

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 C: Avoidance and Minimization Measures

Updated December 2024

For projects to be covered by the Programmatic Biological Opinion (PBO), specific avoidance and minimization measures (AMMs) related to the Indiana bat, northern long-eared bat (NLEB), and tricolored bat (TCB) will be implemented where applicable. AMMs, if adopted under appropriate circumstances, are expected to reduce the potential impacts of the proposed action¹ on both bat species. In some instances, impacts will be reduced to levels that are insignificant or discountable; therefore, not likely to adversely affect (NLAA) either species. In other cases, take will be unavoidable even with the implementation of AMMs; therefore, likely to adversely affect (LAA) either species.

The following AMMs are necessary to avoid and minimize impacts to the Indiana bat, NLEB, and TCB where applicable, and are required for projects using the range-wide programmatic consultation.

AMMs for Programmatic Informal

Unless presence/absence (P/A) surveys in suitable habitat document that Indiana bat, NLEB, and TCB are not likely to be present, the following AMMs are REQUIRED, as applicable, for the range-wide programmatic informal consultation.

All NLAA Projects

General AMM 1. Ensure all operators, employees, and contractors working in areas of Indiana bat, NLEB, or TCB suitable habitat are aware of all Transportation Agency environmental commitments, including all applicable AMMs.

Lighting²

Lighting AMM 1. Direct temporary lighting away from suitable habitat during the active season.³

¹ 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.”

² See glossary in Appendix A for definition.

³ This would be year-round in portions of the NLEB and TCB ranges.

Lighting AMM 2. When installing new/additional permanent lighting or replacing existing permanent lights, use downward-facing, full cut-off lens lights (with same intensity or less for replacement lighting); or for those Transportation Agencies using the Backlight Uplight and Glare (BUG) system developed by the Illuminating Engineering Society,⁴ the project should be as close to 0 for all three ratings with a priority of "uplight" of 0 and "backlight" as low as practicable.

Tree Removal/Trimming

Note: The word "trees" as used in the AMMs refers to trees that are suitable habitat for each species within their range.

Tree Removal/Trimming AMM 1. Modify all phases/aspects of the project (e.g., temporary work areas, alignments) to the extent practicable to avoid tree removal/trimming in excess of what is required to implement the project safely.

Tree Removal/Trimming AMM 2. Ensure tree removal/trimming is limited to that specified in project plans and ensure that contractors understand clearing limits and how they are marked in the field (e.g., install bright colored flagging/fencing prior to any tree removal/trimming to ensure contractors stay within clearing limits).

Tree Removal/Trimming AMM 3. Ensure tree removal/trimming is limited to the inactive season, occurs within 100 ft of the road/rail surface, and is outside of documented habitat for the Indiana bat, NLEB, and TCB.

Bridges, Culverts, and Structures⁵

The following Bridge, Culvert, and Structure AMMs are REQUIRED for the range-wide programmatic consultation, as applicable, unless one or more of the following criteria apply:

- The bridge, culvert, or structure is 1,000 ft (305 m) or more from suitable bat habitat in areas **outside of the TCB range** (i.e., Indiana bat and NLEB only); or
- The culvert does not meet the minimum dimensions provided in the Service's range-wide bat survey guidance;⁶ or
- A bridge, culvert,⁷ or structure bat assessment⁸ has occurred and documented no signs of use by the Indiana bat, NLEB, or TCB;⁹ or

⁴ http://www.escolighting.com/PDFfiles/BUG_rating.pdf

⁵ This category "structures" is intended to capture manmade structures that may provide bat roosting or hibernation habitat that are neither bridges, culverts or crossing structures. They may include but are not limited to rest areas, offices, sheds, outbuildings, barns, and parking garages.

⁶ Refer to Range-wide Indiana and northern long-eared bat survey guidelines for assessment practices and validity length of bridge, culvert bat use assessments: <https://www.fws.gov/library/collections/range-wide-indiana-bat-and-northern-long-eared-bat-survey-guidelines>.

- Documentation from the local Service Field Office confirms that Indiana bats, NLEB, and TCBs are not using bridges, culverts, or structures within the action area.¹⁰

Note: If there are safety concerns associated with assessments of bridges, culverts, or structures, please coordinate with the local Service Field Office for further assistance.

