

Federal Highway Administration (FHWA), Federal Railroad Administration (FRA), and Federal Transit Administration (FTA)

Programmatic Biological Opinion/Conference Opinion for Transportation Projects in the Range of the Indiana Bat, Northern Long-Eared Bat, and Tricolored Bat

## Appendix A: Glossary

Updated December 2024

**Note:** The following definitions are to be used for the purposes of this programmatic consultation only. Please coordinate with the local Service Field Office, as needed, for further clarification on these terms and their definitions.

**Action** – As defined in the Endangered Species Act section 7 regulations (50 CFR 402.02), “action” means “all activities or programs of any kind authorized, funded, or carried out, in whole or in part, by Federal agencies in the United States or upon the high seas.”

**Action area** – The “action area” is defined as “all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action.” Further clarification is provided by the national consultation FAQs at: <https://www.fws.gov/glossary/action-area>.

**Active season** – Period of time outside of the hibernation season when bats are active on the landscape. This varies by geographic location. Refer to the Service’s Range-wide Bat Survey Guidelines<sup>1</sup> for specific dates.

**Bridge** – A structure including supports erected over a depression or an obstruction, such as water, highway, or railway, and having a track or passageway for carrying traffic or other moving loads. A bridge typically uses structural components and elements in the deck, superstructure and substructure (abutments and piers) to support dead and live loads.

**Critical habitat** – Specific areas within the geographical area occupied by the species at the time of listing that contain physical or biological features essential to conservation of the species and that may require special management considerations or protection; and Specific areas outside the geographical area occupied by the species if the agency determines that the area itself is essential for conservation. <https://www.fws.gov/media/critical-habitat-fact-sheet>.

**Culvert** – A structure comprised of one or more barrels or cells, beneath an embankment and designed structurally to account for soil-structure interaction. These structures are hydraulically and structurally

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<sup>1</sup> <https://www.fws.gov/library/collections/range-wide-indiana-bat-and-northern-long-eared-bat-survey-guidelines>

designed to convey water, sediment, debris, and, in many cases, aquatic and terrestrial organisms through roadway embankments. Culvert barrels have many sizes and shapes and have inverts that are either integral or open, i.e., supported by spread or pile-supported footings. A culvert typically has soil materials (i.e., backfill) between the travel way (e.g., road or rail or trail) and actual culvert structure (i.e., barrels, cells). To support dead loads and live loads (e.g., cars, trucks, trains, pedestrians, etc.), the culvert consists of those barrels or cells (typically concrete, metal, or plastic material), backfill, and soil bedding underneath the culvert. In comparison, a bridge typically uses structural components and elements in the deck, superstructure and substructure (abutments and piers) to support those dead and live loads.

**Documented habitat** – is defined as an area that has been documented to be used by the Indiana bat, Northern long-eared bat (NLEB), or Tricolored bat (TCB) and is a subset of a known maternity colony home range (see definition below). This subset of habitat is defined because there are different AMMs within this area for this programmatic consultation.<sup>2</sup>

Documented habitat includes:

1. Any suitable habitat<sup>3</sup> within 0.25 miles (0.4 km) of a capture or acoustic detection location;
2. Any suitable habitat within 0.25 miles (0.4 km) of an identified roost tree;
3. Any suitable habitat within 0.25 miles (0.4 km) of roost tree/area predicted based on radio telemetry biangulation/triangulation.

**Ground Disturbance** – any activity that compacts or disturbs the ground. Ground disturbance activities include, but are not limited to, grading and backfilling. Activities are often performed using heavy equipment (excavators, backhoes, bulldozers, trenching and earthmoving equipment, etc.) and heavy trucks (large four-wheel drive trucks, dump trucks, and tractor trailers). Contact the local Service Field Office, as needed, to assist in determining if and how ground disturbance may affect bat hibernacula.

**Hibernacula** – caves, cave-like structures (which include but are not limited to: rock formations, abandoned or active mines, and railroad tunnels), or associated sinkholes, fissures, or other karst features where bats hibernate in winter. Hibernacula tend to have the volume and complexity to help buffer the environment against rapid and extreme changes in outside temperature.

**Hibernating range** – includes the portion of the range where the species hibernates in the winter, stages and swarms outside of hibernacula in the spring and fall and migrates to summer home ranges.

**Hibernation** – when bats are in extended periods of torpor during winter months. The state of torpor is interrupted by brief periods of arousal when the bats' body temperatures return to normal for a few

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<sup>2</sup> We do not use the larger estimated maternity colony home ranges for the different AMMs because in most cases we do not expect maternity colonies to concentrate their roosting and foraging activities directly alongside roads and rails.

<sup>3</sup> <https://www.fws.gov/library/collections/range-wide-indiana-bat-and-northern-long-eared-bat-survey-guidelines>

hours, at which time the animals may groom or drink water but do not typically leave the hibernaculum ([Hibernate or Migrate - Bats \(U.S. National Park Service\) \(nps.gov\)](https://www.nps.gov/hibernate-or-migrate-bats)).

