

## **Summary of Changes under the 2015 Revision**

The Arkansas Game and Fish Commission submitted a formal letter of intent to review and revise the Arkansas Wildlife Action Plan in June of 2012. Since that time, numerous staff from the agency and staff from many partner agencies have reviewed the lists of species of greatest conservation need and the threats and conservation actions associated with those species. 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 species' priority score (degree of imperilment) is calculated using the global rank and state rank. State ranks were re-evaluated, and updated ranks were submitted to NatureServe for birds, fish, crayfish, amphibians, reptiles, and butterflies. All species accounts were reviewed and updated with the latest information on species status, distribution, threats, research needs, monitoring needs, and conservation actions.

### **Changes to Species of Greatest Conservation Need**

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 Tables 1.1 and 1.2.

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.

All required elements for species (distribution, threats, data gaps, monitoring, and conservation actions) are provided in the species reports in Section 2, pages 44 – 1120.

### **Addition of Threats and Conservation Actions**

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 specific threat of white-nose syndrome is covered in the Plan under the threat "extraordinary predation/parasitism/disease" with a source of "parasites/pathogens" (species accounts for bats are located in Section 2). 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. The specific threat of feral hogs is covered in the Plan under "extraordinary predation/parasitism/disease" with a source of "exotic species". 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 are incorporated into associated species’ accounts in Section 2.

**Table 1.1.** Species added to the Arkansas Wildlife Action Plan under the 2015 revision as SGCN.

Common Name	Scientific Name	Taxa Association
Grotto Salamander "western clade"	<i>Eurycea spelaea</i>	amphibian
Grotto Salamander "eastern clade"	<i>Eurycea spelaea</i>	amphibian
Ouachita Streambed salamander	<i>Eurycea subfluvicola</i>	amphibian
Squirrel Tree Frog	<i>Hyla squirella</i>	amphibian
Boreal Chorus Frog	<i>Pseudacris maculata</i>	amphibian
Sharp-shinned Hawk	<i>Accipiter striatus</i>	bird
Sprague's Pipit	<i>Anthus spragueii</i>	bird
Ruddy Turnstone	<i>Arenaria interpres</i>	bird
Common Nighthawk	<i>Chordeiles minor</i>	bird
Tricolored Heron	<i>Egretta tricolor</i>	bird
American Kestrel	<i>Falco sparverius</i>	bird
Purple Finch	<i>Haemorhous purpureus</i>	bird
American Golden-Plover	<i>Pluvialis dominica</i>	bird
Hubbs' Crayfish	<i>Cambarus hubbsi</i>	crayfish
Pine Hills Digger	<i>Fallicambarus dissitus</i>	crayfish
Redspotted Stream Crayfish	<i>Orconectes acares</i>	crayfish
Little River Creek Crayfish	<i>Orconectes leptogonopodus</i>	crayfish
Brown Bullhead	<i>Ameiurus nebulosus</i>	fish
American Eel	<i>Anguilla rostrata</i>	fish
Highfin Carpsucker	<i>Carpionodes velifer</i>	fish
Autumn Darter	<i>Etheostoma autumnale</i>	fish
Beaded Darter	<i>Etheostoma clinton</i>	fish
Sunburst Darter	<i>Etheostoma mihileze</i>	fish
Highland Darter	<i>Etheostoma teddyroosevelt</i>	fish
Lowland Topminnow	<i>Fundulus blairae</i>	fish
Mooneye	<i>Hiodon tergisus</i>	fish
Plains Minnow	<i>Hybognathus placitus</i>	fish
Least Brook Lamprey	<i>Lampetra aepyptera</i>	fish
American Brook Lamprey	<i>Lethenteron appendix</i>	fish
Ouachita Mountain Shiner	<i>Lythrurus snelsoni</i>	fish
Shoal Chub	<i>Macrhybopsis hyostoma</i>	fish
Striped Mullet	<i>Mugil cephalus</i>	fish
Chub Shiner	<i>Notropis potteri</i>	fish
Rocky Shiner	<i>Notropis suttkusi</i>	fish

