CORRESPONDENCE

From: Scott
Sent: Tuesday, June 08, 2021 11:53 PM
To: Tom Nies <tnies@nefmc.org>
Subject: Regarding Martha's Vineyard

Dear Director Sir,
I am on the opposite coast, and a long-time environmentalist thinker or perhaps an armchair philosopher. I should add the disclaimer that I have relatives who were founders of Boston and New Hampshire, and I have never been to New England, yet.

I get a very bad feeling about the huge windmill electric farm planned for the area near Martha's Vineyard. It is unclear if the true environmental impact of such a project can be guessed at. If we compare wind energy to nuclear, the choice seems obvious. However, it might be better to place the windmills on land, rather than on the ocean floor. Martha's Vineyard seems like a poor choice for this project. I feel like a more industrial (polluted) area is a better fit. We can easily imagine these industrial (pollutants) windmills in parts of New York and New Jersey, for example.

This is somewhat off the subject, but it is appalling that a "green new deal" energy project is about to mow down the state of Maine! A Canadian Company is going to clear cut the forest, something like a 300 yard wide swath, in order to deliver "clean energy" from a hydrothermal dam. This threatens all kinds of animals, including the fish. It may be politically correct, yet it is so very wrong, at the same time! Years ago, I took a sculpture class at college, and the teacher had a sign on the wall that stated: "Do not start vast projects, with half-vast ideas!" We should not sit back and allow "the green new deal" to destroy the environment, without raising serious concerns. Please make each of your concerns known, regarding this huge wind turbine project. For example, I hear that windmills kill many birds. Are these marine birds expendable? Are there any migratory species threatened by these windmills? What will these bird carcasses do to the ocean? Exactly how many tons of concrete will be dumped permanently into the ocean? How about the pipes with the wiring? Is there any hum or EMF? We need everyone on board, raising concerns. I don't believe in just one government report, since they might take bribes from the corporations.

Finally, I feel strongly that this vision of a perfect world, with everything running on batteries- cars- like a cell phone or laptop, is flawed for many reasons. The toxic heavy metals for batteries must be strip mined, and cause pollution. Most of these are imported, thus creating dependence upon especially, the genocidal Chinese dictatorship! I had hopes for hydrogen technology improving to where it would be affordable. The hydrogen requires electricity to produce, but burns cleanly into water: H_2O. However, they had been combining hydrogen with batteries, I believe. So, my feeling is that people are being sold on technologies and big money projects that may not be the best for the environment or for the future.

We have windmills here in California, on land. Mostly, they are not often spinning much. Texas also has windmills on land. You probably heard about people dying from lack of heat and electricity, when these windmills froze in the winter. Maybe they are having better luck with their windmills in England? I'm very much on the fence, at best, regarding wind energy. Please voice your collective opinions, regarding this big ocean project near Martha's Vineyard. It doesn't matter what I think, obviously. But you might be able to make a difference.

Sincerely,
Scott

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
GREATER ATLANTIC REGIONAL FISHERIES OFFICE
55 Great Republic Drive
Gloucester, MA 01930-2276

June 9, 2021

Ms. Diana Heyder, NEPA Division
U.S. Department of Energy
Golden Field Office
15013 Denver West Parkway
Golden, CO 80401

RE: EA-2049: University of Maine's New England Aqua Ventus I, An Offshore Wind Advanced Technology Demonstration Project, Offshore Monhegan Island in the Gulf of Maine

Dear Ms. Heyder:

The U.S. Department of Energy (DOE) is proposing to authorize the expenditure of federal funding by the University of Maine to design, construct, and commission an offshore wind energy demonstration project called New England Aqua Ventus I (Aqua Ventus). The Aqua Ventus test site is located in the Gulf of Maine, approximately 2.5 miles south of Monhegan Island, Lincoln County, Maine and 12 miles off the mainland, and is approximately 1.1 miles by 2.1 miles. The installation would consist of an 11 MW wind turbine mounted to a floating submersible concrete hull, anchored to the seabed by three marine mooring lines. It would be connected to the Maine power grid by an approximately 19 nautical mile subsea cable making landfall in East Boothbay. Additional project activities and/or potential impacts from the project could occur in or near Boothbay, Boothbay Harbor, Brewer, Searsport, Eastport, and/or Monhegan Island, Maine.

DOE will prepare an Environmental Assessment (EA) pursuant to the requirements of the National Environmental Policy Act (NEPA). DOE is requesting input and the public is invited to submit written comments on the scope of issues, resources, impact producing factors, reasonable alternatives (such as geographic, seasonal, or other restrictions on construction and siting of facilities and activities) and potential mitigation measures to be analyzed in the EA.

In our role as a consulting agency under the Magnuson-Stevens Fishery Conservation and Management Act (MSA), the Fish and Wildlife Coordination Act (FWCA), and section 7 of the Endangered Species Act (ESA), we offer the following comments and technical assistance related to significant issues and information and analysis needs for the EA related to resources in the project area over which we have special expertise or legal jurisdiction, including associated consultation requirements. Data related to the occurrence and status of these resources, evaluation of effects to them, and development of responsive mitigation are critical elements of the NEPA process, which require early identification in the scoping process and full evaluation throughout the NEPA process.

NEPA Analysis

Alternatives Analysis

The Alternatives section of the EA should consider and evaluate the full range of reasonable alternatives to the proposed action, including those that would cause less damage to the environment. The analysis should include development of mitigation measures that follow the sequence of avoidance, minimization, and compensation, or offsetting, of adverse impacts. Of particular concern are adverse impacts that may occur to sensitive and complex habitats (e.g., eelgrass, rocky habitats) as a result of the project. We recommend that you fully consider how each identified alternative will impact these habitats and what mitigative measures could be taken to reduce those impacts. Given the potentially high prevalence of complex habitats that occur along the proposed cable corridor, we recommend you include an alternative specifically for avoiding and minimizing impacts to sensitive and complex habitats in the EA.

A full range of reasonable alternatives to the proposed export cable corridor should be considered and evaluated, including an alternative to avoid and minimize impacts to important, sensitive, and complex habitats located in the project area. Such sensitive habitats include, important commercial and recreational fishing areas, rocky habitats, SAV, shellfish reefs, biogenic habitats, coastal marshes, subtidal and intertidal flats (e.g., mudflats), and designated Habitat Areas of Particular Concern (HAPC). HAPCs are designated as a high priority for conservation due to the important ecological functions they provide, their vulnerability to anthropogenic degradation and development stressors, and/or their rarity. The project area includes areas designated as HAPC for juvenile cod. Under the Omnibus Essential Fish Habitat Amendment 2[1], the New England Fishery Management Council (NEFMC) has designated HAPC for juvenile cod in southern New England as far west as the Rhode Island - Connecticut border, from the mean high-water line down to depths of 20 meters (m). This HAPC includes rocky habitats (pebble, cobble, and boulder) with and without attached macroalgae or emergent epifauna, SAV, and sandy habitats adjacent to rocky or SAV habitats, which are used for foraging. DOE should consider an alternative that evaluates how cable installation and operation may impact these different habitat types and identify ways to avoid and minimize impacts to sensitive and complex habitats.

Minimizing impacts to sensitive habitats along the export cable route may include evaluating modification or expansion of the cable route to ensure the cable can be routed around complex and sensitive habitats. This alternative should also consider methods used to lay the cable within, or adjacent to, complex habitats for both the offshore and inshore landing locations. Options for avoiding and minimizing impacts related to the methods of construction and cable routes, that allow for full cable burial to minimize permanent habitat impacts and potential interactions with fishing gear, should also be considered. This is a reasonable alternative that should be considered in the NEPA document as an individual alternative that may be mixed or matched with other alternatives.

[1] https://www.nefmc.org/library/omnibus-habitat-amendment-2

Affected Environment

The Affected Environment section of the EA should cover a sufficient geographic area to fully examine the impacts of the proposed project and support an analysis of the cumulative effects. It is important that the geographic area encompass all project-related activities, including the test site, cable corridors, landing sites, and the use of ports outside of the immediate project area. This analysis should also include any necessary landside facilities and the staging locations of materials to be used in construction, operation and maintenance of the project, including any potential modifications or expansion of those port facilities to accommodate the project.

The Affected Environment section should also include all of the biological, cultural, and socioeconomic issues related to fisheries and marine resources that may be affected by this project, including species that live within or seasonally use the immediate project area and adjacent locations. For benthic resources, fish, and invertebrate species, this section should include an assessment of species status and habitat requirements, including benthic, demersal, bentho-pelagic, and pelagic species and infaunal, emergent fauna and epifaunal species living on and within surrounding substrates. The discussion of commercial and recreational (party/charter and private angler) fisheries affected should assess landings, revenue, and effort; fishery participants, including vessels, gear types, and dependency upon fishing within the project area; potential impacts beyond the vessel owner level (e.g., shoreside support services such as dealers, processors, distributors, suppliers, etc.); and coastal communities dependent on fishing. Due to the small size of the area that would be affected by this project and limited resolution of vessel logbook data, it will be difficult to evaluate fishing effort within the project area. We could use existing approaches (see our offshore wind socioeconomic impacts page at: https://www.fisheries.noaa.gov/resource/data/socioeconomic-impacts-atlantic-offshore-wind-development?utm_medium=email&utm_source=govdelivery) to evaluate fishing activity across a larger area to help identify important commercial and recreational fisheries that may be affected. The status of many species can be found on our individual species pages (https://www.fisheries.noaa.gov/find-species), and recent trends can be found on our Stock SMART page (https://www.st.nmfs.noaa.gov/stocksmart?app=homepage). Information that can help characterize communities engaged in fishing activity can be found on our website describing social indicators for coastal communities (https://www.fisheries.noaa.gov/national/socioeconomics/social-indicators-coastal-communities) and should be integrated into the EA.

The section describing the Affected Environment for protected species should include information on the seasonal abundance and distribution of marine mammals, sea turtles, ESA-listed marine fish, anticipated habitat uses (e.g., foraging, migrating), threats, and the habitats and prey these species depend on throughout the area that may be directly or indirectly impacted by the project. The status of marine mammal stocks (see our stock assessment reports, https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessments), population trends, and threats should also be identified. Similar information should also be provided for all ESA listed species (see relevant status reviews on our ESA Species Directory, https://www.fisheries.noaa.gov/species-directory/threatened-endangered).[2]

[2] Please note that NOAA Fisheries biological opinions should not be used as a reference unless referring to specific conclusions for which the particular project that the biological opinion was issued. We do not recommend relying

As the EA is developed, specificity between species groups (e.g., low frequency vs. mid frequency cetaceans) of marine mammals and sea turtles should be incorporated as appropriate. A broad grouping approach (e.g., all marine mammals) creates uncertainty and gaps in the analysis and does not fully represent the variability of impacts amongst different taxa. As species within these taxa have different life histories, biology, hearing capabilities, behavioral and habitat use patterns, distribution, etc., project effects may not have the same degree of impact across all species. Also, wherever possible, we encourage you to identify effects to individuals (e.g., injury, behavioral disturbance, disrupted foraging), as well as impacts at the population level.

Environmental Consequences

The Environmental Consequences section of the EA must consider impacts resulting from the construction, operation and maintenance, and decommissioning of the proposed project components, including survey and monitoring activities that are anticipated to occur following approval of the project. Impact descriptions should include both magnitude (negligible, minor, moderate, major) and direction (beneficial or adverse). This section should consider all of the individual, direct, and indirect effects of the project, including those impacts that may occur offsite as a result of the proposed project, such as construction of landside facilities necessary to the construction and support operations of the Aqua Ventus project. Impact producing factors from each phase of development should be considered, including site exploration, construction, operation and maintenance, and decommissioning. DOE should ensure that findings for each effect/species are supported by references where possible and within the context of the proposed project to allow for a well-reasoned and defensible document.

Using the best scientific information available for all marine trust resources is critical to analyzing the impacts resulting from this project. Data used should include a sufficient range of years to reflect natural variability in resource conditions and fishery operations, but also current conditions. This is especially important for marine mammals given recent shifts in distribution and habitat utilization. We recommend that fisheries and marine resources survey analyses consider recent data, including data that has been previously collected at the test site.

Temporary, long-term, and permanent direct and indirect impacts to water quality, protected species, habitats, and fisheries (ecological and economic) throughout construction, operation, and decommissioning should be addressed in the EA. The temporal classification (e.g., short-term or long-term) should be appropriate for the species and types of impacts considered and should be clearly and consistently defined. The time of year that construction activities occur is also an important factor in evaluating potential biological, economic, and social impacts of the project.

In addition to focused evaluations on protected species, fish, invertebrates, and habitats, the Environmental Consequences section of the EA should include a subsection evaluating impacts to commercial and recreational fisheries. The EA should discuss biological impacts to marine species caused by the temporary or permanent loss/conversion of bottom habitat (i.e., resource distribution, productivity, or abundance changes) and direct or indirect socioeconomic impacts to

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on NOAA Fisheries Biological Opinions to support conclusions reached by DOE for other projects that were not the subject of that Opinion.

commercial and recreational fishing activities and support businesses from project construction and operation, such as any projected loss of access to important fishing areas due to the presence of the floating turbine and associated cables and anchoring structures. This evaluation should also include any potential displacement of fishing activities and resulting increased gear conflicts, bycatch, catch rates, and fishing pressure in other locations.

Because coastal and fishing communities often have large minority and low-income populations, we anticipate Environmental Justice concerns will be considered as required under Executive Order 12898 (E.O. 12898, 59 FR 7629; February 16, 1994) Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations. This E.O. requires that "each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations in the United States and its territories…" and take into account E.O. 13985 (86 FR 7009; January 20, 2021) On Advancing Racial Equity and Support for Underserved Communities Through the Federal Government. In addition, for coastal communities that include tribal nations who value the sea and fish to sustain Native American life, projects should also consider E.O. 13175 (65 FR 67249; November 6, 2000), which requires federal agencies to establish regular and meaningful consultation and collaboration with tribal officials where tribal implications may arise.

Endangered Species Act

The following listed species may be found in the Aqua Ventus test site area: Endangered North Atlantic right (*Eubalaena glacialis*), fin (*Balaenoptera physalus*), sei (*Balaenoptera borealis*) whales; and endangered leatherback (*Dermochelys coriacea*) sea turtles; threatened Northwest Atlantic DPS of loggerhead (*Caretta caretta*) sea turtles; endangered Gulf of Maine DPS of Atlantic salmon (*Salmo salar*), and the Carolina DPS, Chesapeake Bay DPS, New York Bight DPS, South Atlantic DPS, and Gulf of Maine DPS of Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*). Endangered blue (*Balaenoptera musculus*), and sperm (*Physeter macrocephalus*) whales and endangered Kemp's ridley (*Lepidochelys kempii*) and threatened North Atlantic distinct population segment (DPS) of green (*Chelonia mydas*) sea turtles could occur in the project area, but their presence is rare. Sea turtles may occasionally be present near the project site seasonally, with occurrence largely limited to June - October. We also note that fabrication/assembly is being considered at locations along the Penobscot River. ESA-listed Atlantic salmon, Atlantic sturgeon, and shortnose sturgeon (*Acipenser brevirostrum*) occur in the Penobscot River and portions of the river are designated as critical habitat for the Gulf of Maine DPS of Atlantic salmon and the Gulf of Maine DPS of Atlantic sturgeon. More information on these species and critical habitats is available on our regional ESA information site[3]. North Atlantic right whale sightings are available at our NOAA Right Whale Sightings Map page[4]. Please note, a tech memo[5] was recently published with the new population estimate (368

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[3] https://www.fisheries.noaa.gov/new-england-mid-atlantic/consultations/section-7-species-critical-habitat-information-maps-greater

[4] https://apps-nefsc.fisheries.noaa.gov/psb/surveys/MapperiframeWithText.html

[5] Pace, RM. 2021. Revisions and Further Evaluations of the Right Whale Abundance Model: Improvements for Hypothesis Testing. NOAA Tech Memo NMFS-NE-269; 49 p. Available online at https://apps-

individuals) for North Atlantic right whales, which was significantly lower than the previous estimate. Additionally, we would like to alert you that the 2020 draft marine mammal Stock Assessment Reports[6] are available, and we aim to publish the final drafts in June 2021. The proposed project also overlaps with Unit 1 (Northeast U.S. Foraging Area) of North Atlantic right whale critical habitat.

ESA Section 7 Consultation

Under section 7(a)(2) of the ESA, each Federal agency is required to ensure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of any endangered or threatened species. Because the activities that are reasonably certain to occur following the proposed approval of the Aqua Ventus project (including surveys, construction, operation, and decommissioning) may affect ESA-listed species and/or designated critical habitat, section 7 consultation is required. It is our understanding that DOE will be the lead Federal agency for this consultation, and that DOE will coordinate with any other Federal agencies that may be issuing permits or authorizations for this project, as necessary, so that we can carry out one consultation that considers the effects of all relevant Federal actions (e.g., issuance of permits by the U.S. Army Corps of Engineers and/or the U.S. Environmental Protection Agency).

