



## INFO Forest Management Guidelines for Avoiding Incidental Take of Indiana Bats and Northern Long-eared Bats within the State of Indiana

These guidelines were developed by the Indiana Field Office (INFO) of the U.S. Fish and Wildlife Service (Service) to conserve the federally endangered Indiana bat (*Myotis sodalis*) and the federally threatened northern long-eared bat (NLEB; *Myotis septentrionalis*) and their habitats within the State of Indiana. Adherence to these guidelines will avoid incidental take<sup>1,2</sup> of federally listed bats and result in forest habitat that is suitable for the species' use, but may not represent optimal habitat. Maintaining or creating optimal Indiana bat and NLEB maternal habitat would likely require additional management practices than provided here. This is a working document and periodically will be revised as new data warrant. Please check with the INFO to ensure that you have the most recent version of this document.

When these guidelines are followed, the INFO typically will provide concurrence letters to land managers needing Section 7 clearance under the Endangered Species Act of 1973 (ESA)(i.e., an informal consultation will suffice) and an incidental take permit/Habitat Conservation Plan (HCP) will not be required on state-owned or privately owned lands because the risk of incidentally taking a federally listed bat will be discountable or insignificant. However, if any aspects of these management guidelines cannot be followed or conflict with other land management goals or directives, then forest managers are strongly encouraged to contact the INFO to discuss alternative processes available to federal and non-federal land managers under the ESA. [NOTE: Take of federally listed species is prohibited by Section 9 of the ESA regardless of whether the taking occurs on federal, state, or privately owned lands]. To obtain an official list of species protected under the ESA that may occur in your specific area of concern, please visit the Service's IPaC website at <https://ecos.fws.gov/ipac/>.

### FOREST MANAGEMENT GUIDELINES

1. At least 60% canopy cover (on a stand-by-stand basis, depending on size of stands) shall be maintained after any timber harvest activities.
2. Shagbark hickory (*Carya ovata*) or shellbark hickory (*C. laciniosa*) trees shall not be harvested or manipulated during timber stand improvement (TSI) activities, unless the combined density of these species exceeds 16 trees/acre. If present, at least 16 live shagbark and shellbark hickory (combined) >11" diameter-at-breast height (dbh) must be maintained per acre.
3. Standing snags shall not be felled/removed, except where they pose a serious human safety hazard (a tree with <10% live canopy should be considered a snag). Snags that have no remaining bark and no visible cracks, splits, or hollows may be felled as well as any snags leaning more than 45° from vertical.

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<sup>1</sup> **Incidental take** – Take that results from, but is not the purpose of, carrying out an otherwise lawful activity.

**“Take”** - To harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct; may include significant habitat modification or degradation if it kills or injures wildlife by significantly impairing essential behavioral patterns including breeding, feeding, or sheltering.

**“Harass”** - To intentionally or negligently, through act or omission, create the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavior patterns such as breeding, feeding, and sheltering (defined by FWS regulation; NOAA Fisheries has not defined harass by regulation).

**“Harm”** - To perform an act that kills or injures wildlife; may include significant habitat modification or degradation when it kills or injures wildlife by significantly impairing essential behavioral patterns including breeding, feeding, or sheltering.

<sup>2</sup> The Service issued a final 4(d) rule in 2016 that exempted incidental take of NLEBs resulting from various activities including forest management practices (provided they occur >0.25 miles from known hibernacula and roost trees). For more details regarding this rule, please visit the Service's NLEB 4(d) rule web site at <https://www.fws.gov/Midwest/endangered/mammals/nleb/4drule.html>



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4. The following species of trees have been identified as having relatively high value as potential Indiana bat and NLEB maternity roost trees:

shagbark hickory ( <i>Carya ovata</i> )	eastern cottonwood ( <i>Populus deltoides</i> )
shellbark hickory ( <i>C. laciniosa</i> )	northern red oak ( <i>Quercus rubra</i> )
mockernut hickory ( <i>C. tomentosa</i> )	post oak ( <i>Q. stellata</i> )
bitternut hickory ( <i>C. cordiformis</i> )	white oak ( <i>Q. alba</i> )
sugar maple ( <i>A. saccharum</i> )	American elm ( <i>Ulmus americana</i> )
silver maple ( <i>Acer saccharinum</i> )	slippery elm ( <i>U. rubra</i> )
red maple ( <i>A. rubrum</i> )	black locust ( <i>Robinia pseudoacacia</i> )
boxelder ( <i>A. negundo</i> )	yellow poplar ( <i>Liriodendron tulipifera</i> )
white ash ( <i>Fraxinus americana</i> )	black walnut ( <i>Juglans nigra</i> )
green ash ( <i>F. pennsylvanica</i> )	

(Tree species based on literature and unpublished roosting data).

On average, at least 3 live trees per acre >20" dbh (of the high-value species listed above) shall always be maintained in the stand (a tree with <10% live canopy should be considered a snag). These "leave trees" must be the largest trees of the listed species remaining in the stand. An additional 6 live trees per acre >11" dbh (of the species listed above) must also be maintained. The "per acre" requirement can be expressed as the average per acre on a stand-wide basis, depending on the definition of a stand.

