

Section 15
Environmental Mitigation Plan

Attachment 15.A
Environmental Mitigation Plan



Environmental Mitigation Plan
for
Beacon Wind
Version 1.0

Prepared Pursuant to [contract number, date (TBD)]
with

New York State Energy Research and Development Authority
Albany, NY

Prepared by
Beacon Wind LLC
600 Washington Blvd
Stamford, CT 06901

January 2023

Record of Revision		
Version No. and Revision Date	Description of changes	Revision on pages
Version 1.0	Built on an earlier version EMP for Beacon Wind 1	

Communication Officers, Contact Information, Links		
Name/Title	Role	Contact Information
Scott Lundin Head of US Permitting and Environmental Affairs	Primary point of contact for Beacon Wind LLC on environmental matters. F-TWG representative (primary)	sclu@equinor.com
Julia Lewis Director of Permitting, Beacon Wind	Point of contact for Beacon Wind LLC on environmental matters related to Beacon Wind. E-TWG Alternate	julew@equinor.com
Jennifer Dupont Strategic Permitting Manager	E-TWG Representative	jdup@equinor.com
Elizabeth Marchetti Fisheries Manager, Beacon Wind LLC	Point of contact for Beacon Wind LLC on matter related to commercial and recreational fisheries. F-TWG representative (alternate)	emarc@equinor.com

Links to project information:

Project website: www.beaconwind.com

Table of Contents

1. Environmental Mitigation Plan Summary

1.1. Overall philosophy and principles

This section should describe the overall philosophy and principles the Developer will follow to avoid, minimize, restore, and off-set potential impacts to environmental resources.

- Beacon Wind believes that from the outset, measures to avoid or mitigate adverse environmental impacts, while maximizing the positive beneficial environmental impacts of an offshore wind energy project should be:
 - Identified and developed in consultation and coordination with the relevant stakeholders;
 - Based on robust baseline characterization that has been developed in consultation with relevant stakeholders;
 - Evidence based and founded on the latest science;
 - Supplemented through targeted data collection, monitoring and/or research where data gaps exist or the receptor-effect interactions are unknown
 - Incorporated into spatial planning, for example project siting and design; and
 - Applied to how the project is implemented, for example surveys, construction methods and operations and maintenance activities.
- Beacon Wind recognizes the importance of adaptive management and will continue to evolve its procedures for the evaluation and mitigation of environmental resources.
 - For example, the Plan described herein is an update to the details described in the connection with prior bid submissions, reviewed and commented on by NYSERDA, presented to the E-TWG on November 20, 2019 and presented to the E-TWG on September 20, 2022 and incorporated into the 2022 NYSERDA Beacon Wind 1 PSA.

1.2. Overall approach to incorporating data and stakeholder feedback

This section should describe how the Developer will use research, data, and stakeholder feedback to update the EMP and support decision-making throughout the life cycle of the project (pre-construction, surveys, site design, construction, operations, and decommissioning).

- Beacon Wind will seek consultation and coordinate with relevant stakeholders.
- Beacon Wind will review existing research and data and seek input from stakeholders regarding data gaps to inform decisions made throughout the project life cycle.
- Beacon Wind will review and seek input from stakeholders on proposed and conducted survey rationales and methodologies as well as design, construction and operation, and decommissioning plans for the project.
- Pre- and post-construction monitoring will be designed to improve the understanding of impacts of offshore wind energy development and operations on wildlife, both onshore and offshore components of the project.
- Additionally:

- Beacon Wind believes consultation and coordination with relevant stakeholders is important as a means of identifying potential risks or opportunities for sufficiently avoiding and mitigating environmental impacts.
- Beacon Wind has identified proven steps to consult with the relevant stakeholder groups to get feedback on plans, data, mitigation, and buy in on decisions in advance of the regulatory process – a “no surprises” approach.

1.3. Existing guidance and best practices that will be followed

This section should present a list of existing guidance documents, publications, tools, and/or plans that will be followed to support the EMP. Include links, if available, for all references.

- Beacon Wind will follow the following guidance documents and update the guidance documents list as appropriate. Beacon Wind also notes that, several adjacent New England offshore wind projects are currently under review by BOEM and will provide case studies for best management practices and mitigation measures. Beacon Wind will consider and potentially adopt or improve such practices for the Beacon Wind project to the maximum extent practicable.
- NOAA NMFS. 2018. 2018 Revision to: Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing: Underwater Acoustic Thresholds for Onset of Permanent and Temporary Threshold Shifts, April 1, 2018. Available at: <https://www.fisheries.noaa.gov/resource/document/technical-guidance-assessing-effects-anthropogenic-sound-marine-mammal-hearing>
- NMFS GARFO. 2020. Recommendations for Mapping Fish Habitat. NMFS GARFO Habitat Conservation and Ecosystem Services Division.
- BOEM. 2019. Guidelines for Providing Information on Marine Mammals and Sea Turtles for Renewable Energy Development on the Atlantic Outer Continental Shelf Pursuant to 30 C.F.R. Part 585 Subpart F. Available online at: <https://www.boem.gov/sites/default/files/renewable-energy-program/Regulatory-Information/BOEM-Marine-Mammals-and-Sea-Turtles-Guidelines.pdf>.
- BOEM. 2019. Guidelines for Providing Information on Fisheries for Renewable Energy Development on the Atlantic Outer Continental Shelf Pursuant to 30 C.F.R. Part 585. Fisheries Study Guidelines. Available at <https://www.boem.gov/sites/default/files/renewable-energy-program/BOEM-Fishery-Guidelines.pdf>
- BOEM. 2019. Guidelines for Providing Benthic Habitat Survey Information for Renewable Energy Development on the Atlantic Outer Continental Shelf Pursuant to 30 C.F.R. Part 585. Available at <https://www.boem.gov/sites/default/files/renewable-energy-program/Regulatory-Information/BOEM-Renewable-Benthic-Habitat-Guidelines.pdf>. The guidance recommends that the NMFS EFH mapper tool (<http://www.habitat.noaa.gov/protection/efh/habitatmapper.html>) be used for species identification and habitat characteristics at any particular location (page 7)
- BOEM. 2020. Guidelines for Providing Information on Fisheries Social and Economic Conditions for Renewable Energy Development on the Atlantic Outer Continental Shelf Pursuant to 30 C.F.R. Part 585. October 20, 2015. Available

- at <https://www.boem.gov/sites/default/files/documents/about-boem/Social%20%26amp%3B%20Econ%20Fishing%20Guidelines.pdf>
- BOEM 2020. Guidelines for Providing Avian Survey Information for Renewable Energy Development on the Outer Continental Shelf. United State Department of the Interior – Bureau of Ocean Energy Management, Office of Renewable Energy Programs. May 27, 2020. Available at <https://www.boem.gov/sites/default/files/documents/newsroom/Avian%20Survey%20Guidelines.pdf>
- <https://www.boem.gov/sites/default/files/documents/newsroom/Avian%20Survey%20Guidelines.pdf>

2. Communications and Collaboration Approach

2.1. Overview and communication plan objectives

This section should provide an overview of the communication plan and objectives and its importance in fisheries migration.

- Beacon Wind will seek methods and processes to allow for a two-way flow of information between key stakeholders and developers, specifically highlighting how the developer usesthis feedback to inform their decision making.
- Beacon Wind will provide updates to environmental stakeholders in an appropriate mannerthat would be easily accessed and widely distributed.
- Additionally:
 - Openness is a core value and cornerstone of Beacon Wind’s approach to engaging with and sharing data with stakeholders.
 - Beacon Wind will continue to approach project development of the COP for Beacon Wind and other state and federal permits on a “no surprises” basis. This includes sharing project updates, plans, results and information regularly and at all stages of the project so that all relevant interested parties have had sufficient opportunities to input into these processes, while also being sensitive to the potential for stakeholder fatigue.
 - Beacon Wind notes that this approach has proven effective and well-received throughout the continued development of projects and submission of the Empire Wind COP.

2.2. Communication officers/positions, responsibilities, and contact information

This section will provide a list of communication officers, their role, and name and contact information. The list should provide stakeholders with an understanding of who should be called fora particular issue or question. It will also include links to the project website so readers know whereto find additional information.

Communication Officers, Contact Information, Links		
Name/Title	Role	Contact Information
Scott Lundin Head of US Permitting and Environmental Affairs	Primary point of contact for Beacon Wind LLC on environmental matters. F-TWG representative (primary)	sclu@equinor.com

Julia Lewis Director of Permitting, Beacon Wind	Point of contact for Beacon Wind LLC on environmental matters related to Beacon Wind. E-TWG representative (alternate)	julew@equinor.com
Jennifer Dupont Strategic Environmental Affairs Manager	E-TWG Representative	jdup@equinor.com
Elizabeth Marchetti Fisheries Manager, Beacon Wind LLC	Point of contact for Beacon Wind LLC on matter related to commercial and recreational fisheries. F-TWG representative (alternate)	emarc@equinor.com

Project website: www.beaconwind.com

2.3. Identification of stakeholders

This section should describe the process by which stakeholders will be identified and classified by stakeholder group.

- Beacon Wind will continue to engage with regulatory agencies, Environmental NGOs (“NGOs”), research institutions, and relevant stakeholders either via independent meetings or through environmental round tables in order to maximize opportunities to discuss the project and solicit feedback. The Beacon Wind project held its latest ENGO roundtable September 17th, 2020.
- Beacon Wind has presented study results at the NYSERDA State of the Science Workshop, has engaged in a discussion with the E-TWG on September 20, 2022 with project and mitigation plan updates, and actively participates in the Regional Wildlife Science Collaborative (RWSC) on all active subcommittees, as well as the Industry Caucus and the Steering Committee.
- This process will continue throughout the development of all of Beacon Wind’s projects.
- Stakeholder lists, contact details and correspondence are listed on Beacon Wind’s internal stakeholder tracking tool and classified accordingly.