Considerations for the EA

We expect that any environmental documentation regarding a proposed wind turbine in the test site area will fully examine all potential impacts to our listed species, the ecosystems on which they depend, and any designated critical habitat within the action area. We have developed a checklist to identify information needs for considering effects of wind projects on ESA-listed species and critical habitats and we encourage you to use that guidance as you develop the EA. While that document was developed in consideration of larger projects, it will provide guidance on the activities and stressors that should be considered as you evaluate effects of the action on ESA listed species.

The construction and operation of a wind turbine and installation of a subsea electrical cable have the potential to impact listed species and the ecosystems on which they depend. Potential effects of offshore wind energy development on listed species that should be considered by DOE when making any determinations about construction and operation in the Aqua Ventus project area include:

- Potential for an increased risk of vessel strike due to increases in vessel traffic and/or shifts in vessel traffic patterns due to the placement of the structure;
- Impacts of elevated noise during any geophysical and geotechnical surveys, anchoring, wind turbine operations, and other activities;
- Potential for entanglement in the floating turbine's mooring system;
- Any activities which may displace species from preferred habitats, alter movements or feeding behaviors, increase stress and/or result in temporary or permanent injury or mortality;

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nefsc.fisheries.noaa.gov/rcb/publications/tm269.pdf

[6] https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessment-reports

- Disruption of benthic habitats during construction and conversion of habitat types (including along the cable route) that may affect the use of the area, alter prey assemblages or result in the displacement of individuals;
- Impacts to water quality through sediment disturbance or pollutant discharge; project lighting as a potential attractant;
- Effects from electromagnetic fields and heat from inter-array and export cable to listed species and their prey (i.e., ability to forage, attraction, etc.); and
- Potential oceanographic and atmospheric changes to pelagic habitat and species (i.e., prey) resulting from the presence of the wind turbine.

The EA should also consider how the wind turbine may displace or alter fishing or existing vessel activity that may change the risk to protected species from interactions with fisheries or vessels, either within or outside the lease area, including potential risks of interactions with recreational fishing activity around the anchoring cables and entanglement in marine debris that may become ensnared on the cables. Additionally, the EA should consider effects of any surveys that may occur following potential project approval that may affect listed species (e.g., gillnet or trawl surveys to characterize fisheries resources), as well as any pre- or post-construction monitoring that may affect listed species. For further information on effects to consider, please refer to the ESA Information Needs checklist.

Magnuson-Stevens Fishery Conservation and Management Act

As currently described, this project (inclusive of the test site, offshore and inshore export cables and corridors, and shoreside landing point) will be constructed, operated, and maintained in areas designated Essential Fish Habitat (EFH) for various life stages of many species of fish and shellfish managed by the New England Fishery Management Council (NEFMC), Mid-Atlantic Fishery Management Council (MAFMC), and NOAA Fisheries. You should be aware that EFH and HAPC are designated in federal and state waters, so the evaluation of project impacts must include species that are designated along the onshore export cable route in state waters.

The most up-to-date EFH and Habitat Areas of Particular Concern (HAPC) designations should be used in DOE's evaluation of impacts to EFH. HAPCs are a subset of EFH that are either rare, particularly susceptible to human-induced degradation, especially important ecologically, or located in an environmentally stressed area. EFH and HAPC for species managed by the NEFMC have been modified under the Omnibus Amendment which was approved and implemented in 2018. The EFH mapper can be used to query, view, and download spatial data for the species managed by the New England, Mid-Atlantic, and South Atlantic Councils and for Highly Migratory Species. The EFH mapper can be accessed from our habitat website at https://www.habitat.noaa.gov/protection/efh/efhmapper/. DOE should also be aware that the Final Amendment 10 to the 2006 Consolidated Atlantic Highly Migratory Species (HMS) Fishery Management Plan (FMP) went into effect on September 1, 2017. This amendment contains several changes to the EFH designations for sharks and other highly migratory species. More information can be found on our website at https://www.fisheries.noaa.gov/topic/atlantic-highly-migratory-species.

For this project, bottom habitats defined to include rocky habitats (pebble, cobble, and boulder) with and without attached macroalgae or emergent epifauna, SAV, and sandy habitats adjacent to rocky or SAV habitats between mean high water and a depth of 20 meters along the entire Maine coast are designated as HAPC for juvenile Atlantic cod. The Gulf of Maine cod stock is severely depleted and commercial fisheries allocations are set at very low levels. Cod spawn in coastal waters in the area just south of the project area in the spring with peak spawning activity in May and June. Larvae settle to the bottom as juveniles 3-4 months after the pelagic eggs hatch and remain in relatively shallow water until they are a year older when they move into deeper water. Age 0 and age 1 juveniles are common in the project area. Given that the onshore export cable will pass through a considerable amount of juvenile cod habitat, the EFH Assessment should pay particular attention to the potential impacts of all construction and operational activities on juvenile cod HAPC.

We would also note that impacts to complex habitats, including those designated as juvenile cod HAPC, are known to result in long recovery times and are potentially permanent. Such impacts may result in cascading long term to permanent effects to species that rely on this area for spawning and nursery grounds and the fisheries and communities that target such species. The evaluation of impacts from project construction and operation, particularly along the cable corridor, should analyze the potential for recovery and the anticipated recovery times based on the habitat type and components that would be impacted. Based on our initial review of the cable route and turbine locations, it is likely that the project will result in direct and indirect impacts to complex habitats. As a result of these activities, complex habitats may suffer permanent adverse impacts or take years to decades to recover. We recommend that you fully discuss and analyze in the EA the variability in recovery times by habitat type.

Considerations for the EA

As noted above, the project area, including both the turbine location and the cable corridor, may result in adverse impacts to complex habitats, including cod HAPC. The NEPA document, and the EFH, benthic resources, finfish and invertebrate sections, in particular, should accurately describe the project area and the resources that rely on each habitat type that will be impacted as a result of the proposed project. Consideration should be given to activities within and adjacent to complex habitat areas that are highly susceptible to adverse impacts. The document should fully describe the distinct habitat features of the entire project area and the importance of different habitat types for providing structure and refuge, not only from the presence of the physical substrate (e.g., pebble, cobbles, boulders), but also the biological components of the habitat, particularly structure-forming taxa (e.g., sponges, anemones, bryozoans). The document should analyze the effects to the different habitats within the project area and the biological consequences of those effects. It is important to consider impacts of the project on all life stages (adults, juveniles, larvae, eggs), and we recommend focusing on species and life stages that may be more vulnerable to impacts, with consideration of impacts to juvenile cod.

EFH Consultation

The MSA requires federal agencies to consult with the Secretary of Commerce, through NOAA Fisheries, with respect to “any action authorized, funded, or undertaken, or proposed to be authorized, funded, or undertaken, by such agency that may adversely affect any essential fish habitat (EFH) identified under this Act,” 16 U.S.C. § 1855(b)(2). This process is guided by the requirements of our EFH regulation at 50 CFR 600.905. Pursuant to the MSA, EFH is defined as “those waters and substrates necessary to fish for spawning, breeding, feeding or growth to maturity,” 16 U.S.C. § 1853(a)(7) and § 1802(10). NOAA’s regulations further define EFH, adding that “waters” include aquatic areas and their associated physical, chemical, and biological properties that are used by fish and may include aquatic areas historically used by fish where appropriate; “substrate” includes sediment, hard bottom, structures underlying the waters, and associated biological communities; “necessary” means the habitat required to support a sustainable fishery and the managed species' contribution to a healthy ecosystem; and “spawning, breeding, feeding, or growth to maturity” covers a species' full life cycle.

The EFH final rule, published in the *Federal Register* on January 17, 2002, defines an adverse effect as: “any impact which reduces the quality and/or quantity of EFH.” The rule further states that:

> An adverse effect may include direct or indirect physical, chemical, or biological alterations of the waters or substrate and loss of, or injury to, benthic organisms, prey species and their habitat and other ecosystems components, if such modifications reduce the quality and/or quantity of EFH. Adverse effects to EFH may result from action occurring within EFH or outside EFH and may include site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions.

As stated above, adverse impacts to EFH may result from actions occurring within or outside of areas designated as EFH. In addition, the EFH final rule also states that the loss of prey (which reduces the quality and quantity of habitat) may constitute an adverse effect on EFH and managed species. As a result, actions that reduce the availability of prey species, either through direct harm or capture, or through adverse impacts to the prey species' habitat, may also be considered adverse effects on EFH. The EFH regulations state that for any Federal action that may adversely affect EFH, Federal agencies must provide NOAA Fisheries with a written assessment of the effects of that action on EFH (50 CFR 600.920(e)). This EFH Assessment should include analyses of all potential impacts, including temporary and permanent and direct and indirect individual, cumulative, and synergistic impacts of the proposed project.

The EFH assessment must contain the following mandatory elements: (i) a description of the action, (ii) an analysis of the potential adverse effects of the action on EFH and the managed species, (iii) the federal agency’s conclusions regarding the effects of the action on EFH, and (iv) proposed mitigation, if applicable (50 CFR 600.920(e)(3)). Due to the potential for substantial adverse effects to EFH from the proposed project, an expanded EFH consultation as described in 50 CFR 600.920(f) is necessary for this project. As part of the expanded EFH consultation, the EFH Assessment for the proposed project should also contain additional information, including: (i) the results of an on-site inspection to evaluate the habitat and the site specific effects of the project; (ii) the views of recognized experts on the habitat or species that may be affected; (iii) a review of pertinent literature and related information; (iv) an analysis of alternatives to the action; and (v) other relevant information.

The EFH expanded consultation process allows the maximum opportunity for NOAA Fisheries and the Federal action agency - in this case, DOE - to work together to review the action's impacts on EFH and federally managed species, and for NOAA Fisheries to develop EFH conservation recommendations (EFH CRs). Although the EFH consultation is a separate review mandated pursuant to the MSA, our EFH regulations encourage the consolidation of the EFH consultation with other interagency consultation, coordination, and environmental review procedures required by other statutes, such as NEPA, where appropriate. Because the information contained within the EA is needed to support a complete EFH Assessment, we request DOE use the NEPA document as the vehicle within which to present the EFH assessment. The EFH Assessment should be included within a separate section or appendix of the document and be clearly identified as an EFH assessment.

Considerations for the EFH Assessment

The expanded EFH Assessment should include full delineation, enumeration, and characterization of all habitat types in the project area including the test site, cable corridors and landing site. Particular attention should be paid to HAPCs, sensitive life stages of species, ecologically sensitive habitats, and difficult-to-replace habitats such as SAV, natural hard bottom substrates with epifauna (including corals), and shellfish habitat and reefs. However, the habitat mapping data should also be shared directly with us in usable GIS format for review, apart from the body of the EFH Assessment and maps and figures contained therein. To aid DOE in the development of comprehensive and complete EFH Assessments, please refer to our *Recommendations for Mapping Fish Habitat*, published in March 2021.

As stated in our habitat mapping recommendations[7], early coordination in the consultation process is essential. In particular, early coordination on proposed habitat mapping procedures, including: 1) data collection (sampling design, sites, replication, and sampling methodology); 2) data processing and interpretation; and 3) the development of maps that accurately characterize and delineate fish habitat, benefits all parties and will help avoid unnecessary delays in project development and consultations. It is critical that the data being collected can be used to accurately characterize and delineate fish habitat within the test site and cable corridor to ensure we can differentiate areas of sensitive and complex habitats and provide appropriate conservation recommendations. Adjustments to early survey plans based on our input will likely result in significantly better habitat data, which will streamline project review. Moving forward with habitat mapping efforts without appropriate coordination may result in the need for additional field seasons/sampling to collect and interpret additional data to accurately map fish habitat for consultation purposes.

In the absence of accurate fish habitat data, we must take a conservative approach to our development of conservation recommendations for the project. We recommend that DOE schedule a habitat mapping–specific meeting with us and the applicants for this project as soon as practicable. Additionally, we recommend all data related to habitat mapping (acoustic survey results, seafloor sampling data, GIS data, figures/maps, etc.) be shared with us as soon as practicable (once it is processed), so we can begin reviewing and providing comments, which will allow for more streamlined project review and consultation.

[7] NMFS Recommendations for Mapping Fish Habitat for wind energy projects: https://media.fisheries.noaa.gov/2021-03/March292021_NMFS_Habitat_Mapping_Recommendations.pdf?null

Fish and Wildlife Coordination Act

The FWCA provides authority for our involvement in evaluating impacts to fish and wildlife from proposed federal actions that may affect waters of the United States. The FWCA requires that wildlife conservation be given equal consideration to other features of water resource development programs through planning, development, maintenance and coordination of wildlife conservation and rehabilitation. The Act does this by requiring federal action agencies to consult with us "with a view to the conservation of wildlife resources by preventing loss of and damage to such resources as well as providing for the development and improvement thereof in connection with such water-resource development" (16 USC 662.) One of the reasons that Congress amended and strengthened the FWCA in 1958 was that it recognized that "[c]ommercial fish are of major importance to our nation [,]" and that federal permitting agencies needed general authority to require "in project construction and operation plans the needed measures for fish and wildlife conservation" S.Rep. 85-1981 (1958). As a result, our FWCA recommendations must be given full consideration by federal action agencies. DOE's consultation with us under the FWCA will occur concurrently with the EFH consultation under the MSA.

Under the FWCA, our authority extends to numerous other aquatic resources in the area of the proposed project, including, but not limited to, the following species and their habitats: American lobster (*Homarus americanus*), striped bass (*Morone saxatilis*), American shad (*Alosa sapidissima*), alewife (*Alosa pseudoharengus*) and blueback herring (*Alosa aestivalis*) (collectively known as river herring), Atlantic menhaden (*Brevoortia tyrannus*), Atlantic silversides (*Menidia menidia*), oyster (*Crassostrea virginica*), blue mussel (*Mytilus edulis*), tautog (*Tautoga onitis*), weakfish (*Cyanoscion regalis*) and other assorted fish and invertebrates. NOAA jointly manages a number of these species through Interstate FMPs with the Atlantic States Marine Fisheries Commission. A list of Commission-managed species and plans can be found on their website at http://www.asmfc.org.

We anticipate all of these species will be included in your impact assessments, both in the EFH Assessment and NEPA document. We also expect the assessment to include impacts to the recreational and commercial fishing communities that rely on these species. The behaviors and habitat needs of diadromous and estuary-dependent fishes (associated with cable route locations) may not be represented by a discussion solely of the surrounding marine fishes in the wind turbine area. The discussion for FWCA species should evaluate the project impacts to organisms or populations associated with the various trophic levels and life history strategies exhibited by FWCA species known to occupy the project area as residents or transients. Focus should be on issues surrounding species, life history stages, or habitat components that would be most susceptible to the various potential project impacts.

Conclusion

Thank you for the opportunity to provide comments during this important scoping process. We are committed to implementing our national strategic goals to maximize fishing opportunities while ensuring the sustainability of fisheries and fishing communities, and to recover and conserve protected species while supporting responsible fishing and resource development. To the extent possible, we will continue working with you to provide the necessary expertise, advice, and scientific information to avoid areas of important fishing activity and sensitive habitats; minimize impacts to fisheries and protected species; and support the conservation and sustainable management of our marine trust resources.

Should you have any questions regarding these comments, please contact Alison Verkade in our Habitat and Ecosystem Services Division at (978) 281-9266 or Alison.Verkade@noaa.gov. For questions regarding ESA and section 7 comments, please contact Julie Crocker in our Protected Resources Division at (978) 282-8480 or Julie.Crocker@noaa.gov.

Sincerely,

Louis A. Chiarella
Assistant Regional Administrator
For Habitat Conservation

Cc:

Roak Parker, DOE
Brooke Barnes, Stantec, DOE Agent
Jay Clement, ACOE
Carl Wilson, MEDMR
Denis Nault, MEDMR
Mark McCollough, FWS
Wende Mahaney, FWS
Mike Marsh, USEPA
Tim Timmemann, USEPA
Michele DesAutels, USCG
Tom Nies, NEFMC
Chris Moore, MAFMC
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UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
GREATER ATLANTIC REGIONAL FISHERIES OFFICE
55 Great Republic Drive
Gloucester, MA 01930-2276

June 8, 2021

Frank Del Giudice, Branch Chief
Permits and Enforcement
U.S. Army Corps of Engineers
New England District
696 Virginia Road
Concord, MA 01742-2751

Re: NAE-2020-01783 Lubec Safe Harbor, Lubec, Maine.

