Environmental Studies Program: Ongoing Study

Title	Transparent modeling of collision risk for three federally-listed bird species to offshore wind development
Administered by	Office of Renewable Energy Programs
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Conducting Organization(s)	US Fish and Wildlife Service with University of Rhode Island
Total BOEM Cost	$273,374
Performance Period	FY 2019–2024
Final Report Due	November 1, 2021
Date Revised	October 29, 2020
PICOC Summary	
Problem	Estimating the number of fatalities of federally-listed birds migrating through offshore wind energy facilities.
Intervention	Develop a stochastic collision risk model to estimate the number of fatalities.
Comparison	NA
Outcome	A tool that estimates whether "take" is likely and how much.
Context	Rare birds migrating on the Atlantic OCS

BOEM Information Need(s): BOEM has a responsibility under the Endangered Species Act (ESA) to assess the risks of offshore wind energy development to listed species. The red knot, piping plover, and roseate tern are listed species that can migrate through areas developed for offshore wind. Information from this effort will be used to inform ESA consultations with the USFWS and NEPA analyses on the risk of offshore wind development projects to the red knot, piping plover, and roseate tern.

Background: Collision Risk Models are frequently used to estimate bird fatalities from operating wind turbines. The Band Model (2012) is widely used in Europe for common species and was recently used in the US (e.g., VOWTAP BA and Vineyard Wind BA). However, the Band Model is deterministic and does not allow biological variability (e.g., number of birds, flight heights, etc...) to be incorporated into input parameters, thus creating uncertainty in the interpretation of the model outputs (e.g., estimated number of collisions). Recently, McGregor et al (2018) developed a stochastic CRM based on the Band Model that accounts for multiple sources of uncertainty and provides confidence intervals to its fatality estimates for common European birds; however, it does not cover the three focal species on the US Atlantic or species in migration. An additional challenge is how to appropriately assess risk to rare species that are by definition are uncommon.

This effort will improve on previous by i) increasing the transparency of the modeling, ii) improving flexibility of the modeling to consider the cumulative effects of exposure to multiple offshore wind facilities, and iii) properly accounting for multiple sources of uncertainty (i.e., stochasticity, parametric variability, and model uncertainty). This will be accomplished through the development of an online-graphical-interactive web application for use in the U.S. Atlantic OCS. The web application should include telemetry data for the three focal species (Loring et al. 2018, Loring et al. 2019) as well as data from other sources, and results from this application will be reported as case studies.

This information is essential for understanding the potential for rare or uncommon species to encounter conflicts with renewable energy development in these areas for NEPA assessments and ESA consultations.

Objective: The objective is to develop a user friendly Collision Risk Model that can inform risk assessments of offshore wind development to three federally listed species (Roseate Tern, Piping Plover, and Red Knot) on the Atlantic OCS.

Methods: The USFWS will develop the online-graphical-interactive web application (i.e., RShiny, https://shiny.rstudio.com/) that adapts and improves upon the McGregor (2018) version of the Band Model. These improvements include a deterministic feature to allow for quick execution of the model a feature to estimate the likelihood of "take", the ability to estimate fatalities during migration, automatic report generation of downloaded .pdfs that will contain all relevant model inputs and outputs. The model will be populated with species-specific data including body size, flight height distributions, etc... for roseate tern, red knot piping plover, common tern, plus other relevant species that uses the Atlantic OCS. A user manual will be prepared. USFWS will also host the web application for public use for two years.

Specific Research Question(s): This simulation tool will allow the user to ask whether there will be "take" of federally listed species and to estimate how much.

Current Status: Post- award meeting conducted on September 26, 2019. Updated Project Plan submitted on May 29, 2020. Quarterly Report submitted in October 2020.

Publications Completed: None.

Affiliated WWW Sites: None.

References:

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