

**Federal Biological Evaluation  
For  
Federal Threatened and Endangered Plants, and Terrestrial and Aquatic Animal  
Species**

**Ozark Road Improvement Project**

**Hidden Springs Ranger District  
Shawnee National Forest  
Pope County, Illinois**

**INTRODUCTION AND PROPOSED MANAGEMENT ACTION**

Forest Service Manual (FSM) Section 2672.41 requires a biological evaluation (BE) and/or biological assessment (BA) be conducted for all Forest Service planned, funded, executed, or permitted programs and activities. The objectives of this BE are to: 1) ensure that Forest Service actions do not contribute to the loss of population viability of any native or desired non-native species or contribute to trends toward federal listing; 2) comply with the requirements of the Endangered Species Act (ESA) so that federal agencies do not jeopardize or adversely modify critical habitat (as defined in ESA) of any federally listed species; and, 3) provide a process and standard to ensure that federally threatened and endangered and Region Nine Sensitive species receive full consideration in the decision-making process.

The Hidden Springs Ranger District supports known occurrences and suitable habitat for federally threatened-endangered and Region Nine Sensitive (TES) plant, animal, and aquatic species, all of which were considered in this analysis. This Federal BE documents the analysis of potential effects of the proposed action to TES plant, animal and aquatic species and associated habitats. It also serves as biological input into the environmental analysis for project-level decision making to ensure compliance with the ESA National Environmental Policy Act (NEPA) and National Forest Management Act (NFMA).

This project proposes to conduct improvements to a 1.7 mile section of Forest Service Road 402 (Ozark Road). The purpose of the proposed project is to execute a maintenance agreement with Pope County in order to allow the County Road Construction Number 2 to maintain and improve a section of Ozark Road. The improvement would accommodate the public traffic and to reduce future maintenance costs. The Ozark Road is one of the most highly used roads on the Forest. Paving this road would stabilize the road and lessen the sediment delivery to the adjacent stream systems. Forest Plan direction states that “Forest roads and highways must be constructed to at least a minimum standard appropriate for their intended uses, considering safety, cost of transportation and effects on land and resources. Under this agreement, the Forest would allow Pope County to maintain and improve the Ozark Road from the intersection of the Delwood Road and Bell Smith Springs to the intersection of Appel Road in McCormick, about 1.7 linear miles. The work would include replacement of eight culverts, clearing, brushing and adding gravel. The road would be upgraded to an oil and chip surface. Removal of brush

and trees up to four inches dbh (diameter at breast height) would occur during routine maintenance.

The proposed project area is as follows:

**Table 1. Location of Ozark Road Improvement Project.**

<b>Project</b>	<b>Estimated Size</b>	<b>Location</b>	<b>County</b>
Ozark Road Improvement Project	1.7 miles	T11S, R5E, Sections 15, 16 and 21	Pope

## **PROJECT AREA AND CUMULATIVE EFFECTS ANALYSIS AREA**

### **Existing Condition: Past and Present actions that have affected the existing situation**

The section of FSR 402 proposed for road improvements extends through a mix of upland habitat types, including mature upland hardwood forest, open agricultural pastureland, private residences, and mature yellow pine forest. An open non-forested road corridor is present along the southeastern side of FSR 402, extending as far as 10 feet in width. This open linear strip is generally composed of a mix of native and non-native herbaceous plants which receives annual mowing. Forest vegetation basically extends right up to the edge of the roadbed along the northwestern side of FSR 402.

Standing dead hardwood and conifer trees are abundance along both sides of the road, consisting of both small (<6" dbh) and large diameter (>9" dbh) snags. Three road culverts have already been replaced, with an additional six (6) culverts remaining to be replaced. These six (6) culverts are fairly open on each end of the culverts, reducing the likelihood of having to clear and remove standing live or dead trees. The road currently has a gravel surface and receives considerably high motor vehicle use.

The proposed section of FSR 402 does not cross any streams or other water bodies. No other water bodies are present. Water run-off handled by road culverts is being dumped out onto the surface of adjacent forestland where sediments are being allowed to settle out onto the forest floor. For several culverts, gullying is starting to take place but the likelihood of sediment from road run-off reaching downslope streams being highly unlikely. Rip-rap is needed to be placed at the downstream terminus of each existing culvert, and for any culverts replaced, so as to reduce the likelihood of further gullying and soil erosion taking place. No karst (caves, cliffs, rock outcrops, etc.) occurs within close proximity to the section of FSR 402. However, an abundance of karst is present a one mile radius of the proposed project area.

