

# Compilation of Bat-Related Definitions

December 2025

Created by the U.S. Fish and Wildlife Service (USFWS) Pennsylvania Field Office to aid the Pennsylvania Department of Transportation (PennDOT) and other transportation entities when using the FHWA/FRA/FTA PBO DKey.

## Reference Documents

The below material comes from the following documents:

The Range-wide Indiana Bat and Northern Long-eared Bat Survey Guidelines (Survey Guidelines, 2024):

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

The FHWA/FRA/FTA Section 7 Range-wide Consultation for Indiana Bat and Northern Long-eared Bat (PBO, 2024): <https://www.fws.gov/program/endangered-species/bat-consultation-conservation-strategy>

Specifically, the glossary of the PBO User's Guide (Appendix A) and the list of avoidance and minimization measures (AMMs, Appendix C):

<https://www.fws.gov/media/users-guide-appendices-e-range-wide-programmatic-consultation-indiana-bat-and-northern-long>

## Suitable Habitat by Bat Species

“Suitable habitat” is often used interchangeably with “suitable summer habitat”. We mean habitat outside of the caves, mines, or other winter hibernacula.

### *Summary of Suitable Habitat*

**Indiana bat**: trees >5 inches dbh with exfoliating bark, cracks, crevices, and/or hollows; variety of forest habitats which may include adjacent or interspersed fields and wetlands; bridges and artificial structures.

**Northern long-eared bat**: trees >3 inches dbh with exfoliating bark, cracks, crevices, and/or cavities; intact mixed-type forests with small gaps or linear features, but flexible in habitat usage; bridges, culverts, and artificial structures.

**Tricolored bat**: trees >4 inches dbh with live or dead leaf clusters, especially oaks; variety of forest habitats which may include adjacent or interspersed fields and wetlands; bridges, culverts, and artificial structures.

## ***Indiana Bat (IBAT)***

Starting on p. 11 of the Survey Guidelines:

“Suitable summer habitat for IBAT consists of a wide variety of forested/wooded habitats... and may also include some adjacent and interspersed non-forested habitats such as emergent wetlands and adjacent edges of agricultural fields, old fields and pastures... Individual trees may be considered suitable habitat when they exhibit the characteristics of a potential roost tree and are located within 1,000 feet (305 meters) of other forested/wooded habitat. Indiana bats have also been observed roosting in human-made structures, such as bridges and bat houses (artificial roost structures); therefore, these structures should also be considered potential summer habitat. (Footnote 19: While trees <5 inches (<12.7 cm) dbh that have exfoliating bark, cracks, crevices, and/or hollows may have some potential to be male IBAT summer roosting habitat, the USFWS does not consider early successional, even-aged stands of trees <5 inches dbh to be suitable roosting habitat for the purposes of this [survey] guidance. Suitable roosting habitat is defined as forest patches with trees of 5-inch (12.7 cm) dbh or larger. However, early successional habitat with small diameter trees may be used as foraging habitat by IBATs. Therefore, a project that would remove or otherwise adversely affect  $\geq 20$  acres of early successional habitat containing trees between 3 and 5 inches (7.6-12.7 cm) dbh would require coordination/consultation with the USFWS FO to ensure that associated impacts would not rise to the level of take.)”

## ***Northern Long-eared Bat (NLEB)***

Starting on p. 12 of the Survey Guidelines:

“Suitable summer habitat for the NLEB consists of a wide variety of forested/wooded habitats... Although they may also traverse habitat adjacent and interspersed with forest habitat, such as emergent wetlands and field edges, they are predominately found in forest/wooded habitat. This includes forests and woodlots containing potential roosts (i.e., live trees and/or snags  $\geq 3$  inches dbh that have exfoliating bark, cracks, crevices, and/or cavities), as well as linear features such as fencerows, riparian forests, and other wooded corridors... NLEB often prefer intact mixed-type forests with small gaps (i.e., forest trails, small roads, or forest-covered creeks) in forest with sparse or medium vegetation for foraging and commuting rather than fragmented habitat or areas that have been clear cut (USFWS 2015, p.17992). Individual trees may be considered suitable habitat when they exhibit characteristics of suitable roost trees and are within 1,000 feet of other forested/wooded habitat. The NLEB has also been observed roosting (although to a lesser degree than forested habitat) in human-made structures, such as buildings, barns, bridges, and bat houses; therefore, these structures should also be considered potential summer habitat.”

For both the IBAT and NLEB:

“Examples of unsuitable habitat:

- Individual trees that are greater than 1,000 feet from forested/wooded areas;
- Trees found in highly developed urban areas (e.g., street trees, downtown areas); and
- A pure stand of less than 3-inch dbh trees that are not mixed with larger trees.”