Channel Shiner	<i>Notropis wickliffi</i>	fish
Stonecat	<i>Noturus flavus</i>	fish
Gilt Darter	<i>Percina evides</i>	fish
Saddleback Darter	<i>Percina vigil</i>	fish
Bell's Roadside-Skipper	<i>Amblyscirtes bellii</i>	insect
Arogos Skipper	<i>Atrytone arogos</i>	insect
Golden-banded Skipper	<i>Autochton cellus</i>	insect
Northern Metalmark	<i>Calephelis borealis</i>	insect
Appalachian Azure	<i>Celastrina neglecta major</i>	insect
Dusky Azure	<i>Celastrina nigra</i>	insect
Gorgonne Checkerspot	<i>Chlosyne gorgone</i>	insect
Outis Skipper	<i>Cogia outis</i>	insect
Ouachita Spiketail	<i>Cordulegaster talaria</i>	insect
Monarch	<i>Danaus plexippus</i>	insect
Mottled Duskywing	<i>Erynnis martialis</i>	insect
Baltimore Checkerspot	<i>Euphydryas phaeton ozarkae</i>	insect
Dion Skipper	<i>Euphyes dion</i>	insect
Leonard's Skipper	<i>Hesperia leonardus</i>	insect
Cobweb Skipper	<i>Hesperia metea</i>	insect
Bronze Copper	<i>Lycaena hyllus</i>	insect
Rattlesnake-master Borer Moth	<i>Papaipema eryngii</i>	insect
Ozark Swallowtail	<i>Papilio joanae</i>	insect
Broad-winged Skipper	<i>Poanes viator</i>	insect
Gray Comma	<i>Polygonia progne</i>	insect
Oak Hairstreak	<i>Satyrium favonius ontario</i>	insect
Ozark Emerald	<i>Somatochlora ozarkensis</i>	insect
Little Brown Bat	<i>Myotis lucifugus</i>	mammal
Northern Long-eared Bat	<i>Myotis septentrionalis</i>	mammal
Western Fanshell	<i>Cyprogenia aberti</i>	mussel
Ouachita Fanshell	<i>Cyprogenia sp. Cf aberti</i>	mussel
Elongate Elktoe	<i>Fusconaia sp. Cf. sampsoniana</i>	mussel
Texas Pigtoe	<i>Pleurobema riddellii</i>	mussel
Purple Pimpleback	<i>Quadrula refulgens</i>	mussel
Lilliput	<i>Toxolasma parvum</i>	mussel
Lined Snake	<i>Tropidoclonion lineatum</i>	reptile

**Table 1.2.** Species removed from the Arkansas Wildlife Action Plan under the 2015 Revision.

Common Name	Scientific Name	Taxa Association
Northern Pintail	<i>Anas acuta</i>	bird
Short-eared Owl	<i>Asio flammeus</i>	bird
Upland Sandpiper	<i>Bartramia longicauda</i>	bird

Ruffed Grouse	<i>Bonasa umbellus</i>	bird
Western Sandpiper	<i>Calidris mauri</i>	bird
Least Sandpiper	<i>Calidris minutilla</i>	bird
Semi-palmated Sandpiper	<i>Calidris pusilla</i>	bird
Ivory-billed Woodpecker	<i>Campephilus principalis</i>	bird
Chuck-will's-widow	<i>Caprimulgus carolinensis</i>	bird
Lark Sparrow	<i>Chondestes grammacus</i>	bird
Northern Harrier	<i>Circus cyaneus</i>	bird
Prairie Warbler	<i>Dendroica discolor</i>	bird
Yellow Warbler	<i>Dendroica petechia</i>	bird
Little Blue Heron	<i>Egretta caerulea</i>	bird
Snowy Egret	<i>Egretta thula</i>	bird
Bald Eagle	<i>Haliaeetus leucocephalus</i>	bird
Worm-eating Warbler	<i>Helmitheros vermivorus</i>	bird
Mississippi Kite	<i>Ictinia mississippiensis</i>	bird
Hudsonian Godwit	<i>Limosa haemastica</i>	bird
Red-headed Woodpecker	<i>Melanerpes erythrocephalus</i>	bird
Wood Stork	<i>Mycteria americana</i>	bird
Black-crowned Night-Heron	<i>Nycticorax nycticorax</i>	bird
Kentucky Warbler	<i>Oporornis formosus</i>	bird
Osprey	<i>Pandion haliaetus</i>	bird
American White Pelican	<i>Pelecanus erythrorhynchos</i>	bird
Wilson's Phalarope	<i>Phalaropus tricolor</i>	bird
Eastern Towhee	<i>Pipilo erythrophthalmus</i>	bird
Pied-billed Grebe	<i>Podilymbus podiceps</i>	bird
Prothonotary Warbler	<i>Protonotaria citrea</i>	bird
American Avocet	<i>Recurvirostra americana</i>	bird
Brown-headed Nuthatch	<i>Sitta pusilla</i>	bird
Lesser Yellowlegs	<i>Tringa flavipes</i>	bird
Greater Yellowlegs	<i>Tringa melanoleuca</i>	bird
Solitary Sandpiper	<i>Tringa solitaria</i>	bird
Greater Prairie Chicken	<i>Tympanuchus cupido</i>	bird
Barn Owl	<i>Tyto alba</i>	bird
Blue-winged Warbler	<i>Vermivora pinus</i>	bird
Hooded Warbler	<i>Wilsonia citrina</i>	bird
Crayfish	<i>Procambarus ferrugineus</i>	crayfish
Ozark Chub	<i>Erimystax harrisi</i>	fish
Sturgeon Chub	<i>Macrhybopsis gelida</i>	fish
Tailight Shiner	<i>Notropis maculatus</i>	fish
Seminole Bat	<i>Lasiurus seminolus</i>	mammal
Black Bear	<i>Ursus americanus americanus</i>	mammal
Flat Floater	<i>Anodonta suborbiculata</i>	mussel

