Bat Habitat Conservation Priorities in Missouri Indiana Bat, Northern Long-Eared Bat, and Gray Bat

NOTE:

The Missouri Heritage Database, adapted for the Natural Resources Conservation Service (NRCS) and the U.S. Fish and Wildlife Service (USFWS), and *Known Northern Long-eared Bat Hibernacula and Maternity Roost Trees in Missouri* map will be consulted for potential impacts to the Indiana Bat, Northern Long-Eared Bat, and Gray Bat.

Please refer questions regarding these Bat Habitat Conservation Priorities to the Area Biologist. Area staff should direct questions to the State Wildlife Biologist.

Indiana Bat

The Indiana Bat (*Myotis sodalis*) is a federal and state listed endangered species. When the NRCS provides technical or financial assistance to landowners, habitat for this species must be considered and evaluated by NRCS staff.

Biology of the Indiana Bat

From late fall through winter, Indiana bats in Missouri hibernate in caves primarily in the North East Region. During the spring and summer, the bats utilize living, injured (e.g. split trunks and broken limbs from lightning strikes or wind), dead or dying trees for roosting throughout the state. Indiana bat roost trees tend to be greater than 9 inches diameter at breast height (DBH) with loose or exfoliating bark. Large trees (greater than 20 inches DBH) are preferred. Most important are the structural characteristics that provide adequate space for bats to roost.

Preferred roost sites are located in forest openings, at the forest edge, or where the overstory canopy allows some sunlight exposure to the roost tree which is usually within 0.6 miles of water. Indiana bats forage for flying insects (particularly moths) in and around the tree canopy of floodplain, riparian, and upland forests.

This use of trees by maternity colonies (summer habitat) requires any tree clearing/cutting activity to be done in a manner that does not destroy or injure the animals.

These habitat considerations apply to all NRCS assisted activities where potential suitable summer roosting habitat is located and suitable trees will be cleared as part of the project construction.

Guidance for Habitat Conservation Priorities for the Indiana Bat (*Myotis sodalis*)

NRCS will conserve the Indiana bat by following the priorities below in order of importance and is dependent upon the area of the state where projects are being conducted:

The Missouri Heritage Database adapted for NRCS will be consulted for bat hibernacula locations and known maternity roost sites when considering proposed actions. The Missouri Heritage Database will have periodic updates.

Maternity Roosts

1. **Is the proposed action within a 1-mile radius of a known maternity roost?**

   Yes. The proposed action "may affect" the Indiana bat. If within a 1-mile radius of a known maternity roost site, contact the Area Biologist. The Area Biologist will consult with the State Wildlife Biologist, who will further coordinate with the Service on these projects under the Section 7 process.

   No. Continue to question 2.

2. **Is the proposed action located in a county: A) North of the Missouri River, OR B) Any county South of the Missouri River with evidence of maternity colonies, or in which any part of the county falls within a 5-mile buffer of a known maternity colony?**

   Yes. If the proposed action is outside of a 1-mile radius of known maternity roosts, the primary concern is the timing of tree removal, therefore, the following criteria will apply.

   - The **no felling period** for summer roosting habitat is **April 1 to October 31** and applies to all potential suitable roost trees that are over 9 inches DBH. Potential suitable trees include any live or dead species that have cracks/crevices, broken tops/branches and/or have plates or slabs of loose bark on the trunks or branches. These tree injuries may be the result of wind throws, lightning strikes, or diseases/insects. In addition, trees that naturally have loose or exfoliating bark have also proven to be desirable sites for bat roosts. The Area Biologist must be contacted for any tree removal during the **no felling period**. If all tree removal greater than 9 inches DBH will occur outside the no felling period, then the Area Biologist does not need to be contacted. The MO-CPA-52 form will be used to document actions taken with regard to suitable bat trees.

   - Manage potential summer roosting habitat to provide roost trees for expanding populations (see Management Considerations below).