Bridge, Culvert, and Structure AMMs – Large Number of Covered Bats (>5); or Assuming Presence of Covered Bat Species

Inactive Season (in the hibernating range)

Bridge, Culvert, and Structure AMM 1a. Perform bridge, culvert or structure removal, replacement, and/or alteration activities during the winter hibernation period¹¹ (inactive season) unless a hibernating colony of bats is present.¹² If hibernating bats are observed using the bridge, culvert, or structure, Transportation Agencies and State DOTs will coordinate with the local Service Field Office for project-specific consultation guidance.

Bridge, Culvert, and Structure AMM 1b. Coordinate with the local Service field office to ensure suitable roosting habitat is still available within the bridge, culvert, or structure once construction/replacement is complete (when assessment documents use by a large number of covered bat species, >5). Suitable roosting sites may be incorporated into the design of a new bridge, culvert, or structure.

Winter Torpor Period (in Zone 1 of the NLEB or TCB YR active ranges)

Bridge, Culvert, and Structure AMM 2. Avoid bridge or culvert removal, replacement, and/or alteration activities between December 15 – February 15.¹³ If activities must be performed during this period, Transportation Agencies and State DOTs will coordinate with the local Service Field Office for project-specific consultation guidance.

⁷ Refer to Range-wide Indiana and northern long-eared bat survey guidelines for assessment practices and validity length of bridge, culvert bat use assessments: <https://www.fws.gov/library/collections/range-wide-indiana-bat-and-northern-long-eared-bat-survey-guidelines>

⁸ Refer to Appendix D – Bridge, Culvert, and Structure Bat Assessment Form Guidance from the User’s Guide or current Service structure assessment guidance for acceptable assessment practices and validity length of bridge, culvert, and structure bat assessments: <https://www.fws.gov/media/users-guide-range-wide-programmatic-consultation-indiana-bat-and-northern-long-eared-bat>

⁹ E.g., P/A surveys, roosting potential, guano testing, emergence survey, etc.

¹⁰ Required documentation may be project specific or geographically based.

¹¹ Coordinate with the local Service Field Office for appropriate dates.

¹² If a hibernating colony of bats other than Indiana bat, NLEB, or TCB is observed, please coordinate with the local Service Field Office and appropriate State agency.

¹³ Date-based time of year restrictions are used instead of temperature-based time of year restrictions, because activities are more difficult to stop and start based on changing site conditions. A temperature-based time of year restriction requires a high level of communication and control over individual practitioners that is not likely to be effectively implemented.

Active Season (in the hibernating and YR active ranges)

Bridge, Culvert, and Structure AMM 3a. Ensure bridge, culvert, or structure removal, replacement, and/or alteration activities conducted during the active season will not disturb roosting Indiana bats, NLEBs, or TCBs using the bridge, culvert, or structure.

The following types of bridge or culvert work can generally be conducted with the presence of bats:

- Above bridge deck or culvert work where construction equipment or materials do not extend to the underside of deck or within the culvert where bats may be located (e.g., materials won't drip down to underside of deck or within the culvert) and does not include vibration or noise above existing background levels, including general traffic (e.g., road line painting, wing-wall work).
- Below bridge deck or culvert work that is conducted away from roosting bats and does not involve vibration or noise above existing background levels, including general traffic (e.g., wing-wall work, some abutment, beam end, scour, or pier repair).

Bridge, Culvert, and Structure AMM 3b. Ensure suitable roosting habitat is still available within the bridge, culvert, or structure once construction/replacement is complete (when assessment documents use by a large number of covered bat species, >5). Suitable roosting sites may be incorporated into the design of a new bridge, culvert, or structure.

Bridge, Culvert, and Structure AMMs – Small Number of Covered Bats (<=5)

Inactive Season (in the hibernating range)

Bridge, Culvert, and Structure AMM 4. Perform bridge, culvert, or structure removal, replacement, and/or alteration activities during the winter hibernation period (inactive season)¹⁴ unless a hibernating colony of bats is present.¹⁵ If hibernating bats are observed using the bridge, culvert, or structure, Transportation Agencies and State DOTs will coordinate with the local Service Field Office for project-specific consultation guidance.

Winter Torpor Period (in Zone 1 of the NLEB or TCB YR active ranges)

Bridge, Culvert, and Structures AMM 5. Avoid bridge or culvert removal, replacement, and/or alteration activities between December 15 – February 15.¹⁶ If activities must be performed during this period,

¹⁴ Coordinate with the local Service Field Office for appropriate dates.

