4.7-1 Environmental Mitigation Plan for Excelsior Wind

Response to New York State Energy Research and Development Authority Request for Proposals ORECRFP22-1

VINEYARD OFFSHORE

Environmental Mitigation Plan for

Excelsior Wind

Version 1.0

Prepared pursuant to [contract number, date (TBD)]

with

New York State Energy Research and Development Authority

Albany, NY

Prepared by

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Links to project information:

Project website: https://www.vineyardoffshore.com/

Fisheries website: https://www.vineyardoffshore.com/fishermen

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 offset potential environmental impacts.

Vineyard Offshore is developing Excelsior Wind, an Offshore Wind Generation Facility (OWF) in Lease Area OCS-A 0544 (the "544 Lease Area"). This Environmental Mitigation Plan (EMP) covers Excelsior Wind and its associated transmission system, which is referred to in this EMP as the "Project."

Vineyard Offshore is committed to developing, constructing, operating, and decommissioning well-sited offshore wind projects with minimal environmental impact. For Vineyard Wind 1, the nation's first commercial-scale offshore wind project, we pioneered a successful approach that prioritized avoiding potential impacts whenever possible and minimized and mitigated those that were not. We will continue our industry-leading efforts for the Project to proactively conserve and protect threatened and endangered species while considering changing technologies, the best available data, and lessons learned from other offshore wind projects.

We have conducted a thorough review of existing literature and site-specific data to characterize the species and habitats within the areas potentially impacted by the Project. Our assessment draws upon a considerable body of existing data for the New York Bight region. For the 544 Lease Area, we are fully engaged in the Programmatic Environmental Impact Statement (PEIS) process, led by the Bureau of Ocean Energy Management (BOEM), to analyze potential impacts from wind energy development activities in the New York Bight region.

As the Project moves forward, we will continue to invest considerable time and resources to identify and employ practicable and appropriate measures that afford the highest levels of environmental protection while maintaining project viability. This data-driven process will incorporate the experience gained from Vineyard Wind 1 as well as other offshore wind projects. We will also continue work in close collaboration with agencies and stakeholders to understand their concerns regarding the potential environmental impacts of offshore wind projects; incorporate their feedback into project design and siting measures; and develop, trial, and implement innovative environmental protection measures.

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 (preconstruction, surveys, site design, construction, operations, and decommissioning).

Vineyard Offshore will rely on research, data, and stakeholder feedback to update this EMP and to develop, construct, and operate the Project following the mitigation hierarchy. In line with this commitment:

- Vineyard Offshore will seek consultation and coordinate with relevant stakeholders.
- Vineyard Offshore will review existing research and data and seek input from stakeholders regarding data gaps to inform decisions made throughout the Project's life cycle.
- Vineyard Offshore 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.

- To the extent that the timeline allows, pre- and post-construction monitoring will be designed to improve the understanding of the impacts of offshore wind energy development and operations on wildlife.
- This EMP will be refined through an iterative and adaptive process that accounts for changing technologies, expanding information about potentially impacted species, and lessons learned from other offshore wind projects in the Northeast.
- Vineyard Offshore will update this EMP to reflect the Project as it evolves.

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.

- Vineyard Offshore will continue to follow and implement best practices that are appropriate and relevant to the Project, such as:
    - Bureau of Ocean Energy Management's (BOEM's) (2020) Information Guidelines for a Renewable Energy Construction and Operations Plan (COP)—Version 4.0
    - BOEM's (2018) Draft Guidance Regarding the Use of a Project Design Envelope in a Construction and Operations Plan
    - BOEM's (2020) Guidelines for Providing Avian Survey Information for Renewable Energy Development on the Outer Continental Shelf Pursuant to 30 CFR Part 585
    - BOEM's (2019) Guidelines for Providing Benthic Habitat Survey Information for Renewable Energy Development on the Atlantic Outer Continental Shelf Pursuant to 30 CFR Part 585
    - BOEM's (2019) Guidelines for Providing Information on Fisheries for Renewable Energy Development on the Atlantic Outer Continental Shelf Pursuant to 30 CFR Part 585
    - BOEM's (2019) Guidelines for Providing Information on Marine Mammals and Sea Turtles for Renewable Energy Development on the Atlantic Outer Continental Shelf Pursuant to 30 CFR Part 585
    - Other related BOEM guidelines/guidance documents found at: https://www.boem.gov/about-boem/regulations-guidance/guidance-portal
    - National Marine Fisheries Services' (NMFS') (2018) 2018 Revision to: Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing (Version 2.0)
    - Project Design Criteria and Best Management Practices for Protected Species Associated with Offshore Wind Data Collection (established through the programmatic consultation completed by NMFS' Greater Atlantic Regional Fisheries Office on June 29, 2021 [revised September 2021])
    - Best practice guidance tools that have been or may be developed by the New York State Energy Research and Development Authority's (NYSERDA) Environmental Technical Working Group (E-TWG) and Fisheries Technical Working Group (F-TWG).

- Guidelines developed by the Regional Wildlife Science Collaborate for Offshore Wind (RWSC), the Responsible Offshore Science Alliance (ROSA), and other regional monitoring organizations, such as ROSA's (2021) *Offshore Wind Project Monitoring Framework and Guidelines*.

- Vineyard Offshore anticipates consulting additional publications, tools, and plans for the Project, including those listed in Sections 4.1, 5.1, and 6.1.
- Vineyard Offshore will also build on the lessons learned and critical hands-on experience gained from developing, permitting, constructing, and operating the Vineyard Wind 1 project.

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 environmental mitigation.

Vineyard Offshore's communication efforts with stakeholders interested in environmental issues prioritize information sharing, soliciting feedback on the design and execution of the Project, and supporting an efficient and timely permitting process. Towards that end:

- Vineyard Offshore will continue to seek methods and processes to allow for a two-way flow of information between key stakeholders and developers, specifically highlighting how Vineyard Offshore uses this feedback to inform our decision-making.
- Vineyard Offshore will continue to provide updates to environmental stakeholders in an appropriate manner that can be easily accessed and widely distributed.
- Vineyard Offshore will continue to actively engage and communicate with stakeholders; foster, build, and maintain trusted relationships; work to better understand and address concerns; and clearly communicate the reasons behind the decisions we make.
- Vineyard Offshore's communication plans and objectives will evolve throughout the life cycle of the Project to ensure effective communication with a range of stakeholders and address stakeholder fatigue wherever possible.

