

A mitigation toolbox approach is successful in achieving bat conservation results

Implementing a Toolbox Approach for Bat Conservation: A Case Study

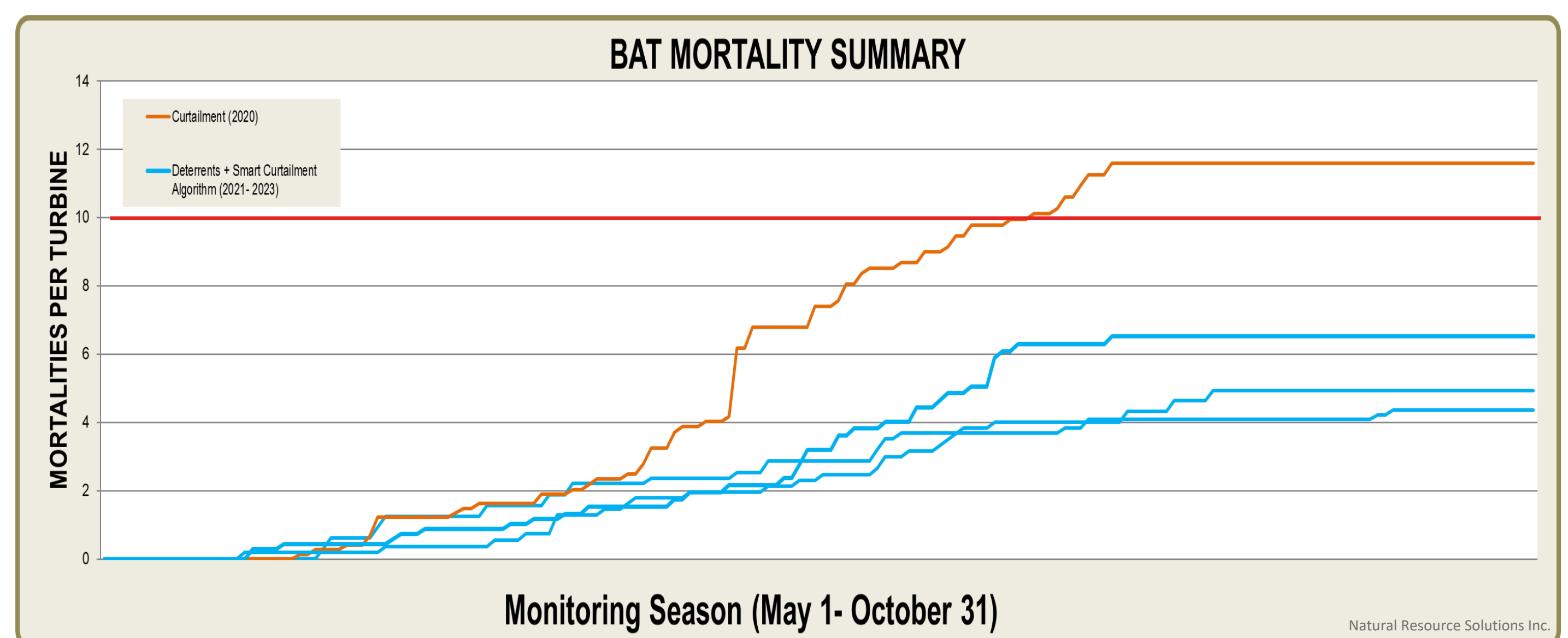
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The Henvey Inlet Wind Energy Centre (HIWEC) is a 300 MW facility located on Henvey Inlet First Nation Reserve #2 in Ontario, Canada. HIWEC's permit identifies a conservation management framework for bat mortality;

- Annual bat mortality must be maintained at levels of under 10 bats/turbine/year
- Site-specific data is used to inform an adaptive management approach
- Effectiveness is assessed using a prescribed monitoring program

Methods

- In 2020 operational curtailment was implemented
- An adaptive management approach was implemented in 2021, and trialed for three years
 - An optimized smart curtailment algorithm was developed by WEST, Inc.
 - The smart curtailment algorithm incorporated NRG deterrents as a part of the decision tree strategy. Mortality results were measured weekly against a management decision tool (a standardized fatality curve created based on the express goal of maintaining mortality under the threshold). When the mortality rates exceeded the curve for that point in time, the curtailment algorithm was added to deterrent operation.
- The annual mortality rate was compared against the 10 bat/turbine/year threshold to determine the effectiveness of the mitigation strategy.



Results

X 2020 (curtailment):

- The bat threshold was exceeded

✓ 2021 -2023 (deterrents + smart curtailment algorithm):

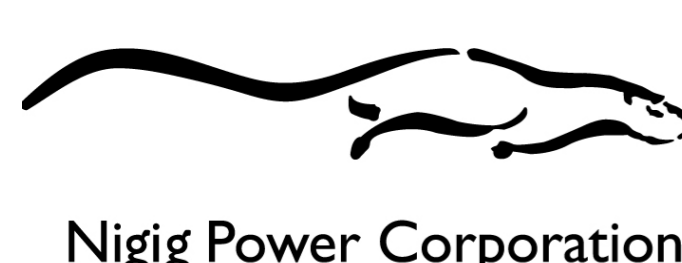
- Bat mortality was maintained under the threshold
- Mortality of hoary and silver-haired bats was reduced more than 50% from 2020 levels

Year	Total Bat Mortalities	Corrected Mortality Rates	
		Bats/Turbine/Year	Bats/MW/Year
2020	72	11.6	3.4
Smart Curtailment Algorithm + Deterrents			
2021	34	6.6	1.9
2022	26	4.9	1.4
2023	21	4.4	1.3

Discussion

- To date the optimal strategy for managing bat fatalities isn't known; minimization strategies are at various stages of development and new research is ongoing.
- Documentation of bat management frameworks and mitigation approaches that have been implemented at operating facilities with an evaluation of their success can contribute to the industry's collective understanding and knowledge base.
- A flexible, adaptive management approach and the ability to implement site-specific, customizable mitigation approaches may be needed.
- This case study provides an example of a management and mitigation approach that successfully achieved identified bat conservation goals using a multi-tool mitigation strategy

HIWEC is a partnership between the Nigig Power Corporation - a subsidiary of Henvey Inlet First Nation - and Pattern Energy.



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