Appendix H – Protected Species

2049 E. Joyce Blvd.
Suite 400
Fayetteville, AR 72703

TEL 479.527.9100
FAX 479.527.9101

www.GarverUSA.com

April 24, 2020

Lindsey Lewis, ARDOT Liaison
U.S. Fish and Wildlife Service
110 South Amity Road, Ste. 300
Conway, AR 72032
#501-513-4489; Lindsey_Lewis@fws.gov

Re: Arkansas Department of Transportation (ARDOT) – XNA Connector Road
ARDOT No. 090069
Request for Technical Assistance
Cave Springs, Benton County, Arkansas

Dear Mr. Lewis:

This letter serves to provide information on the occurrence of suitable habitat for the federally-protected threatened or endangered species listed on the official species list provided by the IPaC project planning tool (attached) for the XNA Connector Road project located near Cave Springs, Benton County, Arkansas (See **Figure 1**).

The Federal Highway Administration (FHWA), in cooperation with the Arkansas Department of Transportation (ARDOT), are proposing to prepare an Environmental Assessment (EA) for approximately four miles of new highway for a connector road from the Springdale Northern Bypass to the Northwest Arkansas National Airport (XNA). The project is currently in the planning stages of its development and ARDOT has retained Garver to conduct a habitat assessment and complete environmental documentation. This report summarizes our findings.

Site investigations of the study corridors for three alternatives being evaluated in the EA were conducted between late January and early February 2020. All areas where construction and/or physical disturbance may occur for each alternative are included in the study corridors (i.e., within the proposed right-of-way) as shown in **Figures 1-3**. The corridors were visually inspected for the New Location Alternative and Partial New Alternative. The corridor associated with the Improve the Existing Highways Alternative was evaluated from existing public right-of-way. This habitat assessment did not include official surveys for federally listed species; however, two occurrences of threatened and endangered species adjacent to the existing alignment of State Highway 264 has been documented in the *Cave Springs Area Karst Resources Conservation Initiative*. Several springs and seeps were identified during the field investigation. Additionally, losing streams have been documented in Benton County. The official species list indicates that no critical habitat is located within the study area. The three alternatives being evaluated in the EA are described below:

1. **New Location Alternative**
   The new location alternative is approximately four miles long and would extend southward on new location from an at-grade intersection at Highway 264 approximately 1,100 feet east of the

existing entrance road to XNA airport. The alignment then continues south approximately one mile where it then veers to the southeast on new alignment to connect to the future section of Highway 612 with a trumpet interchange. Highway 612 would need to be extended approximately 1¼ mile from its current terminus at Highway 112 to meet the new location alternative interchange. The typical section would consist of a four-lane divided highway with a 60-foot depressed grass median and full control of access. The design speed limit would be 70 miles per hour. The alignment would cross four local roads with over or underpasses and have bridges at Little Osage Creek and Osage Creek.

2. **Partial New Location Alternative**
   This alternative would begin by improving Highway 264 to the east of the southern entrance road to the XNA airport. The improvements would follow Highway 264 for approximately 1,700 feet east, then diverge southeast on new location to remove the consecutive 90-degree curves, rejoin with existing Highway 264 for approximately 4,200 feet before diverging south near Colonel Myers Road. An at-grade intersection will connect improved Highway 264 from the northwest, existing Highway 264 to the northeast, Colonel Myers Road to the southeast, and a new alignment section paralleling Colonel Myers Road on the east side. The new alignment will cross over Osage Creek, then turns to the east to connect with Highway 112 where it follows Highway 112 south to connect with the existing Highway 612 interchange. The total distance for this alternative would be approximately 4.4 miles, with the 2.7 miles of new alignment having full control of access, and 1.7 miles of improved Highway 264 and Highway 112 having partial control of access. The typical section consists of four lanes divided with a 15-foot raised grass median and a design speed of 45 miles per hour. This alternative will have at-grade intersections at Highway 264 and Highway 112.

3. **Improve the Existing Highways Alternative**
   This study alternative would begin at the southern entrance of the XNA airport and follow existing Highway 264 to Cave Springs, including the elimination of the consecutive 90-degree curves as in the Partial New Location Alternative. At Cave Springs, the alignment would turn south and follow Highway 112 through downtown Cave Springs, or will follow a future Highway 112 bypass around the west side of Cave Springs, to tie into Highway 112 south of town. South of town, this alternative would improve existing Highway 112 southward to the Highway 612 interchange. The total distance for this alternative would be approximately 6.4 miles. The typical section would consist of four lanes divided with a 15-foot raised grass median with partial control and a design speed of 45 miles per hour.

Refer to **Table 1** for the species, habitat requirements, and effects determinations identified for this project. **Figure 2** depicts the listed species' suitable or preferred habitat within the study corridors for each alternative and **Figure 3** shows the aquatic features within the project vicinity.

Table 1: T&E Listed Species and Habitat Requirements

Species/Status	Habitat Requirements	Suitable Habitat within Proposed ROW A. All New Alt. B. Partial New Alt. C. Improve Existing Alt.	
Gray Bat (*Myotis grisescens*) Endangered	The gray bat occurs in limestone karst areas and primarily uses caves throughout the year, although they move from one cave to another seasonally. Smaller colonies also occasionally roost under bridge structures.	Forested summer foraging habitat A. 75.5 ac B. 26.4 ac C. 20.9 ac	Suitable roosting structures* A. 0 B. 2 C. 2
Indiana Bat (*Myotis sodalis*) Endangered	The Indiana bat hibernates in cool caves and mines in the winter and wooded areas in the spring and summer. During summer, colonies are found behind slabs of exfoliating bark of dead trees, often in bottomland or floodplain habitats, but also in upland situations.	Forested foraging and roosting habitat A. 75.5 ac B. 26.4 ac C. 20.9 ac	Suitable roosting structures* A. 11 B. 15 C. 12
Northern Long-eared Bat (*Myotis septentrionalis*) Threatened	In winter, northern long-eared bats use caves, mine portals, abandoned tunnels, protected sites along cliff lines and similar situations that afford protection from cold. During the summer they roost singly or in colonies underneath bark, in cavities, or in crevices of both live and dead trees.	Forested foraging and roosting habitat A. 75.5 ac B. 26.4 ac C. 20.9 ac	Suitable roosting structures* A. 11 B. 15 C. 12
Ozark Big-eared Bat (*Corynorhinus townsendii ingens*) Endangered	The Ozark big-eared bat inhabits caves year-round, typically located in oak-hickory hardwood forests.	Summer foraging habitat A. 75.5 ac B. 26.4 ac C. 20.9 ac	
Piping Plover (*Charadrius melodus*) Threatened	Piping plovers are usually found along sandbars of major rivers, salt flats, and mudflats of reservoirs.	No sandbars, salt flats or mudflats are located within or adjacent to the study corridors.	
Benton County Cave Crayfish *(Cambaras aculabrum)* Endangered	The Benton County cave crayfish occurs in clean cave springs, near walls of pools, or in stream edges in chert/limestone cave streams.	Karst region has documented caves in Benton County. Springs within the study corridors: A. 2 springs B. 5 springs, 3 wells C. 2 springs	
Ozark Cavefish *(Amblyopsis rosae)* Threatened	The Ozark cavefish occurs in dark cave waters, primarily clear upwelling streams with chert or rubble substrate, and occasionally in pools over silt and sand. They have also been found in wells, springs, and sinkholes.	Karst region has documented caves in Benton County. Springs within the study corridors: A. 2 springs B. 5 springs, 3 wells C. 2 springs	

