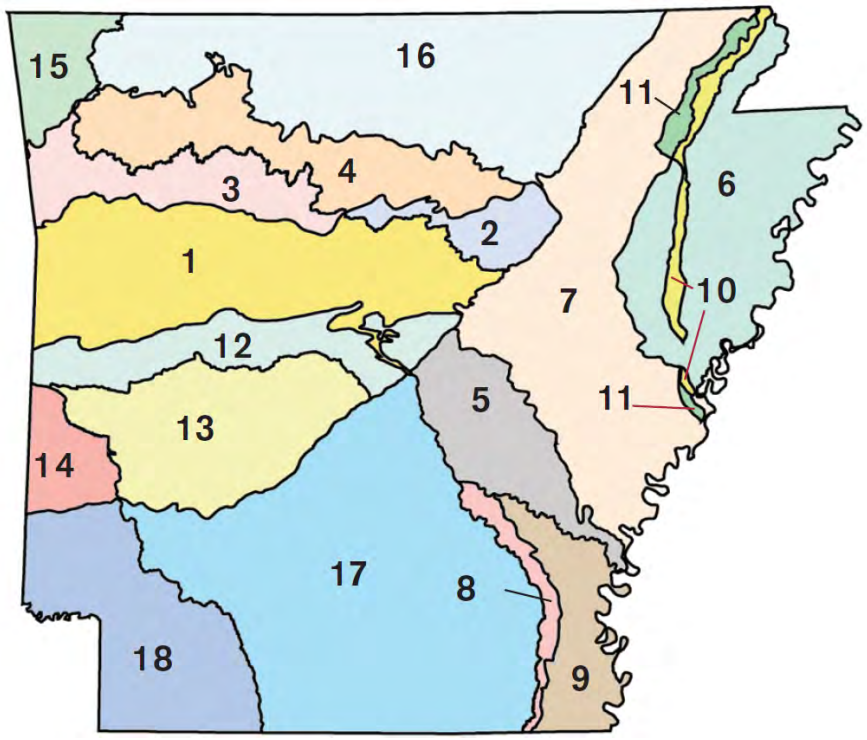


Figure 5.1 Arkansas Ecobasins.

Key	Ecobasin
1	Arkansas Valley - Arkansas River
2	Arkansas Valley - White River
3	Boston Mountains - Arkansas River
4	Boston Mountains - White River
5	Mississippi Alluvial Plain - Arkansas River
6	Mississippi Alluvial Plain - St. Francis River
7	Mississippi Alluvial Plain - White River
8	Mississippi Alluvial Plain (Bayou Bartholomew) - Ouachita River
9	Mississippi Alluvial Plain (Lake Chicot) - Mississippi River
10	Mississippi River Loess Plains - St. Francis River
11	Mississippi River Loess Plains - White River
12	Ouachita Mountains - Arkansas River
13	Ouachita Mountains - Ouachita River
14	Ouachita Mountains - Red River
15	Ozark Highlands - Arkansas River
16	Ozark Highlands - White River
17	South Central Plains - Ouachita River
18	South Central Plains - Red River

Arkansas Valley Ecobasins

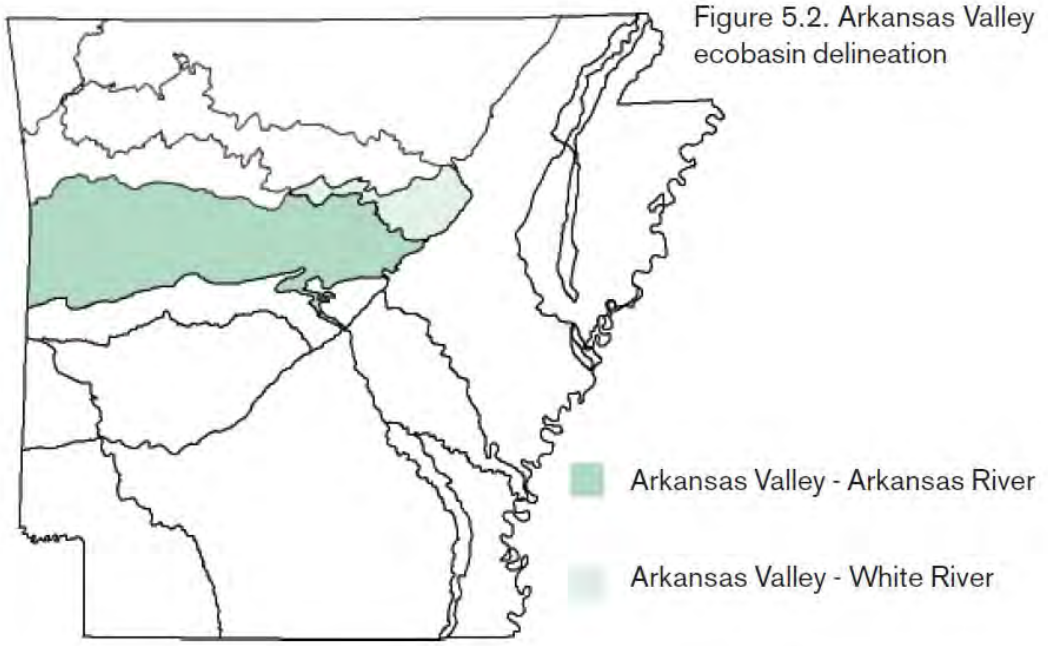


Figure 5.2. Arkansas Valley ecobasin delineation

Arkansas Valley - Arkansas River ecobasin

Streams in this ecobasin (Figure 5.2) vary from slow, meandering streams following major valley floors to smaller, riffle and pool types in the smaller watersheds. Arkansas Valley – Arkansas River streams generally flow over moderately permeable soils having sandy to clayey consistency in the lower gradient valleys to those same soils underlain by sandstones and shales in the upper, smaller watersheds. Stream substrates range widely from silt, gravel, shale, rubble to solid bedrock depending on the valley gradient and localized stream gradient. Many streams in this region are somewhat turbid due to erosion of the soils and shales. Representative streams include the Fourche la Fave, Petit Jean and Poteau Rivers and Dutch Creek.

Table 5.2. Land cover types in Arkansas Valley - Arkansas River ecobasin (percentage).

Arkansas Valley - Arkansas River	Water	Urban	Forest*	Pasture	Crop
2004	3	1	55	36	5
2011	3	7	48	33	3

* Includes forested wetlands



Photo: MAWPT

Arkansas Valley - Arkansas River from Petit Jean Mountain

Table 5.3. Species of Greatest Conservation Need associated with Arkansas Valley - Arkansas River ecobasin.

Common Name	Scientific Name	Priority Score
Magazine Stripetail	*Isoperla szczytkoi*	80
Microcaddisfly	*Paucicalcaria ozarkensis*	80
Nearctic Paduniellan Caddisfly	*Paduniella nearctica*	65
Mayfly	*Paraleptophlebia calcarica*	65
Elevated Spring Amphipod	*Stygobromus elatus*	65
Boston Mountains Crayfish	*Cambarus causeyi*	62
Alabama Shad	*Alosa alabamae*	52
Arkansas River Shiner	*Notropis girardi*	50
Pyramid Pigtoe	*Pleurobema rubrum*	38
Purple Lilliput	*Toxolasma lividum*	33
Isopod	*Lirceus bicuspidatus*	30
Queen Snake	*Regina septemvittata*	29
Alligator Gar	*Atractosteus spatula*	27
Plains Minnow	*Hybognathus placitus*	27
Longnose Darter	*Percina nasuta*	27
American Eel	*Anguilla rostrata*	24
Paddlefish	*Polyodon spathula*	24
Blue Sucker	*Cycleptus elongatus*	23
Bluntface Shiner	*Cyprinella camura*	23

Suckermouth Minnow	*Phenacobius mirabilis*	23
Elktoe	*Alasmidonta marginata*	19
Brown Bullhead	*Ameiurus nebulosus*	19
Sunburst Darter	*Etheostoma mihileze*	19
Goldeye	*Hiodon alosoides*	19
Mooneye	*Hiodon tergisus*	19
Pealip Redhorse	*Moxostoma pisolabrum*	19
Striped Mullet	*Mugil cephalus*	19
Slenderhead Darter	*Percina phoxocephala*	19
Bismark Burrowing Crayfish	*Procambarus parasimulans*	19
Lilliput	*Toxolasma parvum*	19
Highfin Carpsucker	*Carpiodes velifer*	17
Round Pigtoe	*Pleurobema sintoxia*	17
Little Spectaclecase group	*Villosa sp. cf lienosa*	17
Lake Chubsucker	*Erimyzon sucetta*	15
Highland Darter	*Etheostoma teddyroosevelt*	15
"Arkoma" Fatmucket	*Lampsilis sp. A cf hydiana*	15
Shoal Chub	*Macrhybopsis hyostoma*	15
Saddleback Darter	*Percina vigil*	15
Fawnsfoot	*Truncilla donaciformis*	15

Arkansas Valley - White River

While some streams in this ecobasin, especially those near the main stem White River and lower Little Red River, are lower gradient, meandering streams flowing over moderately permeable soils, many of the streams in this ecobasin flow over moderate gradient channels underlain primarily by sandstone, shale and silt- stone. Higher in the subwatersheds, the terrain is mountainous with well-drained rockier soils. Stream substrates range from silt, sand, gravel, shale, rubble, boulders to bedrock ledges. Streams in the lower gradient valleys still retain some of the brownish turbidity of the Arkansas Valley ecoregion, while more upland streams have lower turbidity values due to stony, rockier soils. Representative streams include the Little Red River and Tenmile Creek.

Table 5.4. Land cover types in Arkansas Valley - White River ecobasin (percentage).

Arkansas Valley - White River	Water	Urban	Forest*	Pasture	Crop
2004	5	1	67	25	2
2011	5	5	61	25	1

* Includes forested wetlands

Table 5.5. Species of Greatest Conservation Need associated with Arkansas Valley – White River ecobasin.

Common Name	Scientific Name	Priority Score
Hubricht's Long-tailed Amphipod	*Allocrangonyx hubrichti*	42
Isopod	*Caecidotea dimorpha*	38
Isopod	*Lirceus bicuspidatus*	30
Queensnake	*Regina septemvittata*	29
Brown Bullhead	*Ameiurus nebulosus*	19
Autumn Darter	*Etheostoma autumnale*	19

Boston Mountains Ecobasins

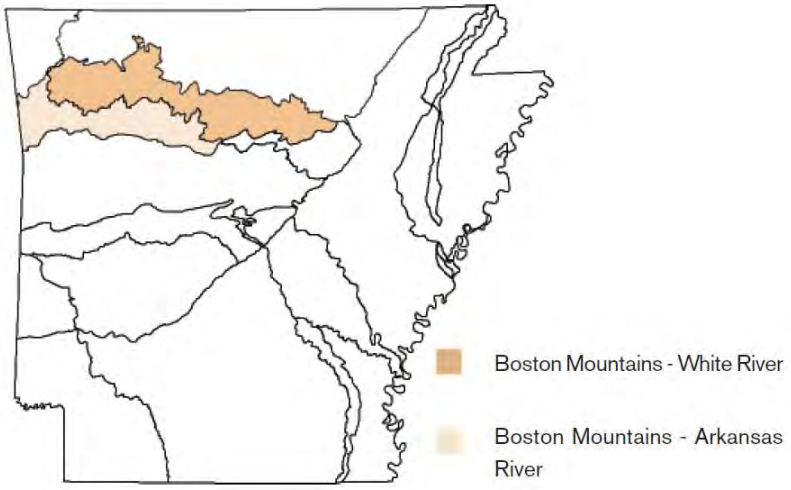


Figure 5.3. Boston Mountains ecobasin delineation

Boston Mountains - White River

Water quality is high in this ecobasin (Figure 5.3) due the predominant land use, which is generally forested except for some pasture land and small farms. Streams have a moderate gradient consisting of riffle/pool complexes flowing over slow to moderately permeable soils. Stream substrates vary from gravel, rubble, boulder to bedrock. Because of the rugged to precipitous local relief, runoff is rapid allowing stream levels to rise quickly, causing seasonal scouring of stream channels. This ecobasin is the source of several of the highest quality streams in the state including the Buffalo, White and Kings Rivers.

Table 5.6. Land cover types in Boston Mountains - White River ecobasin (percentage).

Boston Mountains - White River	Water	Urban	Forest*	Pasture	Crop
2004	1	0	82	15	1
2011	1	4	78	16	1

* Includes forested wetlands

Table 5.7. Species of Greatest Conservation Need associated with Boston Mountain - White River ecobasin.

Common Name	Scientific Name	Priority Score
Yellowcheek Darter	*Etheostoma moorei*	100
Bowed Snowfly	*Allocapnia oribata*	80
Speckled Pocketbook	*Lampsilis streckeri*	80
Boston Mountains Crayfish	*Cambarus causeyi*	62
Rabbitsfoot	*Quadrula cylindrica cylindrica*	52
Winter Stonefly	*Allocapnia jeanae*	50
Winter Stonefly	*Allocapnia ozarkana*	50
Predaceous Diving Beetle	*Heterosternuta phoebeae*	46
Western Fanshell	*Cyprogenia aberti*	43
Isopod	*Caecidotea oculata*	42
Cave Obligate Planarian	*Dendrocoelopsis americana*	42
Isopod	*Caecidotea dimorpha*	38
Williams' Crayfish	*Orconectes williamsi*	34
Salamander Mussel	*Simpsonaias ambigua*	34
Ozark Shiner	*Notropis ozarcanus*	33
Purple Lilliput	*Toxolasma lividum*	33
Isopod	*Lirceus bicuspidatus*	30
Queen Snake	*Regina septemvittata*	29
Isopod	*Caecidotea ancyla*	27
Hubbs' Crayfish	*Cambarus hubbsi*	27
Midget Crayfish	*Orconectes nana*	27
Longnose Darter	*Percina nasuta*	27
American Eel	*Anguilla rostrata*	24
Paddlefish	*Polyodon spathula*	24
Isopod	*Caecidotea stiladactyla*	23
Ouachita Kidneyshell	*Ptychobranchus occidentalis*	23
Ozark Cave Amphipod	*Stygobromus ozarkensis*	23
Bleedingtooth Mussel	*Venustaconcha pleasii*	23
Elktoe	*Alasmidonta marginata*	19
Autumn Darter	*Etheostoma autumnale*	19
Ouachita Diving Beetle	*Heterosternuta ouachita*	19

American Brook Lamprey	*Lethenteron appendix*	19
"White" Hickorynut	*Obovaria sp. cf arkansasensis*	19
Gilt Darter	*Percina evides*	19
Lilliput	*Toxolasma parvum*	19
Pondhorn	*Uniomerus tetralasmus*	19
Highfin Carpsucker	*Carpiodes velifer*	17
Little Spectaclecase group	*Villosa sp. cf lienosa*	17
Rainbow	*Villosa iris*	15

Boston Mountains - Arkansas River

Streams in this ecobasin (Figure 5.3) generally have a moderate gradient and consist of typical pool/riffle complexes flowing through pastureland, small farms and large blocks of forest. Soils are slow/moderately permeable with a significant shale component, giving the water a greenish-blue tinge due to weathering, erosion and sedimentation. Stream substrates vary from sand, gravel, rubble, to car-sized boulders and bedrock. Due to their moderate gradient, rocky/bedrock substrates and streamside areas with high bluffs, these are high quality streams, from a water quality, recreational, as well as, an aquatic biota standpoint. Representative streams include the Mulberry River, part of Big Piney Creek, Lee Creek, forks of the Little Red River and Illinois Bayou.

Table 5.8. Land cover types in Boston Mountains - Arkansas River ecobasin (percentage).

Boston Mountains - Arkansas River	Water	Urban	Forest*	Pasture	Crop
2004	1	0	90	9	0
2011	1	3	87	9	0

* Includes forested wetlands

Table 5.9. Species of Greatest Conservation Need associated with Boston Mountains - Arkansas River ecobasin.

Common Name	**Scientific Name**	**Priority Score**
Winter Stonefly	*Allocapnia warreni*	80
Nearctic Paduniellan Caddisfly	*Paduniella nearctica*	65
Boston Mountains Crayfish	*Cambarus causeyi*	62
Neosho Mucket	*Lampsilis rafinesqueana*	62
Winter Stonefly	*Allocapnia jeanae*	50
Western Fanshell	*Cyprogenia aberti*	43
Cave Obligate Isopod	*Caecidotea simulator*	42
Cave Obligate Planarian	*Dendrocoelopsis americana*	42
Bat Cave Isopod	*Caecidotea macropropoda*	38
Spectaclecase	*Cumberlandia monodonta*	38
Pyramid Pigtoe	*Pleurobema rubrum*	38

Williams' Crayfish	*Orconectes williamsi*	34
Purple Lilliput	*Toxolasma lividum*	33
Mayfly	*Dannella provonshai*	30
"Elongate" Pigtoe	*Fusconaia sp. cf. flava*	29
Queen Snake	*Regina septemvittata*	29
Isopod	*Caecidotea ancyla*	27
Ozark Clubtail Dragonfly	*Gomphus ozarkensis*	27
Midget Crayfish	*Orconectes nana*	27
Longnose Darter	*Percina nasuta*	27
American Eel	*Anguilla rostrata*	24
Bluntface Shiner	*Cyprinella camura*	23
Oklahoma Salamander	*Eurycea tynerensis*	23
Ozark Cave Amphipod	*Stygobromus ozarkensis*	23
Ellipse	*Venustaconcha ellipsiformis*	23
Elktoe	*Alasmidonta marginata*	19
Sunburst Darter	*Etheostoma mihileze*	19
Ouachita Diving Beetle	*Heterosternuta ouachita*	19
Gulf Mapleleaf	*Quadrula nobilis*	19
Little Spectaclecase group	*Villosa sp. cf lienosa*	17
Highland Darter	*Etheostoma teddyroosevelt*	15

Mississippi Alluvial Plain Ecobasins

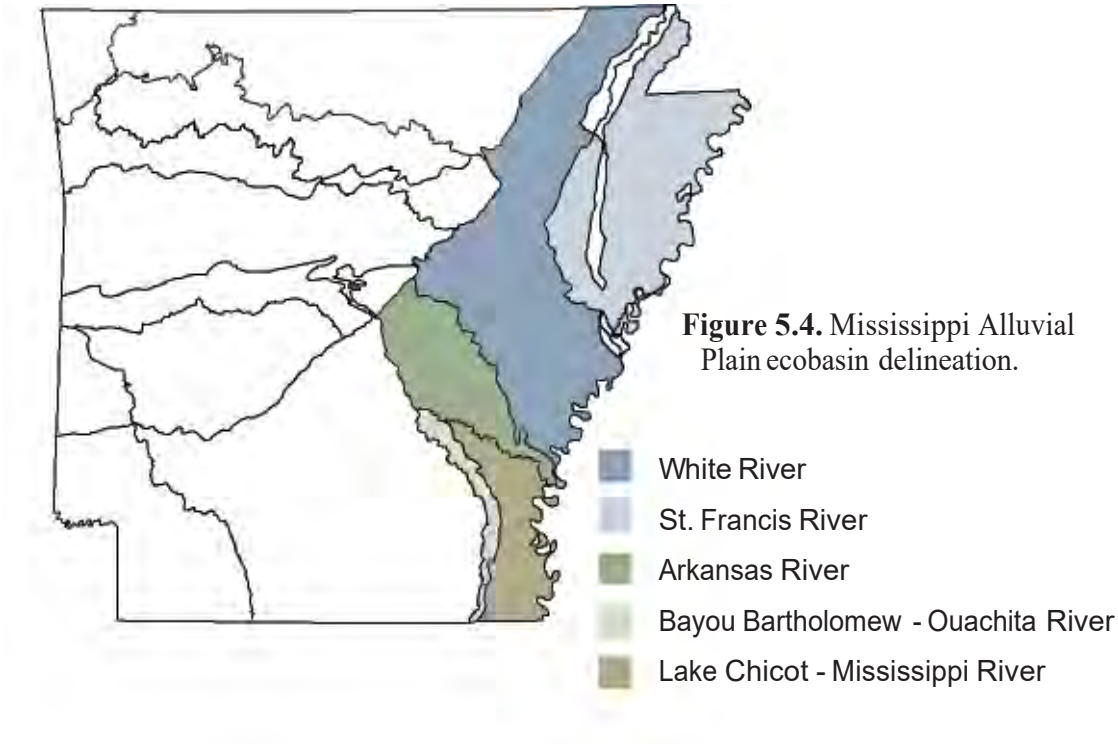


Figure 5.4. Mississippi Alluvial Plain ecobasin delineation.

Mississippi Alluvial Plain (Bayou Bartholomew) - Ouachita River

This is a very narrow ecobasin (Figure 5.4) with varying gradient ranging from essentially flat to low hills. Streams in this ecobasin reflect this varying gradient and range from incised channels to meandering, flat channels with extensive flood- plain benches. Sedimentation in this ecobasin can be high depending on land use practices and extensiveness of the localized riparian zone. Besides Bayou Bartholomew, few streams flow or carry water year round. Bayou Bartholomew is aquatic species rich with much fish habitat, including large woody debris and instream cypress and tupelo brakes. Representative streams include Bayou Bartholomew and Cut-Off Creek.

Table 5.10. Land cover types in Mississippi Alluvial Plain (Bayou Bartholomew) - Ouachita River ecobasin (percentage).

MAP (Bayou Bartholomew) - Ouachita River	Water	Urban	Forest*	Pasture	Crop
2004	2	1	22	9	65
2011	2	5	26	1	66

* Includes forested wetlands

Table 5.11. Species of Greatest Conservation Need associated with Mississippi Alluvial Plain (Bayou Bartholomew) - Ouachita River ecobasin.

Common Name	Scientific Name	Priority Score
Texas Pigtoe	*Pleurobema riddellii*	65
Crystal Darter	*Crystallaria asprella*	38
Pyramid Pigtoe	*Pleurobema rubrum*	38
Bluehead Shiner	*Pteronotropis hubbsi*	33
Alligator Gar	*Atractosteus spatula*	27
Brown Bullhead	*Ameiurus nebulosus*	19
Goldeye	*Hiodon alosoides*	19
Tapered Pondhorn	*Uniomerus declivis*	19
Goldstripe Darter	*Etheostoma parvipinne*	17
Lake Chubsucker	*Erimyzon sucetta*	15
Southern Mapleleaf	*Quadrula apiculata*	15

Mississippi Alluvial Plain (Lake Chicot) - Mississippi River

This ecobasin (Figure 5.4) includes the main stem of the Mississippi River in the Lake Chicot area of extreme SE Arkansas. Soils are alluvial deposits of clay, sand and gravel and permeability is generally low, making drainage poor. Stream substrates mirror the soils in the area but have higher embeddedness values than else- where in the state. Stream gradients here are very flat, with numerous meandering and braided channels. Channel scar lakes (oxbows), abandoned channels and wet- lands are common. Water resources here include marshes, swamps, sloughs and seasonally inundated wetlands. Oxbows and backwaters off larger rivers provide acceptable lentic habitat. Smaller lotic systems are incised, turbid, with generally low water quality and often low aquatic species diversity. Representative water bodies include the Mississippi River, Lake Chicot and Bayou Macon.

Table 5.12. Land cover types in Mississippi Alluvial Plain (Lake Chicot) - Mississippi River ecobasin (percentage).

MAP (Lake Chicot) - Mississippi River	Water	Urban	Forest*	Pasture	Crop
2004	5	1	16	7	71
2011	6	5	15	1	73

* Includes forested wetlands

Table 5.13. Species of Greatest Conservation Need associated with Mississippi Alluvial Plain - Lake Chicot ecobasin.

Common Name	Scientific Name	Priority Score
Alabama Shad	*Alosa alabamae*	52
Pallid Sturgeon	*Scaphirhynchus albus*	48
Sicklefin Chub	*Macrhybopsis meeki*	43
Bluehead Shiner	*Pteronotropis hubbsi*	33
Purple Pimpleback	*Quadrula refulgens*	30
Stonecat	*Noturus flavus*	29
Lake Sturgeon	*Acipenser fulvescens*	27
Alligator Gar	*Atractosteus spatula*	27
American Eel	*Anguilla rostrata*	24
Paddlefish	*Polyodon spathula*	24
Blue Sucker	*Cycleptus elongatus*	23
Flathead Chub	*Platygobio gracilis*	23
Ouachita Kidneyshell	*Ptychobranchus occidentalis*	23
Goldeye	*Hiodon alosoides*	19
Mooneye	*Hiodon tergisus*	19
Striped Mullet	*Mugil cephalus*	19
Channel Shiner	*Notropis wickliffi*	19
Pondhorn	*Uniomerus tetralasmus*	19
Swamp Darter	*Etheostoma fusiforme*	15
Shoal Chub	*Macrhybopsis hyostoma*	15

Mississippi Alluvial Plain - Arkansas River

This ecobasin (Figure 5.4) is the lower Arkansas River section of the Mississippi Alluvial Plain. It has fairly low stream gradients with decreases in elevation of only a few feet per mile. Underlying soils are composed of alluvial deposits of clay, sand and gravel, are deep and generally impermeable. As a result, natural streams in this ecobasin meander strongly, are deeply incised with bottoms composed of silt or clays. Conversion of native forests/vegetation to agricultural fields has decreased riparian zones next to streams and plowed land has added heavy loads of sediment to ecobasin streams. Representative streams in this ecobasin include the lower Arkansas River on one end of the size scale and Bayou Meto and Bayou Two Prairie on the other end of the scale.

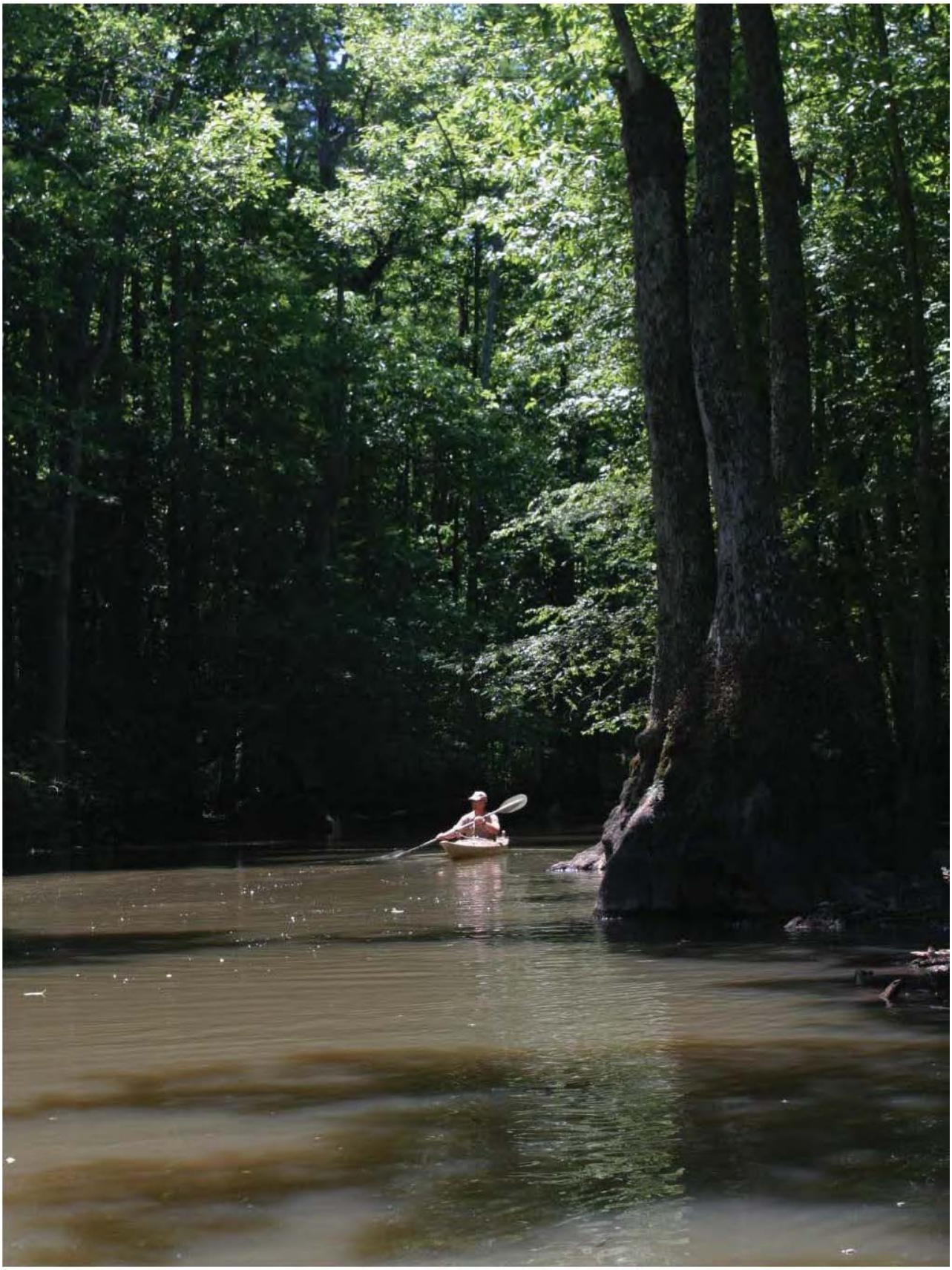
Table 5.14. Land cover types in Mississippi Alluvial Plain - Arkansas River ecobasin (percentage).

