

Part V. Recommendations for Future Guidance and Research

Note: This is an excerpt from “*Guidance for Pre- and Post-Construction Monitoring to Detect Changes in Marine Bird Distributions and Habitat Use Related to Offshore Wind Development*”. The full guidance document is available at www.nyetwg.com/avian-displacement-guidance



Developed by the [Avian Displacement Guidance Committee](#) of the [Environmental Technical Working Group](#), with support from the Biodiversity Research Institute

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While the recommendations presented in this document represent a key first step in developing standardized methods to accurately and reliably detect macro- to meso-scale changes in marine bird distributions and habitat use at OSW facilities, further steps will be needed for effective implementation of this guidance at a regional scale. Additional guidance development efforts and quantitative analyses could also serve to strengthen and build on these recommendations. As such, the Specialist Committee recommends several activities following the publication of this document.

11.0 Next Steps for Guidance

- **Review the recommendations presented in this document to develop formal federal guidelines for OSW energy developers.** BOEM and USFWS should develop guidelines focused on how to conduct pre-and post-construction monitoring to detect changes in marine bird distributions and habitat use. **Statistically robust monitoring should be conducted at all lease areas to detect and characterize changes in distributions and habitat use** (see [Section 7](#) for additional discussion of how to develop statistically robust study plans).
- **Support additional analyses to address unresolved study design questions for surveys.** BOEM and USFWS should support additional quantitative analyses to inform key areas of uncertainty in the recommendations for at-sea surveys ([Section 9](#)). It will be important to provide more detailed and scientifically supported guidance to developers and other stakeholders regarding how various factors affect detection of OSW-related displacement, attraction, and avoidance, and how best to estimate these spatiotemporal changes. The literature review and meta-analysis conducted as part of Phase 1 of this Committee’s work, which assessed displacement distance and other metrics from existing studies of marine bird distributions at OSW facilities ([Appendix C](#)), were limited by small sample sizes and inadequate reporting in the available studies from Europe. Additional analyses could help to quantify unresolved questions on survey design by using existing raw survey data and simulation-based approaches to inform the development of more detailed recommendations for boat-based and aerial survey methods (e.g., Lapeña et al. 2010, MacLean et al. 2013, Vanermen et al. 2015b). This Committee recommends additional quantitative analyses include the following steps:
 - Access finalized observational survey datasets on marine bird species distributions and variability in habitat use from the Northwest Atlantic Seabird Catalog and other databases as appropriate.
 - Use data compiled for the Phase 1 meta-analysis to inform study questions and analytical approaches. The degree of displacement and attraction that occurs at OSW facilities appears to vary in space and time in conjunction with individual and species-level responses, facility characteristics, and environmental conditions. In particular, we recommend the use of these existing data (and associated uncertainty) to refine key study design recommendations related to:
 - Species/taxon of interest. From initial analysis, this seems to be one of the most significant factors determining whether an effect is detected ([Appendix C; Lamb et al. 2024](#)).

- Survey frequency and duration (e.g., number of surveys per year and in total, focusing in part on number of years of post-construction data (following preliminary results in [Appendix C](#) as well as results from Lamb et al. 2024)
 - Size of survey area (e.g., extent of buffer area to survey outside of the project footprint)
 - % ground coverage of surveys required to detect change for different species/taxa
 - Characteristics of survey platforms best suited to answer specific questions.
 - Additional data streams to explain potential sources of variation in response, such as operational status.
- Implement power analyses on the above datasets to inform recommendations for species of interest, for example, using simulation-based approaches. Combining existing data on species distributions with simulated survey efforts will promote more informed U.S.-based recommendations on survey extent and other characteristics. This work has already been initiated as part of Project WOW⁸ and could be expanded to develop a regional study design framework for observational surveys, similar to a recently published framework for marine mammal passive acoustic monitoring in relation to OSW (van Parijs et al. 2021).
- Update the recommendations in this document based on findings from the quantitative simulation study.
- **Formulate more detailed recommendations for non-survey methods identified in this document (e.g., individual tracking, radar, remote visual imagery) for assessing avoidance/attraction.** Detailed recommendations for incorporating additional methods into understanding displacement will improve the quality and standardization of studies across projects.
- **Form an expert working group or technical review panel (potentially through the RWSC) to further refine survey-based guidance and undertake recommendations in this document** (e.g., key unresolved questions, standard protocols, power analyses, and monitoring measures) and facilitate planning and coordination of surveys aimed at understanding displacement at multiple scales. Among other issues, such a Committee could help to develop a recommended joint protocol for surveys conducted at adjoining lease areas (e.g., with overlapping buffer zones) in order to understand cumulative displacement impacts (see [Section 12](#), below). This group should be made up of experts in designing and conducting observational surveys and have broad representation across OSW-wildlife sectors.

12.0 Additional Guidance, Frameworks, and Research Needs

- **Develop approaches for conducting surveys or other monitoring efforts at multi-project scales.** For OSW facilities in proximity (such as adjoining lease areas), research and monitoring efforts focused on a single project will be inefficient, involve challenging logistics, and be less effective at detecting change, due to activities in each project area that may be affecting marine bird distributions in additive or synergistic ways. Ideally, developer-funded surveys in such situations should be coordinated and conducted at a larger multi-project or regional scale to collectively assess changes in marine bird habitat use and distributions from all OSW projects in the vicinity.