Dear Mr. Del Giudice,

We have reviewed your EFH consultation request, received May 18, 2021, and accompanying documents, to construct a stone rubble and sheet pile breakwater, boat ramp, and floating dock to serve the town's commercial fishing fleet, in Lubec, Maine. The project consists of a solid fill breakwater pier, boat ramp, pile supported pier and ramps and floats. The breakwater would be 1250 feet long. The first 760 feet of the breakwater will be constructed using rock fill. The remaining 500 feet of the breakwater will be constructed with 30-foot diameter filled circular sheet pilings. The boat ramp will be 15 feet wide by 260 feet long. A 6' x 105 pile supported pier with a 4' x 123' leading to (8) 8' x 20' pile secured floats. Also, a 6' x 60' ramp attached from the breakwater will lead to a line of floats consisting of (16) 8' x 20' pile secured floats. The stone rubble breakwater will be constructed from shore. Sheet pilings and log pilings will be installed by barge. The proposed project will affect approximately 0.46 acres of ledge, rock, boulders, cobbles, and gravel in the intertidal area and approximately 2.83 acres of deep soft mud in the subtidal area. Loss of this habitat may adversely affect species that use these waters and substrate, total adverse effects amount to 3.29 acres of EFH.

The Magnuson-Stevens Fishery Conservation and Management Act (MSA) and the Fish and Wildlife Coordination Act (FWCA) require federal agencies to consult with one another on projects such as this. Insofar as a project involves EFH, as this project does, this process is guided by the requirements of our EFH regulation at 50 CFR 600.920, which mandates the preparation of EFH assessments and generally outlines each agency's obligations in this consultation procedure. We offer the following comments and recommendations on this project pursuant to the above referenced regulatory process.

Resources in the Project Area

The Johnson Bay and Lubec Harbor project area supports important living marine resources that provide for valuable recreational and commercial fisheries, as well as species and habitats that are critical to a healthy marine ecosystem. Federally-managed species containing EFH in the project area include, but are not limited to; larvae, juvenile and adult cod, haddock, pollock and Atlantic herring, and all life stages of Atlantic sea scallop, winter flounder, windowpane flounder, red hake, and plaice. Winter flounder eggs are demersal, adhesive, and stick together in clusters (Pereira et al. 1999), and can be directly impacted by elevated suspended sediments and turbidity caused by in-water construction activities (Berry et al. 2004; Johnson et al. 2008). In addition, because eggs, larvae, and young-of-year are non-dispersive, spawning areas and nursery areas tend to be close together (Pearcy 1962; Crawford and Carey 1985). Winter flounder spawn in the Gulf of Maine region from March to May. Approximately 0.46 acres of ledge, rock, boulders, cobbles, and gravel in the intertidal area, representing a Habitat Area of Particular Concern (HAPC) for Juvenile Atlantic cod will be lost due to the proposed project. Attached macroalgae have been identified on the larger cobble and boulder habitats. MEDMR has mapped the intertidal area for supporting soft-shell clams and blue mussels and populations were defined as low but present.

In addition, the project site is in close proximity to Cobscook Bay and the entrance to the St. Croix River, which support a robust population of diadromous fish. These species include alewife and blueback herring (collectively known as river herring), American shad, rainbow smelt and American eel. Diadromous fishery resources serve as prey for a number of federally-managed species and are therefore considered a component of EFH pursuant to the MSA. Diadromous fish may use the project area as a migratory pathway and for foraging before and after their spawning migrations through the estuaries into freshwater rivers during the spring months. Spawning for alewife and blueback herring is temperature dependent, and is initiated when water temperature reaches about 13° C in late March/early April (Greene et al. 2009). Diadromous fishery resources serve as prey for a number of federally-managed species, and several species are considered a component of EFH pursuant to the MSA. In addition, blueback herring, alewife, and rainbow smelt have been designated as "species of concern" under the Endangered Species Act due to their depressed populations.

Project History and Measures to Avoid, Minimize and Mitigate Impacts
The U.S. Army Corps of Engineers conducted a Section 107 Navigation Improvement Study which identified seven potential safe harbor sites throughout Lubec. The Town utilized the study to determine a practicable alternative for the safe harbor project. Under a no-build scenario the existing Lubec facilities and vessels would continue to sustain damage from high winds and seas from the north/northeast. In an effort to minimize impacts, a floating breakwater was previous constructed, yet was destroyed by ice and winter storms.

Four measures will be employed to minimize impacts. These methods are to install sheet piles and timber piles from November 8 to April 8, the use of turbidity curtains, adequate sedimentation and erosion control procedures, and soft start procedures for pile installation and removal. The applicant proposes to provide $830,752 in compensatory mitigation to the In Lieu Fee (ILF) program of the Maine Natural Resource Conservation Program. Based on the response regarding permittee-responsible on-site mitigation considerations on June 2, 2021, we agree that mitigation through ILF is appropriate in this circumstance. However, there are typically very few coastal mitigation projects proposed to the Maine ILF program. Therefore, we recommend these ILF funds be applied to projects which offset impacts to coastal resources, rather than towards an out-of-kind mitigation project.

Essential Fish Habitat Conservation Recommendations
Section 305(b)(2) of the MSA requires all federal agencies to consult with us on any action authorized, funded, or undertaken by that agency that may adversely affect EFH. Johnson Bay, Lubec Harbor and adjacent areas have been identified as EFH under the MSA for several federally-managed species. We appreciate the inclusion of the previously identified measures to avoid, minimize and mitigate adverse impacts to EFH.
We recommend, pursuant to Section 305(b)(a)(A) of the MSA, that you adopt the following EFH

conservation recommendations:

1. No in-water activities should occur from March 15-June 30 of any year to protect winter flounder spawning and egg development and diadromous fish spawning migration. This includes activities that release suspended sediments and turbidity, as well as noise producing activities such as the use of impact and vibratory hammers for pile driving.
2. Compensatory mitigation for impacts to 0.46 acres of natural rocky intertidal habitat should be in the form of payment to the Maine ILF program and should be applied to projects which offset impacts to coastal resources, rather than towards an out-of-kind mitigation project.

Please note that Section 305(b)(4)(B) of the MSA requires you to provide us with a detailed written response to these EFH conservation recommendations, including a description of measures you have adopted that avoid, mitigate, or offset the impact of the project on EFH. In the case of a response that is inconsistent with our recommendations, Section 305(b)(4)(B) of the MSA also indicates that you must explain your reasons for not following the recommendations. Included in such reasoning would be the scientific justification for any disagreements with us over the anticipated effects of the proposed action and the measures needed to avoid, minimize, mitigate, or offset such effects pursuant to 50 CFR 600.920(k).

Please also note that a distinct and further EFH consultation must be reinitiated pursuant to 50 CFR 600.920(l) if new information becomes available or the project is revised in such a manner that affects the basis for the above EFH conservation recommendations.

Endangered Species Act
Threatened and endangered species under our jurisdiction may be present in the action area. A consultation pursuant to section 7 of the Endangered Species Act of 1973 is required. If you have any questions regarding the status of this consultation, please contact Roosevelt Mesa at 978-281-9186 or roosevelt.mesa@noaa.gov.

Conclusion
We appreciate the opportunity to provide these EFH conservation recommendations. If you have any questions regarding our conservation recommendations or information in this letter, please contact Kaitlyn Shaw at kaitlyn.shaw@noaa.gov.

Sincerely,

Louis A. Chiarella
Assistant Regional Administrator
for Habitat Conservation

cc:
Roosevelt Mesa, PRD
Shawn Mahaney, USACE
Mike Marsh, EPA
Maria Tur, USFWS
Gail Wippelhauser, ME DMR
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References

Berry WJ, Hinchey EK, Rubinstein NI, Klein-MacPhee G.2004. Winter flounder, Pseudopleuronectes americanus, hatching success as a function of burial depth in the laboratory. Ninth flatfish biology conference- poster presentation; 2004 Dec 1-2; Westbrook, CT. Woods Hole (MA): Northeast Fisheries Science Center Reference Document 04-13.

Crawford RE, Carey CG. 1985. Retention of winter flounder larvae within a Rhode Island salt pond. Estuaries 8:217-227.

Greene KE, Zimmerman JL, Laney RW, Thomas-Blate JC. 2009. Atlantic coast diadromous fish habitat: A review of utilization, threats, recommendations for conservation, and research needs. Atlantic States Marine Fisheries Commission Habitat Management Series No. 9, Washington, D.C.

Johnson MR, Boelke C, Chiarella LA, Colosi PD, Greene K, Lellis-Dibble K, Ludeman H, Ludwig M, McDermott S, Ortiz J, Rusanowsky D, Scott M, Smith J. 2008. Impacts to marine fisheries habitat from nonfishing activities in the northeastern United States. NOAA Technical Memorandum NMFS-NE-2O9. Woods Hole, MA. 328 p.

Pearcy WG. 1962. Ecology of an estuarine population of winter flounder, *Pseudopleurontectes americanus* (Waldbaum). Part I-IV. Bulletin of the Bingham Oceanography Collection 18(1):5-78.

Pereira JJ, Goldberg R, Ziskowski JJ, Berrien PL, Morse WW, Johnson DL. 1999. Essential Fish habitat source document: winter flounder, *Pseudopleuronectes americanus*, life history and characteristics. NOAA Technical Memorandum. NMFS-NE-138. Northeast Fisheries Science Center, Woods Hole, MA

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
GREATER ATLANTIC REGIONAL FISHERIES OFFICE
55 Great Republic Drive
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June 7, 2021

Ms. Michelle Morin
Chief, Environmental Branch for Renewable Energy
Bureau of Ocean Energy Management
45600 Woodland Road, VAM-OREP
Sterling, Virginia 20166-4281

Re: South Fork Offshore Wind Energy Project, Lease Area OCS-A-517, offshore Rhode Island

Dear Ms. Morin:

We have reviewed the final Essential Fish Habitat (EFH) assessment provided on April 7, 2020, for the proposed South Fork offshore wind energy project. The revised EFH Assessment was provided in response to our request for additional information provided on December 14, 2020. This project includes the construction, operation, maintenance, and decommissioning of a commercial scale offshore wind energy facility by South Fork Wind Farm (SFWF), within Lease Area OCS-A 0517, located approximately 19 miles southeast of Block Island, Rhode Island, and 35 miles east of Montauk Point, New York. The SFWF also includes an Operations and Maintenance (O&M) facility that will be located onshore at a commercial port facility at Montauk in East Hampton, New York. The SFWF includes up to 15 wind turbine generators (WTGs or turbines) with a nameplate capacity of 6 to 12 MW per turbine, an offshore substation (OSS), and a submarine transmission cable network connecting the WTGs (inter-array cables) to the OSS. The South Fork Export Cable (SFEC) would transmit energy from the SFWF to either Beach Lane, Town of Easthampton, New York or Hither Hills, Montauk, New York. The Beach Lane alternative would require approximately 61.8 linear miles of cable to a sea-to-shore connection located approximately 1,750 feet offshore of Easthampton, NY or 50.0 linear miles of cable to a sea-to-shore connection located approximately 1,750 feet offshore of Montauk, NY. Both cable corridor alternatives would connect to land by horizontal directional drilling (HDD) of the cable to a depth of 65.6 feet below the seabed.

As you are aware, the Magnuson-Stevens Fishery Conservation and Management Act (MSA) and the Fish and Wildlife Coordination Act (FWCA) require Federal agencies to consult with one another on projects such as this. Insofar as the project involves EFH, the consultation process is guided by the EFH regulatory requirements under 50 CFR 600.920, which mandates the preparation of EFH assessments and generally outlines your obligations. We offer the following comments and recommendations on this project pursuant to the above referenced regulatory process.

Comments on the EFH Assessment

The EFH assessment provided to us on April 7, 2021, has substantial deficiencies and fails to address the majority of the general comments we submitted and the detailed information we requested in our December 14, 2020, letter. These major deficiencies include: (1) failure to address all potential impacts that are expected to occur as a result of the project; (2) inadequate information to determine how stated impacts were determined and evaluated; and (3) conflicting impact assessment calculations and information. Of note is the absence of a meaningful evaluation of the potential project impacts for Atlantic cod. We have significant concerns that the project may result in substantial impacts to Atlantic cod EFH by adversely affecting benthic habitats and causing acoustic impacts that may interfere with cod spawning. These concerns were discussed at length in our December letter and in our follow-up coordination with your staff and the third-party contractor. However, your EFH assessment provides minimal analysis of such impacts and does not respond to our specific information requests or our discussions with you related to the level of detail necessary for the assessment.

Further, the assessment of impacts to EFH is inconsistent with the EFH regulations. This issue was also stated in our December letter and discussed with your staff and the third-party contractor. Your assessment is more consistent with a NEPA analysis. The effects analysis is structured around identified impact producing factors and generally characterizes impacts related to their perceived significance level, rather than evaluating impacts to habitats by activity type or fully analyzing the effects of identified adverse impacts. This approach to the EFH assessment appears to have resulted in both incomplete assessments of the project impact effects to EFH and inconsistent information of project impacts throughout the document. For example, although specifically addressed in both our general comments and detailed information request, your document does not discuss the potential for habitat conversion of small-grained rocky habitats to soft-bottom habitats resulting from cable installation. Further, there are multiple instances of inconsistent project impact calculations presented throughout the document. The inconsistencies in project impact calculations range from very minor differences (e.g. 821 versus 820 acres of vessel anchoring impacts) to moderate differences (e.g. 0.034 to 0.86 acres of dredging for the O&M facility) to major differences (e.g. 0.2 acres of impact per monopile versus 482 to 490 acres of boulder relocation impacts for all monopile installations). Pursuant to the MSA regulations, EFH conservation recommendations are provided to avoid, minimize, or offset adverse impacts to designated EFH for managed species that would occur as a result of the proposed action. While minor deviations in the assessment of a particular impact would unlikely change the basis for our recommendations, moderate to major discrepancies in the calculated impacts of a project element may substantially affect our evaluation of the project and the conservation recommendations necessary to conserve and protect EFH for managed fish species. While we requested detailed information on the specifications and basis for each project component used in the calculations of project impacts in our December 2020 letter and in follow-up meetings, these details for the presented impact calculations are largely missing or unclear.

Also of great concern, on May 20, 2021, we received notice of an updated version of the COP, dated May 7, 2021, that includes new information that was not incorporated or assessed in the EFH assessment. Of particular concern is the additional information provided related to unexploded ordinances (UXO) in the project area. Mitigative actions related to the removal or remediation of UXOs would likely result in impacts to EFH and should be described and evaluated in the EFH assessment. To date we have not received adequate information to determine, if or how the new information presented in the updated COP may affect the basis of our recommendations.

The EFH assessment should be revised to clarify and address the apparent inconsistencies in the project impact calculations and to address the new information included in the May 2021 updated COP. We request that you provide a revised assessment for our review so we may determine whether the new information you provided affects the basis of our EFH conservation recommendations contained herein, or whether supplemental EFH conservation recommendations may be necessary to address the new project information included in the updated COP.

We also recommend that you work with us to develop an EFH template that can be used for future EFH assessments of wind projects in the region. Despite the high level of engagement between our respective staff on habitat concerns and issues related to EFH, that engagement and cooperation between our agencies was not well reflected in your EFH assessment. While we recognize that the tight timelines limit your ability to review and address identified deficiencies in the documents, we cannot continue to consult on these projects with inadequate assessments. An EFH assessment template would provide third-party contractors with a consistent format and basis for the development of project specific EFH assessments moving forward. We welcome the opportunity to work with your staff on the development of such a template in the near term.

Given the expected upcoming workload associated with wind project reviews, there are proactive steps that can be taken to help ensure a more efficient consultation process. As discussed above, the development of an EFH assessment template could help to ensure adequate EFH assessments are provided. However, we also believe it is crucial that you ensure that the COP is complete, and all project information is included and addressed in the EFH assessment prior to initiating consultation with us. This will help to ensure that the full and final project scope is included in the EFH assessment and will minimize the potential for additional workload associated with duplicative project reviews resulting from last minute project changes or new information.

Resources in the Project Area

EFH Designations in the Project Area
The project area is designated as Essential Fish Habitat (EFH) by the New England Fishery Management Council (NEFMC), the Mid-Atlantic Fishery Management Council (MAFMC) and NOAA Fisheries, for multiple federally managed species. These species include Atlantic cod (*Gadus morhua*), summer flounder (*Paralichthys dentatus*), winter flounder (*Pseudopleuronectes americanus*), inshore longfin squid (*Doryteuthis pealeii*), yellowtail flounder (*Limanda ferruginea*), windowpane flounder (*Scophthalmus aquosus*), ocean pout (*Zoarces americanus*), red hake (*Urophycis chuss*), black sea bass (*Centropristis striata*), little skate (*Leucoraja erinacea*), winter skate (*Leucoraja ocellata),* witch flounder (*Glyptocephalus cynoglossus*), Atlantic sea scallop (*Placopecten magellanicus*), Atlantic mackerel (*Scomber scombrus*), Atlantic surfclams (*Spisula solidissima*), albacore (*Thunnus alalunga*), bluefin tuna (*Thunnus thynnus*), skipjack tuna (*Katsuwonus pelamis*), yellowfin tuna (*Thunnus albacares*). In addition, the coastal tiger shark species (*Galeocerdo cuvier*) and sandbar shark (*Carcharhinus plumbeus*) have EFH designated in within the export cable route and the lease area, as do five pelagic shark species (dusky shark (*Carcharhinus obscurus*), blue shark (*Prionace glauca*), porbeagle (*Lamna nasus*), shortfin mako (*Isurus oxyrinchus*), and common thresher shark (*Alopias vulpinus*)).