2.4. Participation in stakeholder and technical working groups

2.4.1 Communication with E-TWG

This should describe the communication and collaboration approach with members of the E- TWG and consultations.

- Beacon Wind will dedicate Project-specific technical resources to the E-TWG.
- Beacon Wind will work with the E-TWG and shall attend E-TWG meetings and workshops.
- Beacon Wind has identified specific individuals to serve at least one-year terms in the role of primary (Jennifer Dupont) and secondary (Julia Lewis) core members.

- Additionally:
 - Beacon Wind has been active in the E-TWG since its inception and is committed to actively participate as a means to collaborate on best practices and research for offshore wind energy development, balance environmental concerns with responsible technically and commercially feasible development, while fostering opportunities for future offshore wind energy development.
 - Beacon Wind will engage with the E-TWG on the basis of the portfolio of projects in development, rather than on a project-by-project basis. This approach is intended to streamline communication by providing a single point of contact for information exchange and consistent message.
 - Current representation of Beacon Wind on the E-TWG can be found within the Communication Officers table located within Section 2.2 of this document.
 - Beacon Wind considers the ENGOs on E-TWG as a proxy “ENGO steering committee” for engagement with the ENGO community on responsible development and to provide guidance on additional outreach that may be valuable.
 - Beacon Wind will also proactively engage with ENGOs not directly represented on the E-TWG, for example through direct engagement or Environmental Round Tables hosted by Beacon Wind, as appropriate. For the Beacon Wind Project, this may include additional ENGOs focused specifically on the New England area.
 - Beacon Wind actively participates in the Regional Wildlife Science Collaborative, with membership on the marine mammal, avian and bat, habitat and ecosystem, and sea turtle subcommittees. In addition, Equinor Wind representative is a member of the RWSC Steering Committee and Industry Caucus lead.

2.4.2 Communication with other New York State agencies

This should describe communication with New York State agencies during each phase of the project.

- Beacon Wind will continue to engage with NY State Agencies throughout the project development process, including project updates and plans, environmental data collection, baseline data, potential mitigation options, terrestrial archaeology, historic architecture, and permitting. Communication with NY State Agencies regarding the Beacon Wind project was initiated on September 25, 2020. The NYS agencies included:
 - NY State Department of Environmental Conservation (NYSDEC);
 - NY State Department of State (NYSDOS);
 - NY State Office of Parks, Recreation and Historic Preservation (NYSOPRHP);
 - NY State Office of General Services (NYSOGS);
 - New York State Energy Research and Development Authority (NYSERDA); and
 - NY State Department of Public Service (NYS DPS).
- Beacon Wind will also continue to consult with additional New England state agencies, as appropriate.

2.4.3 Communication with other stakeholder and working groups

This should describe any relevant participation with other stakeholder groups, such as international fisheries groups that would help inform the EMP.

- Beacon Wind is a member of the Steering Committee that is working with NYSERDA and other partners to stand-up a Regional Wildlife Science Collaborative (“RWSC”) that is envisioned to provide support for regional science collaboration focused on studying the potential impacts from offshore wind development on sensitive environmental receptors.
- Beacon Wind is a board member of the Responsible Offshore Science Alliance (ROSA) and active member of the Advisory Council.
- Beacon Wind is a founding member of the Responsible Offshore Development Alliance (RODA) Joint Industry Task Force.
- Beacon Wind’s Fisheries Manager is a member of the New England Fisheries Management Council Habitat Advisory Panel
- Beacon Wind will continue to participate in the F-TWG and current representation can be found within Section 2.2 of this document.
- Beacon Wind actively participates in the Massachusetts Habitat Working Group and Fisheries Working Group, which are similar in scope and membership to the E-TWG and F-TWG.
- Beacon Wind will continue to engage with Tribal Nations, including but not limited to the Shinnecock Indian Nation, Mashpee Wampanoag Tribe, Mashantucket Pequot Tribal Nation, Wampanoag Tribe of Gay Head – Aquinnah, and the Narragansett Indian Tribe.
- Beacon Wind will continue to engage with federal agencies, including:
 - BOEM as the lead agency to ensure a smooth permitting process and soliciting feedback on baseline data requirements;
 - NOAA’s National Marine Fisheries Service (“NMFS”) in relation to development of survey plans, baseline characterization data, for example, benthic and fisheries data sources and providing feedback on Beacon Wind’s data collection efforts, strategic advice on threatened and endangered species, Incidental Harassment Authorizations (“IHAs”) for geophysical surveys and the potential future requirements for IHAs in relation to construction activities.
 - U.S. Fish and Wildlife Service (“USFWS”);
 - U.S. Environmental Protection Agency (“EPA”);
 - U.S. Coastguard (“USCG”) and U.S. Army Corps of Engineers (“USACE”); and
 - National Park Service (“NPS”)
- Beacon Wind will continue to engage with the general public, which includes open houses and public hearings to address comments and questions.

2.4.4 Communication and collaboration with other developers

This section should describe any relevant participation and collaboration with other developers in the offshore space, with a focus on communication and collaboration with adjacent leaseholders. This may include but is not limited to shared research efforts, coordination of survey methods, or

standardization of navigational and safety protocols.

- Beacon Wind will seek to maximize the impact of research efforts such as data collection, methodology, analysis and dissemination by collaborating with other developers, particularly those in adjacent lease areas, taking on similar initiatives
- Beacon Wind, along with the other developers near the lease area, has committed to a 1 nm X 1 nm turbine spacing to minimize impacts to fishing, shipping, and navigation. This layout was agreed through numerous stakeholder consultations, including with other developers, regulators, commercial fishing groups, eNGOs, and others.
- Beacon Wind is participating in a study, coordinated by Inspire Environmental and the New England Aquarium, in collaboration with four other developers near the lease area (Avangrid, Mayflower Wind, Orsted and Vineyard Wind) to investigate Highly Migratory Species using acoustic telemetry and recreational fishery monitoring.
- Beacon Wind has partnered with the other New England offshore wind developers to support a continuation of the Massachusetts Clean Energy Center and New England Aquarium regional aerial survey for marine mammals and sea turtles, covering all seven lease areas in the region that has been ongoing since 2011.

Beacon Wind continues to engage actively in the development of the RWSC integrated science plan and will coordinate research efforts through the RWSC to ensure that priority regional studies are addressed and that data/results are made available for broad regional application/use.

2.5. Communication methods and tools by phase

This section should describe the communication and outreach methods and tools that will be employed for each stakeholder group during each phase of the project.

Proposed Outreach Methods/Tools	Phase*			
	1	2	3	4
Public meetings, Open houses	X	X	X	X
Stakeholder workgroups	X	X	X	X
Website promotion	X	X	X	X
Visual simulation tools	X	X	X	X
ENGO Round Tables, in person	X	X	X	X
Federal Agency Meetings, in person, webinars	X	X	X	X
State Agency Meetings, in person, webinars	X	X	X	X
E-TWG and F-TWG Meetings	X	X	X	X
Tribal Meetings; in person, webinars	X	X	X	X
Project Newsletters	X	X	X	X
Scientific and Technical Conferences	X	X	X	X

**Phase: 1: Survey/Design; 2: Construction; 3: Operation; 4: Decommission*

3. Supporting Other Research

3.1. Support of collaborative research

This section should describe how opportunities for developing or investing in collaborative research with environmental and academic entities to collect ecological data will be identified and undertaken. The description must account for the need to coordinate with members of the E-TWG during data gathering and assessment.

- Beacon Wind is committed to being an active member of regional science organizations including the RWSC and ROSA. Beacon Wind is a member of the Steering Committee that has worked with NYSDERA and other partners to stand-up the RWSC that is envisioned to provide support for regional science collaboration focused on studying the potential impacts from offshore wind development on sensitive environmental receptors.
- Beacon Wind is a board member of the ROSA and active member of the Advisory Council.
- Beacon Wind is committed to collaborating with the scientific community, E-TWG, relevant stakeholders, other offshore wind energy developers and third-party groups to conduct robust and relevant research studies that relate to environmental resources and offshore wind energy developments.
- Beacon Wind has partnered with the other New England offshore wind developers to support a continuation of the Massachusetts Clean Energy Center and New England Aquarium regional aerial survey for marine mammals and sea turtles, covering all seven lease areas in the region that has been ongoing since 2011.
- Additionally, Beacon Wind will:
 - Consider making existing wind farm related vessels, buoys, or structures available for research opportunities.
 - Explore appropriate monitoring protocols, for example monitoring of potential behavioral responses or changes in spatial and temporal distribution of biological resources as a direct result of the offshore wind energy development.
- Beacon Wind advocates that technical experts conduct statistical power analyses up front in the planning process before implementing any future studies. In addition, F-TWG and/or E-TWG are appropriate forums in which to discuss the development of such analyses and should be part of this process.

3.2. Handling/processing requests

This section should describe how requests for coordination with third-party supported scientists will be processed - including providing reasonably-requested Project data and access to the Project area for independent scientists examining environmental and fishery sensitivities and/or the impacts of offshore wind energy development on fish, invertebrates and fisheries for the purpose of publication in peer reviewed journals or other scientifically rigorous products.

- Beacon Wind will make an effort to meet with any interested parties when contacted to discuss prospective research.
- Beacon Wind is willing to consider requests to access Beacon Wind's affiliates' existing operating offshore wind energy developments in Europe to conduct research and monitoring.

3.3. Data availability

This section should describe how data will be made available in accordance with Section 2.2.8 of the RFP.