### **Cumulative Effects-Temporal and Spatial Boundary**

Cumulative effects analysis takes into account all known past actions, present actions, the proposed action and reasonably foreseeable future actions which could or will impact the analysis area.

### *Wildlife Resources*

FSR 402 is a Forest Service Road that received high levels of public motorized vehicle use levels. It serves as a through-road from State Road 145 connecting to State Road 45. The 1.7 mile stretch of road proposed for improvement work consists primarily of forested national forest lands. It is not anticipated that motorized vehicle use rates will change appreciably by the implementation of proposed road improvements. For the most part, road clearance widths will not change appreciably upon completion of the proposed road improvements.

However, it is anticipated that at some time in the future, as population growth expands and motorized vehicle use levels increase, that there may be proposals to widen the clearance widths along FSR 402.

The temporal boundary used in conducting the cumulative effects analysis for wildlife species is 5 years in the past extending out to 50 years into the future.

The spatial boundary used in conducting the cumulative effects analysis for T&E bats is a three mile radius extending outward from the boundary of the proposed 1.7 mile section of FSR 402.

Several Indiana bat research studies have suggested that Indiana bats will travel as far as 2.5 miles from individual summer roost trees. A three mile radius extending from the project activity area boundary would seem appropriate to cover any potential Indiana bats roosting outside of the project activity area boundary that might forage or roost in the project activity area. Consequently, a three mile radius extending outward from the project activity area boundary would seem biologically appropriate for analyzing potential cumulative effects to Indiana bat populations. The Forest Plan also conducted a comprehensive cumulative effects analysis to the Indiana bat at the Forest-wide scale. This cumulative effects analysis tiers to this analysis in the Forest Plan EIS and the Biological Assessment.

### *Botanical Resources*

The area used for the analysis of effects on botanical resources is an approximately 25 foot distance from the edge of the gravel road because the effects of the proposed alternatives would be confined to the project area. The analysis is temporally bound by a time-frame extending from the mid-1800's, when much of the land was cleared for agriculture, to a point 5 years into the future. The 5 years into the future was selected because it corresponds to the life-span of the Forest Plan. This time-frame is long enough to accurately gauge the management effects and short enough that any deleterious effects resulting could be addressed and reversed or mitigated if necessary.

There are no rare plant species, rare plant communities, or natural areas within or adjacent to Ozark Road Improvement project area.

## *Aquatic Resources*

**Spatial Bounds of Aquatic Analysis** - The boundary for analysis includes the Hunting Branch and Ogden Branch Drainages. This spatial boundary allows for the assessment of potential direct effects within the project area, as well as potential indirect effects downstream of the project area and takes into account past, present, and reasonably foreseeable future actions.

**Temporal Bounds of Aquatic Analysis** - The time frame for analysis extends backward in time to the mid 1800s, when much of the land was cleared for agriculture production and forward to a point fifteen years into the future. This time frame includes all past actions, which have altered stream habitat, as well as the potential actions that could alter stream habitat.

Present Forest Service and actions occurring in the project area vicinity include trail maintenance; construction and use of existing designated trails; unauthorized ATV (all terrain vehicles) use; OHV (off-highway vehicles) use; timber harvest (private lands); issuing of special use permits; residential home construction; pond and waterhole management; picnicking; agricultural management (row cropping and pasture on private land) including pesticide use on private lands; wildlife habitat enhancement; mountain biking; prescribed fire; wildfire suppression; user-created equestrian trails; road maintenance and use; scenic viewing; tree planting; trail rehabilitation; equestrian use; and outdoor recreation use (hiking, hunting, rock climbing, rappelling and fishing).

Within the project area vicinity, the Forest Service has over the past five to ten years maintained roads, maintained recreational trails, issued special use permits, conducted prescribed burning for timber stand improvement, cleared fire control lines for conducting prescribed burning, marked boundary line, installed and maintained communication lines, and suppressed wildfires. The area has been used by the public for camping, horseback riding, hunting, scenic viewing, authorized recreational vehicle driving, unauthorized off highway vehicle (OHV) use, and unauthorized all terrain vehicle (ATV) riding.

The proposed project area lies adjacent to the Burden Falls Wilderness Area and the Bay Creek Wilderness area, so streams within these two wilderness areas are in somewhat good condition.