Species/Status	Habitat Requirements	Suitable Habitat within Proposed ROW A. All New Alt. B. Partial New Alt. C. Improve Existing Alt.
Missouri Bladderpod (*Physaria filiformis*) Threatened	Missouri bladderpods are usually found in open limestone glades, barrens, and outcrops within unglaciated prairie areas. Glades are naturally dry, treeless areas with shallow, loose soil and areas of exposed rock. They are occasionally in dolomitic glades and are often associated with grazed pastures. Cedar invasion of glade sites is common. Sometimes the bladderpod is found on highway right-of-way and pastures where mowing and grazing have kept the area open. Occasionally it is found in open rocky woods.	No dry limestone or dolomitic glades or barrens occur within the study corridors for any of the alternatives.
Eastern Black Rail (*Laterallus jamaicensis*) - Proposed Threatened	Eastern black rails occupy wetlands and marshes in areas of moist soil or shallow flooding. They require dense vegetative cover that allows movement underneath the canopy, such as rushes, sedges, and grasses.	Wetland habitat with dense vegetation. A. 0 ac B. 0.07 ac C. 0.08 ac

*Suitable structure habitat includes barns, abandoned buildings, and bridges.

The photographs below show the typical habitat observed within the study corridors associated with each listed species.

Typical Forested Area	1

Description	Bat foraging and summer roosting habitat.

Typical Forested Area	2

Description	Bat foraging and summer roosting habitat.

Typical Riparian Zone	3

Description	Bat foraging and summer roosting habitat along Osage Creek.

Typical Riparian Zone	4

Description	Bat foraging and summer roosting habitat along a riparian area.

Typical Roosting Habitat	5
	
Description	Bat summer roosting habitat along Osage Creek.

Typical Roosting Habitat	6
	
Description	Bat summer roosting habitat.

Structure Habitat	7

Description	Potential bat summer roosting habitat within abandoned structure.

Structure Roosting Habitat	8

Description	Roosting habitat on Hwy 264 bridge over Osage Creek.

Structure Habitat	9

Description	Bat summer roosting habitat in rural barn.

Seep	10

Description	Seep No. 3 – Lat. 36.234857, Long.-94.271539

Spring	11

Description	Spring No. 7 – Lat. 36.242491, Long.-94.255784

Spring Box	12

Description	Spring No. 9 – Lat. 36.237373, Long.-94.248018

Spring Box and Spring	13
	
Description	Spring No. 15 – Lat. 36.248916, Long. -94.266135

We respectfully request technical assistance from USFWS regarding threatened and endangered species. Thank you for your assistance and please call me (479-903-2041) or email (rcmountain@GarverUSA.com) if you have any questions or need any additional information.

Sincerely,
GARVER, LLC

Ryan Mountain, PWS
Senior Environmental Scientist

Copies To: Bill McAbee - Garver

Enclosures: Figure 1 - Site Location Map
Figure 2 - Habitat Overview Map
Figure 3 - Aquatic Features
IPaC Official Species List

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Arkansas Ecological Services Field Office
110 South Amity Suite 300
Conway, AR 72032-8975
Phone: (501) 513-4470 Fax: (501) 513-4480
http://www.fws.gov/arkansas-es

In Reply Refer To: April 03, 2020
Consultation Code: 04ER1000-2020-SLI-0029
Event Code: 04ER1000-2020-E-01775
Project Name: XNA Connector Road Project

Subject: Updated list of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies endangered, threatened, proposed, and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*). **This letter only provides an official species list and technical assistance; if you determine that listed species and/or designated critical habitat may be affected in any way by the proposed project, even if the effect is wholly beneficial, consultation with the Service will be necessary.**

If you determine that this project will have no effect on listed species and their habitat in any way, then you have completed Section 7 consultation with the Service and may use this letter in your project file or application.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found on our website.

Please visit our website at http://www.fws.gov/arkansas-es/IPaC/home.html for species-specific guidance to avoid and minimize adverse effects to federally endangered,

threatened, proposed, and candidate species. Our web site also contains additional information on species life history and habitat requirements that may be useful in project planning.

If your project involves in-stream construction activities, oil and natural gas infrastructure, road construction, transmission lines, or communication towers, please review our project specific guidance at http://www.fws.gov/arkansas-es/IPaC/ProjSpec.html.

The karst region of Arkansas is a unique region that covers the **northern third of Arkansas** and we have specific guidance to conserve sensitive cave-obligate and bat species. **Please visit http://www.fws.gov/arkansas-es/IPaC/Karst.html to determine if your project occurs in the karst region and to view karst specific-guidance.** Proper implementation and maintenance of best management practices specified in these guidance documents is necessary to avoid adverse effects to federally protected species and often avoids the more lengthy formal consultation process.

If your species list includes any mussels, Northern Long-eared Bat, Indiana Bat, Yellowcheek Darter, Red-cockaded Woodpecker, or American Burying Beetle, your project may require a presence/absence and/or habitat survey prior to commencing project activities. Please check the appropriate species-specific guidance on our website to determine if your project requires a survey. We strongly recommend that you contact the appropriate staff species lead biologist (see office directory or species page) prior to conducting presence/absence surveys to ensure the appropriate level of effort and methodology.