- Beacon Wind will make publicly available relevant information or data and supporting metadata that is developed across our portfolio of projects to enhance the understanding of environmental characteristics, or use by wildlife, of any offshore, nearshore or onshore areas, so long as it is not considered proprietary in nature and done in accordance with permitting timelines/requirements. This includes the following data/studies:
 - Aerial wildlife survey data for the Beacon Wind project is being shared on a public website to make information readily available to the public regarding wildlife species diversity and abundance across the lease area on a monthly basis. www.remote.normandeau.com
 - Protected Species Observer (PSO) data is currently being shared in support of a research study being conducted by NMFS and the New England Aquarium to evaluate how PSO data can be utilized to support regional species stock assessments.
 - Beacon Wind is funding a study with the Woods Hole Oceanographic Institute to evaluate the effectiveness of Infrared Camera Technology and artificial intelligence data processing as a tool for autonomous marine mammal mitigation. Results from this study are expected to be published in an academic-peer reviewed journal for wide application and benefit.
 - Beacon Wind is collaborating with the New England Aquarium to fund a study of highly migratory fish species, which are targeted by recreational fishermen. Data collected from this study will likely be combined with similar research being conducted by NEAq in the region and published in an academic-peer reviewed journal for wide application and benefit.
 - Beacon Wind has installed Motus receivers on two of its metocean buoys and is actively contributing to the Motus network.
 - Beacon Wind metocean facilities (e.g., current meters and wave buoys) are deployed and oceanographic data, not deemed proprietary will be made available upon request.
- Prior to any disclosure, data made available by Beacon Wind will undergo final quality assurance/quality control (“QA/QC”) to be performed by Beacon Wind.
- Beacon Wind is open to exploring outlets for sharing information (e.g., the E-TWG webpage or other data portals), however, version control will be important.
- The following studies and reports will be available to the public once the COP has been issued by BOEM for public comments:
 - Ornithological and Marine Fauna Aerial Survey
 - Avian Impact Assessment for the Proposed Beacon Wind Project
 - 2018 Bat Survey Report
 - Bat Impact Assessment for the Proposed Beacon Wind Project in the New York Bight
 - Benthic Resources Characterization Reports

- Essential Fish Habitat (EFH) Assessment
- Analysis of Visual Effects to Historic Properties
- Visual Impact Assessment
- Aircraft Detection Lighting System (ADLS)
- Obstruction Evaluation & Airspace Analysis
- Navigation Safety Risk Assessment
- Offshore Electric and Magnetic Field Assessment
- Onshore Electric and Magnetic Field Assessment
- In-Air Acoustic Assessment
- Underwater Acoustic Assessment
- Information for Planning and Conservation (IPaC) Report and New York State Department of Environmental Conservation Natural Heritage Response Letters
- Sediment Transport Analysis
- Air Emissions Calculations and Methodology
- Conceptual Project Design Drawings
- Oil Spill Response Plan
- Safety Management System
- Coastal Zone Management Consistency Statements
- Summary of Agency and Stakeholder Engagement

3.4. Proposed restrictions

This section should describe any restrictions on data provision or access that may be required to protect trade secrets or maintain site security.

- Beacon Wind will restrict confidential, propriety, and commercially sensitive data (as noted above).

3.5. Financial commitment for third party research

This section should provide a level of financial commitment, if elected, that will be appropriated to leverage third-party environmental research funding including federal or State-supported research. Or, if elected, provide the level of commitment to a general fund for supporting third-party research into potential environmental effects of offshore wind energy development.

Beacon Wind will support regional monitoring of wildlife and key commercial fish stocks equivalent to the specified value of \$10,000 per MW. Half of this will support regional monitoring of key commercial fish stocks to better understand how offshore wind energy development is potentially altering the biomass and/or distribution of these stocks; and the other half will support regional monitoring of wildlife to better understand how offshore wind energy development effects distribution and abundance of sensitive species. These monitoring efforts may be committed via regional monitoring organizations (e.g., ROSA, Regional Wildlife Science Collaborative (RWSC) or similar) or independently by Beacon Wind.

3.6. Proposed or existing commitments/collaborations

This section should describe proposed or existing commitments and collaborations with third-party researchers in support of monitoring activities and assessing impacts.

- Beacon Wind is funding a study with the Anderson Cabot Center for Ocean Life at the New England Aquarium to establish monitoring systems to assess the impacts of offshore wind development on highly migratory species (HMS; sharks, tunas, billfishes) and the large recreational fishery that targets them.
- Beacon Wind has partnered with the other New England offshore wind developers to support a continuation of the Massachusetts Clean Energy Center and New England Aquarium regional aerial survey for marine mammals and sea turtles, covering all seven lease areas in the region that has been ongoing since 2011.
- Beacon Wind is collaborating with the Woods Hole Oceanographic Institute to support evaluation of the effectiveness of a commercially available high-resolution infrared detection system in comparison to the performance of dedicated professional protected species observers (PSO) in whale detection.
- Beacon Wind will continue to participate in the development of the Regional Wildlife Science Collaborative (RWSC) as it matures, where Jennifer Dupont (Strategic Environmental Affairs Manager) sits on the Steering Committee. In addition, Jennifer is a member of the External Advisory Board for Project WOW.
- Beacon Wind's affiliates have funded and collaborated in the UK Carbon Trust ORJIP One Bird Collision Avoidance Study (ORJIP One), UK Carbon Trust ORJIP Four Acoustic Deterrent Devices (ORJIP Four), Wildlife Conservation Society/Woods Hole Oceanographic Institute PAM buoy deployment in Empire Wind, and the developer led DEPONS (Disturbance Effect on the Harbour Porpoise in the North Sea, DEPONS, 2015).

4. Proposed Mitigation of Impacts to Marine Mammals and Sea Turtles

4.1. Baseline characterization

4.1.1 Available information

Describe key existing literature and datasets that are available for baseline characterization.

- Beacon Wind evaluated the extent to which existing and publicly available data sources were suitable for characterizing environmental resources in the relevant area, including evaluation of NYSERDA's Master Plan (2017).
- Beacon Wind has referenced the NYSERDA Master Plan Marine Mammals and Sea Turtles Study (2017; Appendix L) to characterize baseline conditions. This study reviewed the available data and has provided summaries of "Best Available Data" in the form of comprehensive lists of datasets for marine mammals and sea turtles and notes that current studies will provide reliable species counts when they are complete. Beacon Wind has also referenced NOAA Fisheries Stock Assessment Reports and monitoring surveys conducted for NYSDEC to characterize baseline conditions.
 - NOAA Fisheries 2019. Annual Report of a Comprehensive Assessment of Marine Mammal, Marine Turtle, and Seabird Abundance and Spatial Distribution in US waters of the Western North Atlantic Ocean – AMAPPS II. In Press. 2019.

- Tetra Tech and LGL. 2020. Final Comprehensive New York Bight Whale Monitoring Aerial Surveys Years 1-3 Survey Report for March 2017 – February 2020. Technical Report produced By Tetra Tech and LGL for NYSDEC under Tetra Tech contract C009926. May 18, 2020.
- WHOI (Woods Hole Oceanographic Institution). 2018. Autonomous real-time marine mammal detections – New York Bight Buoy. Woods Hole Oceanographic Institution and Wildlife Conservation Society. Available online at: http://dcs.who.edu/nyb0218/nyb0218_buoy.shtml.
- Beacon Wind also notes that for the project, neighboring lease holders are also engaged in the collection of baseline data that will strengthen the regional understanding of baseline characterization within the project area.
- The Beacon Wind COP provides a detailed review of available baseline data.

4.1.2 Data Collected

Describe data collected, or will be collected, to support baseline characterization.

- Observations of all right whales and dead, entangled, or distressed marine mammals will be communicated to federal authorities as soon as is practicable, and no later than 24 hours after occurrence.
- Additionally:
 - Beacon Wind contracted APEM, as supported by Normandeau, to conduct monthly digital aerial surveys, which capture digital images and of marine mammals and sea turtles in addition to avian species, large fish assemblages and opportunistic vessel sightings.
 - The Avian Survey Protocol, which included marine mammals and sea turtles, was submitted and approved by BOEM and USFWS.
 - Data and reports from past and future surveys have been and will continue to be made available at:
https://remote.normandeau.com/ewind_overview.php
 - Status: Complete
 - Beacon Wind will use data and observations from Protected Species Observers (PSOs) onboard project related offshore survey vessels across projects comprising of a northeast regional dataset, where appropriate. PSOs recorded observations from ongoing and future surveys (initiated August 2020).
 - Status: Active
 - Beacon Wind has worked with USFWS to deploy Motus avian acoustic receivers on metocean buoys and is contributing to the Motus database.

4.2. Species at risk

Describe which species Beacon Wind believes to be of greatest concern and why.

- Beacon Wind notes that BOEM's Environmental Assessment (2014) reports 38 species of marine mammals in the Northwest Atlantic Outer Continental Shelf (OCS) region of the mid-Atlantic that are protected by the MMPA, five of which are listed under the Endangered Species Act (ESA) and are known to be present, at least seasonally or intermittently, in the Beacon Wind Lease Area and potential export cable areas.

- There are five species of sea turtles that have been documented in or within the Northwest Atlantic OCS region waters which includes waters of the Project Area.
- Beacon Wind is aware of the importance of the species categorized with the additional protections mentioned above. Beacon Wind's assessments, design, and mitigations are developed in a manner meant to appropriately address the needs and requirements of all of the species known to occur within the Project Area without having to prioritize some over others.
- Full details of species at risk, likely impact, and proposed mitigation are described in the COP, which was developed in consultation with the relevant stakeholders, including the E-TWG.