In addition to agriculture, which has likely exerted the greatest influence on stream habitat, other past activities have affected habitat conditions and the abundance of aquatic organisms via erosion and sedimentation. These actions include residential development, timber harvest, road construction and maintenance, all terrain vehicle (ATV) use, off-highway vehicle (OHV) use, and managed agricultural lands.

Present practices affecting stream habitat and aquatic communities, primarily via erosion and subsequent sedimentation, include agricultural and logging activity on private land, construction and maintenance of roads, and recreational activity on the Shawnee National Forest, agricultural (row crop and livestock). Erosion resulting from pastures and row crop production is evident on lands within these watersheds (Hite et al. 1990) and does influence downstream habitat on the Shawnee National Forest. Road construction and maintenance also contributes sediment to streams and can influence available habitat (Waters 1995). Although new road construction within the Forest and the surrounding area is minimal, erosion from existing roads and maintenance activities on roads (e.g., bridge or culvert replacement) add sediment to the streams.

The agency is unaware of any proposed future activities planned on private land in the vicinity of the project areas beyond what has been, and is occurring at the present time. Using past and present activity levels, activities on private lands within the vicinity of the proposed project area are expected to remain the same as current level for the next five-ten years.

All of the “*Terms and Conditions*” listed in the US Fish and Wildlife Service (USFWS) December 3, 2005 Biological Opinion (USFWS BO) issued for the 2005 Revised Shawnee National Forest Land and Resource Management Plan (the Forest Plan) will be adhered to during project implementation. The standards listed in Appendix A-Standards and Guidelines for Federally-Listed T and E Species-Gray Bat and Indiana Bat, will be complied with fully.

This proposed project was designed knowing that the project area could potentially represent suitable summer habitat for the Indiana bat (*Myotis sodalis*).

## **Species Reviewed**

Appendix A of this document lists all 10 federally listed terrestrial and aquatic animal species currently known or expected to occur on or near the Hidden Springs Ranger District, Shawnee National Forest. All species on the list were considered during the analysis for this project. The Forest only has one federally-listed plant that is currently known or likely to occur on the Shawnee National Forest, and that species is Mead’s milkweed (*Asclepias meadii*). This rare plant species is not known to occur in Pope County, so it should not be affected by implementation of the proposed road improvement project.

Federal threatened and endangered plant and animal species (T&E) that may potentially be affected by this project were examined using the following existing available information:

1. Reviewing the list of TES animal and plant species known or likely to occur on the Shawnee National Forest, and their habitat preferences. This review included the U.S.

Fish and Wildlife Service current list of endangered, threatened, and proposed species for the Forest.

2. Consulting element of occurrence records (EOR's) for T&E plant and animal species as maintained by the Illinois Department of Natural Resources-Natural Heritage Program, and supplied to the Forest.
3. Reviewing sources listed in the references portion of this report.
4. Reviewing the results of any past field surveys that may have been conducted in the project area.

Most T&E species known to occur on the Forest are associated with unique habitat requirements, such as rock outcrops, cedar glades, boulder fields, caves, springs or seeps, cypress-tupelo gum swamps, bogs or wetlands, and riparian or aquatic habitats.

A “step down” process was followed to eliminate species from further analysis and focus on those species that may be potentially affected by proposed project activities. Species not eliminated are then analyzed in greater detail. Results of this “step down” process are displayed in the Occurrence Analysis Results (OAR) column of the table in Appendix A. First, the range of a species was considered. Species’ ranges and potential occurrences on the Forest are based on county records contained in such documents as “Endangered and Threatened Species of Illinois: Status and Distribution, Volume II – Animals, 1992”; “Additions, Deletions and Changes to the Illinois List of Threatened and Endangered Species-2004”; “Endangered and Threatened Species of Illinois: Status and Distribution, Volume 1 – Plants, 2002;”; “2004 Checklist of Endangered and Threatened Animals and Plants of Illinois”, Illinois Department of Natural Resources “Biological Conservation Database (February 17, 2005)”, “US Fish and Wildlife Service “Distribution of Federally-Listed Threatened (T), Endangered (E), and Proposed (P) Species in Illinois-March 2003”, “1999 Checklist of endangered and threatened animals and plants of Illinois”, and various Species Conservation Assessments that have been funded by the Shawnee National Forest. These databases and scientific research publications were reviewed for current listings, habitat associations, historical records, and known location information.

