Appendix AB - Avian and Bat Post-Construction Monitoring Framework

Avian and Bat Post-Construction Monitoring Framework

Introduction

Ocean Wind, LLC (Ocean Wind) is proposing the approximately 1,100 MW Ocean Wind Offshore Wind Farm Project (OCW01) located in the Bureau of Ocean Energy Management (BOEM) Renewable Energy Lease Area OCS-A 0498 (Lease Area). Offshore, the Project will consist of up to 98 wind turbine generators (WTGs), up to three offshore alternating current (AC) substations, array cables linking the individual turbines to the offshore substations, substation interconnector cables linking the substations to each other, and offshore export cables. This OCW01 Avian and Bat Post-Construction Monitoring Framework (hereafter the "Framework") focuses solely on the offshore footprint of the Project within the Lease Area, and does not apply to the offshore export cable, cable landfall, or onshore portions of the Project.

Ocean Wind has developed this Framework to outline an approach to post-construction monitoring that supports advancement of the understanding of bird and bat interactions with offshore wind farms. The scope of monitoring is designed to meet federal requirements [30 CFR 585.626(b)(15) and 585.633(b)] and is scaled to the size and risk profile of the Project with a focus on species of conservation concern.

The intent of the Framework is to outline overarching monitoring objectives, proposed monitoring elements, and reporting requirements. A detailed Avian and Bat Post-Construction Monitoring Plan (Monitoring Plan), based on this Framework, will be developed in coordination with BOEM, USFWS, and other relevant regulatory agencies. Where feasible, monitoring conducted at the OCW01 will be coordinated with monitoring at other offshore wind projects in the Mid-Atlantic Region to facilitate integrated analyses across a broader geographic area.

Monitoring objectives and associated methods are summarized in Table 1. Technical approaches were selected based on offshore logistical constraints, their ability to address monitoring objectives, and their effectiveness in the marine environment. Emerging technologies, such as multi-sensor radar/camera collision detection systems, are not proposed under this Framework because they have not yet been broadly deployed offshore or demonstrated to effectively reduce uncertainties related to potential impacts on birds and bats.

Table 1. Monitoring objectives, general approaches to be used, and types of data generated.

Taxa	Monitoring Objective	Approach	Duration	Data Output
Bats	Monitor occurrence of bats	Acoustics	2 years	Presence; temporal & weather patterns
Birds	Monitor use by ESA listed birds	Radio-tags	up to 3 years	Presence; temporal & weather patterns
Birds	Monitor use by nocturnal migratory birds	Radar	1–2 years	Flux rates and flight heights of nocturnally migrating birds
Birds	Monitor movement of marine birds around the turbines	Radar	1–2 years	Avoidance rates of marine birds
Both	Document mortality	Incidental observations	Project lifetime	Incidence, identification

Bat Acoustic Monitoring

The presence of bats in the marine environment has been documented in the U.S. (Hatch et al. 2013, Solick and Newman 2021). However, there remains uncertainty regarding the extent to which bats occur offshore,

particularly within offshore wind farms. Acoustic detectors are commonly used to study bat presence, which can improve the understanding of movements and migration (Johnson et al. 2011). Ocean Wind will conduct bat acoustic monitoring to assess bat activity at the OCW01, targeting key data gaps related to species presence/composition, temporal patterns of activity, and relationship with weather and atmospheric conditions.

Acoustic monitoring of bat presence will be conducted for two years post-construction. Ultrasonic bat detector stations will be installed on the offshore substation, wind turbine platforms, and/or buoys in the early spring or late winter (March), and removed in the late fall or early winter (December) after migration, or the most appropriate period as determined in cooperation with BOEM, USFWS, and other relevant regulatory agencies. The detectors will record calls of both cave-hibernating bats, including the northern long-eared bat (*Myotis septentrionalis*), and migratory tree bats; the resulting information can be used to identify bats to species. All acoustic data recorded will be processed with approved software to filter out poor quality data and identify the presence of bat calls. Where information is insufficient to make a species identification, calls will be classified to one of two phonic groups: low frequency bats (LoF), or high frequency bats (HiF). The HiF group includes both migratory tree bats and cave hibernating bats. Since HiFi include the ESA-listed northern long-eared bat, they will then be manually vetted by an experienced acoustician to the highest resolution possible (e.g., species or genus).

All bat calls detected and identified will be analyzed to understand relationships with time of day, season, and weather/atmospheric conditions. The results will provide information on bat presence offshore and the conditions under which they may occur near offshore wind turbines.