4.3. Potential impacts and mitigation measures by phase

The table below should list the potential impacts to marine mammals and sea turtles and proposed mitigation measures. To this end, a description of proposed measures to minimize the impacts of sound on marine mammals and sea turtles during all phases of Project development should be included. In addition, provide a description of the minimum size of exclusion zone intended to be monitored during geophysical surveys and construction; planned approaches to understanding marine mammal and sea turtle presence and absence within the development site exclusion zone during site assessment and construction (e.g., a combination of visual monitoring by protected species observers and passive acoustic monitoring, the use of night vision and infrared cameras during nighttime activities, etc.); proposed temporal constraints on construction activities and geophysical surveys with noise levels that could cause injury or harassment in marine mammals (e.g., seasonal restrictions during periods of heightened vulnerability for priority species; commencing activities during daylight hours and good visibility conditions, dynamic adjustments following the detection of a marine mammal); and proposed equipment and technologies Beacon Wind would use to reduce the amount of sound at the source, if any.

Potential Impacts	Proposed Mitigation Measures	Phase*			
		1	2	3	4
Underwater Noise impacts from geophysical survey equipment	<ul style="list-style-type: none"> • Exclusion, clearance, and monitoring zones will be maintained around noise-generating activities to help measure and mitigate potential noise-related effects on marine mammals, including with NMFS-approved PSOs, as identified through the survey plan approval process; • Monitoring during noise-generating activities will be done through an integrated monitoring approach, including the use of PAM, NMFS-approved PSOs, and/or other proven technologies, as appropriate, to the extent practicable and in compliance with federal regulation; • Noise generating geophysical survey work shall not commence after dark or at other times of low visibility as appropriate, unless an alternative mitigation measure or monitoring plan that does not rely on visual observations has been determined to be effective, to the extent compatible with practicability and worker safety; • ; and • Soft starts and shut-down procedures to minimize impacts associated with noise emitting survey equipment, where technically feasible and in accordance with associated authorizations. 	X	X	X	
Underwater noise impacts from construction and installation activities	<ul style="list-style-type: none"> • Beacon Wind will seek to use noise attenuation technologies to reduce sound from pile driving of foundations; • Monitoring during construction and installation activities, including those done during times of reduced visibility, will be done through an integrated monitoring approach, including the use of PAM, NMFS-approved PSOs, and other proven 		X		

Potential Impacts	Proposed Mitigation Measures	Phase*			
		1	2	3	4
	<p>technologies, as appropriate, to the extent practicable;</p> <ul style="list-style-type: none"> • Beacon Wind will not commence pile driving for foundation installation during poor visibility conditions, such as darkness, fog, and heavy rain, unless an alternative mitigation monitoring plan that does not rely on visual observation has been determined to be effective, to the extent compatible with practicability and worker safety; • Beacon Wind will apply monitoring and exclusion zones as appropriate to underwater noise assessments and impact thresholds, enforced by: <ul style="list-style-type: none"> ○ Qualified NOAA Fisheries approved PSOs; ○ Real-time monitoring systems, as appropriate; ○ Use of PAM systems; ○ Use of reduced visibility monitoring tools/technologies (e.g., night vision, infrared and/or thermal cameras); and/or • Beacon Wind may seek to use quiet foundation solutions or foundation installation technology solutions that reduce acoustic stress, where technically and commercially feasible. 				

<p>Vessel strikes on marine mammals</p>	<ul style="list-style-type: none"> • Beacon shall ensure that all vessel personnel are trained regarding animal identification and protocols when sightings occur; • Beacon Wind shall provide reference materials on board all project vessels for identification of marine mammals and sea turtles; • Appropriate project-related personnel onboard project vessels will be provided marine mammal sighting and reporting procedures training appropriate for each specific phase and its potential impacts to marine mammal species, as necessary. These monitoring, sighting, and reporting protocols will be outlined in any IHA deemed necessary for the Project, in an effort to emphasize individual responsibility for marine mammal awareness and protection. • Use of exclusion/safety zones: <ul style="list-style-type: none"> ○ Real-time monitoring systems as appropriate (e.g., visual observations by PSOs, passive acoustic monitoring, use of night vision and infrared during nighttime activities) to facilitate exclusion and monitoring zones for survey and construction vessels; ○ NOAA NMFS approved PSOs and PAMS where appropriate for monitoring during vessel transits 	<p>X</p>	<p>X</p>	<p>X</p>	<p>X</p>
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Potential Impacts	Proposed Mitigation Measures	Phase*			
		1	2	3	4
	<ul style="list-style-type: none"> • Beacon Wind empowers all personnel onboard a vessel to raise an alert of potential marine mammals and sea turtle risk via the Lead PSO, with the Lead PSO given full mandate for mitigation decisions. • Beacon Wind’s vessel strike avoidance measures will (and have been) consistent with: (1) NOAA NMFS guidance to avoid ship collision with marine mammals and sea turtles; (2) conditions within the lease area; (3) and any Incidental Take Authorizations issued by NOAA NMFS. • Vessel collision avoidance mitigation measures include: <ul style="list-style-type: none"> ○ Vessel operators and crew awareness of collision avoidance measures; ○ Project-related vessels will comply with NOAA Fisheries speed restrictions of 10 knots (18.5 km/h) or less for vessels 65 ft (20 m) or greater within the Mid- Atlantic U.S. Seasonal Management Area (SMA) for North Atlantic right whales during the period of November 1 through April 30, and will comply with the 10 knots or less speed recommendations in any voluntary Dynamic Management Area (DMA), as currently defined in regulations (73 FR 60173, October 10, 2008); ○ Reduction of speed to 10 knots or less if mammal identified near an vessel (within 330 ft/100 m) ○ Maintain separation distance of 1,640 ft or greater from North Atlantic right whale. If observed, must move away from whale at 10 knots or less until separation distance is achieved. If in vessels path, engines must not be engaged until it has moved outside path and beyond 330 ft/100m. ○ Maintain separation distance of 300 ft or greater from any sighted non-delphinoid cetacean. If sighted – follow similar procedures for siting North Atlantic right whale. ○ Maintain separation distance of 164 ft (50 m) or greater from any sighted delphinoid cetacean. If sighted – follow similar procedures for siting North Atlantic right whale. ○ Maintain a separation distance of 164 ft (50 m) or greater from any sighted pinniped • Beacon Wind will adopt vessel collision avoidance measures for project-related vessels working in or in 				

Potential Impacts	Proposed Mitigation Measures	Phase*			
		1	2	3	4
	<p>transit to and from the Lease Area, including a 164 ft (50 m) separation distance from all sea turtle species;</p> <ul style="list-style-type: none"> • Will adopt vessel speed restrictions associated with SMA and DMA relevant to the size of the vessels used and other vessel strike avoidance measures; • Real-time marine mammal monitoring systems for monitoring and exclusion zones, as appropriate; • Vessel collision avoidance mitigation measures for Project-related vessels working in or in transit to and from the Lease Area, including a 328 ft (100 m) separation distance from all marine mammals, except for the right whale, which requires a 1,640 ft (500 m) separation; • Any vessel larger than 300 gross tonnes moving into right whale habitat will report in as part of the right whale Mandatory Ship Reporting System, where they will be immediately responded to with updated reports of right whale sightings in the area, in addition to reminders of safe vessel speeds and movements within the management area. In the event of contact with a North Atlantic right whale, a report must be made immediately to NOAA’s National Marine Mammal Stranding Network; • Marine mammal observers and/or project personnel will check NOAA’s website for any update on DMAs and will respond with vessel movement strategies or work hours accordingly; • Beacon Wind will consider the use of dedicated trained crew members (independent of PSOs) to help reduce the risk of collision under certain circumstances; and • Beacon Wind will consider the use of a Service Operations Vessel (SOV) concept, supported by a Crew Transfer Vessel (CTV), to reduce vessel traffic associated with Operations and Maintenance for the project, if technically and commercially feasible; 				
Electromagnetic Fields (EMF), resulting in potential	<ul style="list-style-type: none"> • Beacon Wind shall use proper shielding to reduce EMF impacts. 	X	X	X	

Potential Impacts	Proposed Mitigation Measures	Phase*			
		1	2	3	4
disturbance to marine mammals/sea turtles and/or their prey resource	<ul style="list-style-type: none"> Beacon Wind shall conduct EMF modeling assessments to identify potential mitigation requirements Electrical cables shall be sufficiently buried where feasible to reduce EMF effects. Surface cable protection where sufficient burial is not possible and where appropriate based on a Cable Burial Risk Assessment (CBRA) and EMF assessments (acting as a further barrier between EMF and receptor). 				
Additional proposed mitigations	<ul style="list-style-type: none"> Continued engagement with regulatory agencies and ENGOs on potential mitigation and best practices, as appropriate; Project-related vessels will operate in accordance with laws regulating the at-sea discharges of vessel-generated waste; During operations and maintenance, Beacon Wind will commit to vessel and structure lighting that minimizes illumination of the sea surface where feasible and subject to approval; Beacon Wind will consider micro-siting of Project-components to avoid and minimize impacts to sensitive benthic habitat and habitat of high value to marine mammals and sea turtles, directly and indirectly; Beacon Wind will consider development of appropriate monitoring program(s) in close coordination with regulatory agencies and stakeholders; and Development of a monitoring program to address specific questions, to include identifying key species of interest, and when possible, to contribute to the understanding of long-term project-specific impacts and larger scale efforts to understand cumulative impacts. 	X	X	X	X
*Phase: 1: Survey/Design; 2: Construction; 3: Operation; 4: Decommission					

4.4. Monitor for impacts during each phase

Describe how potential impacts will be monitored on these species during each phase of physical work for the Project (site assessment, construction, operation, and decommissioning) to inform mitigation planning for later phases of the Project as well as for future Projects.

- Beacon Wind shall seek to collaborate with other regulatory agencies and stakeholder groups to identify research needs and opportunities.
- Beacon Wind will leverage lessons learned and best practices in developing monitoring frameworks (e.g., additional noise mitigation and monitoring plans for marine mammals, as appropriate) from the Empire Wind Project, which has ongoing consultations with regulators and the E-TWG to scope and shape monitoring plans.

