



Land-based Wind Energy Voluntary Operational Avoidance Technical Assistance for the Northern Long-eared Bat: Frequently Asked Questions (FAQs) Supplement

1) How did the U.S. Fish and Wildlife Service (Service) develop its position incidental take (of northern long-eared bats; NLEB) would not be “reasonably certain to occur”, if the measures in the technical assistance are implemented?

When the land-based wind energy technical assistance for NLEB (avoidance technical assistance) is implemented, the Service anticipates that incidental take¹ of NLEBs would not be reasonably certain to occur², because 1) northern long-eared bat fatalities at wind facilities are infrequent occurrences (prior to, and after the establishment of white-nose syndrome (WNS), as explained below), 2) the technical assistance requires operational measures to reduce risk during the entire active season, and 3) additional minimization measures (i.e., curtailment³) during elevated periods of risk (e.g., fall migration).

In addition to these operational measures, the technical assistance requires at least 1 year of standardized postconstruction mortality monitoring⁴ and additional monitoring at specified intervals to verify that these measures are effective, and continue to be effective, at a local level. The Service is currently developing a monitoring framework for wind projects with a low risk of taking listed bat species. We intend to use the new framework in place of these monitoring requirements when completed. For projects with and without a Federal Nexus, also see questions 9, 10, and 11 for recommendations specific to sections 7 and 10 of the Endangered Species Act (ESA).

This technical assistance was developed to be generally applicable, but risk may vary across the range. Facilities or companies that operate differently from this technical assistance are not automatically considered to be at risk of taking NLEBs. Wind projects can also use their own project

¹ The ESA defines 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)).

² The reasonable certainty standard is explained in 80 FR 26832 and Section 3.1 of the Service’s Habitat Conservation Planning and Incidental Take Permit Processing Handbook.

³ Turbine “curtailment” is one strategy for reducing bat fatalities at wind turbines. Curtailment is when turbine operations are altered, that is, blades are “feathered”, during periods of high risk for bats. “Feathered” blades are rotated to reduce the blade angle to the wind, such that the turbine blades cease spinning or rotate very minimally [<1 rpm], thus eliminating or greatly reducing risk of bat fatalities until the designated operating conditions are met.

⁴ Additional intensive post-construction fatality monitoring may be required if the site implements smart curtailment for avoidance.

information and data to determine risk to NLEBs. We recommend coordinating with the local Field Office. Ultimately, it is the company's decision whether to pursue a take permit.

a. Northern long-eared bat mortality at wind facilities is infrequent

NLEB fatalities at existing wind facilities have been infrequent relative to other bat species (e.g., tricolored bat; USFWS 2022, pgs. 115-118; Udell et al. 2021, entire). Service data demonstrates that NLEB fatalities made up 0.08% of all cumulative bat fatalities found within the species range prior to the impacts of WNS becoming established⁵.

Based on reports provided to the Service, 8.6% of unique projects within the range of the species have documented a NLEB fatality. There has been a total of 35 northern long-eared bat fatalities detected at wind facilities in the U.S. (Table 1) (USFWS 2022, unpublished data). All but three occurred when no cut-in speeds were being implemented (i.e., operating at or below the manufacturer's cut-in speed) (Table 3). Two occurred during September at turbines that feathered below 3.5 meters per second (m/s) before WNS was established at both project locations (Tables 2 and 3) (USFWS 2022, unpublished data). The last reported fatality (n=1) occurred at a facility implementing a 5.0 m/s curtailment strategy in August 2016 during the invasion phase of WNS in Illinois (Tables 2 and 3) (USFWS 2022, unpublished data). This facility would not fit within the framework of this technical assistance given the presence of northern long-eared bats during the summer.

Since 2016, extensive post-construction monitoring efforts have been conducted at wind facilities throughout the NLEB range⁶ with no fatalities found. This could be partly due in part to the steep decline of NLEBs resulting from WNS (USFWS 2022, entire), varying curtailment strategies, varying post-construction mortality monitoring methodologies, or a combination.