Mississippi Alluvial Plain – Arkansas River	Water	Urban	Forest*	Pasture	Crop
2004	6	2	23	5	63
2011	7	6	26	2	59

* Includes forested wetlands

Table 5.15. Species of Greatest Conservation Need associated with Mississippi Alluvial Plain - Arkansas River ecobasin.

Common Name	Scientific Name	Priority Score
Pallid Sturgeon	*Scaphirhynchus albus*	48
Sicklefin Chub	*Macrhybopsis meeki*	43
Lake Sturgeon	*Acipenser fulvescens*	27
Alligator Gar	*Atractosteus spatula*	27
American Eel	*Anguilla rostrata*	24
Paddlefish	*Polyodon spathula*	24
Blue Sucker	*Cycleptus elongatus*	23
Flathead Chub	*Platygobio gracilis*	23
Brown Bullhead	*Ameiurus nebulosus*	19
Goldeye	*Hiodon alosoides*	19
Pealip Redhorse	*Moxostoma pisolabrum*	19
Striped Mullet	*Mugil cephalus*	19
Channel Shiner	*Notropis wickliffi*	19
Highfin Carpsucker	*Carpiodes velifer*	17
Lake Chubsucker	*Erimyzon sucetta*	15
Swamp Darter	*Etheostoma fusiforme*	15
Shoal Chub	*Macrhybopsis hyostoma*	15



Mississippi Alluvial Plain - White River (Bayou DeView)

AGFC File Photo

Mississippi Alluvial Plain - White River

Streams in this ecobasin (Figure 5.4) are some of the most productive, speciose, bottomland hardwood, low gradient systems in the state. Natural channels in this ecobasin were tortuously meandering, having silt, sand and gravel substrates and abundant cover consisting of mainly large, woody debris. Riparian zones were dense, having some of the largest hardwood trees in the state. Currently, land use changes have decreased riparian zones significantly and caused substantial increases in turbidity due to sedimentation. While stream and connected oxbow lakes are still some of the most productive in the state, native fish fauna, especially large river fishes, have decreased due to upstream flow and thermal modifications from numerous impoundments. Soils in some sub-watersheds have high levels of magnesium and sodium, contributing to higher total dissolved solids. Representative streams include the lower White River, the Cache River and Boat Gunwale Slash.

Table 5.16. Land cover types in Mississippi Alluvial Plain - White River ecobasin (percentage).

Mississippi Alluvial Plain - White River	Water	Urban	Forest*	Pasture	Crop
2004	3	1	23	5	68
2011	3	5	25	2	65

* Includes forested wetlands

Table 5.17. Species of Greatest Conservation Need associated with Mississippi Alluvial Plain - White River ecobasin.

Common Name	Scientific Name	Priority Score
Alabama Shad	*Alosa alabamae*	52
Rabbitsfoot	*Quadrula cylindrica cylindrica*	52
Pallid Sturgeon	*Scaphirhynchus albus*	48
Pink Mucket	*Lampsilis abrupta*	46
Fat Pocketbook	*Potamilus capax*	46
Western Fanshell	*Cyprogenia aberti*	43
Sicklefin Chub	*Macrhybopsis meeki*	43
Crystal Darter	*Crystallaria asprella*	38
Stargazing Darter	*Percina uranidea*	38
Pyramid Pigtoe	*Pleurobema rubrum*	38
Salamander Mussel	*Simpsonaias ambigua*	34
Western Sand Darter	*Ammocrypta clara*	33
Purple Lilliput	*Toxolasma lividum*	33
Silver Redhorse	*Moxostoma anisurum*	29
Lake Sturgeon	*Acipenser fulvescens*	27
Alligator Gar	*Atractosteus spatula*	27
American Eel	*Anguilla rostrata*	24
Paddlefish	*Polyodon spathula*	24
Blue Sucker	*Cycleptus elongatus*	23
Sabine Shiner	*Notropis sabinae*	23
Flathead Chub	*Platygobio gracilis*	23

Ouachita Kidneyshell	*Ptychobranchus occidentalis*	23
Elktoe	*Alasmidonta marginata*	19
Brown Bullhead	*Ameiurus nebulosus*	19
Goldeye	*Hiodon alosoides*	19
Mooneye	*Hiodon tergisus*	19
American Brook Lamprey	*Lethenteron appendix*	19
Pealip Redhorse	*Moxostoma pisolabrum*	19
Striped Mullet	*Mugil cephalus*	19
Channel Shiner	*Notropis wickliffi*	19
Hickorynut	*Obovaria olivaria*	19
Gilt Darter	*Percina evides*	19
Ohio Pigtoe	*Pleurobema cordatum*	19
Lilliput	*Toxolasma parvum*	19
Texas Lilliput	*Toxolasma texasiense*	19
Pondhorn	*Uniomerus tetralasmus*	19
Highfin Carpsucker	*Carpiodes velifer*	17
Goldstripe Darter	*Etheostoma parvipinne*	17
Round Pigtoe	*Pleurobema sintoxia*	17
Little Spectaclecase group	*Villosa sp. cf lienosa*	17
Lake Chubsucker	*Erimyzon sucetta*	15
Swamp Darter	*Etheostoma fusiforme*	15
Shoal Chub	*Macrhybopsis hyostoma*	15
Southern Mapleleaf	*Quadrula apiculata*	15
Fawnsfoot	*Truncilla donaciformis*	15
Rainbow	*Villosa iris*	15

Mississippi Alluvial Plain - St. Francis River

The topography within this ecobasin has only small differences in elevation with some stream gradients of less than a foot per mile. Natural streams within this ecobasin are low gradient, meandering, incised channels with extensive riparian zones and forested floodplains. Oxbows and backwater areas are abundant on natural channel areas and are home to a variety of aquatic species. However, many of the streams in this ecobasin are extensively modified, including channelization and flood way modification. Stream sedimentation is extreme, reflected in decreased diversity of aquatic fauna. Representative streams include the main stem St. Francis River, L'Anguille River and Second Creek.

Table 5.18. Land cover types in Mississippi Alluvial Plain – St. Francis River ecobasin (percentage).

Mississippi Alluvial Plain - St. Francis	Water	Urban	Forest*	Pasture	Crop
2004	2	1	10	3	83
2011	2	7	8	1	81

* Includes forested wetlands

Table 5.19. Species of Greatest Conservation Need associated with Mississippi Alluvial Plain – St. Francis River ecobasin.

Common Name	Scientific Name	Priority Score
Scaleshell	*Leptodea leptodon*	76
Pallid Sturgeon	*Scaphirhynchus albus*	48
Fat Pocketbook	*Potamilus capax*	46
Western Fanshell	*Cyprogenia aberti*	43
Sicklefin Chub	*Macrhybopsis meeki*	43
Western Sand Darter	*Ammocrypta clara*	33
Purple Lilliput	*Toxolasma lividum*	33
Stonecat	*Noturus flavus*	29
Lake Sturgeon	*Acipenser fulvescens*	27
Alligator Gar	*Atractosteus spatula*	27
American Eel	*Anguilla rostrata*	24
Paddlefish	*Polyodon spathula*	24
Blue Sucker	*Cycleptus elongatus*	23
Sabine Shiner	*Notropis sabinae*	23
Suckermouth Minnow	*Phenacobius mirabilis*	23
Flathead Chub	*Platygobio gracilis*	23
Pink Heelsplitter	*Potamilus alatus*	23
Central Mudminnow	*Umbra limi*	23
Bleedingtooth Mussel	*Venustaconcha pleasii*	23
Goldeye	*Hiodon alosoides*	19
Pealip Redhorse	*Moxostoma pisolabrum*	19
Hickorynut	*Obovaria olivaria*	19
Ohio Pigtoe	*Pleurobema cordatum*	19
Gulf Mapleleaf	*Quadrula nobilis*	19
Lilliput	*Toxolasma parvum*	19
Tapered Pondhorn	*Uniomerus declivis*	19
Pondhorn	*Uniomerus tetralasmus*	19
Little Spectaclecase group	*Villosa sp. cf lienosa*	17
Swamp Darter	*Etheostoma fusiforme*	15
Southern Mapleleaf	*Quadrula apiculata*	15
Fawnsfoot	*Truncilla donaciformis*	15

Mississippi Valley Loess Plains Ecobasins

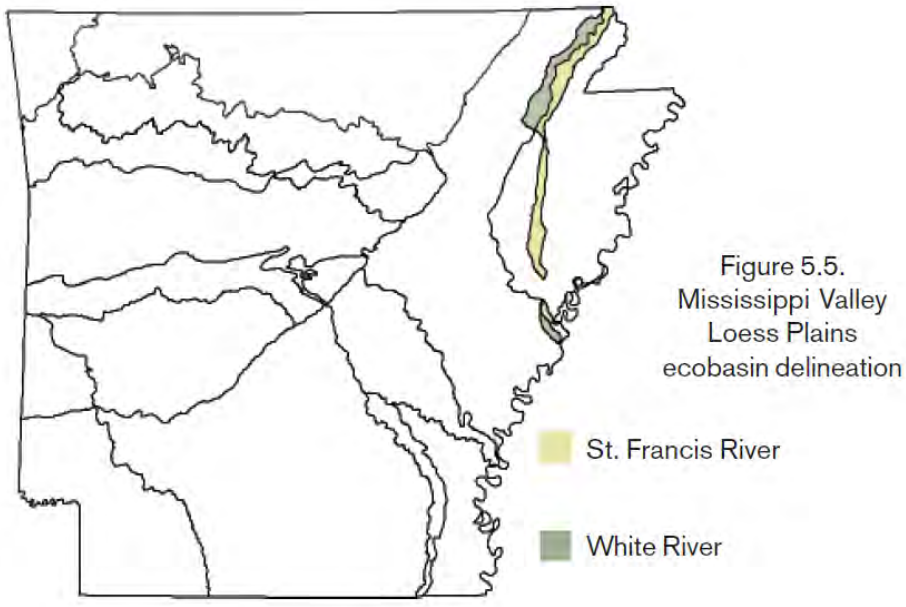


Figure 5.5. Mississippi Valley Loess Plains ecobasin delineation

Mississippi Valley Loess Plains – White River

This narrow ecobasin in northeast Arkansas (Figure 5.5) is veneered with windblown silt deposits (loess) and underlain by erosion-prone, unconsolidated coastal plain sediments. The topography includes hills and ridges. Streams tend to have lower gradients and more silty substrates than the loess plains draining into the St. Francis River. Includes the headwaters of Bayou deView but few other large, perennial streams.

Table 5.20. Land cover types in Mississippi River Loess Plains - White River ecobasin (percentage).

Mississippi River Loess Plains - White River	Water	Urban	Forest	Pasture	Crop
2004	1	4	53	14	28
2011	1	11	52	18	18

* Includes forested wetlands

Table 5.21. Species of Greatest Conservation Need associated with Mississippi River Loess Plains – White River ecobasin.

Common Name	Scientific Name	Priority Score
Brown Bullhead	*Ameiurus nebulosus*	19

Mississippi Valley Loess Plains - St. Francis River

This Northeast Arkansas ecobasin is narrow and a disjunct series of loess-capped hills surrounded by lower elevation Mississippi Alluvial Plain. Spring- fed streams and seep areas occur on the lower slopes and basal areas. Soils are generally well drained and larger creeks deeply incised into the soft substrates. Along with silt and sandy substrates, there are some gravel-bottomed streams in this ecobasin, replete with sensitive fish species. Several of the larger creeks in this ecobasin (Storm Creek, Bear Creek) are impounded by federal and state agencies.

Table 5.22. Land cover types in Mississippi River Loess Plains - St. Francis River ecobasin (percentage).

Mississippi River Loess Plains - St. Francis	Water	Urban	Forest	Pasture	Crop
2004	1	4	55	15	25
2011	1	12	53	19	15

* Includes forested wetlands

Table 5.23. Species of Greatest Conservation Need associated with Mississippi River Loess Plains - St. Francis River ecobasin.

Common Name	Scientific Name	Priority Score
Pyramid Pigtoe	*Pleurobema rubrum*	38
Plains Minnow	*Hybognathus placitus*	27
Goldstripe Darter	*Etheostoma parvipinne*	17
Round Pigtoe	*Pleurobema sintoxia*	17
Shoal Chub	*Macrhybopsis hyostoma*	15

Ouachita Mountains Ecobasins

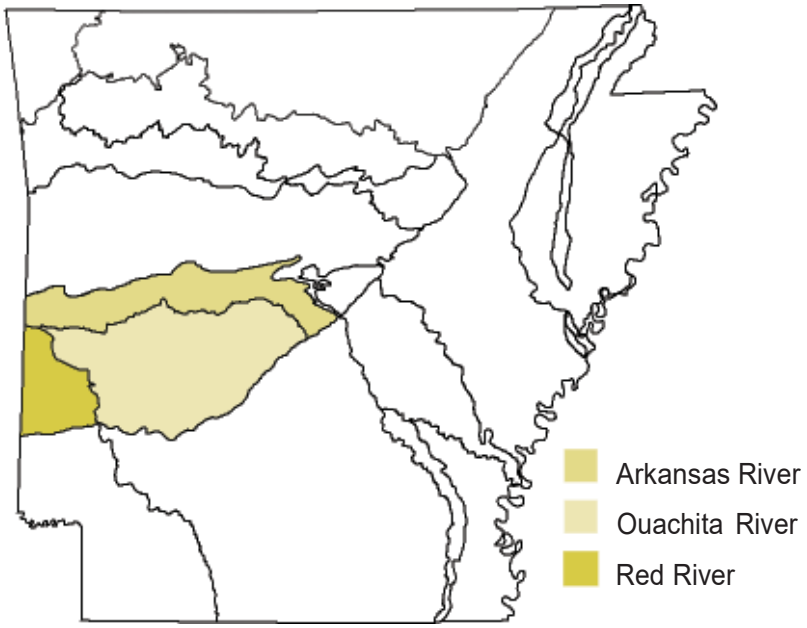


Figure 5.6. Ouachita Mountains ecobasin delineation.

Ouachita Mountains - Ouachita River

Streams in this ecobasin (Figure 5.6) usually follow the east-west valleys in this rugged, interior highland mountain range although occasionally they will cut across the ridges, producing cascades, rapids and waterfalls. Perennial springs and seeps are common. Stream substrates are composed of gravel, cobble, boulder and bedrock. Water quality, in general, is very high in this ecobasin with dissolved solids, turbidity, total phosphorous and biological oxygen demand lower than in most ecobasins and dissolved oxygen levels higher. Some of the state's most sensitive aquatic communities are found in this ecobasin. Stream fish populations are dominated by sensitive species including minnows, sunfish, darters and bass, especially smallmouth bass. Most of the larger rivers in this ecobasin have been dammed, forming large, deep reservoirs with high quality sport fisheries. Representative streams include the Ouachita River, Caddo River, Big Mazarn Creek and Prairie Bayou.

Table 5.24. Land cover types in Ouachita Mountains - Ouachita River ecobasin (percentage).

Ouachita Mountains - Ouachita River	Water	Urban	Forest	Pasture	Crop
2004	3	1	86	10	0
2011	3	6	83	8	0

* Includes forested wetlands

Table 5.25. Species of Greatest Conservation Need associated with Ouachita Mountains – Ouachita River ecobasin.

Common Name	Scientific Name	Priority Score
Caddo Madtom	*Noturus taylori*	80
Irons Fork Burrowing Crayfish	*Procambarus reimeri*	80
Caddo Sallfly	*Alloperla caddo*	65
Saline Burrowing Crayfish	*Fallicambarus strawni*	65
Arkansas Fatmucket	*Lampsilis powellii*	57
Alabama Shad	*Alosa alabamae*	52
Rabbitsfoot	*Quadrula cylindrica cylindrica*	52
Arkansas Agapetus Caddisfly	*Agapetus medicus*	50
Stonefly	*Leuctra paleo*	50
Paleback Darter	*Etheostoma pallididorsum*	46
Ouachita Burrowing Crayfish	*Fallicambarus harpi*	46
Daisy Burrowing Crayfish	*Fallicambarus jeanae*	46
Ouachita Madtom	*Noturus lachneri*	46
Ouachita Darter	*Percina brucethompsoni*	46
Crystal Darter	*Crystallaria asprella*	38
Spectaclecase	*Cumberlandia monodonta*	38
Stargazing Darter	*Percina uranidea*	38
Pyramid Pigtoe	*Pleurobema rubrum*	38
Kiamichi Shiner	*Notropis ortenburgeri*	33
Peppered Shiner	*Notropis perpallidus*	33
Purple Lilliput	*Toxolasma lividum*	33
Ozark Snaketail Dragonfly	*Ophiogomphus westfalli*	32
Ouachita Mountain Crayfish	*Procambarus tenuis*	30
Ozark Clubtail Dragonfly	*Gomphus ozarkensis*	27
Mena Crayfish	*Orconectes menae*	27
American Eel	*Anguilla rostrata*	24
Paddlefish	*Polyodon spathula*	24
Isopod	*Caecidotea fonticulus*	23
Ouachita Streambed Salamander	*Eurycea subfluvicola*	23
Ouachita Shore Bug	*Pentacora ouachita*	23
Ouachita Kidneyshell	*Ptychobranchus occidentalis*	23
Elktoe	*Alasmidonta marginata*	19
Brown Bullhead	*Ameiurus nebulosus*	19
"Ouachita" Fanshell	*Cyprogenia sp. cf aberti*	19
Beaded Darter	*Etheostoma clinton*	19
Southern Pocketbook	*Lampsilis ornata*	19
Redspot Chub	*Nocomis asper*	19
Redspotted Stream Crayfish	*Orconectes acares*	19
Little River Creek Crayfish	*Orconectes leptogonopodus*	19
Bismark Burrowing Crayfish	*Procambarus parasimulans*	19
Lilliput	*Toxolasma parvum*	19

Texas Lilliput	*Toxolasma texasiense*	19
Pondhorn	*Uniomerus tetralasmus*	19
Round Pigtoe	*Pleurobema sintoxia*	17
Little Spectaclecase group	*Villosa sp. cf lienosa*	17
Saddleback Darter	*Percina vigil*	15

Ouachita Mountains - Arkansas River

The Ouachita Mountain ecoregion, in general, is generally composed of sandstones, shales and novaculite, with the Arkansas River basin part of it (Fourche Mountains) having characteristic long east-west ridges (even longer in this ecobasin). This ecobasin also has a higher component of silts and sands, causing north-draining streams to be more turbid due to smaller sediments than other areas of the Ouachitas. Stream gradients are moderate and nutrient, mineral and biochemical water quality parameters are low in the surface waters here. Streams have a typical riffle/pool pattern and structure with silt, sand, gravel, boulder and shale bedrock substrates. Representative streams include the Fourche la Fave, upper Petit Jean River and Little Maumelle Creek.

Table 5.26. Land cover types in Ouachita Mountains - Arkansas River ecobasin (percentage).

Ouachita Mountains - Arkansas River	Water	Urban	Forest	Pasture	Crop
2004	2	3	85	9	1
2011	2	8	81	8	1

* Includes forested wetlands

Table 5.27. Species of Greatest Conservation Need associated with Ouachita Mountains - Arkansas River ecobasin.

Common Name	Scientific Name	Priority Score
Scaleshell	*Leptodea leptodon*	76
Mountain Cave Amphipod	*Stygobromus montanus*	65
Microcaddisfly	*Ochrotrichia robisoni*	57
Kiamichi Shiner	*Notropis ortenburgeri*	33
Purple Lilliput	*Toxolasma lividum*	33
Isopod	*Lirceus bicuspidatus*	30
Ouachita Mountain Crayfish	*Procambarus tenuis*	30
Longnose Darter	*Percina nasuta*	27
American Eel	*Anguilla rostrata*	24
Blue Sucker	*Cycleptus elongatus*	23
Suckermouth Minnow	*Phenacobius mirabilis*	23
Ouachita Kidneyshell	*Ptychobranchus occidentalis*	23
Pealip Redhorse	*Moxostoma pisolabrum*	19
Redspotted Stream Crayfish	*Orconectes acares*	19
Lilliput	*Toxolasma parvum*	19

Little Spectaclecase group	*Villosa sp. cf lienosa*	17
Highland Darter	*Etheostoma teddyroosevelt*	15
"Arkoma" Fatmucket	*Lampsilis sp. A cf hydiana*	15
Fawnsfoot	*Truncilla donaciformis*	15

Ouachita Mountains - Red River

This western ecobasin (Figure 5.6) in the Ouachita ecoregion has medium to occasionally high gradients reflected in the streams coursing through this ecobasin. Due to these higher gradients, substrates are coarser than in other ecobasins with more gravels, cobbles, boulders and bedrock and less silts and sands. Turbidity is very low because of the higher gradient and lower fine sediments and riparian zones are generally fairly intact, except for some intensively logged areas. Channel structure is generally riffle/pool/run and rocky, boulder substrates and bedrock ledges provide adequate cover for a variety of sensitive fish and other aquatic species (i.e. leopard darter, a federally-listed threatened species). Representative streams include the Cossatot River, the Rolling Fork Creek and Board Camp Creek.

Table 5.28. Land cover types in Ouachita Mountains - Red River ecobasin (percentage).

Ouachita Mountains - Red River	Water	Urban	Forest	Pasture	Crop
2004	1	0	88	11	0
2011	1	5	84	10	0

* Includes forested wetlands

Table 5.29. Species of Greatest Conservation Need associated with Ouachita Mountains - Red River ecobasin.

Common Name	**Scientific Name**	**Priority Score**
Saline Burrowing Crayfish	*Fallicambarus strawni*	65
Leopard Darter	*Percina pantherina*	62
Rabbitsfoot	*Quadrula cylindrica cylindrica*	52
Arkansas Agapetus Caddisfly	*Agapetus medicus*	50
Bayou Bodcau Crayfish	*Bouchardina robisoni*	50
Ouachita Needlefly	*Zealeuctra wachita*	50
Kiamichi Shiner	*Notropis ortenburgeri*	33
Purple Lilliput	*Toxolasma lividum*	33
Ozark Snaketail Dragonfly	*Ophiogomphus westfalli*	32
Ouachita Mountain Crayfish	*Procambarus tenuis*	30
Ouachita Shiner	*Lythrurus snelsoni*	27
Rocky Shiner	*Notropis suttkusi*	27
Mena Crayfish	*Orconectes menae*	27
Lowland Topminnow	*Fundulus blairae*	23

Ouachita Shore Bug	*Pentacora ouachita*	23
Ouachita Kidneyshell	*Ptychobranchus occidentalis*	23
Brown Bullhead	*Ameiurus nebulosus*	19
Ouachita Diving Beetle	*Heterosternuta ouachita*	19
Blackspot Shiner	*Notropis atrocaudalis*	19
Little River Creek Crayfish	*Orconectes leptogonopodus*	19
Bismark Burrowing Crayfish	*Procambarus parasimulans*	19
Lilliput	*Toxolasma parvum*	19
Little Spectaclecase group	*Villosa sp. cf lienosa*	17

Ozark Highlands Ecobasins

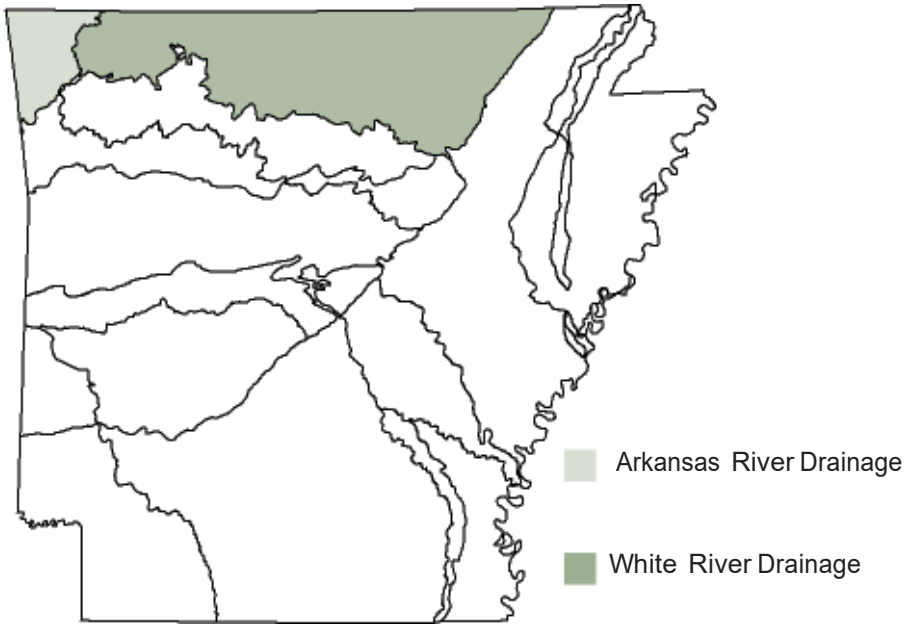


Figure 5.7. Ozark Highlands ecobasin delineation.

Ozark Highlands - Arkansas River

This ecobasin (Figure 5.7) is underlain by cherty limestone with karst features making sinkholes, caves, and cold, spring-fed streams common. Gaining or losing streams are common due to the springs and sinkholes in the region. Streams are composed of riffles and pools with chert gravel and rubble common. Bedrock is also common, forming overhead cover in the way of bedrock ledges for fish, salamanders and aquatic invertebrates. Stream gradients are moderate to high. Ambient natural turbidity is low. Nutrient input from various anthropogenic activities in the watersheds here can be

significant and impact aquatic biota in a number of ways. Representative streams here include the Illinois River and Spavinaw Creek.

Table 5.30. Land cover types in Ozark Highlands - Arkansas River ecobasin (percentage).

Ozark Highlands - Arkansas River	Water	Urban	Forest	Pasture	Crop
2004	1	5	30	57	7
2011	1	16	32	50	1

* Includes forested wetlands

Table 5.31. Species of Greatest Conservation Need associated with Ozark Mountains - Arkansas River ecobasin.