¹⁵ If a hibernating colony of bats other than Indiana bat, NLEB, or TCB is observed, please coordinate with the local Service Field Office and appropriate State agency.

¹⁶ Date-based time of year restrictions are used instead of temperature-based time of year restrictions, because activities are more difficult to stop and start based on changing site conditions. A temperature-based time of year restriction requires a high level of communication and control over individual practitioners that is not likely to be effectively implemented.

Transportation Agencies and State DOTs will coordinate with the local Service Field Office for project-specific consultation guidance.

Active Season (in the hibernating and YR active ranges)

Bridge, Culvert, and Structure AMM 6. Ensure bridge, culvert, or structure removal, replacement, and/or alteration activities conducted during the active season will not disturb roosting Indiana bats, NLEBs, or TCBs using the bridge, culvert, or structure.

The following types of bridge or culvert work can generally be conducted with the presence of bats:

- Above bridge deck or culvert work where construction equipment or materials do not extend to the underside of deck or within the culvert where bats may be located (e.g., materials that may drip down to underside of deck or within the culvert) and does not include vibration or noise above existing background levels, including general traffic (e.g., road line painting, wing-wall work).
- Below bridge deck or culvert work that is conducted away from roosting bats and does not involve vibration or noise above existing background levels, including general traffic (e.g., wing-wall work, some abutment, beam end, scour, or pier repair).

Hibernacula

Hibernacula AMM 1. For projects located within karst areas, on-site personnel will use best management practices,¹⁷ secondary containment measures, or other standard spill prevention and countermeasures to avoid impacts to the possible hibernacula. Where practicable, a 300 ft (91.4 m) buffer will be employed to separate fueling areas and other major contaminant risk activities from caves, sinkholes, losing streams, and springs in karst topography.

AMMs for Programmatic Formal

Unless P/A surveys in suitable habitat document that the Indiana bat, NLEB, and TCB are not likely to be present, the following AMMs are REQUIRED, as applicable, for the range-wide programmatic formal consultation.

All LAA Projects

General AMM 1. Ensure all operators, employees, and contractors working in areas of Indiana bat, NLEB, or TCBs suitable habitat are aware of all Transportation Agency environmental commitments, including

¹⁷ Coordinate with the local Service Field Office on recommended best management practices for karst in your state.

all applicable AMMs.

*Lighting*¹⁸

Lighting AMM 1. Direct temporary lighting away from suitable habitat during the active season.¹⁹

Lighting AMM 2. When installing new/additional permanent lighting or replacing existing permanent lights, use downward-facing, full cut-off lens lights (with same intensity or less for replacement lighting); or for those Transportation Agencies using the BUG system developed by the Illuminating Engineering Society,²⁰ the project should be as close to 0 for all three ratings with a priority of “uplight” of 0 and “backlight” as low as practicable.

Tree Removal/Trimming

Note: The word “trees” as used in the AMMs refers to trees that are suitable habitat for each species within their range.

Tree Removal/Trimming AMM 1. Modify all phases/aspects of the project (e.g., temporary work areas, alignments) to the extent practicable to avoid tree removal/trimming in excess of what is required to implement the project safely.

Tree Removal/Trimming AMM 2. Ensure tree removal/trimming is limited to that specified in project plans and ensure that contractors understand clearing limits and how they are marked in the field (e.g., install bright colored flagging/fencing prior to any tree removal/trimming to ensure contractors stay within clearing limits).

Tree Removal/Trimming AMM 3. Not applicable to LAA (see Informal Consultation AMMs above).

Tree Removal/Trimming AMM 4. Avoid conducting tree removal/trimming outside documented habitat for the Indiana bat, NLEB, or TCB beyond 100 ft of the road/rail surface during the pup season.

Tree Removal/Trimming AMM 5. If removing/trimming trees outside documented habitat for the Indiana bat, NLEB, or TCB within 100 ft of the road/rail surface during the pup season, all trees removed/trimmed must be <9 in (22.9 cm) DBH.

Tree Removal/Trimming AMM 6. Avoid conducting tree removal/trimming within documented habitat for the Indiana bat, NLEB, or TCB during the pup season.

¹⁸ See glossary for definition.

¹⁹ This would be year-round in portions of the NLEB and TCB ranges.