Table 1. Northern long-eared bat (NLEB) mortalities by state at wind facilities. Data were compiled from post-construction mortality monitoring completed in 1997 – 2023.

| State | # Projects with NLEB mortality | Total NLEB Mortalities |
|---------------|--------------------------------|------------------------|
| Iowa | 1 | 2 |
| Illinois | 3 | 4 |
| Indiana | 1 | 1 |
| Maryland | 1 | 1 |
| Michigan | 1 | 1 |
| Missouri | 1 | 1 |
| New York | 4 | 14 |
| Pennsylvania | 3 | 4 |
| West Virginia | 2 | 7 |
| Total | 17 | 35 |

⁵ WNS impacts are considered established beginning five years following the first detection of *Pseudogymnoascus destructans* (Langwig et al. 2015).

⁶ The Service has compiled data from 131 post-construction fatality reports received from existing wind facilities within northern long-eared bat range since 2016. The post-construction monitoring strategies in these reports include voluntary methods (compliance with State recommendations and the Service's Land-based Wind Energy Guidelines) to required methods for compliance with Incidental Take Permits (Section 10(a)(1)(B) of the ESA).

b. Siting to avoid foraging, roosting, and hibernation habitat

The technical assistance is specifically for wind facilities that are not anticipated to pose risk, specifically incidental take in the form of wounding or killing, to local bat populations. Buffers specified in the technical assistance require turbines to be sited away from documented roosting, foraging, and hibernation habitat. The most recent version of the Range-wide Indiana Bat and Northern Long-eared Bat Survey Guidelines must be used to assess whether bats are present or reasonably absent during the summer in the project area. The Service assumes presence of migrating NLEBs throughout the range of the species, because bats may use the airspace affected by wind turbines while migrating, even if the species is not detected on-site during summer surveys (Table 2). Risk to migrating bats is further reduced using curtailment strategies, as explained below.

Table 2. Northern long-eared bat mortalities by month from two datasets. Protocol refers to the post-construction mortality monitoring protocol a wind facility used. Data were compiled from post-construction mortality monitoring completed in 1997 – 2023.

| Data Source | Protocol | May | May/ June | June | July | August | August/ September | September | October |
|--|----------|-----|--------------|------|------|--------|----------------------|-----------|---------|
| USFWS unpublished data (2022) ¹ | variable | 0 | 1 | 2 | 5 | 12 | 6 | 9 | 0 |
| WEST (2020) ² | variable | 2 | n/a | 4 | 5 | 17 | n/a | 13 | 1 |

¹ Data from post-construction mortality reports from the U.S.

² Incorporated data post-construction mortality reports from the U.S. and Canada

c. Turbine Curtailment to Minimize Risk

Eligible wind facilities must implement a 5.0 m/s cut-in speed with feathering during the fall migration period⁷. In addition, wind facilities must feather below the manufacturer's cut-in speeds (which vary by turbine model, but typically range 3.0-3.5 m/s) during the rest of the species active season to reduce the risk of taking NLEB.

Operational curtailment is an effective strategy for reducing bat fatalities at wind energy facilities, and studies have shown meaningful all-bat fatality reductions. Cut-in speeds of 5.0 m/s have been demonstrated to reduce total bat fatalities by an average of 62% (Whitby et al. 2021, Arnett et al. 2013, USFWS unpublished data); feathering (i.e., adjusting the angle of the turbine blade parallel to the wind, to slow or stop the blade rotation) below manufacturer's rate is expected to reduce bat fatalities by over 30% (Whitby et al. 2021, Good et al. 2016, Arnett et al. 2011), although the effectiveness of feathering below various cut-in speeds differs among sites and years (Berthinussen et al. 2021, Arnett et al. 2013). In these studies, the effectiveness of

⁷ Northern long-eared bat fatalities occur more frequently in the fall months (including sites without summer risk), as bats are moving between summer maternity areas to hibernacula (Table 2; USFWS unpublished data 2022, West 2020); this pattern is also consistent with seasonal fatalities using all bat fatality data (Arnett et al. 2008).

curtailment is measured using all bat fatality rates; we are unable to directly measure the effectiveness of curtailment on NLEB specifically, due to the limited number of fatalities and variability in monitoring strategies. However, we review fatalities and available data on curtailment strategies in general, below.

