

Memo

To: Environmental Registry of Ontario
From: Andrew Ryckman
Date: February 12, 2025
Re: Technical Response to ERO Number 019-9411

These comments have been prepared, and are being submitted, by Natural Resource Solutions Inc. (NRSI) in response to ERO number 019-9411 *Regulatory changes under the Endangered Species Act to extend application of conditional exemptions to newly-listed species and update the conditional exemption for the operation of wind facilities*, as posted on January 13, 2025.

NRSI Background

NRSI is an Indigenous-owned consulting firm headquartered in Waterloo, Ontario, with multiple office locations across Canada. NRSI specializes in ecological monitoring, and is actively engaged in private sector development, government contracts, academic research, and conservation-based ecological planning, monitoring, and restoration activities. NRSI has considerable experience both with bat ecology and the impacts of wind energy operations on bats.

NRSI has previously supported the development of regulatory documents for Species at Risk bats at both the provincial and federal level, is actively engaged in the Ontario Bat Network (OBN), and regularly presents scientific information at provincial, national, and international conferences. NRSI has also completed operational monitoring at more than 50 operational wind projects in Ontario since 2007, and along with operational monitoring in four other provinces, has collected the largest privately held database of bat fatality data in Canada.

This combination of bat expertise and unparalleled experience in the operational monitoring of wind energy projects in Ontario makes NRSI well-informed on the behavioural considerations, potential for negative effects, and mitigation opportunities available that are associated with the interaction of migratory bats and operational wind turbines.

General Support

NRSI is very supportive of the approach to develop a conditional exemption specific to the potential impacts of operational wind facilities on migratory bats.

As a company that is actively engaged in the advancement of research and information relating to bats, through Species at Risk monitoring grants, development of federal and provincial regulatory support documents, and the preparation of scientific papers and presentations, NRSI is supportive of the general approach of emphasizing conservation efforts relating to the migratory bat species, in a way that continues to support the progressions towards clean energy generation, which is a critical transition for all Species at Risk.

Further, NRSI has supported the registration of numerous operational wind projects under similar conditional exemptions, has authored corresponding Operational Mitigation Plans (OMPs), and undertaken regular monitoring as a requirement of the OMPs implementation. Through these efforts, NRSI has first hand experience with the successful implementation of adaptive management to minimize impacts to Species at Risk under the current regulatory framework, and is confident that a similar approach to migratory bats will be successful.

NRSI also has considerable experience with formal permitting under the *Endangered Species Act* through what is commonly referred to as an 'Overall Benefit Permit', and agrees that the existing framework for an Overall Benefit Permit would be cumbersome, challenging, and impractical to implement at an industry-wide level.

Technical Comments

It's NRSI's opinion that the greatest benefit to migratory bats will be through the development of a common approach that is scientifically defensible and describes a curtailment strategy that can be feasibly implemented by most operational sites, with a relatively small number of operational sites choosing a custom approach based on site-specific considerations.

As currently proposed, NRSI believes that the common approach is overly restrictive, such that most operators will chose to deviate using a custom approach, which may reduce the overall effectiveness of the regulatory intent.

NRSI has identified 3 areas where further consideration, clarification, and/or technical updates may be warranted:

- Curtailment Parameter of 7.0m/s;
- Ecological Parameters of Common Approach; and
- Definition of 'Smart Curtailment'.

Each of these have been described in more detail below.

Curtailment Parameter

NRSI notes the inclusion of a proposed wind speed curtailment of 7m/s. This specific parameter does not seem to have much, if any, scientific justification, as NRSI is not aware of any published studies that have demonstrated consistently, and significantly, reduced fatality at this curtailment level, relative to other curtailment levels that have been extensively studied and have shown consistent and significant reductions.

A comprehensive review of mitigation studies was undertaken as part of the preparation of Wind Energy and Bat Conservation – A review by the Canadian Wind Energy Association ('CanWEA Review'; DNV-GL 2018), which examined the results of 25 studies of curtailment strategies ranging from 4.0m/s to 6.9m/s. While the summary of literature may seem slightly dated (2018), the majority of Ontario projects were commissioned around, or prior to, this time frame and are therefore expected to use turbine technology, dimensions, and characteristics that are generally similar to the majority of studies referenced in this document.

The CanWEA Review (DNV-GL 2018) includes a comparison of published literature (Table 4-2), which suggests a curtailment regime of 5.5m/s is the most consistent and reliable strategy for obtaining significant reductions in bat fatality, with an approximate mean fatality reduction of 60-

96%, and with 83% of studies (i.e. 5 of 6) demonstrating significant fatality reductions. While similar fatality reductions were noted at higher curtailment levels of 6.0, 6.5, and 6.9m/s, the comparable fatality reductions do not seem to justify the loss of energy production that would accompany these increases in curtailment with no corresponding statistical benefit to bat conservation.