Common Name	Scientific Name	Priority Score
Benton County Cave Crayfish	*Cambarus aculabrum*	80
Sulphur Springs Diving Beetle	*Heterosternuta sulphuria*	80
Neosho Mucket	*Lampsilis rafinesqueana*	62
Rabbitsfoot	*Quadrula cylindrica cylindrica*	52
Arkansas Agapetus Caddisfly	*Agapetus medicus*	50
Contorted Ochrotrichian	*Ochrotrichia contorta*	50
Ozark Cavefish	*Troglichthys rosae*	43
Cave Obligate Planarian	*Dendrocoelopsis americana*	42
Bat Cave Isopod	*Caecidotea macropropoda*	38
Arkansas Darter	*Etheostoma cragini*	38
Bristly Cave Crayfish	*Cambarus setosus*	34
Williams' Crayfish	*Orconectes williamsi*	34
Purple Lilliput	*Toxolasma lividum*	33
Isopod	*Caecidotea steevesi*	30
Meek's Short Pointed Crayfish	*Orconectes meeki brevis*	30
Least Darter	*Etheostoma microperca*	29
"Elongate" Pigtoe	*Fusconaia sp. cf. flava*	29
Isopod	*Caecidotea ancyla*	27
Midget Crayfish	*Orconectes nana*	27
American Eel	*Anguilla rostrata*	24
Isopod	*Caecidotea stiladactyla*	23
Bluntface Shiner	*Cyprinella camura*	23
Spotfin Shiner	*Cyprinella spiloptera*	23
Oklahoma Salamander	*Eurycea tynerensis*	23
Neosho Midget Crayfish	*Orconectes macrus*	23
Ouachita Kidneyshell	*Ptychobranchus occidentalis*	23
Ozark Cave Amphipod	*Stygobromus ozarkensis*	23
Ellipse	*Venustaconcha ellipsiformis*	23
Elktoe	*Alasmidonta marginata*	19
Sunburst Darter	*Etheostoma mihileze*	19
Grotto Salamander "western	*Eurycea spelaea western*	19
Pealip Redhorse	*Moxostoma pisolabrum*	19

Redspot Chub	*Nocomis asper*	19
Slenderhead Darter	*Percina phoxocephala*	19
Lilliput	*Toxolasma parvum*	19
Highfin Carpsucker	*Carpiodes velifer*	17
Little Spectaclecase group	*Villosa sp. cf lienosa*	17
Highland Darter	*Etheostoma teddyroosevelt*	15
Grotto Salamander "eastern clade"	*Eurycea spelaea eastern*	15



Ozark Highlands - White River (Buffalo River)

Ozark Highlands - White River

Streams in the White River ecobasin (Figure 5.7) of the Ozarks Highlands ecoregion are some of the most productive yet have some of the highest water quality in the state. Underlain generally by dolomite and highly fractured and soluble limestone, these streams have alkalinity, total dissolved solids (TDS), and total hardness that are all relatively high. Streams are mostly clear, cold, highly oxygenated, perennial, and often spring-fed, typically with gravel, cobble, boulder, and bedrock substrates. Limestone bluffs arching up from streams are indicative of this ecobasin. Gradients are usually at least moderate. All of the above characteristics meld together to produce aquatic habitat conducive to an aquatic community with many sensitive species. For example, the fish community is dominated by minnows, sunfish, darters, and catostomids. Conversely, significant human and confined animal population growth in areas within this ecobasin in the past decade have caused increases in nitrates, fecal coliform bacteria, orthophosphorous, sedimentation and other water quality metrics that typically have a negative impact on sensitive aquatic species of vertebrates and invertebrates. Representative streams include the middle and lower Buffalo River, upper White River, Spring River, Kings River, Crooked Creek and Yokum Creek.

Table 5.32. Land cover types in Ozark Highlands - White River ecobasin (percentage).

Ozark Highlands - White River	Water	Urban	Forest	Pasture	Crop
2004	3	1	68	26	2
2011	2	5	66	26	1

* Includes forested wetlands

Table 5.33. Species of Greatest Conservation Need associated with Ozark Mountains – White River ecobasin.

Common Name	Scientific Name	Priority Score
Curtis Pearlymussel	*Epioblasma florentina curtisii*	100
Turgid Blossom	*Epioblasma turgidula*	100
Foushee Cavesnail	*Amnicola cora*	80
Hell Creek Cave Crayfish	*Cambarus zophonastes*	80
Isopod	*Lirceus bidentatus*	80
Scaleshell	*Leptodea leptodon*	76
Ozark Hellbender	*Cryptobranchus alleganiensis*	71
Rabbitsfoot	*Quadrula cylindrica cylindrica*	52
Arkansas Agapetus Caddisfly	*Agapetus medicus*	50
Winter Stonefly	*Allocapnia jeanae*	50
Coldwater Crayfish	*Orconectes eupunctus*	50
Predaceous Diving Beetle	*Heterosternuta phoebeae*	46
Pink Mucket	*Lampsilis abrupta*	46
Mammoth Spring Crayfish	*Orconectes marchandi*	46
Western Fanshell	*Cyprogenia aberti*	43
Snuffbox	*Epioblasma triquetra*	43
Ozark Cavefish	*Troglichthys rosae*	43
Amphipod	*Bactrurus pseudomucronatus*	42
Cave Obligate Planarian	*Dendrocoelopsis americana*	42
Isopod	*Caecidotea dimorpha*	38
Crystal Darter	*Crystallaria asprella*	38
Stargazing Darter	*Percina uranidea*	38
Pyramid Pigtoe	*Pleurobema rubrum*	38
Bristly Cave Crayfish	*Cambarus setosus*	34
Williams' Crayfish	*Orconectes williamsi*	34
Salamander Mussel	*Simpsonaias ambigua*	34
Western Sand Darter	*Ammocrypta clara*	33
Ozark Shiner	*Notropis ozarcanus*	33
Purple Lilliput	*Toxolasma lividum*	33
Ozark Snaketail Dragonfly	*Ophiogomphus westfalli*	32
Slippershell Mussel	*Alasmidonta viridis*	31
Isopod	*Caecidotea steevesi*	30

Isopod	*Lirceus bicuspidatus*	30
Strawberry River Darter	*Etheostoma fragi*	29
Silver Redhorse	*Moxostoma anisurum*	29
Isopod	*Caecidotea ancyla*	27
Isopod	*Caecidotea salemensis*	27
Hubbs' Crayfish	*Cambarus hubbsi*	27
Midget Crayfish	*Orconectes nana*	27
Longnose Darter	*Percina nasuta*	27
Southern Cavefish	*Typhlichthys subterraneus*	27
American Eel	*Anguilla rostrata*	24
Paddlefish	*Polyodon spathula*	24
Isopod	*Caecidotea stiladactyla*	23
Blue Sucker	*Cycleptus elongatus*	23
Spotfin Shiner	*Cyprinella spiloptera*	23
Oklahoma Salamander	*Eurycea tynerensis*	23
Ozark Pigtoe	*Fusconaia ozarkensis*	23
Sabine Shiner	*Notropis sabinae*	23
Ouachita Kidneyshell	*Ptychobranchus occidentalis*	23
Ozark Cave Amphipod	*Stygobromus ozarkensis*	23
Bleedingtooth Mussel	*Venustaconcha pleasii*	23
Gapped Ringed Crayfish	*Orconectes neglectus*	20
Elktoe	*Alasmidonta marginata*	19
Autumn Darter	*Etheostoma autumnale*	19
Current Darter	*Etheostoma uniporum*	19
Grotto Salamander "northern	*Eurycea spelaea northern*	19
Ouachita Diving Beetle	*Heterosternuta ouachita*	19
Mooneye	*Hiodon tergisus*	19
American Brook Lamprey	*Lethenteron appendix*	19
Pealip Redhorse	*Moxostoma pisolabrum*	19
Striped Mullet	*Mugil cephalus*	19
Channel Shiner	*Notropis wickliffi*	19
Hickorynut	*Obovaria olivaria*	19
"White" Hickorynut	*Obovaria sp. cf arkansasensis*	19
Gilt Darter	*Percina evides*	19
Slenderhead Darter	*Percina phoxocephala*	19
Ohio Pigtoe	*Pleurobema cordatum*	19
Lilliput	*Toxolasma parvum*	19
Highfin Carpsucker	*Carpiodes velifer*	17
Little Spectaclecase group	*Villosa sp. cf lienosa*	17
Lake Chubsucker	*Erimyzon sucetta*	15
Grotto Salamander "eastern	*Eurycea spelaea eastern*	15
Least Brook Lamprey	*Lampetra aepyptera*	15
Shoal Chub	*Macrhybopsis hyostoma*	15
Saddleback Darter	*Percina vigil*	15
Rainbow	*Villosa iris*	15

South Central Plains Ecobasins

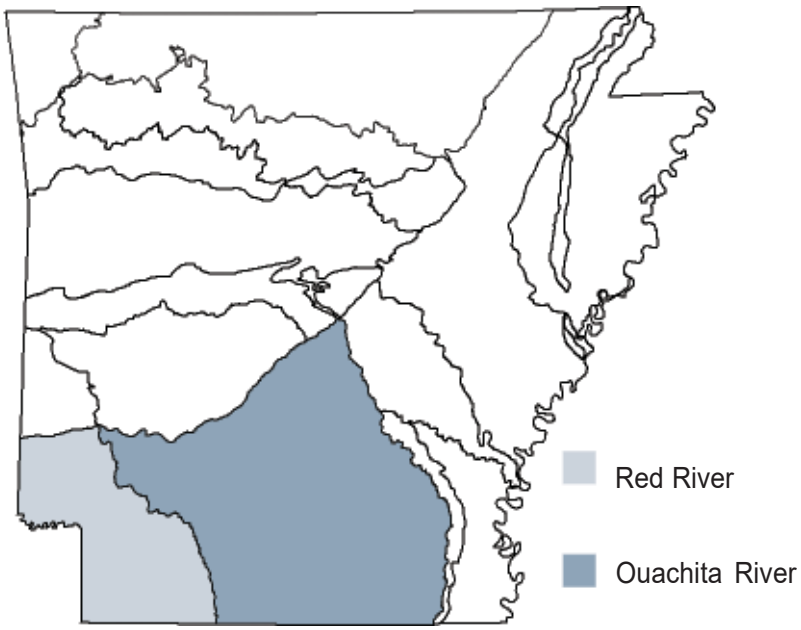


Figure 5.8. South Central Plains ecobasins delineation.

South Central Plains - Red River

Underlain by coastal plain deposits (this ecoregion is sometimes called the Gulf Coastal Plain) and marginal marine sediments, the landscape in this ecobasin (Figure 5.8) of the South Central Plains is dominated by the Red River, which is highly turbid with high suspended sediment loads, hardness and conductivity. The aquatic species in the Red River are those of a large river community including blue suckers and paddlefish, catfishes and minnows. The underlying alluvium allows the formation of oxbow lakes, low terraces, meander scars, backswamps, natural river levees, and tortuous meandering of the main stem Red River. Gradients are typically low to moderate. Smaller streams in this ecobasin are highly incised, either turbid or tannen stained due to predominant pine watersheds, mildly acidic from the tannic acid, with low levels of alkalinity, hardness, pH and often dissolved oxygen. Summer flow in these smaller streams is limited to non-existent with en- during pools forming between dewatered shoal areas. Fish communities are com- posed of a fairly diverse fish complex with limited sensitive species but having a high proportion of sunfishes with darters and minnows common. Representative streams in this ecobasin include the Red River, the Little River, western Saline River and McKinney Creek.

Table 5.34. Land cover types in South Central Plains - Red River ecobasin (percentage).

South Central Plains - Red River	Water	Urban	Forest	Pasture	Crop
2004	3	1	65	23	8
2011	3	6	66	18	6

* Includes forested wetlands

Table 5.35. Species of Greatest Conservation Need associated with South Central Plains - Red River ecobasin.

Common Name	Scientific Name	Priority Score
Ouachita Rock Pocketbook	*Arcidens wheeleri*	80
Scaleshell	*Leptodea leptodon*	76
Saline Burrowing Crayfish	*Fallicambarus strawni*	65
Louisiana Pearlshell	*Margaritifera hembeli*	65
Texas Pigtoe	*Pleurobema riddellii*	65
Leopard Darter	*Percina pantherina*	62
Rabbitsfoot	*Quadrula cylindrica cylindrica*	52
Bayou Bodcau Crayfish	*Bouchardina robisoni*	50
Blair's Fencing Crayfish	*Faxonella blairi*	46
Pink Mucket	*Lampsilis abrupta*	46
Crystal Darter	*Crystallaria asprella*	38
Pyramid Pigtoe	*Pleurobema rubrum*	38
Regal Burrowing Crayfish	*Procambarus regalis*	38
Western Sand Darter	*Ammocrypta clara*	33
Kiamichi Shiner	*Notropis ortenburgeri*	33
Bluehead Shiner	*Pteronotropis hubbsi*	33
Pine Hills Digger	*Fallicambarus dissitus*	32
Alligator Gar	*Atractosteus spatula*	27
Ozark Clubtail Dragonfly	*Gomphus ozarkensis*	27
Plains Minnow	*Hybognathus placitus*	27
Ouachita Shiner	*Lythrurus snelsoni*	27
Red River Shiner	*Notropis bairdi*	27
Rocky Shiner	*Notropis suttkusi*	27
Brown Madtom	*Noturus phaeus*	27
American Eel	*Anguilla rostrata*	24
Paddlefish	*Polyodon spathula*	24
Blue Sucker	*Cycleptus elongatus*	23
Lowland Topminnow	*Fundulus blairae*	23
Chub Shiner	*Notropis potteri*	23
Ouachita Kidneyshell	*Ptychobranchus occidentalis*	23
Brown Bullhead	*Ameiurus nebulosus*	19
Goldeye	*Hiodon alosoides*	19
"Red River" Mucket	*Lampsilis sp. B cf hydiana*	19
Blackspot Shiner	*Notropis atrocaudalis*	19
Slenderhead Darter	*Percina phoxocephala*	19
Bismark Burrowing Crayfish	*Procambarus parasimulans*	19
Gulf Mapleleaf	*Quadrula nobilis*	19
Lilliput	*Toxolasma parvum*	19
Texas Lilliput	*Toxolasma texasiense*	19
Tapered Pondhorn	*Uniomerus declivis*	19
Pondhorn	*Uniomerus tetralasmus*	19

Highfin Carpsucker	*Carpiodes velifer*	17
Goldstripe Darter	*Etheostoma parvipinne*	17
Round Pigtoe	*Pleurobema sintoxia*	17
Lake Chubsucker	*Erimyzon sucetta*	15
Swamp Darter	*Etheostoma fusiforme*	15
Shoal Chub	*Macrhybopsis hyostoma*	15
Southern Mapleleaf	*Quadrula apiculata*	15
Fawnsfoot	*Truncilla donaciformis*	15



South Central Plains - Ouachita River (Lower L'Eau Frais Creek)

South Central Plains - Ouachita River

Marine and ocean-bed sediments and alluvium are the base for stream substrates in this ecobasin (Figure 5.8). Streams are typically of a riffle/pool configuration with medium sinuousity and low to medium gradient. Stream substrates are generally sand, gravel, and silt. The water color in the smaller stream systems is often tannic acid stained (brown, coffee-colored) with fairly high levels of total organic carbon and biochemical oxygen demand. Large areas of this ecobasin are frequently inundated adding to the BOD. Streams with sandy bottoms and spring-fed will often have lower TDS, total suspended solids, alkalinity and hardness values. Although dissolved oxygen values can be fairly low in the early morning hours, fish populations often may have 5-6 species of darters represented along with numerous minnows, sunfishes, and suckers albeit not necessarily many sensitive species. Representative streams include the lower Ouachita River, Dorcheat Bayou, the lower Saline River, L'Aigle Creek and Moro Creek.

Table 5.36. Land cover types in South Central Plains - Ouachita River ecobasin (percentage).

South Central Plains - Ouachita River	Water	Urban	Forest	Pasture	Crop
2004	1	1	87	7	3
2011	1	6	86	6	1

* Includes forested wetlands

Table 5.37. Species of Greatest Conservation Need associated with South Central Plains - Ouachita River ecobasin.

Common Name	Scientific Name	Priority Score
Ouachita Rock Pocketbook	*Arcidens wheeleri*	80
Slenderwrist Burrowing Crayfish	*Fallicambarus petilicarpus*	80
Winged Mapleleaf	*Quadrula fragosa*	80
Scaleshell	*Leptodea leptodon*	76
Texas Pigtoe	*Pleurobema riddellii*	65
Arkansas Fatmucket	*Lampsilis powellii*	57
Alabama Shad	*Alosa alabamae*	52
Rabbitsfoot	*Quadrula cylindrica cylindrica*	52
Jefferson County Crayfish	*Fallicambarus gilpini*	50
Daisy Burrowing Crayfish	*Fallicambarus jeanae*	46
Pink Mucket	*Lampsilis abrupta*	46
Ouachita Darter	*Percina brucethompsoni*	46
Crystal Darter	*Crystallaria asprella*	38
Spectaclecase	*Cumberlandia monodonta*	38
Stargazing Darter	*Percina uranidea*	38
Pyramid Pigtoe	*Pleurobema rubrum*	38
Western Sand Darter	*Ammocrypta clara*	33
Peppered Shiner	*Notropis perpallidus*	33
Bluehead Shiner	*Pteronotropis hubbsi*	33
Purple Lilliput	*Toxolasma lividum*	33
Pine Hills Digger	*Fallicambarus dissitus*	32
Alligator Gar	*Atractosteus spatula*	27
American Eel	*Anguilla rostrata*	24
Paddlefish	*Polyodon spathula*	24
Ouachita Kidneyshell	*Ptychobranchus occidentalis*	23
Elktoe	*Alasmidonta marginata*	19
Brown Bullhead	*Ameiurus nebulosus*	19
"Ouachita" Fanshell	*Cyprogenia sp. cf aberti*	19
Goldeye	*Hiodon alosoides*	19
Mooneye	*Hiodon tergisus*	19
American Brook Lamprey	*Lethenteron appendix*	19
Striped Mullet	*Mugil cephalus*	19
Ohio Pigtoe	*Pleurobema cordatum*	19
Bismark Burrowing Crayfish	*Procambarus parasimulans*	19

Gulf Mapleleaf	*Quadrula nobilis*	19
Lilliput	*Toxolasma parvum*	19
Texas Lilliput	*Toxolasma texasiense*	19
Pondhorn	*Uniomerus tetralasmus*	19
Highfin Carpsucker	*Carpiodes velifer*	17
Goldstripe Darter	*Etheostoma parvipinne*	17
Round Pigtoe	*Pleurobema sintoxia*	17
Little Spectaclecase group	*Villosa sp. cf lienosa*	17
Lake Chubsucker	*Erimyzon sucetta*	15
Swamp Darter	*Etheostoma fusiforme*	15
Shoal Chub	*Macrhybopsis hyostoma*	15
Saddleback Darter	*Percina vigil*	15
Southern Mapleleaf	*Quadrula apiculata*	15
Fawnsfoot	*Truncilla donaciformis*	15
Winter Stonefly	*Allocapnia malverna*	11

Aquatic Habitat Health

Aquatic habitats differ from terrestrial habitats in that the mobility of associated aquatic species is often limited to these habitats. Habitat alteration is the major cause of decline of aquatic diversity in the South. Channelization, impoundment, sedimentation and flow alterations are the most common physical habitat alterations associated with the decline of aquatic species (Etnier 1997, Burkhead and others 1997). Other human-induced impacts to aquatic species include pollution, introduced species and over-harvesting (Miller 1989). Habitat quality within a fresh- water ecosystem is determined by activities within the watershed (Abell 2000; Scott and others 2002). Therefore, the influence of these activities upon habitats, or waterbodies, can be described to determine the condition of the habitat. Arkansas chose to use six measures as markers of aquatic health. As a general rule, better aquatic health usually means fewer dams, fewer roads and road crossings, and more forested areas. Healthier riparian corridors have more forest buffer and fewer roads. The GIS methodology used to develop this information is provided in Appendix 4.1.

Indicators of Aquatic Condition

Dams in ecobasins

Table 5.38 shows the size of the ecobasin in square miles and the number of dams within the ecobasin, calculates the density of dams per square mile and ranks their density using Jenks Optimization. A lower numerical rank (1) indicates a higher density of dams in the ecobasin.

Ecobasin	Total Area (square miles)	Dam Count	Dam Density	Dam Density Rank
Mississippi River Loess Plains - St. Francis River	477	62	0.130	1
Mississippi River Loess Plains - White River	313	34	0.108	1
Ozark Highlands - Arkansas River	984	30	0.030	1
Arkansas Valley - White River	850	23	0.027	2
Ouachita Mountains - Ouachita River	3367	84	0.025	2
South Central Plains - Red River	3466	79	0.023	2
Mississippi Alluvial Plain - Arkansas River	1962	39	0.020	2
Ouachita Mountains - Red River	889	12	0.013	2
Mississippi Alluvial Plain (Bayou Bartholomew) - Ouachita River	491	6	0.012	3
Boston Mountains - Arkansas River	1758	21	0.012	3
Boston Mountains - White River	2876	25	0.009	3
Ouachita Mountains - Arkansas River	2051	12	0.006	4
Mississippi Alluvial Plain (Lake Chicot) - Mississippi River	1520	7	0.005	4
Arkansas Valley - Arkansas River	5285	20	0.004	4
South Central Plains - Ouachita River	9512	18	0.002	4
Ozark Highlands - White River	6553	11	0.002	5
Mississippi Alluvial Plain - White River	6403	10	0.002	5
Mississippi Alluvial Plain - St. Francis River	4123	5	0.001	5

Hydrologic modification is the manipulation or change of stream flow conditions. The altering of flow can be permanent and significant (such as a large impoundment) that creates a physical barrier to migration and movement of aquatic species. For many species of greatest conservation need, dams pose a significant threat to their viability. In addition to impeding flow, dams also affect physical attributes (such as water temperature, width, depth, instream flow) with corresponding impacts on SGCN.

The GIS dam layer was taken from EPA Basins and includes every impounding structure greater than six feet high within the state. This number was normalized by converting it to dams per square mile for each ecobasin. Table 5.38 ranks dam densities to indicate the relative degree of hydrologic disturbance among ecobasins.

Roads in ecobasins

Table 5.39 shows the size of the ecobasin in square miles and the calculated density of road miles per square mile area of ecobasin. The density is ranked using Jenks Optimization. A lower numerical rank (1) indicates a greater number of road miles in the ecobasin. Road density was calculated using the Tiger Census road data. The data was normalized by calculating miles of road per square mile.

Roads have a much greater influence on sediment production than do most landuse activities (cultivated lands are an exception). The range of road densities by ecobasin is broadly indicative of disturbance associated with increases in sediment. In Table 5.39, a lower numerical rank (1) indicates greater disturbance within an ecobasin.

Ecobasin	Total Area (square miles)	Road Density	Road Density Rank
Ozark Highlands - Arkansas River	984	4.102	1
Mississippi River Loess Plains - St. Francis River	477	3.424	1
Mississippi River Loess Plains - White River	313	3.268	1
Arkansas Valley - Arkansas River	5,285	2.570	1
Ouachita Mountains - Red River	889	2.544	2
Ouachita Mountains - Ouachita River	3,367	2.490	2
Ouachita Mountains - Arkansas River	2,051	2.420	2
Ozark Highlands - White River	6,553	2.336	3
Arkansas Valley - White River	850	2.270	3
Mississippi Alluvial Plain - St. Francis River	4,123	2.231	3
Mississippi Alluvial Plain - Arkansas River	1,962	2.219	3
South Central Plains - Ouachita River	9,512	2.157	4
South Central Plains - Red River	3,466	2.102	4
Mississippi Alluvial Plain - White River	6,403	1.906	4
Mississippi Alluvial Plain (Lake Chicot) - Miss. River	1,520	1.887	5
Boston Mountains - White River	2,876	1.853	5
Mississippi Alluvial Plain (Bayou Bartholomew) - Ouachita River	491	1.848	5
Boston Mountains - Arkansas River	1,758	1.665	5

Roads within riparian zones

The riparian zone includes 100 meters on each side of the stream reach. Table 5.40 shows the total area of the riparian zone in square miles within the ecobasin, calculates the density of road miles within the riparian zone and ranks the density using Jenks Optimization. A lower numerical rank (1) indicates a higher density of roads within the riparian zone in each ecobasin.

The Tiger Census roads data were clipped using the riparian shapefile created from the RF3s. From this, the road density within riparian areas was calculated for each ecobasin. This was normalized by calculating the miles of road per square mile of riparian area for each ecobasin.

The effects of road density within riparian areas are similar to those of ecobasin road density: general increases in sediment but may also include flowage disturbance and impediment to movement and migration of aquatic species. In table 5.39, a lower numerical rank (1) expresses greater hydrologic disturbance indicative of a more direct effect of roads within a sensitive riparian area.

Table 5.40

Ecobasin	Total Riparian Area (Sq. Miles)	Road Density	Riparian Road Density Rank
Ozark Highlands - Arkansas River	177	3.38	1
Ouachita Mountains - Ouachita River	730	2.37	1
Mississippi Alluvial Plain (Lake Chicot) - Miss. River	412	2.37	2
Mississippi River Loess Plains - St. Francis River	113	2.29	2
Mississippi Alluvial Plain - St. Francis River	914	2.27	2
Mississippi River Loess Plains - White River	79	2.26	2
Ouachita Mountains - Arkansas River	451	2.24	2
Mississippi Alluvial Plain - Arkansas River	534	2.07	2
Ouachita Mountains - Red River	127	1.93	3
Arkansas Valley - Arkansas River	1,221	1.91	3
Mississippi Alluvial Plain (Bayou Bartholomew) - Ouachita River	151	1.90	3
Ozark Highlands - White River	1,364	1.85	3
Mississippi Alluvial Plain - White River	1,578	1.73	3
Boston Mountains - White River	506	1.69	4
Arkansas Valley - White River	207	1.66	4
Boston Mountains - Arkansas River	309	1.41	5
South Central Plains - Red River	734	1.30	5
South Central Plains - Ouachita River	2,211	1.29	5

Road crossings in ecobasins

Table 5.41 shows the size of the ecobasin in square miles and the calculated density of road crossings of waterways per square mile area of ecobasin. The density is ranked using Jenks Optimization. A lower numerical rank (1) indicates a greater number of road crossings in the ecobasin.

Road crossing within ecobasins are an indicator of hydrologic modification with manipulation or change of stream flow conditions. The altering of flow can be temporal as in a stream crossing that limits the migration and movement of many aquatic species, in part or completely. In many cases, increased sedimentary loads or poorer water quality are associated with road crossings.

Roads and crossings were calculated by intersecting the Tiger roads layer with the RF3 layer. This number was normalized by converting it to crossings per square mile for each ecobasin. Table 5.40 indicates the relative degree of hydrologic disturbance associated with road crossings (among ecobasins).

Table 5.41

Ecobasin	Total Area (Sq. Miles)	Crossing density	Road Crossing Density Rank
Ozark Highlands - Arkansas River	984	2.05	1
Mississippi River Loess Plains - White River	313	1.91	1
Mississippi River Loess Plains - St. Francis River	477	1.76	1
Arkansas Valley - Arkansas River	5,285	1.61	1
Ouachita Mountains - Arkansas River	2,051	1.43	2
Ouachita Mountains - Ouachita River	3,367	1.42	2
Arkansas Valley - White River	850	1.40	2
South Central Plains - Ouachita River	9,512	1.19	3
Mississippi Alluvial Plain - St. Francis River	4,123	1.17	3
Ozark Highlands - White River	6,553	1.09	3
Mississippi Alluvial Plain (Lake Chicot) - Miss. River	1,520	1.08	4
Mississippi Alluvial Plain - White River	6,403	1.05	4
Mississippi Alluvial Plain - Arkansas River	1,962	1.00	4
South Central Plains - Red River	3,466	1.00	4
Ouachita Mountains - Red River	889	0.80	5
Mississippi Alluvial Plain (Bayou Bartholomew) - Ouachita River	491	0.77	5
Boston Mountains - White River	2,876	0.77	5
Boston Mountains - Arkansas River	1,758	0.67	5

Forested areas in ecobasins

Table 5.42 shows the size of the ecobasin in square miles, percent of forested area per square mile and ranks their density using Jenks Optimization. A lower numerical rank (1) indicates a lower percentage of forested area in the ecobasin.

The percent of each ecobasin that was forested was calculated using the 1994 National Land Cover Database (NLCD). Though somewhat dated, it is the most current available. A newer NLCD version should be available in the near future, when it can be compared to the existing NLCD as a monitoring exercise.

The percent of forest in ecobasins was used as a watershed condition parameter because Scott and Helfman (2002) demonstrated that as watersheds become less forested, the relative abundance of native endemic species decline. This measure broadly addresses aquatic condition based on landuse. A lower numerical rank (1) in Table 5.42 indicates a poorer condition and a lower percentage of forested area in the ecobasin.

Table 5.42

Ecobasin	Total Area (Sq. Miles)	Percent forested	Rank
Mississippi Alluvial Plain - St. Francis River	4,123	11	1
Mississippi Alluvial Plain (Lake Chicot) - Miss. River	1,520	17	1
Mississippi Alluvial Plain (Bayou Bartholomew) - Ouachita River	491	23	2
Mississippi Alluvial Plain - Arkansas River	1,962	25	2
Ozark Highlands - Arkansas River	984	31	3
Mississippi Alluvial Plain - White River	6,403	24	2
Mississippi River Loess Plains - White River	313	53	3
Mississippi River Loess Plains - St. Francis River	477	56	3
Arkansas Valley - Arkansas River	5,285	56	4
South Central Plains - Red River	3,466	66	4
Ozark Highlands - White River	6,553	70	4
Arkansas Valley - White River	850	70	4
Boston Mountains - White River	2,876	83	5
Ouachita Mountains - Arkansas River	2,051	87	5
Ouachita Mountains - Ouachita River	3,367	89	5
South Central Plains - Ouachita River	9,512	88	5
Ouachita Mountains - Red River	889	89	5
Boston Mountains - Arkansas River	1,758	90	5

Forested areas within riparian zones

The riparian zone includes 100 meters on each side of the stream reach. The data presented here show the total area of riparian zone within an ecobasin, the calculated percentage of forest occurring within the riparian zone and ranks the percentage using Jenks Optimization. A lower numerical rank (1) indicates a lower percentage of forest within the riparian zone in each ecobasin.

