



# Northern Long-eared Bat and Tricolored Bat Voluntary Environmental Review Process for Development Projects *Version 1.1*

## Purpose

Northern long-eared bat (*Myotis septentrionalis*; NLEB) and tricolored bat (*Perimyotis subflavus*; TCB) populations have declined dramatically due to a disease known as white-nose syndrome (WNS)<sup>1</sup>. As a result, NLEB and TCB are listed as federally endangered or proposed endangered, respectively, under the Endangered Species Act (ESA). The U.S. Fish and Wildlife Service (Service) developed the *Northern Long-eared Bat and Tricolored Bat Voluntary Environmental Review Process for Development Projects Version 1.0*<sup>2</sup> (Consultation Technical Assistance) to describe steps federal<sup>3</sup> and non-federal project proponents may take to address ESA compliance and promote conservation of NLEB and TCB<sup>4</sup> populations. The Consultation Technical Assistance is intended primarily for development projects (or actions<sup>5</sup>), including but not limited to infrastructure projects that result in the conversion or permanent removal of suitable NLEB and/or TCB habitat. The Consultation Technical Assistance does not apply to potential impacts from sustainable forest management<sup>6</sup> (although prescribed fire is addressed within this document), wind energy development, or actions covered by existing programmatic biological opinions or permitted Habitat Conservation Plans. For technical assistance on wind energy development and information on sustainable forest management for bats, please visit: <https://www.fws.gov/species/northern-long-eared-bat-myotis-septentrionalis> (for NLEB) or <https://www.fws.gov/species/tricolored-bat-perimyotis-subflavus> (for TCB).

The recommended approach provided in this document is voluntary and subject to periodic updates. Project proponents are encouraged to use this step-by-step approach to streamline compliance with the ESA and associated implementing regulations, but we recognize other

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<sup>1</sup> Information on white-nose syndrome, a fungal disease impacting bats, can be found here: <https://www.whitenosesyndrome.org/>

<sup>2</sup> This guidance replaces the *Interim Consultation Framework for the Northern Long-eared Bat* (USFWS 2023, entire) and the interim Range-wide Northern Long-eared Bat determination key (Dkey).

<sup>3</sup> Federal actions include all activities or programs authorized, funded, carried out, or permitted--in whole or in part--by federal agencies in the United States or on the high seas.

<sup>4</sup> The Consultation Guidance is applicable for TCB only if the final determination is to list the species as endangered under the ESA.

<sup>5</sup> The terms “project” and “action” are used interchangeably in this document and mean the same thing within this document.

<sup>6</sup> Sustainable forest management involves practicing a land stewardship ethic that integrates the reforestation, managing, growing, nurturing, and harvesting of trees for useful products with the conservation of soil, air and water quality, wildlife and fish habitat, and aesthetics (Helms 1998, entire).

compliance strategies are possible. We note that the Consultation Technical Assistance does not create any new mandatory procedure or requirement for the public and any use of mandatory-type language in this document refers only to lawful obligations present in statute or regulation. Other Federal agencies (other than the Service) should not make technical assistance provided in this document mandatory without first consulting with the Service and following rulemaking processes under the Administrative Procedure Act as necessary.

## **How are NLEB and TCB protected under the ESA?**

Under ESA section 9, it is unlawful for any person to “take” an endangered species. The term “take” is defined as, “to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct” 16 U.S.C. 1542(b). “Harm” means an act that kills or injures wildlife, and it is further defined to include “significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering” (50 C.F.R 17.3). “Harass” means “an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering” (50 C.F.R. 17.3).

## **ESA Section 7 Consultation with the Service**

Federal action agencies’ responsibilities under ESA section 7 are twofold. First, section 7(a)(1) directs federal agencies to use their authorities in furtherance of the purposes of the ESA by carrying out programs for the conservation of listed species. Second, in accordance with section 7(a)(2), federal agencies are required to consult with the Service on any action that may affect federally listed species to ensure they do not jeopardize the species’ continued existence or destroy or adversely modify designated critical habitat.<sup>7</sup> We intend for the approach described below to assist the Service and federal agencies to carry out efficient and effective section 7 consultations and to plan and implement actions that conserve the species.

## **ESA Section 10 Technical Assistance with the Service**

Section 10(a)(1)(B) of the ESA allows non-federal project proponents to pursue an incidental take permit to provide regulatory assurances for their projects while also providing for the conservation of listed species. An incidental take permit is only needed when a project is reasonably certain to “take” a listed species. This is a voluntary process, and it is the applicant’s decision whether to pursue a take permit. The Service can assist non-federal project proponents on the law, regulations, and available technical assistance related to the potential take of federally listed species incidental to their activities; however, the decision and responsibility to seek an incidental take permit lies with the non-federal project proponents based on their own assessment.

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<sup>7</sup> No critical habitat has been designated for NLEB or TCB.

## Consultation Range

The historical NLEB and TCB ranges are extensive, and outside of known capture, roost and acoustic detection locations<sup>8</sup>, there is uncertainty in where both species currently occur on the summer landscape. Because of the steep declines in NLEB and TCB populations, combined with abundant remaining suitable forested habitat throughout much of the species' ranges, the presence of suitable forest or wooded habitat alone is not a reliable predictor of their presence in a given area. When there is uncertainty about a species' presence or absence, the Service uses the best scientific and commercial data available as documented support for why a species' presence is reasonable to expect. If there is no direct evidence of a species' presence in a given area, then we rely on indirect information (e.g., habitat availability, nearby range shifts, or abundance trends). Because single sources of indirect information considered alone may not be sufficient to conclude species presence or absence, models incorporating multiple types of indirect and direct (i.e., presence and absence records) information combined provide a reasonable basis to conclude species' presence or absence in a given area.

We determined the area where NLEB or TCB may be present (and thus will appear on an official species list<sup>9</sup>), also known as the consultation range<sup>10</sup>, using a combination of direct observations (known occurrences) and modeled likelihood of occurrence for each species. First, we buffered locations of known occurrence records from recent years.<sup>11</sup> Known occurrences include not only captures, verified acoustic detections, and summer roosts where the species has been observed, but also carcass retrievals at wind facilities and all historically documented winter roosts where the species has been observed. We applied a buffer<sup>12</sup> around each known occurrence record to geographically encompass expected behavior (e.g., swarming and foraging activity), depending on the type of occurrence record.

We then developed species-specific likelihood of occurrence (or occupancy) estimates for the extent of the species' ranges using Integrated Summer Species Distribution Models (models) in

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<sup>8</sup> Known records include captures using mist-netting, documentation of roosts using radio-telemetry, or acoustic detections using recorded mobile or stationary acoustic calls.

<sup>9</sup> An automated official species list from the Service's Information for Planning and Consultation (IPaC) tool includes a list of federally listed, proposed, or candidate species and critical habitat that may be present in the action area (accessed here: <https://ipac.ecosphere.fws.gov/>).

<sup>10</sup> The consultation range is the same as the *Current Range* displayed on the Service's Environmental Conservation Online System available here: <https://ecos.fws.gov/ecp/species/9045> (for NLEB) and <https://ecos.fws.gov/ecp/species/10515> (for TCB) and the Range displayed on the species' websites found here: <https://www.fws.gov/species/northern-long-eared-bat-myotis-septentrionalis> (for NLEB) and <https://www.fws.gov/species/tricolored-bat-perimyotis-subflavus> (for TCB).

<sup>11</sup> Occurrences include all known hibernacula and all culvert and bridge records rangewide. In the hibernating range (Appendix 1), occurrences are limited to captures, acoustic detections, known roost trees, and wind fatalities recorded at least two years after WNS arrived in the state. There is uncertainty associated with progression of WNS and species' declines within the portion of the range where NLEB and TCB exhibit year-round activity (Appendix 1); therefore, occurrence records during or after year 2000 are included in the year-round activity portions of the range.

<sup>12</sup> NLEB and TCB captures, verified acoustic records, and carcass retrievals at wind facilities are buffered by 3.0-miles, roost trees are buffered by 1.5-miles, and bridge and culvert roosts are buffered by 0.25-mile. NLEB and TCB winter hibernacula are buffered by 5.0-miles and 3.0-miles, respectively.

collaboration with the North American Bat Monitoring Program (NABat; Udell et al. in prep.; Wray et al. in prep.). These models provide accurate and consistent predictions of a species' occupancy<sup>13</sup> across its range by using detection and effort data along with a variety of environmental and other variables (e.g., percent cover of various forest types, percent wetlands, physiographic diversity, and maximum elevation) to estimate likelihood of occurrence, while accounting for potential sources of bias (e.g., imperfect detection and false-positive species misclassification from acoustic data). The models also account for significant declines in NLEB and TCB numbers in areas of the species' ranges where WNS is present. Results from these models are dependent on the availability of data in the NABat database, and as such may be updated in the future as new data are added.

We weighted the model occupancy estimates to account for regional differences in the availability and amount of suitable habitat within a reasonable dispersal distance (NLEB= 89 kilometers (km) or 55 miles; TCB= 243 km or 151 miles) of the species. We then applied a 50 percent threshold to the model estimates and combined this output with the known occurrence record buffers (as described above) to determine the areas where the species' may be present, i.e., the consultation range (Figures 1 and 2). Given the severe population declines of NLEB and TCB populations throughout most of their ranges, we determined that consultation should be focused in areas where it is more likely than not that one or both species may be present. We believe that there is enough certainty to conclude the species may be present in the action area when the likelihood of model occurrence in that area is equal to or greater than 50 percent or the area is within a buffered known occurrence.

There is uncertainty associated with progression of WNS and species' declines within the portion of the range where NLEB and TCB exhibit shorter torpor bouts (i.e., a state of lowered body temperature and metabolic activity) and remain active and feed year-round, i.e., Year-Round Active Zones 1 and 2 (see Appendix 1). Environmental (e.g., shorter and milder winters) and biological (e.g., shorter torpor bouts, winter foraging opportunities) factors may contribute to NLEB and TCB being less susceptible to WNS in areas where they are active year-round. Model predictions for the year-round active portions of the species' ranges were minimally influenced by WNS-related variables and consequently, these areas are well represented in the consultation range.