Management Considerations

NOTE: No felling techniques, such as girdling and hack-and-squirt, of live trees in the area of existing summer roosting habitat trees can provide alternate habitat in the future, but this action does not mitigate for the loss of the existing summer roosting habitat trees. The existing summer roosting habitat trees must remain until the no felling period has passed. The existing summer habitat trees can be girdled during Forest Stand Improvement but not removed. This applies to any action taken by NRCS.

The following items demonstrate the positive efforts of NRCS for Indiana bat recovery:

- Forest Stand Improvement by the use of no felling techniques, such as girdling and hack-and-squirt, of live trees girdling and done with a focus on suitable trees and Indiana bat habitat.

- Programs that encourage riparian corridors and tree planting. Tree/Shrub Establishment (612) Conservation Practice Standard will be considered beneficial to Indiana Bat if the species planted contain at least two species of either Shagbark hickory, Shellbark hickory, Silver maple, Oak, or Cottonwood.

- Bottomland wetland restoration.

- Woody edge feathering or hedgerow renovation with girdling of habitat suitable trees during the protected summer roosting and brood rearing season.

Known Hibernacula

1. Is the proposed action within a 1-mile radius of a known hibernaculum?

Yes. Tree removal proposals within a 1-mile radius of a known hibernaculum requires that you contact your Area Biologist. The Area Biologist will consult with the State Wildlife Biologist, who will further coordinate with the Service on these projects under the Section 7 process.

No. Continue to question 2.

2. Is the proposed action between 1-mile and 5-mile radius of a known hibernaculum?

Yes. This requires a no tree removal zone, September 15 to October 31 and March 15 to April 30 and management (restricted tree removal based on Forest Stand Improvement or Harvest Plan with bat consideration approved by the Area

Biologist) of Indiana bat habitat within a 4-mile radius beyond the 1-mile no tree removal zone (see #1).

Caves

1. **Is the proposed action within a 100-foot radius of a known cave?**

   Yes. Contact Area Biologist for approved management activities. Protect other caves and adjacent forested habitat in a 100-foot radius with a management zone.

   - If adequate buffer zones are lacking in areas of other caves, recommend improving site with native trees, shrubs, and grasses.

Gray Bat

The gray bat *(Myotis grisescens)* is a federally-endangered species found where karst topography occurs in the southeastern and Midwestern United States. It is the largest *Myotis* species in the eastern United States. Like the Indiana bat, the main causes for declines are human disturbance and vandalism of hibernacula as well as harmful alterations of entrances in both maternity and hibernation caves. Range wide, gray bat populations made an excellent recovery from the original listing in 1976. De-listing of the gray bat was considered in the early 2000's, but when large-scale declines in populations of multiple species of bats were documented because of white-nose syndrome (WNS), discussion of de-listing was postponed until impact of the disease on the species is known. To date, no gray bats have been documented to die from WNS, but they are known to contract the disease and carry the fungus. In Missouri, there is an estimated 600,000 to 800,000 hibernating gray bats currently.

Biology of the Gray Bat

Gray bats are highly associated with karst topography. In Missouri they can be found from the very southwestern part of the state, throughout the Ozarks to the northeastern part of the state along the Mississippi River. Gray bats use caves year round with separate maternity caves, bachelor caves, transient caves and hibernation caves (hibernacula). The majority of gray bats hibernate in nine major caves throughout their range; three of those being in Missouri. Those three hibernacula combined contain roughly 600,000 of Missouri's gray bats. There are also numerous small hibernacula in Missouri and throughout their range. Gray bats typically enter hibernation in mid-October to late October and exit hibernation early to mid-March.

In Missouri, gray bats use caves, storm sewers, bridges, quarry caves (limestone mines), and other mines (such as lead mines) for maternity colonies, transient sites, bachelor colonies, and hibernation sites. They seem to be very loyal to their caves, returning to the same maternity and hibernation sites each year, making protection of these sites from vandalism and disturbance vital. The majority of the males form small bachelor colonies

in separate caves, however, in some large caves, maternity colonies and bachelor colonies may be found in separate sections. The gray bat is easily disturbed, many arousing as soon as humans enter the cave. This may cause mothers to abandon their young during the maternity season. Gray bats are known to be active on warm days in winter (mainly to drink), but are not known to forage.

