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

NOTE:

The Missouri Heritage Database, adapted for NRCS Field Office Technical Guide use, 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 Natural Resources Conservation Service (NRCS) provides technical or financial assistance to landowners, habitat for this species must be considered and evaluated by NRCS staff that has completed the joint agency workshop, "U. S. Fish and Wildlife Service/NRCS Coordination for the Conservation of the Indiana Bat in Missouri."

Biology of the Indiana Bat

From late fall through winter, Indiana bats in Missouri hibernate in caves in the Ozark Region. During the spring and summer, the bats utilize living, injured (e.g. split trunks and broken limbs from lightening strikes or wind), dead or dying trees for roosting throughout the state. Indiana bat roost trees tend to be greater than 9 inches (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 such as farm ponds, water and sediment control basins, grass waterways, or flood control structures, etc., where potential suitable summer roosting habitat is located and suitable trees will be cleared as part of the project construction.

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:

1. Protect all known hibernacula.

2. Manage a 5-mile radius around each hibernaculum. This requires a no tree removal zone within a 1-mile radius and managed (restricted tree removal based on TSI/Harvest plan with bat consideration) Indiana bat habitat within a 4-mile radius beyond the 1-mile no tree removal zone. **For any tree removal proposals within a one-mile radius of a known hibernaculum, please contact the Area Biologist and the State Wildlife Biologist will further coordinate with the Service on these projects under the Section 7 process.**

3. Protect known maternity roosts and manage adjacent area (1-mile) for alternate roost trees and roost tree recruitment. **If within a 1-mile radius of a known maternity roost site, please contact the Area Biologist and the State Wildlife Biologist who will further coordinate with the Service on these projects under the Section 7 process.**

4. Manage potential summer roosting habitat to provide roost trees for expanding populations. For projects outside of a 1-mile radius of known maternity roosts, the primary concern is the timing of tree removal.

   The **no cut period** for summer roosting habitat is **April 1 to October 31** for **all counties north of the Missouri River and all counties south of the Missouri River with known maternity roost sites that have been documented in the current MDC Heritage Database used by NRCS**. The policy applies to the entire county in both cases. Potential roost trees can be cut during November 1to March 31. Trees not meeting suitable summer roost habitat criteria can be cut/cleared at any time. The MO-CPA-52 form will be used to document actions taken with regard to suitable bat trees.

   The **no cut period** applies to all potential suitable roost trees that are over 9 inches DBH (Diameter at Breast Height). 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.

5. Protect other caves and adjacent forested habitat in a 100-foot radius with a no tree removal zone. If adequate buffer zones are lacking in areas of other caves, recommend improving site with native trees, shrubs and grasses.

The Missouri Heritage Database adapted for NRCS - eFOTG use will be consulted for bat hibernacula location; known maternity roost sites; and south of Missouri River summer roosting habitat counties. The Heritage Database will have periodic updates.

NOTE: Girdling 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 the loss of the existing summer roosting habitat trees. The existing summer roosting habitat trees must remain until the no cut period has passed. The existing summer habitat trees can be girdled during TSI but not removed. This applies to any action taken by NRCS.

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

- Timber Stand Improvement by the use of 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) 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.

Northern Long-Eared Bat

The U.S. Fish and Wildlife Service (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 (Myotis septentrionalis) 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 and modification or range curtailment, overutilization, regulatory inadequacy, collisions with wind power turbines, and other factors affecting existence) and were found to have varying levels of local

impacts, the leading reason for the proposed listing is the disease, white-nose syndrome (WNS). 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 than Indiana bat colonies (up to 30 individuals) 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. Figures 2-3 provide examples of northern long-eared bat roost trees.

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)

NRCS has initiated National-level informal consultation on the NLEB with USFWS to comply with Endangered Species Act, Section 7 responsibilities for federal agencies. The informal consultation will only cover activities provided under and consistent with the interim 4(d) rule published as part of the NLEB listing.

- NRCS can implement NRCS-funded activities that are covered in the NLEB interim 4(d) rule but must still go through project-level consultation with USFWS for those activities that may affect the NLEB, as determined through the Environmental Evaluation CPA-52 preparation. Inclusion of activities in a 4(d) rule does not indicate that those activities will not cause take, but that the take resulting from those activities is exempted. Under section 7 of the ESA, federal agencies must consult with the USFWS to ensure that any action they authorize, fund, permit or carry out does not jeopardize the existence of a listed species.

This requirement does not change when a 4(d) rule is implemented. Federal agencies are still required to consult with the USFWS on actions that may affect the NLEB. However, with a 4(d) rule in place, any take caused by Federal activities that are covered in the 4(d) rule is exempted and will not require an incidental take statement in a biological opinion.

Provisions and implementation of the NLEB Interim 4(d) rule:

- The geographic scope of the interim 4(d) Rule: **All of Missouri is included in the NLEB range and the White-nose Syndrome Buffer Zone** (http://www.fws.gov/midwest/endangered/mammals/nleb/pdf/WNSBufferZone.pdf).

- The types of activities (statewide) covered by the interim 4(d) Rule:
  - Forest management
  - Maintenance of rights-of-way and transmission corridors
  - Native prairie management
  - Minimal tree removal
  - Hazardous tree removal

- NRCS will conserve the northern long-eared bat by following these conservation measures (statewide) that must be in place during implementation of covered activities to receive take exemption: **(Contact the Area Biologist when a NLEB record is found for the project)**
  - Do not conduct any activities within 1/4 mile of known, occupied hibernacula.
  - Do not cut or destroy a known, occupied roost tree from June 1 to July 31 (the pup season)
  - Do not clearcut (and similar harvest methods that cut most or essentially all trees from an area, e.g., seed tree, shelterwood, and coppice) within a 1/4 mile of known, occupied roost trees from June 1 to July 31.

- Projects that may affect but are not likely to adversely affect NLEB should receive concurrence from USFWS. No take is expected.

- Projects that may affect and are likely to adversely affect NLEB that include activities covered in the interim 4(d) rule must incorporate the conservation measures to receive take exemption through formal consultation. Take is expected but is exempted.

- Projects that may affect and are likely to adversely affect NLEB that include activities not covered in the interim 4(d) rule must receive an incidental take statement through formal consultation. Take is expected but is not exempted.

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. Rangewide, gray bat populations made an excellent recovery from the original listing in 1976. Delisting of the gray bat was considered in the early 2000s, but when large-scale declines in populations of multiple species of bats were documented because of 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- 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.

Habitat Conservation Priorities for the Gray Bat (Myotis grisescens}

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

- Maternity and bachelor caves should be closed to human entry from April 1st through October 30th. Winter hibernacula should be closed to human entry from September 1st through April 30th.

- Retain corridors of mature trees between cave and waterways.

- Protect riparian habitat in a 12 mile radius of caves by retaining large mature trees, 16" dbh or greater. Protect riparian buffers with a no cut zone of 100 ft. of all streams.

- Protect cave entrances with a no cut zone of 100ft. If adequate buffer zones are lacking in areas of other caves, recommend improving site with native trees and shrubs.

- If livestock have access to streams and riparian areas, recommend fencing out those areas to protect buffers.