We acknowledge uncertainty when applying models to determine whether a species may be present and are not affirming NLEB or TCB presence in all modeled areas - only that the species *may* be present. Voluntary presence/absence surveys following the Service's *Range-wide Indiana Bat and Northern Long-eared Bat Survey Guidelines*<sup>14</sup> (*Guidelines*) are always an option for projects within modeled areas when NLEB or TCB presence is unknown. Again, although it is less likely than not that NLEB or TCB occur outside of modeled locations, we will incorporate new data to improve these NABat models and update the consultation range maps annually to reflect new information.

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<sup>13</sup> The probability that an area has at least one individual of a species.

<sup>14</sup> *Range-wide Indiana Bat and Northern Long-eared Bat Survey Guidelines* available here: <https://www.fws.gov/media/range-wide-indiana-bat-and-northern-long-eared-bat-survey-guidelines>

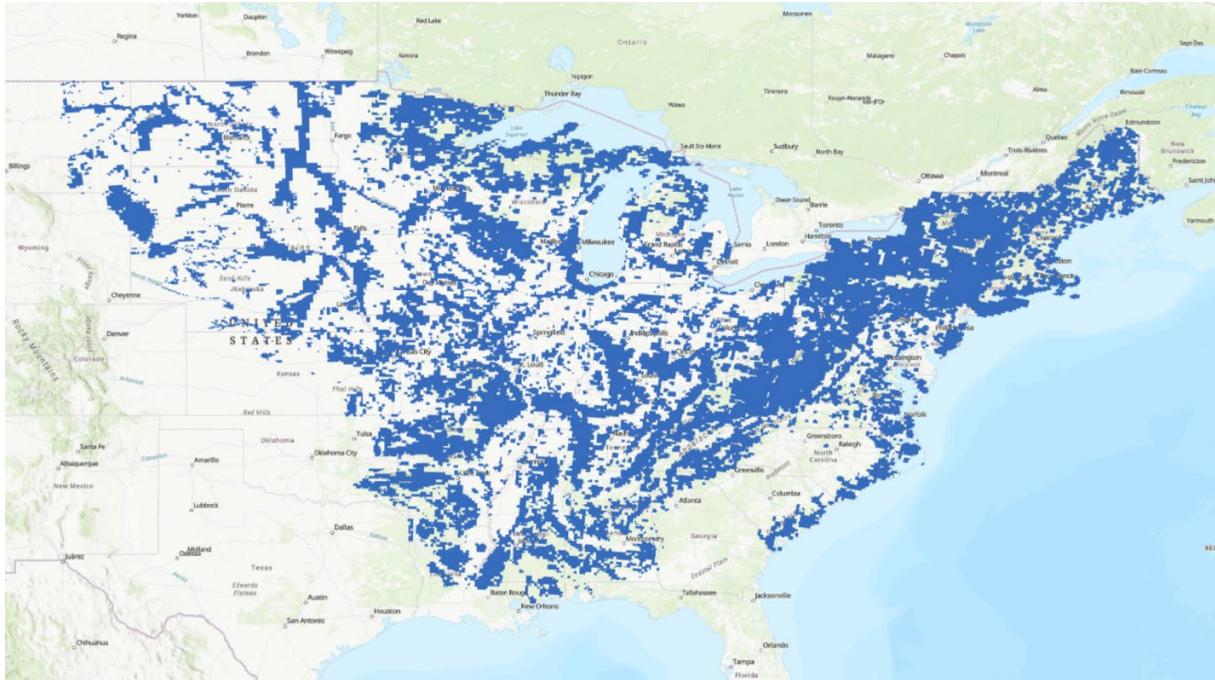


Figure 1. The NLEB consultation range, which is the area where NLEB may be present.

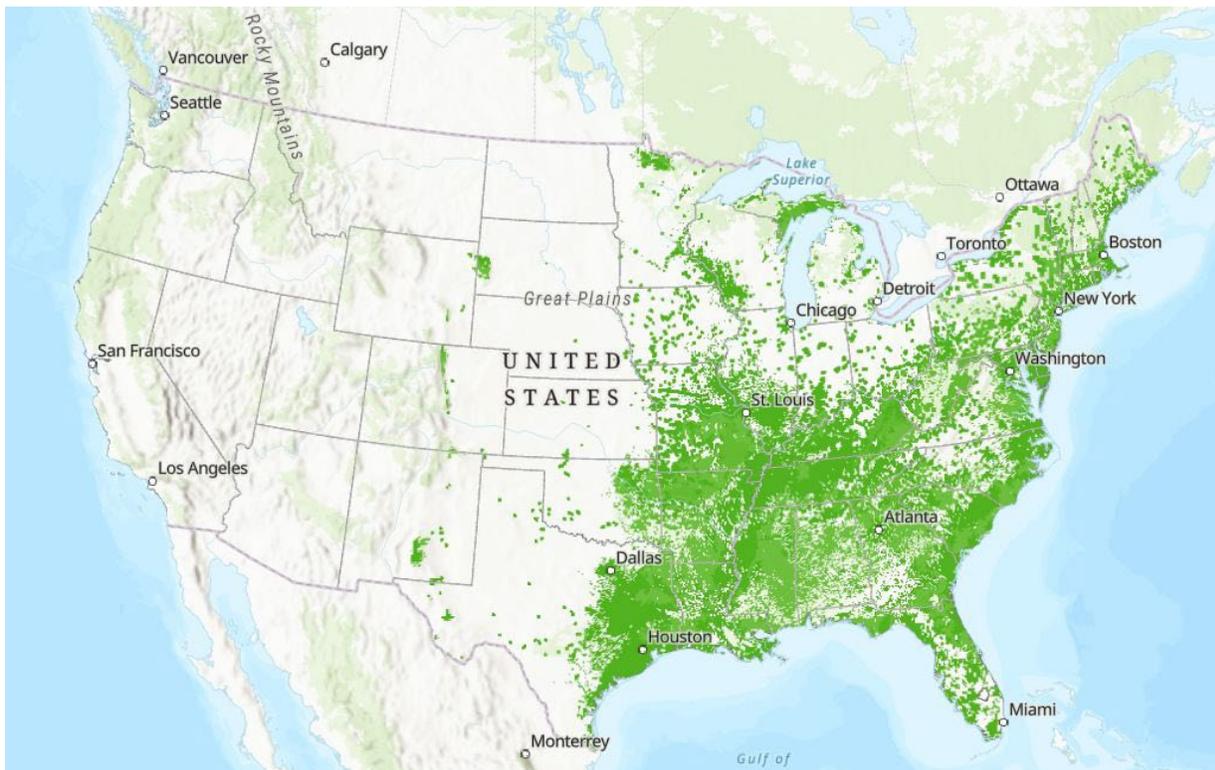


Figure 2. The TCB consultation range, which is the area where TCB may be present.

## Background

In the spring, summer, and fall, NLEB and TCB occur in a wide variety of forested or wooded habitats where they roost in trees and forage for insects. During the summer, reproductive females roost in maternity colonies (i.e., groupings of one or more females and their young) while non-reproductive females and males roost singly. During the winter, NLEB and TCB hibernate (i.e., prolonged period of torpor or dormancy) in caves (or associated sinkholes, fissures, or other karst features), abandoned mines, abandoned tunnels, rocky outcroppings, and other features offering similar microclimates. In the southern portion of their ranges, however, NLEB and TCB exhibit shorter torpor bouts and remain active and feed year-round. During the winter in the year-round active portion of the range (see Appendix 1), both NLEB and TCB continue to roost in trees, but TCB also commonly roost in road-associated culverts and occasionally bridges.

## Suitable Habitat

Suitable NLEB roost trees include both live and dead trees with exfoliating bark, cavities, crevices, or hollows that are typically  $\geq 3$  inches diameter at breast height (dbh) although most maternity roost trees are  $\geq 9$  inches (dbh). NLEB is a forest-interior species, preferring contiguous mixed-type forests (for roosting and foraging) with only small gaps (e.g., forest trails, small roads, forest-covered creeks). NLEB will use linear features (e.g., fencerows and riparian corridors) to commute between forest patches but rarely flies more than a few meters from the forest edge.

Suitable TCB roost trees include both live and dead trees with live and dead leaf clusters, large live pines with clusters of dead pine needles, and trees containing Spanish moss (*Tillandsia usneoides*). TCB 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 (e.g., leaf clusters, Spanish moss) is present. TCB 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.

## Bat Activity Periods

The Service developed the Bat Activity Period table (Appendix 2) to identify timeframes when NLEB and TCB are exhibiting specific behaviors and/or where they are most likely to occur during the spring, summer, fall, and winter. The table is intended to assist project proponents evaluate the timing of their activities as they relate to NLEB and TCB behavior and/or occurrence. In many cases, adverse impacts to NLEB and TCB can be minimized or avoided by implementing time of year restrictions on certain activities. Timeframes included in the Bat Activity Period table include:

- **Hibernation:** Timeframe when most bats are hibernating (i.e., inactive season) (*only applicable for NLEB and/or TCB in the Hibernating Range*).

- Winter Torpor: Timeframe when mean winter temperatures fall below 40 degrees Fahrenheit and bats roosting in trees are in torpor (*only applicable for NLEB and/or TCB in Year-Round Active Range Zone 1*).
- Spring Staging: Timeframe when most bats are emerging from hibernation, roosting in trees near<sup>15</sup> hibernacula, and preparing for migration to summer home range.
- Summer Occupancy: Timeframe when bats are present and roosting in trees on their summer home range and/or roosting in colonies.
- Pup Season: Timeframe during late pregnancy and when most young are born until they can fly and forage independently.
- Fall Swarming: Period of increased activity near hibernacula (including foraging, roosting in trees near<sup>16</sup> hibernacula, and mating) prior to hibernation.