For many T&E species, range information clearly indicates a species will not occur in the project area due to restricted geographic distribution. When the project area is located outside the known range for a species, that species is eliminated from further consideration by being coded as OAR Code “1” in the Appendix A table. For this project, 7 species was eliminated from further consideration because the project area is not within the species known range and no surveys are needed. For the remaining species, likelihood of occurrence was further analyzed using results from past surveys, knowledge of the area, and the potential for the presence of suitable habitat being present within the affected project area.

Some species could not be eliminated from further consideration based on known range and because there were no existing field surveys in portions of the project activity areas. Other than the Indiana bat, no other federally threatened or endangered species habitat was observed within the affected project activity areas.

Based on the results of field surveys and knowledge of the area, species were eliminated from further consideration either because of: 1) a lack of suitable habitat in the project area (OAR code “2”); b) habitat present and the species has been searched for, but has not been found (OAR code “3”); c) the species is located in the project area, but out of the actual area of activity (OAR code “4”); and/or, d) for aquatic species, they are known or suspected downstream of project activity area activity but far enough downstream in the watershed to be considered beyond the projected geographic bounds of having any potentially adverse effects on aquatic habitat (OAR code “7”). Disposition of species considered are documented in the Appendix A table. For this project, 2 species were further eliminated from consideration because of one of the above reasons.

**Species Identified as Known or Likely to Occur In the Action Area or Potentially Affected by the Action**

Utilizing past surveys and knowledge of the project area, and given the proposed action, those species which would be analyzed and discussed further in this document are those that: a) are found to be located in the proposed activity area (OAR code “5”); b) were not seen during the survey(s) but possibly occur in the activity area based on habitat observed during the survey(s) , field surveys were not conducted when species is recognizable, or no field surveys were completed (OAR code “6”); and, c) for aquatic species, they are known or suspected downstream of project or activity area and within projected geographic bounds of having potential adverse effects to aquatic habitat (OAR code “8”).

Based on their known or likely occurrence within or in close proximity to the affected project area, the following 1 species were selected for further effects analysis:

**Table 6. Federal T&E Species Analyzed.**

OAR Code	Scientific Name	Common Name	Taxa	Status
6	Indiana Bat	<i>Myotis sodalis</i>	Mammal	Federal Endangered
6	Gray Bat	<i>Myotis grisescens</i>	Mammal	Federal Endangered

**Potential Direct, Indirect and Cumulative Effects of Proposed Management Action on Federally Listed Species**

The analysis of potential effects to species identified as known or expected to occur in the vicinity of the proposed project, or likely to be affected by the action, includes the following existing information:

1. Data on species/habitat relationships.
2. Species range distribution.
3. Occurrences developed from past field surveys or field observations.
4. The amount, condition, and distribution of suitable habitat.

### Federally Listed Animal Species

#### *Indiana Bat*

Effects to the federally endangered Indiana bat (*Myotis sodalis*) were considered in this BE/BA because it is assumed the entire Forest represents potential habitat (summer roosting and/or summer foraging) for this species. This BE is tied to the December 3, 2005 U.S. Fish and Wildlife Biological Opinion (BO) for the Programmatic Biological Assessment prepared for the 2006 Forest Plan; and, the 2006 Final Environmental Impact Statement for the Proposed Shawnee National Forest. This BE incorporates the “Standards and Guidelines for Federally Listed Threatened and Endangered Species-Gray Bats and Indiana Bats-Appendix A”; and, the “*Terms and Conditions*” of the USFWS BO. Recent research papers on Indiana bat habitat and ecology were also reviewed prior to the preparation of this biological evaluation/assessment.

The entire Shawnee National Forest is considered to be potentially occupied by Indiana bats during summer months, utilizing standing dead and live trees for summer roost sites, and for foraging. The proximity of the proposed project to Bay Creek and Hunting Branch increases the likelihood that Indiana bats may be present on or adjacent to the project. An abundance of suitable summer roost trees located adjacent to the section of FSR 402 proposed for improvements elevates the likelihood of Indiana bats being present along FSR 402. However, no trees (dead or live) will need to be cut/removed from April 1-September 30 as part of the proposed project. Forest Service roads are likely to be used at both travel corridors and for foraging. No Indiana bat summer roost records exist within the proposed project area at this time.