Disturbance within areas immediately adjacent to streams or lakes is generally associated with direct disturbance to aquatic integrity. This measure assumes that a forested riparian area is less likely to be impaired than an urbanized or cultivated riparian area. Forested riparian areas provide shading over a stream, affecting water temperature; provide habitat for vertebrates and invertebrates; provide bank stability and thus, better sediment control and filtering capability and provide an energy source for the aquatic species ecosystem.

Within the GIS data, riparian areas were created by buffering (100 feet) the EPA RF3 data layer (lakes and streams). This area was then overlain with the landuse layer. The percent of the riparian area that was forested (not pasture, cultivated, mined or urban) was determined for each ecobasin.

Table 5.43 compares the extent of direct disturbance to aquatic systems within ecobasins. A higher numerical rank (5) indicates a higher percentage of forest (better condition) within the riparian zone of each ecobasin.

Table 5.43. Total area of riparian zone within ecobasins, the calculated percentage of forest occurring within riparian zones and rank.

Ecobasin	Total Riparian Area (Sq. Miles)	Percent Forested	Rank
Mississippi Alluvial Plain - St. Francis River	914	16	1
Mississippi Alluvial Plain (Lake Chicot) - Miss. River	412	18	1
Mississippi Alluvial Plain (Bayou Bartholomew) - Ouachita	151	29	2
Mississippi Alluvial Plain - Arkansas River	534	32	2
Ozark Highlands - Arkansas River	177	32	2
Mississippi Alluvial Plain - White River	1,578	33	2
Mississippi River Loess Plains - White River	79	51	3
Mississippi River Loess Plains - St. Francis River	113	54	3
Arkansas Valley - Arkansas River	1,221	58	3
South Central Plains - Red River	734	68	4
Ozark Highlands - White River	1,364	70	4
Arkansas Valley - White River	207	72	4
Boston Mountains - White River	506	83	5
Ouachita Mountains - Arkansas River	451	85	5
Ouachita Mountains - Ouachita River	730	88	5
South Central Plains - Ouachita River	2,211	89	5
Ouachita Mountains - Red River	127	89	5
Boston Mountains - Arkansas River	309	90	5

Ranking and overall condition

Each of these criteria (dams in ecobasins, roads in ecobasins, roads within riparian zones, road crossings in ecobasins, forested areas in ecobasins, and forested areas within riparian zones) is unique. The effects of road density within riparian areas cannot be directly compared with the percent of the ecobasin that is forested. By calculating a total of the rankings by ecobasin, it is possible to express an overall ecobasin condition to provide an extremely broad measure to monitor. These indicators can be re- run for the biennial AWAP symposia to evaluate trends.

The Ozark Highlands - Arkansas River ecobasin Habitat Score (9 out of a possible 30) demonstrate the greatest degree of anthropogenic impacts. This is an area that is urbanizing rapidly under considerable development pressure. A lower overall score implies greater disturbance and impaired waters.

In contrast, the Boston Mountains - Arkansas River ecobasin (with a 28 score out of a possible 30), an ecobasin that lies adjacent to the Ozark Highlands - Arkansas River, is far more undeveloped with much of the land protected within the Ozark National Forest. This ecobasin is known for high quality streams from water quality, recreational and aquatic biota standpoints.

In table 5.44, the sum of ranks is an indicator of overall aquatic habitat condition. A higher score implies a less disturbed aquatic condition. The lowest (least disturbed) possible score is 5 and the highest (most disturbed) possible score is 30.

Table 5.44. Aquatic Habitat Scores.

Ecobasin	Dam Density Rank	Road Density Rank	Riparian Road Density Rank	Crossing Density Rank	Percent Forest Rank	% Forest in Riparian Rank	Sum of Ranks
Ozark Highlands - Arkansas River	1	1	1	1	3	2	9
Mississippi Valley Loess Plains - St. Francis River	1	1	2	1	3	3	11
Mississippi Valley Loess Plains - White River	1	1	2	1	3	3	11
Mississippi R. Alluvial Plain - Arkansas River	2	3	2	4	2	2	15
Mississippi R. Alluvial Plain - St. Francis River	5	3	2	3	1	1	15
Arkansas Valley - Arkansas River	4	1	3	1	4	3	16
Mississippi River Alluvial Plain - Mississippi River	4	5	2	4	1	1	17
Ouachita Mountains - Ouachita River	2	2	1	2	5	5	17
Arkansas Valley - White River	2	3	4	2	4	4	19
Mississippi River Alluvial Plain - Ouachita River	3	5	3	5	2	2	20
Mississippi R. Alluvial Plain - White River	5	4	3	4	2	2	20
Ouachita Mountains - Arkansas River	4	2	2	2	5	5	20
Ouachita Mountains - Red River	2	2	3	5	5	5	22
Ozark Highlands - White River	5	3	3	3	5	4	23
South Central Plains - Red River	2	4	5	4	4	4	23
South Central Plains - Ouachita River	4	4	5	3	5	5	26
Boston Mountains - White River	3	5	4	5	5	5	27
Boston Mountains - Arkansas River	3	5	5	5	5	5	28



Boston Mountains - White River (Cave Creek)

Photo by Jane Anderson

Section 6. Informing and Engaging the Public

Continuing Efforts for Informing and Engaging the Public

Since the approval of the first version of the Wildlife Action Plan, Arkansas has continued to foster public and scientific community involvement in planning and implementation in a number of ways.

Engaging the Scientific Community

Continued Representation by Partners on the Steering Committee, Implementation Committee, and Taxa Teams. The process of developing the Arkansas Wildlife Action Plan resulted in strong partner relationships and support for implementing the plan. Partners from various agencies serve on committees and taxa teams that determine the highest priority actions and select projects for state wildlife grant funding. Input from the scientific community is requested on all state wildlife grant project proposals. In addition, partners were instrumental in the 2015 revision and updating of the Plan.

Table 6.1 AWAP Implementation Committee Members. The Implementation Committee reviews project proposals and makes recommendations for funding.

Name	Association
Allison Fowler	Arkansas Game and Fish Commission
Ricky Chastain	Arkansas Game and Fish Commission
Brad Carner	Arkansas Game and Fish Commission
Chris Racey	Arkansas Game and Fish Commission
Melvin Tobin	U.S. Fish and Wildlife Service
Scott Simon	The Nature Conservancy
Chris Colclasure	The Arkansas Natural Heritage Commission

Table 6.2. AWAP Steering Committee Members. The Steering Committee reviews the priority lists provided by the taxa and habitat teams and determines the highest priorities to be included in a request for proposals for state wildlife grant funding.

Name	Association
Allison Fowler	Arkansas Game and Fish Commission
A.J. Riggs	Arkansas Game and Fish Commission
Eric Brinkman	Arkansas Game and Fish Commission
Chris Davidson	U.S. Fish and Wildlife Service
Dan Schieman	Audubon Arkansas
Doug Zollner	The Nature Conservancy
Bill Holimon	The Arkansas Natural Heritage Commission
Betty Crump	U.S. Forest Service

Table 6.3. Taxa and Habitat Team Members. The taxa and habitat teams review the needs and status of SGCN and their habitats every two years and develop a list of funding priorities for each taxonomic group and habitat category. Names listed here include those who attended taxa team meetings from 2010-2015. Members with an asterisk (*) contributed to the 2015 AWAP revision by providing information, writing species or habitat accounts, and/or reviewing accounts.

Mammal Team	
Blake Sasse*, Chair	Arkansas Game and Fish Commission
Raymond Benjamin	National Park Service
Jacob Bokker	Arkansas Game and Fish Commission
Allen Cathey	Arkansas Game and Fish Commission
Matthew Connior	Southern Arkansas University
Betty Crump	U.S. Forest Service
Jason Honey	Arkansas Game and Fish Commission
Melissa Lombardi*	U.S. Fish and Wildlife Service
Tom Nupp	Arkansas Tech University
Roger Perry*	U.S. Forest Service
Tom Risch*	Arkansas State University
David Saugey*	U.S. Forest Service
Renn Tumlinson*	Henderson State University
Don White	University of Arkansas-Monticello
Bird Team	
Karen Rowe*, Chair	Arkansas Game and Fish Commission
Leif Anderson*	U.S. Forest Service
Dick Baxter*	Arkansas Game and Fish Commission
Than Boves*	Arkansas State University
Michael Budd*	U.S. Fish and Wildlife Service
Brad Carner	Arkansas Game and Fish Commission
Garrick Dugger*	Arkansas Game and Fish Commission
Steve Duzan*	U.S. Forest Service
Allison Fowler*	Arkansas Game and Fish Commission
Steven Fowler	Arkansas Game and Fish Commission
David Graves	Arkansas Game and Fish Commission
Bubba Groves	Arkansas Game and Fish Commission
Bill Holimon*	Arkansas Natural Heritage Commission
Brad Hufhines	Beaver Water District
Clifton Jackson	Arkansas Game and Fish Commission
Chris Kellner*	Arkansas Tech University
Erin Knoll*	U.S. Fish and Wildlife Service
David Krementz*	USGS Cooperative Fish and Wildlife Unit
Matt Mourot	Arkansas Game and Fish Commission
Allan Mueller*	Citizen; retired U.S. Fish and Wildlife Service
Luke Naylor*	Arkansas Game and Fish Commission
Douglas Osborne*	University of Arkansas-Monticello
Seth Pearson	The Nature Conservancy
Dan Scheiman*	Audubon Arkansas
Doyle Shook	Lower Mississippi Valley Joint Venture

Kim Smith*	University of Arkansas
Fish Team	
Jeff Quinn*, Chair	Arkansas Game and Fish Commission
Ginny Adams*	University of Central Arkansas
Reid Adams	University of Central Arkansas
Eric Brinkman*	Arkansas Game and Fish Commission
Lindsey Bruckerhoff	University of Arkansas
Steve Filipek	Arkansas Game and Fish Commission
Brook Fluker	Arkansas State University
Charlie Gagen	Arkansas Tech University
Cory Gallipeau	The Nature Conservancy
Jessie Green*	Arkansas Department of Environmental Quality
Shawn Hodges	National Park Service
John Jackson	Arkansas Tech University
Lindsey Lewis*	U.S. Fish and Wildlife Service
Dustin Lynch*	University of Arkansas
Dan Magoulick	University of Arkansas
Mark Oliver	Arkansas Game and Fish Commission
Cindy Osborne	Arkansas Natural Heritage Commission
Todd Slack	U.S. Army Corps of Engineers
Tim Snell	The Nature Conservancy
Rich Standage	U.S. Forest Service
Justin Stroman	Arkansas Game and Fish Commission
Jason Throneberry*	Arkansas Natural Heritage Commission
Brian Wagner*	Arkansas Game and Fish Commission
Nathan Wentz*	Arkansas Department of Environmental Quality
Jim Wise	Arkansas Department of Environmental Quality
Jonathan Young	Audubon Arkansas
Mussel Team	
Bill Posey*, Chair	Arkansas Game and Fish Commission
Chris Davidson	U.S. Fish and Wildlife Service
John Harris*	Arkansas State University
Josh Seagraves	Arkansas Highway and Transportation Department
Ben Thesing	Arkansas Highway and Transportation Department
Crayfish Team	
Brian Wagner*, Chair	Arkansas Game and Fish Commission
Daniel Magoulick	University of Arkansas
Herpetofauna Team	
Kelly Irwin*, Chair	Arkansas Game and Fish Commission
Ben Cash	University of Central Arkansas
Matthew Gifford	University of Central Arkansas
Glenn Manning	University of Arkansas-Monticello
Don Shepard	University of Central Arkansas
John Willson	University of Arkansas
Insects/Other Invertebrates Team	
William Baltosser*	University of Arkansas-Little Rock

Van Brahana	University of Arkansas
Charles Ely	Retired
Scott Longing	University of Arkansas
Craig Rudolph	U.S. Forest Service
Samantha Scheiman*	Arkansas Natural Heritage Commission
Brian Wagner	Arkansas Game and Fish Commission
Stephen Yanoviak	University of Arkansas-Little Rock
Aquatic Habitat Team	
Joy DeClerk	The Nature Conservancy
Sally Entrekin	University of Central Arkansas
Michelle Evans-White	University of Arkansas
Steve Filipek	Arkansas Game and Fish Commission
Charlie Gagen	Arkansas Tech University
Brian Haggard	University of Arkansas
Ethan Inlander	The Nature Conservancy
Doug Leasure	University of Arkansas
Matt Lindsey	The Nature Conservancy
David Long	Arkansas Game and Fish Commission
Daniel Millican	The Nature Conservancy
Jason Milks	The Nature Conservancy
Stephen O'Neal	Arkansas Game and Fish Commission
Jennifer Sheehan	Arkansas Game and Fish Commission
Jason Throneberry	Arkansas Natural Heritage Commission
Keith Whalen	U.S. Forest Service
Terrestrial Habitat Team	
A.J. Riggs, Chair	Arkansas Game and Fish Commission
Jennifer Akin	Arkansas Natural Heritage Commission
Martin Blaney*	Arkansas Game and Fish Commission
Brad Carner	Arkansas Game and Fish Commission
Ricky Chastain	Arkansas Game and Fish Commission
James Foster	Arkansas Game and Fish Commission
Tom Foti*	Arkansas Natural Heritage Commission
Allison Fowler	Arkansas Game and Fish Commission
Daniel Greenfield	Arkansas Game and Fish Commission
Clint Harris	The Nature Conservancy
Jason Honey	Arkansas Game and Fish Commission
Mark Hutchings	Arkansas Game and Fish Commission
Clifton Jackson	Arkansas Game and Fish Commission
Clint Johnson	Arkansas Game and Fish Commission
Joe Krystofik	U.S. Fish and Wildlife Service
Terri Lane	Northwest Arkansas Land Trust
Katherine Larson	University of Central Arkansas
Karen Rowe*	Arkansas Game and Fish Commission
Carl Scott	National Park Service
Jeffrey Taverner	Arkansas Game and Fish Commission
Ray Wiggs	Arkansas Game and Fish Commission

Barbara Wilson	National Park Service
Ted Zawislak	Arkansas Game and Fish Commission
Doug Zollner*	The Nature Conservancy
Karst Habitat Team	
Mike Slay*, Chair	The Nature Conservancy
Chuck Bitting	National Park Service
Levi Horrell	Arkansas Game and Fish Commission
Trevor Mills	Arkansas Game and Fish Commission
Ron Redman	Mitigation Surveying Services, LLC
Brian Wagner	Arkansas Game and Fish Commission
Mitch Wine	U.S. Fish and Wildlife Service

Biennial Wildlife Action Plan Symposium. Since 2006, a Wildlife Action Plan Symposium has been held every 2 years to bring partners together for collaboration. At the Symposium, results from state wildlife grant funded projects are presented. Also, the taxa teams and habitat teams meet to review the top needs for species and habitats. They select the highest conservation actions, research, and monitoring priorities to be funded with state wildlife grant dollars. Attendance at the symposium has increased each time and a number of partners from state and federal agencies, non-governmental organizations, and universities are represented.



2014 AWAP Symposium

Wildlife Arkansas Website. The Arkansas Wildlife Action Plan website serves as the primary clearinghouse for wildlife action plan information and news (www.wildlifearkansas.com). State wildlife grant apportionment amounts and requests for proposals are available on the website. Final reports from state wildlife grant funded projects are also distributed on the website. In addition, digital versions of the Wildlife Action Plan and AWAP database are available for download.



Engaging the Public

Use of Media. Every opportunity to relay information on species of greatest conservation need to the public is taken. Presentations on SGCN have been given to Boy Scout troops, school groups, and master naturalist groups. Success stories for SGCN as a result of state wildlife grants are disseminated as often as possible, typically through AGFC's weekly Arkansas Outdoors newsletter.



Arkansas Outdoors newsletter story on successful SWG project

2015 AWAP Revision Conservation Partner Input. Input from conservation partners was requested for the revision of the Plan at the beginning of the revision period. Specifically, at the 2012 AWAP Symposium, the needs for review and revision were presented to the group and they were tasked with beginning the review for their taxa and/or habitat. After the Symposium, all teams held meetings or conference calls to finish updates and revisions. All teams had representatives from multiple agencies (see Table 6.3). In addition to reviewing species and habitat information, partners were asked to review and provide comments on the draft Plan in its entirety summer of 2016. An email with a link to the draft Plan was sent out to the entire mailing list of partners.

2015 AWAP Revision Public Input. As part of the required public input process for the revision of the Plan, a draft of the updated plan was made available to the public via the Arkansas Wildlife website. A notice of the review/comment period was disseminated via the Arkansas Democrat-Gazette newspaper, which is distributed statewide. The notice ran from August 13 through August 27, 2016. Requests for public comments were also distributed on the AGFC website, the AGFC Facebook page, and the AGFC Arkansas Outdoors newsletter. The wildlife diversity program coordinator also conducted a radio interview on the Plan revision, which aired on public radio channels in northwest and central Arkansas. A period of 31 days was given for the public to provide suggestions and comments for the Plan. Arkansas does not have any federally recognized Native American tribes, so no specific contacts were made to this group.

Comments received were few. Comments were reviewed and changes were incorporated into the Plan, where necessary.

Section 7. Climate Change in Arkansas

Introduction

In the last several years, evidence suggesting detrimental effects from changing climate patterns has increased and stirred concern within the conservation community. In 2010, Arkansas cited climate change as an emerging threat to species and habitats within the Arkansas Wildlife Action Plan (AWAP). The incorporation of climate change into the AWAP, as part of the required revision process, is a recommended best practice from The Association of Fish and Wildlife Agencies (AFWA 2012). Incorporating climate change into the AWAP provides us an opportunity to be proactive in our approach, consistent with other state's wildlife action plans and efforts, and to be included in funding opportunities that may arise for addressing climate change impacts. This chapter will provide a general overview of climate science, a synopsis of projected changes to Arkansas's climate, a discussion of anticipated impacts to Arkansas's habitats and species of greatest conservation need, and a strategy to adapt to predicted changes.

Background

In regards to climate change, it is important to understand the distinction between climate and weather. Weather is a set of the meteorological conditions for a given point in time in one particular place, while climate is the average, long-term (30 years or more) meteorological conditions and patterns for a geographic area (Brandt and others 2014). Climate change is defined as a change in the state of the climate that can be identified (e.g., by using statistical tests) by changes in the mean and/or the variability of its properties, that persists for an extended period, and that is attributed to either natural variability or human-related activities (IPCC 2007).

Analyses of climate data from as long ago as 1880, show that the Earth's surface temperature has increased by more than 1.4°F over the past 100 years, with much of the increase taking place over the past 35 years (National Research Council 2012). Warming temperatures are often attributed to an increase in greenhouse gas emissions, particularly carbon dioxide, which increased 80% between 1970 and 2004 (IPCC 2007).

To model future climate change, scientists utilize various general circulation models (GCM). Climate change analysis becomes more complex for the future than the past because there is not

one time-series of climate, but rather many future projections from different GCMs run with a range of CO^2 emissions scenarios (IPCC 2007). It is important not to analyze only one GCM for any given emission scenario, but rather to use ensemble analysis to combine the analyses of multiple GCMs and quantify the range of possibilities for future climates under different emissions scenarios. Human population growth and related greenhouse gas emissions and changes in land cover have been modeled under various scenarios in order to project future trends for global temperature and precipitation.

SRES refers to the scenarios described in the IPCC Special Report on Emissions Scenarios (IPCC 2007). The SRES scenarios are grouped into four scenario categories (A1, A2, B1 and B2) that characterize various urban development pathways, covering a wide range of demographic, economic and technological driving forces and resulting GHG emissions. These emissions projections are widely used in the assessments of future climate change.

Under the A2 scenario, we see rapid economic growth, a global population that peaks in mid-century and no reduction in emission levels. The B1 scenario also describes a global population that peaks mid-century, but with a shift toward sustainable energy and a significant reduction in global emissions. The A1B scenario describes a moderate reduction in emissions levels.

Projected Changes for Arkansas

The Nature Conservancy's climate wizard is a widely accepted, interactive web tool that incorporates data from IPCC climate models and can be used to assess how climate has changed over time and to project what future changes are likely to occur in a given area. It uses a non-parametric quantile-rank approach that maps out the 0 (minimum), 20, 40, 50 (median), 60, 80, and 100th (maximum) percentiles. Here we display maps produced by the Climate Wizard for changes in mean temperature and precipitation for Arkansas using an ensemble of GCMs and the 3 more widely accepted emissions scenarios (A2, A1B, and B1) for 50 years into the future (Girvetz and others 2009).

Temperature

Historical average temperature for Arkansas ranged from 58 to 63 degrees between 1895 and 2013 (Figure 7.1).

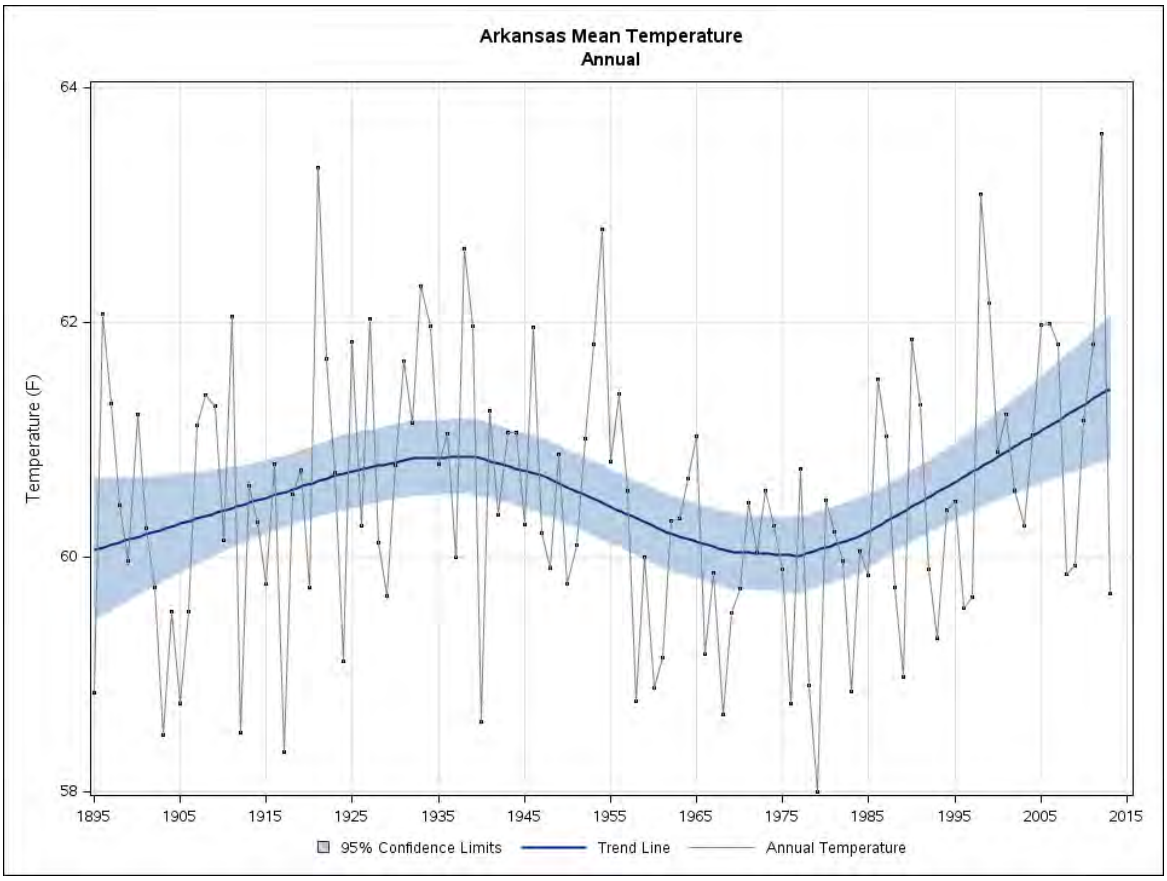


Figure 7.1. Mean annual temperature for years 1895-2013 for Arkansas. Map produced by NOAA Climatic Data Center.

Average annual temperature by mid-century (2050) is expected to increase under each emissions scenario. The most significant increase is predicted under the moderate emissions scenario (5.1°F). Under this scenario, the change in temperature is more widespread across the state (Figure 7.2). Under the high emissions scenario, an average increase of 4.9°F is anticipated, with a higher increase in the northwest part of the state (Figure 7.3). Even with a dramatic decrease in emissions under the B1 scenario, the average annual temperature is predicted to increase by 3.6°F (Figure 7.4).

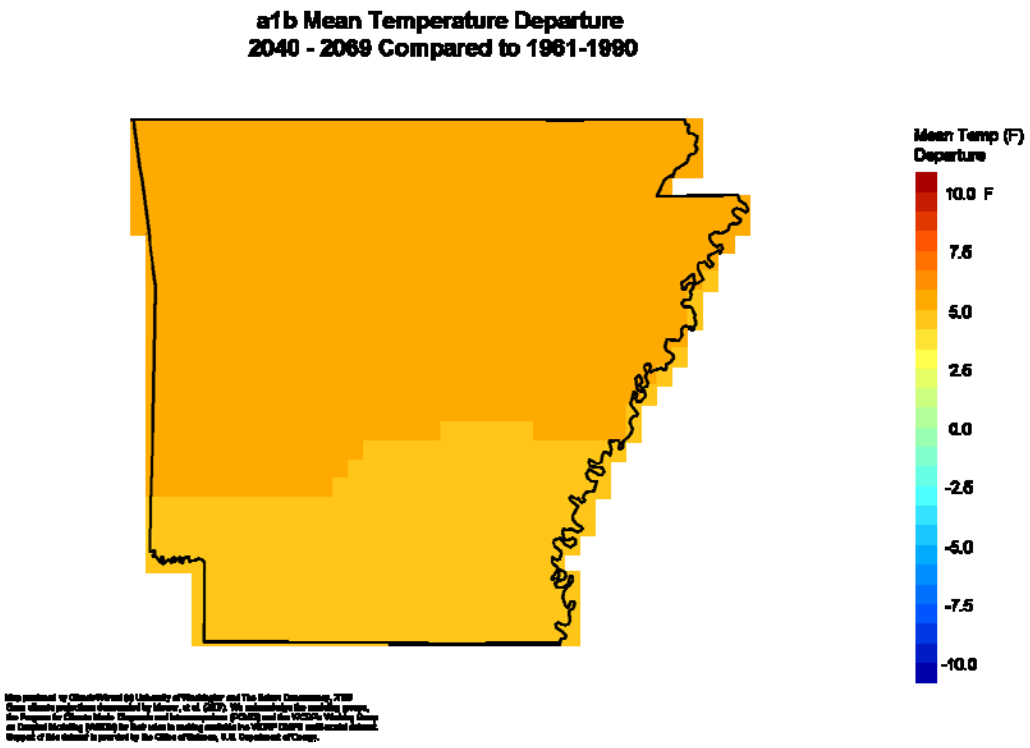


Figure 7.2. Predicted change in mean temperature in the next 50 years for Arkansas under the moderate emissions scenario (A1B).