4.4.1 Assess and quantify changes

Describe how changes to environmental resources will be quantified using statistically sound methods

- Ideally, specific questions and focal taxa shall be chosen for the Project either based on site-specific fisheries risk assessment, or in relation to broader regional efforts to assess variation between sites and understand cumulative impacts for sensitive species.
- Monitoring will, to the extent practicable, use appropriate study designs and methodologies to effectively analyze risk prior to construction and evaluate impacts during construction and operation by testing hypotheses and helping to assure statistical power for meaningful data analysis.
- Outside expertise will, if practicable, be consulted during study design and data analysis processes.
- Additionally:
 - Beacon Wind will ideally target monitoring and research towards interactions between offshore wind energy developments and the potential receptors that may be impacted.
 - Beacon Wind understands that from the outset, any research and monitoring to assess changes and impacts should be statistically robust. However, for some biological monitoring, this level of robustness is not always possible as many outside factors can influence these variations with much greater significance than the factors that can be attributed to causes from offshore wind energy developments (e.g., seawater temperature, nutrient levels, etc.). As such, Beacon Wind is open to sharing or using oceanographic data from the Metocean facilities for a better understanding of these relationships.

4.4.2 Address data gaps

Describe how data gaps will be addressed.

- Beacon Wind believes there is sufficient marine mammal and sea turtle data to inform spatial planning and support assessments in the COP and IHA applications. However, Beacon Wind is willing to collaborate on studies, research and monitoring to supplement what is required under the regulations, to inform mitigation options.

- Beacon Wind will engage with relevant stakeholders, for example through the regulatory process and E-TWG to identify areas where data gaps beyond the COP document design exist for further monitoring and research and will consider proposals for research on a case by case basis.

4.5. Strategies for developing alternate protocols

Describe the process for determining when mitigation strategies are insufficient and under what conditions they might elect to rehabilitate or restore impacted marine mammals and sea turtles in an alternative location.

- Beacon Wind will work with stakeholders, including regulatory agencies and local groups, in the design phase of the Project to identify data gaps to be addressed through surveys or permitting applications.
- Additionally:
 - Beacon Wind has not finalized a process for alternative protocols, but is open to exploring this further in consultation with the E-TWG, regulatory agencies and relevant stakeholders.
 - Beacon Wind will take additional measures to avoid or reduce potential impacts to marine mammal and sea turtle prey resources in consultation with E-TWG and BOEM and other stakeholders, consistent with the EMP.
 - Beacon Wind will continue to consult with NOAA NMFS and other key stakeholders throughout the project development process in order to determine if any alternative or additional appropriate and proportionate mitigation measures may be necessary.
 - All required mitigation and monitoring measures will be integrated into the Project's "Protected Species Mitigation Protocol(s)".
 - Beacon Wind is open to consulting with relevant agencies, ENGOs and E-TWG on further appropriate and proportionate mitigation options, for example, real-time monitoring or observations of marine mammals when in transit and commitments to monitor daily reports on marine mammal sightings and DMAs.

5. Proposed Mitigation of Impacts to Birds and Bats

5.1. Baseline characterization

Describe how baseline data will be established on the presence of bird and bat assemblages, temporal and spatial use of the site by key species within the area of the proposed Project.

5.1.1 Available information

Describe key existing literature and datasets that are available for baseline characterization.

- Beacon Wind has followed BOEM guidelines on the baseline assessment of avian and bat species and potential impacts in support of the COP (30 C.F.R. § 585.626(a)(3)) and will follow other guidelines associated consultations under Section 7 of the Endangered Species Act with the USFWS.
- Beacon Wind will rely on the following information for its baseline characterization of birds:
 - NYSERDA funded digital aerial avian surveys covering the Lease Area over four quarterly surveys and the Offshore planning Area (OPA) over twelve quarterly surveys (data have been combined with Equinor's surveys for species abundance modelling). Data and reports are also publicly available on https://remote.normandeau.com/nyserda_overview.php
 - Information on threatened and endangered species and/or their habitat is also available through USFWS IPaC, available at <https://ecos.fws.gov/ipac/>
 - NYSDEC Environmental Resource Mapper, available at <https://www.dec.ny.gov/animals/38801.html>
 - Kinlan, B.P., Menza, C., & F. Huettmann. 2012. Predictive Modeling of Seabird Distribution Patterns in the New York Bight. Chapter 6 in "A biogeographic assessment of seabirds, deep sea corals and ocean habitats of the New York Bight: science to support offshore spatial planning." NOAA Technical Memorandum NOS NCCOS 141 (2012).
 - NYSERDA 2010a. Pre-development of avian species for the proposed Long Island – New York City Offshore Wind Project Area. Final Report prepared for the New York State Energy Research and Development Authority. October 2010.
 - Kinlan, B.P., Winship, A.J., White, T.P., & J. Christensen. 2016. Modeling At-Sea Occurrence and Abundance of Marine Birds to Support Atlantic Marine Renewable Energy Planning: Phase I Report. U.S. Department of the Interior, Bureau of Ocean Energy Management, Office of Renewable Energy Programs, Sterling, VA. OCS Study BOEM 2016-039. xvii+113 pp., available at <https://www.data.boem.gov/PI/PDFImages/ESPIS/5/5512.pdf> .
 - NYSERDA 2017. New York State Offshore Wind Master Plan, November 2017, available at <https://www.nyserda.ny.gov/All-Programs/Programs/Offshore->

- [Wind/Offshore-Wind-in-NewYork-State-Overview/NYS-Offshore-Wind-Master- Plan](#)
- Studies funded by BOEM on baseline offshore and near-shore avian studies:
 - Paton, P., K. Winiarski, C. Trocki, and C. McWilliams. 2010. Spatial Distribution, Abundance and Flight Ecology of Birds in Nearshore and Offshore Waters in Rhode Island. Chapter 11a in: Rhode Island Ocean Special Area Management Plan (Ocean SAMP) Volume 2. University of Rhode Island, Kingston, RI. 304pp.
 - Veit, R.R., T.P. White, S.A. Perkins, and S. Curley. 2016. Abundance and Distribution of Seabirds off Southeastern Massachusetts, 2011-2015.
 - U.S. Department of the Interior, Bureau of Ocean Energy Management, Sterling, Virginia. OCS Study BOEM 2016-067. 82 pp.
 - Williams, K.A, I.J. Stenhouse, E.E. Connelly, and S.M. Johnson. 2015. Mid-Atlantic Wildlife Studies: Distribution and Abundance of Wildlife along the Eastern Seaboard 2012-2014. Biodiversity Research Institute. Portland, Maine. Science Communications. Series BRI 2015-19. 32 pp.
- NJDEP 2010a. Ocean/Wind Power Ecological Baseline Studies, Final Report, January 2008December 2009. New Jersey Department of Environmental Protection Office of Science, available at <https://www.nj.gov/dep/dsr/ocean-wind/report.htm>
- Cetacean and Seabird Assessment Program (CSAP) database of bird observations from 1980-1988
- Rhode Island Block Island Wind Farm and the Massachusetts Cape Wind Projectbaseline assessment data
- Carbon Trust ORJIP One Bird Collision Avoidance Study co-funded by Equinor - Skov, H., Heinanen, S. Norman, T., Ward, R.M., Mendez-Roldan, S & Ellis, I. 2018. ORJIP Bird Collision and Avoidance Study. Final Report- April 2018. The Carbon Trust. United Kingdom. 247 pp., available at https://www.carbontrust.com/media/675793/orjip-bird-collision-avoidance-study_april2018.pdf
- Bocetti, Carol I., Deahn M. Donner and Harold F. Mayfield. 2014. Kirtland's Warbler (*Setophaga kirtlandii*), version 2.0. In *The Birds of North America* (P. G. Rodewald, editor). Cornell Lab of Ornithology, Ithaca, New York, USA, available at <https://doi.org/10.2173/bna.19>.
- Brown, Charles R. and Mary B. Brown. 1999. Barn Swallow (*Hirundo rustica*), version 2.0. In *The Birds of North America* (P. G. Rodewald, editor). Cornell Lab of Ornithology, Ithaca, New York, USA, available at <https://doi.org/10.2173/bna.452>.
- ESRI. 2016. Audubon Important Bird Areas – Polygon. Available at <https://www.arcgis.com/home/item.html?id=af5fe0b13bae4f8297700345d27201fa>. Accessed April 6, 2020.
- Kerlinger, P., J.D. Cherry, and K.D. Powers. 1982. "Records of Migrant Hawks from the North Atlantic Ocean." *The Auk* 100;488-490.
- Vineyard Wind. (2020). Construction and Operations Plan (COP), Vineyard WindLease OCS-A 0501.

- Bureau of Ocean Energy Management Office of Renewable Energy Programs. (2018). Vineyard Wind Offshore Wind Energy Project Draft Environmental Impact Statement.
- Beacon Wind will rely on the following existing information for its baseline characterization of bats:
 - NYSDEC. 2015a. List of Endangered, Threatened and Special Concern Fish & Wildlife Species of New York State. New York State Department of Environmental Conservation. Available at <http://www.dec.ny.gov/animals/7494.html>. NYSDEC. 2015b. New York State Wildlife Action Plan (SWAP) Species of Greatest Conservation Need, available at <http://www.dec.ny.gov/animals/7179.html>
 - NYSERDA 2017. New York State Offshore Wind Master Plan, November 2017, available at <https://www.nyserda.ny.gov/All-Programs/Programs/Offshore-Wind/Offshore-Wind-in-NewYork-State-Overview/NYS-Offshore-Wind-Master-Plan>
 - Vineyard Wind. (2020). Construction and Operations Plan (COP), Vineyard Wind Lease OCS-A 0501.
 - Bureau of Ocean Energy Management Office of Renewable Energy Programs. (2018). Vineyard Wind Offshore Wind Energy Project Draft Environmental Impact Statement.