Some species and life stages may be more vulnerable to effects of the project. Species with benthic life stages as designated EFH may be more vulnerable, particularly those such as Atlantic cod (*Gadus morhua*), Atlantic sea scallop (*Placopecten magellanicus*), Atlantic surfclam (*Spisula solidissima*), little skate (*Leucoraja erinacea*), longfin inshore squid (*Doryteuthis pealeii*), ocean quahog (*Arctica islandica*), scup (*Stenotomus chrysops*), white hake (*Urophycis tenuis*), red hake (*Urophycis chuss*), and winter skate (*Leucoraja ocellata*). Species that are habitat limited, aggregate to spawn, or have benthic eggs and larvae may be more vulnerable to the effects from the project. Project effects are of particular concern for Atlantic cod, a species with benthic life history stages dependent upon complex structured habitats that are vulnerable to project related impacts. Atlantic sea scallop, Atlantic surfclam, and ocean quahog are also particularly vulnerable due to their benthic existence and limited mobility. Winter flounder, ocean pout, Atlantic wolffish and longfin squid are benthic spawners with demersal eggs, making reproduction for these species particularly vulnerable. Atlantic cod and longfin squid aggregate to spawn and may be more vulnerable to longer term impacts if spawning behavior is disrupted.

Habitat Areas of Particular Concern
The project area includes areas designated as Habitat Areas of Particular Concern (HAPC) for summer flounder. HAPCs are designated as high priorities for conservation due to the major ecological functions they provide, and their vulnerability to anthropogenic degradation and development stressors, and/or their rarity. Under Amendment 13 of the Summer Flounder, Scup, and Black Sea Bass Fishery Management Plan, the MAFMC has designated areas of macroalgae and submerged aquatic vegetation (SAV) as a HAPC, when associated with EFH for juvenile and adult summer flounder. This HAPC is present in and adjacent to the project area, particularly along the export cable route that runs from the wind lease area to both landing locations on Long Island, NY.

Cox Ledge
The proposed project is located on Cox Ledge, an area with particularly complex and unique habitat conditions that support a wide range of marine resources. This area provides habitat for feeding, spawning, and development of federally managed species, and supports commercial and recreational fisheries and associated communities. Impacts to complex habitats, such as those found in the project area, are known to result in long recovery times and may take years to decades to recover from certain impacts. Such impacts may result in cascading long term to permanent effects to species that rely on this area for spawning and nursery grounds and the fisheries and communities that target such species. This area is also known to support spawning aggregations of Atlantic cod.

Atlantic cod
Atlantic cod are an iconic species in New England waters and a highly sought-after catch for recreational fishermen. In 2013, the recreational marine bait and tackle industry in New England was estimated to contribute $200 million in total sales, $78.9 million in income, and 1,256 jobs to the local economy (Hutt et al. 2015). Atlantic cod was reported to be the fifth greatest generator of sales. In the most recent Economies of the Fisheries (2016), commercial and recreational fisheries are estimated to contribute 97,000 jobs and generate $8.7 billion in sales annually in the New England region with Atlantic cod remaining one of the key recreational species in the region (NOAA 2018).

Atlantic cod are divided into two stocks for assessment and management purposes, a Georges Bank (GB) and a Gulf of Maine (GOM) stock. The Atlantic cod stock most affected by the project area is the Georges Bank stock, which includes cod found in Southern New England waters and those around Cox Ledge. According to a preliminary 2019 operational assessment, the Georges Bank cod stock is overfished and near record low biomass observed in 2014. Despite recent emergency management actions and severe reductions in fishery resource allocations, cod stocks in the region remain at less than 10% of the target sustainable spawning stock biomass, with the latest stock status report for Atlantic cod GOM and GB stocks estimate at 6-9 percent and 7 percent, respectively, of the target for maximum sustainable yield (National Marine Fisheries Service - 1st Quarter 2021 Update Table A. Summary of Stock Status for FSSI Stocks).

Although the cod resource in southern New England has traditionally been assessed as part of the Georges Bank stock, new information on the stock structure of Atlantic cod in U.S. waters of the northwest Atlantic has identified five separate, but interrelated, spawning sub-populations in the region (Zemeckis et al. 2014a, 2017, NEFSC 2020). The southernmost sub-population is in the area that includes Cox Ledge. These sub-populations have not yet been designated as separate stocks for management purposes, so there are no population size assessments available for them. There is, however, information indicating that, unlike other spawning components, cod in southern New England have increased in abundance during the last 20 years (Langan et al. 2020). Depletion of individual spawning groups of cod is being driven by overfishing and climate change (Mieszkowska et al. 2009), so further reductions in spawning habitat from wind energy construction and operation activities pose an additional, cumulative, threat to local cod resources. Given the state of Atlantic cod stocks and the economic importance of the species to recreational and commercial fisheries, it is essential to minimize adverse impacts to habitats that can support and increase survivorship of critical life stages for cod in southern New England.

<u>Habitat Types within the Project Area</u>

Rocky Habitats

The project area overlaps with structurally complex habitats, including natural rocky habitats that have been identified as occurring throughout most of the project area. Rocky habitats provide three-dimensional structure that plays an important ecological role for fish as shelter and refuge from predators (Auster 1998; Auster and Langton 1999; NRC 2002; Stevenson *et al.* 2004). The relationship between benthic habitat complexity and demersal fish community diversity has also been positively correlated (Malek et al. 2010). Rocky habitats are inherently complex, where their physical complexity provides crevices for species to seek shelter from predation and flow, these habitats also provide a substrate for macroalgal and epibenthic growth that can increase the functional value of these habitats as refuge for juvenile fish. Multiple managed fish species have life history stages that are dependent on, or mediated by, rocky habitats and their associated attributes (Gotceitas et al.1995, Lindholm et al. 1999, Auster 2001, Auster 2005, Methratta and Link 2006). Rocky habitats are particularly sensitive to disturbances that reduce their fundamental complexity, with impacts ranging from long-term to permanent where extended recovery times of biological components are on the order of years to decades (Auster and Langton 1999; Bradshaw et al. 2000, Collie *et al*. 2005; NRC 2002; Tamsett *et al.* 2010). Due to their important role for multiple marine organisms and vulnerability to disturbances, impacts to rocky habitats should be avoided wherever feasible.

Submerged aquatic vegetation
Eelgrass, a submerged aquatic vegetation (SAV), is another complex habitat found in the project area. Eelgrass is known to play a critical ecosystem role. Highly valued as a refuge, nursery ground, and food resource for a number of commercially important finfish and shellfish (Kenworthy *et al.* 1988; Thayer *et al.* 1984), eelgrass also stabilize sediments by buffering the erosive force of waves and currents (Fonseca and Cahalan 1992) and plays an important role in carbon sequestration (Fourqurean *et al*. 2012, Duarte and Krause-Jenson 2017). In many locations along the east coast, eelgrass coverage has declined by fifty percent or more since the 1970's (Thayer et al. 1975, Short et al. 1993, Short and Burdick 1996). Loss of eelgrass is attributed to reduced water quality and clarity resulting from elevated inputs of nutrients or other pollutants such as suspended solids and disturbances such as dredging (Kemp et al. 1983, Short et al. 1993, Short and Burdick 1996, Orth et al. 2006). Eelgrass may also be adversely affected through shading and burial or smothering resulting from turbidity and subsequent sedimentation (Deegan and Buchsbaum 2005, Duarte et al. 2005, Johnson et al. 2008). Given the widespread decline in eelgrass beds along the East Coast, any additional loss to this habitat may significantly affect the resources that depend on these meadows. Successful compensatory mitigation for impacts to SAV can be costly and difficult to implement, making this habitat especially vulnerable to permanent loss. While no eelgrass was found within the cable corridor, eelgrass beds were mapped in the vicinity of the proposed O&M facility, with one bed located approximately 114 m away. We expect direct project impacts can be avoided; however, it will be important to ensure vessel operators have access to updated and accurate eelgrass delineations to ensure vessels associated with project construction or maintenance avoid anchoring within the adjacent beds.

Sand waves
In addition to complex habitats, sand waves provide structural complexity and are specified as components of EFH for multiple managed fish species. Sand ripples and sand waves are found in both the lease area and along the export cable route. Sand waves (ripples and megaripples) found in sandy, high flow environments provide fish with shelter and opportunities for feeding and migration (Gerstner 1998). In addition to providing flow refugia, sand waves may also play an important role in mediating fish-prey interactions and providing shelter from predation (Auster *et al.* 2003). Disruptions of these features during sensitive life history stages may result in disproportionate impacts to the species that rely upon their mediating effects.

Pelagic habitat
The presence of resources within the project area is also driven by pelagic habitat. Water temperatures in this region are warmer at the surface and cooler at the bottom with strong stratified conditions occurring in the spring and summer. Vertical mixing occurs in the fall, maximizing bottom temperatures, followed by a drop in temperatures and nearly isothermal conditions in the winter (Guida *et al.* 2017). Coast wide distributions of fish and macroinvertebrates have recently been shown to align with distributional trends in lower trophic levels, in addition to more generally known physical factors such as temperature and depth (Friedland *et al.* 2019). Species distribution models (Friedland *et al*. 2021) suggest that these primary and secondary production factors are important features of suitable habitat for managed species that are likely to occur in the project area. Specifically, individual taxa are often associated with environmental variables that affect the pelagic habitat including depth, bottom temperature, chlorophyll and thermal fronts, and the presence of several zooplankton species. Large scale changes in hydrodynamics or vertical mixing could potentially affect the habitat suitability for managed species.

Soft Bottom Habitats
Sand and mud habitats serve important functions for the fish and invertebrate species that rely on them for refuge, feeding, and reproduction. These habitat types support distinct benthic communities that serve as EFH for managed fish species by directly providing prey and foraging habitat, or through emergent fauna providing increased structural complexity and shelter from predation. Habitat attributes within fine grained substrates also provide important functions for managed fish species including shelter, foraging, and prey. For example, biogenic depressions, shells, moonsnail egg cases, anemone, and polychaete tubes within mud and sand habitats serve as shelter for red hake (Able and Fahay 1998; Wicklund 1966; Ogren *et al.* 1968; Stanley 1971; Shepard *et al.* 1986). While impacts to soft bottom habitats would affect EFH for multiple managed fish species, soft bottom habitats are expected to recover more quickly than other more complex habitats.

Project Effects to Essential Fish Habitat

<u>Benthic Habitat Impacts</u>

Habitat Conversion and Community Structure
According to the EFH assessment, the South Fork project is expected to result in permanent habitat conversion of 871.6 acres within the SFWF and up to 441.3 acres in the SFEC due to the installation of monopiles, including the foundations and associated scour protection, and inter-array cable protection within the lease area, and for cable protection in portions of the export cable. Permanent impacts of the project will largely result from the addition of artificial hard substrate for foundation and cable protection, boulder clearing, and anchoring within complex habitats. The addition of artificial hard substrate to protect turbine foundations and cables in structurally complex rocky habitats will result in a loss of both physical and biological structural complexity provided previously by natural rocky habitats. The introduction of hard substrate into soft bottom habitats will provide more habitat within the project area for species such as black sea bass and red hake, but will result in habitat loss for other species, particularly bivalves such as ocean quahog and surf clams.

Turbines have been shown to serve as artificial reefs and fish aggregation devices for demersal and semi-pelagic species (Petersen and Malm 2006; Reubens *et al.* 2013; Wilhelmsson *et al.* 2006). Results from Horn Rev I showed that during the first three years after construction, fish species increased in number, while other post-construction studies have shown high spatial and temporal dynamics in fish communities and only minor effects on fish assemblages near the turbines (Leonhard *et al.* 2011; Lindeboom, *et al.* 2011). A meta-analysis examining fish abundance at offshore wind farms in Europe found several factors were associated with higher finfish abundance inside wind farms, including characteristics of the wind farm, sampling methodology used, and location of the farms. Specifically, abundance was higher for soft bottom species and complex-bottom species, but no difference was seen with pelagic species (Methratta and Dardick 2019). Turbine foundations at the Block Island Wind Farm attract large numbers of black sea bass, a common resource species that aggregates around structured benthic habitats to feed and reproduce (HDR 2020). This species is expected to benefit from the addition of WTGs and scour protection. Black sea bass are known to be voracious predators and it is not clear if or how an increase in this species around the WTG would impact sensitive life stages of other fish species including juveniles, eggs, and larvae.

In addition to a change in fish abundance, the introduction of hard artificial substrate in soft bottom areas may result in the presence of species that had not previously used the area. At offshore wind farms in Belgian waters, the introduction of hard substrate in otherwise sandy areas resulted in the presence of fish species that had rarely been observed previously. These effects were more pronounced for turbines that required scour protection (Kerckhof *et al.* 2018). Small scale changes in fish communities observed around wind turbine structures may, in part, be a result of diversification of feeding opportunities and higher food availability (Leonhard *et al.* 2011, Degraer *et al.* 2012).

The addition of artificial hard substrate within natural rocky habitat may also result in shifts in the community composition of fishes, as they often do not mimic natural rocky habitat. The structural complexity of natural rocky habitats such as pebble, cobble, and boulders provide important functional value for fish as shelter and refuge from predators (Auster 1998; Auster and Langton 1999; NRC 2002; Stevenson *et al.* 2004). The type and attributes of artificial hard substrates will be an important factor in how fish species may use these artificial substrates. As previously discussed, natural rocky habitats are inherently complex and multiple managed fish species have life history stages that are dependent on, or mediated by, rocky habitats and their intrinsic fine-scale attributes (Gotceitas et al.1995 , Lindholm et al. 1999, Methratta and Link 2006). The three-dimensional physical structure of rocky habitats creates a diversity of complex crevices within piled cobble and boulder habitats, as well as areas of refuge in the crevices between gravels in pavement habitats and along emergent rock surfaces for species that use the habitats for shelter from predation and flow. These habitats also provide a substrate for macroalgal and epibenthic growth that can increase the functional value of these habitats as refuge for juvenile fish. It also takes time to establish the epifauna and macroalgae that play an important role in mediating the spatial distribution and success of multiple managed fish species, thus the addition of artificial substrates is not expected to mimic natural habitats, particularly for juvenile species. Of particular concern, and addressed in more detail below, are impacts to species such as Atlantic cod that use fine-scale features of natural rocky habitats as shelter from flow and to mediate predation risk.

In addition to fish communities, presence of turbines and artificial hard substrates for scour and cable protection may also affect macrobenthic communities. The addition of turbines and artificial hard substrates within natural rocky habitats would result in losses of established epifaunal communities within the area of placement and are likely to result in impacts to adjacent benthic communities during installation. Similar to fish utilization of artificial habitats, epibenthic colonization of installed artificial hard substrates may vary widely based on the structure and composition of the installed substrate. For example, benthic monitoring at the Block Island Wind Farm found that three years post-construction installed concrete mattress used as cable protection supported no epifaunal growth, indicating that deployment of these devices would have an overall negative effect on organisms that inhabit natural hard bottom substrates (HDR 2019). As discussed in more detail below, artificial substrates provide novel habitats that can provide a platform for the introduction or expansion of invasive invertebrate species. Further, impacts to benthic communities of adjacent natural rocky habitats during installation of artificial substrates are expected to be long-term, with recovery times of the biological components ranging from years to a decade or more (Auster and Langton 1999; Collie *et al.* 2005; NRC 2002; Tamsett *et al.* 2010). The long recovery times of these habitats also provide a pathway for introduced invasive species to expand into adjacent natural hard habitats. Changes to benthic communities within soft-sediment habitats would also be expected, resulting from not only direct conversion of soft to hard substrate within the footprint, but also indirect effects to adjacent soft-sediment habitats. Coates *et al.* (2011) found noticeable differences in the macrobenthic communities with the distance from the turbine, with a lower median grain size and higher macrobenthic densities detected in closer vicinity to the turbine. An increase in local colonizing epifouling communities that develop over time generally results in higher organic matter in sediment closer to turbines; however, the effects on macrobenthic communities appear to be site specific and depend on local-scale factors and the foundation type (Lefaible *et al.* 2018) as well as the age of the turbine (Causon and Gill 2018). Three years after construction at the Block Island Wind Farm, coarse sandy sediments under turbines had been converted to organically enriched soft sediment supporting dense mussel aggregations with increases in mussel growth extending 90 meters out from the turbines (HDR 2020).

Given that the changes in fish distribution and macrobenthic communities may depend on site specific conditions and type of structure, it is important to understand local effects of habitat conversion on fish species, as well as primary productivity and macrobenthic communities. While the addition of artificial hard substrate could aid to offset some of the losses of natural rocky habitats that will result from the construction and operation of the proposed project it will be necessary to evaluate changes at the site to understand impacts to the local ecosystem and habitat use by regional fish species. The success of placed artificial hard substrate in offsetting losses of natural rocky habitats will be highly dependent on the physical attributes and composition of the novel hard substrate and the fine scale features of the natural rocky habitats that will be lost.