²⁰ http://www.escolighting.com/PDFfiles/BUG_rating.pdf

Tree Removal/Trimming AMM 7. Avoid conducting tree removal/trimming of suitable habitat for the NLEB and/or TCB in Zone 1 of their YR active ranges between December 15 – February 15.²¹

Bridges, Culverts, and Structures²²

The following Bridge, Culvert, and Structure AMMs are REQUIRED for the range-wide programmatic consultation, as applicable, unless one or more of the following criteria apply:

- The bridge, culvert, or structure is 1,000 ft (305 m) or more from suitable bat habitat in areas **outside of the TCB range** (i.e. Indiana bat and NLEB only); or
- The culvert does not meet the minimum dimensions provided in the Service’s range-wide bat survey guidance;²³ or
- A bridge, culvert,²⁴ or structure bat assessment²⁵ has occurred and documented no signs of use by the Indiana bat, NLEB, or TCB;²⁶ or
- Documentation from the local Service Field Office confirms that Indiana bats, NLEBs, and TCBs are not using bridges/culverts or structures within the action area. ²⁷

Note: If there are safety concerns associated with assessments of bridges, culverts, or structures please coordinate with the local Service Field Office for further assistance.

Bridge, Culvert, and Structure AMMs – Large Number of Covered Bats (>5) or Assuming Presence of Covered Bat Species

Bridge, culvert, and structures activities with the potential to adversely affect a large number of covered bat species (>5) is outside the scope of this programmatic consultation and requires project-specific consultation guidance with the local Service Field Office; therefore, there are no AMMs for this scenario

²¹ Date-based time of year restrictions are used instead of temperature-based time of year restrictions, because activities are more difficult to stop and start based on changing site conditions. A temperature-based time of year restriction requires a high level of communication and control over individual practitioners that is not likely to be effectively implemented.

²² This category “structures” is intended to capture manmade structures that may provide bat roosting or hibernation habitat that are neither bridges, culverts or crossing structures. They may include but are not limited to rest areas, offices, sheds, outbuildings, barns, and parking garages.

²³ Refer to Range-wide Indiana and northern long-eared bat survey guidelines for assessment practices and validity length of bridge, culvert bat use assessments: <https://www.fws.gov/library/collections/range-wide-indiana-bat-and-northern-long-eared-bat-survey-guidelines>.

²⁴ Refer to Range-wide Indiana and northern long-eared bat survey guidelines for assessment practices and validity length of bridge, culvert bat use assessments: <https://www.fws.gov/library/collections/range-wide-indiana-bat-and-northern-long-eared-bat-survey-guidelines>.

²⁵ Refer to the Service’s current survey guidance for acceptable assessment practices and validity length of bridge, culvert, and structure bat assessments: <https://www.fws.gov/library/collections/range-wide-indiana-bat-and-northern-long-eared-bat-survey-guidelines>.

²⁶ E.g., P/A surveys, roosting potential, guano testing, etc.

²⁷ Required documentation may be project specific or geographically based.

in this programmatic.

Bridge, Culvert, and Structure AMMs – Small Number of Covered Bats (≤ 5)

Inactive Season (in the hibernating range) – Not applicable to LAA (see Informal Consultation AMMs above)

Winter Torpor Period (in Zone 1 of the NLEB and TCB YR active ranges)

Bridge, Culvert, and Structures AMM 5. Avoid bridge, culvert, removal, replacement, and/or alteration activities between December 15 – February 15.²⁸ If activities must be performed during this period, Transportation Agencies and State DOTs will coordinate with the local Service Field Office for project-specific consultation guidance.

Active Season (in the hibernating and YR active ranges) – Not applicable to LAA (see Informal Consultation AMMs above)

Hibernacula

Hibernacula AMM 1. For projects located within karst areas, on-site personnel will use best management practices,²⁹ secondary containment measures, or other standard spill prevention and countermeasures to avoid impacts to the possible hibernacula. Where practicable, a 300 ft (91.4 m) buffer will be employed to separate fueling areas and other major contaminant risk activities from caves, sinkholes, losing streams, and springs in karst topography.

²⁸ Date-based time of year restrictions are used instead of temperature-based time of year restrictions, because activities are more difficult to stop and start based on changing site conditions. A temperature-based time of year restriction requires a high level of communication and control over individual practitioners that is not likely to be effectively implemented.

²⁹ Coordinate with the local Service Field Office on recommended best management practices for karst in your state.