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 for a particular issue or question. It will also include links to the project website so readers know where to find additional information.

Name/Title	Role/Responsibilities	Contact Information
Rachel Pachter Chief Development Officer	Oversees project development activities	rpachter@vineyardoffshore.com
Juan Levesque Director of Environmental Affairs	Manages environmental activities	jlevesque@vineyardoffshore.com
Emily Rochon Analyst	E-TWG representative	erochon@vineyardoffshore.com
Crista Bank Fisheries Manager	Lead fisheries contact, F-TWG representative	508-525-0421 cbank@vineyardoffshore.com
Travis Lowery Fisheries Liaison	Focuses on communications and engagement with the fishing industry	508-728-4529 TLowery@vineyardoffshore.com
Vineyard Offshore Fisheries Representatives	Represent the interests of different fisheries to Vineyard Offshore	See the Fisheries Communication Plans at: https://www.vineyardoffshore.com/fishermen

Project website: https://www.vineyardoffshore.com/
Fisheries website: https://www.vineyardoffshore.com/fishermen

2.3 Identification of stakeholders

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

Vineyard Offshore regularly communicates with a wide variety of stakeholders and will continue to identify stakeholders relevant to both onshore and offshore environmental issues by, among other things:

- participating in federal, state, and regional environmental, and fisheries technical working groups, advisory boards, councils, and commissions, including E-TWG, F-TWG, RWSC, ROSA, and the New York Offshore Wind Alliance;
- conducting community and stakeholder engagement activities and engaging in project partnerships, particularly in New York;
- continuing and expanding environmental engagement efforts prior to filing the Project's federal and state permit applications;
- continuing to consult with relevant federal and state agencies;
- continuing to implement other stakeholder engagement methods outlined in Vineyard Offshore's Stakeholder Engagement Plan and Fisheries Communication Plan;
- maintaining stakeholder lists, classifying stakeholders by stakeholder group where appropriate, and tracking communications on an internal basis.

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.

- Vineyard Offshore will continue to actively participate in and dedicate Project-specific technical resources to the E-TWG. Vineyard Offshore notes that our staff has been actively engaged in E-TWG since its formation. Project updates will be provided at appropriate intervals.
- To the extent practicable, Vineyard Offshore will work with the E-TWG and attend E-TWG meetings and workshops.
- Vineyard Offshore will identify specific individuals to serve at least one-year terms in the role of primary and secondary core members.

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.

- Vineyard Offshore has already communicated with New York State agencies, including several Consulting State Agencies, during the development of the Project to inform siting and design measures as well as permitting plans and timelines.
- Vineyard Offshore will communicate with Consulting State Agencies about the Site Assessment Plan (SAP) and the COP for the 544 Lease Area (the "544 COP") and as we prepare New York state permit applications, including meeting with Consulting State Agencies at reasonable times and intervals, in order to attempt to resolve any identified issues.
- Vineyard Offshore will engage with New York State agencies on evolving project design and potential mitigation and monitoring measures.
- Vineyard Offshore will continue to meet with New York State agencies, including Consulting State Agencies, at reasonable times and intervals, during the construction and operational phases of the Project.
- Vineyard Offshore has developed draft communication plans, as required by our BOEM Lease Agreement for the 544 Lease Area (the "544 Lease Agreement"), that will guide communication and engagement activities with certain stakeholder groups, including New York State agencies.

2.4.3 Communication with other stakeholder and working groups

This should describe any relevant participation with other stakeholder groups that would help inform the EMP.

- Vineyard Offshore will continue to collaborate with other regulatory agencies, academic and research institutions, environmental non-governmental organizations (eNGOs), and other stakeholder groups and will continue to maintain memberships and participate in such collaborative efforts. We are a member of, actively participate in, and/or attend meetings for the following technical working groups, advisory boards, councils, and commissions:
    - RWSC
    - ROSA

- New York Offshore Wind Alliance
- NYSERDA's E-TWG
- NYSERDA's F-TWG
- International Council on Exploration of the Seas (member of Working Group on Offshore Wind Development and Fisheries)
- Massachusetts Fisheries Working Group on Offshore Wind Energy
- Massachusetts Habitat Working Group on Offshore Wind Energy
- Mid-Atlantic Fishery Management Council
- New England Fishery Management Council

- Vineyard Offshore intends to maintain these relationships and develop new partnerships in connection with the Project, particularly in New York.
- Further host community and Disadvantaged Community outreach and communication efforts, such as hiring local staff and community representatives to conduct outreach, community meetings, and open houses, will ideally lead to the development of partnerships and initiatives that may help inform this EMP.

2.4.4 Communication and collaboration with other developers

This 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 or coordination of survey methods.

- Vineyard Offshore will continue to collaborate with other developers in relation to streamlining communications to reduce stakeholder fatigue, sharing data, and supporting the sustainable development of the offshore wind industry. We will also continue to participate in regional monitoring organizations (e.g., ROSA and RWSC) and agency-led efforts to standardize scientific methods, surveys, and monitoring plans across lease areas.
- Vineyard Offshore 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.
- BOEM's Programmatic Environmental Impact Statement (PEIS) process will serve as an opportunity for Vineyard Offshore to collaborate with other developers.

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.

Recognizing that stakeholder groups have different needs when it comes to receiving information and participating in the project development process, Vineyard Offshore employs an array of methods to disseminate information and engage stakeholders. We will continually evaluate and adapt our approach to ensure the effectiveness of our efforts. The table below includes a subset of the communication methods and tools in our stakeholder engagement toolkit. Additional communication methods and tools are described in the Stakeholder Engagement Plan.