Invasive Species

The introduction of new artificial hard substrate into the environment may also provide habitat for non-native species. The number of non-native species on new artificial hard substrate can be 2.5 times higher than on nature substrate, which may provide opportunities for the spread of introduced species (Glasby *et al.* 2007, Taormina *et al.* 2018). Some post-construction studies have observed invasive species colonizing on turbines and scour protection rocks (Degraer *et al.* 2012; De Mesel *et al.* 2015; Guarinello and Carey 2020; HDR 2020; Lindeboom *et al.* 2011), using the introduced substrate to expand their range in the area (De Mesel *et al.* 2015). Fouling assemblages often differ between manmade structures and natural hard bottom habitat, and some evidence suggests these structures can potentially influence biota on adjacent natural hard substrate (Wilhelmsson and Malm 2008). This may be of particular concern for the natural rocky hard bottom habitat to be impacted with the lease area on Cox Ledge.

The invasive tunicate *Didemnum vexillum* (*D. vexillum)* has been expanding its presence in New England waters. Benthic monitoring at the Block Island Wind Farm have shown that this species is part of a diverse faunal community on morainal deposits and is an early colonizer along the edges of anchor scars left in mixed sandy gravel with cobbles and boulders (Guarinello and Carey 2020). Four years after construction at the Block Island Wind Farm, *D. vexillum* was common on WTG structures (HDR 2020). Studies have shown that activities that cause fragmentation of *D. vexillum* colonies can facilitate its distribution (Lengyel *et al.* 2009; Morris and Carman 2012). It is important to minimize or eliminate activities that return fragmented colonies of *D. vexillum* to the water column, to reduce the spread of this invasive species (Morris and Carman 2012). We expect the effects of turbine and cable installation within hard bottom habitat where *D. vexillum* is present could fragment the invasive colonies. The addition of new artificial substrate used for cable and scour protection and the presence of WTG structures may provide habitat for this invasive tunicate. It will be necessary to incorporate an invasive species monitoring component into a benthic monitoring plan.

Juvenile Cod
The project area overlaps with structurally complex habitats on Cox Ledge and along the cable corridor and are particularly important for the survival of newly settled juvenile cod. Multiple studies have demonstrated that despite the potential that juvenile cod may initially settle to the substrate indiscriminately, age-0+ juveniles are more abundant in complex habitats (e.g. rocky or vegetated habitats) (Cote *et al.* 2004; Fraser *et al.* 1996; Gotceitas *et al.* 1997; Gotceitas and Brown 1993; Grant and Brown 1998; Keats *et al.* 1987; Lazzari and Stone 2006; Linehan *et al.* 2001; Lough *et al*., 1989). Tupper and Boutilier (1995) found settlement of cod did not differ between habitat types, but post settlement survival and juvenile densities were higher in more structurally complex habitats, with cod survival highest on rocky reefs and cobble bottoms. A mark-recapture study found a level of site fidelity exhibited by the age-0+ juvenile cod sampled indicating that once settled into complex habitat juvenile cod maintain a level of residency within that habitat (Grant and Brown 1998). Further, rocky habitats provide a substrate for epibenthic growth that provides additional complexity and serves as refuge for juvenile fish that has been shown to significantly increase survivorship of juvenile cod (Lindholm *et al.* 1999 and 2001). These complex benthic habitats are vulnerable to disturbance that may range from long-term to permanent, with extended recovery times on the order of years to decades (Auster and Langton 1999; Collie *et al*. 2005; NRC 2002; Tamsett *et al.* 2010). Permanent losses of these complex habitats or disturbances that result in a reduction of structural complexity, either the physical or biological component of the habitat, during and just after settlement occurs, are likely to have substantial impacts on the recruitment of juvenile cod in the project area.

As discussed in more detail below, the best available science indicates that spawning in the project area peaks in the late fall/early winter (November-January) with additional spawning likely occurring in the late winter/early spring (February-April) (Deese 2005, NEFSC 2020). Studies conducted on Georges Bank found cod settlement begins approximately 3-4 months post-spawn (Lough *et al.* 1989). Based on this information, we would expect most settlement to occur in the project area from late winter to late spring. The timing of benthic disturbances including placement of scour protection, boulder clearing, cable installation throughout the SFWF and the SFEC, and anchoring could impact settlement of juvenile cod in this area through direct disturbance of habitat.

Cod Spawning
The EFH Assessment does not fully acknowledge the importance of Cox Ledge as a known spawning location for Atlantic cod, instead stating that it *may* provide important spawning habitat for cod. Information provided in multiple sources has documented that Cox Ledge is an important spawning ground for cod (Deese 2005, Zemeckis 2014c, NEFSC 2021). Spawning on Cox Ledge occurs between November and April, with peak spawning expected between December and March (NEFSC 2020). However, preliminary results from a BOEM-funded acoustic and telemetry study[1] suggest peak spawning times for cod on Cox Ledge and within the project area occur between

[1] Van Parijs pers.comm. related to ongoing study - Mapping the distribution of habitat use of soniferous fish on Cox's ledge, with a focus on Atlantic cod spawning aggregations (BOEM. Award #M19PG00015)

November and January (Van Parijs pers comm). Adult cod that spawn in southern New England are primarily residential, with high rates of site fidelity (Zemeckis 2014c, NEFSC 2021). Spawning cod also congregate over specific substrate types, gravel during the day when resting and adjacent muddy areas at night (Siceloff and Howell 2013). Atlantic cod spawning on Cox Ledge have recently been identified as genetically distinct from other spawning groups (Clucas et al. 2019). These factors increase the vulnerability of this population to impacts resulting from reduced spawning success. Physical habitat disturbance occurring during spawning may interfere with mating behavior and egg production (Dean et al 2014, Siceloff and Howell 2013). Spawning cod form dense aggregations (known as "haystacks") prior to and during spawning that last for days to weeks. Cod spawning aggregations are easily disrupted and disturbances may result in the dispersion of spawning aggregations for extended periods. In the Gulf of Maine, subsequent to the dispersion of a spawning aggregation by bottom gillnet fishing, the dispersed cod did not return to the spawning site for the duration of the spawning season (Dean 2012).

The construction activities in the South Fork project area are proposed to occur 24 hours a day for the duration of project construction. Pile driving is expected to occur from May through December. Due to the vulnerability of spawning aggregations to physical disturbance during spawning and their affinity to specific bottom types and spawning sites, we strongly recommend that measures to avoid and minimize impacts resulting from the construction and operation activities within the South Fork lease area and along the offshore cable corridor are implemented. At a minimum, benthic and demersal construction activities, including pile driving and bottom disturbing activities, should be restricted during the peak spawning season. Based upon the preliminary results of the ongoing BOEM funded study, this would require a time of year restriction from November through January. However, since there is limited data available from the ongoing study, we recommend BOEM extend the time of year restriction through March, consistent with the prior determinations of the peak spawning period for this spawning aggregation. Reduced recruitment, even during a single year, could have a substantial impact on this population. There are also indications that this stock is increasing in size, unlike other stock components that have been severely depleted by overfishing (Langan et al. 2020). Given the current stock status for the species in the region, there is the potential for substantial negative effects for the population should spawning activities be adversely impacted in this segment of the stock.

Sedimentation Effects

Several of the project construction activities will result in the suspension and redeposition of fine-grained sediments, including cable installation, boulder clearing, the placement of scour and cable protection, anchoring, and dredging. Sedimentation impacts will be most impactful for epibenthic invertebrate species and sensitive life stages of fish, such as demersal eggs. Sedimentation impacts vary by habitat type and the depth of deposition. Adverse impacts in soft bottom habitats typically occur as a result of substantial deposition events or burial of demersal eggs, whereas adverse sedimentation impacts in hard habitats may occur even with limited deposition of sediments. The deposition of fine-grained sediments within rocky habitats may result in adverse impacts ranging from the loss of attached epifauna due to smothering, to inhibiting the settlement of larvae resulting from even small depths of deposition on rock surfaces. The proposed construction period of May through December will overlap with peak invertebrate and shellfish spawning and/or settlement periods, which generally occur between April 15 and October 15, with specific spawning timings dependent on the species. Demersal eggs are sensitive to sedimentation impacts (Berry *et al.* 2011; Newcombe and Jensen 1996) and are expected to be impacted by project construction, including cable laying and dredging, as well as direct impacts associated with construction and placement of scour protection within the lease area. Species with designated EFH with demersal eggs include winter flounder, longfin squid, and ocean pout.

Winter flounder, a federally managed species with EFH designated in the project area, may be more vulnerable to project impacts, particularly inshore construction associated with the O&M facility. Winter flounder typically spawn in the winter and early spring, although the exact timing is temperature dependent and thus varies with latitude (Able and Fahay 1998); however, movement into these spawning areas may occur earlier, generally from mid- to late November through December. Winter flounder have demersal eggs that sink and remain on the bottom until they hatch. After hatching, the larvae are initially planktonic, but following metamorphosis they assume an epibenthic existence. Winter flounder larvae are negatively buoyant (Pereira et al. 1999) and are typically more abundant near the bottom (Able and Fahay 1998). Young-of-the-year flounder tend to burrow in the sand rather than swim away from threats. Increased turbidity and the subsequent deposition of the suspended sediments can smother the winter flounder eggs and adversely affect their EFH. Avoiding in-water construction activities such as dredging and pile driving when early life stages are present, particularly in estuarine areas, would avoid and minimize adverse effects to winter flounder EFH for these early life stages. We recommend dredging and silt-producing activities associated with nearshore construction be avoided from January 1 to May 31 to minimize adverse effects to winter flounder eggs and larvae.

Longfin squid also have EFH designated in the project area, including for sensitive early life stages. Squid egg mops are attached to the seabed and may be impacted by project construction through direct loss, dislodging, turbidity and sedimentation. Scientific literature indicates that jarring of egg masses that are near the late stages of embryonic development results in premature hatching and high mortality of the embryos. The egg masses require clear, well-oxygenated overlying water for normal embryonic development so sediment resuspension during cable laying and dredging is expected to impact squid eggs within the cable corridor (Boletzy and Hanlon, 1983; Vidal *et al.* 2002). Impacts to squid eggs will be dependent upon the time of year the project is constructed. Squid mop biomass is highest between May and August. Construction activities during this time, particularly installation of the SFEC and associated dredging offshore Long Island, would likely result in adverse effects to longfin squid eggs.

Electromagnetic Fields

EFH in the project area will also be altered through the emission of electromagnetic fields (EMF) during transmission of the electricity produced during project operation. The project is proposing to construct two 220 kiloVolt (kV) alternating current (AC) offshore export cables with a targeted minimum burial depth of 1.5 m. The two cables will be located approximately 100 m (328 ft) apart, within the proposed export cable corridor. While shielded cables can restrict electric fields, they cannot shield the magnetic component of EMF (Boehlert and Gill 2010) and the movement of water through the magnetic fields induces localized electric fields (Ohman *et al.* 2007).

Burial depth has been suggested to be the most effective means of minimizing magnetic fields (Ohman *et al.* 2007). While the developer will attempt to fully bury the cable for this project, cable protection will be used in areas where minimum burial depth cannot be obtained. We would expect EMF emissions to be greater in those areas. Field measurements of two high voltage DC cables operating in our region found EMF emission deviations based on power transmitted and the burial depth of the cables (Hutchison *et al.* 2018). While deeper burial does not dampen the intensity of EMF, it increases the distance between the cable and seabed or water column, where marine species will detect the EMF emissions. The study did find that even with lower emissions from burial, the EMF emissions were still within levels detectable by marine species (Hutchinson *et al.* 2018).

Many animal groups in the marine environment can sense and respond to EMF, including elasmobranchs, crustacea, teleosts and chondrosteans (Hutchison *et al.* 2018; Thomsen *et al.* 2015; Normandeau *et al.* 2011). Elasmobranch sensitivity to EMF has been documented (Gill *et al.* 2009; Normandeau, 2011) and evidence suggests that sharks may be able to differentiate between EM fields (Kimber *et al.* 2011). A recent field enclosure study showed American lobster (*Homarus americanus*) exhibited a statistically significant but subtle change in behavioral activity when exposed to the EMF emissions from a high voltage DC cable, and little skate (*Leucoraja erinacea*) exhibited a strong behavioral response to the EMF (Hutchison et al. 2020). While behavioral changes were demonstrated, the EMF did not constitute a barrier to movements across the cable for either species (Hutchison *et al.* 2018). However, free-ranging field studies for sensitive species are needed to understand if their natural spatial movements are affected by EMF emissions (Hutchinson *et al.* 2018, Klimley *et al.* 2021). These studies are particularly important, to understand how multiple offshore wind projects affect species migration or habitat use in these areas.

While recent studies have provided more information on this topic, uncertainties still exist around the impacts of EMF emissions on fish and invertebrates, as information on sensitivity thresholds is limited and the biological significance of species detection on a population scale remains unknown (Boehlert and Gill 2010, Taormina *et al.* 2018). EMF emissions are expected to be higher along the export cable than the inter-array cables due to the level of power running through the cables (Thomsen *et al.* 2015). However, the potential impacts on marine fauna from a network of multiple cables in close proximity, across multiple projects, remain uncertain. While BOEM has made the determination that impacts of EMF on fish species in southern New England are negligible (CSA 2019), cumulative effects of multiple wind farms must also be considered (Taormina *et al.* 2018), and therefore, EMF research would be an important component of any monitoring plan, particularly at a cross-project or regional scale. Before and after assessments of EMF emissions associated with cable networks and transport cables are needed (Boehlert and Gill 2010, Hutchinson *et al.* 2018). Observational studies from existing cables and soon to be constructed cables can be used to validate and improve modeling efforts. Such information is necessary to work toward understanding how these projects are modifying habitat and potentially impacting marine resources, particularly at a cumulative scale.

Measures to avoid and minimize impacts to complex benthic habitats

As discussed above, we expect this project to have substantial long-term to permanent impacts to complex habitats as a result of both WTG and inter-array cable installation. While the proposed action considers micrositing of turbine and cable locations to avoid and minimize impacts to sensitive habitats there are limited options for micrositing of turbine and cable locations due to the extensive presence of complex habitats within the identified area. Therefore, the presence of complex habitat in the area substantially limits the effectiveness of micrositing for each turbine location and within the cable corridor in avoiding or adequately minimizing impacts to complex habitats. Other factors, including the need to maintain a 1 x 1 nm turbine layout and engineering restrictions, reduce the feasibility of micrositing to avoid habitat impacts. In some cases, as described below, there are opportunities to microsite to minimize impacts to complex habitats, but we expect the benefits to benthic habitat and fauna to be minimal. As we describe below, micrositing, combined with other measures, may effectively mitigate project impacts to complex habitat.

While not reflected in the EFH assessment, we met with BOEM staff several times to discuss the South Fork habitat data and the feasibility for micrositing to minimize project impacts. Subsequent to the submittal of our December 14, 2020, request for additional information letter, we met with BOEM multiple times between January to March to evaluate the potential for micrositing each of the proposed individual WTG locations, including the two alternate locations, and the inter-array cable routes to avoid and minimize impacts to complex habitats. As you are aware from those discussions, we reviewed multiple layers of data provided by the developer in both an online data viewer portal and as GIS files for our evaluation of the impacts to complex habitat and in our assessment of whether micrositing could avoid or minimize the identified impacts.

We used all the data available to us to evaluate project impacts. For each individual turbine location and inter-array cable route, we first considered the complex, potentially complex, and soft bottom habitat delineations. We further considered the underlying data used to support the delineations at a fine scale for each turbine and inter-array cable route. The additional data we considered included: 1) the multibeam backscatter mosaic provided in the online viewer; 2) the side scan sonar mosaic provided in the online viewer, and at a 0.10-meter resolution as a GIS shapefile; 3) the "boulder pick" data layer provided in both the online viewer and as a GIS shapefile; and 4) the available benthic sample data provided in the online data viewer portal.

Based on the available data, we evaluated the potential for using micrositing to avoid and minimize impacts to complex habitats at each of the proposed WTG locations, including the OSS and two alternate locations, and along the cable routes. In our assessment of project impacts we grouped turbine locations and cable routes based on scenarios identified in BOEM's Draft Environmental Impact Statement for the project.

Scenario A: WTGs are sited within and adjacent to complex habitat and micrositing would not reduce impacts to complex habitats.

We found five (5) turbine locations where micrositing would not avoid or minimize impacts to complex habitats. Specifically, the identified turbine locations include WTGs 1, WTG 7, and WTG 15, as well as the alternate locations 16A and 17A. The inter-array cable routes where micrositing would not avoid impacts include the cables connecting the WTGs 5, 12, and 15 to the array. Construction of WTGs at these locations and the associated inter-array cables would result in substantial unavoidable long-term to permanent impacts to complex habitats. Specifically, WTG locations 1, 15, 16A and 17A are located within or adjacent to larger continuous areas of complex habitats.

