

PROTECTING MICHIGAN'S BATS



Photos: USFWS

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Tri-colored Bat



Hoary Bat



Evening Bat



Big Brown Bat



Little Brown Bat



Indiana Bat



Red Bat



Silver-haired Bat



include beetles, bees, leafhoppers and an occasional moth.

Indiana Bat

(Myotis sodalis):
ENDANGERED in Michigan. The Indiana bat is about 3 to 4 inches in length and weighs 5 - 11 grams. It is a small, dark, mostly colored species with blackish ears and membrane. The Indiana bat can often be confused with the little brown bat because they look very similar. This bat hibernates in mine tunnels and natural caverns, most of which are found south of Michigan. Most Indiana bats migrate into Michigan beginning in late April. The Indiana bat eats flies, moths and caddisflies.

Silver-haired Bat

(Lasiurus noctivagans):
The silver haired bat is 3.5 to 4.5 inches in length and weighs 8 to 12 grams. This bat appears to be dark brown to black with some white fringing on its fur. This species could be confused with the hoary bat, but because it appears so much darker and is smaller it tends to be easy to identify. It flies very slowly and sometimes is confused for a huge moth. The silver haired bat eats flies, beetles, moths and any other patch of insects it may come across.

Red Bat

(Lasiurus borealis):
The red bat is 2.7 to 4.0 inches in length and weighs 7 to 13 grams. This medium sized bat is an unmistakable brick red to yellowish red color. Red bats are migratory and usually hibernate just south of Michigan. Moths are the most common prey for red bats along with beetles, bees, leafhoppers or flying ants.

Michigan's Brilliant Bats



Michigan's bats need your help. You can make a direct contribution to the Nongame Wildlife Fund at www.michigan.gov/dnr.



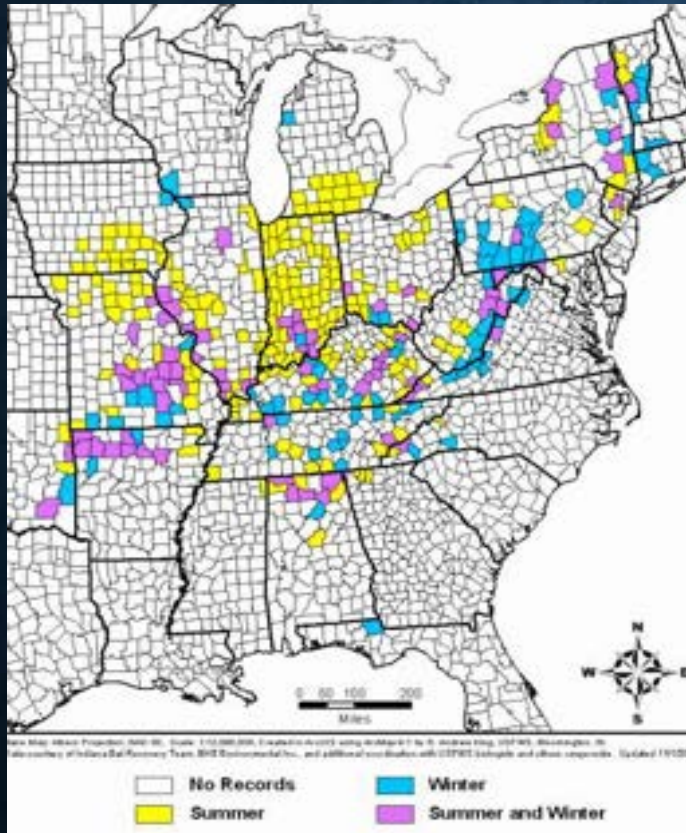
INDIANA BAT (*MYOTIS SODALIS*)

- State Endangered
- Federally Endangered (1967)
- Major Threats:
 - Loss of critical hibernacula
 - Human disturbance
 - Summer habitat loss/degradation
 - Pesticides/contaminants
 - Climate change
 - White-Nose Syndrome (2006)



Photo: USFWS/Andrew King

IBAT RANGE & DISTRIBUTION



USFWS. 2007. Indiana Bat Draft Recovery Plan: First Revision. Fort Snelling, Minnesota.