### ***Tricolored Bat (TCB)***

Starting on p. 13 of the Survey Guidelines:

“Suitable TCB summer habitat consists of a wide variety of forested/wooded habitats... and include some adjacent and interspersed non-forested habitats such as emergent wetlands, shrublands, grasslands, and forested edges of agricultural fields, old fields, and pastures. Roosting habitat includes forests, woodlots, and linear features (e.g., fencerows and riparian corridors) containing trees with potential roost substrate (e.g., live and dead leaf clusters of live and recently dead deciduous trees...) TCBs will roost in a variety of tree species, especially oaks (*Quercus* spp.), and often select roosts in tall, large diameter trees, but will roost in smaller diameter trees when potential roost substrate is present (e.g., 4-inch [10-centimeter]...) ... TCBs seem to prefer foraging along forested edges of larger forest openings, along edges of riparian areas, and over water and avoid foraging in dense, unbroken forests, and narrow road cuts through forests... TCBs also roost in human-made structures, such as bridges and culverts, and occasionally in barns or the underside of open-sided shelters (e.g., porches, pavilions); therefore, these structures should also be considered potential summer habitat...”

## **FHWA/FRA/FTA PBO Documented Habitat**

From the PBO User Guide’s Appendix A Glossary:

“**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... This subset of habitat is defined because there are different AMMs within this area for this programmatic consultation.

Documented habitat includes:

1. Any suitable habitat 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.”

The definition of “maternity colony home range” differs by species. Note that for the PBO, documented habitat is about suitable summer habitat, not hibernacula.

**DKeys Note:** If your project has not done a survey, then you can answer “no” to the question of whether documented habitat is nearby. If a survey had been done in the past and found bats (such as a biological study unrelated to your project), then that data would be in the background of

PNDI and you would have received a direct hit conflict in PNDI (and likely a conflict with both USFWS and PGC).

## Seasons of Bat Habitat Usage

From Appendix L of the Survey Guidance (Pennsylvania row of the table, p.88).

Hibernation	Spring Staging	Summer Occupancy	Pup Season	Fall Swarming
Nov 16 – Mar 31	Apr 1 – May 14	Apr 1 – Sept 30	May 15 – July 31	Aug 16 – Nov 15
Bats are in hibernacula (caves, mines, tunnels; rocky outcrops potentially for NLEB and TCB).  Typically the tree cutting TOYR if near a hibernaculum.	IBAT and NLEB are generally in suitable habitat within 5 miles of hibernacula.  TCB are generally in suitable habitat within 3 miles of hibernacula.	Bats are in suitable habitat.	Bats are in suitable habitat; females and young form maternity colonies in locations they return to year after year.	Same as Spring Staging

## Time of Year Restrictions (FHWA/FRA/FTA PBO only)

The FHWA/FRA/FTA PBO DKey will ask whether you are cutting during the pup season (LAA or outside the PBO's scope, depending on location). Then it will ask if you're cutting during the active season (LAA).

From Appendix L, p. 85, footnote 93 of the Survey Guidelines: "The 'active season' is the inverse of the hibernation season."

Therefore, the tree cutting Time of Year Restriction for the FHWA/FRA/FTA PBO is to **allow cutting during the hibernation season, November 16 to March 31**. The inverse is to avoid cutting from the Spring Staging through Fall Swarming seasons.

## List of Bat AMMs

Although the PBO's determinations and incidental take statement are reserved for projects with a FHWA/FRA/FTA nexus, any project can still be designed with the PBO's AMMs to avoid and minimize effects to bats. The AMMs are in Appendix C of the PBO User's Guide.

Note the [blue headings](#) of the document. The list of AMMs is separated into 2 sections: AMMs for Programmatic Informal (starting on p. 1) and AMMs for Programmatic Formal (starting on p. 5). The latter are for projects that are Likely to Adversely Affect the bat species (meant to reduce the amount of take, rather than be able to avoid take altogether). Most projects will use the first set of AMMs for Programmatic Informal to reach Not Likely to Adversely Affect (NLAA).

Within each of the two sections, the AMMs are organized by stressor: lighting; tree removal/trimming; bridges, culverts, and structures; and hibernacula impacts. The bridges, culverts, and structures subsection is further separated by those with a large number of bats (>5) or assumed presence, versus those with a small number of bats (<5).

In Pennsylvania we are in the hibernating range, meaning our listed bats hibernate. We are not in Zones 1 & 2 or the year-round (YR) active ranges, so ignore the AMMs for these areas and focus on the ones for the hibernating range.

## Bridge, Culvert, Structures, and Tunnels

From the PBO User Guide's Appendix A Glossary:

**“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.

**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 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.

**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.”

The range-wide NLEB and TCB DKey asks “Does the action area contain any caves (or associated sinkholes... culverts, or tunnels that could provide habitat for hibernating bats)?”

**Tunnel** refers to railroad or roadway tunnels, not small pipes or conduits. Regarding culverts, you can answer “No” to this question. In PA our bats seem to use culverts as active season roosts, not as hibernation habitat.

For more information on conducting a bridge/culvert/structure assessment, please see our “Pennsylvania Guidance on Transportation Structure Bat Bird Surveys” document.