5.1.2 Data being collected

Describe data that is currently being collected or will be collected to support baseline characterization.

- Beacon Wind conducted avian surveys within the Beacon Wind project area.
 - Status: Complete
- Additionally, data is being collected in neighboring Lease Areas which would be applicable to the Beacon Wind project.
 - Status: Active
- Beacon Wind has deployed acoustic receivers on metocean data buoys that will detect Motus tags and provide information about avian species and abundance in the area surrounding the buoys.
 - Status: Active
- Beacon Wind installed a passive bat detector onboard the survey vessel RV Stril Explorer to detect bats while the vessel was engaged in other survey activity in the 0520 lease area starting in August 2020.
 - Status: Complete
- Beacon Wind has and will continue to share the results of the monitoring with the relevant regulatory authorities and stakeholders, and consider whether there is a further need to collect additional site-specific data offshore.
 - Status: Active.

5.2. Species at risk

Describe which species Beacon Wind believes to be of greatest concern and why.

- BOEM’s Revised Environmental Assessment for the Commercial Wind Lease Issuance and Site Assessment Activities on the Atlantic Outer Continental Shelf Offshore Massachusetts states that, “...the most likely taxa to occur in the offshore areas [of the Massachusetts WEAs] include approximately 19 species of waterfowl, 4 species of loons and grebes, 10 species of shearwaters and petrels, 3 species of gannets and cormorants, 2 shorebirds, 3 jaegers, 6 alcids, 3 sulids, and 20 species of gulls and terns (eBird, 2014; Table 4-5). Long-tailed Duck (*Clangula hyemalis*) and other sea ducks winter in the WEA and surrounding areas and especially large populations of Long-tailed Duck occur in the area during November through March (Table 4-5; Allison et al., 2006; Allison et al., 2009)”.
- Full details of avian species at risk, likely impact and proposed mitigation are described in the COP, and Beacon Wind will continue to consult with the relevant stakeholders and present this EMP at the E-TWG.
- Beacon Wind identified the following bats with the greatest potential to migrate through the lease area on their way between breeding and wintering grounds in the spring and fall:
 - eastern red bat,
 - hoary bat, and
 - silver-haired bat.
- Beacon Wind has followed BOEM’s guidelines and use the Mid-Atlantic Ocean Data Portal’s data of temporal use, abundance, and species distribution by avian species or groups in the Lease Area. The modeling data can also be used to potentially identify species that are high risk for collision or displacement, and species that are protected by federal and/or state laws.

5.3. Potential impacts and mitigation measures by phase

The table below should list the potential impacts and mitigation measures to understand and minimize the Project’s risk to birds and bats. At a minimum this should include the steps the Empire Wind will pursue to minimize risk to birds and bats (e.g., lighting); and identification of technological approaches to assess impacts or any Proposals for other research or mitigations relating to birds or bats planned or under consideration at this time.

Potential Impacts	Proposed Mitigation Measures	Phase*			
		1	2	3	4
Collision risk to marine birds and bats	<ul style="list-style-type: none"> • To avoid and minimize attraction- and disorientation-related impacts to birds and bats, artificial lighting on the Beacon Wind project will be reduced to the extent practicable while maintaining human safety and compliance with FAA, USCG, BOEM and other regulations; 		X	X	X

Potential Impacts	Proposed Mitigation Measures	Phase*			
		1	2	3	4
	<ul style="list-style-type: none"> Monitoring will be conducted to determine if there is a need for perching-related deterrents to reduce attraction and minimize potential perching and loafing opportunities for birds; During construction, installation of anti-perching devices where appropriate on offshore, above-water, project-related vessels and structures to minimize introduction of perching structures to the offshore environment; Project-related vessels will be instructed to avoid rafting seabirds to minimize disturbance during construction, operations, and maintenance; Beacon Wind will consider the use of HDD for installation of the export cable landfalls. Beacon Wind will consider the maintenance of anti-perching devices where appropriate on offshore, above-water Project-related vessels and structures to minimize introduction of perching structures to the offshore environment, during operations and maintenance. 				
Habitat impacts, including breeding and nesting areas	<ul style="list-style-type: none"> Siting and construction of nearshore and onshore project components for offshore wind farms (including but not limited to nearshore export cable routes, landfall sites, onshore cable routes, and onshore substations) shall be conducted in such a way as to avoid or minimize the loss or alteration of bird and bat habitat, as well as avoid or minimize disturbance and direct and indirect effects to bird and bat populations and their prey. Specifically, onshore infrastructure (i.e., landfall site, cable routes, substations) and development activities should 1) maximize the use of previously developed or disturbed areas, and 2) avoid unique or protected habitats, as well as habitat for key species, where feasible; For bats, Beacon Wind will avoid tree-clearing at the onshore project components, unless otherwise determined acceptable by the USFWS 		X	X	X

Potential Impacts	Proposed Mitigation Measures	Phase*			
		1	2	3	4
	and relevant state agencies, to minimize risks to bats; <ul style="list-style-type: none"> • Avoidance of key habitats and tree clearing within the onshore substation sites where appropriate and required during sensitive times of year (e.g., breeding season), to minimize risk to tree nesting birds. • Adherence to time of year restrictions as necessary in sensitive onshore bird habitats, where feasible and required, unless otherwise determined acceptable by the applicable agencies. • For both birds and bats, temporarily disturbed areas will be revegetated with appropriate native species, as appropriate. 				
Additional proposed mitigations	<ul style="list-style-type: none"> • Development of a monitoring program to address specific questions, to include identifying key species of interest, and when possible, to contribute to the understanding of long-term project-specific impacts and larger scale efforts to understand cumulative impacts. 	X	X	X	X
*Phase: 1: Survey/Design; 2: Construction; 3: Operation; 4: Decommission					

5.4. Monitor for impacts during each phase

Describe how potential impacts will be monitored on these species during each phase of physical work for the Project (site assessment, construction, operation, and decommissioning) to inform mitigation planning for later phases of the Project as well as for future Projects.

5.4.1 Pre/Post Monitoring to assess and quantify changes

Describe how changes to environmental resources will be quantified using statistically sound methods

- Pre- and post-construction monitoring will be designed in such a way that it improves understanding of the impacts of offshore wind energy development on birds and bats, including identifying specific questions and taxa on which to focus monitoring efforts for the proposed project, or in relation to broader regional efforts to assess variation between sites and understand cumulative impacts for sensitive species.
- Monitoring will, to the extent practicable, use appropriate study designs and methodologies to effectively analyze risk prior to construction and evaluate impacts during construction and operation by testing hypotheses and helping to assure statistical power for meaningful data analysis.
- Outside expertise will, if practicable, be consulted during study design and data analysis processes.

- Additionally:
 - Beacon Wind believes that monitoring of highly mobile species, such as birds, should focus on behavioral responses rather than pre-, during, and post-construction monitoring of abundance, which may not always have robust statistical power to identify change as a direct result of the wind farm.
 - Should further monitoring of birds be required, for example for Roseate terns, then Beacon Wind is willing to explore monitoring through novel techniques such as GPS tagging exercises, subject to approvals from the relevant regulatory agencies.
 - Beacon Wind will continue desktop studies and stakeholder discussions for avian and bat species. During field studies, Beacon Wind will complete appropriate surveys to further characterize the project area and determine presence/absence of habitat within proposed project activities.
 - Impacts to avian and bat species will be sufficiently examined as part of BOEM's NEPA process and as part of the COP, through state permitting processes, and in consultation with USFWS and relevant stakeholders such as the E-TWG. Where appropriate, mitigation will be implemented to reduce impacts to as low as practicable.

5.4.2 Address data gaps

Describe how data gaps will be addressed.

- Beacon Wind shall work with stakeholders, including regulatory agencies and local groups, in the design phase of the project to identify data gaps to be addressed through surveys or permitting applications.
- Additionally:
 - Beacon Wind notes that further research and monitoring is important where data and knowledge gaps remain and where there remain uncertainties over potential significant adverse impacts attributable to the offshore wind farm.
 - Beacon Wind will engage with relevant stakeholders, for example through the regulatory process and E-TWG to identify areas where data gaps may exist for further monitoring and research and will consider proposals for research on a case by case basis.
 - Beacon Wind will continue to participate in the RWSC avian and bat subcommittee and steering committee and contribute to the development of an integrated science plan that address regional gaps and priorities research needs for the region.

5.5. Strategies for developing alternate protocols

Describe the process for determining when mitigation strategies are insufficient and under what conditions they might elect to rehabilitate or restore impacted birds and bats in an alternative location.

- As necessary, Beacon Wind will explore this further in consultation with the E-TWG, regulatory agencies and relevant stakeholders.
- Additionally:

- Beacon Wind has yet to finalize a process for alternative protocols, but is open to exploring this further in consultation with the E-TWG, regulatory agencies and relevant stakeholders.

6. Proposed Mitigation of Impacts to Fish, Invertebrates, and their Habitats

6.1. Baseline characterization

Describe what is known about the proposed site in terms fish and invertebrate assemblage, and temporal and spatial variations in fish, invertebrates and their habitats at the proposed site. The use of collaborative monitoring models with the fishing community is encouraged to develop trusted baseline data.

6.1.1 Available information

Describe existing literature and datasets that are available for baseline characterization.