USFWS Data

NORTHERN LONG-EARED BAT (NLEB; *MYOTIS SEPTENTRIONALIS*)

- Federally listed as Threatened April 2, 2015
- Final 4(d) rule published January 14, 2016
- Reclassified as Endangered November 29, 2022 (effective March 31, 2023)
- State Listed as Threatened (2023)

- Major Threat: WNS
 - Historically common and widespread in MI, but now extremely rare
 - MI hibernating population has declined by at least 98.5%



Photo: USFWS/Ann Froschauer

NLEB RANGE & DISTRIBUTION



USFWS



Physical Records
(Historic-Current)

USFWS Data

TRICOLORED BAT (TCB; *PERIMYOTIS SUBFLAVUS*)

- Proposed for listing as Endangered
September 13, 2022
- State Threatened (2023)
- Final listing decision expected Fall 2023
- Historically rare in MI, exceedingly rare
post-WNS
 - ↓ 93.9% in winter surveys
 - No documented maternity MI colonies
 - If species summers in MI, it is likely near
known hibernacula

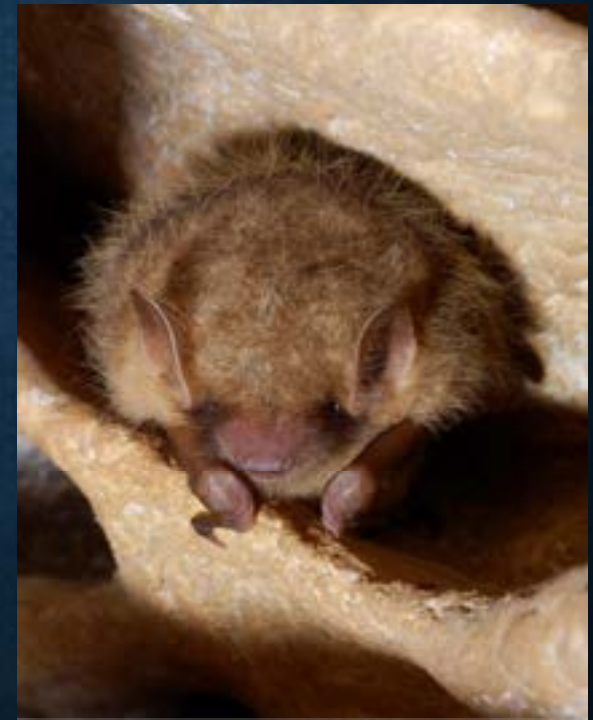


Photo: USFWS/Pete Pattavina

TCB RANGE & DISTRIBUTION



USFWS. 2021. Species Status Assessment Report for the Tricolored Bat (*Perimyotis subflavus*), Version 1.1. December 2021. Hadley, MA



USFWS Data

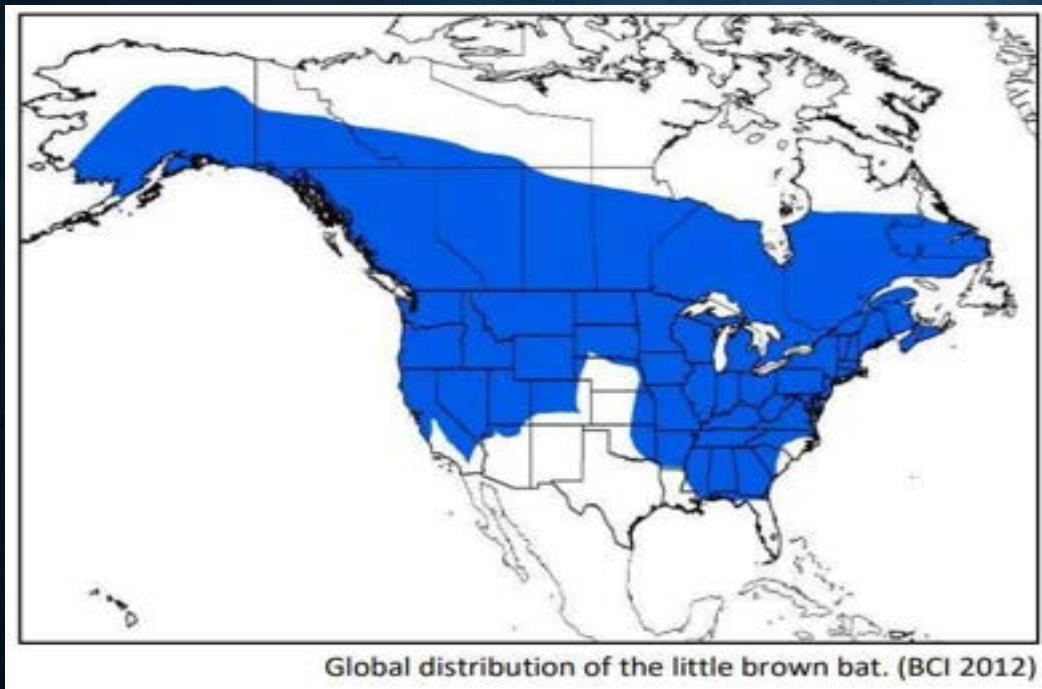
LITTLE BROWN BAT (LBB; *MYOTIS LUCIFUGUS*)