Proposed Outreach Method/Tools	Phase*			
	1	2	3	4
Vineyard Offshore website	X	X	X	X
Social media, digital advertisements, newsletters, press releases, videos	X	X	X	X
Newspaper, radio, podcast, and television interviews	X	X	X	X
Participation in E-TWG, F-TWG, and similar federal, state, and regional environmental, wildlife, and fisheries technical working groups, advisory boards, councils, and commissions; responding to data and site access requests	X	X	X	X
Hiring specialized fisheries staff, consultants, and representatives (e.g., Fisheries Manager, Fisheries Liaisons, Fisheries Representatives, and Offshore Fisheries Liaisons) who will implement the Fisheries Communication Plan	X	X	X	X
Virtual and in-person meetings and events, phone calls, e-mails	X	X	X	X
Project partnerships, attending/sponsoring/tabling at conferences and events, formal and informal coalition building, site visits, focus groups, informal networking	X	X	X	X
**Phase: 1: Survey/Design; 2: Construction; 3: Operation; 4: Decommissioning*				

3 Supporting Other Research

3.1 Support of collaborative research

This section should describe how opportunities for developing or investing in collaborative research with the environmental community 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.

- Vineyard Offshore is committed to being an active member of regional monitoring organizations (e.g., RSWC, ROSA).
- Vineyard Offshore is committed to supporting collaborative research to collect ecological data and we will continue to work with a wide array of stakeholders, including members of the E-TWG, to identify collaborative research opportunities.
- Vineyard Offshore has previously coordinated with third-party scientists to support regional data collection programs and studies, such as working with New England Aquarium and INSPIRE Environmental to deploy acoustic receivers in the 522 Lease Area and supporting tagging efforts. We would consider supporting similar efforts for the 544 Lease Area.
- Vineyard Offshore will continue to identify opportunities to support collaborative research through the engagement processes described above and below.

3.2 Handing/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 sensitivities and/or the impacts of offshore wind energy development on the environment for the purpose of publication in peer-reviewed journals or other scientifically rigorous products.

- Vineyard Offshore will coordinate with third-party scientists regarding the provision of data and site

access, and we will review any requests on a case-by-case basis. All requests will be considered and discussed with the requestor and will not be unreasonably denied.

- With the exception of temporary safety buffer zones established around work areas, third-party research vessels will be permitted to transit through and within the 544 Lease Area.

3.3 Data availability

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

- Vineyard Offshore has made or intends to make non-proprietary environmental and fisheries data publicly available.
- Much of the data will be publicly available through the federal and state permitting processes, as well as reports or academic publications that result from survey or monitoring work, and will be readily accessible to stakeholders. We proactively publish our fisheries research on our website at: https://www.vineyardoffshore.com/fishermen
- Where practicable, we will disseminate raw environmental data to the most appropriate database(s), such as those recommended in NYSERDA's (2021) Wildlife Data Standardization and Sharing: Environmental Data Transparency for New York State Offshore Wind Energy, as soon as feasible following internal quality assurance and quality control (QA/QC).
- We will continue working with agencies, stakeholders, and other offshore wind developers to find cost-effective and user-friendly ways to streamline and standardize available data across lease areas.
- Vineyard Offshore will provide a Data Management and Availability Plan to NYSERDA detailing how Site and Environmental Data will be made available for use by third- parties on an ongoing basis as soon as practicable after collection and QA/QC.

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.

- Vineyard Offshore will seek to explain why identified data types are considered commercially sensitive.
- In certain instances, Vineyard Offshore may impose restrictions on data provision or the deployment of research equipment (e.g., buoys, environmental sensors, telemetry receivers, cameras) within the 544 Lease Area, OECC, and on our facilities to protect proprietary and/or competitively sensitive information, maintain site security, ensure safety, etc.
- Vineyard Offshore notes that some data, while not proprietary, may be time-consuming or costly to produce depending on the specific request and the primary format it was collected in. Vineyard Offshore will work to advance such requests, but also hopes that regional monitoring organizations will make accessing data from all developers easier and more standardized to, at least in part, address this issue.

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.

- Vineyard Offshore plans to carefully consider all funding opportunities that arise through regional monitoring organizations (e.g., RWSC and ROSA). These groups will be raising funds from other entities and, with support from offshore wind developers, will be able to expand the scope and impact of their efforts to better under the potential environmental effects of offshore wind energy development.

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.

- Vineyard Offshore is firmly committed to supporting regional studies and other independent environmental research.
- Vineyard Offshore plans to develop new partnerships in connection with the Project, particularly in New York, with an expected focus on supporting independent research and regional studies.

4 Proposed Mitigation of Impacts to Marine Mammals and Sea Turtles

4.1 Baseline characterization

4.1.1 Available information

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

Numerous data sources characterize the distribution and abundance of marine mammals and sea turtles potentially affected by the Project. Key sources include, but are not limited to:

- NMFS Marine Mammal Stock Assessment Reports
- Atlantic Marine Assessment Program for Protected Species (AMAPPS) surveys
- Duke University Habitat-based Cetacean Density Models for the US Atlantic (Roberts et al. 2016; Roberts 2022)
- New York Bight Whale Monitoring Program aerial and acoustic surveys
- Wildlife Conservation Society/Woods Hole Oceanographic Institution New York Bight Acoustic Buoy
- NYSERDA's (2021) Digital Aerial Baseline Survey of Marine Wildlife in Support of Offshore Wind Energy and Remote Marine and Onshore Technology (ReMOTe)
- NYSERDA's (2017) Marine Mammals and Sea Turtles Study
- North Atlantic Right Whale Consortium (NARWC) Database
- The North Atlantic Right Whale Sighting Survey and Right Whale Sighting Advisory System
- NMFS Sea Turtle Stranding and Salvage Network (STSSN)

- Ocean Biogeographic Information System Spatial Ecological Analysis of Megavertebrate Populations (OBIS-SEAMAP) Model Repository
- Northeast Ocean Data Portal
- BOEM studies and environmental assessments for other offshore wind projects, such as BOEM's (2022) Draft Environmental Impact Statement (DEIS) for Empire Wind

4.1.2 Data being collected

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

- Vineyard Offshore is collecting additional information on the presence and abundance of marine mammals and sea turtles via opportunistic observations by PSOs that occur during G&G surveys within the 544 Lease Area.
- BOEM is preparing a PEIS to analyze potential impacts from wind energy development activities in the New York Bight region, which includes the 544 Lease Area, and this will help to inform the baseline characterization of marine mammals and sea turtles.
- Using the wealth of existing information on marine mammals and sea turtles in the New York Bight region (see Section 4.1.1), we have prepared an initial assessment of the occurrence of marine mammals and sea turtles in the vicinity of the 544 Lease Area. This initial assessment will be refined as part of the 544 COP through a detailed review of available data, integration of BOEM's analysis in the PEIS, and consultations with agencies and stakeholders.

