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NORTHERN LONG-EARED BAT
(Myotis septentrionalis)

Photo courtesy of Copperhead Consulting

BE AWARE!

There are potential seasonal tree removal restrictions around winter hibernacula (e.g., caves) and summer (e.g., maternity) roost trees.

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

Potential impacts from:

- **Noise and vibration**
- **Loss of roost trees**
- **Death/injury during tree removal**
- **Disturbance during hibernation**

BACKGROUND

The northern long-eared bat (NLEB) was listed as federally threatened under the 4(d) rule [1] of the Endangered Species Act as of May 2015 due to population declines caused by White-nose Syndrome (WNS), a disease causing bat mortality during hibernation [2]. The NLEB is protected and regulated by the United States Fish and Wildlife Service (USFWS) and state natural resource agencies [3].

KEY FACTS

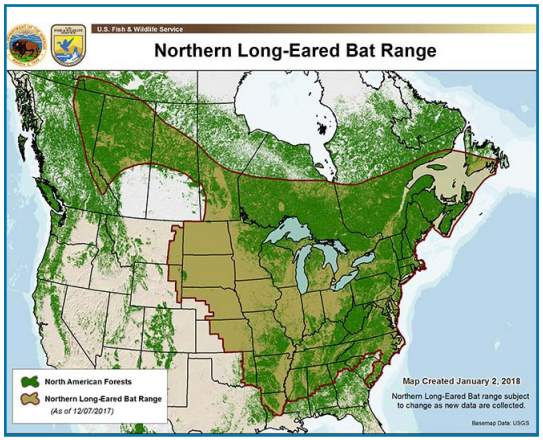
- Long-lived (up to 18 yrs), nocturnal, small brown bat, weighs about as much as a nickel (< 8 grams/0.3 ounces), and eats insects off vegetation.
- Range in the U.S.: Maine down to South Carolina, across to Louisiana and Oklahoma, and up to eastern Montana. Also widespread across Canada [4].
- Males and females hibernate singly in winter → emerge in spring and move to summer habitat → females live and have young in small colonies, males live alone → move from summer to winter habitat in fall → swarm and mate before hibernating.
- Roosts and feeds primarily in forests, but will also feed over croplands.

SEASONAL HABITAT

- Winter (Hibernacula): caves, mines, rock crevices, tree cavities*
- Spring (Emergence) & Fall (Swarming): Trees within 5 miles of hibernacula
- Summer: trees, man-made structures (e.g., barns, sheds, utility poles, porch umbrellas)

** For further information on this topic, see Northern Long-Eared Bat Supplemental Information.*

https://www.fws.gov/midwest/endangered/mammals/nleb/nlebRangeMap.html



← Active Season →											
January	February	March	April	May	June	July	August	September	October	November	December
Hibernation			Spring Emergence	Young Rearing				Fall Swarming		Hibernation	

GENERAL HABITAT USE FOR ROOSTING AND FORAGING

- Forested areas, both contiguous and isolated
- Woody wetlands
- Riparian areas (i.e., forested streams or waterways)

MATERNITY ROOSTS

- Roost during day in trees
  - Dominant tree species found in a given area*
  - Cracks, crevices, cavities, under bark
  - Large or small trees (i.e., ≥ 3 inch diameter at breast height [dbh])
  - Live, damaged, or dead trees
  - Often roosts in 56 – 84% canopy cover, but also in isolated groups of trees
- Roost trees are often clustered close to each other
- Switch roosts frequently; use approx. 10 roosts in summer (max 21 days of tracking).
- Maternity colony size < 60 bats (adults and juveniles), but usually < 5 bats.
- Small foraging range – usually within 2 miles of roost in summer but can be up to 3 miles. Small home range – max 28 acres.
- Females give birth to one pup as early as May in the southern limits of the range, and into July in the northern regions. Pups begin to fly 18–21 days after birth.

** For further information on this topic, see Northern Long-Eared Bat Supplemental Information.*

INFORMATION FOR UTILITY OPERATIONS, MAINTENANCE, AND PROJECT DEVELOPMENT PROJECTS

- No action required if:
  - Your project is located outside WNS areas (check WNS mapping for state and county) [4].
  - Removing trees farther than 0.25 miles of a NLEB hibernaculum.
  - Removing NLEBs from human structures.
  - Removing hazardous trees to protect human life or property (USFWS recommends removing these during winter).

DETERMINE IF NLEB ACTION REQUIRED BEFORE A PROJECT STARTS

- Identify if the proposed project is located within WNS areas (as above, check WNS mapping for state and county [4]) and near known NLEB maternity areas (i.e., summer habitat) and/or hibernacula (i.e., winter habitat).
- Will hibernacula be altered (including entrances or physical environment), or
- Will any known maternity roosts or any trees within 150 ft of known maternity roost trees be removed from 1 June – 31 July, or
- Will any trees within 0.25 miles of a hibernaculum be removed?

IF PROJECT IS WITHIN WNS AREA AND YOU ANSWERED YES TO ONE OF THE BULLETS:

- Contact company environmental representative to discuss next steps before conducting proposed activities (e.g., environmental representative may need to coordinate with federal or state agency)

RESOURCES

1. Information about the 4(d) rule and above map can be found here, updated annually – https://www.fws.gov/midwest/endangered/mammals/nleb/4drule.html
2. Information about White-nose Syndrome (WNS) – https://www.whitenosesyndrome.org/
3. USFWS page about NLEB – https://www.fws.gov/Midwest/endangered/mammals/nleb/index.html
4. Map of NLEB species range and WNS buffer – https://www.fws.gov/midwest/endangered/mammals/nleb/pdf/WNSZone.pdf
5. Studies on conservation efforts and their effectiveness – https://www.conservationevidence.com/

CONTACT INFORMATION

Insert company contact information here.