- State Threatened (2023)
- FWS is conducting a discretionary status review
- Listing decision expected FY 2024
- Historically abundant across MI, especially in the northern LP and UP but declining due to WNS
 - ↓ 89.9% in winter surveys
 - Winter population largely overlaps with NLEB but use some additional hibs (mostly in western UP)
 - Distribution and habitat use similar to NLEB
 - Extensive use of anthropogenic summer roosts



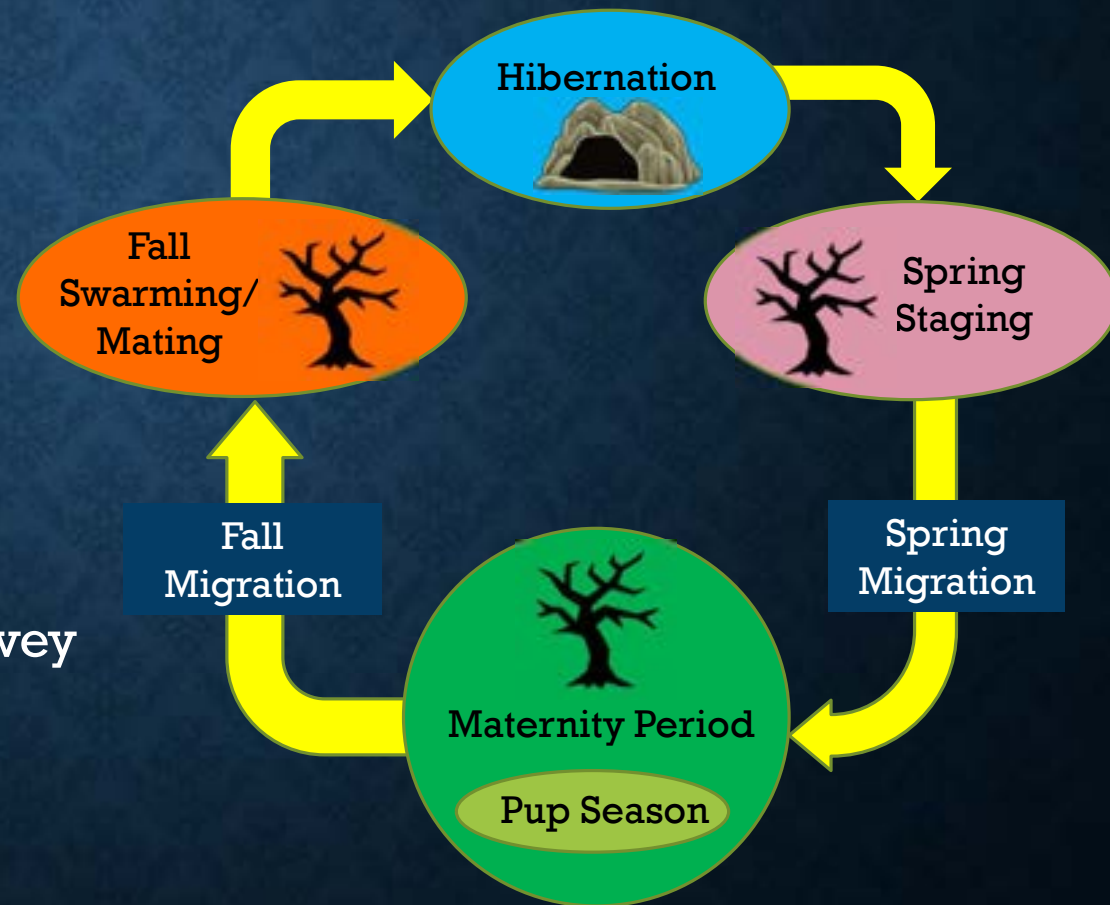
Photo: USFWS/Ann Froschauer

LBB RANGE & DISTRIBUTION



ANNUAL LIFECYCLE

- Spring/Fall Migration:
 - IBAT: up to 360 mi
 - NLEB: up to 60 mi
 - TCB: up to 151 mi
 - LBB: up to 310 mi
- Swarming and mating:
~August - November
- Hibernation: ~October - April
- Summer roosting/maternity/survey period: May 15 - August 15
 - Nonvolant/Pup Season:
June 1 - July 31



SUMMER/FALL/SPRING

Preferred Roosting/Foraging Habitats:

- Mature forests & interspersed/adjacent non-forested areas (e.g., agricultural fields, meadows, water bodies)
 - Hardwood/mixedwood composition
 - Greater overstory than understory clutter (e.g., high canopy cover with flight space below) and/or flight corridors
 - Structural complexity, canopy caps, and/or edges (e.g., agricultural edges, ROWs)
 - Available open water (e.g., river/stream, pond)
 - High snag density