If there are no trees >20" dbh to leave, then 16 live trees per acre must be left, and these must include the largest specimens of the listed species remaining in the stand.

5. No timber harvest or TSI activities shall occur within 100 feet of a perennial stream or within 50 feet of an intermittent stream.
6. No felling of trees >5" dbh while Indiana bats may be present from 1 April through 30 September (i.e., trees may be felled from 1 October through 31 March).

### PRESCRIBED FIRE GUIDELINES

1. In burn areas containing potential bat roost trees/snags >5" dbh, prescribed burns shall not be conducted from 15 April through 15 September in southern and central Indiana or from 25 April through 15 September in northern Indiana<sup>3</sup>.
2. Temporary fire breaks shall be created/maintained around any known Indiana bat primary maternal roost trees that occur within a proposed burn area prior to the burn.

**NOTE:** If any of these guidelines can't be followed or additional clarification is needed, please contact the INFO.

**NOTE:** If proposed forest/timber management actions or prescribed burns will occur within a 10-mile radius of a known Indiana bat hibernaculum, then please contact the INFO for additional guidance (i.e., additional conservation measures may be required). Indiana bat hibernacula in Indiana are known to occur in Crawford, Greene, Harrison, Lawrence, Martin, Monroe, Orange, and Washington counties. You should also contact INFO if you will be conducting active forest management activities within 0.25 miles of a known occupied NLEB hibernaculum, which can be determined via IPaC (<https://ecos.fws.gov/ipac/>) (If NLEB is included on your project area's species list, you're within a known area).

<sup>3</sup> For the purposes of these guidelines "northern Indiana" includes Adams, Allen, Benton, Blackford, Carrol, Cass, Clinton, DeKalb, Elkhart, Fulton, Grant, Howard, Huntington, Jay, Jasper, Kosciusko, Lake, La Grange, La Porte, Marshall, Miami, Newton, Noble, Porter, Pulaski, Starke, St. Joseph, Steuben, Tippecanoe, Tipton, Wabash, Wells, Warren, White, and Whitley counties.

# Useful Links for Federally Listed Bats and Forest Management in Indiana

USFWS List of Federally-Listed Species in INDIANA with County Distribution

<https://www.fws.gov/midwest/Endangered/lists/indiana-spp.html>

USFWS Information for Planning and Consultation (IPaC; access an official federal TE species list for your specific project area)

<https://ecos.fws.gov/ipac/>

USFWS Primary Indiana Bat (*Myotis sodalis*) web site

<https://www.fws.gov/midwest/Endangered/mammals/inba/index.html>

USFWS Primary Northern Long-eared Bat (*Myotis septentrionalis*) web site

<https://www.fws.gov/Midwest/Endangered/mammals/nleb/index.html>

USFWS Range-wide Indiana Bat Survey Guidelines

<https://www.fws.gov/midwest/Endangered/mammals/inba/inbasummersurveyguidance.html>

White-Nose Syndrome (WNS; the devastating fungal disease affecting N. American bat species)

<https://www.whitenosesyndrome.org/>

USFWS Bat Literature Database - Scientific literature pertaining to bats, forest/fire management and other topics

<http://www.refworks.com/refshare?site=040621159761600000/RWWEB103971662/USFWS%20Bat%20Lit.%20Database%20-%20Public%20Version>

ESA Section 7 Consultation Process

<https://www.fws.gov/midwest/Endangered/section7/index.html>

ESA Section 10 HCP Process

<https://www.fws.gov/Midwest/Endangered/permits/hcp/index.html>

Beneficial Forest Management Practices for WNS-Affected Bats: Voluntary Guidance for Land Managers and Woodland Owners in the Eastern United States (May 2018)

<https://www.whitenosesyndrome.org/mmedia-education/beneficial-forest-management-practices-for-wns-affected-bats-voluntary-guidance-for-land-managers-and-woodland-owners-in-the-eastern-united-states>

Going to Bat for Bats (SAF, The Forestry Source, Oct. 2018)

<https://s3.amazonaws.com/org.whitenosesyndrome/assets/prod/97f360f0-e75b-11e8-a344-bd763fb60c04-Forestry%20Source%20October%202018%20Email%20Low-Res.pdf>

Conserving Federally Endangered Indiana Bats on Private Woodlands

[Indiana Woodland Steward, Spring Issue 2013, Volume 21(1)]

<http://www.inwoodlands.org/conserving-federally-endangere/>

Northern Long-Eared Bat Listed under Endangered Species Act: What Woodland Owners in Indiana Need to Know

[Indiana Woodland Steward, Spring Issue 2015, Volume 24(1)]

<http://www.inwoodlands.org/northern-long-eared-bat-listed/>

A Few Beneficial Forest Management Practices (BFMPs) for Bats

[Indiana Woodland Steward, Winter Issue 2018, Volume 27(3)]

<http://www.inwoodlands.org/-beneficial-forest-manage-bats/>

Economic importance of bats in Agriculture (Science, April 2011)

<https://science.sciencemag.org/content/332/6025/41>