Under the ESA, it is the responsibility of the Federal action agency or its designated representative to determine if a proposed action "may affect" endangered, threatened, or proposed species, or designated critical habitat, and if so, to consult with the Service further. Similarly, it is the responsibility of the Federal action agency or project proponent, not the Service, to make “no effect” determinations. If you determine that your proposed action will have “no effect” on threatened or endangered species or their respective critical habitat, you do not need to seek concurrence with the Service. Nevertheless, it is a violation of Federal law to harm or harass any federally-listed threatened or endangered fish or wildlife species without the appropriate permit.

Through the consultation process, we will analyze information contained in a biological assessment that you provide. If your proposed action is associated with Federal funding or permitting, consultation will occur with the Federal agency under section 7(a)(2) of the ESA. Otherwise, an incidental take permit pursuant to section 10(a)(1)(B) of the ESA (also known as a habitat conservation plan) is necessary to harm or harass federally listed threatened or endangered fish or wildlife species. In either case, there is no mechanism for authorizing incidental take “after-the-fact.” For more information regarding formal consultation and HCPs, please see the Service's Consultation Handbook and Habitat Conservation Plans at www.fws.gov/endangered/esa-library/index.html#consultations.

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to

federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, **the accuracy of this species list should be verified after 90 days.** This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. **Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.**

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Arkansas Ecological Services Field Office
110 South Amity Suite 300
Conway, AR 72032-8975
(501) 513-4470

Project Summary

Consultation Code: 04ER1000-2020-SLI-0029

Event Code: 04ER1000-2020-E-01775

Project Name: XNA Connector Road Project

Project Type: TRANSPORTATION

Project Description: The XNA Connector Road Project is located in Benton County, Arkansas and is approximately 4 miles in length. The purpose of the proposed action is to provide a reliable and efficient connection from the Northwest Arkansas Regional Airport in Bentonville to the Springdale Northern Bypass (Highway 612) . The project will evaluate two alternatives on new location and one alternative that improves existing Highway 112 and Highway 264.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/36.23661580516328N94.26508978650236W

Counties: Benton, AR | Washington, AR

Endangered Species Act Species

There is a total of 10 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Gray Bat *Myotis grisescens* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/6329	Endangered
Indiana Bat *Myotis sodalis* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/5949	Endangered
Northern Long-eared Bat *Myotis septentrionalis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Threatened
Ozark Big-eared Bat *Corynorhinus (=Plecotus) townsendii ingens* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/7245	Endangered

Birds

NAME	STATUS
Eastern Black Rail *Laterallus jamaicensis ssp. jamaicensis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/10477	Proposed Threatened
Piping Plover *Charadrius melodus* Population: [Atlantic Coast and Northern Great Plains populations] - Wherever found, except those areas where listed as endangered. There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/6039	Threatened
Red Knot *Calidris canutus rufa* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/1864	Threatened

Fishes

NAME	STATUS
Ozark Cavefish *Amblyopsis rosae* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/6490	Threatened

Crustaceans

NAME	STATUS
Benton County Cave Crayfish *Cambarus aculabrum* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/5011	Endangered

Flowering Plants

NAME	STATUS
Missouri Bladderpod *Physaria filiformis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/5361	Threatened

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

Northwest Arkansas
National Airport Access Road
Benton County, Arkansas

0 0.5 1
Miles

Improve Existing Alternative
All New Alternative
Partial New Alternative

Figure 1
Site Location Map

Northwest Arkansas National Airport
Little Osage Creek
Murdock Rd.
Airport Blvd
Brush Arbor Rd.
Mill Dam Rd.
264
Holmes Rd.
Colonel Myers Rd.
Farrar Rd.
Spring Creek
Wagon Wheel Rd.
Haden Rd.
Osage Creek
Wager Dr.
Robbins Rd.
Kelly Rd.
612
112
Marchant Rd.
Future Springdale Northern Bypass

Northwest Arkansas National Airport Access Road

Benton County, Arkansas

0 0.25 0.5
Miles

N W E S

- Improve Existing Alternative
- Partial New Alternative
- All New Alternative
- Suitable Foraging / Roosting Forest Habitat
- Potential Bat Habitat Structures
- Springs
- Wells

Note: Cave Springs Cave and Recharge Area not in project area.
Data outside of project areas shown is not included in impacts.

Figure 2

Habitat Overview Map

ARDOT ARKANSAS DEPARTMENT OF TRANSPORTATION FLYXNA GARVER

Northwest Arkansas National Airport
Little Osage Creek
Mill Dam Rd.
Murdock Rd.
Airport Blvd
Brush Arbor Rd.
264
Holmes Rd.
Colonel Myers Rd.
Farrar Rd.
Zone A
Spring Creek
Wagon Wheel Rd.
Haden Rd.
Osage Creek
Wager Dr.
Robbins Rd.
Kelly Rd.
612
112
Marchant Rd.
Future Springdale Northern Bypass

Northwest Arkansas National Airport Access Road

Benton County, Arkansas

0 0.25 0.5
Miles

N W E S

- Perennial Channel
- Intermittent Channel
- Ephmeral with OHWM
- PEM Wetland
- PFO Wetland
- PUB Wetland
- Pond
- Improve Existing Alternative
- Partial New Alternative
- All New Alternative
- FEMA Effective Zone

Figure 3

Aquatic Features

ARDOT ARKANSAS DEPARTMENT OF TRANSPORTATION
FLYXNA
GARVER

ARKANSAS HERITAGE

Asa Hutchinson
Governor
Stacy Hurst
Secretary

Date: May 26, 2020
Subject: Elements of Special Concern
XNA Connector Road Project
Benton County, AR
ANHC No.: P-CF..-20-037

Mr. Ryan Mountain
Garver
2049 East Joyce Boulevard
Suite 400
Fayetteville, AR 72703

Dear Mr. Mountain:

Staff members of the Arkansas Natural Heritage Commission (ANHC) have reviewed our files for records indicating the occurrence of rare plants and animals, outstanding natural communities, natural or scenic rivers, or other elements of special concern within the XNA Connector Road Project Area. The results of this review have been provided as Geographic Information System (GIS) shapefiles. Documentation is provided to help you interpret the information contained in these files.