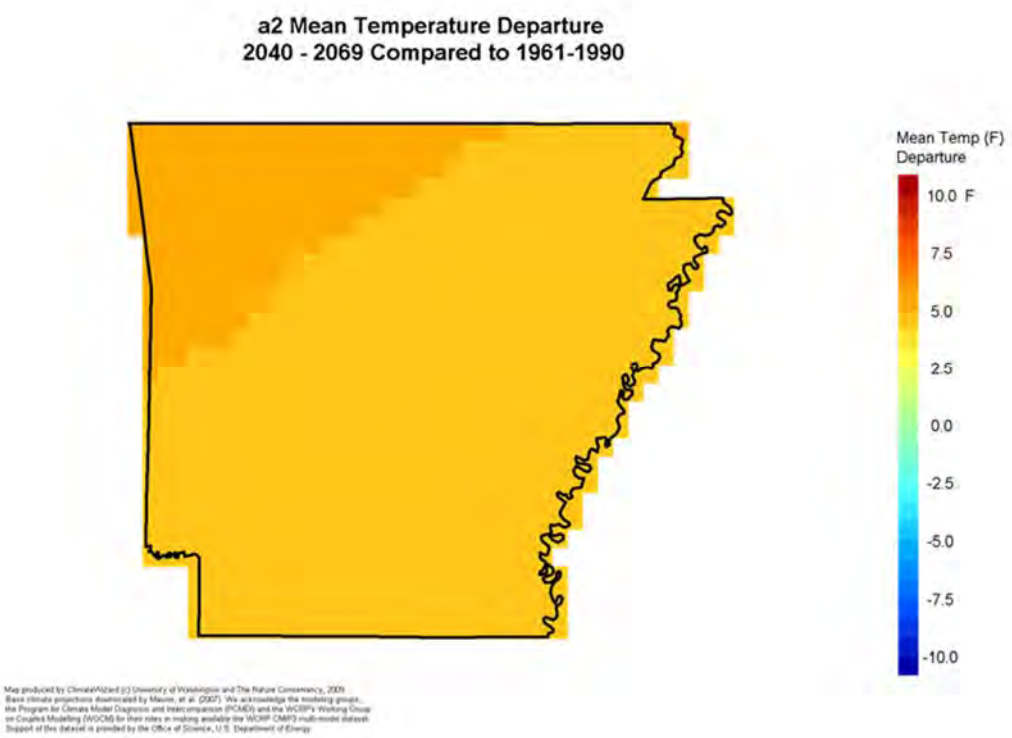


Figure 7.3. Predicted change in mean temperature in the next 50 years for Arkansas under the high emissions scenario (A2).

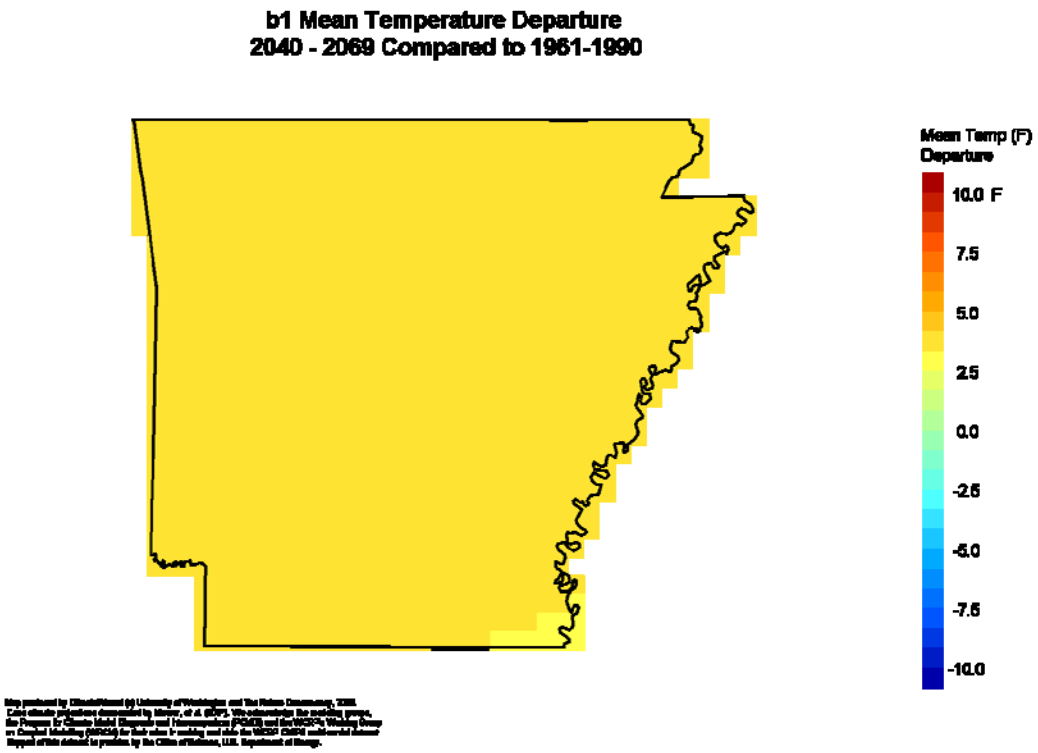


Figure 7.4. Predicted change in mean temperature in the next 50 years for Arkansas under the low emissions scenario (B1).

Precipitation

The average annual precipitation for Arkansas from 1951 to 2006 was 49.4 inches. During this timeframe, the average increased by a rate of 0.101% per year. Global predictions for precipitation changes into the future point to an overall decrease. This may be because the Southeast is located in the transition zone between projected wetter conditions to the north and drier conditions to the southwest. The average change in precipitation for Arkansas by mid-century is predicted to be +1.65%, - 0.79%, and +1.74% under the A2, A1B, and B1 scenarios, respectively (Figures 7.6, 7.7, and 7.8). Under each scenario, the southern portion of the state would see the greatest decrease in precipitation. Though there is uncertainty among the scenarios in projected precipitation amounts, rising temperatures will account for an increased rate of evapotranspiration, and a decrease in available water (Kunkel and others 2013, Carter and others 2013). Further, climate change models project that precipitation will be produced in fewer and heavier rainfall events. If so, this could lead to a decrease in aquifer recharge because more rainfall would be lost to runoff and could also result in an increase in both drought and flooding

events. The southeast region is thus predicted to see a significant reduction in water availability (Carter and others 2014).

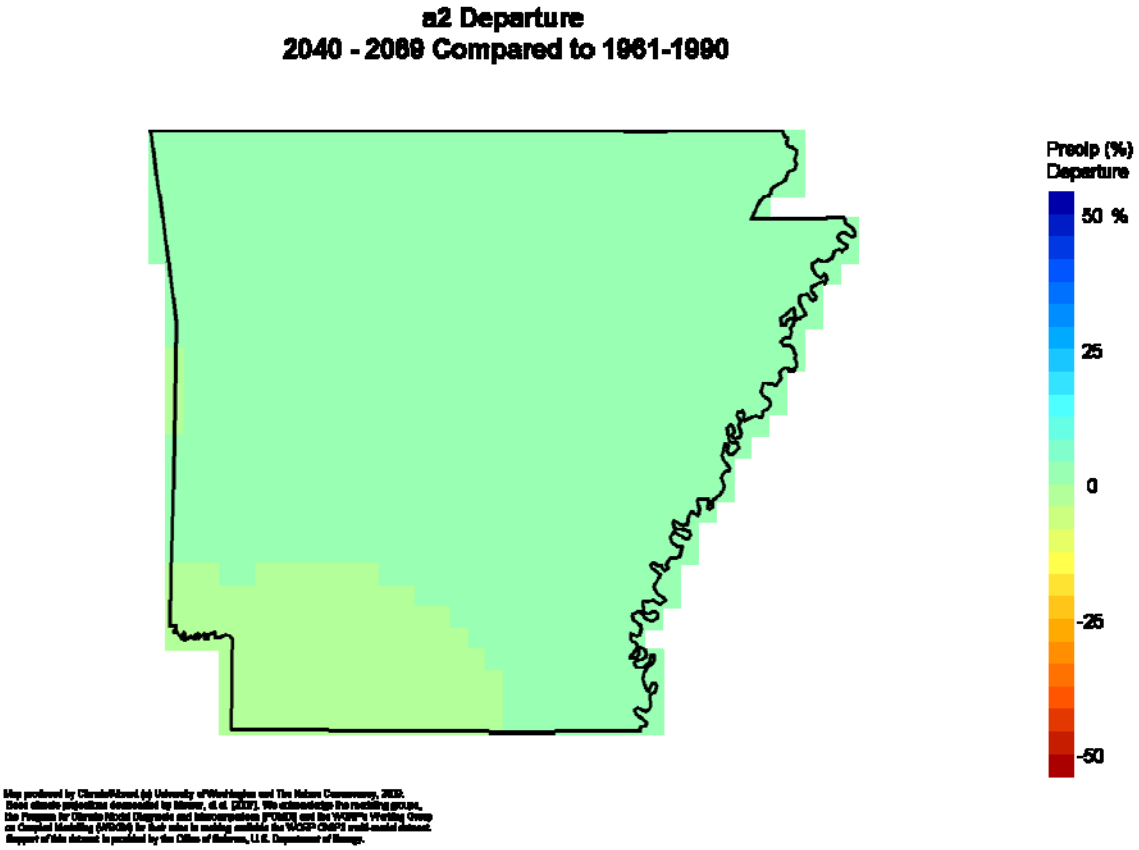


Figure 7.5. Predicted change in mean precipitation in the next 50 years for Arkansas under the high emissions scenario (A2).

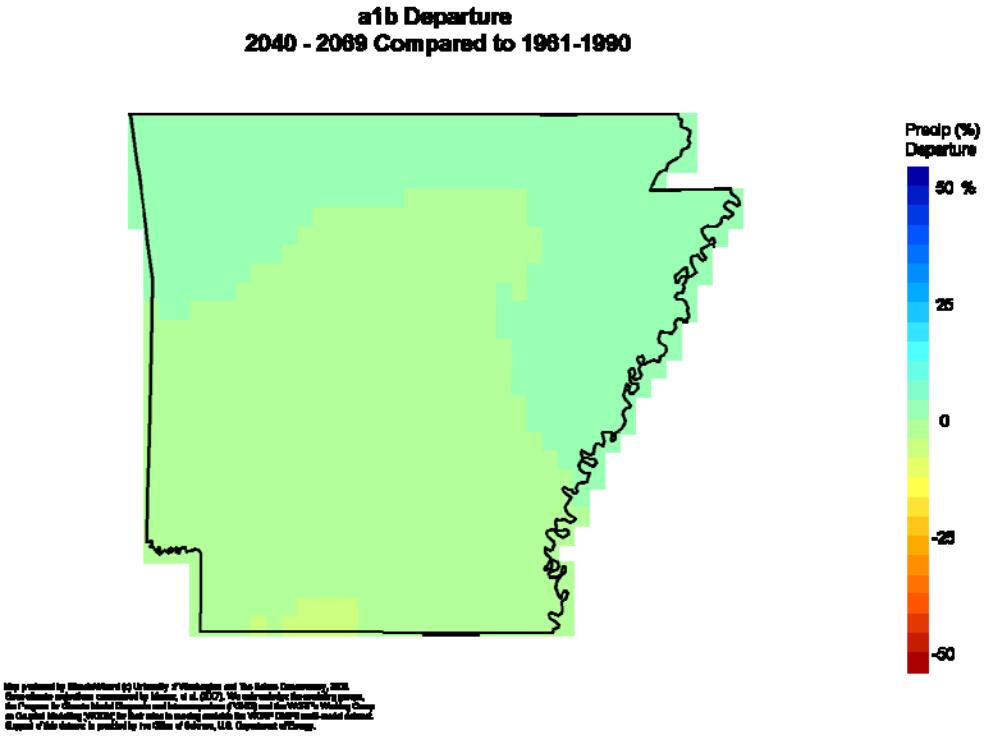


Figure 7.6. Predicted change in mean precipitation in the next 50 years for Arkansas under the moderate emissions scenario (A1B).

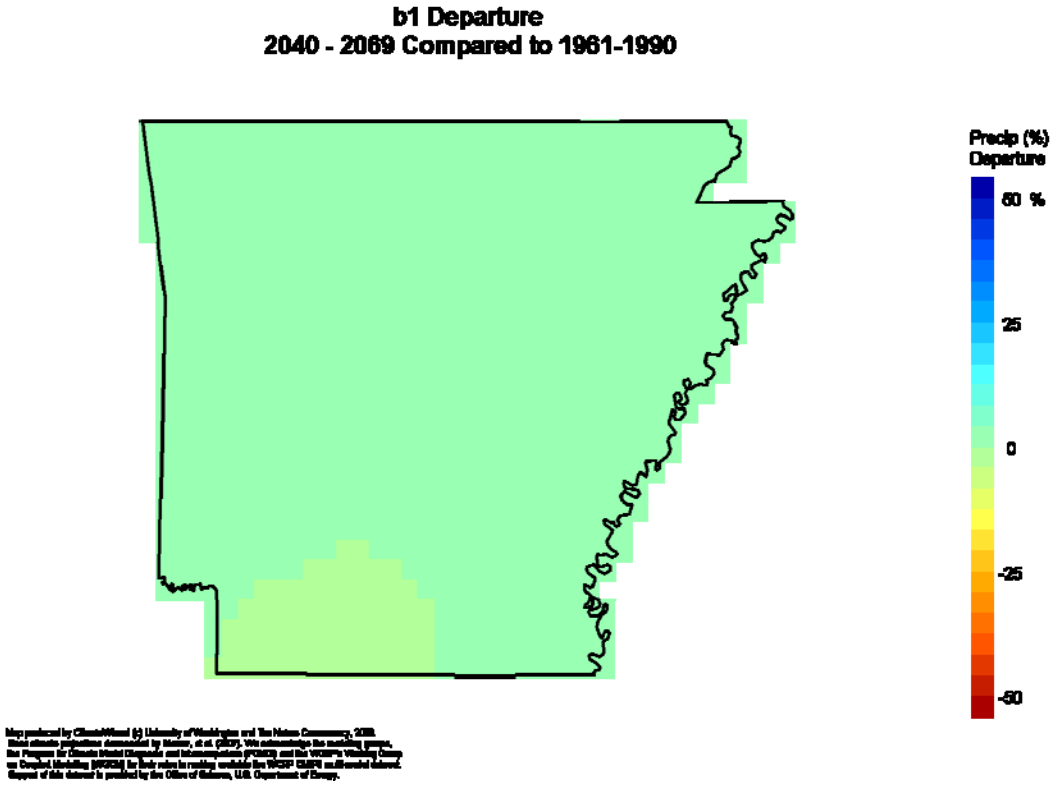


Figure 7.4. Predicted change in mean precipitation in the next 50 years for Arkansas under the low emissions scenario (B1).

Potential Impacts to Habitats

The Arkansas Wildlife Action Plan identifies 37 terrestrial and 18 aquatic habitat types that occur within the state. These habitats are threatened by many factors, including fire suppression, habitat alteration and fragmentation, invasive species, and diversion of water. Changes to climate could potentially exacerbate existing threats within many habitats.

Terrestrial Habitats

With an anticipated increase in temperature and overall drier conditions, habitats that are drought-tolerant could fare better under future projected climate scenarios. In Arkansas, these habitats would include glades and barrens, dry upland forests, and open woodlands/savannas. These conditions could also favor more wildfires on the landscape, thus potentially expanding these communities and improving habitat conditions for associated SGCN species.

Mesic forests would be more at risk to compositional changes due to drier conditions. Some of the species associated with these forests, such as sugar maple, would be expected to decrease (Brandt and others 2014). The dominance in these communities would shift to more tolerant species, such as sweetgum, white oak, and red maple. Forests in general could experience a decrease in basal area and canopy cover if trees are stressed by higher temperatures or rates of pest outbreaks increase.

Bottomland systems could be negatively impacted by the reduction of water coverage and altered hydrology. Forest cover in this system would be expected to increase with extended periods of dry weather and reduced water coverage. Seasonal/herbaceous wetlands and ephemeral ponds would especially be at risk for contraction and reduced habitat quality. In agricultural areas, such as the Mississippi Alluvial Plain, flood events could introduce herbicide and pesticide run-off into wetlands. Flood events would also increase sedimentation in wetlands and streams.

With overall warmer temperatures, conditions would be favorable for more non-native plant species from sub-tropical regions to invade communities. This would be especially true in areas where native species decline. Invasive non-native species would be an increased threat to all terrestrial habitats.

Aquatic Habitats

Aquatic systems could see substantial impacts from a changing climate. A reduction in available water, either due to decreased precipitation or increased evapotranspiration, would result in reduced stream flows and altered hydrology. Warmer air temperatures would result in increased water temperatures and reduced dissolved oxygen (Meyer and others 1999). Flood events would result in increased sedimentation and turbidity, as well as increased nutrient loading and agricultural run-off.

Potential Impacts to Species

There are 377 species listed as species of greatest conservation need in Arkansas. Because these species are already stressed by existing threats and because these threats will be further exacerbated by changes in climate, these species are more vulnerable to climate change impacts than other species.

Several factors determine how well a species will fare in light of a changing climate or, in other words, a species' degree of vulnerability to climate change. Vulnerability consists of three primary factors; exposure, sensitivity, and adaptive capacity (Stein and others 2014). Exposure is a measure of the character, magnitude, and rate of climatic changes a species may experience (i.e, direct climatic variables such as air temperatures, precipitation, water temperatures, etc.). Sensitivity is the degree to which a species is likely to be affected by climatic change and is related to life-history traits of the species (phenology, physiological factors, etc.). Adaptive capacity refers to the ability of a species to cope with climate change impacts. These 3 factors are utilized in vulnerability assessments that can rate the degree to which a species or system will be impacted (Glick and others 2011). We have not completed formal vulnerability assessments for species of greatest conservation need in Arkansas, though it is our intent to do so in the future as more data and appropriate resources become available. Completing vulnerability assessments would allow us to prioritize conservation actions and adaptation strategies to benefit the most at-risk species.

Below, we provide generalizations on how each species group may be impacted by the predicted changes in climate and factors that would influence response.

Mammals

In general, due to their high ability to disperse and generalized habitat and diet requirements, mammals would have a higher adaptive capacity to respond to altered climate and shifts in suitable habitat. However, bat species would be at risk for a number of reasons. Increases in air temperature could cause warming of roosts beyond what is tolerable for some species, causing them to abandon previously suitable roosts. Data for Brazilian free-tailed bats show that bats emerge earlier from hibernation during drought years, increasing competition for resources and the risk of predation (Frick and others 2012). Bat species that forage for insects over water would be negatively impacted by decreased prey availability and water coverage during drought events.

Birds

Birds have high dispersal ability, allowing them to shift their ranges to more suitable habitats and climatic conditions.

Many species of birds rely on insect availability for prey and migrant species may time their arrival to breeding grounds to occur with insect emergence. Increases in drought may decrease availability of insect prey and could potentially decrease reproductive success of birds. Nest success in Missouri has been show to decline under higher temperatures (Cox et al. 2013a) likely due to increased predator activity (Cox et al. 2013b). Degraded conditions on wintering grounds in the tropics (due to habitats becoming drier) may reduce the health of neotropical migrants as they migrate north to breeding grounds. This could result in decreased reproductive success and increased predation risk. Species that rely on wetlands (marshbirds and migratory waterfowl) and mud flats (shorebirds) would be negatively impacted by a reduction in available habitat due to increased drought events. Species that use open woodlands and glades would be expected to fare better, given that these habitats may expand in projected drier conditions.

Reptiles

Reptiles that require aquatic, wetland, or mesic habitats would be most impacted by predicted changes in climate. Available habitat in these systems would be degraded or reduced with increasing drought events. In their favor, reptiles have a moderate capability to disperse to more suitable habitats. Increases in habitat fragmentation and barriers to movements (i.e., roads) would reduce the adaptive capacity of this group.

Amphibians

Semi-aquatic and terrestrial amphibians typically prefer cool, moist microhabitats. With increases in temperatures and a decrease in available moisture, these microhabitats could be degraded or lost. In addition, many amphibians rely on ephemeral wetlands for breeding which may have shorter hydro-periods or lost altogether during this critical life history stage due to warmer temperatures and increased drought.

Amphibians have a limited ability to disperse long distances, which would reduce their adaptive capacity. Aquatic amphibians, such as the Ozark Hellbender and other stream salamanders, could be negatively impacted by increased stream temperatures, turbidity, and sedimentation.

Fishes

Warming stream temperatures will negatively impact fish by lowering dissolved oxygen levels and disrupting spawning timing. Increased siltation and agricultural run-off due to flood events

will decrease suitability of habitat for many species. Fish species that rely on shallow pools and small streams would be most impacted by altered flows and drier conditions. Fish have dispersal capability, but only in systems without man-made barriers (i.e., dams).

Crayfish

Both aquatic and terrestrial species of crayfish would be negatively impacted by warmer, drier conditions. Aquatic species would be impacted by warmer stream temperatures, increased turbidity due to flood events, and a potential increase in the abundance of non-native crayfish species. Terrestrial, burrowing crayfish prefer cool, moist habitats. Drought events and higher temperatures would relocate the water table, altering available habitat.

Mussels

Increased sedimentation and turbidity in streams due to flood events would negatively impact many mussel species. Altered stream flows could also negatively impact species that require fast flowing streams. Because mussels are dependent on fish hosts for reproduction, any negative impacts to host fish become negative impacts to the mussel species.

Insects and Invertebrates

Insects and invertebrates that rely on aquatic systems for all or a portion of their life cycle would be impacted by warmer temperatures and drier conditions. Species with specialized habitat requirements and/or host plants could also be negatively impacted if populations of the obligate host plant are reduced. Most insects have the ability to disperse and some may migrate northward as climatic conditions shift (Parmesan and others 1999).

Adaptation Strategy

Because climate change has the potential to irrevocably alter species and habitat compositions across the landscape, it is imperative that natural resource managers strategize on the best approaches for adaptation (Mawdsley and others 2009). Incorporating climate change considerations into natural resource and wildlife management plans is an important first step. In Arkansas, our overarching goal will be to implement the wildlife action plan, which will increase adaptive capacity and affords our best chance of reducing threats to species and ensuring healthy, stable populations of SGCN that will be more resilient in the face of climate change. The goals

outlined below are developed in line from those recommended in the National Fish, Wildlife, and Plants Climate Adaptation Strategy (National Fish, Wildlife, and Plants Climate Adaptation Partnership 2012).

Goal 1: Restore and maintain habitats to support healthy species populations and ecosystem functions. Loss and degradation of habitat is one of the most predominant threats for species of greatest conservation need. Restoring fully functioning habitats not only alleviates the threat to SGCN, but also provides alternative areas for species to shift their ranges onto if needed and available.

- Objective 1: Restore habitats to desired condition. It may be possible to ameliorate the effects of climate change through direct management activities. For instance, restoring a natural fire regime to grasslands and open woodlands will reduce fuel loads and lessen the potential for catastrophic wildfires.
- Objective 2: Provide connectivity between habitats. Providing stepping-stones between tracts of habitats will improve the ability of species to migrate to more suitable conditions. Providing additional refugia for species will improve species' chances for survival.

Goal 2: Protect key areas or habitats. Increasing the amount of lands protected from urbanization, fragmentation, and degradation increases the opportunity to provide restored habitats for species. In addition, some species have very specific, narrow habitat requirements. Protecting particular habitats where these species occur will decrease the risk of extinction for these species.

- Objective 1: Create a network of protected lands that meets the needs for a diversity of wildlife. The Gulf Coastal Plains and Ozarks Landscape Conservation Cooperative is currently working to develop comprehensive conservation strategies for the each of the sub-geographies within the region. This would include the Arkansas ecoregions Ozark Highlands, Mississippi Alluvial Plain, and West Gulf Coastal Plain. The product of this effort will be the identification of conservation opportunity areas that provide a foundation for strategic planning. Climate change impacts, as well as other threats (e.g. fragmentation due to expanding urbanization), are included in this planning process.
- Objective 2: Identify and protect critical habitats for specialist species and/or narrow endemics. Identifying high-priority caves and their recharge areas has been a priority conservation action under the wildlife action plan. Protecting important hibernacula will

help ensure the long-term sustainability of cave bat populations. Also, identifying and protecting habitats that are home to endemics, such as salamanders and darters, should remain a high priority.

Goal 3: Increase adaptive management capacity. Climate change information and tools are developing rapidly. In order to be proactive in our management, it is crucial to remain up-to-date on information and tools available to us.

- Objective 1: Continue to coordinate with the Landscape Conservation Cooperatives, Climate Science Centers, and other entities regarding the latest science and tools for use in conservation planning and wildlife management.
- Objective 2: Incorporate climate change considerations into species and habitat management plans, where feasible.

Goal 4: Monitor the response of species and habitats to climate change. Monitoring programs provide information that natural resource managers can use to adjust their activities. Monitoring becomes particularly important when changes are anticipated to occur at a fast rate, such as with climate change.

- Objective 1: Continue to implement monitoring priorities as outlined in the Wildlife Action Plan. This includes breeding bird surveys, Christmas bird count surveys, pollinator surveys, etc. These long-term data are important for determining population trends and will be especially important for detecting any changes in species phenology or distribution as a result of climate change.
- Objective 2: Participate in other regional and national monitoring programs as they are developed.

Section 8. Appendices

Appendix 1.1 — Acronyms

Terminology

AWAP – Arkansas Wildlife Action Plan
BMP – Best Management Practice
CWCS — Comprehensive Wildlife Conservation Strategy
EO — Element Occurrence
GIS — Geographic Information Systems
SGCN — Species of Greatest Conservation Need
LIP — Landowner Incentive Program
MOA — Memorandum of Agreement
ACWCS — Arkansas Comprehensive Wildlife Conservation Strategy
SWG — State Wildlife Grant
LTA — Land Type Association
WNS — White-nose Syndrome

Organizations

ADEQ — Arkansas Department of Environmental Quality
AGFC — Arkansas Game and Fish Commission
AHTD — Arkansas Highway and Transportation Department
ANHC — Arkansas Natural Heritage Commission
ASU — Arkansas State University
ATU — Arkansas Technical University
FWS — Fish and Wildlife Service
HSU — Henderson State University
NRCS — Natural Resources Conservation Service
SAU — Southern Arkansas University
TNC — The Nature Conservancy
UA — University of Arkansas (Fayetteville)
UA/Ft. Smith — University of Arkansas at Fort Smith
UALR — University of Arkansas at Little Rock
UAM — University of Arkansas at Monticello
UCA — University of Central Arkansas
USFS — United States Forest Service

Appendix 2.1. List of Species of Greatest Conservation Need by Priority Score.

List of species of greatest conservation need ranked by Species Priority Score. A higher score implies a greater need for conservation concern and actions.