 - Conditions leading to continual snag creation (e.g., succession, flooding, natural disturbance, management)

Low-quality forest types: young, monoculture pine plantations, young aspen stands, highly cluttered, exotic-dominated forests



Photos: USFWS

IBAT ROOSTS

- Typical roost: large, dead/dying tree or live tree with loose bark (e.g., hickory)
- Near forest edge or canopy gap (direct sunlight)
- Near water
- Smallest reported roost DBH = 2.5", but most >5"
- Common roost species :
 - Ash (*Fraxinus*)
 - Elm (*Ulmus*)
 - Hickory (*Carya*)
 - Maple (*Acer*)
 - Poplar (*Populus*)
 - Oak (*Quercus*)
- Uncommon: beech, basswood, cherry, box elder, willow, conifers
- Roost mainly beneath peeling bark and occasionally in cracks/crevices
- Infrequently roost in buildings



Photo: US Forest Service

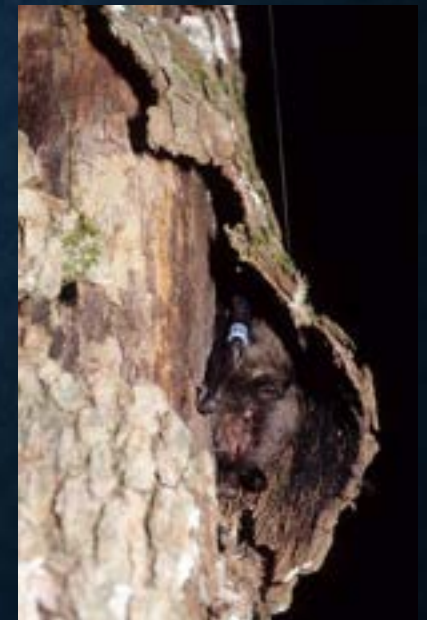


Photo: John MacGregor

NLEB ROOSTS

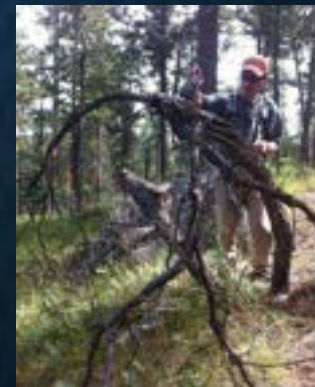
- Greater variation in roosts compared with IBAT
 - >35 tree species documented (hardwoods & conifers)
 - Appear more tolerant of shade than IBATS
 - Utilize tree cavities in addition to loose bark/crevices
 - Use live trees as well as snags
 - Often use smaller trees than sympatric Indiana bats
 - Maternity roosts <3 inches dbh reported
 - Reported roosting in stumps and fallen logs
 - Occasionally use manmade structures (buildings, bridges)