Motus Tracking Network and Use by ESA-listed Birds Study

Tracking studies indicate that at least some individual ESA-listed Piping Plovers (*Charadrius melodus*) and Red Knots (*Calidris canutus rufa*) pass through the New Jersey Wind Energy Area within which the OCW01 is located (Loring et al. 2018, 2019). Roseate Terns (*Sterna dougallii*) have not been detected in the Wind Energy Area, but the birds are expected to pass through the region during migration. However, due to limited coverage of onshore automated telemetry receiving stations and low probability of detecting tags (hereafter, Motus receivers and tags) in the offshore environment (Loring et al. 2019), there remains uncertainty related to offshore movements of ESA-listed birds during migration. OCW01 will install offshore Motus receiver stations and contribute funding to radio-tagging efforts to address this data gap. The exact species being studied will be determined in consultation with federal agencies and will be dependent on existing, ongoing field efforts. The Motus receivers will also provide opportunistic presence/absence data on other species carrying Motus tags, such as migratory songbirds and bats.

Movements of radio-tagged ESA-listed birds in the vicinity of the OCW01 will be monitored for up to three years post-construction, during the spring, summer, and fall. Motus receivers will be installed within the wind farm to determine the presence/absence of ESA-listed species. The specific number and location of offshore receiver stations will be selected to optimize study design goals, and will be determined using a design tool currently being developed through a New York State Energy Research and Development Authority (NYSERDA) funded project[3]. In addition, existing Motus receiver stations at up to two onshore locations near the OCW01 (e.g., Brigantine, Holgate) will be refurbished to confirm the presence and movements of radio-tagged ESA-species in areas adjacent to OCW01 (refurbishment needs will be discussed with USFWS). Funding for up to 150 Motus tags per year will be provided to researchers working with ESA-listed birds for up to three consecutive years. Ocean Wind will also consider contributing to existing GPS based tracking efforts for ESA-listed birds.

[3] https://www.briloon.org/renewable/automatedvhfguidance

ESA-listed bird presence/absence in the wind farm will be analyzed by comparing detections within the wind farm to coastal receiver towers. All detections will be analyzed to understand relationships with time of day, season, and weather.

Radar Monitoring: Nocturnal Migrants Flux and Flight Heights

Nocturnal migrants, including songbirds and shorebirds, are documented to fly offshore (Adams et al. 2015, Loring et al. 2021). Since nocturnal migration events are episodic and cannot be detected during daytime surveys, there is uncertainty on the timing and intensity of migration offshore. Radar, oriented vertically, has been used at offshore wind farms in Europe to study nocturnal migration events (Hill et al. 2014). Ocean Wind is considering conducting a one-to-two-year radar study to record the passage rates (flux) of migrants and their flight heights. Since radar approaches to monitoring birds are actively evolving, a specific system and methods will be determined closer to when the projects begin operating. The results could be related to time of year and weather conditions, to increase the understanding on when nocturnal migrants may have higher collision risk.

Radar Monitoring: Marine Bird Avoidance

Marine birds, particularly loons, sea ducks, auks, and the Northern Gannet (*Morus bassanus*), have been documented to avoid offshore wind farms, potentially leading to displacement from habitat (Goodale and Milman 2016). However, there remains uncertainty on how birds will respond to larger more widely spaced turbines, like those proposed for OCW01. Based on methods used by Desholm and Kahlert (2005) and Skov et al. (2018), Ocean Wind is considering conducting a one-to-two-year radar study to collect data on macro (and potentially meso) avoidance rates. The radar would run continuously and could be paired with observers to collect data at times when birds vulnerable to displacement are present. These data on macro-avoidance would support understanding of both displacement and collision vulnerability.

Documentation of Dead and Injured Birds and Bats

Ocean Wind, or its designated operator, will implement a reporting system to document dead or injured birds or bats found incidentally on vessels and project structures during construction, operation, and decommissioning. The location will be marked using GPS, an Incident Reporting Form will be filled out, and digital photographs taken. Any animals detected that could be ESA-listed, will have their identity confirmed by consulting biologists, and a report will be submitted to the designated staff at Ocean Wind who will then report it to BOEM, USFWS, and other relevant regulatory agencies. Carcasses with federal or research bands or tags will be reported to the U.S. Geological Survey (USGS) Bird Band Laboratory, BOEM, and USFWS.

Adaptive Monitoring

Adaptive monitoring is an important principle underlying Ocean Wind's post-construction monitoring Framework. Over the course of monitoring, Ocean Wind will work with BOEM, USFWS, and other relevant regulatory agencies, to determine the need for adjustments to monitoring approaches, consideration of new monitoring technologies, and/or additional periods of monitoring, based on an ongoing assessment of monitoring results. Potential triggers for adaptive monitoring may include, but not be limited to, equipment failure, an unexpected impact to birds or bats identified through monitoring, or new opportunities to collaborate with other projects in the region. The Monitoring Plan will include a series of potential adaptive monitoring actions, developed in coordination with BOEM, USFWS, and other relevant regulatory agencies, to be considered as appropriate.

Reporting

Ocean Wind will submit an annual report to BOEM and USFWS summarizing post-construction monitoring activities, preliminary results as available, and any proposed changes in the monitoring program. Ocean Wind will participate in an annual meeting with BOEM and USFWS to discuss the report.

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