Assessing the Cumulative Effects of Pressures from Offshore Wind Energy Development and Other Sources on Northern Gannets (Morus bassanus) in Atlantic Canada

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Abstract ID: 65
Call:: MRC 2025 Technical Track – Call for Abstracts
What Theme Are You Submitting for?: Environmental and Ecosystem Considerations
Keywords: Newfoundland and Labrador, Nova Scotia, aerofauna, cumulative effects assessment, cumulative impacts assessment, marine spatial planning, mitigation, seabirds, wildlife

To inform offshore wind energy development (OSW) in Atlantic Canada, we developed a flexible framework for assessing the cumulative effects (CE) of OSW and other pressures on wildlife. Our regional, species-centric approach is based on best practices currently used in Europe, the United States, and Canada. As a demonstration, we apply the framework to the North American population of Northern Gannets (Morus bassanus). The aims are to (1) show that the framework can handle species with very different levels of data quality, (2) illustrate how multiple pressures can be integrated into a single CE assessment, and (3) demonstrate how a CE metric can identify “least-worst” options within a portfolio of wind farm arrangements.

The complete scope of sources and pressures included in the assessment include: behavioral disturbance and collision from wind farms; oil pollution from chronic discharge and accidental

spills by vessels and offshore platforms; fisheries bycatch; behavioral disturbance from vessel traffic; disease; and climate change. Our analytical strategy uses spatial optimization to generate alternative wind farm arrangements that minimize predicted collision risk mortality for gannet. A CE metric is then calculated to evaluate OSW arrangements across future development scenarios defined by build-out, turbine technology, and density. We show how the results from the spatial analysis can flow into an aspatial population viability analysis to explore population-level impacts from pressures. Lastly, we present numerous scenarios that will be used to investigate uncertainty in model predictions and the sensitivity of results to assumptions. With refinement, results of CEAs using this

methodology could support early planning for OSW in Nova Scotia by helping to identify licensing areas, within broader Wind Energy Areas, that minimize cumulative effects on wildlife VECs.