No winter roost sites (hibernacula) are known to occur within the project area, nor within a five mile radius of the project area boundary.

No Indiana bat summer maternity roosts are known to occur within or near the proposed project area.

#### *Gray Bat*

For the most part, gray bats confine summer foraging activities within close proximity to rivers and creeks, with minimal use of upland mature hardwood forest. It is highly unlikely that gray bats would be present using the section of FSR 402 proposed for road improvements. Roost sites for gray bats are nearly exclusively restricted to caves throughout the year. Large summer colonies utilize caves that trap warm air; maternity

caves often have a stream flowing through them. Occasionally non-cave roost sites are used.

Gray bats are known from Pope County, but are considered very rare. Two gray bats have been recorded near the Pope and Hardin County line. The Pope County specimens were captured during summer surveys conducted along Grande Pierre Creek in 1989 and 1991. Two gray bats, both adult males, were captured during mist net surveys conducted by forest service wildlife biologists along Grand Pierre Creek on August 9, 2006. It is believed that these bats were most likely roosting in nearby Cave Springs Cave, which is the only known roost in the vicinity of the Shawnee National Forest. Cave Spring Cave is privately owned and is located in Hardin County (Whitaker 1975).

Because suitable winter and summer roosting habitat, and foraging habitat are absent from the project area, this analysis considers the project area to represent unsuitable gray bat habitat. Given this, and the fact that the project area does not lie in close proximity to any known gray bat roost sites, this analysis considers the gray bat to be absent from the project area. Consequently, there should be no adverse effects to gray bat populations, foraging habitat, or roosting habitat from the implementation of proposed road improvement activities.

#### Federally Listed Aquatic Species

There are no federal listed aquatic species known or likely to occur: 1) within the proposed project area, or 2) downstream of the project area such that implementation of the project could have any adverse effects on aquatic species or aquatic habitats.

#### Federally Listed Plant Species

Based upon the most current (February 20, 2004) distribution list of federally-listed threatened, endangered, and proposed species for Illinois, only one Federal Threatened plant species is known from current or historical records from the Shawnee National Forest. Mead's milkweed (*Asclepias meadii*) is the only Federally Threatened plant species that may be found within the proposed area for the Ozark Road Improvement Project.

#### *Mead's Milkweed*

*Asclepias meadii* is primarily a prairie inhabitant and is not found within the affected county. In the Shawnee National Forest it is only found within the Shawnee Hills Natural Division in Saline County. Typical habitat is natural, hill prairie-like openings in dry upland oak forest. It is not known to be extant from any other county in the State of Illinois.

Because none of the planned alternatives will have any environmental effects on known populations or potential habitat of *Asclepias meadii*, it is concluded that there should be no direct, indirect, or cumulative adverse effects.

## **Determination of Effect**

### Indiana bat

In a letter dated December 3, 2005, the USFWS transmitted the Service's Programmatic Biological Opinion (BO) for the proposed 2005 Forest Plan and the Plans effect on federally listed species. With regards to the potential effects on the Indiana bat, the USFWS concluded: "*It is the Service's biological opinion that the 2005 Forest Plan, as proposed, is not likely to jeopardize the continued existence of the Indiana bat*". In addition, the USFWS provided a list of "*Reasonable and Prudent Measures-Terms and Conditions*" which are necessary to minimize the impacts of incidental take of Indiana bats. In order to be exempt from the prohibitions of section 9 of the Endangered Species Act, the Shawnee National Forest must comply with a list of "*Terms and Conditions*", which carry out the reasonable and prudent measures described in the USFWS BO (as listed on pages 88-90 of the BO).

The implementation of proposed road improvement activities will be in full compliance with the "*Terms and Conditions*" of the December 3, 2005 USFWS BO for the 2006 Shawnee Forest Plan, and therefore constitutes compliance with ESA Section 7 requirements.

The proposed project will have "no effect" to summer foraging or roosting habitat for the Indiana bat. Implementation of the project is not expected to result in any effects beyond those effects currently taking place prior to implementation of the proposed road improvement project. No trees >4" dbh will be cut during implementation of the proposed project. Since implementation of this project will be in full compliance with, and tiers to, the USFWS BO that was issued as a result of formal consultation, and actions will have no effect on habitat or populations of Indiana bats, implementation of the proposed road improvement project should have "no effect" on Indiana bat populations within the project area, or on the Forest. Consequently, no further consultation with the US Fish and Wildlife Service is required.