Priority Score	Common Name	Scientific Name	Taxa Association
100	Curtis Pearlymussel	*Epioblasma florentina curtisii*	Mussel
100	Turgid Blossom	*Epioblasma turgidula*	Mussel
100	Yellowcheek Darter	*Etheostoma moorei*	Fish
80	Bowed Snowfly	*Allocapnia oribata*	Insect
80	Winter Stonefly	*Allocapnia warreni*	Insect
80	Foushee Cavesnail	*Amnicola cora*	Invertebrate - other
80	Ouachita Rock Pocketbook	*Arcidens wheeleri*	Mussel
80	Magazine Mountain Mold Beetle	*Arianops sandersoni*	Insect
80	Benton County Cave Crayfish	*Cambarus aculabrum*	Crayfish
80	Hell Creek Cave Crayfish	*Cambarus zophonastes*	Crayfish
80	Ozark Big-eared Bat	*Corynorhinus townsendii ingens*	Mammal
80	Slenderwrist Burrowing Crayfish	*Fallicambarus petilicarpus*	Crayfish
80	Sulphur Springs Diving Beetle	*Heterosternuta sulphuria*	Insect
80	Magazine Mountain Shagreen	*Inflectarius magazinensis*	Invertebrate - other
80	Magazine Stripetail	*Isoperla szczytkoi*	Insect
80	Speckled Pocketbook	*Lampsilis streckeri*	Mussel
80	Isopod	*Lirceus bidentatus*	Invertebrate - other
80	Ozark Pyrg	*Marstonia ozarkensis*	Invertebrate - other
80	Caddo Madtom	*Noturus taylori*	Fish
80	Striate Supercoil	*Paravitrea aulacogyra*	Invertebrate - other
80	Microcaddisfly	*Paucicalcaria ozarkensis*	Insect
80	Irons Fork Burrowing Crayfish	*Procambarus reimeri*	Crayfish
80	Winged Mapleleaf	*Quadrula fragosa*	Mussel
80	Ground Beetle	*Rhadine ozarkensis*	Insect
80	Ouachita Pebblesnail	*Somatogyrus amnicoloides*	Invertebrate - other
80	Thicklipped Pebblesnail	*Somatogyrus crassilabris*	Invertebrate - other
80	Channelled Pebblesnail	*Somatogyrus wheeleri*	Invertebrate - other
76	Scaleshell	*Leptodea leptodon*	Mussel
71	Ozark Hellbender	*Cryptobranchus alleganiensis bishopi*	Amphibian
65	Caddo Sallfly	*Alloperla caddo*	Insect
65	Cave Obligate Pseudoscorpion	*Apochthonius diabolus*	Invertebrate - other
65	Cave Obligate Pseudoscorpion	*Apochthonius titanicus*	Invertebrate - other
65	Ouachita Spiketail	*Cordulegaster talaria*	Insect
65	Cave Obligate Harvestman	*Crosbyella distincta*	Invertebrate - other

65	Cave Obligate Harvestman	*Crosbyella roeweri*	Invertebrate - other
65	Saline Burrowing Crayfish	*Fallicambarus strawni*	Crayfish
65	Louisiana Pearlshell	*Margaritifera hembeli*	Mussel
65	Nearctic Paduniellan Caddisfly	*Paduniella nearctica*	Insect
65	Rattlesnake-Master Borer Moth	*Papaipema eryngii*	Insect
65	Mayfly	*Paraleptophlebia calcarica*	Insect
65	Calico Rock Oval	*Patera clenchi*	Invertebrate - other
65	Texas Pigtoe	*Pleurobema riddellii*	Mussel
65	Elevated Spring Amphipod	*Stygobromus elatus*	Invertebrate - other
65	Mountain Cave Amphipod	*Stygobromus montanus*	Invertebrate - other
65	Cave Obligate Millipede	*Trigenotyla parca*	Invertebrate - other
65	Arkansas Wedge	*Xolotrema occidentale*	Invertebrate - other
63	Northern Long-eared Bat	*Myotis septentrionalis*	Mammal
62	Boston Mountains Crayfish	*Cambarus causeyi*	Crayfish
62	Neosho Mucket	*Lampsilis rafinesqueana*	Mussel
62	Indiana Bat	*Myotis sodalis*	Mammal
62	Leopard Darter	*Percina pantherina*	Fish
57	Ozark Pocket Gopher	*Geomys bursarius ozarkensis*	Mammal
57	Arkansas Fatmucket	*Lampsilis powellii*	Mussel
57	Microcaddisfly	*Ochrotrichia robisoni*	Insect
52	Alabama Shad	*Alosa alabamae*	Fish
52	Rabbitsfoot	*Quadrula cylindrica cylindrica*	Mussel
50	Arkansas Agapetus Caddisfly	*Agapetus medicus*	Insect
50	Winter Stonefly	*Allocapnia jeanae*	Insect
50	Winter Stonefly	*Allocapnia ozarkana*	Insect
50	Arogos Skipper	*Atrytone arogos iowa*	Insect
50	Bayou Bodcau Crayfish	*Bouchardina robisoni*	Crayfish
50	Jefferson County Crayfish	*Fallicambarus gilpini*	Crayfish
50	Stonefly	*Leuctra paleo*	Insect
50	Arkansas River Shiner	*Notropis girardi*	Fish
50	Contorted Ochrotrichian Microcaddisfly	*Ochrotrichia contorta*	Insect
50	Coldwater Crayfish	*Orconectes eupunctus*	Crayfish
50	Kiamichi Slimy Salamander	*Plethodon kiamichi*	Amphibian
50	Sequoyah Slimy Salamander	*Plethodon sequoyah*	Amphibian
50	Springtail	*Pseudosinella dubia*	Invertebrate - other
50	Cave Obligate Springtail	*Schaefferia alabamensis*	Invertebrate - other
50	Ouachita Needlefly	*Zealeuctra wachita*	Invertebrate - other
48	Pallid Sturgeon	*Scaphirhynchus albus*	Fish
46	Paleback Darter	*Etheostoma pallididorsum*	Fish
46	Ouachita Burrowing Crayfish	*Fallicambarus harpi*	Crayfish
46	Daisy Burrowing Crayfish	*Fallicambarus jeanae*	Crayfish
46	Blair's Fencing Crayfish	*Faxonella blairi*	Crayfish

46	Predaceous Diving Beetle	*Heterosternuta phoebeae*	Insect
46	Pink Mucket	*Lampsilis abrupta*	Mussel
46	Ouachita Madtom	*Noturus lachneri*	Fish
46	Mammoth Spring Crayfish	*Orconectes marchandi*	Crayfish
46	Ouachita Darter	*Percina brucethompsoni*	Fish
46	Caddo Mountain Salamander	*Plethodon caddoensis*	Amphibian
46	Fourche Mountain Salamander	*Plethodon fourchensis*	Amphibian
46	Fat Pocketbook	*Potamilus capax*	Mussel
46	Rich Mountain Slitmouth	*Stenotrema pilsbryi*	Invertebrate - other
43	Piping Plover	*Charadrius melodus*	Bird
43	Western Fanshell	*Cyprogenia aberti*	Mussel
43	"Ouachita" Fanshell	*Cyprogenia sp. cf aberti*	Mussel
43	Snuffbox	*Epioblasma triquetra*	Mussel
43	Sicklefin Chub	*Macrhybopsis meeki*	Fish
43	Red-cockaded Woodpecker	*Picoides borealis*	Bird
43	Illinois Chorus Frog	*Pseudacris illinoensis*	Amphibian
43	Ozark Cavefish	*Troglichthys rosae*	Fish
42	Hubricht's Long-tailed Amphipod	*Allocrangonyx hubrichti*	Invertebrate - other
42	Amphipod	*Bactrurus pseudomucronatus*	Invertebrate - other
42	Isopod	*Caecidotea oculata*	Invertebrate - other
42	Cave Obligate Isopod	*Caecidotea simulator*	Invertebrate - other
42	Texas Frosted Elfin	*Callophrys irus hadros*	Insect
42	Cave Obligate Planarian	*Dendrocoelopsis americana*	Invertebrate - other
42	American Burying Beetle	*Nicrophorus americanus*	Insect
38	Linda's Roadside-Skipper	*Amblyscirtes linda*	Insect
38	Isopod	*Caecidotea dimorpha*	Invertebrate - other
38	Bat Cave Isopod	*Caecidotea macropropoda*	Invertebrate - other
38	Crystal Darter	*Crystallaria asprella*	Fish
38	Spectaclecase	*Cumberlandia monodonta*	Mussel
38	Arkansas Darter	*Etheostoma cragini*	Fish
38	Stargazing Darter	*Percina uranidea*	Fish
38	Rich Mountain Salamander	*Plethodon ouachitae*	Amphibian
38	Pyramid Pigtoe	*Pleurobema rubrum*	Mussel
38	Regal Burrowing Crayfish	*Procambarus regalis*	Crayfish
38	Indiana Phlox Moth	*Schinia indiana*	Insect
34	Swamp Metalmark	*Calephelis muticum*	Insect
34	Bristly Cave Crayfish	*Cambarus setosus*	Crayfish
34	White Liptooth	*Daedalochila peregrina*	Invertebrate - other
34	Williams' Crayfish	*Orconectes williamsi*	Crayfish
34	Salamander Mussel	*Simpsonaias ambigua*	Mussel
34	Ozark Emerald	*Somatochlora ozarkensis*	Insect
34	Ouachita Slitmouth	*Stenotrema unciferum*	Invertebrate - other

33	Western Sand Darter	*Ammocrypta clara*	Fish
33	Henslow's Sparrow	*Ammodramus henslowii*	Bird
33	Sprague's Pipit	*Anthus spragueii*	Bird
33	Little Brown Bat	*Myotis lucifugus*	Mammal
33	Kiamichi Shiner	*Notropis ortenburgeri*	Fish
33	Ozark Shiner	*Notropis ozarcanus*	Fish
33	Peppered Shiner	*Notropis perpallidus*	Fish
33	Bachman's Sparrow	*Peucaea aestivalis*	Bird
33	Bluehead Shiner	*Pteronotropis hubbsi*	Fish
33	King Rail	*Rallus elegans*	Bird
33	Purple Lilliput	*Toxolasma lividum*	Mussel
32	Dukes' Skipper	*Euphyes dukesi*	Insect
32	Pine Hills Digger	*Fallicambarus dissitus*	Crayfish
32	Prairie Mole Cricket	*Gryllotalpa major*	Insect
32	Ozark Snaketail Dragonfly	*Ophiogomphus westfalli*	Insect
31	Interior Least Tern	*Sternula antillarum athalassos*	Bird
31	Slippershell Mussel	*Alasmidonta viridis*	Mussel
30	Isopod	*Caecidotea steevesi*	Invertebrate - other
30	Mayfly	*Dannella provonshai*	Insect
30	Isopod	*Lirceus bicuspidatus*	Invertebrate - other
30	Giant Prairie Robberfly	*Microstylum morosum*	Insect
30	Meek's Short Pointed Crayfish	*Orconectes meeki brevis*	Crayfish
30	Ozark Swallowtail	*Papilio joanae*	Insect
30	Ouachita Mountain Crayfish	*Procambarus tenuis*	Crayfish
30	Purple Pimpleback	*Quadrula refulgens*	Mussel
29	Buff-breasted Sandpiper	*Calidris subruficollis*	Bird
29	Rafinesque's Big-Eared Bat	*Corynorhinus rafinesquii*	Mammal
29	Swallow-tailed Kite	*Elanoides forficatus*	Bird
29	Mottled Duskywing	*Erynnis martialis*	Insect
29	Strawberry River Darter	*Etheostoma fragi*	Fish
29	Least Darter	*Etheostoma microperca*	Fish
29	Rusty Blackbird	*Euphagus carolinus*	Bird
29	"Elongate" Pigtoe	*Fusconaia sp. cf. flava*	Mussel
29	Meske's Skipper	*Hesperia meskei*	Insect
29	Silver Redhorse	*Moxostoma anisurum*	Fish
29	Stonecat	*Noturus flavus*	Fish
29	Queensnake	*Regina septemvittata*	Reptile
29	Bewick's Wren	*Thryomanes bewickii*	Bird
27	Lake Sturgeon	*Acipenser fulvescens*	Fish
27	Lace-winged Roadside-Skipper	*Amblyscirtes aesculapius*	Insect
27	Carolina Roadside-Skipper	*Amblyscirtes carolina*	Insect
27	Alligator Gar	*Atractosteus spatula*	Fish

27	Isopod	*Caecidotea ancyla*	Invertebrate - other
27	Isopod	*Caecidotea salemensis*	Invertebrate - other
27	Hubbs' Crayfish	*Cambarus hubbsi*	Crayfish
27	Appalachian Azure	*Celastrina neglectamajor*	Insect
27	Baltimore Checkerspot	*Euphydryas phaeton ozarkae*	Insect
27	Land Snail	*Gastrocopta rogersensis*	Invertebrate - other
27	Ozark Clubtail Dragonfly	*Gomphus ozarkensis*	Insect
27	Plains Minnow	*Hybognathus placitus*	Fish
27	Ouachita Shiner	*Lythrurus snelsoni*	Fish
27	Eastern Small-Footed Bat	*Myotis leibii*	Mammal
27	Georgia Satyr	*Neonympha areolatus*	Insect
27	Red River Shiner	*Notropis bairdi*	Fish
27	Rocky Shiner	*Notropis suttkusi*	Fish
27	Brown Madtom	*Noturus phaeus*	Fish
27	Mena Crayfish	*Orconectes menae*	Crayfish
27	Midget Crayfish	*Orconectes nana*	Crayfish
27	Longnose Darter	*Percina nasuta*	Fish
27	Louisiana Slimy Salamander	*Plethodon kisatchie*	Amphibian
27	Shelled Cave Springtail	*Pseudosinella testa*	Invertebrate - other
27	King's Hairstreak	*Satyrium kingi*	Insect
27	Southern Cavefish	*Typhlichthys subterraneus*	Fish
25	Tiger Beetle	*Cicindela lepida*	Insect
25	Giant Stag Beetle	*Lucanus elaphus*	Insect
25	Springtail	*Pygmarrhopalites clarus*	Invertebrate - other
25	Diana	*Speyeria diana*	Insect
24	American Eel	*Anguilla rostrata*	Fish
24	Ruddy Turnstone	*Arenaria interpres*	Bird
24	Smith's Longspur	*Calcarius pictus*	Bird
24	Common Nighthawk	*Chordeiles minor*	Bird
24	Eastern Collared Lizard	*Crotaphytus collaris*	Reptile
24	Migrant Loggerhead Shrike	*Lanius ludovicianus*	Bird
24	Southeastern Bat	*Myotis austroriparius*	Mammal
24	Yellow-crowned Night-Heron	*Nyctanassa violacea*	Bird
24	Black-bellied Plover	*Pluvialis squatarola*	Bird
24	Paddlefish	*Polyodon spathula*	Fish
24	American Woodcock	*Scolopax minor*	Bird
24	Cerulean Warbler	*Setophaga cerulea*	Bird
23	Millipede	*Abacion wilhelminae*	Invertebrate - other
23	Lace Bug	*Acalypta susanae*	Insect
23	Rufous-crowned Sparrow	*Aimophila ruficeps*	Bird
23	Copeland's Mold Beetle	*Arianops copelandi*	Insect
23	American Bittern	*Botaurus lentiginosus*	Bird

23	Isopod	*Caecidotea fonticulus*	Invertebrate - other
23	Isopod	*Caecidotea stiladactyla*	Invertebrate - other
23	Northern Metalmark	*Calephelis borealis*	Insect
23	Lincoln Underwing	*Catocala lincolnana*	Insect
23	Dusky Azure	*Celastrina nigra*	Insect
23	Outis Skipper	*Cogia outis*	Insect
23	Blue Sucker	*Cycleptus elongatus*	Fish
23	Bluntface Shiner	*Cyprinella camura*	Fish
23	Spotfin Shiner	*Cyprinella spiloptera*	Fish
23	Beetle	*Derops divalis*	Insect
23	Spotted Dusky Salamander	*Desmognathus conanti*	Amphibian
23	Willow Flycatcher	*Empidonax traillii*	Bird
23	Ouachita Streambed Salamander	*Eurycea subfluvicola*	Amphibian
23	Oklahoma Salamander	*Eurycea tynerensis*	Amphibian
23	Lowland Topminnow	*Fundulus blairae*	Fish
23	Ozark Pigtoe	*Fusconaia ozarkensis*	Mussel
23	Pseudoscorpion	*Hesperochernes occidentalis*	Invertebrate - other
23	Squirrel Treefrog	*Hyla squirella*	Amphibian
23	Crawfish Frog	*Lithobates areolatus*	Amphibian
23	Chub Shiner	*Notropis potteri*	Fish
23	Sabine Shiner	*Notropis sabinae*	Fish
23	Neosho Midget Crayfish	*Orconectes macrus*	Crayfish
23	Ouachita Shore Bug	*Pentacora ouachita*	Insect
23	Suckermouth Minnow	*Phenacobius mirabilis*	Fish
23	Flathead Chub	*Platygobio gracilis*	Fish
23	Great Plains Skink	*Plestiodon obsoletus*	Reptile
23	Yehl Skipper	*Poanes yehl*	Insect
23	Purple Gallinule	*Porphyrio martinicus*	Bird
23	Pink Heelsplitter	*Potamilus alatus*	Mussel
23	Byssus Skipper	*Problema byssus*	Insect
23	Ouachita Pseudactium	*Pseudactium magazinensis*	Insect
23	Ozark Pseudactium	*Pseudactium ursum*	Insect
23	Ouachita Kidneyshell	*Ptychobranchus occidentalis*	Mussel
23	Plains Harvest Mouse	*Reithrodontomys montanus*	Mammal
23	Ground Beetle	*Scaphinotus inflectus*	Insect
23	Ground Beetle	*Scaphinotus parisiana*	Insect
23	Western Groundsnake	*Sonora semiannulata*	Reptile
23	Plains Spadefoot	*Spea bombifrons*	Amphibian
23	Ozark Cave Amphipod	*Stygobromus ozarkensis*	Invertebrate - other
23	Pseudoscorpion	*Tartarocreagris ozarkensis*	Invertebrate - other
23	Anthophorid Bee	*Tetraloniella albata*	Insect
23	Lined Snake	*Tropidoclonion lineatum*	Reptile

23	Central Mudminnow	*Umbra limi*	Fish
23	Ellipse	*Venustaconcha ellipsiformis*	Mussel
23	Bleedingtooth Mussel	*Venustaconcha pleasii*	Mussel
21	Le Conte's Sparrow	*Ammodramus leconteii*	Bird
21	Bell's Roadside-Skipper	*Amblyscirtes belli*	Insect
21	Golden-banded Skipper	*Autochton cellus*	Insect
21	Ant-like Tiger Beetle	*Cicindela cursitans*	Insect
21	Scrubland Tiger Beetle	*Cicindela obsoleta*	Insect
21	Woodland Tiger Beetle	*Cicindela unipunctata*	Insect
21	Sedge Wren	*Cistothorus platensis*	Bird
21	Black-tailed Jackrabbit	*Lepus californicus*	Mammal
21	Eastern Spotted Skunk	*Spilogale putorius*	Mammal
21	Red Milkweed Beetle	*Tetraopes quinquemaculatus*	Insect
21	Texas Milkweed Beetle	*Tetraopes texanus*	Insect
20	Gapped Ringed Crayfish	*Orconectes neglectus chaenodactylus*	Crayfish
19	Lace Bug	*Acalypta lillianus*	Insect
19	Sharp-shinned Hawk	*Accipiter striatus*	Bird
19	Elktoe	*Alasmidonta marginata*	Mussel
19	Ringed Salamander	*Ambystoma annulatum*	Amphibian
19	Brown Bullhead	*Ameiurus nebulosus*	Fish
19	Grasshopper Sparrow	*Ammodramus savannarum*	Bird
19	American Black Duck	*Anas rubripes*	Bird
19	Anhinga	*Anhinga anhinga*	Bird
19	Eastern Whip-poor-will	*Antrostomus vociferus*	Bird
19	Sanderling	*Calidris alba*	Bird
19	Dunlin	*Calidris alpina*	Bird
19	Stilt Sandpiper	*Calidris himantopus*	Bird
19	Common Wormsnake	*Carphophis amoenus*	Reptile
19	Chimney Swift	*Chaetura pelagica*	Bird
19	Yellow-billed Cuckoo	*Coccyzus americanus*	Bird
19	Northern Bobwhite	*Colinus virginianus*	Bird
19	Chicken Turtle	*Deirochelys reticularia*	Reptile
19	Six-banded Longhorn Beetle	*Dryobius sexnotatus*	Insect
19	Tricolored Heron	*Egretta tricolor*	Bird
19	Autumn Darter	*Etheostoma autumnale*	Fish
19	Beaded Darter	*Etheostoma clinton*	Fish
19	Sunburst Darter	*Etheostoma mihileze*	Fish
19	Current Darter	*Etheostoma uniporum*	Fish
19	Dion Skipper	*Euphyes dion*	Insect
19	Grotto Salamander "northern clade"	*Eurycea spelaea northern*	Amphibian
19	Grotto Salamander "western clade"	*Eurycea spelaea western*	Amphibian

19	American Kestrel	*Falco sparverius*	Bird
19	Common Gallinule	*Gallinula galeata*	Bird
19	Great Plains Narrowmouth Toad	*Gastrophryne olivacea*	Amphibian
19	Purple Finch	*Haemorhous purpureus*	Bird
19	Four-toed Salamander	*Hemidactylium scutatum*	Amphibian
19	Leonard's Skipper	*Hesperia leonardus*	Insect
19	Cobweb Skipper	*Hesperia metea*	Insect
19	Ouachita Diving Beetle	*Heterosternuta ouachita*	Insect
19	Goldeye	*Hiodon alosoides*	Fish
19	Mooneye	*Hiodon tergisus*	Fish
19	Wood Thrush	*Hylocichla mustelina*	Bird
19	Least Bittern	*Ixobrychus exilis*	Bird
19	Southern Pocketbook	*Lampsilis ornata*	Mussel
19	"Red River" Mucket	*Lampsilis sp. B cf hydiana*	Mussel
19	American Brook Lamprey	*Lethenteron appendix*	Fish
19	Short-billed Dowitcher	*Limnodromus griseus*	Bird
19	Swainson's Warbler	*Limnothlypis swainsonii*	Bird
19	Texas Coralsnake	*Micrurus tener*	Reptile
19	Pealip Redhorse	*Moxostoma pisolabrum*	Fish
19	Striped Mullet	*Mugil cephalus*	Fish
19	Redspot Chub	*Nocomis asper*	Fish
19	Crawford's Gray Shrew	*Notiosorex crawfordi*	Mammal
19	Blackspot Shiner	*Notropis atrocaudalis*	Fish
19	Channel Shiner	*Notropis wickliffi*	Fish
19	Black-crowned Night-Heron	*Nycticorax nycticorax*	Bird
19	Hickorynut	*Obovaria olivaria*	Mussel
19	"White" Hickorynut	*Obovaria sp. cf arkansasensis*	Mussel
19	Redspotted Stream Crayfish	*Orconectes acares*	Crayfish
19	Little River Creek Crayfish	*Orconectes leptogonopodus*	Crayfish
19	Small-eyed Mold Beetle	*Ouachitychus parvoculus*	Insect
19	Gilt Darter	*Percina evides*	Fish
19	Slenderhead Darter	*Percina phoxocephala*	Fish
19	Prairie Skink	*Plestiodon septentrionalis*	Reptile
19	Ohio Pigtoe	*Pleurobema cordatum*	Mussel
19	Gray Comma	*Polygonia progne*	Insect
19	Bismark Burrowing Crayfish	*Procambarus parasimulans*	Crayfish
19	Boreal Chorus Frog	*Pseudacris maculata*	Amphibian
19	Strecker's Chorus Frog	*Pseudacris streckeri*	Amphibian
19	Gulf Mapleleaf	*Quadrula nobilis*	Mussel
19	Graham's Crayfish Snake	*Regina grahamii*	Reptile
19	Eastern Harvest Mouse	*Reithrodontomys humulis*	Mammal
19	Oak Hairstreak	*Satyrium favonius ontario*	Insect

19	Eastern Spadefoot	*Scaphiopus holbrookii*	Amphibian
19	Hurter's Spadefoot	*Scaphiopus hurterii*	Amphibian
19	Southeastern Shrew	*Sorex longirostris*	Mammal
19	Southern Bog Lemming	*Synaptomys cooperi*	Mammal
19	Ornate Box Turtle	*Terrapene ornata*	Reptile
19	Lilliput	*Toxolasma parvum*	Mussel
19	Texas Lilliput	*Toxolasma texasiense*	Mussel
19	Tapered Pondhorn	*Uniomerus declivis*	Mussel
19	Pondhorn	*Uniomerus tetralasmus*	Mussel
19	Bell's Vireo	*Vireo bellii*	Bird
17	Highfin Carpsucker	*Carpiodes velifer*	Fish
17	Big Sand Tiger Beetle	*Cicindela formosa pigmentosignata*	Insect
17	Beach-dune Tiger Beetle	*Cicindela hirticollis*	Insect
17	Sandy Stream Tiger Beetle	*Cicindela macra*	Insect
17	Western Diamond-backed Rattlesnake	*Crotalus atrox*	Reptile
17	Trumpeter Swan	*Cygnus buccinator*	Bird
17	Earthworm	*Diplocardia meansi*	Invertebrate - other
17	Goldstripe Darter	*Etheostoma parvipinne*	Fish
17	Round Pigtoe	*Pleurobema sintoxia*	Mussel
17	Little Spectaclecase group	*Villosa sp. cf lienosa*	Mussel
16	Gray Bat	*Myotis grisescens*	Mammal
16	American Badger	*Taxidea taxus*	Mammal
15	Mole Salamander	*Ambystoma talpoideum*	Amphibian
15	Eastern Tiger Salamander	*Ambystoma tigrinum*	Amphibian
15	Gorgone Checkerspot	*Chlosyne gorgone*	Insect
15	Cow Path Tiger Beetle	*Cicindela purpurea*	Insect
15	Monarch	*Danaus plexippus*	Insect
15	Lake Chubsucker	*Erimyzon sucetta*	Fish
15	Swamp Darter	*Etheostoma fusiforme*	Fish
15	Highland Darter	*Etheostoma teddyroosevelt*	Fish
15	Dwarf Salamander	*Eurycea quadridigitata*	Amphibian
15	Grotto Salamander "eastern clade"	*Eurycea spelaea eastern*	Amphibian
15	Bird-voiced Treefrog	*Hyla avivoca*	Amphibian
15	Least Brook Lamprey	*Lampetra aepyptera*	Fish
15	"Arkoma" Fatmucket	*Lampsilis sp. A cf hydiana*	Mussel
15	Glossy Swampsnake	*Liodytes rigida*	Reptile
15	Wood Frog	*Lithobates sylvaticus*	Amphibian
15	Shoal Chub	*Macrhybopsis hyostoma*	Fish
15	Long-tailed Weasel	*Mustela frenata*	Mammal
15	Slender Glass Lizard	*Ophisaurus attenuatus*	Reptile
15	Saddleback Darter	*Percina vigil*	Fish
15	American Golden-Plover	*Pluvialis dominica*	Bird

15	Broad-winged Skipper	*Poanes viator*	Insect
15	Southern Mapleleaf	*Quadrula apiculata*	Mussel
15	Western Harvest Mouse	*Reithrodontomys megalotis*	Mammal
15	Fawnsfoot	*Truncilla donaciformis*	Mussel
15	Rainbow	*Villosa iris*	Mussel
13	Twelve-spotted Tiger Beetle	*Cicindela duodecimguttata*	Insect
11	Winter Stonefly	*Allocapnia malverna*	Insect
11	Bronze Copper	*Lycaena hyllus*	Insect

Appendix 2.2. List of SGCN by Taxonomic Group.

Table 2.2.1. Calculated Species Priority Scores for Amphibian Species of Greatest Conservation Need. A higher score implies a greater need for conservation concern and actions.

Priority Score	Common Name	Scientific Name
71	Ozark Hellbender	*Cryptobranchus alleganiensis bishopi*
50	Kiamichi Slimy Salamander	*Plethodon kiamichi*
50	Sequoyah Slimy Salamander	*Plethodon sequoyah*
46	Caddo Mountain Salamander	*Plethodon caddoensis*
46	Fourche Mountain Salamander	*Plethodon fourchensis*
43	Illinois Chorus Frog	*Pseudacris illinoensis*
38	Rich Mountain Salamander	*Plethodon ouachitae*
27	Louisiana Slimy Salamander	*Plethodon kisatchie*
23	Spotted Dusky Salamander	*Desmognathus conanti*
23	Ouachita Streambed Salamander	*Eurycea subfluvicola*
23	Oklahoma Salamander	*Eurycea tynerensis*
23	Squirrel Treefrog	*Hyla squirella*
23	Crawfish Frog	*Lithobates areolatus*
23	Plains Spadefoot	*Spea bombifrons*
19	Ringed Salamander	*Ambystoma annulatum*
19	Grotto Salamander "northern clade"	*Eurycea spelaea northern*
19	Grotto Salamander "western clade"	*Eurycea spelaea western*
19	Great Plains Narrowmouth Toad	*Gastrophryne olivacea*
19	Four-toed Salamander	*Hemidactylium scutatum*
19	Boreal Chorus Frog	*Pseudacris maculata*
19	Strecker's Chorus Frog	*Pseudacris streckeri*
19	Eastern Spadefoot	*Scaphiopus holbrookii*
19	Hurter's Spadefoot	*Scaphiopus hurterii*
15	Mole Salamander	*Ambystoma talpoideum*
15	Eastern Tiger Salamander	*Ambystoma tigrinum*
15	Dwarf Salamander	*Eurycea quadridigitata*
15	Grotto Salamander "eastern clade"	*Eurycea spelaea eastern*
15	Bird-voiced Treefrog	*Hyla avivoca*
15	Wood Frog	*Lithobates sylvaticus*

Table 2.2.2. Calculated Priority Scores for Bird Species of Greatest Conservation Need. A higher score implies a greater need for conservation concern and actions.