## Recommended Approach for Development Projects

Below we describe steps that federal agencies (or designated representatives)<sup>17</sup> and non-federal project proponents may take to meet ESA section 7(a)(2) and/or section 10(a)(1)(B) requirements, respectively, for new or ongoing<sup>18</sup> projects:

**Step 1 – Request an official species list through the Service’s Information for Planning and Consultation (IPaC) project planning tool: <https://ipac.ecosphere.fws.gov/>.** An automated official species list from IPaC includes a list of federally listed, proposed, or candidate species and critical habitat that may be present in the action area. If NLEB and/or TCB appear on your IPaC-generated official species list<sup>19</sup> proceed to **Step 2**. If neither NLEB nor TCB appear on the species list, no further action is needed for these species by federal agencies under section 7. For non-federal projects with neither NLEB nor TCB appearing on your species list, the Service does not expect take of these species to occur; however, the decision lies with the project proponent whether to seek an incidental take permit under section 10 of the ESA (as described above under **ESA Section 10 Technical Assistance with the Service**). If other federally listed, proposed, or candidate species or critical habitat are identified on the official species list, please continue through the IPaC review process to complete consultation for those species and/or critical habitat or coordinate directly with your local Ecological Services Field Office (Field Office) if needed.

**Step 2 – Evaluate project impacts using the determination key (DKey).** The Service has developed a combined species, rangewide DKey to streamline review of routine, predictable

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<sup>15</sup> 5.0-miles and 3.0-miles from hibernaculum entrance for NLEB and TCB, respectively.

<sup>16</sup> 5.0-miles and 3.0-miles from hibernaculum entrance for NLEB and TCB, respectively.

<sup>17</sup> A federal agency may designate a non-federal representative to conduct informal consultation or prepare a biological assessment by giving written notice to the Service of such designation [50 CFR 402.08](#).

<sup>18</sup> The consultation range has changed for the NLEB based on the best available information; therefore, we recommend ongoing projects that previously ran their project under the interim NLEB determination key (DKey) or beta version of the (NLEB/TCB) DKey re-run their project under the updated (NLEB/TCB) Dkey.

<sup>19</sup> See Consultation Range section above.

projects that will not affect or are “not likely to adversely affect” NLEB and/or TCB. By answering a series of automated questions, DKeys provide a streamlined process to reduce the amount of Service staff time necessary to review routine actions and provides federal agencies, consultants, and other project proponents with a prompt response for eligible actions. DKeys rely on a Standing Analysis<sup>20</sup> that contains the analytical basis for automated consultation outcomes. The Standing Analysis is based on the best available scientific and commercial information relevant to the species and the actions considered. The Standing Analysis also explains the basis for actions that do not warrant automated consultation outcomes via the DKey (i.e., are not eligible for the DKey) and that should undergo additional Field Office review. For a list of actions that will result in a May Affect Consistency letter through the NLEB and TCB DKey and are ineligible for predetermined consultation outcomes<sup>21</sup>, see Appendix 3. Actions that result in a May Affect Consistency letter through the Dkey may ultimately receive Service concurrence with a determination of “not likely to adversely affect” (federal projects) or “take is not reasonably certain to occur” (non-federal projects) outcomes; however, further Field Office review is needed first (see **Step 3**). For a list of actions that are eligible for “no effect” or “not likely to adversely affect” outcomes with incorporation of avoidance and minimization measures within the DKey, see Appendix 4. Instructions for reviewing projects and using DKeys through IPaC are available on the Service’s IPaC website (see link above in **Step 1**). After evaluating project impacts using the DKey, if the consultation outcome is “no effect” or “not likely to adversely affect” (federal projects) or the project “is not reasonably certain to cause incidental take” (non-federal actions), no further action is needed for these species. Project proponents will receive a consistency letter that can be retained for their records. If the consultation outcome in the DKey results in a “may affect,” proceed to **Step 3**.

**Step 3 – Coordinate with the Field Office for projects that receive a “may affect” determination in the DKey).** For projects that receive a “may affect” determination in the DKey, Field Offices will review project-specific information, including project activities and potential effects to NLEB and/or TCB from those activities. Project proponents may receive Service concurrence with a determination of “not likely to adversely affect” (federal projects) or “take is not reasonably certain to occur” (non-federal projects) outcomes either based on additional project-specific information or if additional voluntary conservation measures<sup>22</sup> are implemented as needed. In coordination with the project proponent, if the Field Office agrees that the project will have “no effect,” is “not likely to adversely affect,” or “take is not reasonably certain to occur” for NLEB and/or TCB, no further action would be expected for these species. If the Field Office concurs with the federal action agency’s determination of “likely to adversely affect” NLEB and/or TCB, continue to **Step 4**. For non-federal actions for which take is reasonably certain to occur, project proponents may choose to apply for an incidental take permit depending on their own assessment and continue to **Step 4** if desired.

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<sup>20</sup> NLEB and TCB DKey Standing Analysis available here: <https://www.fws.gov/library/collections/northern-long-eared-bat-and-tricolored-bat-range-wide-determination-key>.

<sup>21</sup> Actions ineligible for predetermined consultation outcomes in the DKey need further review by the Field Office. This does not mean the proposed action equates to a “likely to adversely affect” determination – it just means the project is complex enough that the action needs further review by the Field Office.

<sup>22</sup> In most cases, conservation measures that would result in “not likely to adversely affect” would be more inclusive and protective of the species than the MCMs described in Step 4.

**Step 4 – For projects that are “likely to adversely affect” (federal projects) NLEB and/or TCB, or when “take is reasonably certain to occur” (non-federal actions), the Service recommends that project proponents incorporate Minimum Conservation Measures (MCMs) into the proposed action (Table 1).** Based on our consultation and recovery experience with listed bats, we developed MCMs to be protective of the most sensitive life stages and to promote recovery. One of our primary goals in developing MCMs was to provide regulatory predictability and consistency across both species’ wide ranges and the many Field Offices that will be consulting with federal agencies and project proponents. We anticipate that even with the inclusion of these measures, adverse effects and take may occur. The Service determined these MCMs would appropriately minimize or offset the impact of incidental take on the species for most projects (see Appendix 5 for MCM rationales). For section 7 formal consultation for NLEB and/or TCB, if the federal agency includes the recommended MCMs in the project, and the Service determines in its biological opinion the proposed action is not likely to jeopardize either species, the Service does not anticipate the need to specify any additional reasonable and prudent measures.<sup>23</sup> There may be cases where these measures are not feasible, and we recommend federal agencies discuss with the Field Office why that may be the case. When appropriate and warranted, Federal agencies are encouraged to include additional conservation measures to help conserve NLEB and/or TCB under ESA section 7(a)(1). For non-federal actions under ESA section 10, we also recommend these measures be included in Habitat Conservation Plans, which require non-federal project proponents to minimize and mitigate the impacts of the take of either NLEB and/or TCB to the maximum extent practicable in order to attain an incidental take permit.

Table 1. **Minimum Conservation Measures** (MCMs) for projects that are “likely to adversely affect” (federal projects) or when “take is reasonably certain to occur” (non-federal actions) NLEB and/or TCB (see Appendix 5 for MCM rationales).<sup>24</sup>

Minimum Conservation Measure (MCM)		Applicable Range <sup>25</sup>	Time of Year Restrictions <sup>26</sup>
MCM-1	Avoid activities resulting in the disruption or disturbance of NLEB and/or TCB in their hibernacula during hibernation.	Hibernating	Hibernation

<sup>23</sup> As part of the terms and conditions of an Incidental Take Statement, the Service is obligated to require monitoring and report the impacts of incidental take (50 CFR 402.14(i)(3)); therefore, project-specific monitoring and reporting may also be required and are not included here.

<sup>24</sup> Implementation of (only) the MCMs described in Step 4 will typically not result in “not likely to adversely affect” determinations.

<sup>25</sup> Hibernating Range (Hibernating), Year-round active Zone 1 (YRA-Zone 1), and Year-round active Zone 2 (YRA-Zone 2); see Appendix 1.

<sup>26</sup> See Bat Activity Periods, Appendix 2.

Minimum Conservation Measure (MCM)		Applicable Range <sup>25</sup>	Time of Year Restrictions <sup>26</sup>
MCM-2	Avoid activities resulting in adverse effects to NLEB and/or TCB hibernaculum entrance(s) or internal environments (e.g., adverse alterations to airflow, microclimate, and hydrology) at any time of year.	Hibernating	All year
MCM-3	Avoid removing suitable roost trees within 0.25-mile of a known NLEB and/or TCB hibernaculum entrance(s) during spring staging and fall swarming. In addition, avoid removing suitable roost trees within 0.25-mile of a known NLEB and/or TCB hibernaculum when flightless young are present (i.e., pup season). <sup>27</sup>	Hibernating	Spring staging Fall swarming Pup season
MCM-4	Avoid removing known roost trees and suitable roost trees within 0.25-mile of a known NLEB and/or TCB maternity roost during the pup season.	Hibernating YRA-Zone 1 YRA-Zone 2	Pup season
MCM-5	Avoid removing suitable roost trees within 1.5-miles of a NLEB and/or TCB capture or acoustic record <sup>28</sup> during the pup season.	Hibernating YRA-Zone 1 YRA-Zone 2	Pup season
MCM-6	If the project area is located outside of known buffered locations but within an area where NLEB and/or TCB may be present (see <b>Consultation Range</b> ), conduct a voluntary presence/absence survey following the Service's <i>Guidelines</i> or assume presence and avoid removing suitable roost trees during the pup season.	Hibernating YRA-Zone 1 YRA-Zone 2	Pup season
MCM-7	Avoid removing known and suitable roost trees within 0.25-mile of a known NLEB and/or TCB roost between December 15 and February 15. <sup>29</sup>	YRA-Zone 1	Winter torpor

<sup>27</sup> Project proponents may conduct a voluntary presence/absence survey following the Service's *Guidelines*. If the results of presence/absence surveys indicate NLEB and/or TCB is not present during the summer, trees may be removed outside the spring staging and fall swarming periods.