Our records indicate the occurrence of ten species of conservation concern within the project area. A list of these elements, with habitat information is attached for your reference. The study site falls within a Karst region of the state characterized by caves, springs, and sinkholes. These habitats support a variety of rare species. Most notable in this area are species associated with streams, springs and spring runs. Four fish and two crayfish species listed in the State's Wildlife Action Plan as species of "Greatest Conservation Concern" have been recorded from the main channels, tributaries and spring runs of Osage Creek, Spring Creek, and Little Osage Creek,

Etheostoma cragini, Arkansas Darter
Etheostoma microperca, Least Darter
Etheostoma mihileze, Sunburst Darter
Nocomis asper, Redspot Chub
Orconectes meeki brevis, Meek's Short Pointed Crayfish
Orconectes nana, Midget Crayfish

Arkansas darter and least darter are limited to very specific habitat in Benton and Washington Counties. Recent information suggests one or both may represent undescribed species. The Arkansas Highway and Transportation Department (ARDOT) has recently purchased property for mitigation within the Healing Springs complex which supports many of these species. This

agency is partnering with ARDOT in the management and protection of the Healing Springs site. Placement and construction of a connector road should seek to minimize impact to the sensitive aquatic habitats in this area.

A list of elements of conservation concern recorded within a five-mile radius of the project area is enclosed for your reference. Represented on this list are elements for which we have records in our database. The list has been annotated to indicate those elements known to occur within a one-mile radius of the project site. A legend is enclosed to help you interpret the codes used on this list.

Please keep in mind that the project area may contain important natural features of which we are unaware. Staff members of the Arkansas Natural Heritage Commission have not conducted a field survey of the study site. Our review is based on data available to the program at the time of the request. It should not be regarded as a final statement on the elements or areas under consideration. Because our files are updated constantly, you may want to check with us again at a later time.

Thank you for consulting us. It has been a pleasure to work with you on this study.

Sincerely,

Cindy Osborne

Cindy Osborne
Data Manager/Environmental Review Coordinator

Enclosures: GIS shapefiles
Documentation
Project Area Element list with Habitat Information
Element List
Legend
Data Sharing Agreement
Invoice

ANHCDATA

Shapefile

Tags

Rare species, thretened species, endangered species, XNA Connector Road.

Summary

This shapefile was created in response to an information request from the Garver, LLC. The data will be used to evaluate potential impacts to sensitive elements for the proposed XNA Connector Road Project in Benton County, Arkansas.

Description

Description of Data:

Occurrence data entered into the Natural Diversity Database represent known locations of elements, which the Arkansas Natural Heritage Commission (ANHC) currently tracks. These elements include species considered either endangered, threatened, rare, peripheral or status undetermined as well as outstanding examples of natural communities (terrestrial, palustrine and aquatic), geologic features, and colonial bird nesting sites. Generally speaking, the basic requirement for entering an occurrence into the natural diversity database is that the place marked as an occurrence must contribute to the survival of the element. The specific criterion used for each type of element depends on the basic biology of the element. Data has been "summarized" into 20-acre hexagons.

Contact Information:

Cindy Osborne, Data Manager

Arkansas Natural Heritage Commission

1100 North Street

Little Rock, AR 72201

Phone: 501-324-9762

Fax: 501-324-9618

e-mail: Cindy.Osborne@Arkansas.gov

Source of Data:

Data entered into the database have been collected from literature sources, herbaria, museums, Universities and field surveys by staff biologists.

Mapping Information:

All mappable occurrence data entered into the natural diversity database are mapped on 7.5' Topographic quadrangles (1:24,000) and are assigned a township, range and section as well as latitude and longitude coordinates. In some cases the actual mapped location represents a "best guess" based on the information available. The accuracy of mapped locations can vary from approximately one hundred feet to roughly five miles (the level of a 7.5' quadrangle). Close attention should be given to the Precision Code. This code indicates the accuracy of the mapped location. Precision codes are described in greater detail below. A hexagon shape may include multiple observations of a given species within the area covered by the hexagon. Details for the most recent record fallling within the hexagon are included in the attribute table of the shapefile. This includes the latitude/longitude location for the most recent record.

Descriptions of Fields in Data Table

ELCODE

Element Code. This is a code identifying the species.

SNAME

Scientific Name.

SCOMNAME

Common Name.

GRANK

Global Rank. This is a conservation rank used by State Heritage Programs and The Nature Conservancy. The rank indicates the relative rarity of an element throughout its range. The following codes are used:

G1 = Critically imperiled globally. At a very high risk of extinction due to extreme rarity, very steep declines, very severe threats or other factors.

G2 = Imperiled globally. At high risk of extinction due to very restricted range, very few populations, steep declines, or other factors.

G3 = Vulnerable globally. At moderate risk of extinction due to a restricted range, relatively few populations, recent and widespread declines, or other factors.

G4 **=** Apparently secure globallyAt fairly low risk of extinction or elimination due to an extensive range and/or many populations or occurrences, but with possible cause for some concern as a result of local recent declines, threats, or other factors.

G5 = Secure globally. At very low risk or extinction or elimination due to a very extensive range, abundant populations or occurrences, and little to no concern from declines or threats.

GH = Of historical occurrence, possibly extinct globally. Missing; known from only historical occurrences, but still some hope of rediscovery.

GU = Unrankable. Currently unrankable due to lack of information or due to substantially conflicting information about status or trends.

GX = Presumed extinct globally. Not located despite intensive searches and virtually no likelihood of rediscovery.

GNR = Unranked. The global rank not yet assessed.

GNA = Not Applicable. A conservation status rank is not applicable.

T-RANKS= T subranks are given to global ranks when a subspecies, variety, or race is considered at the state level. The subrank is made up of a "T" plus a number or letter (1, 2, 3, 4, 5, H, U, X) with the same ranking rules as a full species.

Q = A "Q" in the global rank indicates the element's taxonomic classification as a species is a matter of conjecture among scientists.

RANGES= Ranges are used temporarily until a final rank decision can be made.

? = A question mark is used temporarily when there is some indecision regarding the rank assignment or when an element has not been ranked.

B = Breeding status

N = Non-breeding status

SRANK

State Rank. This is a conservation rank used by State Heritage Programs and The Nature Conservancy. The rank indicates the relative rarity of an element throughout Arkansas. The following codes are used:

S1 = Critically imperiled in the state. At very high risk of extirpation in the jurisdiction due to very restricted range, very few populations or occurrences, very steep declines, severe threats, or other factors.

S2 = Imperiled in the state. At high risk of extirpation in the jurisdiction due to restricted range, few populations or occurrences, steep declines, severe threats, or other factors.