**Inactive season** – Period of time inside of the hibernation season, when bats are in a state of inactivity characterized by lower body temperature, slower breathing, and lower metabolic rate (*torpor*). This varies by geographic location. Refer to the Service’s Range-wide Bat Survey Guidelines<sup>4</sup> for specific dates.

**Invasive** – Under Executive Order 13112, as amended by Executive Order 13751, invasive species means, with regard to a particular ecosystem, a non-native organism whose introduction causes or is likely to cause economic or environmental harm, or harm to human, animal, or plant health.

**Karst** – Karst topography is a landscape created by groundwater dissolving sedimentary rock such as limestone that often includes features such as caves, sinkholes, springs, and sinking streams. <http://www.watersheds.org/earth/karst.htm> Coordinate with the local Service Field Office on recommended best management practices for karst in your state.

**Lighting** – Refers to roadway and bridge/culvert or structure lighting, and **not** vehicle headlights, signal lighting and/or railroad crossing signals.

**Maternity colony** – a gathering of pregnant female bats as they prepare to give birth. Maternity colony size varies by species (see Section 4.1 and 4.2 for further details).

**Maternity colony home range (Indiana bat)** – Areas that include maternity, foraging, roosting, and commuting habitat for the Indiana bat, typically occurring within 5 miles (8 km) of a mist-net capture or acoustic detection, or within 2.5 miles (4 km) of a roost.

- 5 miles (8 km) from capture/detection points is used to account for the entire potential range. It is calculated by multiplying the typical foraging distance (2.5 miles [4 km]) by two – the capture/acoustic detection location could be at the edge of the home range and the direction(s) the bat(s) may fly are unknown. A 5-mile buffer encompasses 50,265 acres.
- 2.5 miles (4 km) from roost trees is the standard threshold used to delineate the typical foraging distance of Indiana bats (Butchkoski and Hassinger 2002, Murray and Kurta 2004). A 2.5-mile buffer encompasses 12,566 acres.

**Maternity colony home range (NLEB)** – Areas that include maternity, foraging, roosting, and commuting habitat for the NLEB, typically occurring within 3 miles (4.8 km) of a mist-net capture or acoustic detection, or within 1.5 miles (2.4 km) of a roost.

- 3 miles (4.8 km) from capture/detection points is used to account for the entire potential range. It is calculated by multiplying the typical foraging distance (1.5 miles [2.4 km]) by two –

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<sup>4</sup> <https://www.fws.gov/library/collections/range-wide-indiana-bat-and-northern-long-eared-bat-survey-guidelines>

capture/acoustic detection location could be at the edge of the home range and the direction(s) the bat(s) may fly are unknown. A 3-mile buffer encompasses 18,086 acres.

- 1.5 miles (2.4 km) from a roost tree is the standard threshold used to delineate the typical foraging distance of NLEBs (Sasse and Pekins 1996, Jackson 2004). A 1.5-mile buffer encompasses 4,524 acres.

**Maternity colony home range (TCB)** – Areas that include maternity, foraging, roosting, and commuting habitat for the TCB, typically occurring within 3 miles (4.8 km) of a mist-net capture or acoustic detection, or within 1.5 miles (2.4 km) of a roost.

- 3 miles (4.8 km) from capture/detection points is used to account for the entire potential range. It is calculated by multiplying the typical foraging distance (1.5 miles [2.4 km]) by two – the capture/acoustic detection location could be at the edge of the home range and the direction(s) the bat(s) may fly are unknown. A 3-mile buffer encompasses 18,086 acres.
- 1.5 miles (2.4 km) from a roost tree is the threshold we use to delineate the typical foraging distance of TCBs (Service 2022b). A 1.5-mile buffer encompasses 4,524 acres.

**Pup season** – The period of time when females are close to giving birth (two weeks prior to birth) and young (pups) are non-volant (i.e., unable to fly). [Refer to the Service’s Range-wide Bat Survey Guidelines<sup>5</sup> for specific dates.]

**Road/rail surfaces** – road surface is defined as the actively used (e.g., motorized vehicles) driving surface and shoulders (may be pavement, gravel, etc.), and rail surface is defined as the edge of the actively used rail ballast.

**Structure** - refers to buildings (i.e., non-bridge and non-culvert), including but not limited to homes, barns, or sheds slated for demolition, rest stops, welcome centers, picnic shelters, kiosks, ticket stations and platforms at rail stations, vehicle inspection pits, storage facilities, and structures at weigh stations.

**Suitable summer habitat (Indiana bat, NLEB, TCB)** – this encompasses habitat both within and outside of documented habitat. For additional details regarding each species’ potential suitable summer habitat, refer to the description in the Service’s Range-wide Bat Survey Guidelines.

**Torpor** – a state of lowered physiological activity typically characterized by reduced metabolism, heart rate, respiration, and body temperature (Merriam-Webster Dictionary, 2023).

**Year round (YR) active range** – includes the portion of the NLEB and TCB range where bats remain active on the landscape and feed year-round; and may include short bouts of winter torpor during colder periods.

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<sup>5</sup> <https://www.fws.gov/library/collections/range-wide-indiana-bat-and-northern-long-eared-bat-survey-guidelines>