<sup>28</sup> Acoustic records should meet the maximum likelihood estimator from Service approved software programs and/or be manually vetted. Refer to the most recent version of the Service's *Guidelines* for more information.

<sup>29</sup> Project proponents may remove trees between December 15 and February 15 if temperatures are above 40 degrees Fahrenheit with Field Office approval.

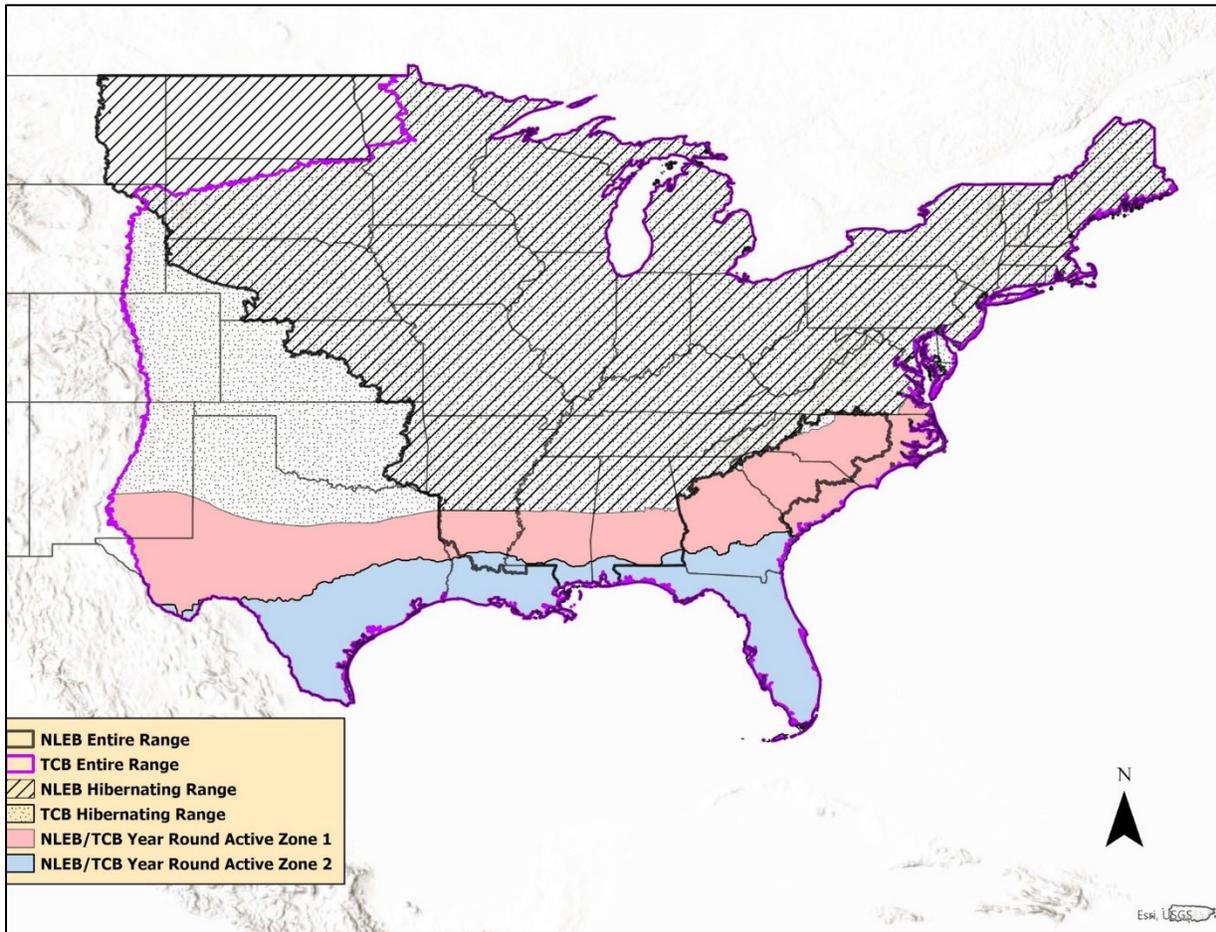
Minimum Conservation Measure (MCM)		Applicable Range <sup>25</sup>	Time of Year Restrictions <sup>26</sup>
MCM-8	Avoid removing suitable roost trees within 1.5-miles of a NLEB and/or TCB capture or acoustic record <sup>30</sup> between December 15 and February 15. <sup>27</sup>	YRA-Zone 1	Winter torpor
MCM-9	If the project area is located outside of known buffered locations, but within an area where NLEB and/or TCB may be present (see <b>Consultation Range</b> ), conduct a voluntary presence/absence survey following the Service's <i>Guidelines</i> or assume presence and avoid removing suitable roost trees between December 15 and February 15. <sup>27</sup>	YRA-Zone 1	Winter torpor
MCM-10	Offset any remaining impacts of incidental take that were not avoided. <sup>31</sup> For example, offsetting measures could include (but are not limited to) restoring or protecting known habitat for the affected species, locating and protecting new colonies, and treating NLEB and/or TCB for white-nose syndrome (WNS) if treatments are available. <sup>32</sup>	Hibernating YRA-Zone 1 YRA-Zone 2	Not applicable

<sup>30</sup> Acoustic records should meet the maximum likelihood estimator from Service approved software programs and/or be manually vetted. Refer to the most recent version of the Service's *Guidelines* for more information.

<sup>31</sup> Coordinate with the Field Office on potential offsets.

<sup>32</sup> WNS treatment requires approval from the local Field Office in coordination with the Service's regional WNS coordinators to ensure consistency with policies.

**Appendix 1.** NLEB and TCB Hibernating Ranges and Year-Round Active Zones 1 and 2.



**Appendix 2. Bat Activity Periods.**

State	Hibernation	Winter Torpor <sup>33</sup>	Spring Staging <sup>34</sup>	Summer Occupancy	Pup Season	Fall Swarming <sup>35</sup>
	Timeframe when most bats are hibernating (i.e., inactive <sup>36</sup> season)	Timeframe when mean winter temperatures fall below 40° F and bats roosting in trees are in torpor <sup>37</sup>	Timeframe when most bats are emerging from hibernation, roosting in trees near hibernacula, and preparing for migration to summer home range	Timeframe when bats are present and roosting in trees on their summer home range and/or roosting in colonies <sup>38</sup>	Timeframe during late pregnancy and when most young are born until they can fly and forage independently	Period of increased activity near hibernacula (including foraging, roosting in trees, and mating) prior to hibernation
Alabama: Hibernating Range	Nov 16 – Mar 14	N/A	Mar 15 – Apr 30	Mar 15 – Sept 30	May 15 – July 31	Sept 1 – Nov 15
Alabama: Year-round Active Range (Zone 1) <sup>39</sup>	N/A	Dec 15 – Feb 15	N/A	Mar 15 – July 15	May 1 – July 15	N/A
Alabama: Year-round Active Range (Zone 2)	N/A	N/A	N/A	Mar 15 – July 15	May 1 – July 15	N/A
Arkansas	Nov 16 – Mar 14	N/A	Mar 15 – Apr 30	Mar 15 – Sept 30	May 15 – July 31	Aug 16 – Nov 15

<sup>33</sup> Only applies in Year-Round Active Zone 1 (see Appendix 1).

<sup>34</sup> We currently have no information to inform spring staging timeframe near winter roosts within the year-round active portion of the NLEB or TCB range; consequently, the Service will consider new information in the future that may inform spring staging timeframe.

<sup>35</sup> We currently have no information to inform fall swarming timeframe near winter roosts within the year-round active portion of the NLEB or TCB range; consequently, the Service will consider new information in the future that may inform fall swarming timeframe.

<sup>36</sup> The “active season” is the inverse of the hibernation period. If no hibernation period is listed, bats in this area exhibit activity year-round.

<sup>37</sup> State of lowered body temperature and metabolic activity.

<sup>38</sup> NLEB (hibernating range) often remain in colonies until the end of summer occupancy. TCB (rangewide) and NLEB (year-round active range) roost singly once young can fly and forage independently (i.e., the end of the pup season).

<sup>39</sup> For Alabama, if your project falls within suitable summer IBAT habitat and IBATs are assumed or confirmed present, then default to using the more protective activity periods (i.e., Alabama: Hibernating Range).

State	Hibernation	Winter Torpor <sup>33</sup>	Spring Staging <sup>34</sup>	Summer Occupancy	Pup Season	Fall Swarming <sup>35</sup>
	Timeframe when most bats are hibernating (i.e., inactive <sup>36</sup> season)	Timeframe when mean winter temperatures fall below 40° F and bats roosting in trees are in torpor <sup>37</sup>	Timeframe when most bats are emerging from hibernation, roosting in trees near hibernacula, and preparing for migration to summer home range	Timeframe when bats are present and roosting in trees on their summer home range and/or roosting in colonies <sup>38</sup>	Timeframe during late pregnancy and when most young are born until they can fly and forage independently	Period of increased activity near hibernacula (including foraging, roosting in trees, and mating) prior to hibernation
Colorado	Nov 16 – Mar 31	N/A	Apr 1 – May 14	Apr 1 – Sept 30	May 15 – July 31	Aug 16 – Nov 15
Connecticut	Nov 1 – Apr 14	N/A	Apr 15 – May 14	Apr 15 – Sept 30	June 1 – Aug 15	Aug 16 – Oct 31
Delaware	Nov 16 – Mar 31	N/A	Apr 1 – May 14	Apr 1 – Sept 30	May 15 – July 31	Aug 16 – Nov 15
District of Columbia	Nov 16 – Mar 31	N/A	Apr 1 – May 14	Apr 1 – Sept 30	May 15 – July 31	Aug 16 – Nov 15
Florida	N/A	N/A	N/A	Mar 15 – July 15	May 1 – July 15	N/A
Georgia: Hibernating Range	Nov 16 – Mar 14	N/A	Mar 15 – Apr 30	Mar 15 – Sept 30	May 15 – July 31	Sept 1 – Nov 15
Georgia: Year-round Active Range (Zone 1)	N/A	Dec 15 – Feb 15	N/A	Mar 15 – July 15	May 1 – July 15	N/A
Georgia: Year-round Active Range (Zone 2)	N/A	N/A	N/A	Mar 15 – July 15	May 1 – July 15	N/A
Illinois	Nov 16 – Mar 31	N/A	Apr 1 – May 14	Apr 1 – Sept 30	May 15 – July 31	Aug 16 – Nov 15
Indiana	Nov 16 – Mar 31	N/A	Apr 1 – May 14	Apr 1 – Sept 30	May 15 – July 31	Aug 16 – Nov 15
Iowa	Nov 16 – Mar 31	N/A	Apr 1 – May 14	Apr 1 – Sept 30	May 15 – July 31	Aug 16 – Nov 15
Kansas	Nov 16 – Mar 31	N/A	Apr 1 – May 14	Apr 1 – Sept 30	May 15 – July 31	Aug 16 – Nov 15