No caves known to harbor Indiana bats are known to be present within the immediate vicinity of the project area (all known hibernacula are located greater than 5 miles away from project area), so there should be no adverse direct, indirect or cumulative effects to winter roosting bats.

It is anticipated that there will be no direct, indirect, or cumulative adverse effects to any other federally listed animal species.

Implementation of proposed road improvement activities should have no direct, indirect or cumulative adverse environmental effects on any known populations or habitat of the

federal threatened *Asclepias meadii*. If the above species are found prior to or during project implementation, the appropriate standards and guidelines will be followed to insure that the new locations of these species are protected.

This takes into consideration the past, proposed, present, and reasonably foreseeable future actions. No further analysis is needed unless additional information is brought forward prior to or during project implementation. In the case of new information, the Forest Service will initiate informal consultation with the U.S. Fish and Wildlife Service.

Implementation of proposed road improvement activities is not expected to have any direct, indirect, or cumulative adverse effects to any federally listed aquatic species.

Because there are no other federally proposed or listed species habitat present within the affected project activity areas, implementation of this proposed project will have “no direct, indirect or cumulative adverse effects” on any other federally listed plant, animal or aquatic species. Consequently, no additional consultation with the US Fish and Wildlife Service is required. In the case of new information, the Forest Service will initiate informal consultation with the US Fish and Wildlife Service.

### **Mitigation**

The 2005 Revised Shawnee National Forest Land and Resource Management Plan contains standards and guidelines to protect habitat, to sustain species diversity, and to ensure the sustaining of populations for the majority of the federal listed and proposed, as well as regional nine sensitive, species known or likely to occur on lands within the administrative boundary for the Shawnee National Forest. These standard and guidelines would apply when and where needed during various stages of project implementation. These standards and guidelines were reviewed by the US Fish and Wildlife Service during formal consultation for the Amended Forest Plan. In the event any new information is derived that would indicate the presence of other federally listed-proposed species within the project activity area, project activities would be temporarily suspended, the information would be analyzed, and a determination rendered for any additional project stipulations or mitigation deemed necessary to protect species viability across the Forest.

### **Prepared by:**

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May 11, 2012  
Date

\_\_\_\_\_  
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May 11, 2012  
Date

## **U. S. Fish and Wildlife Service Concurrence**

Since the effects determination upon federally-listed, proposed or candidate animal and plant species is “no effect”, no concurrence is required from the US Fish and Wildlife Service.

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### **Attachments:**

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Appendix A – Forest Federal T&E Species OAR List

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**APPENDIX A**

**Documentation of Federal Threatened and Endangered (T&E) Aquatic and Terrestrial Animal and Plant Species Occurrences  
For**

**Ozark Road Improvement Project**

**National Forest Lands in Alexander (A), Pulaski (Pu), Jackson (Ja), Union (U), Hardin (H), Gallatin (G), Pope (P), Massac (M), Johnson (J), Williamson (W), and Saline (S) Counties, Illinois  
Coding for Occurrence Analysis Results (OAR)**

**May 2012**

**This updated list reflects changes to the Region Nine December 2011 R9 RFSS List**

<b>O A R</b>	<b>Species Name</b>	<b>Common Name</b>	<b>Range on or near Shawnee NF</b>	<b>Habitat-Detail</b>	<b>Federal T&amp;E, and Region Nine Sensitive</b>	<b>G Rank</b>	<b>Illinois State Rank</b>	<b>County</b>	<b>Threats/Misc. Comments</b>
6	<i>Myotis grisescens</i>	Gray Bat	Big Grand Pierre Creek, Griffith Cave, Martin-Marietta Stone Quarry, Cave Spring Cave	Cave-summer and winter, Foraging-rivers, streams, and lakes adjacent to forests.	E	G3	S1	A, G, Ja, Pu, H, J, P	Disturbance to caves; WNS
6	<i>Myotis sodalis</i>	Indiana Bat	Simmons Creek Cave, Brasher Cave, Herod-private mine, Ellis Cave, Martin-Marietta Stone Quarry	Winter: caves, mines; Summer-snags; Foraging-small stream corridors with well developed riparian woods/upland and bottomland forests.	E	G2	S1	A, G, Ja, J, Pu, U, H, P, S	Loss of mature bottomland hardwood forest, disturbance to caves, WNS
2	<i>Sterna antillarum</i>	Least Tern		Bare alluvial and dredge spoil islands	E	G4T2Q	SNR	A, Pu, M, Ja, P, U	Flooding of nesting sites; predation
1	<i>Scaphirynchus albus</i>	Pallid Sturgeon	Extirpated/ Possibly extirpated in IL	Large turbid free-flowing riverine habitat, strong current over firm gravel or sandy substrate. Large rivers	E	G2	S1	A, Ja, U	Construction of large dams and river channelization