Similarly, studies have similarly demonstrated significant reductions in bat mortality rates across North America for Silver-haired Bat (*Lasionycteris noctivagans*), Eastern Red Bat (*Lasiurus borealis*), and Hoary Bat (*Lasiurus cinereus*) at cut-in speeds of 5.0 m/s (Arnett et al., 2009; Arnett et al., 2011; Arnett et al., 2013; Whitby et al., 2024), 4.5 m/s (Good et al., 2011; Good et al., 2012; Arnett et al., 2013), and even at 4.0 m/s (Baerwald 2008; Baerwald et al., 2009; Arnett et al., 2013). Furthermore, an industry-wide best management practice for reducing wind turbine-caused bat fatalities has been suggested by the American Wind Energy Association (AWEA), which includes limiting the rotation of turbine blades (e.g. feathering turbine blades) during low-wind speed conditions, prior to energy production or manufacture's cut-in speed, through the fall bat migration season (Bat Conservation International 2015). Studies have shown this best management practice has been proven to substantially reduce bat fatalities (Arnett et al. 2013).

In the interest of scientific defensibility, NRSI requests that the province review, rely upon, and cite publicly available literature that has demonstrated consistently significant fatality reductions at the proposed curtailment level, relative to lower curtailment levels that have been well-studied and show significant reductions in fatality.

Ecological Parameters of Common Approach

The ecological parameters, seasonality and time of night, appear to have been designed relative to the general activity period of the individual species, without acknowledgement that risk of impact is not uniform throughout the general activity period.

Considerable information exists that shows a clear increase in risk during the late summer and early fall months, as seen in Wind Energy Bird and Bat Monitoring Database Summary of the Findings from Post-construction Monitoring Reports (Figure 2; Bird Studies Canada et al. 2018), which shows a peak in fatality risk from calendar weeks 31 to 36 (i.e. early August to early September), with moderate peaks from calendar weeks 27 to 30 (i.e. early July to early August) and calendar weeks 37 to 39 (i.e. mid September to early October).

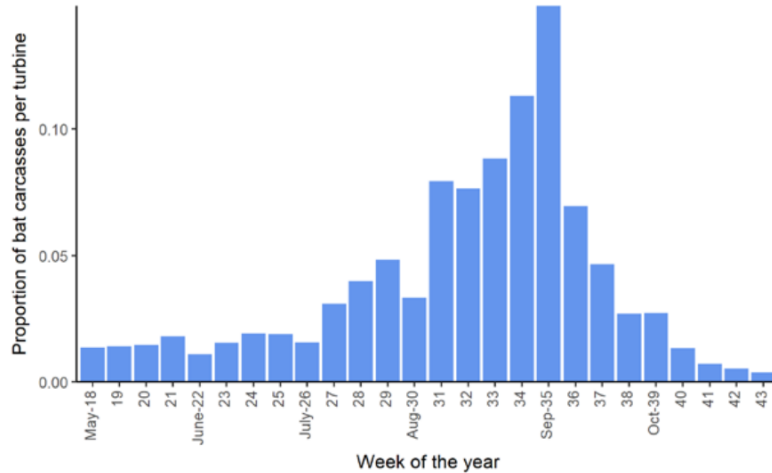


Figure 1. As copied from Figure 2 of BSC et al (2018), *The average proportion of total corrected bat mortality found during each week between May 1 and Oct 31.*

Using NRSI’s internal database of Ontario bat fatality monitoring results, which will be very similar to Bird Studies Canada’s Ontario-specific data, NRSI notes that 73.4% of all migratory bat fatalities have occurred during the period of July 15th to September 15th, a period which reflects approximately 40% of the overall time period originally included in the common approach of the regulatory notice. This represents an opportunity to focus curtailment on a period when migratory bats are known to be most at risk, while significantly reducing the overall loss of renewable energy generation.

In order to support the continued transition towards renewable energy generation, and the overall benefit that renewable energy provides to all species, NRSI recommends using well-studied, and consistently documented, Ontario fatality patterns to focus curtailment periods on those when migratory bats are most at risk of fatality.

While existing literature also supports that bat activity is concentrated at specific times of night, it is more challenging to demonstrate that bat fatalities also occur during these same periods of peak activity. As such, NRSI generally supports the broad timeframe established in the common approach, but recommends including specific definitions of dusk and dawn to ensure a clear interpretation and application of terms. It’s NRSI’s recommendation, based on other applications of dusk and dawn, that they are most commonly defined as ‘30 minutes after sunset’ and ‘30 minutes before sunrise’. Providing clear definitions is expected to facilitate the accurate and consistent implementation of the curtailment across facilities and remove any potential ambiguity in the terms.

Definition of Smart Curtailment

The example definition of the term “smart curtailment” used in the regulatory posting does not accurately reflect the industry application of the term. In particular, the reference to ‘live acoustic monitoring’ is not consistent with most applications of smart curtailment.