State	Hibernation	Winter Torpor <sup>33</sup>	Spring Staging <sup>34</sup>	Summer Occupancy	Pup Season	Fall Swarming <sup>35</sup>
	Timeframe when most bats are hibernating (i.e., inactive <sup>36</sup> season)	Timeframe when mean winter temperatures fall below 40° F and bats roosting in trees are in torpor <sup>37</sup>	Timeframe when most bats are emerging from hibernation, roosting in trees near hibernacula, and preparing for migration to summer home range	Timeframe when bats are present and roosting in trees on their summer home range and/or roosting in colonies <sup>38</sup>	Timeframe during late pregnancy and when most young are born until they can fly and forage independently	Period of increased activity near hibernacula (including foraging, roosting in trees, and mating) prior to hibernation
Kentucky	Nov 16 – Mar 31	N/A	Apr 1 – May 14	Apr 1 – Oct 15	May 15 – July 31	Aug 16 – Nov 15
Louisiana: Year-round Active Range (Zone 1)	N/A	Dec 15 – Feb 15	N/A	Mar 15 – July 15	May 1 – July 15	N/A
Louisiana: Year-round Active Range (Zone 2)	N/A	N/A	N/A	Mar 15 – July 15	May 1 – July 15	N/A
Maine	Nov 1 – Apr 14	N/A	Apr 15 – May 14	Apr 15 – Sept 30	June 1 – Aug 15	Aug 16 – Oct 31
Maryland	Nov 16 – Mar 31	N/A	Apr 1 – May 14	Apr 1 – Sept 30	May 15 – July 31	Aug 16 – Nov 15
Massachusetts (Inland)	Nov 1 – Apr 14	N/A	Apr 15 – May 14	Apr 15 – Sept 30	June 1 – Aug 15	Aug 16 – Oct 31
Massachusetts (Coastal) <sup>40</sup>	Dec 1 – Mar 14	N/A	Mar 15 – May 14	Mar 15 – Sept 30	June 1 – Aug 15	Aug 16 – Nov 30
Michigan (Outside Indiana Bat Range)	Nov 1 – Apr 14	N/A	Apr 15 – May 14	Apr 15 – Sept 30	June 1 – Aug 15	Aug 16 – Oct 31
Michigan (Within Indiana Bat Range)	Nov 16 – Mar 31	N/A	Apr 1 – May 14	Apr 1 – Sept 30	May 15 – July 31	Aug 16 – Nov 15

<sup>40</sup> Coastal Massachusetts includes Martha's Vineyard, Nantucket, and Cape Cod.

State	Hibernation	Winter Torpor <sup>33</sup>	Spring Staging <sup>34</sup>	Summer Occupancy	Pup Season	Fall Swarming <sup>35</sup>
	Timeframe when most bats are hibernating (i.e., inactive <sup>36</sup> season)	Timeframe when mean winter temperatures fall below 40° F and bats roosting in trees are in torpor <sup>37</sup>	Timeframe when most bats are emerging from hibernation, roosting in trees near hibernacula, and preparing for migration to summer home range	Timeframe when bats are present and roosting in trees on their summer home range and/or roosting in colonies <sup>38</sup>	Timeframe during late pregnancy and when most young are born until they can fly and forage independently	Period of increased activity near hibernacula (including foraging, roosting in trees, and mating) prior to hibernation
Minnesota	Nov 1 – Apr 14	N/A	Apr 15 – May 14	Apr 15 – Sept 30	June 1 – Aug 15	Aug 16 – Oct 31
Mississippi: Hibernating Range	Nov 16 – Mar 14	N/A	Mar 15 – Apr 30	Mar 15 – Sept 30	May 15 – July 31	Sept 1 – Nov 15
Mississippi: Year-round Active Range (Zone 1)	N/A	Dec 15 – Feb 15	N/A	Mar 15 – July 15	May 1 – July 15	N/A
Mississippi: Year-round Active Range (Zone 2)	N/A	N/A	N/A	Mar 15 – July 15	May 1 – July 15	N/A
Missouri	Nov 16 – Mar 31	N/A	Apr 1 – May 14	Apr 1 – Oct 15	May 15 – July 31	Aug 16 – Nov 15
Montana	Nov 1 – Apr 14	N/A	Apr 15 – May 14	Apr 15 – Sept 30	June 1 – Aug 15	Aug 16 – Oct 31
Nebraska	Nov 16 – Mar 31	N/A	Apr 1 – May 14	Apr 1 – Sept 30	May 15 – July 31	Aug 16 – Nov 15
New Hampshire	Nov 1 – Apr 14	N/A	Apr 15 – May 14	Apr 15 – Sept 30	June 1 – Aug 15	Aug 16 – Oct 31
New Jersey	Nov 16 – Mar 31	N/A	Apr 1 – May 14	Apr 1 – Sept 30	May 15 – July 31	Aug 16 – Nov 15
New Mexico: Hibernating Range	Nov 16 – Mar 31	N/A	Apr 1 – May 14	Apr 1 – Sept 30	May 15 – July 31	Sept 1 – Nov 15
New Mexico: Year-round Active Range (Zone 1)	N/A	Dec 15 – Feb 15	N/A	Apr 1 – July 15	May 1 – July 15	N/A

State	Hibernation	Winter Torpor <sup>33</sup>	Spring Staging <sup>34</sup>	Summer Occupancy	Pup Season	Fall Swarming <sup>35</sup>
	Timeframe when most bats are hibernating (i.e., inactive <sup>36</sup> season)	Timeframe when mean winter temperatures fall below 40° F and bats roosting in trees are in torpor <sup>37</sup>	Timeframe when most bats are emerging from hibernation, roosting in trees near hibernacula, and preparing for migration to summer home range	Timeframe when bats are present and roosting in trees on their summer home range and/or roosting in colonies <sup>38</sup>	Timeframe during late pregnancy and when most young are born until they can fly and forage independently	Period of increased activity near hibernacula (including foraging, roosting in trees, and mating) prior to hibernation
New Mexico: Year-round Active Range (Zone 2)	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>	Apr 1 – July 15	May 1 – July 15	<b>N/A</b>
New York (Inland)	Nov 1 – Apr 14	<b>N/A</b>	Apr 15 – May 14	Apr 15 – Sept 30	June 1 – Aug 15	Aug 16 – Oct 31
New York (Long Island)	Dec 1 – Feb 28	<b>N/A</b>	Mar 1 – May 14	Mar 1 – Sept 30	June 1 – Aug 15	Aug 16 – Nov 30
North Carolina: Hibernating Range	Nov 16 – Mar 31	<b>N/A</b>	Apr 1 – May 14	Apr 1 – Sept 30	May 15 – July 31	Aug 16 – Nov 15
North Carolina: Year-round Active Range (Zone 1)	<b>N/A</b>	Dec 15 – Feb 15	<b>N/A</b>	Apr 1 – July 15	May 1 – July 15	<b>N/A</b>
North Dakota	Nov 1 – Apr 14	<b>N/A</b>	Apr 15 – May 14	Apr 15 – Sept 30	June 1 – Aug 15	Aug 16 – Oct 31
Ohio	Nov 16 – Mar 31	<b>N/A</b>	Apr 1 – May 14	Apr 1 – Sept 30	May 15 – July 31	Aug 16 – Nov 15
Oklahoma	Nov 16 – Mar 14	<b>N/A</b>	Mar 15 – Apr 30	Mar 15 – Sept 30	May 15 – July 31	Aug 16 – Nov 15
Pennsylvania	Nov 16 – Mar 31	<b>N/A</b>	Apr 1 – May 14	Apr 1 – Sept 30	May 15 – July 31	Aug 16 – Nov 15
Rhode Island	Nov 1 – Apr 14	<b>N/A</b>	Apr 15 – May 14	Apr 15 – Sept 30	June 1 – Aug 15	Aug 16 – Oct 31
South Carolina: Hibernating Range	Nov 16 – Mar 31	<b>N/A</b>	Apr 1 – May 14	Apr 1 – Sept 30	May 15 – July 31	Sept 1 – Nov 15