Gray bats are the only bats in Missouri that inhabit caves year round. Preferred hibernation sites are typically deep vertical pit caves, while maternity caves often contain large entrances with large dome rooms. Females form maternity colonies in the warm areas of these dome rooms.

Gray bats can migrate fairly long distances between their summer and wintering sites. Banding studies have noted bats banded at hibernacula in Missouri being found in Oklahoma, Arkansas, Kansas, and other surrounding states. During current banding studies, some gray bats have been recovered 60 to 100 miles from their original banding site. Gray bats forage along streams, rivers, and other bodies of water to consume flying aquatic and terrestrial insects.

Guidance for Habitat Conservation Priorities for the Gray Bat (Myotis grisescens)

1. **Is the proposed action within a 12-mile radius buffer of a known cave?**

   Yes. Maintain the health and longevity of the forested riparian corridor between known caves and the nearest waterway. Establishment and proper management, that benefits the health and function of riparian corridors on perennial streams, will positively affect Gray Bats. Maintain all corridors on perennial streams within a 12-mile buffer of known caves or capture sites. Within riparian areas, retain all trees 16 inch DBH or greater within 100 feet (50 feet on each side) of perennial streams regardless of riparian corridor width unless removal of trees (16 inch DBH or greater) is part of a conservation plan and is approved by an Area Biologist. Activities that negatively affect riparian corridors within a 12-mile buffer of a known cave or capture site requires that you contact your Area Biologist for plan approval. **Continue to question 2.**

   No. See conservation measures below.

2. **Is the proposed action within a 100-foot radius of a known cave?**

   Yes. Contact Area Biologist for approved management activities. Protect other caves and adjacent forested habitat in a 100-foot radius with a management zone.

   - If adequate buffer zones are lacking in areas of other caves, recommend improving site with native trees, shrubs, and grasses.

Conservation Measures

NRCS will conserve the gray bat by following these conservation measures:

- Suggest to landowners that maternity and bachelor caves should be closed to human entry from April 1 through October 31. Winter hibernacula should be closed to human entry from September 1 through April 30.

- Suggest to landowners that all streams and riparian areas be fenced out from livestock access.

Northern Long-Eared Bat

The USFWS listed the northern long-eared bat (*Myotis septentrionalis)* (NLEB) as a federal threatened species, effective May 4, 2015. The NLEB is listed as potentially occurring throughout Missouri in the summer and in caves and abandoned mines during the winter.

Biology of the Northern Long-Eared Bat

The northern long-eared bat is a medium-sized, insectivorous bat occurring across much of North America. The species hibernates in underground sites throughout the winter and uses a variety of wooded habitats during the maternity season.

The northern long-eared bat has been considered relatively common throughout much of its North American range. While other negative influences on the population were considered in the listing proposal (i.e., habitat destruction or range curtailment, overutilization, regulatory inadequacy, collisions with wind power turbines, and other factors affecting existence), the leading reason for the listing is the WNS disease. Hibernacula counts indicate declines of 98-99 percent in northern long-eared bat numbers across eight states in the northeastern United States.

During winter, northern long-eared bats hibernate in caves and mines. They are difficult to census because they roost in tiny cracks, crevices, holes and inside the folds of cave formations. Active season (i.e., non-hibernation period) roosts occur in cracks, crevices or under loose bark or in man-made structures. Maternity colonies are generally smaller (up to 30 individuals) than Indiana bat colonies and often use smaller diameter trees than Indiana bats. Tree species are often used for roosting by the northern long-eared bat in proportion to their occurrence in the surrounding landscape, so it appears that the structure of the tree and immediate surroundings is more important than species. Northern long-eared bat roost trees may occur in the forest understory and are often located on side slopes or ridge tops.