Priority Score	Common Name	Scientific Name
43	Piping Plover	*Charadrius melodus*
43	Red-cockaded Woodpecker	*Picoides borealis*
33	Henslow's Sparrow	*Ammodramus henslowii*
33	Sprague's Pipit	*Anthus spragueii*
33	Bachman's Sparrow	*Peucaea aestivalis*
33	King Rail	*Rallus elegans*
31	Interior Least Tern	*Sternula antillarum athalassos*
29	Buff-breasted Sandpiper	*Calidris subruficollis*
29	Swallow-tailed Kite	*Elanoides forficatus*
29	Rusty Blackbird	*Euphagus carolinus*
29	Bewick's Wren	*Thryomanes bewickii*
24	Ruddy Turnstone	*Arenaria interpres*
24	Smith's Longspur	*Calcarius pictus*
24	Common Nighthawk	*Chordeiles minor*
24	Migrant Loggerhead Shrike	*Lanius ludovicianus*
24	Yellow-crowned Night-Heron	*Nyctanassa violacea*
24	Black-bellied Plover	*Pluvialis squatarola*
24	American Woodcock	*Scolopax minor*
24	Cerulean Warbler	*Setophaga cerulea*
23	Rufous-crowned Sparrow	*Aimophila ruficeps*
23	American Bittern	*Botaurus lentiginosus*
23	Willow Flycatcher	*Empidonax traillii*
23	Purple Gallinule	*Porphyrio martinicus*
21	Le Conte's Sparrow	*Ammodramus leconteii*
21	Sedge Wren	*Cistothorus platensis*
19	Sharp-shinned Hawk	*Accipiter striatus*
19	Grasshopper Sparrow	*Ammodramus savannarum*
19	American Black Duck	*Anas rubripes*
19	Anhinga	*Anhinga anhinga*
19	Eastern Whip-poor-will	*Antrostomus vociferus*
19	Sanderling	*Calidris alba*
19	Dunlin	*Calidris alpina*
19	Stilt Sandpiper	*Calidris himantopus*
19	Chimney Swift	*Chaetura pelagica*
19	Yellow-billed Cuckoo	*Coccyzus americanus*
19	Northern Bobwhite	*Colinus virginianus*
19	Tricolored Heron	*Egretta tricolor*
19	American Kestrel	*Falco sparverius*
19	Common Gallinule	*Gallinula galeata*
19	Purple Finch	*Haemorhous purpureus*

Table 2.2.2. Birds, continued.

Priority Score	Common Name	Scientific Name
19	Wood Thrush	*Hylocichla mustelina*
19	Least Bittern	*Ixobrychus exilis*
19	Short-billed Dowitcher	*Limnodromus griseus*
19	Swainson's Warbler	*Limnothlypis swainsonii*
19	Black-crowned Night-Heron	*Nycticorax nycticorax*
19	Bell's Vireo	*Vireo bellii*
17	Trumpeter Swan	*Cygnus buccinator*
15	American Golden-Plover	*Pluvialis dominica*

Table 2.2.3. Calculated Priority Scores for Crayfish Species of Greatest Conservation Need. A higher score implies a greater need for conservation concern and actions.

Priority Score	Common Name	Scientific Name
80	Benton County Cave Crayfish	*Cambarus aculabrum*
80	Hell Creek Cave Crayfish	*Cambarus zophonastes*
80	Slenderwrist Burrowing Crayfish	*Fallicambarus petilicarpus*
80	Irons Fork Burrowing Crayfish	*Procambarus reimeri*
65	Saline Burrowing Crayfish	*Fallicambarus strawni*
62	Boston Mountains Crayfish	*Cambarus causeyi*
50	Bayou Bodcau Crayfish	*Bouchardina robisoni*
50	Jefferson County Crayfish	*Fallicambarus gilpini*
50	Coldwater Crayfish	*Orconectes eupunctus*
46	Ouachita Burrowing Crayfish	*Fallicambarus harpi*
46	Daisy Burrowing Crayfish	*Fallicambarus jeanae*
46	Blair's Fencing Crayfish	*Faxonella blairi*
46	Mammoth Spring Crayfish	*Orconectes marchandi*
38	Regal Burrowing Crayfish	*Procambarus regalis*
34	Bristly Cave Crayfish	*Cambarus setosus*
34	Williams' Crayfish	*Orconectes williamsi*
32	Pine Hills Digger	*Fallicambarus dissitus*
30	Meek's Short Pointed Crayfish	*Orconectes meeki brevis*
30	Ouachita Mountain Crayfish	*Procambarus tenuis*
27	Hubbs' Crayfish	*Cambarus hubbsi*
27	Mena Crayfish	*Orconectes menae*
27	Midget Crayfish	*Orconectes nana*
23	Neosho Midget Crayfish	*Orconectes macrus*
20	Gapped Ringed Crayfish	*Orconectes neglectus chaenodactylus*
19	Redspotted Stream Crayfish	*Orconectes acares*
19	Little River Creek Crayfish	*Orconectes leptogonopodus*
19	Bismark Burrowing Crayfish	*Procambarus parasimulans*

Table 2.2.4. Calculated Priority Scores for Fish Species of Greatest Conservation Need. A higher score implies a greater need for conservation concern and actions.

Priority Score	Common Name	Scientific Name
100	Yellowcheek Darter	*Etheostoma moorei*
80	Caddo Madtom	*Noturus taylori*
62	Leopard Darter	*Percina pantherina*
52	Alabama Shad	*Alosa alabamae*
50	Arkansas River Shiner	*Notropis girardi*
48	Pallid Sturgeon	*Scaphirhynchus albus*
46	Paleback Darter	*Etheostoma pallididorsum*
46	Ouachita Madtom	*Noturus lachneri*
46	Ouachita Darter	*Percina brucethompsoni*
43	Sicklefin Chub	*Macrhybopsis meeki*
43	Ozark Cavefish	*Troglichthys rosae*
38	Crystal Darter	*Crystallaria asprella*
38	Arkansas Darter	*Etheostoma cragini*
38	Stargazing Darter	*Percina uranidea*
33	Western Sand Darter	*Ammocrypta clara*
33	Kiamichi Shiner	*Notropis ortenburgeri*
33	Ozark Shiner	*Notropis ozarcanus*
33	Peppered Shiner	*Notropis perpallidus*
33	Bluehead Shiner	*Pteronotropis hubbsi*
29	Strawberry River Darter	*Etheostoma fragi*
29	Least Darter	*Etheostoma microperca*
29	Silver Redhorse	*Moxostoma anisurum*
29	Stonecat	*Noturus flavus*
27	Lake Sturgeon	*Acipenser fulvescens*
27	Alligator Gar	*Atractosteus spatula*
27	Plains Minnow	*Hybognathus placitus*
27	Ouachita Shiner	*Lythrurus snelsoni*
27	Red River Shiner	*Notropis bairdi*
27	Rocky Shiner	*Notropis suttkusi*
27	Brown Madtom	*Noturus phaeus*
27	Longnose Darter	*Percina nasuta*
27	Southern Cavefish	*Typhlichthys subterraneus*
24	American Eel	*Anguilla rostrata*
24	Paddlefish	*Polyodon spathula*
23	Blue Sucker	*Cycleptus elongatus*
23	Bluntface Shiner	*Cyprinella camura*
23	Spotfin Shiner	*Cyprinella spiloptera*
23	Lowland Topminnow	*Fundulus blairae*

Table 2.2.4. Fish, continued.

Priority Score	Common Name	Scientific Name
23	Chub Shiner	*Notropis potteri*
23	Sabine Shiner	*Notropis sabinae*
23	Suckermouth Minnow	*Phenacobius mirabilis*
23	Flathead Chub	*Platygobio gracilis*
23	Central Mudminnow	*Umbra limi*
19	Brown Bullhead	*Ameiurus nebulosus*
19	Autumn Darter	*Etheostoma autumnale*
19	Beaded Darter	*Etheostoma clinton*
19	Sunburst Darter	*Etheostoma mihileze*
19	Current Darter	*Etheostoma uniporum*
19	Goldeye	*Hiodon alosoides*
19	Mooneye	*Hiodon tergisus*
19	American Brook Lamprey	*Lethenteron appendix*
19	Pealip Redhorse	*Moxostoma pisolabrum*
19	Striped Mullet	*Mugil cephalus*
19	Redspot Chub	*Nocomis asper*
19	Blackspot Shiner	*Notropis atrocaudalis*
19	Channel Shiner	*Notropis wickliffi*
19	Gilt Darter	*Percina evides*
19	Slenderhead Darter	*Percina phoxocephala*
17	Highfin Carpsucker	*Carpiodes velifer*
17	Goldstripe Darter	*Etheostoma parvipinne*
15	Lake Chubsucker	*Erimyzon sucetta*
15	Swamp Darter	*Etheostoma fusiforme*
15	Highland Darter	*Etheostoma teddyroosevelt*
15	Least Brook Lamprey	*Lampetra aepyptera*
15	Shoal Chub	*Macrhybopsis hyostoma*
15	Saddleback Darter	*Percina vigil*

Table 2.2.5. Calculated Priority Scores for Insect Species of Greatest Conservation Need. A higher score implies a greater need for conservation concern and actions.

Priority Score	Common Name	Scientific Name
80	Bowed Snowfly	*Allocapnia oribata*
80	Winter Stonefly	*Allocapnia warreni*
80	Magazine Mountain Mold Beetle	*Arianops sandersoni*
80	Sulphur Springs Diving Beetle	*Heterosternuta sulphuria*
80	Magazine Stripetail	*Isoperla szczytkoi*
80	Microcaddisfly	*Paucicalcaria ozarkensis*
80	Ground Beetle	*Rhadine ozarkensis*
65	Caddo Sallfly	*Alloperla caddo*
65	Ouachita Spiketail	*Cordulegaster talaria*
65	Nearctic Paduniellan Caddisfly	*Paduniella nearctica*
65	Rattlesnake-Master Borer Moth	*Papaipema eryngii*
65	Mayfly	*Paraleptophlebia calcarica*
57	Microcaddisfly	*Ochrotrichia robisoni*
50	Arkansas Agapetus Caddisfly	*Agapetus medicus*
50	Winter Stonefly	*Allocapnia jeanae*
50	Winter Stonefly	*Allocapnia ozarkana*
50	Arogos Skipper	*Atrytone arogos iowa*
50	Stonefly	*Leuctra paleo*
50	Contorted Ochrotrichian Microcaddisfly	*Ochrotrichia contorta*
46	Predaceous Diving Beetle	*Heterosternuta phoebeae*
42	Texas Frosted Elfin	*Callophrys irus hadros*
42	American Burying Beetle	*Nicrophorus americanus*
38	Linda's Roadside-Skipper	*Amblyscirtes linda*
38	Indiana Phlox Moth	*Schinia indiana*
34	Swamp Metalmark	*Calephelis muticum*
34	Ozark Emerald	*Somatochlora ozarkensis*
32	Dukes' Skipper	*Euphyes dukesi*
32	Prairie Mole Cricket	*Gryllotalpa major*
32	Ozark Snaketail Dragonfly	*Ophiogomphus westfalli*
30	Mayfly	*Dannella provonshai*
30	Giant Prairie Robberfly	*Microstylum morosum*
30	Ozark Swallowtail	*Papilio joanae*
29	Mottled Duskywing	*Erynnis martialis*
29	Meske's Skipper	*Hesperia meskei*
27	Lace-winged Roadside-Skipper	*Amblyscirtes aesculapius*
27	Carolina Roadside-Skipper	*Amblyscirtes carolina*
27	Appalachian Azure	*Celastrina neglectamajor*
27	Baltimore Checkerspot	*Euphydryas phaeton ozarkae*

Table 2.2.5. Insects, continued.

Priority Score	Common Name	Scientific Name
27	Ozark Clubtail Dragonfly	*Gomphus ozarkensis*
27	Georgia Satyr	*Neonympha areolatus*
27	King's Hairstreak	*Satyrium kingi*
25	Tiger Beetle	*Cicindela lepida*
25	Giant Stag Beetle	*Lucanus elaphus*
25	Diana	*Speyeria diana*
23	Lace Bug	*Acalypta susanae*
23	Copeland's Mold Beetle	*Arianops copelandi*
23	Northern Metalmark	*Calephelis borealis*
23	Lincoln Underwing	*Catocala lincolnana*
23	Dusky Azure	*Celastrina nigra*
23	Outis Skipper	*Cogia outis*
23	Beetle	*Derops divalis*
23	Ouachita Shore Bug	*Pentacora ouachita*
23	Yehl Skipper	*Poanes yehl*
23	Byssus Skipper	*Problema byssus*
23	Ouachita Pseudactium	*Pseudactium magazinensis*
23	Ozark Pseudactium	*Pseudactium ursum*
23	Ground Beetle	*Scaphinotus inflectus*
23	Ground Beetle	*Scaphinotus parisiana*
23	Anthophorid Bee	*Tetraloniella albata*
21	Bell's Roadside-Skipper	*Amblyscirtes belli*
21	Golden-banded Skipper	*Autochton cellus*
21	Ant-like Tiger Beetle	*Cicindela cursitans*
21	Scrubland Tiger Beetle	*Cicindela obsoleta*
21	Woodland Tiger Beetle	*Cicindela unipunctata*
21	Red Milkweed Beetle	*Tetraopes quinquemaculatus*
21	Texas Milkweed Beetle	*Tetraopes texanus*
19	Lace Bug	*Acalypta lillianus*
19	Six-banded Longhorn Beetle	*Dryobius sexnotatus*
19	Dion Skipper	*Euphyes dion*
19	Leonard's Skipper	*Hesperia leonardus*
19	Cobweb Skipper	*Hesperia metea*
19	Ouachita Diving Beetle	*Heterosternuta ouachita*
19	Small-eyed Mold Beetle	*Ouachitychus parvoculus*
19	Gray Comma	*Polygonia progne*
19	Oak Hairstreak	*Satyrium favonius ontario*
17	Big Sand Tiger Beetle	*Cicindela formosa pigmentosignata*

Table 2.2.5. Insects, continued.

Priority Score	Common Name	Scientific Name
17	Beach-dune Tiger Beetle	*Cicindela hirticollis*
17	Sandy Stream Tiger Beetle	*Cicindela macra*
15	Gorgone Checkerspot	*Chlosyne gorgone*
15	Cow Path Tiger Beetle	*Cicindela purpurea*
15	Monarch	*Danaus plexippus*
15	Broad-winged Skipper	*Poanes viator*
13	Twelve-spotted Tiger Beetle	*Cicindela duodecimguttata*
11	Winter Stonefly	*Allocapnia malverna*
11	Bronze Copper	*Lycaena hyllus*

Table 2.2.6. Calculated Priority Scores for Invertebrate Species of Greatest Conservation Need. A higher score implies a greater need for conservation concern and actions.

Priority Score	Common Name	Scientific Name
80	Foushee Cavesnail	*Amnicola cora*
80	Magazine Mountain Shagreen	*Inflectarius magazinensis*
80	Isopod	*Lirceus bidentatus*
80	Ozark Pyrg	*Marstonia ozarkensis*
80	Striate Supercoil	*Paravitrea aulacogyra*
80	Ouachita Pebblesnail	*Somatogyrus amnicoloides*
80	Thicklipped Pebblesnail	*Somatogyrus crassilabris*
80	Channelled Pebblesnail	*Somatogyrus wheeleri*
65	Cave Obligate Pseudoscorpion	*Apochthonius diabolus*
65	Cave Obligate Pseudoscorpion	*Apochthonius titanicus*
65	Cave Obligate Harvestman	*Crosbyella distincta*
65	Cave Obligate Harvestman	*Crosbyella roeweri*
65	Calico Rock Oval	*Patera clenchi*
65	Elevated Spring Amphipod	*Stygobromus elatus*
65	Mountain Cave Amphipod	*Stygobromus montanus*
65	Cave Obligate Millipede	*Trigenotyla parca*
65	Arkansas Wedge	*Xolotrema occidentale*
50	Springtail	*Pseudosinella dubia*
50	Cave Obligate Springtail	*Schaefferia alabamensis*
50	Ouachita Needlefly	*Zealeuctra wachita*
46	Rich Mountain Slitmouth	*Stenotrema pilsbryi*
42	Hubricht's Long-tailed Amphipod	*Allocrangonyx hubrichti*
42	Amphipod	*Bactrurus pseudomucronatus*
42	Isopod	*Caecidotea oculata*
42	Cave Obligate Isopod	*Caecidotea simulator*
42	Cave Obligate Planarian	*Dendrocoelopsis americana*
38	Isopod	*Caecidotea dimorpha*
38	Bat Cave Isopod	*Caecidotea macropropoda*
34	White Liptooth	*Daedalochila peregrina*
34	Ouachita Slitmouth	*Stenotrema unciferum*
30	Isopod	*Caecidotea steevesi*
30	Isopod	*Lirceus bicuspidatus*
27	Isopod	*Caecidotea ancyla*
27	Isopod	*Caecidotea salemensis*
27	Land Snail	*Gastrocopta rogersensis*
27	Shelled Cave Springtail	*Pseudosinella testa*
25	Springtail	*Pygmarrhopalites clarus*
23	Millipede	*Abacion wilhelminae*

Table 2.2.6. Invertebrates - other, continued.

Priority Score	Common Name	Scientific Name
23	Isopod	*Caecidotea fonticulus*
23	Isopod	*Caecidotea stiladactyla*
23	Pseudoscorpion	*Hesperochernes occidentalis*
23	Ozark Cave Amphipod	*Stygobromus ozarkensis*
23	Pseudoscorpion	*Tartarocreagris ozarkensis*
17	Earthworm	*Diplocardia meansi*

Table 2.2.7. Calculated Priority Scores of Mammal Species of Greatest Conservation Need. A higher score implies a greater need for conservation concern and actions.

Priority Score	Common Name	Scientific Name
80	Ozark Big-eared Bat	*Corynorhinus townsendii ingens*
63	Northern Long-eared Bat	*Myotis septentrionalis*
62	Indiana Bat	*Myotis sodalis*
57	Ozark Pocket Gopher	*Geomys bursarius ozarkensis*
33	Little Brown Bat	*Myotis lucifugus*
29	Rafinesque's Big-Eared Bat	*Corynorhinus rafinesquii*
27	Eastern Small-Footed Bat	*Myotis leibii*
24	Southeastern Bat	*Myotis austroriparius*
23	Plains Harvest Mouse	*Reithrodontomys montanus*
21	Black-tailed Jackrabbit	*Lepus californicus*
21	Eastern Spotted Skunk	*Spilogale putorius*
19	Crawford's Gray Shrew	*Notiosorex crawfordi*
19	Eastern Harvest Mouse	*Reithrodontomys humulis*
19	Southeastern Shrew	*Sorex longirostris*
19	Southern Bog Lemming	*Synaptomys cooperi*
16	Gray Bat	*Myotis grisescens*
16	American Badger	*Taxidea taxus*
15	Long-tailed Weasel	*Mustela frenata*
15	Western Harvest Mouse	*Reithrodontomys megalotis*

Table 2.2.8. Calculated Priority Scores for Mussel Species of Greatest Conservation Need. A higher score implies a greater need for conservation concern and actions.

Priority Score	Common Name	Scientific Name
100	Curtis Pearlymussel	*Epioblasma florentina curtisii*
100	Turgid Blossom	*Epioblasma turgidula*
80	Ouachita Rock Pocketbook	*Arcidens wheeleri*
80	Speckled Pocketbook	*Lampsilis streckeri*
80	Winged Mapleleaf	*Quadrula fragosa*
76	Scaleshell	*Leptodea leptodon*
65	Louisiana Pearlshell	*Margaritifera hembeli*
65	Texas Pigtoe	*Pleurobema riddellii*
62	Neosho Mucket	*Lampsilis rafinesqueana*
57	Arkansas Fatmucket	*Lampsilis powellii*
52	Rabbitsfoot	*Quadrula cylindrica cylindrica*
46	Pink Mucket	*Lampsilis abrupta*
46	Fat Pocketbook	*Potamilus capax*
43	Western Fanshell	*Cyprogenia aberti*
43	"Ouachita" Fanshell	*Cyprogenia sp. cf aberti*
43	Snuffbox	*Epioblasma triquetra*
38	Spectaclecase	*Cumberlandia monodonta*
38	Pyramid Pigtoe	*Pleurobema rubrum*
34	Salamander Mussel	*Simpsonaias ambigua*
33	Purple Lilliput	*Toxolasma lividum*
31	Slippershell Mussel	*Alasmidonta viridis*
30	Purple Pimpleback	*Quadrula refulgens*
29	"Elongate" Pigtoe	*Fusconaia sp. cf. flava*
23	Ozark Pigtoe	*Fusconaia ozarkensis*
23	Pink Heelsplitter	*Potamilus alatus*
23	Ouachita Kidneyshell	*Ptychobranchus occidentalis*
23	Ellipse	*Venustaconcha ellipsiformis*
23	Bleedingtooth Mussel	*Venustaconcha pleasii*
19	Elktoe	*Alasmidonta marginata*
19	Southern Pocketbook	*Lampsilis ornata*
19	"Red River" Mucket	*Lampsilis sp. B cf hydiana*
19	Hickorynut	*Obovaria olivaria*
19	"White" Hickorynut	*Obovaria sp. cf arkansasensis*
19	Ohio Pigtoe	*Pleurobema cordatum*
19	Gulf Mapleleaf	*Quadrula nobilis*

Table 2.2.8. Mussels, continued.

Priority Score	Common Name	Scientific Name
19	Lilliput	*Toxolasma parvum*
19	Texas Lilliput	*Toxolasma texasiense*
19	Tapered Pondhorn	*Uniomerus declivis*
19	Pondhorn	*Uniomerus tetralasmus*
17	Round Pigtoe	*Pleurobema sintoxia*
17	Little Spectaclecase group	*Villosa sp. cf lienosa*
15	"Arkoma" Fatmucket	*Lampsilis sp. A cf hydiana*
15	Southern Mapleleaf	*Quadrula apiculata*
15	Fawnsfoot	*Truncilla donaciformis*
15	Rainbow	*Villosa iris*

Table 2.2.9. Calculated Species Priority Scores for Reptile Species of Greatest Conservation Need. A higher score implies a greater need for conservation concern and actions.

Priority Score	Common Name	Scientific Name
29	Queensnake	*Regina septemvittata*
24	Eastern Collared Lizard	*Crotaphytus collaris*
23	Great Plains Skink	*Plestiodon obsoletus*
23	Western Groundsnake	*Sonora semiannulata*
23	Lined Snake	*Tropidoclonion lineatum*
19	Common Wormsnake	*Carphophis amoenus*
19	Chicken Turtle	*Deirochelys reticularia*
19	Texas Coralsnake	*Micrurus tener*
19	Prairie Skink	*Plestiodon septentrionalis*
19	Graham's Crayfish Snake	*Regina grahamii*
19	Ornate Box Turtle	*Terrapene ornata*
17	Western Diamond-backed Rattlesnake	*Crotalus atrox*
15	Glossy Swampsnake	*Liodytes rigida*
15	Slender Glass Lizard	*Ophisaurus attenuatus*

Appendix 2.3. List of Added and Removed SGCN List for 2015 Revision.

Table 2.3.1. Species added to the Arkansas Wildlife Action Plan under the 2015 revision as SGCN.

Common Name	Scientific Name	Taxa Association
Grotto Salamander "western clade"	*Eurycea spelaea*	amphibian
Grotto Salamander "eastern clade"	*Eurycea spelaea*	amphibian
Ouachita Streambed Salamander	*Eurycea subfluvicola*	amphibian
Squirrel Tree Frog	*Hyla squirella*	amphibian
Boreal Chorus Frog	*Pseudacris maculata*	amphibian
Sharp-shinned Hawk	*Accipiter striatus*	bird
Sprague's Pipit	*Anthus spragueii*	bird
Ruddy Turnstone	*Arenaria interpres*	bird
Common Nighthawk	*Chordeiles minor*	bird
Tricolored Heron	*Egretta tricolor*	bird
American Kestrel	*Falco sparverius*	bird
Purple Finch	*Haemorhous purpureus*	bird
American Golden-Plover	*Pluvialis dominica*	bird
Hubbs' Crayfish	*Cambarus hubbsi*	crayfish
Pine Hills Digger	*Fallicambarus dissitus*	crayfish
Redspotted Stream Crayfish	*Orconectes acares*	crayfish
Little River Creek Crayfish	*Orconectes leptogonopodus*	crayfish
Brown Bullhead	*Ameiurus nebulosus*	fish
American Eel	*Anguilla rostrata*	fish
Highfin Carpsucker	*Carpiodes velifer*	fish
Autumn Darter	*Etheostoma autumnale*	fish
Beaded Darter	*Etheostoma clinton*	fish
Sunburst Darter	*Etheostoma mihileze*	fish
Highland Darter	*Etheostoma teddyroosevelt*	fish
Lowland Topminnow	*Fundulus blairae*	fish
Mooneye	*Hiodon tergisus*	fish
Plains Minnow	*Hybognathus placitus*	fish
Shoal Chub	*Macrhybopsis hyostoma*	fish
Striped Mullet	*Mugil cephalus*	fish
Chub Shiner	*Notropis potteri*	fish
Rocky Shiner	*Notropis suttkusi*	fish
Channel Shiner	*Notropis wickliffi*	fish
Stonecat	*Noturus flavus*	fish
Gilt Darter	*Percina evides*	fish
Saddleback Darter	*Percina vigil*	fish
Bell’s Roadside-Skipper	*Ambylscirtes bellii*	insect

Arogos Skipper	*Atrytone arogos*	insect
Golden-banded Skipper	*Autochton cellus*	insect
Northern Metalmark	*Calephelis borealis*	insect
Appalachian Azure	*Celastrina neglecta major*	insect
Dusky Azure	*Celastrina nigra*	insect
Gorgonne Checkerspot	*Chlosyne gorgone*	insect
Outis Skipper	*Cogia outis*	insect
Ouachita Spiketail	*Cordulegaster talaria*	insect
Monarch	*Danaus plexippus*	insect
Mottled Duskywing	*Erynnis martialis*	insect
Baltimore Checkerspot	*Euphydryas phaeton ozarkae*	insect
Dion Skipper	*Euphyes dion*	insect
Leonard's Skipper	*Hesperia leonardus*	insect
Cobweb Skipper	*Hesperia metea*	insect
Bronze Copper	*Lycaena hyllus*	insect
Rattlesnake-master Borer Moth	*Papaipema eryngii*	insect
Ozark Swallowtail	*Papilio joanae*	insect
Broad-winged Skipper	*Poanes viator*	insect
Gray Comma	*Polygonia progne*	insect
Oak Hairstreak	*Satyrium favonius ontario*	insect
Ozark Emerald	*Somatochlora ozarkensis*	insect
Little Brown Bat	*Myotis lucifugus*	mammal
Northern Long-eared Bat	*Myotis septentrionalis*	mammal
Western Fanshell	*Cyprogenia aberti*	mussel
Ouachita Fanshell	*Cyprogenia sp. Cf aberti*	mussel
Elongate Elktoe	*Fusconaia sp. Cf. sampsoniana*	mussel
Texas Pigtoe	*Pleurobema riddellii*	mussel
Purple Pimpleback	*Quadrula refulgens*	mussel
Lilliput	*Toxolasma parvum*	mussel
Lined Snake	*Tropidoclonion lineatum*	reptile

Table 2.3.2. Species removed from the Arkansas Wildlife Action Plan under the 2015 Revision.

Common Name	Scientific Name	Taxa Association
Northern Pintail	*Anas acuta*	bird
Short-eared Owl	*Asio flammeus*	bird
Upland Sandpiper	*Bartramia longicauda*	bird
Ruffed Grouse	*Bonasa umbellus*	bird
Western Sandpiper	*Calidris mauri*	bird
Least Sandpiper	*Calidris minutilla*	bird
Semi-palmated Sandpiper	*Calidris pusilla*	bird
Ivory-billed Woodpecker	*Campephilus principalis*	bird
Chuck-will's-widow	*Caprimulgus carolinensis*	bird
Lark Sparrow	*Chondestes grammacus*	bird
Northern Harrier	*Circus cyaneus*	bird
Prairie Warbler	*Dendroica discolor*	bird
Yellow Warbler	*Dendroica petechia*	bird
Little Blue Heron	*Egretta caerulea*	bird
Snowy Egret	*Egretta thula*	bird
Bald Eagle	*Haliaeetus leucocephalus*	bird
Worm-eating Warbler	*Helmitheros vermivorus*	bird
Mississippi Kite	*Ictinia mississippiensis*	bird
Hudsonian Godwit	*Limosa haemastica*	bird
Red-headed Woodpecker	*Melanerpes erythrocephalus*	bird
Wood Stork	*Mycteria americana*	bird
Black-crowned Night-Heron	*Nycticorax nycticorax*	bird
Kentucky Warbler	*Oporornis formosus*	bird
Osprey	*Pandion haliaetus*	bird
American White Pelican	*Pelecanus erythrorhynchos*	bird
Wilson's Phalarope	*Phalaropus tricolor*	bird
Eastern Towhee	*Pipilo erythrophthalmus*	bird
Pied-billed Grebe	*Podilymbus podiceps*	bird
Prothonotary Warbler	*Protonotaria citrea*	bird
American Avocet	*Recurvirostra americana*	bird
Brown-headed Nuthatch	*Sitta pusilla*	bird
Lesser Yellowlegs	*Tringa flavipes*	bird
Greater Yellowlegs	*Tringa melanoleuca*	bird
Solitary Sandpiper	*Tringa solitaria*	bird
Greater Prairie Chicken	*Tympanuchus cupido*	bird
Barn Owl	*Tyto alba*	bird
Blue-winged Warbler	*Vermivora pinus*	bird
Hooded Warbler	*Wilsonia citrina*	bird
Crayfish	*Procambarus ferrugineus*	crayfish

Ozark Chub	*Erimystax harryi*	fish
Sturgeon Chub	*Macrhybopsis gelida*	fish
Tailight Shiner	*Notropis maculatus*	fish
Seminole Bat	*Lasiurus seminolus*	mammal
Black Bear	*Ursus americanus americanus*	mammal
Flat Floater	*Anodonta suborbiculata*	mussel
Rock Pocketbook	*Arcidens confragosus*	mussel
Purple Wartyback	*Cyclonaias tuberculata*	mussel
Butterfly	*Ellipsaria lineolata*	mussel
Round Pearlshell	*Glebula rotundata*	mussel
Louisiana Fatmucket	*Lampsilis hydiana*	mussel
Arkansas Brokenray	*Lampsilis reeveiana*	mussel
Fatmucket	*Lampsilis siliquodea*	mussel
Flutedshell	*Lasmigona costata*	mussel
Black Sandshell	*Ligumia recta*	mussel
Round Hickorynut	*Obovaria subrotunda*	mussel
Creeper	*Strophitus undulatus*	mussel
Ouachita Creekshell	*Villosa arkansasensis*	mussel

Appendix 3.1 Potential Habitat: GIS Methodology

Approach: Use GAP Vegetation Map in combination with ancillary layers (polygons from Level III Omernik Ecoregions, STATSGO soils, 1:500,000 Arkansas Geology, Saucier Geomorphology. These were used to clip the GAP Vegetation Raster map to define areas of existing vegetation associated with particular ecological systems). Future phases will add to and improve this map. In the Ozark-Ouachita (Interior Highlands) region, systems are not generally defined in such a way that the data layers available for Phase 1 added any ability to map ecological systems. Therefore in these areas GAP vegetation units were selected without using any other layers.