S3 = Vulnerable in the state. At moderate risk of extirpation in the jurisdiction due to a fairly restricted range, relatively few populations or occurrences, recent and widespread declines, threats, or other factors.

S4 = Apparently secure in the state. At a fairly low risk of extirpation in the jurisdiction due to an extensive range and/or many populations or occurrences, but with possible cause for some concern as a result of local recent declines, threats, or other factors.

S5 = Secure in the state. At very low or no risk of extirpation in the jurisdiction due to a very

extensive range, abundant populations or occurrences, with little to no concern from declines or threats.

SH = Of historical occurrence, with some possibility of rediscovery. Its presence may not have been verified in the past 20-40 years. A species may be assigned this rank without the 20-40 year delay if the only known occurrences were destroyed or if it had been extensively and unsuccessfully sought.

SU = Unrankable. Currently unrankable due to lack of information or due to substantially conflicting information about status or trends.

SX = Presumed extirpated from the state. Not located despite intensive searches and virtually no likelihood of rediscovery.

SNR = Unranked. The state rank not yet assessed.

SNA = Not Applicable. A conservation status rank is not applicable.

USESA

U.S. Endangered Species Act status. This field provides information on whether the species is listed as Endangered or Threatened by the U.S. Fish and Wildlife Service. A blank indicates the element has no federal listing. The following codes are used:

C = Candidate species. The U.S. Fish and Wildlife Service has enough scientific information to warrant proposing these species for listing as endangered or threatened under the Endangered Species Act.

LE = Listed Endangered; the U.S. Fish and Wildlife Service has listed these species as endangered under the Endangered Species Act.

LT = Listed Threatened; the U.S. Fish and Wildlife Service has listed these species as threatened under the Endangered Species Act.

PE = Proposed Endangered; the U.S. Fish and Wildlife Service has proposed these species for listing as endangered.

PT = Proposed Threatened; the U.S. Fish and Wildlife Service has proposed these species for listing as threatened.

T/SA = Threatened (or Endangered) because of similarity of appearance.

E/SA

STATESTAT

State Status Code. At present, Arkansas does not have a law providing special state protection to species considered endangered or threatened in Arkansas. However, lists of species of special concern have been developed by this program in cooperation with other government agencies, and professionals. Species appearing on these lists are believed to be rare in the

state and are presently being inventoried by this agency. The following codes have been used in this field:

INV = Inventory Element; The Arkansas Natural Heritage Commission is currently conducting active inventory work on these elements. Available data suggests these elements are of conservation concern. These elements may include outstanding examples of Natural Communities, colonial bird nesting sites, outstanding scenic and geologic features as well as plants and animals which, according to current information, may be rare, peripheral, or of an undetermined status in the state. The ANHC is gathering detailed location information on these elements.

SE = State Endangered; this term is applied differently for plants and animals

Animals - These species are afforded protection under Arkansas Game and Fish Commission (AGFC) Regulation. The AGFC states that it is unlawful to import, transport, sell, purchase,hunt, harrass or possess any threatend or endangered species of wildlife or parts. The AGFC lists as endangered any wildlife species or subspecies endangered or threatened with extinction, listed or proposed as a candidate for listing by the U.S. Fish and Wildlife Service or any native species or subspecies listed as endangered by the Commission.

Plants - These species have been recognized by the Arkansas Natural Heritage Commission as being in danger of being extirpated from the state. This is an administrative designation with no regulatory authority.

ST = State Threatened; These species have been recognized by the Arkansas Natural Heritage Commission as being likely to become endangered in Arkansas in the foreseeable future, based on current inventory information. This is an administrative designation with no regulatory authority.

LASTOBS

Last Observed Date. The most recent date that the occurrence was last observed and recorded as extant within the hexagon shape.

FIRSTOBS

First Observed Date. The date of the earliest observation record falling within the hexagon shape.

CNT_of_OBS

Count of Observations. This is a count of the number of observation records falling within the hexagon shape.

COUNTYCODE

County Code. A four digit code for the county(s) in which the occurrence falls. The code is in the following format:

1st 4 letters of county name

Example: GARL = Garland County

SITE

Site Name. This is a short site name for the area in which the occurrence falls. Not all records will have a site name associated with them. This is listed for quick reference.

PRECISION

Precision of mapped location. All mappable occurrence data entered into the natural diversity database are mapped on topographic quadrangles and are assigned a township, range and section as well as latitude and longitude coordinates. In some cases the actual mapped location represents a "best guess" based on the information available. Careful attention should be paid to the precision code assignments to distinguish these "best guesses" from confirmed locations. The location given represents the centrum of the occurrence. The following codes are used:

S = Element is specifically mapped (within a three second radius, ~100 feet).

M = Element mapped to within one minute radius (1.5 mile).

G = Element is mapped to a general region identified by a geographic name on a U.S.G.S. quadrangle.

TBA = This is a new "observation" record for which a precision code has not been assigned.

QUADNAME

Quadrangle Name. The name of the 7.5' topographic quadrangle(s) on which the occurrence falls.

TRS

The Township/Range/Section of the record of the most recent record within the hexagon shape.

DIRECTIONS

Directions to the most recent record within the hexagon shape

GENDESC

General Description of the location/habitat of the most recent record within the hexagon shape.

EODATA

Element Occurrence Data (size, number of individuals, vigor, etc...) for the most recent record within the hexagon shape.

BESTSOURCE

Best Source of information used for the most recent record in the hexagon shape.

EOCODE

Element Occurrence Code. A unique identifier for the occurrence. This number identifies the

most recent occurrence of a given species within the hexagon shape.

LATNUM

Latitude. The latitude of the centrum of the occurrence in decimal degrees.

LONGNUM

Longitude. The longitude of the centrum of the occurrence in decimal degrees.

SHAPE_ID

A unique identifier for the element within the shape. This number should be used when requesting or supplying data on an occurrence to the Arkansas Natural Heritage Commission.

SHAPECODE

An arbitrary number assigned to the shape.

Credits

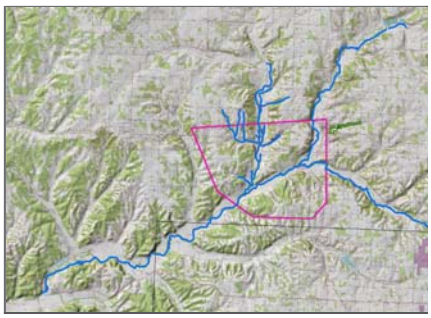
This data was compiled by the Arkanas Natural Heritage Commission, Division of Arkansas Heritage, Arkansas Department of Parks,Heritage and Tourism, Little Rock, AR.