⁸ More information on Project WOW: <https://offshorewind.env.duke.edu/>

This type of coordination may be challenging, particularly given differing permitting and construction timelines across projects. However, a lack of coordination can increase the expense of surveys for individual OSW developers and hinder the ability of both OSW developers and regulators to detect effects of offshore wind energy using pre- and post-construction surveys. The Committee recommends that BOEM and USFWS:

- Encourage OSW developers to contribute to a common fund or research effort, perhaps coordinated via the RWSC, to fund regional-scale surveys in lieu of surveys conducted on a site-by-site basis. This approach could be even more effective than standardizing studies on a site-by-site basis for producing high-quality, consistent data to reduce uncertainty and inform understanding of effects, while also increasing cost efficiency.
 - Prioritize the designation of one or more people with appropriate expertise to coordinate the implementation of the recommendations in this document. Most likely this person would be a federal agency biologist, possibly working in coordination with the RWSC bird and bat subcommittee. Regardless, this position must have sufficient regulatory support and authority to support the design and coordination of studies, data sharing, and other key aspects to ensure the quality, standardization, and availability of data and findings from site-level effects research.
- **Develop standardized approaches and recommendations for conducting power analyses and analytical approaches to inform study design and reporting.** As described in Sections [7](#) and [9](#)), power analyses are key to informing study design choices, and estimating the anticipated variability of the data represents an important step of this process. Given the pitfalls of using insufficient/inaccurate data to inform power analyses, and the potential conflicts of interest associated with such an important/consequential analysis, it is important to develop a standardized or centralized approach to power analyses for study design purposes to ensure that they are used consistently, correctly, and in a scientifically robust manner. Additional guidance on the analytical approaches that should be used for study design power analysis as well as data analysis could also be beneficial to improve consistency across projects.
 - **Formulate recommendations for studies of other types of OSW effects on marine birds.** While changes in marine bird habitat use and distributions are important to study and understand, other types of effects, including collisions, are also important, particularly as they may affect a wider range of taxa, including nocturnal migrants. Recommendations focused on other types of OSW effects studies should include the identification of effective approaches for assessing micro-scale avoidance, collisions, and habitat alteration (including changes in distribution and abundance of prey species). In some cases, this may require agencies to also develop standardized validation/acceptance approaches for new technologies. BOEM or USFWS could choose to develop research and monitoring guidelines directly or could participate in an effort like the current Specialist Committee (through the E-TWG, the RWSC, or another venue) to obtain specialized expertise in shaping the development of federal guidelines. This could help to form comprehensive guidelines for all avian monitoring at offshore wind facilities.
 - **Develop species distribution modeling frameworks that integrate data from different sources (e.g., surveys, tracking, colony data, environmental covariates) to inform risk assessments and improve understanding of potential cumulative and population-level impacts.**
 - Currently, surveys and tracking data are largely considered independently when conducting risk assessments for marine birds. Integration of these data types into a single

spatiotemporal framework for risk assessment would better utilize existing data, fill data gaps, and improve the overall quality of risk assessments. However, given the different spatiotemporal scales at which surveys and tracking operate, such integration would require substantial quantitative expertise and method development. There is a current study⁹ funded through the Offshore Renewables Joint Industry Programme (ORJIP) for Offshore Wind that is beginning to tackle this issue; further work should build on the ORJIP effort.

- Better integration of colony data (e.g., productivity, adult survival) with survey data would be useful both for understanding spatial patterns of habitat use during the breeding season and for understanding how changes in distribution and habitat use in relation to OSW development may affect fitness and survival, thus, drive population level change. In the U.S. Atlantic, we recommend starting with a dedicated effort to QA/QC a federal seabird colony dataset and use it in an analysis of breeding seabird foraging ranges.
- **Conduct studies to better understand the mechanisms of behavioral change, as well as the potential for population-level impacts from resulting attraction and avoidance.** This guidance focuses on detecting and characterizing displacement, attraction, and avoidance but does not address the mechanisms and potential impacts of these effects on populations and ecosystems. Further study is needed to 1) understand causal mechanisms (e.g., what aspect of OSW turbines or wind farms birds are responding to when they avoid or are attracted, and why), and 2) determine the fitness consequences, if any, of these behavioral changes, and the potential for resulting population-level impacts.

The end goals of all these surveys and analyses are to be able to (1) assess the impacts to fitness of cumulative changes in habitat use in response to OSW development, and (2) minimize and mitigate changes in fitness, if they exist. While these objectives are beyond the scope of this guidance, successful implementation of the recommendations in this document will be an important step towards achieving these goals for the OSW industry in the U.S. Atlantic. Existing effects data are from a very different set of ecosystems than the U.S. Atlantic, and it is important to assess whether changes in distribution and habitat use at U.S. wind facilities are consistent with those observed at European OSW facilities, as well as adding additional datasets to the global knowledge base on this issue.

⁹ ORJIP for Offshore Wind: Integration of tracking and at-sea survey data (InTaS) www.carbontrust.com/news-and-insights/tenders/orjip-for-offshore-wind-integration-of-tracking-and-at-sea-survey-data-intas