- Public data sources are suitable for characterizing benthic habitat and fisheries resources in the project area, including:
 - The evaluation of NYSERDA's Master Plan Fish and Fisheries Study (2017; Appendix J).
 - NOAA National Centers for Coastal Ocean Science and BOEM Comprehensive Seafloor Substrate Mapping and Model Validation in the Atlantic (2019).
 - Estuarine Living Marine Resource database (NOAA 2000) provide descriptions of spatial and temporal distributions of species (by life stage) in Hudson River/Raritan Bay and the Great South Bay, however, the database is not updated regularly.
 - Use of commercial and recreational fisheries effort data as a proxy for fish species.

6.1.2 Data being collected

Describe data collected, or will be collected, to support baseline characterization.

- Beacon Wind has conducted extensive surveys of the Lease Area using multibeam echo sounder, digital imagery, grab samples, and SPI/PV – these were used to characterize the habitat as predominantly homogeneous consisting of silty sand with high occurrence of faunal beds and mobile crustaceans.
 - Status: Complete
- Beacon Wind has funded a study by the Anderson Cabot Center for Ocean Life at the New England Aquarium to establish monitoring systems to assess the impacts of offshore wind development on highly migratory species (Highly Migratory Species (HMS); sharks, tunas, billfishes) and the large recreational fishery that targets them. The study will occur over an 18-month period and will expand upon a MassCEC project to monitor HMS presence and will also work to monitor recreational fishing activities for HMS.
 - Status: Active
- Beacon Wind also notes that for the project, neighboring lease holders are also engaged in the collection of baseline data that will strengthen the regional understanding of baseline characterization within the project area.
 - Status: Active

6.2. Species at risk

Describe which species Beacon Wind believes to be of greatest concern and why.

- Beacon Wind notes that fish and invertebrate species of interest in the lease area fall into three groups based on regulatory status: (1) species managed under the MSA; (2) species listed under the ESA; and (3) non-game fish and invertebrate species that are considered important prey (or shelter, in the case of biogenic habitats) for fish and wildlife.
- In addition, the role of the benthic habitat as a fisheries resource is fundamental to the identification of essential fishing habitat (EFH), as reflected in the emphasis on EFH in BOEM’s benthic survey guidance (BOEM 2019). There are 29 species in the Beacon Wind Project Area with designated EFH life stages in the blocks where the proposed area of the Project will be located.

6.3. Potential impacts and mitigation measures by phase

The table below should list the potential impacts to fish, invertebrates, and their habitats and proposed mitigation measures. To this end, this section should describe how the Developer will minimize risk to fish, invertebrates and their habitats (e.g., foundation type, scour protection, cable shielding for electromagnetic fields, construction windows, siltation/turbidity controls, use of dynamic-positioning vessels and jet plow embedment).

Potential Impacts	Proposed Mitigation Measures	Phase*			
		1	2	3	4
Micro-siting conflicts with habitats and fishery resources	<ul style="list-style-type: none"> • Beacon Wind will seek input from regulatory authorities, the fishing industry, and maritime industry to locate foundations and cable routes in the least impactful manner that is practicable. • Beacon Wind will avoid, to the extent possible, siting structures (wind turbines, offshore substations, and submarine cables) in areas of sensitive habitat, where feasible; • Beacon Wind will consider the timing of construction activities; working with the fishing industry and fisheries agencies on sensitive spawning and fishing periods to actively avoid or reduce interaction with receptors, where feasible. 	X			
Temporary, alteration of the seabed and	<ul style="list-style-type: none"> • Beacon Wind will seek to use quiet foundation solutions or foundation installation technology solutions that reduce acoustic stress, where technically and commercially feasible. • Beacon Wind shall seek to use noise attenuation technologies to reduce the sound from pile driving of foundations. 	X	X	X	X

Potential Impacts	Proposed Mitigation Measures	Phase*			
		1	2	3	4
localized increases in noise and turbidity	<ul style="list-style-type: none"> • Most construction vessels will maintain position using dynamic positioning, limiting the use of anchors and jack-up features, where feasible. Any anchors or jack-up features would be placed within the previously cleared and/or disturbed area around the foundations; • Beacon Wind will consider the use of HDD at landfall to minimize physical disturbance of coastal habitats. Beacon Wind would implement appropriate measures during HDD activities at landfalls to minimize potential release of HDD fluid. To minimize an inadvertent fluid return, an HDD Contingency Plan would be developed and implemented; and • Beacon Wind will consider the use of appropriate measures and timing during cable installation activities to minimize sediment resuspension and dispersal in areas of known historically contaminated sediments. 				
Long-term changes to seabed and habitat	<ul style="list-style-type: none"> • Beacon Wind will, to the extent possible, avoid sensitive benthic habitats. • Beacon Wind will implement mitigation and avoidance measures to protect water quality, such as spill prevention. Specifically, Beacon Wind will use appropriate measures for vessel operation and implementation of an OSRP, which will include measures to prevent, detect, and contain accidental release of oil and other hazardous materials. Project personnel will be trained in accordance with relevant laws, regulations, and Project policies, as described in the OSRP; • During construction, operations, and maintenance, Beacon Wind will utilize sensitive lighting schemes to minimize exposure of light, as practicable; 	X	X	X	X

Potential Impacts	Proposed Mitigation Measures	Phase*			
		1	2	3	4
	<ul style="list-style-type: none"> • Most construction vessels will maintain position using dynamic positioning, limiting the use of anchors and jack-up features, where feasible. Any anchors or jack-up features would be placed within the previously cleared and/or disturbed area around the foundations; • Beacon Wind will consider the use of HDD at the landfall to minimize physical disturbance of coastal habitats. Beacon Wind would implement appropriate measures during HDD activities at landfalls to minimize potential release of HDD fluid. To minimize an inadvertent fluid return, an HDD Contingency Plan would be developed and implemented. 				
EMF Impacts	<ul style="list-style-type: none"> • Beacon Wind will use proper shielding to reduce EMF impacts; • Beacon Wind will conduct EMF modeling and assessments to identify potential mitigation requirements; • Electrical cables will be armored and sufficiently buried where feasible to reduce EMF effects; and • As noted above, Beacon Wind will conduct both onshore and offshore EMF assessments for the COP. 		X	X	
Cable burial	<ul style="list-style-type: none"> • Beacon Wind shall bury export and interarray cables to an appropriate minimal depth to reduce exposure risk. If depth cannot be reached, Beacon Wind will add protective materials over the cable. • Sufficient burial of inter-array and export cables to facilitate continued seabed penetrating fishing activity. • Dissemination of information to fishers on cable locations including inclusion on navigational charts. • Intention to bury inter-array and export cables based on Cable Burial Risk Assessment. • Beacon Wind shall conduct routine surveys or inspections of sub-sea cables, and shall conduct a survey or inspection to ensure and correct for cable exposure following hurricane or other major events causing disturbance to the seabed. • Development of a Cable Installation Plan, detailing 		X	X	

	how cable installation will be managed.				
Turbine Scour Protection	<ul style="list-style-type: none">• Beacon Wind shall seek collaboration with state and federal regulatory authorities and key stakeholders to assess the feasibility and use of ecological enhancements for turbine scour protection.	X			

Potential Impacts	Proposed Mitigation Measures	Phase*			
		1	2	3	4
Additional proposed mitigations	<ul style="list-style-type: none"> Beacon Wind will install scour protection, as needed; and Beacon Wind will develop a monitoring program to address specific questions, to include identifying key species of interest, and when possible, to contribute to the understanding of long-term project-specific impacts and larger scale efforts to understand cumulative impacts. 	X	X	X	X
*Phase: 1: Survey/Design; 2: Construction; 3: Operation; 4: Decommission					

6.4. Monitor for impacts during each phase

Describe how potential impacts will be monitored on these types of fish and invertebrates during each phase of physical work for the Project (site assessment, construction, operation, and decommissioning) to inform mitigation planning for later phases of the Project as well as for future Projects.

6.4.1 Pre/Post Monitoring to assess and quantify changes

Describe how changes to environmental resources will be quantified using statistically sound methods.

- Ideally, specific questions and focal taxa shall be chosen for the Project either based on site-specific fisheries risk assessment, or in relation to broader regional efforts to assess variation between sites and understand cumulative impacts for sensitive species.
- Monitoring will, to the extent practicable, use appropriate study designs and methodologies to effectively analyze risk prior to construction and evaluate impacts during construction and operation by testing hypotheses and helping to assure statistical power for meaningful data analysis.
- Outside expertise will, if practicable, be consulted during study design and data analysis processes.
- Beacon Wind will seek to collaborate with other regulatory agencies and stakeholder groups to identify research needs and opportunities.
- Additionally:
 - Beacon Wind understands that from the outset, any research and monitoring to assess changes and impacts should be statistically robust. However, for some biological monitoring, this level of robustness to adequately detect change as a direct result of an offshore wind farm is not always possible as many outside factors can influence these variations with much greater significance than the factors that can be attributed to causes from offshore wind energy developments (e.g., seawater temperature, nutrient levels, etc.).

- As such, Beacon Wind is open to monitoring that explores other approaches to detect and quantify change, where further monitoring is appropriate, for example behavioral responses. Beacon Wind will work with the regulatory agencies, E-TWG, F-TWG, ROSA, and relevant stakeholders to identify research and monitoring needs and agree on methodology.

6.4.2 Address data gaps

Describe how data gaps will be addressed.

- Beacon Wind will seek to work with stakeholders, including regulatory agencies, to identify data gaps to be addressed through surveys or permitting applications.
- Additionally:
 - Beacon Wind will conduct further research and monitoring where data and knowledge gaps remain that present uncertainties over potential significant adverse impacts attributable to the effects of offshore wind farm development.
 - Beacon Wind is open to discussing further monitoring and research to fill data gaps as appropriate through regulatory agencies, E-TWG, F-TWG, ROSA, and relevant stakeholders.