Photos: USFWS



Photos: NPS



LBB ROOSTS

- Tree roosts similar to Ibat/NLEB roosts (particularly cavity trees)
- Extensive use of anthropogenic structures (buildings, bat boxes)
 - 70% of roosts identified in MI = buildings
- In parts of range, also use rock crevices



Photos: USFWS



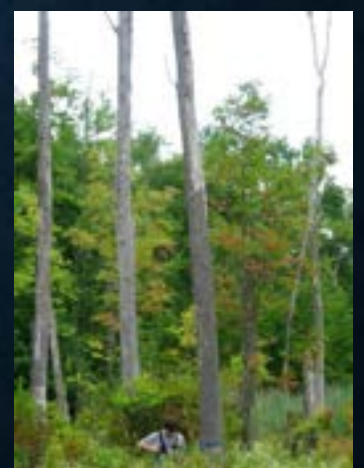
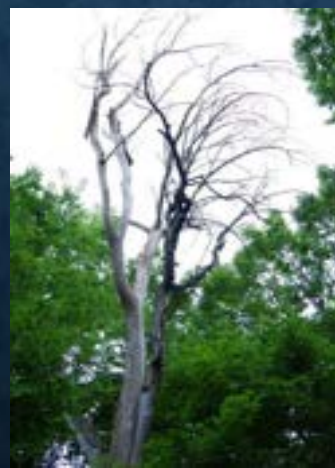
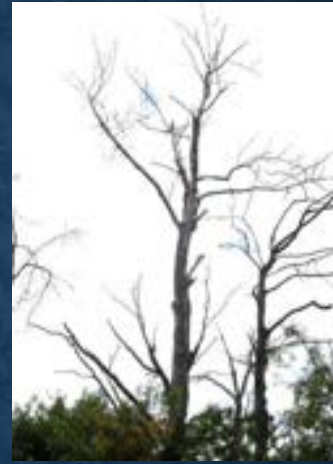
TCB ROOSTS

- Live and dead leaf clusters of live or recently dead deciduous hardwood trees
- TCB have also been observed roosting:
 - Among pine needles & eastern red cedar
 - Among Spanish moss and *Usnea trichodea* lichen
 - In artificial roosts (e.g., barns, beneath porch roofs, bridges, concrete bunkers)
 - Rarely, within caves
- No documented MI maternity/summer roosts
- 4/5 TCB (male migratory) roosts identified in MI = live oak trees
 - Fifth = behind wooden shingles of a home



Photo: USFWS

HIGH QUALITY ROOST TREES (IBAT, NLEB, LBB)



WHY PROTECT BATS?

- WNS has caused notable declines in all 4 spp.
- Slow life histories
 - Indiana, northern long-eared, and little brown bats give birth to a single pup per year
 - Tricolored bats typically have 2 pups per year
 - Lifespans of 5-10 years or more in wild
- Colonial species that roost, raise young, and hibernate communally



Photo: Jonathan Mays, Maine Department of Inland Fisheries and Wildlife



Photo: USFWS/Ann Froshauer

WHY PROTECT BATS?

- Essential to healthy forest and cave ecosystems
- Significant predators of nocturnal insects, including many crop/forest product pests and disease vectors
 - Contribute at least \$3 billion annually to U.S. agriculture
 - Reduce need for chemical pesticides



Photo: USFWS/Ann Froschauer

BATS & ESA COMPLIANCE

Under ESA section 9, it is illegal to import, export, or take endangered species for any purpose, including commercial activity.

“Take” = harass, hunt, shoot, capture, trap, kill, collect, wound, harm, or pursue an ESA-listed species, or attempt any of these activities.