Northern long-eared bats have a strong affinity for a summer location, but are known to move to new trees within that area quite readily. The social structure within the

maternity colony appears to be a fusion-fission relationship where members of the colony will roost together in smaller sub-groups, switching between various roost locations. Individuals typically switch tree roost locations every 2-5 days. The central node tree(s) may host a larger number of bats on many nights, but not necessarily all individuals of the colony. Ranges of distinct maternity colonies have been documented to overlap to the extent of individuals classified to different colonies using the same tree though not on the same day. Individual females appear to form preferred associations with other females. Use of individual trees has been documented in two consecutive years, while others have found a higher degree of fidelity to a roosting area with low fidelity to individual roost trees.

Northern long-eared bats are adept at foraging within and under the forest canopy. This species is known to glean prey from foliage. The northern long-eared bat has been shown to forage mainly in upland forests rather than riparian areas.

Habitat Conservation Priorities for the Northern Long-Eared Bat (Myotis septentrionalis)

The following information is from the **"Key to the Northern Long-Eared Bat 4(d) Rule for Federal Actions that May Affect Northern Long-Eared Bats".** This document can be found at http://www.fws.gov/midwest/endangered/mammals/nleb/KeyFinal4dNLEBFedProjects.html for more information.

Key to the Northern Long-Eared Bat 4(d) Rule for Federal Actions that May Affect Northern Long-Eared Bats

Federal agency actions that involve incidental take not prohibited under the final 4(d) rule may result in effects to individual northern long-eared bats. Per section 7 of the Act, if a federal agency's action may affect a listed species, consultation with the Service is required. This requirement does not change when a 4(d) rule is implemented. However, for this 4(d) rule, the Service proposed a framework to streamline section 7 consultations when federal actions may affect the northern long-eared bat but will not cause prohibited take. Federal agencies have the option to rely upon the finding of the programmatic biological opinion for the final 4(d) rule to fulfill their project-specific section 7 responsibilities by using the framework. This key will help federal agencies determine if their actions may cause prohibited incidental take of northern long-eared bats as defined in the 4(d) rule under the Endangered Species Act and if separate section 7 consultation may be necessary. Also, the framework for streamlining northern long-eared bat section 7 consultation is provided.

1. Have you determined that the proposed action will have "no effect" on the northern long-eared bat? Always answer "NO" to question 1 in Missouri.

☐ **Yes.** The proposed action will have "no effect" on the northern long-eared bat.

When the action agency determines its proposed action will not affect a listed species, there is no need to coordinate further with the Service. If the northern long-eared bat will not be exposed directly or indirectly to the proposed action or any resulting environmental changes, an agency should conclude "no effect" and document the finding and this completes the section 7 process.

☐ **No.** The proposed action "may affect" the northern long-eared bat or individual northern long-eared bats. **Continue to #2.**

2. Will your activity purposefully take (see Definitions below) northern long-eared bats? For example, are you removing bats from a human structure or capturing bats for research?

☐ **Yes.** The activity includes purposefully taking northern long-eared bats.

- Removing bats from human structures is not prohibited and take of northern long-eared bats as required for public health monitoring (disease testing) is not prohibited. Other purposeful take (see Definitions below) of northern long-eared bats is prohibited.

☐ **No.** The activity does not include purposefully taking northern long-eared bats. **Continue to #3.**

3. Is the action area (i.e., the area affected by all direct and indirect project effects) located wholly outside the White-nose Syndrome Zone? All of Missouri is in the White-Nose Syndrome Zone, so the answer is always No to Question 3. For the most current version of the White-nose Syndrome Zone map, please see www.fws.gov/midwest/endangered/mammals/nleb/pdf/WNSZone.pdf

☐ **No.** (As stated above, all of Missouri is IN the White-Nose Syndrome Zone, so the answer is always No to Question 3). **Continue to #4.**

4. Will the action affect caves or mines where northern long-eared bats are known to hibernate (i.e., hibernaculum) or could it alter the entrance or the environment (physical or other alteration) of a hibernaculum?

☐ **Yes.** The action will affect a northern long-eared bat hibernaculum or it could alter the entrance or the environment (physical or other alteration) of a hibernaculum.