4.2 Species at risk

Describe which species the Developer believes to be of greatest concern and why.

- Of the 38 marine mammal species that have been documented in the Western North Atlantic Outer Continental Shelf (OCS) region, which encompasses the 544 Lease Area and OECC, five ESA-listed species are the species of greatest concern given their biology, habitat use, low abundance, ESA status, existing threats, and potential to occur at least seasonally in and around the 544 Lease Area and OECC. These are the NARW, sperm whale, fin whale, blue whale, and sei whale.
    - Vineyard Offshore notes that the protection of the critically endangered NARW is of utmost concern to us as well as many other stakeholders. Vineyard Offshore has and will continue to engage with agencies and stakeholders on ways to further monitor and protect this species as the Project moves forward.
- Four species of sea turtles are likely to occur in the Western North Atlantic OCS region: loggerhead sea turtles, Kemp's Ridley sea turtles, leatherback sea turtles, and green sea turtles. In light of sea turtles' status under the ESA and their occurrence in and around the 544 Lease Area and OECC, all four species of sea turtles are considered species of concern.
- While Vineyard Offshore has heightened concern regarding the species identified above, Vineyard Offshore treats all marine mammals and sea turtles with great concern and will implement protective measures for all marine mammals and sea turtle species.

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 to Project development should be included. In addition, provide a description of the anticipated pre- and post- construction survey techniques to establish an ecological baseline and changes to that baseline within the Project site; 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 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 infra-red cameras during nighttime activities, etc.); proposed temporal constraints on construction activities and geophysical surveys with noise levels that could cause injury to 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 the Developer would use to reduce the amount of sound at the source, if any.

Vineyard Offshore has identified preliminary measures to avoid, minimize, and mitigate potential impacts to marine mammals and sea turtles from the Project. However, it is premature to finalize monitoring and mitigation measures at this stage of the Project's permitting process, which necessarily entails a thorough assessment of potential impacts and subsequent finalization of appropriate and practicable mitigation measures to address impacts. This is a multi-year iterative and adaptive process that accounts for changing technologies, expanding information about marine species, and lessons learned from other offshore wind projects in the Northeast.

Potential Impacts	**Proposed Mitigation Measures[1]**	**Phase***			
		1	**2**	**3**	**4**
Underwater noise impacts from geophysical survey equipment	• Pre-start clearance and shutdown zones will be maintained around noise-generating activities (for high-resolution geophysical [HRG] survey acoustic sources operating below-specified frequencies based on species' hearing ranges) to help monitor and mitigate potential noise-related effects on marine mammals and sea turtles. The size of these zones will be based on the best available science and applicable thresholds and will be determined in consultation with BOEM and NMFS. • Monitoring during noise-generating activities will be done through an integrated monitoring approach, including the use of NMFS-approved PSOs and other proven technologies, as appropriate, to the extent practicable and in compliance with federal regulations and our permits. • Due to extensive BOEM survey requirements, survey work must occur on a 24/7 basis in order to permit the Project in a timely and efficient manner. It is currently best practice to use alternative	X	X	X	X

Potential Impacts	Proposed Mitigation Measures[1]	Phase*			
		1	2	3	4
	technologies during low visibility conditions to protect marine mammals and sea turtles. Vineyard Offshore will consider opportunities to reduce nighttime survey work, where possible. • Shutdown and ramp-up procedures will be employed for certain HRG surveys.				
Underwater noise impacts from construction and installation activities	• Vineyard Offshore will use noise attenuation technologies to reduce sound from pile driving of foundations (if such methods are used). • The need for and duration of a pile driving seasonal restriction to protect NARW will be based on further analysis of the most recent NARW data during the permitting process, with input from scientific experts. • A soft start will be used at the beginning of pile driving. • Monitoring during pile driving activities will be done through an integrated monitoring approach, including the use of PAM, NMFS-approved PSOs, and other proven technologies, as appropriate, to the extent practicable. • As practicable, pre-start clearance and shutdown (i.e., exclusion) zones will be established during pile driving. The size of feasible pre-start clearance and shutdown zones for pile driving will be determined using acoustic modeling in consultation with BOEM and NMFS during the federal permitting process. • Vineyard Offshore will not commence impact pile driving for foundation installation during poor visibility conditions such as darkness, fog, and heavy rain unless an alternative mitigation monitoring plan has been approved by the relevant federal agencies.		X		
Vessel strikes on marine mammals	• Trained visual observers aboard each vessel will maintain a vigilant watch for all marine mammals and sea turtles, and vessel operators will slow down or maneuver their vessels, as appropriate, to avoid striking protected species. • Vineyard Offshore will follow NMFS guidelines for vessel strike avoidance, including vessel speed	X	X	X	X

Potential Impacts	Proposed Mitigation Measures[1]	Phase*			
		1	2	3	4
	restrictions and separation distances, that are applicable at the time of construction and operations.[2] • Vineyard Offshore will ensure that all vessel personnel are trained regarding animal identification and protocols when sightings occur. • Vineyard Offshore will provide reference materials onboard all Project vessels for the identification of marine mammals and sea turtles.				
Electromagnetic Fields (EMF), resulting in potential disturbance to marine mammals/sea turtles and/or their prey resource	• Vineyard Offshore will use proper shielding to reduce EMF impacts. This can be achieved through sheathing and burial of cables; where sufficient burial depth cannot be achieved, the cables can be covered by cable protection (which would shield EMF). • Vineyard Offshore will conduct EMF modeling and assessments that could be used to identify potential mitigation requirements as part of the permitting process.	X	X	X	