State	Hibernation	Winter Torpor <sup>33</sup>	Spring Staging <sup>34</sup>	Summer Occupancy	Pup Season	Fall Swarming <sup>35</sup>
	Timeframe when most bats are hibernating (i.e., inactive <sup>36</sup> season)	Timeframe when mean winter temperatures fall below 40° F and bats roosting in trees are in torpor <sup>37</sup>	Timeframe when most bats are emerging from hibernation, roosting in trees near hibernacula, and preparing for migration to summer home range	Timeframe when bats are present and roosting in trees on their summer home range and/or roosting in colonies <sup>38</sup>	Timeframe during late pregnancy and when most young are born until they can fly and forage independently	Period of increased activity near hibernacula (including foraging, roosting in trees, and mating) prior to hibernation
South Carolina: Year-round Active Range (Zone 1)	<b>N/A</b>	Dec 15 – Feb 15	<b>N/A</b>	Apr 1 – July 15	May 1 – July 15	<b>N/A</b>
South Dakota (Plains)	Nov 1 – Apr 14	<b>N/A</b>	Apr 15 – May 14	Apr 15 – Sept 30	June 1 – Aug 15	Aug 16 – Oct 31
South Dakota (Black Hills)	Oct 1 – April 30	<b>N/A</b>	May 1 – June 1	May 1 – Aug 31	June 15 – Aug 31	Aug 16 – Sept 30
Tennessee	Nov 16 – Mar 31	<b>N/A</b>	Apr 1 – May 14	Apr 1 – Sept 30	May 15 – July 31	Aug 16 – Nov 15
Texas: Hibernating Range	Nov 16 – Mar 14	<b>N/A</b>	Mar 15 – Apr 30	Mar 15 – Sept 30	May 15 – July 31	Sept 1 – Nov 15
Texas: Year-round Active Range (Zone 1)	<b>N/A</b>	Dec 15 – Feb 15	<b>N/A</b>	Mar 15 – July 15	May 1 – July 15	<b>N/A</b>
Texas: Year-round Active Range (Zone 2)	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>	Mar 15 – July 15	May 1 – July 15	<b>N/A</b>
Vermont	Nov 1 – Apr 14	<b>N/A</b>	Apr 15 – May 14	Apr 15 – Sept 30	June 1 – Aug 15	Aug 16 – Oct 31
Virginia: Hibernating Range	Nov 16 – Mar 31	<b>N/A</b>	Apr 1 – May 14	Apr 1 – Sept 30	May 15 – July 31	Aug 16 – Nov 15
Virginia: Year-round Active Range (Zone 1)	<b>N/A</b>	Dec 15 – Feb 15	<b>N/A</b>	Apr 1 – July 15	May 1 – July 15	<b>N/A</b>
West Virginia	Nov 16 – Mar 31	<b>N/A</b>	Apr 1 – May 14	Apr 1 – Sept 30	May 15 – July 31	Aug 16 – Nov 15

<b>State</b>	<b>Hibernation</b>	<b>Winter Torpor<sup>33</sup></b>	<b>Spring Staging<sup>34</sup></b>	<b>Summer Occupancy</b>	<b>Pup Season</b>	<b>Fall Swarming<sup>35</sup></b>
	Timeframe when most bats are hibernating (i.e., inactive <sup>36</sup> season)	Timeframe when mean winter temperatures fall below 40° F and bats roosting in trees are in torpor <sup>37</sup>	Timeframe when most bats are emerging from hibernation, roosting in trees near hibernacula, and preparing for migration to summer home range	Timeframe when bats are present and roosting in trees on their summer home range and/or roosting in colonies <sup>38</sup>	Timeframe during late pregnancy and when most young are born until they can fly and forage independently	Period of increased activity near hibernacula (including foraging, roosting in trees, and mating) prior to hibernation
Wisconsin	Nov 1 – Apr 14	N/A	Apr 15 – May 14	Apr 15 – Sept 30	June 1 – Aug 15	Aug 16 – Oct 31
Wyoming (Plains)	Nov 1 – Apr 14	N/A	Apr 15 – May 14	Apr 15 – Sept 30	June 1 – Aug 15	Aug 16 – Oct 31
Wyoming (Black Hills)	Oct 1 – April 30	N/A	May 1 – June 1	May 1 – Aug 31	June 15 – Aug 31	Aug 16 – Sept 30

**Appendix 3.** Actions that are **INELIGIBLE**<sup>41</sup> for predetermined “no effect” (NE) or “not likely to adversely affect” (NLAA) automated consultation outcomes in the rangewide NLEB and TCB DKey (see the Standing Analysis found on [DKey page](#) for more information). These actions may still receive Service concurrence with a determination of “not likely to adversely affect” (federal projects) or “take is not reasonably certain to occur” (non-federal projects) outcomes; however, further Field Office review is needed.

Actions requiring Field Office review include the following:

1. Purposeful take of either bat species – for example, capture and handling for surveys or research.
2. Construction or operation of wind turbines.
3. Actions within 0.5-mile of an entrance to a known NLEB or TCB hibernaculum.
4. Actions that affect areas that contain potentially suitable hibernacula (e.g., caves (or associated sinkholes, fissures, or other karst features), mines, rocky outcroppings, or tunnels) when a survey following the Service’s *Range-wide Indiana Bat and Northern Long-eared Bat Survey Guidelines (Guidelines)*<sup>42</sup> has not ruled out use by NLEB or TCB.
5. Actions in areas that contain (1) talus or (2) anthropogenic or naturally formed rock shelters or crevices in rocky outcrops, rock faces or cliffs, in identified states where NLEB or TCB may use these features as winter roosts or hibernation sites, unless the Service confirms in writing that these rock features are not likely to contain suitable roosts and/or that the proposed action would not affect these features.
6. Actions that affect any area within 150 feet of a known NLEB or TCB roost tree.
7. Actions within 0.25-mile of a bridge or culvert with a known occurrence of NLEB or TCB.
8. Actions that fall within the scope of a range-wide programmatic consultation with the Federal Highway Administration, Federal Railroad Administration, and Federal Transit Administration (range-wide transportation programmatic) for transportation-related actions within the range of the Indiana bat, northern long-eared bat, and/or tricolored bat.
9. For the following transportation actions (that do not fall within the scope of the range-wide transportation programmatic):
  - a. Actions that affect bridges in Georgia, Michigan, Mississippi, Missouri, and North Dakota where the Service has determined individual review is always necessary.
  - b. Actions that affect bridges in all other States not listed above when a survey following the Service’s *Guidelines* has not ruled out use by NLEB or TCB.
  - c. For TCB: Actions that affect culverts  $\geq 23$  feet (7.0 meters) in length and  $\geq 3.0$  feet (0.9 meters) in height unless a survey following the Service’s *Guidelines* has ruled out use by TCB.

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<sup>41</sup> Actions ineligible for automated NE or NLAA outcomes in the DKey need further review by the Field Office. This does not mean all actions listed here equate to a “likely to adversely affect” determination – it just means the project is complex enough that the action needs further review by the Field Office.

<sup>42</sup> Available here: <https://www.fws.gov/media/range-wide-indiana-bat-and-northern-long-eared-bat-survey-guidelines>.

- d. For NLEB: Actions that affect culverts  $\geq 23$  feet (7.0 meters) in length and  $\geq 4.5$  feet (1.4 meters) in height unless a survey following the Service's *Guidelines* has ruled out use by NLEB.

The following actions are also **INELIGIBLE** for a predetermined NE or NLAA outcome in the DKey if they affect areas **within 1,000 feet of suitable NLEB and/or TCB summer habitat**.<sup>43</sup> For these actions, additional coordination with the Field Office will be required. These actions may still receive Service concurrence with a determination of "not likely to adversely affect" (federal projects) or "take is not reasonably certain to occur" (non-federal projects) outcomes; however, further Field Office review is needed. Note: these actions may receive Service concurrence with a determination of "not likely to adversely affect" if a survey following the Service's *Guidelines*<sup>44</sup> has ruled out use by NLEB or TCB.

1. Actions that introduce a new or increased threat of bat-vehicle collisions (that do not fall within the scope of the range-wide transportation programmatic (see above)).
2. Actions that include intentional removal of NLEB or TCB from a building or structure.
3. Actions that involve removal, modification, or maintenance of a human-made structure (barn, house, or other building) known or suspected to contain roosting bats.
4. Actions that involve creation of a new water-borne contaminant source, a new point source discharge from a facility other than a water treatment plant or storm water system, military training that affects suitable habitat, application or drift of pesticides other than herbicides (e.g., fungicides, insecticides, or rodenticides) into suitable summer habitat, or chronic or intense nighttime noise.
5. Actions that include drilling or blasting activities in certain states (Alabama, Arkansas, Kansas, Kentucky, Michigan, Nebraska, New York, and Ohio) where the Service has determined individual project review outside the DKey is always necessary.
6. Actions that include drilling or blasting in all other States (not listed in #5 above) that will affect suitable summer habitat when bats may be present. Actions that include drilling or blasting that will affect suitable hibernacula will be included within actions within 0.5-mile of an entrance to a known NLEB or TCB hibernaculum and actions that affect areas that contain potentially suitable hibernacula.
7. Actions that result in cutting or other means of knocking down, bringing down, topping, or trimming suitable NLEB and/or TCB roost trees on Long Island, New York.
8. Actions that include tree cutting, limbing and trimming within established utility rights-of-way, if they will expand the maintained utility corridor or include tree cutting outside of the established right-of-way. Note: tree cutting, trimming, or limbing can be conducted outside maintained utility rights-of-way, but tree cutting, trimming or limbing will be subject to additional restrictions as noted.

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<sup>43</sup> If presence is unknown, project proponents have the option to assume presence or conduct voluntary surveys following the most recent version of the Service's *Guidelines*. If a survey does not detect NLEB and/or TCB, the project would be eligible for a predetermined NE or NLAA consultation outcome via the DKey.

<sup>44</sup> Available here: <https://www.fws.gov/media/range-wide-indiana-bat-and-northern-long-eared-bat-survey-guidelines>.

**Appendix 4.** Actions that are **ELIGIBLE** for predetermined “no effect” (NE) or “not likely to adversely affect” (NLAA) consultation outcomes in the rangewide NLEB and TCB DKey<sup>45</sup> (see the Standing Analysis found on [DKey page](#) for more information). For action types that do not appear below, these actions/projects may still receive Service concurrence with a determination of “not likely to adversely affect” (federal projects) or “take is not reasonably certain to occur” (non-federal projects) outcomes; however, further Field Office review is needed.