Rock Pocketbook	<i>Arcidens confragosus</i>	mussel
Purple Wartback	<i>Cyclonaias tuberculata</i>	mussel
Butterfly	<i>Ellipsaria lineolata</i>	mussel
Round Pearlshell	<i>Glebula rotundata</i>	mussel
Louisiana Fatmucket	<i>Lampsilis hydiana</i>	mussel
Arkansas Brokenray	<i>Lampsilis reeveiana</i>	mussel
Fatmucket	<i>Lampsilis siliquodea</i>	mussel
Flutedshell	<i>Lasmigona costata</i>	mussel
Black Sandshell	<i>Ligumia recta</i>	mussel
Round Hickorynut	<i>Obovaria subrotunda</i>	mussel
Creeper	<i>Strophitus undulatus</i>	mussel
Ouachita Creekshell	<i>Villosa arkansasensis</i>	mussel

### **Re-evaluation of Terrestrial 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. This habitat type captures the vegetation parameters required by several marshbird species of greatest conservation need. The number of terrestrial habitats decreased from 46 to 37. A revised list of terrestrial habitats is provided in Table 1.3. A crosswalk of habitat changes is provided in Section 8, Appendix 2.3. The herbaceous wetland habitat description is located in Section 4, page 1263. Habitat indicators and species lists were reviewed for each habitat type and are provided in the habitat reports, Section 4.

**Table 1.3.** Revised List of Terrestrial Habitats included in the Arkansas Wildlife Action Plan.

<b>Habitat Name</b>
Caves, Mines, Sinkholes and other Karst Features
Crop Land
Crowley's Ridge Loess Slope Forest
Cultivated Forest
Herbaceous Wetland
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
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 Prairie and Woodland
Ozark-Ouachita Riparian
Pasture Land
Ponds, Lakes, and Water Holes
Urban/Suburban
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

**Addressing Climate Change**

Climate change impacts were not addressed in the original version of the Plan. A chapter has been added in the revised version 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. The climate change chapter can be found in Section 7, pages 1639 – 1656.

## Road Map to the Eight Elements

The following section provides information on how the eight required elements were addressed and where they can be located in the Plan. Specific descriptions on how each element was reviewed and/or updated as part of the 2015 revision are provided in red.