**Phase: 1: Survey/Design; 2: Construction; 3: Operation; 4: Decommission*
Notes:
1. *The proposed measures described in this table are preliminary in nature and subject to review and approval from jurisdictional agencies in accordance with regulatory and permitting requirements. Final mitigation measures will be determined pursuant to applicable permitting processes and may vary from the list provided herein.*
2. *Except where following these requirements would put the safety of the vessel or crew at risk.*

4.4 Monitor for potential impacts during each phase

Describe how potential impacts will be monitored on marine mammals and sea turtles 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.

- Vineyard Offshore will seek to collaborate with other regulatory agencies and stakeholder groups to identify research needs and opportunities.
- PSOs monitoring during pile driving and certain HRG surveys will follow standard monitoring protocols.
- During the Project, observations of NARW and dead, entangled, or distressed marine mammals will be communicated to federal authorities in accordance with applicable permit conditions.

- Vineyard Offshore will work with agencies and stakeholders to develop appropriate and practicable post-construction (and, eventually, decommissioning) survey/monitoring techniques to document any observed impact to marine mammals and sea turtles. The monitoring measures will be informed by those that have been put in place for Vineyard Wind 1 and other offshore wind projects.

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 will be chosen for the Project either based on site-specific 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.
- Vineyard Offshore will assess the most appropriate statistical tools to use and will incorporate lessons learned from monitoring being conducted for Vineyard Wind 1 and other offshore wind projects and research efforts off the East Coast.

4.4.2 Address data gaps

Describe how data gaps will be addressed.

- Extensive survey and monitoring work has been (and continues to be) conducted to characterize the distribution and abundance of marine mammals and sea turtles in the New York Bight region.
- Vineyard Offshore will work with stakeholders, including regulatory agencies, E-TWG, and local groups, in the design phase of the Project (and throughout the permitting process) to identify data gaps that may be addressed through surveys or permitting applications.
- Broader concerns about data gaps are anticipated to be identified and addressed through regional monitoring organizations, such as RWSC and ROSA, where Vineyard Offshore is an active member.

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 habitat for impacted marine mammals and sea turtles in an alternative location.

- Vineyard Offshore will incorporate lessons learned from Vineyard Wind 1 and other offshore wind project development, including lessons learned on the efficacy of mitigation, when developing mitigation strategies for the Project. This experience will allow Vineyard Offshore to select, in consultation with regulatory authorities, those mitigation measures that are most likely to be effective and practicable.
- Vineyard Offshore understands that there are ways to benefit species that may experience impacts from offshore wind in alternate locations. At this time, it is difficult to know if offsite or restorative mitigation related directly to Project impacts will be appropriate or effective. The decision to incorporate offsite mitigation would be influenced by, among other factors, the anticipated level of

impact, what is known at the time about the efficacy of available mitigation measures, and whether regulatory agencies would accept these methods as appropriate mitigation for the Project.

- As necessary, Vineyard Offshore will explore this topic further in consultation with the E-TWG, regulatory agencies, and relevant stakeholders.

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.

The occurrence of birds in the New York Bight region and surrounding waters is well-documented, with multiple studies providing important information on avian presence and abundance at a series of useful scales. Additionally, a growing number of studies exist on the presence of bats in and around the New York Bight region. Existing studies and reports that contribute to the available information related to birds and bats occurring near the Project include but are not limited to the following:

- Marine-life Data and Analysis Team (MDAT) marine bird relative density and distribution models
- Northwest Atlantic Seabird Catalog
- Tracking Offshore Occurrence of Common Terns, Endangered Roseate Terns, and Threatened Piping Plovers with VHF Arrays (Loring et al. 2019)
- Tracking Movements of Threatened Migratory Rufa Red Knots in US Atlantic OCS Waters (Loring et al. 2018)
- Assessing the Exposure of Three Diving Bird Species to Offshore Wind Areas on the U.S. Atlantic Outer Continental Shelf using Satellite Telemetry (Stenhouse et al. 2020)
- Atlantic and Great Lakes Sea Duck Migration Study initiated by the Sea Duck Joint Venture (SDJV)
- NYSERDA's (2021) Digital Aerial Baseline Survey of Marine Wildlife in Support of Offshore Wind Energy and Remote Marine and Onshore Technology (ReMOTe)
- NYSERDA's (2017) Birds and Bats Study
- NYSERDA's (2017) Cable Landfall Permitting Study
- NYSERDA's Multi-Scale Relationships Between Marine Predators and Forage Fish project (ongoing)
- Bat Activity during Autumn Relates to Atmospheric Conditions: Implications for Coastal Wind Energy Development (Smith & McWilliams 2016)
- Empire Offshore Wind Project Construction and Operations Plan Appendix R: 2018 Bat Survey Report (Tetra Tech 2022)
- BOEM studies and environmental assessments for other offshore wind projects, such as:

- BOEM's (2022) Draft DEIS for Ocean Wind 1
- BOEM's (2022) Draft DEIS for Empire Wind

5.1.2 Data collected

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

- BOEM is preparing a PEIS to analyze potential impacts from wind energy development activities in the New York Bight region, which includes the 544 Lease Area, and this will help to inform the baseline characterization of birds and bats.
- Through scientific literature review, we have performed an initial assessment of the occurrence of birds and bats in the vicinity of the 544 Lease Area, OECC, and onshore facilities, which will be refined as part of the 544 COP through a detailed review of available data, integration of BOEM's analysis in the PEIS, and consultations with agencies and stakeholders.

5.2 Species at risk

Describe which species the Developer believes to be of greatest concern and why.