Smart curtailment is an approach that uses any environmental variable, beyond wind speed alone, to focus operational curtailment when the risk of impact is elevated, with the goal of

minimizing unnecessary loss of energy production when risk of collision is low. Most current applications of smart curtailment rely on previously collected acoustic data along with site-specific meteorological data (e.g. temperature, precipitation, wind speed, barometric pressure) to create a statistical algorithm that identifies the mix(es) of environmental conditions that is most commonly associated with periods of peak activity. This application of smart curtailment is widely used as an acceptable, if not expressly recommended, minimization approach within several jurisdictions across North America, including current applications in Ontario and Alberta.

Only a small proportion of smart curtailment applications rely on real-time, or live, acoustic bat recordings, and NRSI is not aware of any current applications of this approach in Canada. Further, there are only two companies that provide this type of device, neither of which has been extensively studied in published literature. The expectation for smart curtailment to specifically utilize live acoustic recordings will make this approach unappealing to most energy companies and also unnecessarily promotes the two companies (both in the US) that are able to provide this specific service.

NRSI has recently presented data at the Wind Wildlife Research Meeting (Pomezanski et al. 2024; enclosure) demonstrating that acoustic data collected during the operational phase of a wind project is a reasonable predictor of fatality risk, suggesting that previously collected operational acoustic data can be used as a surrogate to live acoustic data to create a successful algorithm that can similarly minimize risk of bat fatality.

NRSI supports the application of smart curtailment, but recommends that the example referencing the reliance on 'live acoustic monitoring' is overly restrictive, relative to the vast majority of smart curtailment algorithms that are currently being adopted, including in several jurisdictions in Canada. Instead, NRSI recommends generic reference to the application of smart curtailment in custom approach 1.

Summary of Technical Recommendations

As noted above, it is NRSI's broad recommendation to develop a common approach that is both scientifically defensible and that is balanced with the generation of renewable energy. Using this approach, there is likely to be greater industry acceptance of the common approach and therefore a greater overall benefit to migratory bat conservation.

NRSI's recommendations are summarized as follows:

- Re-consider a curtailment value that is supported by publicly available science, with defensible demonstration of significant reductions in fatality;
- Consider a seasonal curtailment period of **July 15 to September 15** for the common approach, which still overlaps with approximately 75% of the migratory bat fatalities, but within 40% of the originally proposed time frame. This focuses curtailment on the key risk periods and reduces the curtailment period by 60% and supports the need for renewable energy generation;
- Include specific definitions of dusk and dawn in the final regulatory language. Specifically referencing "30 minutes after sunset" and "30 minutes before sunrise" for dusk and dawn respectively; and
- Remove the example of "live time acoustic monitoring" from custom approach #1, to not limit operators to one specific application of smart curtailment which is less widely available, and unfairly promotes the few companies associated with those specific technologies.

Regulatory Consideration

While NRSI has focused comments primarily on technical considerations, our involvement with the vast majority of operational projects in Ontario has also provided some additional context on the feasible application of the proposed regulations. Specifically, the range of facilities in Ontario span a considerable time frame, during which the wind energy technology has changed considerably. Further, there are numerous projects that may have less than five years left on their energy contract, which may mean significant additional costs are not feasible.

As such, NRSI recommends considering a tiered approach in the conditional exemption that reflects the differences in project status through a consideration of project commissioning date. This will generally allow for the consideration of older projects, which NRSI understands may experience greater financial effects from the regulation, from newer projects.

For example, the common approach could be presented differently for projects that were approved prior to September 8, 2009 (Green Energy Act), to those approved between September 9, 2009 and January 28, 2025 (SARO listing of migratory bats), and new facilities that will be approved after January 28, 2025.

NRSI understands that an approach that differs based on approval date is already applied in several conditional exemptions, including the existing exemption for operational wind facilities (23.20). While these existing applications may not require different fundamental requirements, they do differ in regulatory submission requirements that are based on project application and/or approval dates.

Closure

In consideration of the technical nuances to what is being proposed, such as the current definition of smart curtailment, as well as the widespread and significant implications of this exemption, NRSI recommends that another opportunity to review the content of the conditional exemption is provided. It is requested a subsequent review opportunity allows for the review of specific regulatory language, rather than summarized language, to ensure the technical expectations are definitions are consistent with current best practices for minimizing impacts and that the proposed approach(es) are feasible to implement at a wide range of facilities that vary significantly in turbine size, generation capacity, geographic landscape, and associated wind regime.

If you have any questions on the input provided above, or would like additional information or to have follow-up discussions regarding the data presented or recommendations provided, NRSI staff specializing in bat ecology and/or impacts of wind energy on bats can be available for technical discussions associated with the finalization of the proposed conditional exemption criteria. Any documents cited in this submission can be provided upon request.

Sincerely,
Natural Resource Solutions Inc.

Andrew Ryckman

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Senior Biologist

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