The following actions are **ELIGIBLE** for a predetermined NE or NLAA outcome in the DKey within NLEB and/or TCB suitable summer habitat:

1. Herbicide application when restricted to targeted methods, such as hack-and-squirt, basal bark, injections, cut-stump, or spot-spraying (foliar spraying on individual herbaceous plants with no foliar spraying of deciduous tree leaves or Spanish moss).
2. Addition of artificial lighting provided it is downward facing and does not increase ambient lighting conditions<sup>46</sup> within NLEB and/or TCB suitable summer habitat.
3. Prescribed fire when average flame length is  $\leq 4$  feet in Colorado, Kansas, Montana, Nebraska, North Dakota, New Mexico, Oklahoma, South Dakota, and Wyoming or  $\leq 8$  feet (all other States), is conducted when temperatures are  $\geq 40$  degrees Fahrenheit, and when fire will occur outside the pup season (see Bat Activity Periods, Appendix 2).
4. Tree removal (i.e., cutting or other means of knocking down, bringing down, topping, or trimming suitable NLEB and/or TCB roost trees) is conducted (see Bat Activity Periods, Appendix 2):
  - a. Outside the summer occupancy period for NLEB.
  - b. Outside the pup season for TCB.
  - c. Outside the winter torpor period in Year-Round Active Zone 1 (Appendix 1).
  - d. Outside spring staging and fall swarming periods within known NLEB and/or TCB spring staging/fall swarming areas (i.e., 5.0-miles or 3.0-miles from NLEB or TCB hibernaculum entrances, respectfully) in the hibernating range.
  - e. And, when the extent of tree removal does not exceed the following:

Forest cover (percent) within 5x5 km grid cell where the project area intersects <sup>47</sup>	Tree removal thresholds (acres) with time of year restrictions (see above)
0–9.9	$\leq 0.5$
10.0–19.9	$\leq 5$
20.0–29.9	$\leq 40$
30.0–100	$\leq 100$

<sup>45</sup> If presence is unknown, project proponents have the option to assume presence or conduct voluntary surveys following the most recent version of the Service’s *Range-wide Indiana Bat and Northern Long-eared Bat Survey Guidelines*, available here: <https://www.fws.gov/media/range-wide-indiana-bat-and-northern-long-eared-bat-survey-guidelines>. If a survey does not detect NLEB and/or TCB, the project would be eligible for a predetermined NE or NLAA consultation outcome via the DKey.

<sup>46</sup> Does not increase the cumulative amount of lumens above the previously existing baseline conditions.

<sup>47</sup> The Service calculated the percent forest cover for every 5x5 km grid cell within the NLEB and TCB range using the National Land Cover Database (available here: <https://www.usgs.gov/centers/eros/science/national-land-cover-database>). These forest density maps are built into the DKey where they can also be viewed.

**Appendix 5. Rationales for Minimum Conservation Measures (MCMs)** for projects that are “likely to adversely affect” (federal projects) NLEB and/or TCB, or when “take is reasonably certain to occur” (non-federal actions).

Rationales for Minimum Conservation Measures (MCMs) apply to both NLEB and TCB. Specific to NLEB, the NLEB Species Status Assessment analyzed NLEB population trends and status, providing evidence that NLEB’s viability had declined substantially and is expected to continue to rapidly decline over the near term (USFWS 2022a, entire); therefore, the species required a status change from threatened to endangered since it is now in danger of extinction (USFWS 2022b, entire). With the status change, we recognized that conservation measures included in the NLEB threatened 4(d) rule may not allow for conservation and recovery of remaining populations. Within the rationales below, we noted where there were changes to measures from those included in the NLEB 4(d) rule.

**MCM-1** – Avoid activities resulting in the disruption or disturbance of NLEB and/or TCB in their hibernacula during hibernation.<sup>48</sup>

Winter is a challenging period in general for bats and can be particularly stressful for those affected by white-nose syndrome (WNS). Hibernating bats balance their physical condition (e.g., fat reserves upon entering hibernation), hibernaculum requirements (e.g., stable temperatures, high humidity), social resources (e.g., roosting singly or in groups), and metabolic condition (i.e., degree of torpor, or a state of lowered body temperature and metabolic activity) to meet winter survival needs. During the winter, NLEB and TCB must maintain body temperature above freezing, minimize water loss, and meet energetic needs until prey become available again. Disturbance at hibernacula often leads to increased arousals during hibernation, which may cause accelerated depletion of critical fat reserves, which can significantly influence NLEB and TCB winter survival. Avoiding activities that result in disturbance at hibernacula will ensure protection of NLEB and TCB during hibernation.

**MCM-2** – Avoid activities resulting in adverse effects to NLEB and/or TCB hibernaculum entrance(s) or internal environments (e.g., adverse alterations to airflow, microclimate, and hydrology) at any time of year.<sup>49</sup>

Winter hibernacula are a primary driver influencing NLEB and TCB distributions (e.g., Kurta 1982, p. 302; Geluso et al. 2005, p. 406; Slider and Kurta 2011, p. 380). In the hibernating portion of their ranges (Appendix 1), NLEB and TCB typically select subterranean features (e.g., caves, abandoned mines, other karst features) as winter hibernacula, but have also been found hibernating in abandoned tunnels, crawl spaces, talus or rock crevices in rocky outcrops, rock faces or cliffs, and other shelter spaces offering similar structure and conditions (i.e., lack of disturbance, consistent temperature, humidity, and airflow). NLEB and TCB have shown a high degree of philopatry (i.e., using the same hibernaculum over multiple years; e.g., Pearson 1962, p. 30; Davis 1966, entire). Activities resulting in the physical alteration of a hibernaculum

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<sup>48</sup> This measure is unchanged from the former 4(d) rule for the NLEB (USFWS 2016, entire) and continues to be necessary for the conservation of the species.

<sup>49</sup> This measure is unchanged from the former 4(d) rule for the NLEB (USFWS 2016, entire) and continues to be necessary for the conservation of the species.

entrance may result in altered flight patterns, reduced access, and adverse alterations to airflow, temperature, and humidity, all of which may eliminate the site's suitability for hibernation (Spanjer and Fenton 2005, p. 1110; USFWS 2007, p. 71). Avoiding activities that would result in adverse effects to hibernaculum entrances and/or internal environments will ensure continued suitability of NLEB and TCB winter hibernacula.

**MCM-3** – Avoid removing suitable roost trees within 0.25-mile of a known NLEB and/or TCB hibernaculum entrance(s) during spring staging and fall swarming. In addition, avoid removing suitable roost trees within 0.25-mile of a known NLEB and/or TCB hibernaculum when flightless young are present (i.e., pup season).<sup>50</sup>

This measure is slightly modified from the former 4(d) rule for the NLEB (USFWS 2016, entire) to allow some flexibility for tree removal, but still minimizes impacts during sensitive life stages. During the spring, when NLEB and TCB are emerging from hibernation, they will have their lowest fat reserves of the year and will be concentrated in trees near hibernacula while they forage in preparation for spring migration to summer habitat (i.e., spring staging). In the fall, there is a period of increased activity (including mating) near hibernacula prior to hibernation, and similar to spring staging, bats will be concentrated in trees near hibernacula (i.e., fall swarming). Cooler temperatures are also common in the early spring and late fall, and NLEB and TCB may be in deeper or prolonged torpor during these periods while roosting in trees near hibernacula. NLEB and TCB may roost up to 5.0-miles and 3.0-miles, respectively, from hibernacula during spring staging/fall swarming, although most individuals likely roost closer (Kurta et al. 1999, p. 8; Lowe 2012, p. 58; White et al. 2017, p. 43; ESI 2018, p. 20; Thalken et al. 2018, p. 1112; Tate 2020, p. 65). Additionally, NLEB and TCB maternity colonies may roost in suitable habitat in close proximity to hibernacula during the summer. Avoiding removal of suitable roost trees within 0.25-mile of known NLEB and/or TCB hibernaculum entrances during sensitive life periods (i.e., spring staging, fall swarming, and pup season) will minimize harm of NLEB and TCB roosting in trees near known hibernacula. Note that any tree removal conducted within 0.25-mile of a known NLEB or TCB hibernaculum (at any time of the year) should not result in adverse effects to hibernaculum entrance(s) and/or internal environments (see **MCM-2**).

**MCM-4** – Avoid removing known roost trees and suitable roost trees within 0.25-mile of a known NLEB and/or TCB maternity roost during the pup season.

This measure is modified from the former 4(d) rule for the NLEB (USFWS 2016, entire), which prohibited removal of known, occupied roost trees and other tree removal occurring within a 150-foot radius of known roosts during the pup season. While adult NLEB and TCB may be capable of flushing during tree removal activities, removal of occupied roosts when flightless young are present may result in direct injury or mortality. Based on NLEB and TCB radio-tracking studies, the species typically roost, commute, and forage within 1.5-miles of known roost trees (Veilleux et al. 2003, p. 1073; Leput 2004, p. 28; Helms 2010, p. 14; Timpone et al.

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<sup>50</sup> Project proponents may conduct a voluntary presence/absence survey following the Service's *Range-wide Indiana Bat and Northern Long-eared Bat Survey Guidelines*, available here: <https://www.fws.gov/media/range-wide-indiana-bat-and-northern-long-eared-bat-survey-guidelines>. If the results of presence/absence surveys indicate NLEB and/or TCB is not present during the summer, trees may be removed outside the spring staging and fall swarming periods.