Use limitations

Reproduction and/or distribution of the complete electronic data set or subsets thereof to any parties other than Garver, LLC is strictly prohibited.

SensStrms

Shapefile



Tags

streams, rare speices, endangered species, threatened species

Summary

This shapefile was developed to help identify those streams supporting species of conservation concern.

Description

Description of Data:

Using the USGS Streams shapefile, Arkansas Natural Heritage Commission Staff has developed a layer of streams in the state that are known to support rare species. Listing in this shapefile does not imply any legal designation or regulatory authority. The file was developed for information purposes only. A "sister" table has been provided with the shapefile (Species.dbf). This table lists the species recorded in the riparian zone or within a given stream and provides rank and status information for the species. The "sister" table may be linked to the shapefile using the stream name field (STREAM).

Contact Information:

Cindy Osborne, Data Manager

Arkansas Natural Heritage Commission

1100 North Street

Little Rock, AR 72201

Phone: 501-324-9762

Fax: 501-324-9618

e-mail: Cindy.Osborne@Arkansas.gov

Source of Data:

Streams were selected using the Arkansas Natural Heritage Commission's sensitive species database. Those streams supporting species of conservation concern were included.

Mapping Information:

The streams were derived using the USGS Streams Layer. Each stream segment was united

into a single feature.

Descriptions of Fields in Attribute Table for Sensitive_Streams shapefile

Stream

Stream Name – The name applied to the stream. This field serves as a link to a sister table (SPECIES.dbf) that allows users to know what species have been recorded from each stream.

Descriptions of Fields in data table for Stream Species File (SPECIES.DBF)

ELCODE

Element Code. This is a unique code identifying the element.

STREAM

Name of the Stream.

SNAME

Scientific Name for the Element

SCOMNAME

Common Name for the Element

GRANK

Global Rank. This is a conservation rank used by State Heritage Programs and NatureServe. The rank indicates the relative rarity of an element throughout its range. The following codes are used:

G1 = Critically Imperiled Globally - At very high risk of extinction or elimination due to veryrestricted range, very few populations or occurrences, very steep declines, very severe threats, or other factors.

G2 = Imperiled Globally - At high risk of extinction or elimination due to restricted range, few populations or occurrences, steep declines, severe threats, or other factors.

G3 = Vulnerable Globally - At moderate risk of extinction or elimination due to a fairly restricted range, relatively few populations or occurrences, recent and widespread declines, threats, or other factors.

G4 = Apparently Secure Globally - At fairly low risk of extinction or elimination due to an extensive range and/or many populations or occurrences, but with possible cause for some concern as a result of local recent declines, threats, or other factors.

G5 = Secure Globally - At very low risk or extinction or elimination due to a very extensive range, abundant populations or occurrences, and little to no concern from declines or threats.

GH = Possibly Extinct Globally - Known from only historical occurrences but still some hope of rediscovery.

G = Unrankable. Currently unrankable due to lack of information or due to substantially conflicting information about status or trends.

GX = Presumed extinct globally. Not located despite intensive searches and virtually no likelihood of rediscovery.

GNR = Unranked. The global rank not yet assessed.

GNA = Not Applicable. A conservation status rank is not applicable.

T-RANKS = T subranks are given to global ranks when a subspecies, variety, or race is considered at the state level. The subrank is made up of a "T" plus a number or letter (1, 2, 3, 4, 5, H, U, X) with the same ranking rules as a full species.

Q = A "Q" in the global rank indicates the element's taxonomic classification as a species is a matter of conjecture among scientists.

RANGES = Ranges are used to indicate uncertainty about the exact status of a taxon. Ranges cannot skip more than two ranks.

? = Denotes inexact numeric rank.

B = Breeding status

N = Non-breeding status

M = Migrant - Migrant species occurring regularly on migration at particular staging areas or concentration spots where the species might warrant conservation attention. Conservation status refers to the aggregating transient population of the species in the nation or state/province.

SRANK

State Rank. This is a conservation rank used by State Heritage Programs and NatureServe. The rank indicates the relative rarity of an element throughout Arkansas. The following codes are used:

S1 = Critically Imperiled - At very high risk of extirpation in the jurisdiction due to very

restricted range, very few populations or occurrences, very steep declines, severe threats, or other factors.

S2 = Imperiled - At high risk of extirpation in the jurisdiction due to restricted range, few populations or occurrences, steep declines, severe threats, or other factors.

S3 = Vulnerable - At moderate risk of extirpation in the jurisdiction due to a fairly restricted range, relatively few populations or occurrences, recent and widespread declines, threats, or other factors.

S4 = Apparently Secure - At a fairly low risk of extirpation in the jurisdiction due to an extensive range and/or many populations or occurrences, but with possible cause for some concern as a result of local recent declines, threats, or other factors.

S5 = Secure - At very low or no risk of extirpation in the jurisdiction due to a very extensive range, abundant populations or occurrences, with little to no concern from declines or threats.

SH = Possibly Extirpated – Known from only historical records but still some hope of rediscovery.

SU = Unrankable - Currently unrankable due to lack of information or due to substantially conflicting information about status or trends.

SX = Presumed Extirpated - Species is believed to be extirpated from the jurisdiction. Not located despite intensive searches of historical sites and other appropriate habitat, and

virtually no likelihood that it will be rediscovered.

SNR = Unranked. The state rank not yet assessed.

SNA = Not Applicable. A conservation status rank is not applicable.

FEDSTAT

Federal Status under the U.S. Endangered Species Act. The following codes are used. A blank indicates the element has no federal listing:

C = Candidate species. The U.S. Fish and Wildlife Service has enough scientific information to warrant proposing these species for listing as endangered or threatened under the Endangered Species Act.

LE = Listed Endangered; the U.S. Fish and Wildlife Service has listed these species as endangered under the Endangered Species Act.

LT = Listed Threatened; the U.S. Fish and Wildlife Service has listed these species as threatened under the Endangered Species Act.

PE = Proposed Endangered; the U.S. Fish and Wildlife Service has proposed these species for listing as endangered.

PT = Proposed Threatened; the U.S. Fish and Wildlife Service has proposed these species for listing as threatened.