O A R	Species Name	Common Name	Range on or near Shawnee NF	Habitat-Detail	Federal T&E, and Region Nine Sensitive	G Rank	Illinois State Rank	County	Threats/Misc. Comments
2	<i>Potamilis capax</i>	Fat pocketbook pearl mussel	Found in sand, mud, and fine gravel substrates and flowing water	Mississippi, Ohio, Saline Rivers	E	G1	S1	G, H, M, P	Dredging, impoundments,
1	<i>Plethobasis copperianus</i>	Orange-footed pearl mussel	Large rivers in sand, gravel, and cobble substrates in riffles and shoals in deep water and steady currents	Ohio River	E	G1	S1	M, Pu	Siltation, drain of bottomlands, species introductions, pollution, impoundments
1	<i>Lampsis orbiculatum</i>	Pink mucket pearl mussel	Large rivers, with strong currents, rocky substrates, in deeper water with sand and gravel substrates	Ohio River	E	G2	S1	M	Dams, dredging, siltation, pollution, channelization
1	<i>Quadrula cylindrica</i>	Rabbitsfoot	Medium to large rivers with moderate to swift currents, and in smaller streams in bars or gravel and cobble in fast current	Ohio River	Candidate	G3G4T3	SNR/SU	A, M, Pu	Impoundments, channelization, chemical contaminants, mining and sedimentation
1	<i>Plethobasus cyphus</i>	Sheepnose	Medium to large-sized rivers; riffles and gravel/cobble substrates in deep water with slight to swift currents and mud, sand or gravel bottoms	Shallow areas in large rivers	Proposed-E	G3	S1	A, M, Pu	Impoundments, channelization, pollution, contaminants, sedimentation, over-exploitation, population fragmentation

OAR	Species Name	Common Name	Range on or near Shawnee NF	Habitat-Detail	Federal T&E, and Region Nine Sensitive	G Rank	Illinois State Rank	County	Threats/Misc. Comments
1	<i>Cumberlandia monodonta</i>	Spectaclecase	Large rivers in areas sheltered from the main force of the current	Mississippi and Ohio Rivers	Candidate Species Proposed-E	G3	S1	M	Habitat loss and degradation: impoundments, channelization, chemical contaminants, mining, sedimentation,
1	<i>Asclepias meadii</i>	Mead's milkweed	Eagle Mountain	Dry upland barrens and tall grass prairies	T	G2	S1	S	Habitat loss in barrens and tall grass prairies

**LEGEND FOR TES SPECIES IN OCCURRENCE ANALYSIS RESULTS (OAR):**

**OAR Codes:**

- 1=Project located out of species known range.
- 2=Lack of suitable habitat for species in project area.
- 3=Suitable habitat present, species was searched for during field surveys, but not found.
- 4=Species occurs in project area, but outside of activity area.
- 5=Field surveys located species in proposed activity area.
- 6=Species not seen/found during field survey, but could possibly occur in activity area based on habitat observed; or, field survey not conducted when species is recognizable (time of year or time of day). Therefore, assume presence and no additional surveys are needed.
- 7=Aquatic species or habitat known or suspected downstream of project activity area, but outside of projected water cumulative effects analysis area (defined as point below which sediment amounts are immeasurable and insignificant).
- 8=Aquatic species or habitat known or suspected downstream of project activity area, but inside projected water cumulative effects analysis area.