**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 2-8.

Lists of SGCN presented by taxa group and ranked by Species Priority Score are provided in Section 2. Species of Greatest Conservation Need on pages 9-23. **The list of species of greatest conservation need was revised after the review of species status. Lists of added and removed species are provided in Tables 1.1 and 1.2.**

Each SGCN has an individual Species Report located on pages 44-1120. Refer to this for Species Priority Score. Species Priority Scores reflect the **abundance** and population trend of the SGCN. **Global ranks, state ranks, and population trends were updated for all species. Priority scores, which are calculated with these factors, were updated for all species. Taxonomic changes were also incorporated into the species reports and AWAP database.**

Refer to Species Reports on pages 44-1120 for occurrence data mapping for SGCN. Occurrence Maps are located on the first page of each Species Report. Occurrence data mapping reflects the **distribution** of the SGCN. **Where data were available, distribution maps were updated with the most recent locations for species. Location data were provided by the Arkansas Natural Heritage Commission and records from species experts. E-Bird data were used in combination with data from the Arkansas Natural Heritage Commission to produce updated bird location maps. The display of maps for aquatic species (fish, mussels, crayfish) was updated to reflect the occurrence in a HUC-12 watershed unit instead of a point location.**

Refer to Species Reports on pages 44-1120 for ecoregions, ecobasins, terrestrial and aquatic habitats associated with SGCN. The ecoregions and habitats associated with SGCN represent **distribution**. **All species-habitat associations were reviewed and updated where necessary.**

The entire list of SGCN is listed by Species Priority Score in Appendix 2.1 (pages 1659-1668). **The SGCN list was updated to reflect changes in species and species' scores.**

**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 1121-1231. 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. *Species lists by ecoregions were updated.*

Section 4. Terrestrial Habitat, pages 1231-1542, 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. *Terrestrial habitats and associated key factors and indicators were reviewed. Some terrestrial habitats were combined and some habitat names were changed. A list of changes is available in Appendix 2.3. A new habitat type, Herbaceous Wetland, was added along with associated descriptions, locations, key factors, and indicators (page 1263). The ranking of terrestrial habitats was updated.*

Section 5. Aquatic Habitats, pages 1543-1583, has **descriptions, maps and indicators of aquatic condition**. Each aquatic habitat is ranked according to its overall importance to SGCN associated with it. *Aquatic habitats were reviewed. Indicators in the form of land/use landcover were updated with the most recent information.*

**Descriptions of relative condition** of key habitats and community types essential to conservation of species are discussed in Appendices 3.1, 3.2 and 3.3 (TNC's Ecoregional Assessments), pages 1677-1824.

**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 44-1120, 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**. *Data gaps/research needs were updated for all SGCN.*

Refer to the Species Reports, pages 44-1120. Each Species Report lists **problems (threats and sources) which may adversely affect each SGCN**. *Threats and sources were reviewed and updated for all SGCN. New threats white-nose syndrome, feral hogs, natural gas extraction, and wind energy development were added to the Plan.*

Refer to Section 3. The Ecoregions of Arkansas, pages 1121-1231, for tables that summarize and

rank the **problems faced**. Problems faced by SGCN are presented in each ecoregion section. **The ranking of threats was updated for each ecoregion.**

**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 44-1120. Each Species Report has a section which lists **conservation actions associated with each SGCN**. **Conservation actions were reviewed and updated for all SGCN. Conservation actions to address new threats were added to some species accounts.**

Refer to Section 3. The Ecoregions of Arkansas, pages 1121-1231, **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. **The rankings of conservation actions within each ecoregion were updated.**

**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 xxvii - xxxiv.

Refer to Section 2. Species Reports, pages 44-1120, for a list of **species-specific monitoring actions**. **Monitoring strategies were reviewed and updated for all SGCN.**

Refer to Section 4. Terrestrial Habitats, page 1236, for **monitoring associated with conservation actions**.

Refer to Section 5. Aquatic Habitat, page 1577, 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. **Wildlife Action Plan**, page xxxiv. **A commitment was made to review the plan by October 1, 2025.**

**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 “Major partners,” page x for a discussion of teams and partnerships involved in producing the AWAP. 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.

Refer to Section 6. Informing and engaging the public on pages 1597-1598 for description of website. The draft revised plan was made available on the website along with a summary of significant changes.

Refer to Section 6. Reaching out to the scientific community, pages 1599-1603; 1636. An email notification was sent to the Arkansas wildlife action plan and state wildlife grant distribution list with a link to the document and request for inputs/comments.

Refer to Section 6. Native American contact, page 1618. There are no federally recognized tribes in Arkansas, therefore no contact was made for the revision.

**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 1585-1638) documents outreach and public participation. The draft revised plan was made available on the Arkansas Wildlife webpage and a 31 day public comment period was held between August 12<sup>th</sup> and September 11<sup>th</sup>. The notice 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.