T/SA or E/SA = Threatened (or Endangered) because of similarity of appearance.

Credits

This shapefile was developed by the Arkanas Natural Heritage Commission, an agency of the Department of Arkansas Heritage.

Use limitations

This file should not be redistributed without prior written permission from the Arkansas Natural Heritage Commission

5/26/2020

Arkansas Natural Heritage Commission
Division of Arkansas Heritage
Arkansas Department of Parks, Heritage and Tourism
Elements of Special Concern Within a Five-mile Radius
XNA Connector Road Project Study Area

	Scientific Name	Common Name	Federal Status	State Status	Global Rank	State Rank
	Animals-Invertebrates					
*	*Caecidotea stiladactyla*	an isopod	-	INV	G3G4	S3
	Cambarus aculabrum	Benton County cave crayfish	LE	SE	G1	S1
*	*Faxonius meeki brevis*	Meek's short pointed crayfish	-	INV	G4T3	S2
*	*Faxonius nana*	midget crayfish	-	INV	G3	S3
*	*Ligidium elrodii*	an isopod	-	INV	G4G5	S2
*	*Stygobromus onondagaensis*	an amphipod	-	INV	G3	S1?
*	*Stygobromus ozarkensis*	Ozark cave amphipod	-	INV	G4	S2
	Animals-Vertebrates					
*	*Ambystoma annulatum*	Ringed Salamander	-	INV	G4	S3
	Ambystoma tigrinum	Eastern Tiger Salamander	-	INV	G5	S3
*	*Etheostoma cragini*	Arkansas darter	-	INV	G3G4	S1
*	*Etheostoma microperca*	least darter	-	INV	G5	S1
*	*Etheostoma mihileze*	sunburst darter	-	INV	G4	S3
*	*Eurycea spelaea*	Grotto Salamander	-	INV	G4	S3
*	*Myotis grisescens*	gray bat	LE	SE	G4	S2S3
*	*Myotis sodalis*	Indiana bat	LE	SE	G2	S1
*	*Nocomis asper*	redspot chub	-	INV	G4	S3
*	*Troglichthys rosae*	Ozark cavefish	LT	SE	G3	S1
	Plants-Vascular					
*	*Asclepias incarnata ssp. incarnata*	swamp milkweed	-	INV	G5T5	S2
*	*Carex aggregata*	cluster sedge	-	INV	G5	S1
*	*Carex sparganioides*	bur-reed sedge	-	INV	G5	S3
*	*Crataegus palmeri*	Palmer's hawthorn	-	INV	GNR	SNR
*	*Koeleria macrantha*	prairie June grass	-	INV	G5	S2
*	*Trillium ozarkanum*	Ozark trillium	-	INV	G3	S3
	Special Elements-Natural Communities					
*	*Cave Stream*		-	INV	GNR	SNR
*	*Spring-Ozark Mountains*		-	INV	GNR	SNR
	Special Elements-Other					
	Colonial nesting site, water birds		-	INV	GNR	SNR

* - These elements have been recorded within a one-mile radius of the XNA Connector Road Study Area.

5/20/2020

Arkansas Natural Heritage Commission
Division of Arkansas Heritage
Arkansas Department of Parks, Heritage and Tourism
Elements of Special Concern
Sensitive Elements, XNA Connector Road Project, Benton County, AR

Scientific Name	Common Name	Federal Status	State Status	Global Rank	State Rank	Habitat	NatureServe Link
Animals-Invertebrates							
Faxonius meeki brevis	Meek's short pointed crayfish	-	INV	G4T3	S2	Small, clear streams with bedrock, rubble, or gravel substrate	http://explorer.natureserve.org/servlet/NatureServe?searchName=Orconectes+meeki+brevis
Faxonius nana	midget crayfish	-	INV	G3	S3	Clear, flowing permanent streams with substrates of limestone gravel and cobbles. Usually found in riffles.	http://explorer.natureserve.org/servlet/NatureServe?searchName=Orconectes+nana
Animals-Vertebrates							
Ambystoma annulatum	Ringed Salamander	-	INV	G4	S3	Ponds, lakes, and water holes, mesic hardwood forest, riparian, pine-oak forest, woodland, sinkhole and depression ponds	http://explorer.natureserve.org/servlet/NatureServe?searchName=Ambystoma+annulatum
Etheostoma cragini	Arkansas darter	-	INV	G3G4	S1	Small permanent-flow springs and spring run creeks often less than three feet wide and one foot deep, always found in association with aquatic vegetation over a substrate of gravel, sand, and silt.	http://explorer.natureserve.org/servlet/NatureServe?searchName=Etheostoma+cragini
Etheostoma microperca	least darter	-	INV	G5	S1	Small clear springs and quiet pools of spring creeks having permanent flow and gravel bottoms, often with accumulations of detritus and thich growths of water cress and filamentous algae	http://explorer.natureserve.org/servlet/NatureServe?searchName=Etheostoma+microperca
Etheostoma mihileze	sunburst darter	-	INV	G4	S3	Small, clear, cool, permanently flowing streams and creeks with a clean gravel and/or cobble substrate. Particularly found in pools.	http://explorer.natureserve.org/servlet/NatureServe?searchName=Etheostoma+mihileze
Nocomis asper	redspot chub	-	INV	G4	S3	Upland, clear spring-fed streams with gravel bottoms	http://explorer.natureserve.org/servlet/NatureServe?searchName=Nocomis+asper
Plants-Vascular							
Asclepias incarnata ssp. incarnata	swamp milkweed	-	INV	G5T5	S2	Moist to wet prairie, stream banks, pond and lake margins, and ditches	http://explorer.natureserve.org/servlet/NatureServe?searchName=Asclepias+incarnata+ssp.+incarnata

Scientific Name	Common Name	Federal Status	State Status	Global Rank	State Rank	Habitat	NatureServe Link
Crataegus palmeri	Palmer's hawthorn	-	INV	GNR	SNR	Dry to mesic forest or woodland, occasionally upland prairie, seasonally moist depressions in prairies, often on chert or novaculite substrates.	
Trillium ozarkanum	Ozark trillium	-	INV	G3	S3	Dry to mesic forest or woodland, occasionally upland prairie, often on chert or novaculite substrates	http://explorer.natureserve.org/servlet/NatureServe?searchName=Trillium+pusillum+var.+ozarkanum