Of the 35 NLEB fatalities that have been detected, 32 occurred when no operational curtailment was implemented. Of the three fatalities that occurred where curtailment was implemented, two fatalities occurred at wind facilities that were feathering below manufacturers' cut-in speeds, and one occurred at a facility curtailing below wind speeds of 5.0 m/s (Table 3).

Table 3. Cut-in speeds at which northern long-eared bats fatalities have been documented. Data were compiled from post-construction mortality monitoring completed in 1997 – 2023.

| Cut-in Speed (m/s) | Northern long-eared bat fatalities |
|---------------------------|---|
| None implemented | 32 |
| 3.0 | 1 |
| 3.5 | 1 |
| 4.0 | 0 |
| 4.5 | 0 |
| 5.0 | 1 |
| 6.9 | 0 |
| 7.0 | 0 |

2) Why is the Service requiring different blanket curtailment wind speeds for NLEB compared to tricolored bat (TCB).

As stated above, a total of 35 NLEB carcasses have been reported at seven percent of unique projects within the range of NLEB (USFWS 2023). In comparison, a total of 1,208 TCB carcasses have been reported at 37 percent of unique projects (86 out of 233) in the range of the TCB (USFWS 2023). The number of reported TCB fatalities is much higher than the number reported for NLEB and suggests that TCB are much more susceptible to wind energy-related mortality. The relatively large number of TCB mortalities also provides more opportunity to evaluate different seasonal impacts of wind fatalities on TCB.

3) Why is the Service technical assistance requiring different curtailment wind speeds for wind projects with summer risk to NLEB compared to TCB?

The updated NLEB Wind Avoidance Technical Assistance has incorporated curtailment options for projects that have summer risk to NLEB, which are slightly different from the TCB avoidance blanket curtailment wind speeds for projects with summer risk. This is based on the relative magnitude of TCB mortality data available compared to the limited NLEB mortality data reported (i.e., 1,208 TCB vs. 35 NLEB mortalities). The summer curtailment wind speed for NLEB is 11.2 mph (5.0 m/s) for projects with documented summer risk should be implemented during the pup season (see Appendix A of the NLEB Wind Avoidance Technical Assistance) as we have not documented a mortality event at 11.2 mph (5.0 m/s) for NLEB during this time. However, the Service has documented mortalities of TCB during the summer risk period at 11.2 mph (5.0 m/s).

4) Why does the NLEB technical assistance recommend the most protective curtailment (i.e., 11.2 mph (5.0 m/s)) from November 16 – March 14 in the year-round active zones?

The Service has limited data collected outside the Indiana bat and NLEB hibernating range. Therefore, our blanket curtailment technical assistance for areas within the year-round NLEB range is more protective from November 16 to March 14 (i.e., requiring 11.2 mph (5.0 m/s) cut-in speeds when temperatures are above 40°F) for two reasons: (1) the Service lacks acoustic and mortality data to understand impacts during these months in areas with year-round activity, and (2) the Service chose to be more protective of these year-round active populations as they are likely not as impacted by WNS and therefore may be critical to recovering the species. The Service is erring on the side of the species to protect these populations until we collect additional data to refine the blanket curtailment approaches from November 16 to March 14 in locations with year-round activity of NLEB. If projects within the year-round active zone have site-specific acoustic and/or mortality data covering this period, please provide this information to your local Field Office and batwindguidance@fws.gov.

The Service will incorporate new information as it becomes available and modify our NLEB wind technical assistance to better reflect the seasonal risk to NLEB during this period. Examples of data that can be submitted are post-construction mortality monitoring data with the dates of any NLEB found at a wind project and acoustic data identified to NLEB. The Service also asks for information on the duration and intensity of monitoring efforts (e.g., weekly carcass searches from January 1 to December 31). If projects would like to combine data with other projects in the same county or portion of the state (e.g. Southern Louisiana) that is acceptable as long as the data on how monitoring is consistent across projects or called out (e.g., project A, project B, etc.).

5) What does this technical assistance mean for projects with a federal nexus⁸?

