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Guidance for State Wildlife Agencies to Reduce Impacts from Wind Energy Development on North American Bats

Purpose

Renewable energy development and expansion in North America is a critical component in the effort to limit the impacts of climate change. To this end, wind is an abundant and inexhaustible resource, but as with all sources of energy, it does not come without costs. It has become clear over the last twenty years that the high rates of bat fatalities at wind energy facilities are a serious threat to the survival of certain species of bats, especially migratory tree bats. In a Statement on Wind Energy Impacts on Bat Populations (2024), the North American Society for Bat Research (NASBR) called for immediate action to reduce bat fatality rates at wind energy facilities

This document provides guidance for states, provinces, and other jurisdictions when reviewing proposed wind energy development projects. It offers a set of recommended practices for siting, operating, and monitoring wind energy facilities to minimize impacts on North American bat populations, aiming to prevent future listings under the Endangered Species Act (ESA) and the Species at Risk Act (SARA). The document will be updated regularly as new information becomes available.

Core Principles

- Use Best Available Science: Siting and operational decisions must be based on the best available data and models to minimize bat fatalities and protect habitats.
- Integrate Multidisciplinary Data**:** Include data on bat activity, wind resources, ecological sensitivity, and predictive modeling for informed decision-making.
- Early and Frequent Communication**:** Encourage ongoing dialogue between developers and state wildlife agencies.

Recommendations

1. Pre-Construction Planning and Siting

- Engage state wildlife agencies early in the siting process, as recommended by the AFWA/ACP Wind Communications Framework.
- Conduct pre-construction acoustic monitoring to assess bat activity patterns in space and time. Submit data to the **North American Bat Monitoring Program (NABat)**.
    - Recommendations for other surveys (mist netting, roost identification, emergence counts, etc.) can be included in cases where more information is needed on the bat community pre-construction.
- Use existing resources, tools and modeling to identify optimal siting locations with minimal bat impacts. The following is a non-exhaustive list of resources that can be used to inform siting decisions:
    - Site Renewables Right (does not include bat activity in analysis)

        - Currently, this tool only includes mid-American states, but is a planned expansion to all of the continental US by 2025, and while it includes bat hibernacula in analysis it does not include bat activity data.
    - NABat
    - REWI American Wind Wildlife Information Center
    - WEST RENEW Database (not publicly available, fee for access)
    - AFWA Renewable Energy BMP & Data Resources
    - USFWS Wind Energy Guidelines
    - WAFWA CHAT tool (as of Jan 2023, this tool is legacy & is no longer being updated)

- Offshore wind projects should refer to guidance from the Regional Wildlife Science Collaborative for Offshore Wind (East Coast) or the California Marine Sanctuary Foundation

2. Minimization Strategies During Operation

- Implement a curtailment plan tailored to site-specific wind conditions and bat activity. Curtailment is the only scientifically proven method for minimization of bat fatality at wind facilities (Conservation Evidence: Evidence Data). Curtailment plans should consider:
    - Feathering blades below manufacturer's cut-in speeds. as recommended by American Clean Power (2015) or at least 5 m/s during periods of high collision risk, per NASBR's recommendation.
    - Adjusting cut-in speeds based on local bat activity.
    - Consulting with SFWA for state or site-specific cut-in speeds and bat fatality thresholds.
    - Considering adaptive management approaches to adjust strategies based on post-construction monitoring.
    - Considering smart curtailment strategies including but not limiting sensor-based and model-based curtailment.
    - Using the recommendations laid out in the USFWS Seasonal Curtailment Guidance for Tricolored Bats and FAQ
- Technical Advisory Committees (TACs) have been used in CA (Altamont Pass TAC) and Wyoming (Guidelines for Wind and Solar energy Development, Appendix F) and may provide a useful model for other states to review and advise survey and monitor plans at wind facilities. Ideally, TACs should have diverse stakeholder participation including state and federal regulators, conservation organizations, industry, and independent experts.
- Explore voluntary programs or incentives (e.g., wildlife-friendly certifications) to encourage industry participation and public recognition.
- Investigate alternative minimization techniques (e.g., ultrasonic deterrents), though these remain experimental.

3. Post-Construction Monitoring and Adaptive Management

- Conduct rigorous post-construction fatality monitoring at a representative sample of turbines, with additional monitoring at data-deficient sites.
    - Mortality monitoring data collection should include carcass searches, searcher efficiency trials, and carcass persistence trials using accepted protocols. Below is a non-exhaustive list of resources on PCMM protocols.
        - Post construction bird and bat fatality monitoring for onshore wind energy facilities in emerging market countries (International Finance Corporation)
        - USFWS Land-Based Wind Energy Guidelines (Chapter 4)
        - Post Construction Wind Energy Protocol for Bats for Alberta, CA (2015)
        - AFWA SFWA Wind Guidance's
- Submit data collected during PCMM to the appropriate databases and use the latest estimators (e.g. GenEst) for unbiased fatality estimates. Below is a list of standard databases, organizations, and carcass submission projects:
    - REWI American Wind Wildlife Information Center
    - USFWS Bat & Wind Fatality Reporting Form (eventually through NABat)
    - NABat
    - Renewables Wildlife Solutions Initiative Carcass Submissions
    - Mark Davis Lab
    - State Fish and Wildlife Agencies
- Implement long-term (3-5 years) acoustic and weather monitoring (nacelle and ground) to refine curtailment strategies.
- Develop site-specific fatality thresholds to guide adaptive management. Some states have already developed their own thresholds, linked below:
    - CA Altamont Pass
- In the offshore landscape, collision detection systems should be deployed across a representative sample of turbines to inform curtailment, and adaptively manage curtailment regimes based on results. Research is ongoing in offshore wind bat monitoring. Refer to the following resources for offshore wind research:
    - TETHYS: Environmental Effects of Wind and Marine Renewable Energy
    - National Renewable Energy Laboratory Wind Research

4. Data Collection and Research

- Coordinate with NABat Regional Monitoring Hubs for standardized data collection and reporting.
- Use available templates and data entry forms, including:

- USFWS Bat & Wind Fatality Reporting Form

- Data collection should include:
  - Pre-construction monitoring
  - Post-construction bat activity
  - Abiotic data at sites (wind speed, temperature)
- To the extent possible, align data collection with the NABat Generalized Random-Tesselation Stratified (GRTS) survey design.
- Allocate mitigation funds to research focused on bat species impacted by wind development. Refer to the USFWS 2023 Research as Mitigation Memo for more information.
- Support research to close data gaps (use NABat to identify), enhance monitoring, better understand migration (e.g. MOTUS), and evaluate new minimization technologies.

Conclusion

This guidance promotes the use of the best available science, adaptive management, and collaboration to protect bat populations while supporting responsible wind energy development. Stakeholders are encouraged to share feedback and updated information with the **AFWA Bat Working Group** and the **Energy and Wildlife Policy Committee** to continually improve this guidance*.

Comments, suggestions, edits and updates are appreciated for this working document and can be submitted at any time through the form at this link.