“Harm” = an act which actually kills or injures wildlife., and may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering.

Under section 7, federal agencies must consult with FWS when any action the agency carries out, funds, or authorizes may affect a listed species or its designated critical habitat.

BATS & ESA COMPLIANCE

Project activities with potential to take or adversely affect listed bats, depending on timing and extent:

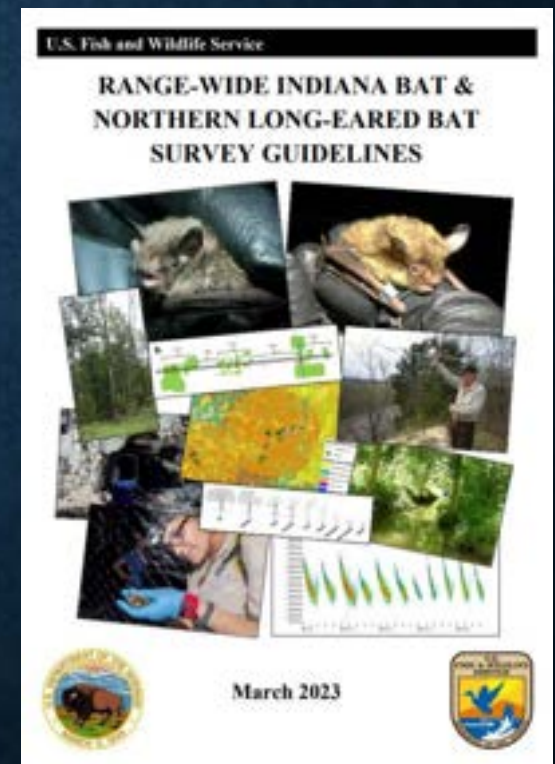
- Projects that affect hibernacula
- Cutting/trimming potential roost trees or clearing suitable forest habitat
- Prescribed burning
- Pesticide (including insecticide and rodenticide) application
- Removal/modification of a suitable bridge/culvert(s), or a building known to contain listed bats

Primary considerations for evaluating potential for habitat impacts to listed bats:

- Timing (season)
- Extent (acres/proportion of habitat affected)

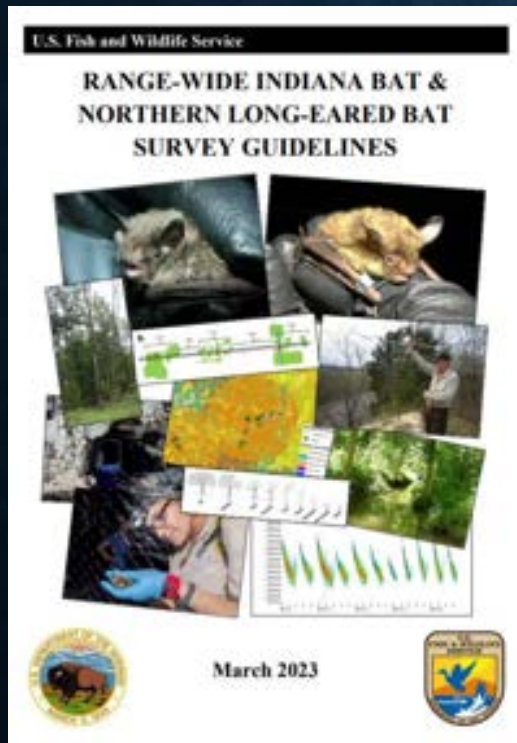
INDIANA BAT GUIDANCE

<https://www.fws.gov/species/indiana-bat-myotis-sodalis>
<https://www.fws.gov/media/michigan-bat-project-design-guidelines>



NORTHERN LONG-EARED BAT GUIDANCE

<https://www.fws.gov/species/northern-long-eared-bat-myotis-septentrionalis>



Final Rule

On November 29, 2022 the U.S. Fish and Wildlife Service published a final rule to reclassify the northern long-eared bat as endangered under the Endangered Species Act. The bat faces extinction due to the range-wide impacts of [white-nose syndrome](#), a deadly disease affecting cave-dwelling bats across the continent.