6.5. Strategies for developing alternate protocols

Describe the process for determining when mitigation strategies are insufficient and under what conditions they might elect to rehabilitate or restore impacted fisheries in an alternative location or when the provision of compensation of some form may be appropriate.

- As necessary, Beacon Wind shall explore this further in consultation with the E-TWG, F-TWG, ROSA, and regulatory agencies and relevant stakeholders.
- Additionally:
 - Beacon Wind has yet to finalize a process for alternative protocols, but is open to exploring this further in consultation with the E-TWG, regulatory agencies and relevant stakeholders.

7. Considerations for Subsea and Overland Cables

7.1. Mitigation strategies for subsea and overland cables

This section should describe any additional environmental mitigation strategies for proposed subsea and overland cable routes that support the offshore wind project.

- Proposed subsea and overland cable routes are described in the Beacon Wind COP, along with the full list of reference materials and mitigation measures. These are summarized below.
- Baseline terrestrial vegetation and wildlife condition studies were conducted using the following resources:
 - 2019 National Land Cover Dataset (NLCD): Land cover conterminous United States (USGS 2019); and
 - 2020 Half-Foot 4 and Long Island Zone New York City (NYC) Aerial Ortho-Photography (NYSDEC 2021)
 - Environmental Resource Mapper used to check for the presence of Rare Plants and Animals and Significant Natural Communities
 - New York Nature Explorer digital database (NYSDEC 2021a)
 - USFWS National Wetlands Inventory (USFWS 2021)
 - NYSDEC Regulatory Freshwater Wetlands, Queens and Bronx Counties, Tidal Wetlands, and Water Quality Classifications reports
- The onshore component of the Beacon Wind Project Area is located in a highly developed area with few areas of natural vegetation cover.
- Three federally-listed birds (piping plover, red knot and roseate terns) and one flowering plant (seabeach amaranth) were identified as potentially occurring within the Queens, New York Project Area. The three federally-listed birds are considered shorebird species that require natural stretches of beaches and other coastal, marine and estuarine habitats and the roseate tern nests almost exclusively on islands to avoid higher predation rates on the mainland. The seabeach amaranth occurs on wide sandy beaches above the HTL and adjacent to foredune areas.\
- Beacon wind onshore facilities have been sited in a manner that avoids natural habitat – approximately 96% of the onshore portions fo the Project Area consist of impervious surfaces, maintained lawn, and disturbed open space.
- Impacts to the shoreline and intertidal zones at the landfall locations may be avoided or minimized by using trenchless installation methods to connect the marine cable to the onshore substation facilities.
- Onshore substation facility locations, onshore export and interconnection cable routes, and POIs are situated within an intensely developed landscape of commercial/industrial buildings, roads, and maintained lawns which further

discourages the use of this area by bird species sensitive to human disturbance.

- Forage habitat along Luyster Creek are not expected to be impacted by the Project.
- During construction, Beacon Wind will commit to the following avoidance, minimization, and mitigation measures to mitigate impacts: •
 - Limiting lighting associated with construction vehicles and work zones to the extent practicable, to reduce the attraction of insect prey for wildlife species such as bats and insectivorous birds;
 - The siting of onshore components in previously disturbed areas, existing roadways, and/or rights-of-way to the extent practicable;
 - The implementation of soil erosion and sediment control plans, which will be provided for agency review and approval, as applicable, for each onshore component
 - The implementation of an Inadvertent Return Plan, which will be provided for agency review and approval, as applicable
 - The management of accidental spills or releases of oils or other hazardous wastes through a SPCC plan, which will be provided for agency review and approval, as applicable;
 - During construction, access will be restricted to existing paved roads and approved access routes to avoid impacts to naturally vegetated areas and wildlife resources;
 - The implementation of an invasive species control plan, which will be provided for agency review and approval, as applicable, to avoid the spread of invasive species and replant with native vegetation only; and
 - Landscaping and restoration work will be completed with appropriate native species, per a Landscape Restoration Plan or other appropriate plan, and in compliance with an invasive species control plan to prevent the introduction of invasive plant species, which will be provided for agency review and approval, as applicable.
- In addition, during construction, Beacon Wind will consider the following avoidance, minimization, and mitigation measures to mitigate impacts
 - A trenchless method may be used for installation of the export cable landfalls to avoid surficial disturbances and impacts to coastal resources including the intertidal zone, freshwater and tidal wetlands, naturally vegetated areas and wildlife resources;
 - Although not anticipated within the Project Area due to the highly developed nature of the onshore area and absence of suitable habitat, evaluation of seasonal restrictions will be conducted should sensitive species be detected prior to vegetation clearing or other construction related activities, to mitigate potential impacts to breeding individuals; and
 - Consideration of staggering silt fencing or other erosion control devices in sensitive areas to facilitate the passage of biota, if deemed effective. The

strategy will be implemented on a sitespecific basis and finalized during the permitting process. As the Project design is still preliminary, detailed mitigation strategies will be developed as part of the final design and conform to the requirements of state and federal permitting respective to wetlands and waterbody resources.

- During operations, Beacon Wind will commit to the following avoidance, minimization, and mitigation measures to mitigate impacts:
 - Protective measures will be installed around Project-components to restrict access to wetlands, naturally vegetated areas, and wildlife resources during operation and maintenance activities;
 - Revegetation monitoring will be conducted consistent with a Landscaping Restoration Plan and Invasive Species Control Plan, which will be provided for agency review and approval,
 - Mitigation monitoring, as required and defined during the regulatory process for any areas identified as mitigation sites as a result of long-term unavoidable impacts to freshwater and tidal wetlands, naturally vegetated areas, and wildlife resources; and •
 - The implementation of lighting reduction measures such as downward projecting lights, lights triggered by motion sensors, and limiting artificial light to the extent practicable, where safe.
- Avoidance, minimization, and mitigation measures proposed to be implemented during conceptual decommissioning are expected to be similar to those experienced during construction and operations,. A full decommissioning plan will be approved by BOEM prior to any decommissioning activities, and avoidance, minimization, and mitigation measures for decommissioning activities will be proposed at that time.

8. Additional Considerations

8.1. Additional mitigation strategies and EMP refinement

This section should describe any additional mitigation strategies not otherwise described herein that would improve the Plan and reduce impacts on wildlife. In addition, describe how the EMP will be updated and refined based on additional information and stakeholder feedback.

- Beacon Wind will support collaborative research on potential mitigation strategies and best management practices, with other developers, agencies, and stakeholders.
- Additionally:
 - Beacon Wind will continue to monitor new and novel approaches to mitigation in the offshore wind industry both in the US and from existing offshore wind farms owned by Beacon Wind's affiliates and developments elsewhere in the world, including the forums and networks in which Beacon Wind's affiliates participate.

8.2. Process for updating the EMP

This section should describe how feedback from the fishing industry stakeholders, F-TWG, and other agencies and working groups will be incorporated and updated in the EMP.

- Updates to the EMP are intended to reflect the results of iterative exchanges with members of the E-TWG, F-TWG, and relevant stakeholders.
- Additionally:
 - Beacon Wind will continuously evaluate and evolve this EMP so that all the components of the EMP are complete and sufficient.
 - Beacon Wind expects that additional guidance and information will become available throughout the planning and regulatory process and as such will continue to consider its relevance to the EMP at the appropriate intervals.
 - Updates to the EMP are intended to reflect the results of iterative exchanges with members of the E-TWG, F-TWG, and relevant stakeholders.
 - Currently Beacon Wind is working with the E-TWG to establish a process for updating the Empire Wind EMP, where formal updates will likely occur after major Project milestones (e.g., a project NOI).

9. Project Decommissioning

9.1. Potential impacts on marine wildlife, birds, bats, and fisheries

This section should describe potential impacts to marine mammals, sea turtles, birds, bats, and fisheries and habitats from decommissioning the project, based on available information and relevant experience (if any).

- Beacon Wind's waste handling processes during decommissioning will focus on re-use or recycling, with disposal as the last option.

- Beacon Wind will collaborate with regulatory authorities and key environmental stakeholder groups better understand the effects and potential impacts associated with decommissioning.
- Additionally:
 - Beacon Wind does not expect impacts from decommissioning to exceed impacts resulting from the maximum design scenarios associated with construction.
 - As monitoring during operations provides a better understanding of the spatial and temporal presence of marine mammals, sea turtles, birds, bats, and fish habitats within the Lease Area, mitigation measures can be more tailored and effective at further reducing the likelihood and level of impacts.
 - Beacon Wind will collaborate on further research into the effects and potential impacts associated with decommissioning, including coordination with the E-TWG and F-TWG, using the experiences in Europe to help inform that process as well as experiences from decommissioning of oil and gas installations and other offshore wind developments on the eastern seaboard of the United States.
 - Beacon Wind will continue to investigate potential evolving technologies and processes for implementing the mitigation hierarchy related to waste, through incorporation of circularity principles and life cycle assessment work that is being conducted within the broader organization and externally.

9.2. Approach for developing a decommissioning plan and coordination with stakeholders

This section should describe how a decommissioning plan will be developed to identify and mitigate potential impacts, including coordination with stakeholders, and any elements of its contemplated decommissioning plan that can be identified at this stage

- Beacon Wind will decommission the project in accordance with all necessary laws and regulations and generate a detailed Project-specific decommissioning plan.
- Beacon Wind will seek input on the detailed project-specific decommissioning plan from regulatory agencies, fisheries and marine stakeholders, and local communities.
- Beacon Wind will use “lessons learned” from the construction and operations activities and apply them when appropriate to the decommissioning plan.
- Additionally:
 - Beacon Wind will continuously evaluate and improve this EMP so that all the components of the EMP are complete and sufficient, including the decommissioning plan.
 - Beacon Wind expects that additional guidance and information will become available throughout the planning and regulatory process and will continue to consider its relevance to the EMP at the appropriate intervals.