- Of the bird species that may pass through the vicinity of the 544 Lease Area, the species of greatest concern are the three federally listed species (which are also State listed): roseate tern, piping plover, and red knot. These species of birds are expected to have minimal to low exposure to the 544 Lease Area.
- The northern long-eared bat is expected to be the bat species of greatest concern because the species was recently reclassified as endangered under the ESA and the onshore facilities may be located near roosting or foraging habitat. Vineyard Offshore will work with the New York Natural Heritage Program (NYNHP), as necessary, with respect to potential impacts to the northern long-eared bat from the onshore facilities' proximity to known roost trees or hibernacula.

5.3 Potential impacts/risks and mitigation measures by project stage

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 Developer 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[1]	Phase*			
		1	2	3	4
Collision risk to marine birds and bats	• The OWF's location far offshore avoids and minimizes exposure of birds and bats. • The WTGs will be spaced far apart and have significant air gaps, which minimizes collision risk to marine birds given that many seabirds will fly below the rotor swept zone. • To avoid and minimize attraction- and disorientation-related impacts to birds and bats, the Project's artificial		X	X	

Potential Impacts	Proposed Mitigation Measures[1]	Phase*			
		1	2	3	4
	lighting will be reduced to the extent practicable while maintaining human safety and compliance with FAA, USCG, BOEM, and other regulations. • During operations, the Project will use an Aircraft Detection Lighting System (ADLS) or similar system that automatically activates all aviation obstruction lights on the WTGs and electrical service platform (ESP) when aircraft approach the structures, subject to BOEM approval. The use of an ADLS will dramatically reduce the amount of time that the aviation obstruction lights are illuminated. • 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. • Physical and/or other deterrents to perching (e.g., such as spikes and netting or other best available technology) will be implemented if there is demonstrated risk at the site (e.g., perching and roosting on infrastructure is a common occurrence) and to the extent that they do not represent a human safety hazard.				
Habitat impacts, including breeding and nesting areas	• Siting and construction of nearshore and onshore Project components (including but not limited to nearshore export cable routes, landfall sites, onshore cable routes, and onshore substations) will 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 and development activities should: 1) maximize the use of previously developed or disturbed areas (e.g., by installing onshore cables within existing roadway layouts), and 2) avoid unique or protected habitats, as well as habitat for key species, where feasible.	X	X	X	X

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

1. The proposed measures described in this table are preliminary in nature and subject to review and approval from jurisdictional agencies in accordance with regulatory and permitting requirements. Final mitigation measures will be determined pursuant to applicable permitting processes and may vary from the list provided herein.

5.4 Monitor for impacts during each phase

Describe how potential impacts will be monitored on birds and bats 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.

- Vineyard Offshore will implement appropriate monitoring measures to assess potential impacts to birds and bats from the Project.
- Vineyard Offshore will consult with agencies and stakeholders to decide on which Project phases will include monitoring and what specific questions should be addressed. This will take into account efforts already underway or planned for other projects in order to avoid redundancy and address issues specific to the Project.
- In accordance with the 544 Lease Agreement, to help address information gaps on offshore movements of birds and bats, we will install Motus stations on meteorological or environmental data buoys in coordination with the US Fish and Wildlife Service's (USFWS's) Offshore Motus network.

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 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.
- To the greatest extent practicable, monitoring activities will be designed to work with or operate within regional study efforts to both contribute to regional science and enable the use of larger data sets to assess impacts.

5.4.2 Address data gaps

Describe how data gaps will be addressed.

- The occurrence of birds in the New York Bight region and surrounding waters is well-documented.
- In accordance with the 544 Lease Agreement, to help address information gaps on offshore movements of birds and bats, we will install Motus stations on meteorological or environmental data buoys in coordination with the US Fish and Wildlife Service's (USFWS's) Offshore Motus network.
- In addition, broader concerns about data gaps are anticipated to be identified and addressed through regional monitoring organizations, such as RWSC and ROSA. Vineyard Offshore will continue participating in regional monitoring organizations in of support efforts to address identified data gaps.

- Vineyard Offshore will work with stakeholders, including regulatory agencies, to identify data gaps to be addressed through surveys or permitting applications.

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 habitat for impacted birds and bats in an alternative location.

- Vineyard Offshore will incorporate lessons learned from Vineyard Wind 1 and other offshore wind project development, including lessons learned on the efficacy of mitigation, when developing mitigation strategies for the Project. This experience will allow Vineyard Offshore to select, in consultation with regulatory authorities, those mitigation measures that are most likely to be effective and practicable.
- Vineyard Offshore understands that there are ways to benefit species that may experience impacts from offshore wind in alternate locations. At this time, it is difficult to know if offsite or restorative mitigation related directly to Project impacts will be appropriate or effective. The decision to incorporate offsite mitigation would be influenced by, among other factors, the anticipated level of impact, what is known at the time about the efficacy of available mitigation measures, and whether regulatory agencies would accept these methods as appropriate mitigation for the Project.
- As necessary, Vineyard Offshore will explore this topic 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 key existing literature and datasets that are available for baseline characterization.

Numerous data sources characterize the temporal and spatial distribution, abundance, and community composition of fish, invertebrates, and their habitats potentially affected by Project activities. Key data sources by others include, but are not limited to:

- Northeast Fisheries Science Center (NEFSC) multispecies bottom trawl surveys
- NEFSC Atlantic surf clam and ocean quahog surveys
- NEFSC Atlantic sea scallop dredge surveys
- Northeast Area Monitoring and Assessment Program (NEAMAP) trawl surveys
- SMAST 2003–2012 regional video survey data (Bethoney et al. 2015)

- Northeast Ocean Data Portal
- NYSERDA's (2021) Digital Aerial Baseline Survey of Marine Wildlife in Support of Offshore Wind Energy and Remote Marine and Onshore Technology (ReMOTe)
- NYSERDA's (2017) Fish and Fisheries Study
- NMFS' Fisheries and Endangered Species and Deep-Sea Coral Data Portal databases
- NMFS' Socioeconomic Impacts of Atlantic Offshore Wind Development website
- Habitat Mapping and Assessment of Northeast Wind Energy Areas (Guida et. al 2017)
- Southern New England Industry-Based Yellowtail Flounder Survey (2003–2005) (Valliere 2007)
- BOEM studies and environmental assessments for other offshore wind projects, such as BOEM's (2016) Commercial Wind Lease Issuance and Site Assessment Activities on the Atlantic Outer Continental Shelf Offshore New York