- [Press Release](#)
- [Frequently Asked Questions](#)
- [Species Status Assessment Report](#)
- [Final Rule](#)
- [Webinar Slides for Final Rule](#)
- [Summer Survey Guidelines for Indiana Bat and Northern Long-eared Bat](#) have been released for 2022.

Effective date delayed until March 31, 2023

- [Final Rule Effective Date Extension](#)

Tools and Guidance Documents for Stakeholders

The U.S. Fish and Wildlife Service has developed several tools and guidance documents to assist stakeholders in assessing impacts of projects.

- [Rangewide Determination Key](#)
- [Interim Consultation Framework](#)
- [Interim Habitat Modification Guidance](#)
- [Interim Wind Guidance](#)

IPAC AND ASSISTED DETERMINATION KEYS

- Information for Planning and Consultation:
<https://ipac.ecosphere.fws.gov/fws>
- Obtain an official species list
 - List of federally listed species, critical habitat, migratory birds, and other natural resources that may be in your action area
- Determination keys (Dkeys) to expedite consultation

U.S. Fish & Wildlife Service
IPaC Information for Planning and Consultation

IPaC is a project planning tool that streamlines the USFWS environmental review process

GET STARTED LOG IN

Integrate the environmental review process into your project design
Quickly and easily identify USFWS managed resources and suggested conservation measures for your project.

- Explore species and habitat
See if any listed species, critical habitat, migratory birds or other natural resources may be impacted by your project.
- Conduct a regulatory review
Log in and define a project to get an official species list and evaluate potential impacts on resources managed by the U.S. Fish and Wildlife Service.
- Build a Consultation Package
Consultation Package Builder (CPB) replaces and improves on the original Impact Analysis by providing an interactive, step-by-step process to help

AVAILABLE DKEYS IN MI

- All Species Michigan Determination Key

Release date: April 12, 2023

This key is intended to streamline review of projects for potential effects to Federally listed threatened and endangered species and designated critical habitat. This key covers all Michigan species and incorporates the rangewide NLEB dkey as an option.

EVALUATE

SKIP / DOES NOT APPLY

- FHWA, FRA, FTA Programmatic Consultation for Transportation Projects affecting NLEB or Indiana Bat

Release date: May 3, 2023

The key is intended for projects funded or authorized by FHWA, FRA, or FTA, that may affect the endangered Indiana bat and/or the endangered northern long-eared bat, which requires consultation with the USFWS under Section 7 of the ESA.

EVALUATE

SKIP / DOES NOT APPLY

- Northern Long-eared Bat Rangewide Determination Key

Release date: May 5, 2023

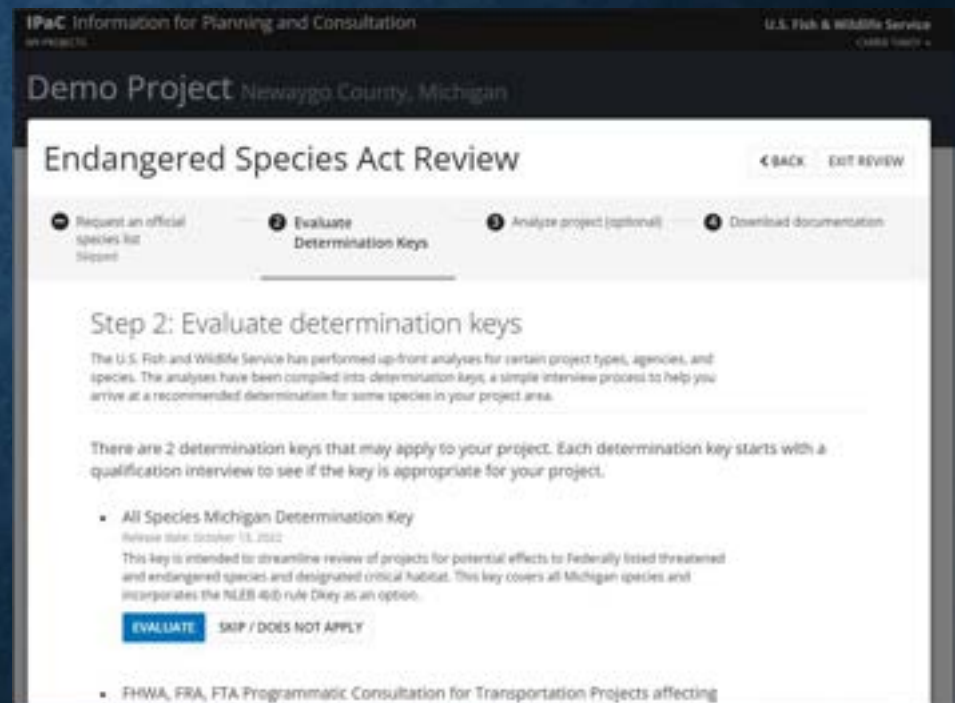
This key is intended to streamline review of projects for potential effects to the Northern Long-eared Bat (*Myotis septentrionalis*).