The 2ha aggregate GAP Vegetation Map was the base vegetation layer – Initial efforts used the finer 30-m pixel size that was the base GAP map resulting from image classification. After doing some clipping of this map it was apparent that the selected areas of vegetation included many single-pixel or few-pixel "speckles" that would have to be aggregated with larger areas before a useful polygon map could be created. The GAP project had already produced aggregated raster maps of 2ha, 10ha and 100ha. It would simplify the current project to use one of these. After inspecting the alternatives the 2ha was chosen as the base vegetation map since it would be easy to "polygonize" but would retain considerable detail. This was a smaller area than would be tracked by the CWCS planning effort for large patch or matrix communities but might be useful for some small patch communities.

Factors involved in selecting clipping layer – GAP used STATSGO map to constrain spectral classification, that is, spectral classification was often done within certain STATSGO polygons within a certain satellite scene. Therefore the vegetation map overlays better on the STATSGO map than on the other maps and is the preferred clipping file unless another is preferred for a specific reason. The STATSGO map was most useful in the Coastal Plain because systems there are closely associated with soils. The Saucier map was preferred in the Mississippi Alluvial Plain because it better represents the definitions of those alluvial systems. The Ecoregion map did not exactly overlay the other maps but CWCS has already made the decision to use that map to define ecoregions so it was used for that purpose. The Geology map was used as a backup to these.

Map Accuracy: The ecological systems map can be no more accurate than the maps used in creating it. The GAP project did an accuracy assessment and found wide variations in accuracy depending on the vegetation type. The highest accuracy was forest vs. non-forest at 75%. In creating the ecological systems map, unless it was essential to do otherwise, all natural vegetation types within a clipping polygon were selected as representing the system, even if, for example, wetland types along streams were known to be a different system from the dominant upland system. The wetland pixels were usually scattered and occurred both along defined stream courses and in inappropriate sites as well, indicating that there would have been as much error in placing them into a different system as including them in the prevalent system. Thus overall accuracy was improved by selecting all forested types as belonging to the system. Although this resulted in a decrease in detail within any given system polygon, the number of systems so defined, at about 20, is not greatly different from the total number of vegetation types defined in the original GAP map, 31.

Map Units Organized by Ecoregion

OZARK-OUACHITA (INTERIOR HIGHLANDS) REGION (comprised of Omernik Level 3 ecoregions Ozark Highlands, Boston Mountains, Arkansas Valley, Ouachita Mountains)

Method: Select vegetation types from the 2 ha. Gap vegetation map (no clip polygons are used).

Ozark-Ouachita Dry-mesic Oak Forest habitat (and same ecological system)

GAP types:

8 T.1.B.3.a.II, *Quercus alba,* white oak - mixed hardwoods

9 T.1.B.3.a.III, *Quercus rubra* - Quercus spp., northern red oak - oak

10 T.1.B.3.a.IV, *Quercus falcata* - Quercus spp., south-

ern red oak - oak 15 T.2.B.4.a.I, *Quercus* spp. - *Carya texana*, oak - black hickory

"Interior Highlands Glade-Barrens" type includes three habitats: Central Interior Highlands Dry Acidic Glade and Barrens (and same ecological system)

Central Interior Highlands Calcareous Glade and Barrens (and same ecological system)

Ozark-Ouachita Dry Oak Woodland (and same ecological system)

GAP types:

3 T.1.A.9.c.I, *Juniperus virginiana*, eastern red cedar

6 T.1.B.2.b.IV, *Juniperus virginiana*, eastern red cedar

11 T.1.B.3.a.V, *Quercus stellata*, post oak

12 T.2.A.2.b.I, *Juniperus virginiana* - Quercus spp., eastern red cedar - oak

14 T.2.B.3.a.II, *Juniperus ashei* - *Quercus* spp., white cedar - oak

"Ozark-Ouachita Pine-Oak Forest and Woodland" type includes pine-hardwood co-dominated sites in three habitats:

Ozark-Ouachita Pine-Oak Forest habitat Ozark-

Ouachita Pine-Oak Woodland habitat Ozark-

Ouachita Pine/Bluestem Woodland habitat

All of which make up Ozark-Ouachita Shortleaf Pine-Oak Forest and Woodland ecological system. (This map unit is probably more comparable to the first two habitats, depending on structure, either forest or woodland, not distinguished by GAP).

GAP types:

4 T.1.B.2.b.II, *Quercus* spp. - *Pinus echinata* - *Carya* spp., oak - shortleaf pine - hickory 13 T.2.B.3.a.I, *Pinus echinata* - *Quercus* spp., shortleaf pine - oak

"Ozark-Ouachita Pine" type includes pine-dominated sites in three habitats:

Ozark-Ouachita Pine-Oak Forest habitat Ozark-

Ouachita Pine-Oak Woodland habitat Ozark-

Ouachita Pine/Bluestem Woodland habitat

All of which make up Ozark-Ouachita Shortleaf Pine-Oak Forest and Woodland ecological system. (This may be comparable to the third habitat if structure is very open, and may also be a distinct habitat from the first two, even if fairly dense.)

GAP types:

1 T.1.A.9.b.I, *Pinus echinata*, shortleaf pine

Ozark-Ouachita Mesic Hardwood Forest habitat (and same ecological system)

GAP types:

7 T.1.B.3.a.I, *Fagus grandifolia*, american beech (The GAP map shows very few areas of this type in only part of the highlands – the type is under-represented in that map.)

"Ozark-Ouachita Riparian" type includes two habitats:

Ozark-Ouachita Riparian habitat (and same ecological system)

South-Central Interior Large Floodplain habitat (and same ecological system)

GAP types:

23 P.1.B.3.c.VII, *Quercus phellos*, willow oak

24 P.1.B.3.c.VIII, *Liquidambar styraciflua*, sweetgum

30 R.1.B.3.c.I, *Salix* - *Populus*, willow - cottonwood

31 R.1.B.3.c.II, *Betula* - *Platanus* - Acer, birch - sycamore - maple

CROWLEY'S RIDGE ECOREGION (defined by Omernik Level 3 map)

"Crowley's Ridge Dry-Mesic Forest" type is a part of Mississippi River Alluvial Plain Loess Slope Forest habitat (and same ecological system)

GAP types:

8 T.1.B.3.a.II, *Quercus alba*, white oak - mixed hardwoods

9 T.1.B.3.a.III, *Quercus rubra* - Quercus spp., northern red oak - oak

10 T.1.B.3.a.IV, *Quercus falcata* - Quercus spp., southern red oak - oak

15 T.2.B.4.a.I, *Quercus* spp. - *Carya texana*, oak - black hickory

"Crowley's Ridge Pine" type is a part of Mississippi River Alluvial Plain Loess Slope Forest habitat (and same ecological system)

GAP types:

1 T.1.A.9.b.I, *Pinus echinata*, shortleaf pine

MISSISSIPPI ALLUVIAL PLAIN ECOREGION defined by Omernik Level 3 map.

Method: Clip 2 ha. GAP vegetation map with appropriate geomorphology polygons defined by Saucier's map.

Lower Mississippi River Dune Woodland and Forest habitat (equivalent to Lower Mississippi River Dune Woodland and Forest and Lower Mississippi River Dune Pond ecological systems).

Saucier types:

Ps sand dune fields and eolian deposits on valley trains

GAP types - All except:

32 R.6.A.1.a.I, Bare, bare

33 W, Water, water

34 AGW, Agriculture, Agriculture (wet crops)

35 AGD, Agriculture, Agriculture (dry crops)

36 AGP, Agriculture, Agriculture (pasture)

37 URC, Urban, Urban Commercial-Industrial

38 URR, Urban, Urban Residential

"Mississippi River Low Bottomland and Depression" map unit includes Lower Mississippi River Low Bottomland Forest and Lower Mississippi River Bottomland Depression habitats (equivalent to Mississippi River Low Floodplain (Bottomland) Forest and Lower Mississippi River Bottomland Depression ecological systems).

Saucier types:

Hb Backswamp (floodbasin) deposits

Hal Alluvial fans and aprons along valley margins

Hchm Abandoned channels (neck and chute cutoffs) of the Mississippi River

Hcom Abandoned courses of the Mississippi River

Pdch Abandoned channels (cutoffs) of the Deweyville Complex

Pdp Point bar (meander scroll) deposits of the Deweyville Complex

Pdu Undifferentiated fluvial deposits of the Deweyville Complex

Ptc Undifferentiated fluvial deposits of the Cache River Terrace

Pvcl Relict channels of late Wisconsin Stage Valley Train

GAP types – All except:

32 R.6.A.1.a.I, Bare, bare

33 W, Water, water

34 AGW, Agriculture, Agriculture (wet crops)

35 AGD, Agriculture, Agriculture (dry crops)

36 AGP, Agriculture, Agriculture (pasture)

37 URC, Urban, Urban Commercial-Industrial

38 URR, Urban, Urban Residential

"Mississippi River Riparian and High Bottomland" map unit includes Lower Mississippi River Riparian Forest and Lower Mississippi River High Bottomland Forest habitats (equivalent to Lower Mississippi River Riparian Forest and Lower Mississippi River High Floodplain (Bottomland) Forest.

Saucier types:

Hpa 1-7 Point bar (meander scroll) deposits of Arkansas meander belts

Hps Point bar (meander scroll) deposits of small streams

GAP types – All except:

32 R.6.A.1.a.I, Bare, bare

34 AGW, Agriculture, Agriculture (wet crops)

35 AGD, Agriculture, Agriculture (dry crops)

36 AGP, Agriculture, Agriculture (pasture)

37 URC, Urban, Urban Commercial-Industrial

38 URR, Urban, Urban Residential

Lower Mississippi Alluvial Plain Grand Prairie habitat (equivalent to Lower Mississippi Alluvial Plain Grand Prairie ecological system).

Saucier types:

Ppu Undifferentiated fluvial deposits of the Prairie Complex. Mostly natural levee and backswamp deposits of the Mississippi, Arkansas and Red rivers.

Pdp Point bar (meander scroll) deposits of the Deweyville Complex. Note-some prairie occurred on Pdp but it is primarily in flatwoods, below.

Pi The part adjacent to Ppu

GAP types – all except:

25 Baldcypress – mixed hardwoods (moved to Mississippi River Low Bottomland and Depression.

32 R.6.A.1.a.I, Bare, bare

33 W, Water, water

34 AGW, Agriculture, Agriculture (wet crops)

35 AGD, Agriculture, Agriculture (dry crops)

36 AGP, Agriculture, Agriculture (pasture)

37 URC, Urban, Urban Commercial-Industrial

38 URR, Urban, Urban Residential

Lower Mississippi River Flatwoods Woodland and Forest habitat (equivalent to Lower Mississippi River Flatwoods ecological system).

Saucier types:

Had Principal abandoned deltaic distributaries.

Pdp Point bar (meander scrolls) of the Deweyville Complex.

Pve 1-4 Early Wisconsin Stage valley trains.

Pvl Late Wisconsin Stage valley trains where levels are not separately delineated.

Pvl 1-2 Late Wisconsin Stage valley trains Levels 1 and 2.

GAP types – all except:

25 Baldcypress – mixed hardwoods (moved to Mississippi River Low Bottomland and Depression.

32 R.6.A.1.a.I, Bare, bare

33 W, Water, water 34 AGW, Agriculture, Agriculture (wet crops)

35 AGD, Agriculture, Agriculture (dry crops)

36 AGP, Agriculture, Agriculture (pasture)

37 URC, Urban, Urban Commercial-Industrial

38 URR, Urban, Urban Residential

WEST GULF COASTAL PLAIN ECOREGION defined by Omernik Level 3 map.

Method: Clip 2 ha. GAP vegetation map with appropriate polygons defined by NRCS STATSGO soil map.

"West Gulf Coastal Plain Flatwoods" includes two habitats:

West Gulf Coastal Plain Dry Pine-Hardwood Flatwoods (and same ecological system)

West Gulf Coastal Plain Wet Hardwood Flatwoods (and same ecological system)

STATSGO types:

Adaton-Felker-Gore AR035

Amy-Pheba-Guyton AR040

Calloway-Henry-Grenada AR038

Bussy-Tullou-Guyton

Sacul-Savannah-Sawyer

Smithdale-Savannah-Sacul (only that area of Sacul lying within the 1:500,000 geology Qt-Quaternary Terrace)

Wrightsville-Acadia-Louin

GAP types – all except:

32 R.6.A.1.a.I, Bare, bare

33 W, Water, water

34 AGW, Agriculture, Agriculture (wet crops)

35 AGD, Agriculture, Agriculture (dry crops)

36 AGP, Agriculture, Agriculture (pasture)

37 URC, Urban, Urban Commercial-Industrial 3

8 URR, Urban, Urban Residential

"West Gulf Coastal Plain Sandhill" equivalent to West Gulf Coastal Plain Sandhill Oak and Shortleaf Pine Forest and Woodland habitat (and same ecological system)

STATSGO types:

Briley-Alaga

GAP types – all except:

32 R.6.A.1.a.I, Bare, bare

33 W, Water, water34 AGW, Agriculture, Agriculture (wet crops)

35 AGD, Agriculture, Agriculture (dry crops)

36 AGP, Agriculture, Agriculture (pasture)

37 URC, Urban, Urban Commercial-Industrial

38 URR, Urban, Urban Residential

"Red River" equivalent to West Gulf Coastal Plain Red River Floodplain Forest habitat and Red River Large Floodplain Forest ecological system.

STATSGO types:

Severn-Billyhaw

Billyhaw-Perry

Rilla-Hebert

GAP types – all except:

32 R.6.A.1.a.I, Bare, bare

33 W, Water, water

34 AGW, Agriculture, Agriculture (wet crops)

35 AGD, Agriculture, Agriculture (dry crops)

36 AGP, Agriculture, Agriculture (pasture)

37 URC, Urban, Urban Commercial-Industrial

38 URR, Urban, Urban Residential

"Blackland" equivalent to West Gulf Coastal Plain Calcareous Prairie habitat (and same ecological system)

STATSGO types:

Oktibbeha-Sumter (But eliminated areas south of I-40 and north of the main belt of these soils.

GAP types – all except:

32 R.6.A.1.a.I, Bare, bare

33 W, Water, water

34 AGW, Agriculture, Agriculture (wet crops)

35 AGD, Agriculture, Agriculture (dry crops)

36 AGP, Agriculture, Agriculture (pasture)

37 URC, Urban, Urban Commercial-Industrial

38 URR, Urban, Urban Residential

ALSO within a TNC conservation site boundary, included

36 AGP, Agriculture, Agriculture (pasture): This was done because there is a substantial amount of native prairie pasture within this area. However, it is properly beyond Phase 1.

West Gulf Coastal Plain Large River Floodplain Forest habitat (and same ecological system)

STATSGO Types:

Guyton-Amy-Ouachita (but only those areas along the Ouachita, Saline, Little Missouri, Little and Cossatot Rivers.)

GAP types – all except:

32 R.6.A.1.a.I, Bare, bare

34 AGW, Agriculture, Agriculture (wet crops)

35 AGD, Agriculture, Agriculture (dry crops)

36 AGP, Agriculture, Agriculture (pasture)

37 URC, Urban, Urban Commercial-Industrial

38 URR, Urban, Urban Residential

West Gulf Coastal Plain Small Stream/River Forest habitat (and same ecological system)

STATSGO Types:

Guyton-Amy-Ouachita (but only those areas other than the Ouachita, Saline, Little Missouri, Little and Cossatot Rivers.)

GAP types – all except:

32 R.6.A.1.a.I, Bare, bare

34 AGW, Agriculture, Agriculture (wet crops)

35 AGD, Agriculture, Agriculture (dry crops)

36 AGP, Agriculture, Agriculture (pasture)

37 URC, Urban, Urban Commercial-Industrial

38 URR, Urban, Urban Residential

West Gulf Coastal Plain Pine-Hardwood Forest habitat (and same ecological system)

STATSGO types:

All, except those listed above

GAP types – all except:

32 R.6.A.1.a.I, Bare, bare33 W, Water, water

34 AGW, Agriculture, Agriculture (wet crops)

35 AGD, Agriculture, Agriculture (dry crops)

36 AGP, Agriculture, Agriculture (pasture)

37 URC, Urban, Urban Commercial-Industrial

38 URR, Urban, Urban Residential

MOSAICKING IMAGES

The purpose of mosaicking was to stitch all the different images that were produced during different spatial operations into one continuous reclassified image.

Each one of those map units discussed earlier in the draft were output as a raster image and each raster image ended up with pixels representing two classes. One class would be the appropriate gap type or types aggregated into one and other class would the classes that weren't taken into consideration from the original GAP 2Ha data due to their inappropriacy; hence were classified under single class as unclassified. The unclassified classes from all the images were given a consistent number "0" and each class was given a unique number depending on its order in the mosaic operation. At end there were 21 images (21 classes) to be mosaicked.

Mosaic rule: Since there was lot of clipping operations done on the STASGO soil layer there were likely overlaps amongst the raster layers (most expectedly at the borders) while mosaicking all of them together. As a general rule, the classes having smaller spatial extents were given higher priority in the overlap areas over the classes having bigger spatial extents. For instance, if there is a classification conflict due to pixel overlap between the red river and the uplands image then the overlapping pixels will be classified as red river and not the uplands since the red river has much smaller geographical extent than the uplands which are widespread in the UWGCP. To implement this general rule, the "Maximum" overlap function was set while mosaicking all these images together into one contiguous raster. What the maximum overlap function does is in any instance of overlapping pixels for the classification purpose the priority will be given to the pixel or class having higher order. Again as an example; in an overlap between Sandhills- class 3 and Blackland- class 4; according to our rule the overlapping pixel will classified as blacklands since it has higher order than Sandhills and hence will get the preference. Setting the same rule, all the images were mosaicked together and were output as a single image representing all the classes including unclassified pixels.

ERDAS Imagine 8.7 remote sensing software was used to do all the raster operations including mosaicking and the other spatial data were produced, edited and displayed in ESRI software suite.

MOSAICKING ORDER

Upper West Gulf Coastal Plain

0- Unclassified
1- Uplands
2- Flatwoods
3- Sandhills
4- Blacklands
5- Red River
6- Large River
7- Small River

Interior Highlands

8- Dry Mesic Uplands Oak
9- Pine
10- Pine Hardwoods
11- Glade Barrens
12- Riparian
13- Mesic Forest

Crowley's Ridge

14- Mesic Uplands Oak
15- Pine Hardwoods

Mississippi River Alluvial Plain

16- Riparian
17- Grand Prairie
18- Low bottomland
19- Flatwoods
20- Sand Dunes

Appendix 3.2. Crosswalk of Terrestrial Habitat Changes.

The following table summarizes the terrestrial habitat team revisions to terrestrial habitat types from the original plan to the 2015 revised plan. The final updated list includes 37 terrestrial habitats.

Original Habitat Name	Change	New Habitat Name
Arkansas Valley Prairie and Woodland	name change; combine with Southeast tallgrass prairie	Ozark-Ouachita Prairie and Woodland
Caves, Mines & Karst Habitat	name change	Caves, Mines, Sinkholes and other Karst Features
Central Interior Acidic Cliff and Talus	combined acidic and calcareous	Ozark-Ouachita Cliff and Talus
Central Interior Calcareous Cliff and Talus	combined acidic and calcareous	Ozark-Ouachita Cliff and Talus
Central Interior Highlands and Appalachian Sinkhole and Depression Pond	combined into caves, mines, karst	Caves, Mines, Sinkholes and other Karst Features
Central Interior Highlands Calcareous Glade and Barrens	name change, delete 'central'	Interior Highlands Calcareous Glade and Barrens
Central Interior Highlands Dry Acidic Glade and Barrens	name change, delete 'central'	Interior Highlands Dry Acidic Glade and Barrens
Crop Land	no change	Crop Land
Cultivated Forest	no change	Cultivated Forest
Lower Mississippi Alluvial Plain Grand Prairie	no change	Lower Mississippi Alluvial Plain Grand Prairie
Lower Mississippi Flatwoods Woodland and Forest	no change	Lower Mississippi Flatwoods Woodland and Forest
Lower Mississippi River Bottomland Depression	no change	Lower Mississippi River Bottomland Depression
Lower Mississippi River Dune Pond Woodland and Forest	no change	Lower Mississippi River Dune, Pond, Woodland and Forest
Lower Mississippi River High Bottomland Forest	no change	Lower Mississippi River High Bottomland Forest
Lower Mississippi River Low Bottomland Forest	no change	Lower Mississippi River Low Bottomland Forest
Lower Mississippi River Riparian Forest	no change	Lower Mississippi River Riparian Forest
Mississippi River Alluvial Plain Loess Slope Forest	name change	Crowley's Ridge Loess Slope Forest

Mud Flats	no change	Mud Flats
Ouachita Montane Oak Forest	no change	Ouachita Montane Oak Forest
Ouachita Mountain Forested Seep	name change, include Ozarks	Ozark-Ouachita Forested Seep
Ouachita Novaculite Glade and Woodland	combined with Interior Highlands dry acidic glade and barrens	Interior Highlands Dry Acidic Glade and Barrens
Ozark-Ouachita Dry Oak Woodland	name change, include pine	Ozark-Ouachita Dry Oak and Pine Woodland
Ozark-Ouachita Dry-Mesic Oak Forest	no change	Ozark-Ouachita Dry-Mesic Oak Forest
Ozark-Ouachita Mesic Hardwood Forest	no change	Ozark-Ouachita Mesic Hardwood Forest
Ozark-Ouachita Pine/Bluestem Woodland	no change	Ozark-Ouachita Pine/Bluestem Woodland
Ozark-Ouachita Pine-Oak Forest	combine with Ozark-Ouachita Pine-oak Woodland	Ozark-Ouachita Pine-Oak Forest/Woodland
Ozark-Ouachita Pine-Oak Woodland	combine with Ozark-Ouachita Pine-oak Forest	Ozark-Ouachita Pine-Oak Forest/Woodland
Ozark-Ouachita Riparian	no change	Ozark-Ouachita Riparian
Pasture Land	no change	Pasture Land
Ponds, Lakes, and Water Holes	no change	Ponds, Lakes, and Water Holes
South-Central Interior Large Floodplain	name change	Ozark-Ouachita Large Floodplain
Southeastern Great Plains Tallgrass Prairie	combine with Arkansas Valley Prairie- rename	Ozark-Ouachita Prairie and Woodland
Urban/Suburban	no change	Urban/Suburban
West Gulf Coastal Plain Calcareous Prairie	Add “and woodland”	West Gulf Coastal Plain Calcareous Prairie and Woodland
West Gulf Coastal Plain Dry Pine-Hardwood Flatwoods	name change, delete the word dry	West Gulf Coastal Plain Pine-Hardwood Flatwoods
West Gulf Coastal Plain Large River Floodplain Forest	no change	West Gulf Coastal Plain Large River Floodplain Forest
West Gulf Coastal Plain Mesic Hardwood Forest	combined with West Gulf Coastal Plain Pine-Hardwood Forest/Woodland	West Gulf Coastal Plain Pine-Hardwood Forest/Woodland
West Gulf Coastal Plain Nepheline Syenite Glade	combined with Central Interior Highland Calcareous Glades and Barrens	Interior Highlands Calcareous Glades and Barrens
West Gulf Coastal Plain Pine-Hardwood Forest	combined with West Gulf Coastal Plain Pine-Hardwood Forest/Woodland	West Gulf Coastal Plain Pine-Hardwood Forest/Woodland

West Gulf Coastal Plain Red River Floodplain Forest	no change	West Gulf Coastal Plain Red River Floodplain Forest
West Gulf Coastal Plain Saline Glade	combined with West Gulf Coastal Plain Pine-Hardwood Flatwoods	West Gulf Coastal Plain Pine-Hardwood Flatwoods
West Gulf Coastal Plain Sandhill Oak and Shortleaf Pine Forest and Woodland	name change, delete the word "and"	West Gulf Coastal Plain Sandhill Oak and Shortleaf Pine Forest/Woodland
West Gulf Coastal Plain Seepage Swamp and Baygall	no change	West Gulf Coastal Plain Seepage Swamp and Baygall
West Gulf Coastal Plain Small Stream/River Forest	no change	West Gulf Coastal Plain Small Stream/River Forest
West Gulf Coastal Plain Wet Hardwood Flatwoods	no change	West Gulf Coastal Plain Wet Hardwood Flatwoods
	New Habitat	Herbaceous Wetland

Appendix 4.1 Aquatic health and ecobasin condition: GIS Methodology

Data Sources:
Stream reaches layer- NHD (National Hydrography Dataset) from NRCS (National Resource Conservation Science)

Roads layer- TIGER (Topologically Integrated Geographic Encoding and Referencing system)

Dams Data- EPA Basin CD

Riparian Zones- A polygon layer derived by buffering 100 meters on each side of the stream reach

Land use/Land cover Raster- NLCD (National Land Cover Data) from USGS

Measurement Concepts and Units:-
Dam Density- Number of dams per ecobasin (sq. miles)
Methodology- Dams (point layer) were intersected with the Ecobasins layer (polygon) and summed the number of dams for respective ecobasins based upon their spatial locations. Units were expressed as the number of dams per square mile of Ecobasin.

Road Density- Length of roads (miles) per ecobasin (sq. miles)
Methodology- Roads (line layer) were intersected with the Ecobasins layer (polygon) and measured the lengths of road segments for respective ecobasins based upon their spatial locations. Units were expressed as the miles of roads per square mile of Ecobasin.

Riparian Road Density- Length of roads (miles) in riparian zone per ecobasin (sq. miles)
Methodology- Same methodology as measuring the road density except the measurement was taken inside the riparian zones in each ecobasin. Units were expressed as the total number of miles of roads within the total square miles of riparian area for each Ecobasin.

Crossing Density - Number of stream-roads intersections (points) per ecobasin (sq. miles)
Methodology- Stream layer (line features) was intersected to the road layer (line features); at every intersection of a stream and a road line feature, programmatically generated a point. Such intersection points were counted for each ecobasin as number of stream-road intersections. Units were expressed as the total number of crossings per square mile of Ecobasin.

Ecobasin Forested- Percent forest present inside each ecobasin
Methodology- Classified NLCD dataset was used; based upon the ecobasins spatial location land cover was mapped in percentage. 'Tabulate Areas' function was used in ESRI ArcView software. As a result the function returned % contribution of each class from the NLCD dataset for each ecobasin.

Percent forest in Riparian zone- Percent forest present inside the riparian zone in each ecobasin
Methodology- Same methodology as measuring Forested- % forest present inside each ecobasin except the forest cover was mapped inside the riparian zones (100 meters).

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