Take (see Definitions below) of northern long-eared bats within hibernacula is prohibited, including actions that may change the nature of the hibernaculum's environment or entrance to it, even when the bats are not present. If your activity includes work in a hibernaculum or it could alter its entrance or environment, **please contact the Area Biologist.**

☐ **No.** The action will not take place within a northern long-eared bat hibernaculum or alter its entrance or environment. **Continue to #5.**

5. Will the action involve tree removal (see definition below)?

☐ **No.** The action does not include tree removal.

Incidental take (see Definitions below) from activities that do not involve tree removal and do not take place within hibernacula or would not alter the hibernaculum's entrance or environment (see Question #4), is not prohibited.

☐ **Yes.** The action involves tree removal. **Continue to #6.**

6. Is the action the removal of hazardous trees for protection of human life or property?

☐ **Yes.** The action is removing hazardous trees.

Incidental take (see Definitions below) of northern long-eared bats as a result of hazardous tree removal is not prohibited.

☐ **No.** The action is not removing hazardous trees. **Continue to #7.**

7. Will the action include one or both of the following: 1) removing a northern long-eared bat known occupied maternity roost tree or any trees within 150 feet of a known occupied maternity roost tree from June 1 through July 31; or 2) removing any trees within 0.25 miles of a northern long-eared bat hibernaculum at any time of year?

☐ **No.** Incidental take (see Definitions below) from tree removal activities is not prohibited unless it results from removing a known occupied maternity roost tree or from tree removal activities within 150 feet of a known occupied maternity roost tree from June 1 through July 31 or results from tree removal activities within 0.25 mile of a hibernaculum at any time.

☐ **Yes.** Incidental take (see Definitions below) of northern long-eared bats is prohibited if it occurs as a result of removing a known occupied maternity roost tree or removing trees within 150 feet of a known occupied maternity roost tree during the pup season from June 1 through July 31 or as a result of removing trees from within 0.25 mile of a hibernaculum at any time of year. This does not mean that you cannot conduct your action; however, standard section 7 consultation procedures apply. **Contact the Area Biologist if you answer YES to question 7. The Area Biologist will consult with the State Wildlife Biologist who will further coordinate with the Service on these projects under the Section 7 process.**

Definitions

Incidental take is defined by the Endangered Species Act as take that is "incidental to, and not the purpose of, the carrying out of an otherwise lawful activity." For example, harvesting trees can kill bats that are roosting in the trees, but the purpose of the activity is not to kill bats.

Known hibernacula are defined as locations where one or more northern long-eared bats have been detected during hibernation or at the entrance during fall swarming or spring emergence. Given the challenges of surveying for northern long-eared bats in the winter, any hibernacula with northern long-eared bats observed at least once, will continue to be considered “known hibernacula” as long as the hibernacula remains suitable for northern long-eared bat.

Known occupied maternity roost trees is defined in the 4(d) rule as trees that have had female northern long-eared bats or juvenile bats tracked to them or the presence of female or juvenile bats is known as a result of other methods. Once documented, northern-long eared bats are known to continue to use the same roosting areas. Therefore, a tree will be considered to be a “known occupied maternity roost”

as long as the tree and surrounding habitat remain suitable for northern long-eared bat. The incidental take prohibition for known occupied maternity roosts trees applies only during the during the pup season (June 1 through July 31).

Purposeful take is when the reason for the activity or action is to conduct some form of take. For instance, conducting a research project that includes collecting and putting bands on bats is a form of purposeful take. Intentionally killing or harming bats is also purposeful take and is prohibited.

Take is defined by the Endangered Species Act as 'to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect" any endangered species. Purposeful take is when the reason for the activity or action is to conduct some form of take. For instance, conducting a research project that includes collecting and putting bands on bats is a form of purpose*f*ul take.

Tree removal is defined in the 4(d) rule as cutting down, harvesting, destroying, trimming, or manipulating in any other way the trees, saplings, snags, or any other form of woody vegetation likely to be used by northern long-eared bats.