Project impacts to complex habitat at WTG 7 would be less than anticipated impacts at the other WTG locations grouped within this scenario. This turbine location was determined to fall within Scenario A, as impacts to complex habitat would be unavoidable, but micrositing the turbine location would not appear to result in the minimization of these impacts. Habitat in and around the

WTG 7 location is heterogenous and we do not expect micrositing at this location would reduce impacts to complex habitat.

Scenario B: WTGs are sited within and/or adjacent to complex habitats and micrositing (if engineering and spacing restrictions allow) would reduce, but not fully avoid, impacts to complex habitats.

Impacts to complex habitats at three (3) turbine locations, including the OSS, and each of the remaining turbine to turbine inter-array cable routes, could be minimized by micrositing, but substantial unavoidable impacts to complex habitats would remain. Specifically, these turbine locations include WTG 5, WTG 12, and the OSS location. Construction at these locations is expected to have substantial direct impacts to complex habitats even with micrositing and mitigation measures imposed on seafloor disturbances during construction. The WTG 5 and WTF 12 areas are located within or immediately adjacent to large areas of continuously complex habitat areas. WTG 5 is proposed within a unique habitat feature that overlaps with cod activity in the area. While micrositing of the turbine location would minimize the direct impacts to complex habitat, the proposed turbine location overlaps with a unique habitat feature of softer sediments surrounded by complex habitats with a high density of large boulders and megaclasts. It would also be infeasible to route the cable connection to this turbine location without resulting in substantial impacts to this complex area. The ongoing Atlantic cod surveys have documented spawning activity in the area surrounding WTG 5.

Scenario C: WTGs are sited within and/or adjacent to complex habitats and micrositing, (if engineering and spacing restrictions allow) would fully avoid impacts to complex habitats.

During our evaluation, it was determined that eight (8) of the turbine locations could potentially be microsited to avoid impacts to complex habitats, while maintaining the 1 x 1 nm turbine layout. To fully avoid impacts to complex habitats, restrictions within areas of temporary bottom disturbances would be necessary during turbine installation. The turbine locations where micrositing and seafloor disturbance restrictions could avoid impacts to complex habitats include WTGs 6, WTG 8, WTG 9, WTG 10, WTG 13, and WTG 14. Based on the available data reviewed, micrositing of WTG 2 and WTG 4, may be necessary to avoid impacts to complex habitats, but the benefits of micrositing are expected to be minimal.

Scenario D: WTGS are sited in areas outside of complex habitats (i.e., sited wholly in [soft bottom] habitat) and micrositing is not necessary to avoid impacts to complex habitats.

Based on our review of the delineations and underlying data, we identified two (2) turbine locations, WTG 3 and WTG 11, that would not require micrositing to avoid or minimize impacts to complex habitat. The proposed inter-array cable connecting WTG 3 to WTG 4 was also identified as not requiring micrositing to avoid complex habitat impacts.

Based on this turbine by turbine and cable route evaluation to assess the feasibility of using micrositing alone to avoid and minimize impacts to complex habitats, substantial impacts to complex habitats would be unavoidable even without imposing any additional or unforeseen micrositing limitations resulting from engineering restrictions or the presence of unexploded ordinances. While the EFH assessment does not consider the Fisheries Habitat Minimization Alternative currently being evaluated as a project alternative under the NEPA review process, we recommend that BOEM fully consider and adopt this alternative to ensure that the substantial permanent and long-term impacts to EFH are avoided and minimized to the greatest extent possible.

Consistent with this evaluation, we have included specific EFH conservation recommendations for each WTG location and a general cable route recommendation below. Generally, we recommend that you consider removing from the project the turbine locations and cable routes identified as falling within the Scenario A and B bins, as they are expected to have the greatest long-term impacts to complex habitats. In the evaluation of micrositing for each turbine location and cable route identified as consistent with either Scenario B or Scenario C, we recommend that you relocate the turbines and cables to areas, within the micrositing limitations, that exhibit the lowest multibeam backscatter returns.

Should BOEM determine that it is not feasible to eliminate all the turbine locations under Scenarios A and B, we recommend that you consider both the direct impacts of the proposed turbine and cable routes as well as the location of the turbine and cable in the context of the surrounding habitat. Specifically, we consider construction and operation of WTGs 1, 5, 15, 16A and 17A to result in the greatest impact to complex habitats due to the anticipated direct and indirect impacts of these locations and associated cables. While WTG 12 and the OSS would also result in substantial permanent impacts to complex habitats, we understand that the removal of seven turbine locations would not meet the purpose and need of the project. We recommend that you fully evaluate both direct and indirect impacts to complex habitats in the project area as you consider our EFH conservation recommendations related to turbine location and cable route removal.

In addition to turbine removal and micrositing, measures to further minimize impacts to complex habitats can be achieved during construction and maintenance of the project. This can include the development of anchoring plans with identified areas restricted for anchoring to ensure vessels avoid anchoring in sensitive habitat areas. The placement of mid-line buoys along anchor chains can also minimize impacts of anchor sweep on the seafloor. Given the particularly complex nature of Cox Ledge, all feasible measures to avoid and minimize adverse impacts to EFH should be required.

Pelagic Habitat Impacts

Acoustic Effects

The project will also affect EFH through changes in the acoustic environment, which will occur during all phases of the project, construction, operation, and decommissioning. The greatest acoustic effects are expected to come from construction activities (Hoffmann *et al.* 2000). While elevated noise level will occur during construction from increased vessel traffic and cable installation (Taormina *et al.* 2018), noise generated from pile driving during construction of the wind turbine generators is expected to result in the greatest noise levels and affect a more extensive area of EFH.

High levels of acoustic exposure have been shown to cause physical damage and/or mortality in fishes. Pile driving, specifically, is the only other anthropogenic sound source other than explosives that has been known to cause fish kills. The level and duration of sound exposure from pile driving appear to contribute to the degree of damage to fish species (Popper and Hastings 2009). Fish can experience injury from sound exposure both physically, (i.e., tissue damage) as well as physiologically through increased stress levels (Anderson *et al.* 2011; Banner and Hyatt 1973; Popper and Hawkins 2018; Popper and Hawkins 2019). Sound exposure can also result in temporary threshold shifts (TTS) or a temporary decrease in or loss of sensitivity (Amoser and Ladich, 2003).

Effects of acute and chronic sound exposure may also affect necessary life functions for fish and invertebrates, including health and fitness, foraging efficiency, avoidance of predation, swimming energetics, migration, and reproductive behavior (Hawkins and Popper 2017; Popper and Hawkins 2019). Behavioral impacts to fish and invertebrates from anthropogenic noise remains a concern, as noise generated through pile driving may affect a much larger area than mortality and injury (Popper and Hawkins 2016, 2019). A study in Europe has shown that cod and herring can perceive construction noise at distances up to 80 km from the source (Thomsen *et al.* 2008). The behavioral responses from acoustic effects in fish is less understood and may vary by species (Popper and Hawkins 2018; Popper and Hawkins 2019). Behavioral impacts can include startle responses or if capable, fish may leave the area of elevated noise levels (Feist 1992; Nedwell *et al.* 2003; Popper and Hastings 2009; Samson *et al.* 2014, Slotte *et al.* 2004), eliminating the ability of fish species to use the habitat for feeding or reproduction. Migratory routes may also be altered when fish are frightened away from areas. Stanley *et al*. (NMFS/WHOI, unpublished data) shows that the most sensitive hearing frequencies of black sea bass directly overlap with anthropogenic sound such as that produced from the construction of offshore wind farms, e.g., pile driving and vessel sound. Further, within a controlled environmental setting, black sea bass exposed to replayed pile driving signals showed consistent observable reactions to sound onset, exhibiting changes in general behaviors such as time resting on the benthos and swimming (Shelledy *et al*., NMFS-NEFSC, unpublished data). Elevated noise levels may also result in masking or a reduction in an animal's ability to hear necessary natural sounds (Popper and Hawkins 2019; Thomsen *et al.* 2006; Wahlberg and Westerberg 2005). Effects of noise on habitat is of particular concern for reproduction. There is little information on how noise disrupts reproduction in fish (Hawkins *et al.* 2014), but disruption in reproduction, particularly for species that aggregate when they spawn, is of concern.

Noise from pile driving activity may also impact sensitive life stages and habitat (Hastings and Popper 2005; Popper and Hasting 2009), including disruption of larval settlement (Popper and Hawkins 2019). Developing larvae may have different levels of sensitivity to noise at varying stages of development with potential for impacting larval growth in some fishes (Banner and Hyatt 1973). Nedelec (2015) exposed Atlantic cod larvae to random ship noise and regular intervals of noise and found that fish that were exposed had lower body width-length ratios, an indicator of condition. The authors suggest that 45 minutes between noise exposure periods did not allow for sufficient energetic recovery from the disruption of foraging, leading to a cumulative stress response.

There is much less known about acoustic impacts on invertebrates, as there is little information available on how invertebrates detect sound (Popper and Hawkins 2018). However, a study looking at scallop larvae demonstrated that noise exposure may result in malformations in early larval stages, suggesting potential reductions in recruitment from noise exposure (de Soto *et al.* 2013). Sessile species and sensitive life stages, such as demersal eggs, are expected to be vulnerable to noise emitted through project construction, due to their inability to leave the area. The vibrations at the interface between the sediment and water column can extend several kilometers from the source and potentially impact bottom dwelling species in the project area (Thomsen *et al.* 2015, Hawkins and Popper 2017, Popper and Hawkins 2019).

Sound Pressure
Guidelines have been established to provide protection to fish species (Popper *et al.* 2014 and FHWG 2008) and these guidelines are included in the evaluation of acoustic impacts in the EFH Assessment. However, only the behavioral guidelines provided in FHWG (2008) were used in the EFH assessment. The guidelines in the FHWG (2008) for smaller (<0.2 g) and larger (>/+0.2g) individuals that would allow for the assessment of impacts to juveniles were not included in the EFH assessment. The assessment focuses solely on sound pressure and the susceptibility of sound pressure on different fish species. The impacts of sound pressure on fish may vary depending on physiology. Fish with swim bladders may be more sensitive to sound pressure than fish without swim bladders, while fish with swim bladders that use hearing, such as Atlantic cod, may be most vulnerable to impacts from pile driving (Popper *et al.* 2014). No guidelines have been established for invertebrates (Popper and Hawkins 2018; Hawkins and Popper 2017).

Particle Motion
There is a growing body of knowledge demonstrating the importance of particle motion, which accompanies transmitted sound waves, in the sensitivity of fish and invertebrates to noise (Hawkins and Popper 2017; Mooney *et al.* 2010; Mueller-Blenkle *et al.* 2010; Nedelec *et al.* 2016; Popper and Hawkins 2018; Solé *et al.* 2017). While some fish can detect sound pressure, particularly at high frequencies, all fish detect and use particle motion, including elasmobranchs and fish that are sensitive to sound pressure (Popper and Hawkins 2018 and 2019). Particle motion is fundamental to the hearing of fish and invertebrates and may allow fish to detect the direction of the sound source (Nedelec *et al.* 2016; Popper and Hawkins 2019). When considering the potential effects of acoustics on fish, it is important to not just consider sound effect, but also particle motion (Popper and Hawkins 2018).

While the EFH assessment acknowledges the importance of particle motion, the impacts to fish species are not evaluated due to the lack of threshold standards or measurement and modeling standards. The difficulty in measuring and modeling particle motion and the lack of guidelines to indicate the levels of particle motion that may adversely affect fish and invertebrate species has often led to inadequate assessments of acoustic impacts (Popper and Hawkins 2018). More studies are also needed to better understand hearing sensitivities to particle motion to inform standards and guidelines (Popper and Hawkins 2018 and 2019). Given the number of offshore wind projects planned off the east coast, additional studies on this topic are warranted.

Effects On Cod Spawning
Atlantic cod are known to spawn offshore on Cox Ledge and Nantucket Shoals between November and April, with peak spawning expected between December-March (NEFSC 2020). However, preliminary results from a BOEM-funded acoustic and telemetry study[2] suggest peak spawning times for cod on Cox Ledge and within the project area occur between November and January (Van Parijs pers comm). Cod form dense aggregations during spawning (known as "haystacks") that last for days or weeks. Evidence of spawning cod has been reported near and within the project area (Gervelis and Carey 2020; Van Parijs pers. comm.). Spawning aggregations can be easily disturbed by demersal activities and disruptions to spawning aggregations may affect reproductive success, which could result in significant long-term effects to the stock (Dean et al. 2012, Zemeckis et al. 2014c). Research in the Gulf of Maine found that once spawning cod left the area from in-water

[2] Van Parijs pers.comm. related to ongoing study - Mapping the distribution of habitat use of soniferous fish on Cox's ledge, with a focus on Atlantic cod spawning aggregations (BOEM. Award #M19PG00015)

disturbances such as gillnet fishing, they did not return (Dean et al. 2012). Research in the Gulf of Maine has also shown that cod exhibit strong fidelity to chosen spawning sites, returning to the same site year after year (Zemeckis et al. 2014b). Observations of the movements of spawning cod using acoustic tags has also shown that they congregate over specific substrate types - gravel during the day when resting and adjacent muddy areas at night (Siceloff and Howell 2013). There is also evidence that cod in southern New England are less connected (by larval transport) to other spawning stocks, meaning that they are more susceptible to local depletion by mechanisms such as warming water temperatures, overfishing, and the adverse impacts of wind farm construction (NEFSC 2020). The combined effects of underwater sound and physical disturbance of the water column and the seabed pose serious risks to the maintenance of the southern New England cod stock and recruitment to the fishery.

Measures to minimize acoustic impacts

Effects from pile driving may be minimized with the use of mitigation measures. Specifically, avoiding pile driving and in-water activities that may disrupt spawning activity could avoid impacts to sensitive life stages such as spawning activity. In addition, noise dampening measures may reduce the overall extent of EFH affected by pile driving activity. The EFH assessment indicated the project will be required to use noise dampening methods to reduce noise levels by at least 10 dB, though these methods have not yet been defined. Some noise dampening methods, such as bubble curtains, may be effective in reducing sound pressure emitted from pile driving, but may be less effective in reducing impacts of particle motion (Andrew Gill, pers. comm., Oct 25, 2018, Narragansett, RI). In addition, on-site verification is important; a study in Belgium measuring noise levels from pile driving found that a single bubble curtain proved less effective at mitigating noise effects than predicted (Norro 2018). Some additional measures such as soft start, where noise levels are slowly ramped up to allow animals to evacuate the area, may help reduce the extent of mortality. However, this may not be effective for all species, particularly those that cannot easily move out of the area or for species that either do not exhibit flee response or may have delayed flee responses.

Operational Noise

Operation of offshore wind turbines also results in acoustic emissions, though there is limited information available on the acoustic characteristics of offshore turbines (Popper and Hawkins 2019). Based on the evaluation in the EFH assessment, you do not anticipate detectable impacts on acoustic habitats through project operations. The analysis in the EFH assessment is based on sound pressure measurements taken at the Block Island Wind Farm (BIWF). The BIWF project includes 5 jacket pile turbines which emit an average sound pressure intensity of 119 dB above background levels at a distance of 50 m from turbine foundations during operation. South Fork Wind Farm is using a monopile foundation and noise emissions may vary as studies have found the distances and ability of fish to detect operating wind turbines may depend on conditions at the project site, including the type and number of turbines, water depth, substrate and wind speed (Wahlberg and Westerberg 2005). Existing studies suggest operational noise may be detectable by some fish species, with species such as cod and herring detecting the noise several kilometers away, which may result in masking of communication for some species that use sound; however, behavioral impacts or avoidance is currently expected to be restricted within close range of the turbines (Thomsen *et al.* 2008; Tougaard *et al.* 2008; Wahlberg and Westerberg 2005). However, as noted in the EFH assessment, underwater noise sufficient to alter behavior or cause TTS could have disruptive effects on cod spawning (Dean et al. 2012).

More precise information is needed on turbine emissions, including both sound pressure and particle motion, as well as effects on the seabed (Thomsen *et al.* 2015; Wahlberg and Westerberg 2005; Roberts and Elliot 2017). There is also a lack of scientific knowledge on ambient seabed vibrations, which is necessary to understand any potential effects on the seabed from project operation (Roberts and Elliot 2017). It is important to measure ambient noise prior to construction to obtain background levels and therefore, better understand project effects (Thomsen *et al.* 2015). Given the potential impacts of noise on EFH from both construction and operation, acoustic monitoring will be a critical component of a monitoring plan. The monitoring plan should also address potential effects of the project to cod spawning activities in and around the project area throughout construction and the operation of the project.