6.1.2 Data being collected

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

- Vineyard Offshore is collecting benthic habitat data as part of its G&G surveys in the 544 Lease Area.
- BOEM is preparing a PEIS to analyze potential impacts from wind energy development activities in the New York Bight region, which includes the 544 Lease Area, and this will help to inform the baseline characterization of fish, invertebrates, and their habitats.
- Using the wealth of existing data sources for the New York Bight region (see Section 6.1.1), we have prepared an initial desktop assessment of the presence of finfish, invertebrates, and their habitats in the 544 Lease Area and the OECC. As part of a future 544 COP, this preliminary information will be confirmed and refined through subsequent desktop review, analysis of G&G survey data, integration of BOEM's analysis contained in the PEIS, and consultations with agencies and stakeholders.

6.2 Species at risk

Describe which species the Developer believes to be of greatest concern and why.

- Of the four federally listed fish species that may occur off the northeast Atlantic coast (shortnose sturgeon, Atlantic sturgeon, Atlantic salmon, and giant manta ray) only the Atlantic sturgeon is anticipated to potentially occur within the 544 Lease Area, OECC, and surrounding waters.
- Essential Fish Habitat (EFH) is designated for 38 species within the 544 Lease Area and 39 species within the OECC. No Habitat Areas of Particular Concern (HAPCs) are located within either the 544 Lease Area or OECC.
- Based on NMFS' (2021) *Landing and Revenue Data for Wind Energy Areas, 2008-2019*, key commercially important fish and invertebrate species within the 544 Lease Area are expected to include: Atlantic herring, Atlantic sea scallop, Atlantic mackerel, monkfish, longfin squid, scup, summer flounder, black sea bass, and American lobster.

6.3 Potential impacts/risks and mitigation measures by project stage

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 Developers 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[1]	Phase*			
		1	2	3	4
Micro-siting conflicts with habitats and fishery resources	• BOEM sited the 544 Lease Area through a public, multi-year process to avoid and minimize potential impacts to fish, invertebrates, and fisheries from offshore wind development. • Vineyard Offshore will seek input from regulatory authorities, the fishing industry, and the maritime industry to locate foundations and cable routes in the least impactful manner that is practicable. • The WTGs are widely spaced so that their foundations (and associated scour protection), along with cable protection for inter-array cables (if needed), only occupy a minimal portion of the 544 Lease Area, leaving the vast majority of the site undisturbed. • To the greatest extent feasible, Vineyard Offshore will site the offshore cables to avoid and minimize impacts to sensitive habitats. • Vineyard Offshore will continue to conduct geophysical, geotechnical, and environmental surveys to inform the Project's design and layout.	X			
Temporary alteration of the seabed and localized increases in noise and turbidity	• Vineyard Offshore will use noise attenuation technologies to reduce sound from pile driving of foundations (if such methods are used). • Pile driving noise will be mitigated through a soft start, which allows fish time to move away from the area. • Other mitigation measures implemented to protect marine mammals and sea turtles from underwater noise will also protect fish species (see Section 4.3). • Scour protection may be installed around foundations, where necessary, to minimize scouring and sediment suspension around foundations. • The use of mid-line anchor buoys will be considered, where feasible and safe, as a potential measure to reduce impacts from anchor line sweep.	X	X	X	X

Potential Impacts	Proposed Mitigation Measures[1]	Phase*			
		1	2	3	4
Long-term changes to seabed and habitat	• Vineyard Offshore will, to the extent possible, avoid sensitive benthic habitats. • Vineyard Offshore's goal is to minimize the use of cable protection to the greatest extent possible through a careful routing assessment and the selection of the most appropriate cable burial tool(s) to achieve a sufficient burial depth, taking into account site-specific environmental conditions and cable properties. • The addition of foundations, scour protection, and cable protection (if required) may act as an artificial reef and provide habitat previously absent from the area.	X	X	X	X
EMF Impacts	• Vineyard Offshore will use proper shielding to reduce EMF. This can be achieved through sheathing and burial of cables; where sufficient burial depth cannot be achieved, the cables will be covered by cable protection (which would shield EMF). • Vineyard Offshore will conduct EMF modeling and assessments that could be used to identify potential mitigation requirements as part of the permitting process.	X	X	X	
Cable burial	• Vineyard Offshore will bury export and inter-array cables to an appropriate minimal depth to reduce exposure risk. If sufficient depth cannot be reached, Vineyard Offshore will add protective materials over the cable. • Cable burial techniques will be selected to maximize the likelihood of achieving sufficient cable burial, minimize the need for cable protection, and minimize suspended sediments during installation. • Vineyard Offshore will conduct routine surveys or inspections of sub-sea cables and will conduct a survey or inspection to ensure and correct for cable exposure following a hurricane or other major events causing disturbance to the seabed.		X	X	
Turbine Scour Protection	• Vineyard Offshore will seek collaboration with federal and state regulatory authorities and key stakeholders to assess the use of ecological enhancements for turbine scour protection to provide offsets from potential adverse impacts.	X	X	X	X

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

1. The proposed measures described in this table are preliminary in nature and subject to review and approval from jurisdictional agencies in accordance with regulatory and permitting requirements. Final mitigation measures will be determined pursuant to applicable permitting processes and may vary from the list provided herein.

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.