EVALUATE

SKIP / DOES NOT APPLY

ALL-SPECIES MICHIGAN DETERMINATION KEY

- Covers most types of routine, predictable projects
- Explicitly does not cover projects with potential for broad/variable impacts
 - Long-term (>10 years) permits, plans or other actions (e.g., FERC licenses)
 - Construction/operation of wind turbines
 - Projects for which there are <30 days prior to action occurring
 - Certain types of communications towers
 - Water withdrawals greater than 10,000 gallons/day
 - Aerial or other broad application of chemicals



VOLUNTARY CONSERVATION MEASURES

- Avoid disturbing known or potential hibernacula
- Avoid impacts to suitable habitat during the summer (especially June and July, when nonvolant pups may be roosting in trees)
- Protect, create, and enhance mature forest, particularly hardwood/mixedwood stands, riparian forests, and forested wetlands
- Preserve wooded corridors such as tree lines and fencerows in fragmented habitats (like agricultural-dominated landscapes)
- Protect potential roost trees (e.g., standing snags)
- Limit use of chemical insecticides



RESOURCES & LINKS

- Michigan Indiana Bat Project Design Guidelines: <https://www.fws.gov/media/michigan-bat-project-design-guidelines>
- Michigan Indiana Bat Habitat Suitability Model: <https://www.fws.gov/media/indiana-bat-habitat-suitability-model-michigan-d-key>
- Northern Long-eared Bat Range-wide Interim Guidelines: <https://www.fws.gov/species/northern-long-eared-bat-myotis-septentrionalis>
- Range-wide Indiana Bat and Northern Long-eared Bat Survey Guidelines: <https://www.fws.gov/library/collections/range-wide-indiana-bat-and-northern-long-eared-bat-survey-guidelines>
- USFWS Tricolored Bat Page: <https://www.fws.gov/species/tricolored-bat-perimyotis-subflavus>
- Beneficial Forest Management Practices for WNS-affected Bats: Voluntary Guidance for Land Managers and Woodland Owners in the Eastern United States: https://www.researchgate.net/publication/351060175_Beneficial_Forest_Management_Practices_for_WNS-affected_Bats_Voluntary_Guidance_for_Land_Managers_and_Woodland_Owners_in_the_Eastern_United_States
- IPaC website: <https://ipac.ecosphere.fws.gov/>
- Detailed IPAC instructions (Michigan): [Instructions for https://www.fws.gov/media/mifo-ipac-instructions in MI](https://www.fws.gov/media/mifo-ipac-instructions-in-MI);
- Video Demo, All Species Michigan Dkey: <https://www.youtube.com/watch?v=FfcerNCiL0IDkey>
- Michigan Dkey Standing Analysis: <https://www.fws.gov/media/michigan-endangered-species-determination-key-standing-analysis>
- National Listing Workplan: <https://www.fws.gov/project/national-listing-workplan>
- Section 7 Technical Assistance Page (to consult outside of IPaC): <https://www.fws.gov/office/midwest-region-headquarters/midwest-section-7-technical-assistance>
- ESA Consultation Handbook: <https://www.fws.gov/sites/default/files/documents/endangered-species-consultation-handbook.pdf>