2010, p. 118; Wisconsin DNR 2017, unpaginated; Swingen et al. 2018, pp. 26–27; Wisconsin DNR 2018, pp. 8–11; Cable and Willcox 2024, p. 6), and we refer to this area as the colony home range (USFWS 2024, p. 52). Typically, during consultation, Service Field Offices recommend implementing avoidance and minimization measures within the entire colony home range area (i.e., area within 1.5-mile of known roost trees). For this MCM, however, we are focused on minimizing impacts to flightless young within the core maternity colony roosting area. Core maternity colony roosting areas (i.e., area encompassing most or many roost trees used by a colony) are typically smaller than the colony home range (i.e., roosting, commuting, and foraging area) (Henderson and Broders 2008, p. 956; Poissant 2009, p. 67; Johnson et al. 2012, p. 227; Silvis et al. 2014, p. 286). Maternity colony roosting areas consist of many trees since NLEB and TCB colonies typically switch roost trees regularly (every 1–7 days). Poissant (2009, entire) observed the core maternity colony roost area among 5 TCB maternity colonies averaged 67 acres (range = 3.7–191 acres). For several NLEB studies that assessed the core maternity roost area, the average area was 52 acres (range = 3.2–235 acres; Foster and Kurta 1999, p. 666; Owen et al. 2003, p. 364; Henderson and Broders 2008, p. 956; Silvis et al. 2014, p. 286; Swingen et al. 2018, pp. 26–27; Hyzy et al. 2020, p. 62). Based on these studies, we estimate a typical colony roosting area for NLEB and TCB of 150 acres, which equates to 0.25-mile radius from known roosts. Consequently, avoiding removal of known and suitable roost trees within 0.25-mile of a known NLEB and/or TCB roost trees during the pup season will minimize harm to NLEB and TCB during this sensitive life period.

**MCM-5** – Avoid removing suitable roost trees within 1.5-miles of a NLEB and/or TCB capture or acoustic record<sup>51</sup> during the pup season.

This is a new measure that was not included in the former 4(d) rule for the NLEB (USFWS 2016, entire). In MCM-4, we described the NLEB and TCB maternity colony home range includes all suitable roosting, commuting, and foraging habitat within 1.5-miles of known roost trees. We assume if a NLEB and/or TCB is captured or acoustically detected during surveys and the roost tree(s) is not found, however, the capture or detection site may be anywhere within a 3.0-mile buffer since the capture or detection location could be at the edge of the 1.5-mile home range.<sup>52</sup> Since a 3.0-mile buffer encompasses four times more area than a 1.5-mile buffer (18,096 acres vs. 4,524 acres), it is reasonable to assume that only approximately 25 percent of a 3.0-mile buffered area is truly occupied by the documented NLEB or TCB maternity colony at any given time during the summer occupancy period, thus approximately 75 percent remains unoccupied or could be used by members of another undocumented colony. Using this same logic, a 1.5-mile buffer from capture or acoustic detection would ensure that application of this MCM applies to at least 39 percent of the area where the colony could be roosting. Consequently, avoiding removal

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<sup>51</sup> Acoustic records should meet the maximum likelihood estimator from Service approved software programs and/or be manually vetted. Refer to the most recent version of the Service's *Range-wide Indiana Bat and Northern Long-eared Bat Survey Guidelines*, available here: <https://www.fws.gov/media/range-wide-indiana-bat-and-northern-long-eared-bat-survey-guidelines>.

<sup>52</sup> Further explanation of this logic can be found in the Service's *Range-wide Indiana Bat and Northern long-eared bat Survey Guidelines*, Appendix G: The Outer-Tier Guidance, available here: <https://www.fws.gov/media/range-wide-indiana-bat-and-northern-long-eared-bat-survey-guidelines>.

of suitable roost trees located within 1.5-miles of a NLEB and/or TCB capture or acoustic record during the pup season will minimize harm to NLEB and TCB.

**MCM-6** – If the project area is located outside of known buffered locations but within an area where NLEB and/or TCB may be present (see **Consultation Range**), conduct a voluntary presence/absence survey following the Service’s *Guidelines* or assume presence and avoid removing suitable roost trees during the pup season.

This is a new measure that was not included in the former 4(d) rule for the NLEB (USFWS 2016, entire). As stated under **MCM-4** above, removal of occupied roosts during the pup season when flightless young are present may result in direct injury or mortality. Avoiding removal of suitable roost trees during the pup season will minimize harm of NLEB and TCBs potentially roosting in trees.

**MCM-7** – Avoid removing known and suitable roost trees within 0.25-mile of a known NLEB and/or TCB roost between December 15 and February 15<sup>53</sup> within Year-Round Active Zone 1.

This is a new measure that was not included in the former NLEB 4(d) rule (USFWS 2016, entire). We only learned that some NLEB exhibit year-round activity (Girder et al. 2016, p. 11; Jordan 2020, p. 672) after publication of the rule. Both NLEB and TCB in much of the southern portions of their ranges exhibit shorter torpor bouts (i.e., a state of lowered body temperature and metabolic activity) and remain active and feed year-round. During the winter in the year-round active portion of the range, in addition to roosting in road-associated culverts (most often) and bridges (less common), TCB will also roost in cavities in live trees, live and dead leaf clusters, and Spanish moss (Sandel et al. 2001, pp. 174–176; Newman et al. 2021, pp.1335–1336). In the year-round active range in winter, NLEB have been found roosting in trees with cavities, cracks or crevices, and exfoliating bark (Jordan 2020, p. 669; Garcia et al. 2023, p. 5).

To delineate the year-round active portion of the NLEB and TCB ranges, we compared winter bat activity data (e.g., captures, acoustic detections, culvert use) and the number of frost-free days and determined that NLEB and TCB are active year-round in areas where the number of frost-free days is  $\geq 200$  days. Consequently, we determined NLEB and TCB are active year-round in all or portions of Alabama, Florida, Georgia, Louisiana, Mississippi, New Mexico, North Carolina, South Carolina, Texas, and Virginia (Year-Round Active Zones 1 and 2, Appendix 1). Furthermore, based on a review of winter bat activity data, when temperatures fell below 40 degrees Fahrenheit, NLEB and TCB were less likely to be detected in mist-net and acoustic surveys. We assume during these colder periods, NLEB and TCB are likely entering a state of prolonged torpor and, consequently, NLEB and/or TCB roosting in trees may not rouse in sufficient time to flush from tree roosts during tree removal activities. Based on a review of climate data from the last 30 years from the National Oceanic and Atmospheric Administration U.S. Climate Normals<sup>54</sup>, mean temperatures fell below 40 degrees Fahrenheit between December 15 and February 15 within Year-Round Active Zone 1 (Appendix 1). Therefore, to avoid harm to NLEB and TCB during the timeframe when mean winter temperatures fall below 40 degrees

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<sup>53</sup> Project proponents may remove trees between December 15 and February 15 if temperatures are above 40 degrees Fahrenheit with Field Office approval.

<sup>54</sup> Source: <https://www.ncei.noaa.gov/products/land-based-station/us-climate-normals>.

Fahrenheit and bats roosting in trees are in torpor, suitable roost tree removal should be avoided between December 15 and February 15 within Year-Round Active Zone 1. Although we recognize winter temperatures can occasionally drop below 40 degrees Fahrenheit in Year-Round Active Zone 2, we anticipate these periods would be short in duration.

Similar to NLEB and TCB in the summer (see **MCM-4**), we assume bats may forage or roost anywhere within a 1.5-mile buffered area from known roost tree(s). If we assume NLEB and TCB within Year-Round Active Zone 1 are remaining in or near their summer habitat, avoiding suitable roost tree removal between December 15 and February 15 within 0.25-mile buffer from known roosts minimizes take of NLEB and/or TCB roosting in trees while in winter torpor.

**MCM-8** – Avoid removing suitable roost trees within 1.5-miles of a NLEB and/or TCB capture or acoustic record<sup>55</sup> between December 15 and February 15<sup>56</sup> within Year-Round Active Zone 1.

See **MCM-5** for our rationale for a 1.5-mile buffer and **MCM-7** for a discussion on NLEB and TCB winter torpor. Avoiding removal of suitable roost trees located within 1.5-mile of a NLEB and/or TCB capture or acoustic record between December 15 and February 15 will minimize take of NLEB and TCB roosting in trees and in winter torpor.

**MCM-9** – If the project area is located outside of known buffered locations but within an area where NLEB and/or TCB may be present (see **Consultation Range**), conduct a voluntary presence/absence survey following the Service's *Guidelines* or assume presence and avoid removing suitable roost trees between December 15 and February 15<sup>57</sup> within Year-Round Active Zone 1.

See **MCM-7** for a discussion on NLEB and TCB winter torpor. Avoiding removal of suitable roost trees between December 15 and February 15 will minimize take of NLEB and/or TCB potentially roosting in trees while in shortened winter torpor.

**MCM-10** – Offset any remaining impacts of incidental take that were not avoided.<sup>58</sup> For example, offsetting measures could include (but are not limited to) restoring or protecting known habitat for the affected species, locating and protecting new colonies, and treating NLEB and/or TCB for WNS if treatments are available.<sup>59</sup>

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<sup>55</sup> Acoustic records should meet the maximum likelihood estimator from Service approved software programs and/or be manually vetted. Refer to the most recent version of the Service's *Range-wide Indiana Bat and Northern Long-eared Bat Survey Guidelines*, available here: <https://www.fws.gov/media/range-wide-indiana-bat-and-northern-long-eared-bat-survey-guidelines>.

<sup>56</sup> Project proponents may remove trees between December 15 and February 15 if temperatures are above 40 degrees Fahrenheit with Field Office approval.

<sup>57</sup> Project proponents may remove trees between December 15 and February 15 if temperatures are above 40 degrees Fahrenheit with Field Office approval.

<sup>58</sup> Coordinate with the Field Office on potential offsets.

<sup>59</sup> WNS treatment requires approval from the local Field Office in coordination with the Service's regional WNS coordinators to ensure consistency with policies.

This is a new measure that was not included in the former 4(d) rule for the NLEB (USFWS 2016, entire). As discussed previously, NLEB and TCB have experienced severe declines following the arrival of WNS. WNS has caused estimated population declines of 97–100 percent across 79 percent of NLEB’s range (USFWS 2022a, p. 35) and 90–100 percent across 59 percent of TCB’s range (USFWS 2021, p. 34). Given that these NLEB and TCB populations where WNS is present are severely reduced, it is essential to locate remaining colonies (through surveys and monitoring) and protect these remaining populations until impacts from WNS are abated. Potential WNS treatment plans should comply with the [National Plan for Assisting States, Federal Agencies, and Tribes in Managing White-nose Syndrome in Bats \(WNS National Plan\)](#) and be developed in coordination with Field Offices and the Service’s regional WNS coordinators to ensure consistency with policies.

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