LEGEND

STATUS CODES

FEDERAL STATUS CODES

C = **Candidate species. The U.S. Fish and Wildlife Service has enough scientific information to warrant proposing this species for listing as endangered or threatened under the Endangered Species Act.**

LE = **Listed Endangered; the U.S. Fish and Wildlife Service has listed this species as endangered under the Endangered Species Act.**

LT = **Listed Threatened; the U.S. Fish and Wildlife Service has listed this species as threatened under the Endangered Species Act.**

-PD = **Proposed for Delisting; the U.S. Fish and Wildlife Service has proposed that this species be removed from the list of Endangered or Threatened Species.**

PE = **Proposed Endangered; the U.S. Fish and Wildlife Service has proposed this species for listing as endangered.**

PT = **Proposed Threatened; the U.S. Fish and Wildlife Service has proposed this species for listing as threatened.**

T/SA = **Threatened (or Endangered) because of similarity of appearance.**
E/SA

STATE STATUS CODES

INV = **Inventory Element - The Arkansas Natural Heritage Commission is currently conducting active inventory work on these elements. Available data suggests these elements are of conservation concern. These elements may include outstanding examples of Natural Communities or animal assemblages as well as plants and animals, which, according to current information, may be rare, peripheral, or of an undetermined status in the state. The ANHC is gathering detailed location information on these elements.**

WAT = **Watch List Species; The Arkansas Natural Heritage Commission is not conducting active inventory work on these species, however, available information suggests they may be of conservation concern. The ANHC is gathering general information on status and trends of these elements. An "*" indicates the status of the species will be changed to "INV" if the species is verified as occurring in the state (this typically means the agency has received a verified breeding record for the species).**

MON = **Monitored Species; The Arkansas Natural Heritage Commission is currently monitoring information on these species. These species do not have conservation concerns at present. They may be new species to the state, or species on which additional information is needed. The ANHC is gathering detailed location information on these elememts**

SE = **State Endangered; this term is applied differently for plants and animals.**

Animals – These species are afforded protection under Arkansas Game and Fish Commission (AGFC) Regulation. The AGFC states that it is unlawful to import, transport, sell, purchase, hunt, harass or possess any threatened or endangered species of wildlife or parts. The AGFC lists as endangered any wildlife species or subspecies endangered or threatened with extinction, listed or proposed as a candidate for listing by the U.S. Fish and Wildlife Service or any native species or subspecies listed as endangered by the Commission.

Plants – These species have been recognized by the Arkansas Natural Heritage Commission as being in danger of being extirpated from the state. This is an administrative designation with no regulatory authority.

ST = **State Threatened; These plant species have been recognized by the Arkansas Natural Heritage Commission as being likely to become endangered in Arkansas in the foreseeable future, based on current inventory information. This is an administrative designation with no regulatory authority.**

DEFINITION OF RANKS

Global Ranks

G1 = **Critically imperiled globally. At a very high risk of extinction due to extreme rarity, very steep declines, very severe threats or other factors.**

G2 = **Imperiled globally. At high risk of extinction or elimination due to restricted range, few populations or occurrences, steep declines, severe threats or other factors.**

G3 = **Vulnerable globally. At moderate risk of extinction or elimination due to a fairly restricted range, relatively few populations or occurrences, recent and widespread declines, threats, or other factors.**

G4 = **Apparently secure globally At fairly low risk of extinction or elimination due to an extensive range and/or many populations or occurrences, but with possible cause for some concern as a result of local recent declines, threats, or other factors.**

G5 = Secure globally. At very low risk or extinction or elimination due to a very extensive range, abundant populations or occurrences, and little to no concern from declines or threats.

GH = Of historical occurrence, possibly extinct globally. Known from only historical occurrences but still some hope of rediscovery.

GU = Unrankable. Currently unrankable due to lack of information or due to substantially conflicting information about status or trends.

GX = Presumed extinct globally. Not located despite intensive searches and virtually no likelihood of rediscovery.

GNR = Unranked. The global rank not yet assessed.

GNA = Not Applicable. A conservation status rank is not applicable because the species or ecosystem is not a suitable target for conservation activities.

T-RANKS= Infraspecific Taxon (trinomial) - The status of infraspecific taxa (subspecies or varieties) are indicated by a "T-rank" following the species' global rank. Rules for assigning T-ranks follow the same principles as those for GRANKS.

State Ranks

S1 = Critically imperiled in the state. At very high risk of extirpation in the jurisdiction due to very restricted range, very few populations or occurrences, very steep declines, severe threats, or other factors.

S2 = Imperiled in the state. At high risk of extirpation in the jurisdiction due to restricted range, few populations or occurrences, steep declines, severe threats, or other factors.

S3 = Vulnerable in the state. At moderate risk of extirpation in the jurisdiction due to a fairly restricted range, relatively few populations or occurrences, recent and widespread declines, threats, or other factors.

S4 = Apparently secure in the state. At a fairly low risk of extirpation in the jurisdiction due to an extensive range and/or many populations or occurrences, but with possible cause for some concern as a result of local recent declines, threats, or other factors.

S5 = Secure in the state. At very low or no risk of extirpation in the jurisdiction due to a very extensive range, abundant populations or occurrences, with little to no concern from declines or threats.

SH = Of historical occurrence in the state. Known from only historical records but still some hope of rediscovery. There is evidence that the species or ecosystem may no longer be present in the jurisdiction, but not enough to state this with certainty Examples of such evidence include (1) that a species has not been documented in approximately 20-40 years despite some searching and/or some evidence of significant habitat loss or degradation; (2) that a species or ecosystem has been searched for unsuccessfully, but not thoroughly enough to presume that it is no longer present in the jurisdiction.

SU = Unrankable in the state. Currently unrankable due to lack of information or due to substantially conflicting information about status or trends.

SX = Presumed extirpated from the state. Species or ecosystem not located despite intensive searches of historical sites and other appropriate habitat, and virtually no likelihood that it will be rediscovered.

SNR = Unranked. The state rank not yet assessed.

SNA = Not Applicable. A conservation status rank is not applicable because the species or ecosystem is not a suitable target for conservation activities.

General Ranking Notes

Q = A "Q" in the global rank indicates the element's taxonomic classification as a species is a matter of conjecture among scientists.

RANGES= Ranges are used to indicate a range of uncertainty about the status of the element.

? = A question mark is used to denote an inexact numeric rank.

B = Refers to the breeding population of a species in the state.

N = Refers to the non-breeding population of a species in the state.