Turbidity/Entrainment Effects
Cable installation and dredging will result in both turbidity from the suspension of fine grain sediments and entrainment impacts to pelagic habitats. Boulder relocation as well as scour and cable protection placement will also result in turbidity impacts to pelagic habitats. Elevated suspended sediments in the water column have been documented to result in adverse impacts to various life stages of fish. High turbidity can impact fish by requiring greater utilization of energy, gill tissue damage and mortality (Newcombe and Jensen 1996; Wilber and Clark 2001). Turbidity and entrainment impacts will be most impactful for sensitive life stages of fish, such as demersal eggs and larvae and demersal invertebrate species. The lease area and cable route are designated EFH for sensitive life history stages of multiple managed fish species, including Atlantic cod and several demersal shellfish species including surf clam, ocean quahog and sea scallops. Demersal eggs, larvae, and juveniles are also sensitive to turbidity and sedimentation (Berry *et al.* 2011; (Newcombe and Jensen 1996) and are expected to be impacted by project construction with effects ranging from direct mortality to behavioral impacts. Shellfish are susceptible to elevated levels of suspended sediments which can interfere with spawning success, feeding, and growth (Newcombe and MacDonald 1991; Wilber and Clark 2001). Cable installation will also result in impacts to shellfish and finfish eggs and larvae from water withdrawals. Water withdrawals would result in 100% mortality of any eggs or larvae (benthic and pelagic) that becomes entrained. As discussed above, Atlantic cod eggs and larvae are expected to occur in the project area from late winter through late spring. While the extent of mortality of eggs and larvae will depend on the timing of installation, cable laying activity occurring in the spring, particularly in the area of Cox Ledge, is expected to result in greater entrainment of settling or recently settled cod larvae. The proposed cable construction period will overlap with peak shellfish spawning and/or settlement periods which generally occur between April 15 and October 15, with specific spawning timings dependent on the species.

Hydrodynamic Effects
A limited number of studies have analyzed offshore wind farm effects on pelagic ecosystems. Evaluations have been assessed through modeling and by direct observation (van Berkel et al. 2020). As acknowledged in the EFH Assessment, modeling studies have found that wind farms can alter vertical mixing and seasonal stratification in areas outside the footprint of individual wind farms (Brostrom 2008; Carpenter *et al.* 2016; Cazenave *et al.* 2016). However, direct observation of hydrodynamic effects in two wind farms in the North Sea have indicated that vertical mixing is increased during the summer when the water column is stratified as is the transport of nutrients into the surface layer (Floeter et al. 2017). Given the results of these studies, we question the conclusion

in the EFH Assessment that the potential hydrodynamic effects of the South Fork Wind Farm, especially in combination with the other wind energy projects that are planned in southern New England, would be limited to within 200-400 meters of individual WTGs, a conclusion that is inappropriately attributed to a Biological Opinion from another project[3].

In Europe, the presence of wind farms and associated hydrodynamic changes have led to increased suspended sediment observed in the wakes of monopile foundations with direction of wakes changing based on tides and extending up to 1 or more km downstream (Vanhellemont and Ruddick 2014). The impacts of these sediment plumes are unknown but may affect the light field which could have implications for primary productivity and visual predation (Vanhellemont and Ruddick 2014). We would expect the severity of any sediment plumes to depend on local conditions, particularly sediment type and any local scour at the site. Sediment within the lease area is largely heterogeneous and complex, as compared with finer sediment of the North Sea where sediment plumes have been shown to be quite large. We would expect sediment plumes to be less extensive in the project area, but increased turbidity at the site may be possible and may affect adjacent complex habitats. Monitoring at the turbine locations would be necessary to understand changes in local conditions. Further research is also needed to understand the effects from turbine wake sediment plumes, and the impacts of those plumes on local ecosystems (Vanhellemont and Ruddick 2014).

Decommissioning
Habitat will also be altered at the decommissioning phase of the project. BOEM requires all equipment to be removed up to 15 feet (4.6 meters) below the mudline. This will again alter habitat by removing the introduced structures that have colonized epibiota during the 25+ years of operation. While details related to decommissioning are limited at this time, we expect habitat to be further altered and disturbed during this process. As noted in the EFH assessment, additional coordination will be necessary for decommissioning of the project.

Monitoring Project Effects
As discussed in this letter, data gaps remain related to effects from construction and operation of the wind farms, which complicates our ability to fully understand impacts to EFH. Despite the construction and operation of wind farms across Europe, effects on the distribution and abundance of fish species remain poorly understood. The lack of a consistent monitoring framework across wind farms has made it difficult to draw comparisons among studies and to understand how wind farms are affecting fish at a local or regional level (Methratta and Dardick 2019). Wilding *et al.* 2017 cautioned against this "data-rich, information-poor" approach to monitoring effects of Marine Renewable Energy Devices (MRED), as several monitoring programs in Europe have not informed interactions of MRED at relevant ecosystem scales (Wilding *et al.* 2017). Since offshore wind development is at its infancy in the U.S., we have the opportunity to standardize data collection methods across projects to allow for hypothesis-driven monitoring at a regional level. This is particularly important as existing monitoring systems are likely to be insufficient in answering questions related to impacts of offshore wind, and these monitoring systems will also be impacted by

[3] Please note that NOAA Fisheries biological opinions should not be used as a reference unless referring to specific conclusions for which the particular project that the biological opinion was issued. We do not recommend relying on NOAA Fisheries Biological Opinions to support conclusions reached by BOEM for other projects that were not the subject of that Opinion.

future development.

Given the scale of development proposed on the OCS in a relatively short period of time, it will be important for BOEM to take initiative to ensure regional programs can move forward expeditiously to address these data gaps. Several important questions need to be addressed to understand the cumulative effects of large-scale development on EFH, particularly related to hydrodynamic effects and atmospheric energy extraction and the consequential effects to primary productivity and larval distribution, a major driver in understanding the presence and seasonality of fish species (Friedland *et al*. 2021, Chen *et al*. 2021). Additional studies are also needed related to impacts of particle motion on the benthos and demersal species as well as effects on migration from large-scale habitat alteration and EMF emissions across multiple adjacent projects. Specifically, studies are needed to understand how habitat alteration impacts juvenile fish species in the development areas as the WTGs are expected to attract predatory species, such as black sea bass that also have been found to exhibit site fidelity to particular reefs once established. Studies that evaluate the predator/prey dynamics in these areas are needed to understand potential cumulative effects of large-scale development on juvenile species. Research on existing wind farms suggests the potential for altered food web structures, which may have important ecosystem implications; however, this has not been well studied (Methratta and Dardick 2019). It will be important for BOEM to incorporate requirements for developers to integrate investigation of such issues into regional or project-specific monitoring plans to ensure the regional monitoring programs can move forward.

In addition to regional studies, site specific monitoring and research should be employed by Orsted to understand impacts from the project on EFH and other marine resources. Site specific studies must be designed in a manner capable of identifying project effects. Before-After-Gradient (BAG) studies have advantages for studying impacts of wind farms, as this method can inform the spatial scale of the effects, eliminate the need for control sites, and offer greater statistical power (Methratta and Dardick 2019). Using the distance from the turbine as a survey stratum provides a sampling scheme that can combine the qualities of a BACI study with gradient sampling that allows for better detection and assessment of localized effects, in addition to more diffuse wind-farm wide effects. We recommend this approach be used for site specific monitoring studies, in order to avoid missing the relatively small areas that are likely to be strongly impacted. A BAG approach to monitoring also provides the opportunity to collect more data to help understand changes in community structure, including epibiota, colonization of invasives, macrobenthic communities, and the acoustic environment.

It is our understanding that Orsted is proposing to conduct fisheries and benthic monitoring studies in the project area. Specifically, based on a study plan dated September 2020, Orsted is proposing to collect fisheries information using various gear types including gillnet, beam trawl, fish pot and ventless trap. They are also proposing to conduct benthic monitoring in the project area. An acoustic and telemetry study funded by BOEM and led by the NEFSC is currently ongoing on Cox Ledge. Orsted has incorporated this study as well as an ongoing telemetry study looking at highly migratory species (HMS) into their monitoring plan and described financial contributions to these studies to help increase pre-construction data collection in the area. We would note that Table 6.2 on page 171 of the EFH Assessment incorrectly suggests that NMFS has “approved” these monitoring plans. We did review drafts of the monitoring plans submitted to us by Orsted, and provided comments on June 12, 2020, and additional comments on December 14, 2020 specific to the benthic monitoring plan dated September 2020. While we may have approved experimental fishing permits to conduct some of the proposed surveys, these approvals and previous comments do not constitute approval of the monitoring plan at large, as we have not provided any official concurrence of these plans. Rather, we have raised significant concerns with some of the studies as proposed, which should be addressed prior to commencement.

Given the complex habitat in the project area and the potential impacts of the project on spawning Atlantic cod, we consider a robust benthic monitoring plan and continuation of acoustic and telemetry studies to be the most important components for this project to understand potential impacts of the project on EFH. The latest draft of the proposed monitoring plans was not incorporated into the EFH assessment; however, based on our review of the benthic monitoring plan dated September 30, 2020, we have significant concerns about the ability of the design to detect changes. Specifically, it is not clear that there is adequate sampling or replication to detect meaningful changes (i.e., the statistical power of the study to detect changes). The proposed lack of multi-year pre-construction data collection will also place unnecessary constraints on the study's ability to distinguish between annual variability and changes related to the project construction and operation. The plan does incorporate a Before-After-Gradient (BAG) approach for monitoring changes to benthic habitats at increasing distances from turbines and along transects placed perpendicularly to the onshore cable route; however, there does not appear to be adequate replicates along fixed distances from the turbine and the OEC to support a robust statistical analysis. In addition, it will be critical for the benthic monitoring plan to identify effects of project construction on all different habitat types in the project area, not just boulder habitats. It will be important to ensure that benthic monitoring of the project not only documents pre- and post-construction habitat conditions and benthic communities, including demersal juvenile finfish species that may be more vulnerable to project impacts, but that monitoring is capable of detecting changes at relevant scales as well as across and within different habitat types. It may be necessary to use a variety of sampling techniques to gain proper insight into changes in the community composition and biodiversity in the wind farm (Kerckhof *et al.* 2018; Walsh and Guida 2017). The project should be designed to identify effects of these habitats and changes to macrobenthic communities at various distances from the turbine. Affected hard bottom habitats may be vulnerable to colonization of invasive species, so it will be critical for any benthic monitoring plan to incorporate an evaluation of invasive species growth on the surrounding habitats. We strongly recommend that you coordinate closely with us in the development of the benthic monitoring plan.

The ongoing acoustic and telemetry study mapping the distribution of habitat use of soniferous fish on Cox Ledge, with a focus on Atlantic cod spawning aggregations (Van Parijs *et al*. in progress) is providing important information to help inform cod activity in and around the project area. While this study is only considered to inform "pre-construction" in Orsted's September 2020 monitoring plan, it will be critical for this study to continue through construction and post-construction to help evaluate how cod are using this area over time. The study is funded through 2022, but we would recommend it be expanded as a component of project specific monitoring to help contribute to an understanding of any changes in cod activity from project development in this area.

Additional monitoring and assessments particularly around acoustic effects of construction would provide important information that may help supplement ongoing studies on Atlantic cod in the area. Specifically, the September 2020 monitoring plan does not include any proposed monitoring of the acoustic effects of project construction and operation, which will be important to understand the extent of impacts, particularly on Atlantic cod in this area. We recommend passive acoustic monitoring also be conducted along a range of gradients from near field sites to locations much further from the turbine site, including tens of kilometers. This should be done before, during, and after construction and include both construction and operation measurements. In addition to providing information on project effects on the acoustic environment, acoustic monitoring could detect changes in the presence of species that produce biological sounds and help supplement information found in the ongoing acoustic and telemetry studies. We strongly recommend you work with us in the development of any monitoring study.

EFH Conservation Recommendations

The project area, covering both the WDA and the OECC, is designated as EFH under the MSA for multiple federally managed species, including Atlantic cod, summer flounder, winter flounder, windowpane flounder, scup, black sea bass, longfin inshore squid, Atlantic scallop, surfclam and ocean quahog. As described above, the proposed project would result in significant adverse effects on EFH. Pursuant to Section 305(b)(4)(A) of the MSA, we recommend that you adopt the following EFH conservation recommendations.

1. The inadequacies of the EFH assessment have hindered our ability to provide comprehensive and detailed conservation recommendations. These inadequacies include inconsistencies in your impact calculations and proposed project elements as well as the lack of analysis of new information in the updated May 7, 2021, COP. We recommend that you update and revise the EFH assessment to clarify the type of turbine scour protection to be used and the extent of boulder relocation required for each turbine location. The EFH assessment should also be updated to reflect new information incorporated into the COP, including any identified unexploded ordinances (UXOs) and proposed plans for remediation and movement of any UXOs. We also recommend that your updated EFH assessment describe any anticipated impacts from proposed monitoring plans. If the new information affects the basis of our EFH conservation recommendations, or if upon review of the updated EFH assessment we determine that additional recommendations are necessary to avoid, minimize, or offset adverse impacts to EFH, you will be required to reinitiate the EFH consultation. Additionally, BOEM should coordinate with us to develop an EFH assessment template to help standardize the structure and content of future assessments.

2. Based on the available habitat delineations and data, we have determined that the proposed turbine locations WTG 1, WTG 5, WTG 15, WTG 16A, and WTG 17A would result in substantial adverse impacts to complex habitats. BOEM should remove these turbine locations from the proposed project and prohibit development at these locations.

3. Based on the available habitat delineations and data, we have also determined that micrositing turbine locations will be necessary to avoid and minimize substantial adverse impacts to complex habitats. We recommend that turbine locations WTG 2, WTG 4, WTG 6, WTG 8, WTG 9, WTG 10, WTG 12, WTG 13, TG 14, OSS, and the associated inter-array cables be microsited into low multibeam backscatter return areas and that restrictions on seafloor disturbance (e.g. anchoring) during construction be required to avoid impacts to higher multibeam backscatter return areas. BOEM should require a micrositing plan be developed for each of the identified turbine locations and associated cable routes. The micrositing plan should be submitted for our review and comment prior to BOEM approval.

4. Given the extent of complex habitats in the project areas, BOEM should require the applicant to develop an anchoring plan to ensure anchoring is avoided and minimized in complex habitats during construction and maintenance of the project. This plan should specifically delineate areas of complex habitat around each turbine and cable locations, and identify areas restricted from anchoring. Anchor chains should include mid-line buoys to minimize impacts to benthic habitats from anchor sweep where feasible. The habitat maps and inshore maps delineating eelgrass habitat adjacent to the O&M facility should be provided to all cable construction and support vessels to ensure no anchoring of vessels be done within or immediately adjacent to these complex habitats. The anchoring plan should be provided for our review and comment prior to BOEM approval.

5. BOEM should require scour and cable protection within complex habitats of the lease area use natural, rounded stone of consistent grain size to match existing conditions. Scour and cable protection placed within soft-sediment habitats should incorporate natural, rounded cobble and boulders (2.5-10 inches in diameter for cobble or >10-inch diameter for boulder). Concrete mattresses should not be permitted to be used as scour protection within hard bottom and structurally complex habitats, and any required use of concrete mattresses for cable protection should be mitigated through the addition of natural, rounded stone. Should the use of any engineered stone be necessary, it should be designed and selected to provide three-dimensional structural complexity that creates a diversity of crevice sizes. BOEM should require that the applicant provide descriptions and specifications for any proposed engineered stone for agency comment and review prior to final design selection.

6. BOEM should restrict pile driving and all bottom-disturbing activities within the lease area during periods of Atlantic cod spawning. Pile driving activity and bottom-tending disturbances should be prohibited during peak spawning, from November through March to avoid and minimize substantial adverse impacts to Atlantic cod EFH.

7. BOEM should require the applicant to use noise mitigating measures during construction, such as soft start procedures, to ensure fish have the opportunity to evacuate the area prior to pile driving activity, and the deployment of noise dampening equipment such as bubble curtains. BOEM should require the development of a plan outlining noise mitigation procedures in consultation with the resource agencies prior to any construction activities. This should include a minimum of 30 days for the resource agencies to review and provide comments. The noise mitigation plan should be filed with BOEM for approval before construction commences. The noise mitigation plan should include a process for notifying resource agencies within 24 hours if any evidence of a fish kill during construction activity is observed, and contingency plans to resolve issues.

8. BOEM should require passive acoustic monitoring to be conducted along a range of gradients from the proposed turbine locations before, during, and after pile driving activities. Resource agencies should be provided a draft of the acoustic monitoring plan for review and comment. The plan should also include sound verification monitoring during pile driving activities. Additional noise dampening technology should be applied should real-time monitoring indicate noise levels are not attenuated to the minimum required 10 decibels. Acoustic monitoring reports should be provided to the resource agencies.

9. BOEM should require the applicant to revise the proposed Benthic Habitat Monitoring Plan to address agency concerns related to the adequacy of the proposed methods to detect changes, and to require that the plan address potential changes to macrobenthic communities across and within each habitat type in the project area, including the artificial substrates to be constructed. The plan should include monitoring of invasive species growth on constructed habitats, habitats impacted by project construction as well as expansion to the adjacent habitats. The monitoring plan should also include measures to evaluate demersal juvenile fish species response to habitat impacts as a result of the project. The applicant should consult with the resource agencies in the revision and refinement of this plan and give the resource agencies a minimum of 30 days to review and comment on the plan. The applicant should ultimately file the plan with BOEM for approval. BOEM should ensure that the applicant's filing addresses, and includes, all resource agency comments, as well as the applicant's response to those comments.