**Definition of Terms:**

- Species**=The term "species" includes any subspecies of fish or wildlife, and any distinct population segment of any species of vertebrate, invertebrate, or mussel, which interbreeds when mature. (Endangered Species Act of 1973, as amended through the 100<sup>th</sup> Congress).
- Range**=The geographical distribution of a species. For use here "range" is expressed as where a species is known or expected to occur on or near the Shawnee National Forest in terms of landform (feature name, physiographic province), political boundary (county name), or watershed (river, or stream name).
- Habitat**=A place where the physical and biological elements of ecosystems provide a suitable environment and the food, cover, and space resources needed for plant and animal livelihood (FSM 2605-91-8, pg. 10 of 13).
- Global Rank**=Global ranks are assigned by a consensus of the network of natural heritage programs, scientific experts, and the Nature Conservancy to designate a rarity based on the range-wide status of a species or variety. This system was developed by the Nature Conservancy and is widely used by other agencies and organizations as the best available scientific and objective assessment of taxon rarity and level of threat to its existence. The ranks are assigned after considering a suite of factors including number of occurrences, numbers of individuals, and severity of threats.
- G1**=Extremely rare and critically imperiled with 5 or fewer occurrences or very few remaining individuals; or because of some factor(s) making it especially vulnerable to extinction.
- G2**=Very rare and imperiled with 6 to 20 occurrences or few remaining individuals; or because of some factor(s) making it especially vulnerable to extinction.
- G3**=Either very rare and local throughout its range or found locally (even abundantly at some of its locations) in a restricted range; or vulnerable to extinction because of other factors. Usually fewer than 100 occurrences are documented.
- G4**=Common and apparently secure globally, though it may be rare in parts of its range, especially at the periphery.
- G5**=Very common and demonstrably secure globally, though it may be rare in parts of its range, especially at the periphery.
- GH**=Formally part of the world's biota with the exception that it may be rediscovered.
- GX**=Believed extinct throughout its range with virtually no likelihood of rediscovery.
- GU**=Possibly rare, but status uncertain and more data needed.
- G?**=Unranked, or, if following a ranking, ranking uncertain (ex. G3?).
- G\_Q**=The taxon has a questionable taxonomic assignment, such as G3Q.

**G\_T**=Signifies the rank of a subspecies or variety. For example, G5T1 would apply to a subspecies of a species that is demonstrably secure globally (G5) but the subspecies warrants a rank of T1, critically imperiled.

**State Rank:** The following ranks are used by the Illinois Department of Conservation to set protection priorities for natural heritage resources. Natural Heritage Resources (NHR's) are rare plant and animal species, rare and exemplary natural communities, and significant geologic features. The criterion for ranking NHR's is the number of populations or occurrences, i.e. the number of known distinct localities; the number of individuals in existence at each locality or, of a highly mobile organism (e.g. sea turtles, many birds, and butterflies), the total number of individuals; the quality of the occurrences, the number of protected occurrences; and threat.

- **S1** – Extremely rare; usually 5 or fewer populations or occurrences in the state; or may be a few remaining individuals; often especially vulnerable to extirpation.
- **S2** – Very rare; usually between 5 and 20 populations or occurrences; or with many individuals in fewer occurrences; often susceptible to becoming extirpated.
- **S3** – Rare to uncommon; usually 20 and 100 populations or occurrences; may have fewer occurrences, but with a large number of individuals in some populations; may be susceptible to large-scale disturbances.
- **S4** – Common; usually >100 populations or occurrences, but may be fewer with many large populations; may be restricted to only a portion of the state; usually not susceptible to immediate threats.
- **S5** – Very common; demonstrably secure under present conditions.
- **SA** – Accidental in the state.
- **S#B** – Breeding status of an organism within the state.
- **SH** – Historically known from the state, but not verified for an extended period, usually >15 years; this rank is used primarily when inventory has been attempted recently.
- **S#N** – Non-breeding status within the state. Usually applied to winter resident species.
- **SR** – Reported for Illinois, but without persuasive documentation that would provide a basis for either accepting or rejecting the report.
- **SU** – Status uncertain, often because of low search effort or cryptic nature of the element.
- **SX** – Apparently extirpated from the state.
- **SZ** – Long distant migrant, whose occurrences during migration are too irregular, transitory and/or dispersed to be reliably identified, mapped and protected.
- **SN** – Not ranked, under review

These ranks should not be interpreted as legal descriptions.

**County:**

A=Alexander; Pu=Pulaski; P=Pope; S=Saline; H=Hardin; G=Gallatin; Ja=Jackson; J=Johnson; M=Massac; U=Union; W=Williamson.

**T**-Listed as Federally threatened by the US Fish and Wildlife Service.

**E**-Listed as Federally endangered by the US Fish and Wildlife Service.

**P**-Proposed for federal listing by the US Fish and Wildlife Service.

**C**-Federal candidate species.