- Vineyard Offshore will likely develop a benthic habitat monitoring plan to monitor key indicators before and after construction. Such a monitoring plan, if developed, may also be part of regional monitoring efforts.
- Vineyard Offshore may develop a fisheries monitoring plan to monitor key indicators before and after construction. The need for a fisheries monitoring plan would be identified through the permitting process and in consultation with regulatory agencies and relevant stakeholders. Such a monitoring plan, if developed, may also be part of regional monitoring efforts
- When developing monitoring plans, Vineyard Offshore would consider ROSA's *Offshore Wind Project Monitoring Framework and Guidelines* and would rely heavily on our experience and data obtained from developing and implementing monitoring plans for Vineyard Wind 1.

6.4.1 Pre/Post monitoring to assess and quantify changes

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

- Vineyard Offshore will continue to gain valuable experience assessing changes attributable to project activities through the monitoring plans that are being developed and implemented for Vineyard Wind 1. For example, scientifically sound, statistically rigorous methods employed for Vineyard Wind 1 include a beyond Before-After-Control-Impact (BACI) framework to assess potential impacts to fish and a combination BACI-Before-After Gradient (BAG) sampling design to assess potential impacts to benthic resources.
- Ideally, specific questions and focal taxa will 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.
- Vineyard Offshore will continue to collaborate with other regulatory agencies and stakeholder groups to identify research needs and opportunities.

6.4.2 Addressing data gaps

Describe how data gaps will be addressed.

- Many recently completed studies as well as data from long-term monitoring programs provide information about fish, invertebrates, and benthic habitats (especially sensitive habitats) within the 544 Lease Area, OECC, and surrounding waters.
- To help address data gaps regarding recreational fishing in the MA WEA and RI/MA WEA, we

previously partnered with the New England Aquarium's Anderson Cabot Center for Ocean Life to study highly migratory species presence and are supporting INSPIRE Environmental and the New England Aquarium's study of highly migratory species in the region. We would consider supporting similar efforts for the 544 Lease Area.

- Vineyard Offshore will continue to work with agencies and stakeholders to identify data gaps that may be addressed through surveys or permitting applications.

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 habitat for impacted fisheries in an alternative location or when the provision of compensation of some form may be appropriate.

- Vineyard Offshore will incorporate lessons learned from Vineyard Wind 1 and other offshore wind project development, including lessons learned on the efficacy of mitigation, when developing mitigation strategies for the Project. This experience will allow Vineyard Offshore to select, in consultation with regulatory authorities, those mitigation measures that are most likely to be effective and practicable.
- Vineyard Offshore understands that there are ways to benefit species that may experience impacts from offshore wind in alternate locations. At this time, it is difficult to know if offsite or restorative mitigation related directly to Project impacts will be appropriate or effective. The decision to incorporate offsite mitigation would be influenced by, among other factors, the anticipated level of impact, what is known at the time about the efficacy of available mitigation measures, and whether regulatory agencies would accept these methods as appropriate mitigation for the Project.
- As necessary, Vineyard Offshore will explore this topic 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.

- Vineyard Offshore has and will continue to design the OECC in consultation with agencies and stakeholders to avoid or minimize the length of cable through sensitive habitats (e.g., mapped hard and complex bottom, critical habitat for ESA-listed species, artificial reefs, submerged aquatic vegetation, etc.), to the extent feasible.
- To further minimize impacts, Vineyard Offshore will micro-site individual offshore export cable alignments within the OECC to avoid sensitive habitats (where feasible) using the extensive geophysical survey data that we collect, but avoidance of all sensitive habitats is not always possible.
- Vineyard Offshore will require our cable installation contractors to prioritize the least environmentally impactful cable installation methods(s) and tool(s) that are practicable for each segment of cable.
- Vineyard Offshore's goal is to minimize the use of cable protection to the greatest extent possible

through a careful routing assessment and the selection of the most appropriate cable burial tool(s) to achieve a sufficient burial depth, taking into account site-specific environmental conditions and cable properties.

- Vineyard Offshore will endeavor to consolidate the Project's cables with existing infrastructure, where possible.
- The proposed landfall sites were selected to minimize offshore and onshore cable length (and correspondingly, minimize impacts), avoid and minimize potential impacts to sensitive habitats nearshore and onshore, and prioritize previously disturbed areas.
- Trenchless crossing methods are expected to be used: (1) in nearshore areas where sensitive resources are located near the potential landfall sites to minimize disturbance of coastal habitats by drilling underneath them instead of through them; and (2) where onshore export cables routes traverse wetlands and waterbodies to avoid impacts to those features.
- The underground onshore export cable routes are sited almost entirely within public roadway layouts to minimize disturbance to terrestrial wildlife and habitat (as well as cultural resources).

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.

- Vineyard Offshore is committed to ensuring that we employ measures that afford the highest levels of environmental protection while maintaining project viability. Throughout the Project's multi-year permitting process, we will continue to assess potential risks to species and identify and implement measures to avoid, minimize, or mitigate potential impacts to wildlife in line with applicable permitting requirements as well as regional monitoring efforts. Stakeholder input as well as lessons learned from Vineyard Wind 1 and other offshore wind projects will inform this effort.
- Vineyard Offshore will support collaborative research on potential mitigation strategies and best management practices in coordination with other developers, agencies, and stakeholders.

8.2 Process for updating the EMP

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

- Vineyard Offshore will continuously evaluate and evolve this EMP, in line with applicable federal and state permitting requirements.
- Vineyard Offshore 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, working groups, agencies, and relevant stakeholders.

- Vineyard Offshore will update the EMP in a timely manner that reflects changes made based on key regulatory project deliverable dates.

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).

- Vineyard Offshore's waste handling processes during decommissioning will focus on re-use or recycling, with disposal as the last option.
- Vineyard Offshore will collaborate with regulatory authorities and key environmental stakeholder groups to better understand the effects and potential impacts associated with decommissioning.

9.2 Approach for 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.

- Vineyard Offshore will decommission the Project in accordance with all necessary laws and regulations and generate a detailed Project-specific decommissioning plan.
- Vineyard Offshore will seek input on the detailed Project-specific Decommissioning Application from regulatory agencies, fisheries and marine stakeholders, and local communities.
- Vineyard Offshore will use lessons learned from the construction and operations activities as well as other offshore wind projects and apply them (when appropriate) to the decommissioning plan.