Section 7 of the Endangered Species Act (ESA) requires federal agencies to consult with the Service to ensure that actions they fund, authorize, permit, or otherwise carry out will not jeopardize the continued existence of any listed species. Although this technical assistance specifies a way for wind facilities to operate in a way that “take” (i.e., wound, kill) of NLEBs is not likely to occur, the action (50 CFR 402.02) may still cause adverse effects to NLEBs (i.e., harass, harm) and/or other federally listed species or critical habitats and necessitate formal consultation between the action agency and the Service. However, incorporating this technical assistance into the agency’s action is typically expected to reduce the risk of take and reach a “may affect, not likely to adversely affect” determination for NLEB. Risk may vary across the range, and it may be possible to reach a “may affect, not likely to adversely affect” determination based on project-specific information and/or data. If a project cannot implement this technical assistance, the project should initiate consultation with the Service.

6) What does this technical assistance mean for projects with existing Habitat Conservation Plans (HCP) and Section 10(a)(1)(B) Incidental Take Permits for NLEBs?

⁸ Projects with a Federal Nexus include those funded, authorized, and/or carried out by a Federal government agency.

Projects with existing Incidental Take Permits (ITP) and associated Habitat Conservation Plans (HCPs) for NLEBs under Section 10(a)(1)(B) of the ESA do not need to implement this technical assistance as their project already has coverage for incidental take. In addition to take authorization, ITPs provide regulatory assurances (Habitat Conservation Plan Assurances “No Surprises” Rule, FR 8859 8859-5573 1998); the Service will not impose additional requirements or restrictions as long as the permittee is properly implementing the HCP. If an unforeseen circumstance occurs, unless the permittee consents, the Service will not require additional to commitments (e.g., additional land, water, or financial compensation) or impose additional restrictions on the use of land, water, or other natural resources beyond the level agreed to in the HCP. The Service will honor these assurances as long as a permittee is implementing the requirements of the HCP, permit, and other associated documents in good faith, and their permitted activities will not jeopardize the species.

However, if a permittee would like to amend their existing permit to remove NLEB or adjust their conservation strategy in light of this technical assistance, they may reach out to their [local Ecological Services Field Office](#) to discuss further, and if appropriate, begin the process. [Additional information on Habitat Conservation Plans can be found on our website.](#)

7) What does this NLEB technical assistance mean for projects with existing Section 10(a)(1)(B) permits, where the HCPs meet the eligibility requirements outlined in the technical assistance?

Some projects may be sited and operating in alignment with the permits, where the HCPs meet the eligibility requirements outlined in the technical assistance (i.e., in a manner such that take of NLEB is unlikely to occur) and be authorized incidental take for NLEB. Limited data on risk of NLEB fatalities at wind facilities was available at the time these permits were issued. For this reason, permit applicants and the Service erred on the side of conservation of the species and developed HCPs. Now, in part due to the standardized post-construction monitoring conducted at these permitted facilities, data demonstrates siting and operational protocols reduce risk to NLEBs to the point where take is not reasonably certain to occur (See question 1, above).

These permits are still valid and necessary for the authorized take to other covered bat species (e.g., Indiana bat (*Myotis sodalis*), little brown bat (*M. lucifugus*), etc.). In addition, these permits also continue to provide projects with the benefit of regulatory assurances for northern long-eared bat (see question 3, above). However, if a permittee would like to amend their existing permit to remove NLEB or adjust their conservation strategy in light of this permits, where the HCPs meet the eligibility requirements outlined in the technical assistance, they may reach out to their [local Ecological Services Field Office](#) to discuss further, and if appropriate, begin the process.

8) Do I need a Section 10(a)(1)(B) Incidental Take Permit for NLEBs and other species?

The technical assistance offers our current recommendation for wind projects to site and operate in a manner in which take of NLEB is not reasonably certain to occur, based on the Service’s examination of the best available information (see question 1, above). However we recognize not all wind facilities will adhere to this permits, where the HCPs meet the eligibility requirements outlined in the technical assistance. Wind projects can also use their own project-

specific information and data to determine risk to NLEBs. Wind project proponents who conclude on their own that their project will result in take regardless of the Service's technical guidance, or projects that are not in alignment with the recommendations in the technical assistance and pose unavoidable risk to NLEB (or other federally listed species) are advised to apply for an ITP. However, seeking an ITP is voluntary, and the HCP process is applicant-driven. [Additional information on Habitat Conservation Plans can be found on our website.](#)

9) Does this technical assistance for the NLEB apply to other bat species?