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NORTHERN LONG-EARED BAT (NLEB) SUPPLEMENTAL INFORMATION

ADDITIONAL INFORMATION	
WINTER HIBERNACULA	Type of winter hibernacula depends on where in the species range the NLEB is found. In coastal plain of North Carolina, NLEBs remain in trees throughout the winter (data collected by contractors for NCDOT and USFWS, 2016 – 2018). In Kentucky, they are often found in caves (T. Hemberger, KDFWR) but have also been found in root wads of overturned trees (M. Gumbert, pers. comm.). In Iowa (Copperhead Consulting) and Nebraska (White et al. 2017), NLEBs overwinter in the rock outcroppings near rivers.
TREE SPECIES	Over 35 species of tree have been used as roosts by NLEB (USFWS 2014). Tree roost preferences vary regionally. The most commonly used tree species correspond with the dominant tree species in a particular forest. In North Carolina, the majority of NLEB roosts occur in various tupelo species trees (Copperhead Consulting, unpub data); in Iowa, NLEBs primarily use basswood and bur oak (Copperhead Consulting, unpub data); in northern Kentucky, bats are predominantly found in sassafras but used 21 species overall (Silvis et al. 2012); and in Mammoth Cave National Park in central KY, 24 tree species were used but the majority were red maple (Thalken and Lacki 2018). In West Virginia, NLEBs most often roost in red maple trees (Copperhead Consulting, unpub data). Eight tree species were used in Missouri with the majority in the red oak group (Timpone et al. 2010).
TREE CHARACTERISTICS	Roost height = 22.8±3.3 ft (range: 12.1 – 35.4 ft; Lacki et al 2009), 31.5±9.5 ft (Timpone et al. 2010), 30.2±4.6 ft (Carter and Feldhamer 2005), and 34.4±3.0 ft (Foster and Kurta 1999). Roosts typically found on upper slopes and midslopes rather than lower slopes; NLEBs used cavities more often than bark (Carter and Feldhamer 2005).
MATERNITY ROOSTS	Maternity trees tend to be large = 11.5±1.4 in diameter at breast height [dbh] (Lacki and Schwierjohann 2001), 14.7±0.1 in (Carter and Feldhamer 2005), 16.9±0.9 in (Timpone et al. 2010). NLEB often use smaller trees than other bat species because they don't form large maternity colonies. NLEBs will return to the same roosts between years (Foster and Kurta 1999).
DISTANCE RESTRICTIONS AROUND MATERNITY ROOSTS	Bats engage in a fission-fusion society where several times throughout the summer, the colony splits up into multiple roosts but comes back together to roost in the same tree. The result is NLEBs switch roosts often (Barclay and Kurta 2007). Changing weather conditions throughout the summer may require different roost types (Patriquin et al. 2016). Any suitable tree within 150 ft of a known roost can be used as a roost by this species, so removing any tree could potentially result in roost removal.
DISTANCE RESTRICTIONS AROUND HIBERNACULA	NLEBs engage in swarming behavior around hibernacula in the fall where they mate and build fat reserves in preparation for hibernation. Bats visit multiple hibernacula and roost in trees around hibernacula during this time (Lowe 2012). Removing trees around hibernacula reduces this swarming habitat and could impact the microclimate of the hibernaculum. In addition, forested areas around caves are also used during staging when bats emerge from hibernation and utilize the landscape outside the hibernaculum before migrating. Male NLEBs can use this area year-round.
TREE REMOVAL TIMES	These dates will vary depending on where in the NLEB range the project is located. Consult the local USFWS field office for specifics. For example, New York allows cutting of trees outside a ¼ mile buffer of a NLEB hibernaculum between November 1 and March 31 without any restrictions. The state, however, does recommend some voluntary measures (e.g., leave uncut known/documented NLEB roost trees).

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KEY COMPARISON OF INDIANA BAT AND NORTHERN LONG-EARED BAT

Photo courtesy of Copperhead Consulting

	INDIANA BAT	NORTHERN LONG-EARED BAT
RANGE	Found over most of the eastern half of the United States. States within the current range of the Indiana bat include Alabama, Arkansas, Connecticut, Illinois, Iowa, Kentucky, Maryland, Michigan, Missouri, New Jersey, New York, North Carolina, Ohio, Oklahoma, Pennsylvania, Tennessee, Vermont, Virginia, West Virginia.	Range in the US: Maine down to South Carolina, across to Louisiana and Oklahoma, and up to eastern Montana.
WINTER HABITAT	During winter, females and males cluster and hibernate in only a few caves. Almost half of all Indiana bats hibernate in caves in southern Indiana.	Females and males hibernate singly in caves, mines, rock crevices, and tree cavities throughout the range of the species.
SUMMER HABITAT	Contiguous forest >10 acres, tree rows connecting larger forested habitat, water sources within 0.5 mi	Cluttered forests, amount of contiguous habitat needed unknown
ROOST TREE CHARACTERISTICS	Use large trees (i.e., ≥ 5 inch diameter at breast height (dbh)). Significant solar exposure. Will use isolated tree if within 1000 ft of other forested habitat. Use 10 – 20 trees per year. Tend to return to the same site, area, or roosts each year.	Use large or small trees (i.e., ≥ 3 inch dbh. Use 4 – 16 roosts per year. Will use the same roosts between years, but less often than Indiana bats
COLONY SIZE	30 – 300 individuals in a single roost	Smaller than Indiana bat colonies: 10 – 60 individuals in a single roost
FORAGING DISTANCES FROM ROOSTS	2.5 miles	1.5 miles

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