Currently, our records do not suggest that this approach could be applied widely across the range of other listed bat species or those proposed to be listed. For example, project(s) cannot avoid reasonable certainty of taking TCB under the NLEB technical assistance, as the TCB is much more susceptible to wind energy-related mortality than the NLEB. There is separate wind energy technical assistance that has been developed for TCB (Land-based Wind Energy Voluntary Avoidance Technical Assistance for the Tricolored Bat (*Perimyotis subflavus*)) that is more protective than the NLEB Wind Avoidance Technical Assistance. For projects with migration risk for Indiana bats, the NLEB Wind Avoidance Technical Assistance is not as protective since it does not require curtailment at 6.9 m/s ft throughout the fall migration period. Field Offices may consider adding listed bat species to the TAL based on project-specific data and occurrence records. Contact information for local Field Offices is available online at [U.S. Fish and Wildlife Service Ecological Services Field Office](#) in your area. Any approval to use the NLEB Wind Technical Assistance for other listed bat species would need to be approved by the respective Service Regional Office to ensure consistency.

10) Are there other options to modifying turbine operations beyond blanket curtailment that may be included in the technical assistance letter (TAL)?

Individual Field Offices, in coordination with the Regional Office, may approve alternative curtailment strategies beyond blanket curtailment described in the technical assistance (e.g., activity-based informed curtailment, etc.). For an alternative approach to be approved, the project proponent should provide evidence (e.g., results of effectiveness from multiple studies, site-specific analysis, etc.) that these curtailment strategies will reduce risk to bats at the same level or better than blanket curtailment at 5.0 m/s during the summer and fall seasons and at manufactures cut-in speeds during spring and summer.

11) Why is post-construction mortality monitoring required, if Service has determined take is not likely to occur?

The effectiveness of the NLEB technical assistance at individual wind facilities is validated through one year of standardized site-specific post construction fatality monitoring and defined intervals thereafter. This monitoring is important to confirm whether implemented operational commitments were as effective as anticipated and to detect if NLEB mortality occurs when no take was initially anticipated (i.e., Type II error). Long-term monitoring at specified intervals will continue to validate the effectiveness of the technical assistance in light of variables that may change over time (e.g., landscape cover changes, NLEB population changes). The monitoring required for consistency with the technical assistance is in alignment with the Service's Land-based Wind Energy Guidelines (USFWS 2012). Although the Service anticipates that incidental take of NLEBs would not be "reasonably certain to occur" (Question 1, above), monitoring is required for the Service to

validate expectations and reaffirm determinations through the TAL.

12) How does this technical assistance apply to distributed wind projects of single turbines?

The wind energy technical assistance for the NLEB is not specifically tailored for small, distributed wind projects involving single turbines. These projects typically pose lower risk to listed bat species due to their singular nature and smaller rotor-swept zone. Distributed wind energy projects are usually subject to Section 7 consultation with the lead federal agency. Consultations for such projects may be conducted either individually or programmatically through the lead federal agency. During the consultation process, the Service acknowledges and considers logistical constraints.

13) Is a Technical Assistance Letter (TAL) required? What flexibility exists for projects to propose different conservation measures specific to the circumstances of their project and still receive a TAL?

The decision to pursue a Technical Assistance Letter (TAL) under the wind technical assistance is voluntary. As discussed in Question 9, wind projects have the option to utilize their own project-specific information and data to assess the risk to NLEBs. In addition, certain projects may opt to manage endangered species risk by implementing their own conservation measures tailored to the unique context of their project.

While adherence to the conditions outlined in the wind technical assistance is voluntary, following these conditions as written is typically the most efficient route to obtain a TAL from the Service. However, variations in conditions based on project-specific circumstances may still be deemed appropriate for receiving similar technical assistance. It's important to note that proposed variations in project operations might require additional data review by the Field Office and coordination with the Regional Office to ensure consistency. Additionally, the issuance of a TAL by the Service is also voluntary, and the assessment of proposed variations in conditions may be balanced with other priorities within the consultation workload of the Field Office.

14) Where can I learn more about the northern long-eared bat and the final rule to list it as endangered?

[Information on the northern long-eared bat is available online](#) or from a [U.S. Fish and Wildlife Service Ecological Services Field Office in your area](#).

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