10. Given the potential for adverse impacts to Atlantic cod spawning activity as a result of the construction and operation of this project, as well as cumulatively as wind expands in southern New England, BOEM should continue and expand the on-going telemetry and passive acoustic survey. The study should be extended to provide continuous monitoring of Atlantic cod spawning aggregations prior to the construction of the project, and post-construction. We also recommend that the survey be expanded throughout the entire MA and RI/MA wind energy areas (WEA) to allow for detection of shifts to spawning activity and any other spawning activity that may overlap with the WEAs that may be affected by this project and future development.

11. Given the uncertainties surrounding potential impacts to hydrodynamics and predator-prey relationships that may result from this project and cumulatively across the southern New England WEAs, BOEM should take measures to address this uncertainty. BOEM should develop and implement a regional scale study to evaluate and monitor shifts and changes in hydrodynamics (e.g., vertical stratification, current velocities, and direction), primary production, and predator-prey relationships that may occur across wind development areas and result in broader scale impacts for the region, managed fisheries, and NOAA-trust species.

12. BOEM should restrict nearshore dredging and silt-producing activities associated with the sea-to-shore cable installation and proposed O&M facility improvements that occur at or adjacent to water depths of 5 meters or less, from January 1 through May 31, of any calendar year, to protect sensitive life history stage winter flounder EFH.

13. The EFH consultation should be reinitiated prior to decommissioning turbines to ensure that the impact to EFH as a result of the decommissioning activities have been evaluated and minimized to the extent practicable.

Please note that Section 305(b)(4)(B) of the MSA requires you to provide us with a detailed written response to these EFH conservation recommendations, including a description of measures you have adopted that avoid, mitigate, or offset the impact of the project on EFH. In the case of a response that is inconsistent with our recommendations, Section 305(b)(4)(B) of the MSA also indicates that you must explain your reasons for not following the recommendations. Included in such reasoning would be the scientific justification for any disagreements with us over the anticipated effects of the proposed action and the measures needed to avoid, minimize, mitigate, or offset such effects pursuant to 50 CFR 600.920(k).

Please also note that a distinct and further EFH consultation must be reinitiated pursuant to 50 CFR 600.920(1) if new information becomes available or the project is revised in such a manner that affects the basis for the above EFH conservation recommendations.

Fish and Wildlife Coordination Act Recommendations
The Fish and Wildlife Coordination Act (FWCA) provides authority for our involvement in evaluating impacts to fish and wildlife from proposed federal actions that may affect waters of the United States. The FWCA requires that wildlife conservation be given equal consideration to other features of water resource development programs through planning, development, maintenance and coordination of wildlife conservation and rehabilitation. Our FWCA recommendations must be given full consideration.

Horseshoe Crabs

Horseshoe crabs are present in the project area and may be impacted by inshore construction activities including export cable installation and construction and dredging activities associated with the proposed O&M facility. Horseshoe crab eggs and larvae are a food source for a number of fish species including striped bass, white perch, weakfish, American eel, silver perch, and federally managed summer flounder and winter flounder (Steimle *et al*. 1999). Dredge disposal/placement may result in the loss of horseshoe crabs and their eggs and larvae, and their habitat, resulting in a reduction in prey species for several federally managed species and adverse effects to their EFH. As noted in the EFH assessment, horseshoe crabs are known to occur within Lake Montauk. Avoiding dredging and placement between April 15 to July 15 minimizes potential impacts to horseshoe crab spawning.

American Lobster and Jonah Crab
The South Fork offshore energy project area is habitat for American lobster (*Homarus americanus*) and Jonah crab (*Cancer borealis*). American lobster is an important commercial and recreational fisheries species. It is important to note that Vessel Trip Report (VTR) data likely under-report total lobster and Jonah crab landings due to permit reporting requirements. Lobster-only permit holders are not required to report VTR data. In 2019 over 125 million pounds of lobster were landed (NMFS 2021).

Shelter providing habitat has been shown to be a critical requirement for recently settled and early juvenile lobsters (Cowan 1999). Adult lobsters also use cobble-boulder habitat but tend to inhabit a broader range of habitats which may include both protected and exposed locations (Aiken and Waddy 1986; Karnofsky *et al.* 1989; Mackenzie and Moring 1985). The project area is known to support lobster, and spans an area used for inshore and offshore migrations (Fogarty *et al.* 1980). Lobster catch in southern New England has declined since the late 1990s, which in part led to the increase in the closely linked Jonah crab (*Cancer borealis*) fishery (ASMFC 2015). Little is known about Jonah crab biology, but the recent expansion in landings has led the Atlantic States Marine Fisheries Commission (ASMFC) to develop a Fishery Management Plan (FMP) for the species in 2015 (ASMFC 2015). As noted earlier, VTR data likely under-report total lobster and Jonah crab landings due to permit reporting requirements. In 2019, nearly 16 million pounds of Jonah crab were landed (NMFS 2021). Jonah crab are most frequently caught in rocky offshore habitats (ASMFC 2015). Observations with submersibles (Wenner *et al.* 1992) found Jonah crab in softer sediments along the continental slope, which was also in agreement with modelling completed by Collie and King (2016). Female crab have been documented to move inshore during the late spring and summer (ASMFC 2015). Taking steps to minimize project effects to EFH, particularly complex habitats more vulnerable to long-term or permanent impacts, will also be important in reducing project impacts to lobster and Jonah crab in the project area. Incorporation of the EFH conservation recommendations outlined above as conditions of COP approval will also be beneficial for reducing project impacts to lobster and Jonah crab.

The South Fork monitoring plan includes trap surveys targeting lobster and black sea bass in the project area to build baseline and identify habitat use, movement, and seasonal distribution of important species. The monitoring plan should emulate existing trap surveys for pre-, during and post-construction sampling, to allow comparison with regional baseline sampling. For example, the monitoring plan for this project uses different numbers, configurations (ventless vs. standard), and soak times for trap gear than similar efforts conducted for the Vineyard Wind 1 Project. Differences in methodology will make it difficult to compare data collected from these studies with data collected from other regional efforts. We recommend that you require the applicant to consult with the resource agencies and possibly even other wind companies in the development of its monitoring plan. The consultation process should involve active, iterative, coordination with the resource agencies to facilitate the exchange of ideas and harmonization between similar studies.

We also recommend you coordinate with us early in the process related to any potential effects of monitoring activities on NOAA trust resources, including protected species. We note that survey or monitoring activities may require permits or authorizations from us and may need to be considered in an ESA section 7 consultation. It is also important with respect to your review of proposed monitoring plans, that you remain updated on the current actions of the Atlantic Large Whale Take Reduction Plan, which includes measures to reduce risk from vertical lines in the waters in and around the project area. More information can be found at https://www.fisheries.noaa.gov/new-england-mid-atlantic/marine-mammal-protection/atlantic-large-whale-take-reduction-plan.

NOAA Scientific Surveys

As noted in the South Fork Draft Environmental Impact Statement, this project and cumulative wind development on the OCS is anticipated to result in major adverse impacts on NOAA Fisheries scientific surveys. This project would have direct impacts on the federal multi-species bottom trawl survey, the surfclam and ocean quahog clam dredge surveys, the integrated benthic/sea scallop habitat survey, ship and aerial-based marine mammal and sea turtle surveys, and the shelf-wide Ecosystem Monitoring Survey. The impacts to our scientific surveys from this project will be driven by four main mechanisms: 1) exclusion of NOAA sampling platforms from the wind development area, 2) impacts on the random-stratified statistical design that is the basis for data analysis and use in scientific assessments, advice, and analyses; 3) the alteration of benthic, pelagic, and airspace habitats in and around the wind energy development; and 4) potential reductions in sampling outside wind areas caused by potential increased transit time by NOAA vessels. These impacts will occur over the lifetime (approximately 2050) of wind energy operations at the project area and in the region.

Adverse effects on NOAA monitoring and assessment activities will directly impact the critical scientific information used for fisheries management and the recovery and conservation programs for protected species. These impacts will result in increased uncertainty in the surveys' measures of abundance, which could potentially affect decisions for fisheries management. Impacts to these surveys will have implications for habitat management and our consultations under MSA, as data collected through our scientific surveys are used to identify EFH and inform conservation and management of sensitive habitat areas.

The implementation of a NMFS scientific survey mitigation plan for the project will be necessary to mitigate losses in accuracy and precision due to the impacts of wind development on NEFSC surveys and scientific advice. This plan would address both project level and regional impacts and include the following elements for all NEFSC surveys impacted by the project: 1) Evaluate survey designs, 2) Identify and develop new survey approaches, 3) Calibrate new survey approaches, 4) Develop interim provisional survey indices, 5) Monitoring by wind energy industry to fill regional scientific survey data needs over the life of offshore wind operations, and 6) Develop and communicate new regional data streams. The goal of this is to ensure the continuity of the important marine scientific investments in long-term data collection and to maintain scientific support for sustainable fisheries.

Conclusion

We appreciate the opportunity to coordinate with BOEM on the South Fork offshore wind development project. The conservation recommendations we provide in this letter will ensure that the adverse effects to EFH and managed species from this project are adequately minimized and compensated. In the event we receive a revised EFH assessment, we may determine that the recommendations provided need to be augmented, or that the consultation needs to be reinitiated if new information affects the basis of our EFH conservation recommendations. Should you have any questions regarding these comments or the EFH consultation process, please contact Alison Verkade at (978) 281-9266 or alison.verkade@noaa.gov. The ESA consultation is ongoing and is expected to be complete by August 9, 2019. Should you have questions related to the ESA Section 7 consultation, please contact Julie Crocker at (978) 281-9480 or julie.crocker@noaa.gov

Sincerely,

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Literature Cited

Able, K. W. and M.P. Fahay. 1998. The first year in the life of estuarine fishes in the middle Atlantic Bight; Rutgers University Press. New Brunswick, NJ. 342 p.

Aiken, D.E. and S.L. Waddy. 1986. Environmental influence on recruitment of American lobster (*Homarus americanus*): a perspective. Can. J. Fish. Aquat. Sci. 43:2258-2270.

Amoser, S., and F. Ladich. 2003. Diversity in noise-induced temporary hearing loss in otophysine fishes. The Journal of the Acoustical Society of America, 113(4), 2170-2179.

Anderson, P., Berzins, I., Fogarty, F., Hamlin, H., and Guillette, L. 2011. Sound, stress, and seahorses: The consequences of a noisy environment to animal health. Aquaculture, 311, 129-138. doi:doi:10.1016/j.aquaculture.2010.11.013

André, M., Solé, M., Lenoir, M., Durfort, M., Quero, C., Mas, A., … Morell, M. 2011. Low-frequency sounds induce acoustic trauma in cephalopods. Frontiers in Ecology and the Environment, 9(9), 489-493.

ASMFC, Atlantic States Marine Fisheries Commission. 2015. Interstate Fishery Management Plan for Jonah Crabs.

Auster PJ. 1998. A conceptual model of the impacts of fishing gear on the integrity of fish habitats. Conservation Biology 12: II98-I203.

Auster, P.J., J. Lindholm, S. Schaub, G. Funnell, L.S. Kaufman, and P.C. Valentine. 2003. Use of sand wave habitats by silver hake. Journal of Fish Biology 62, 143-152.

Auster, P.J. and R. Langton. 1999. The effects of fishing on fish habitat. American Fisheries Society Symposium 22:150-187.

Banner, A. and Hyatt, M. 1973. Effects of noise on eggs and larvae of two estuarine fishes. Trans. Am. Fish.Soc. 1:134-136.

Berry, W.J., Rubenstein, N.I., Hinchey, E.K., Klein-Mac-Phee, G. and Clarke, D.G. 2011. Assessment of dredging-induced sedimentation effects on winter flounder (*Pseudopleuronectes americanus*) hatching success: results of laboratory investigations. Proceedings of the Western Dredging Association Technical Conference and Texas A&M Dredging Seminar. Nashville, TN June 5-8,2011.

Boehlert, G. W., and Gill, A. 2010. Environmental and Ecological Effects of Ocean Renewable Energy Development - A Current Synthesis. Oceanography, 23(2), 68-81. doi:DOI: 10.5670/oceanog.2010.46

Boletzky Sv, Hanlon RT. 1983. A review of the laboratory maintenance, rearing and culture of cephalopod molluscs. Mem Natl Mus Vic 44:147–187

Bradshaw, C., Veale, L. O., Hill, A. S., & Brand, A. R. 2000. The effects of scallop dredging on gravelly seabed communities. Effects of fishing on non-target species and habitats, 83-104.

Brostrom, G. 2008. On the influence of large wind farms on the upper ocean circulation. Journal of Marine Systems, 74, 585-591. doi:10.1016/j.jmarsys.2008.05.001

Carpenter, J. R., Merckelbach, L., Callies, U., Clark, S., Gaslikova, L., and Baschek, B. 2016. Potential Impacts of Offshore Wind Farms on North Sea Stratification. PLoS One, 11(8). doi:ARTN e016083010.1371/journal.pone.0160830

Causon, P., and Gill, A. 2018. Linking ecosystem services with epibenthic biodiversity change following installation of offshore wind farms. Environmental Science and Policy, 89, 340-347.

Cazenave, P.W., Torres, R. and Allen, J.I. 2016. Unstructured grid modelling of offshore wind farm impacts on seasonally stratified shelf seas. Progress in Oceanography, 145, pp.25-41.

Chen, C, R.C. Beardsley, J. Qi, and H. Lin. 2016. Use of Finite-Volume Modeling and the Northeast Coastal Ocean Forecast System in Offshore Wind Energy Resource Planning. Final Report to the U.S. Department of the Interior, Bureau of Ocean Energy Management, Office of Renewable Energy Programs. BOEM 2016-050.

Clucas GV, Lou RN, Therkildsen NO, Kovach AI. 2019. Novel signals of adaptive genetic variation in northwestern Atlantic cod revealed by whole-genome sequencing. Evol. Appl. DOI: 10.1111/eva.12861

Coates, D. A., Vanaverbeke, J., Rabaut, M., & Vincx, M. 2011. Soft-sediment macrobenthos around offshore wind turbines in the Belgian Part of the North Sea reveals a clear shift in species composition. In S. Degraer, R. Brabant, & B. Rumes (Eds.), Offshore wind farms in the Belgian part of the North Sea: Selected findings from the baseline and targeted monitoring: Royal Belgian Institute for Natural Sciences, Management Unit of the North Sea Mathematical Models.

Collie, J.S., Hermsen, J., Valentine, P.C., and Almeida, F. 2005. Effects of fishing on gravel habitats: assessment and recovery of benthic megafauna on Georges Bank: in P.W. Barnes and J.P. Thomas, editors, Benthic habitats and the effects of fishing: American Fisheries Society Symposium 41, Bethesda, Maryland , p. 325-343.

Collie, J.S. and King, J.W. 2016. Spatial and Temporal Distributions of Lobsters and Crabs in the Rhode Island Massachusetts Wind Energy Area. US Dept. of the Interior, Bureau of Ocean Energy Management, Atlantic OCS Region, Sterling, Virginia. OCS Study BOEM BOEM 2016-073. 48 pp.

Cote, D., Moulton, S., Frampton, P. C. 8., Scruton, D.A., and McKinley, R. S. 2004. Habitat use and early winter movements by juvenile Atlantic cod in a coastal area of Newfoundland. Journal of Fish Biology 64(3):665-679.

Cowan, D.F. 1999. Method for assessing relative abundance, size distribution, and growth of recently settled and early juvenile lobsters (*Homarus americanus*) in the lower intertidal zone. Journal of Crustacean Biology 19(4): 738-751.

CSA, Ocean Sciences Inc. and Exponent. 2019. Evaluation of Potential EMF Effects on Fish Species of Commercial or Recreational Fishing Importance in Southern New England. U.S. Dept. of the Interior, Bureau of Ocean Energy Management, Headquarters, Sterling, VA. OCS Study BOEM 2019-049. 59 pp

Dean, M. J., Hoffman, W. S., and Armstrong, M. P. 2012. Disruption of an Atlantic Cod Spawning Aggregation Resulting from the Opening of a Directed Gill-Net Fishery. North American Journal of Fisheries Management, 32, 124-132. doi:DOI: 10.1080/02755947.2012.663457

Dean,M.J., Hoffman,W.S., Douglas R. D.R. Zemeckis, and M. P. Armstrong. 2014. Fine-scale diel and gender-based patterns in behaviour of Atlantic cod (*Gadus morhua*) on a spawning ground in the Western Gulf of Maine. ICES Journal of Marine Science (2014), 71(6), 1474–1489. doi:10.1093/icesjms/fsu040.

Deegan, L.A. and Buchsbaum, R.N. 2005. The effect of habitat loss and degradation on fisheries. In: Buchsbaum, R., Pederson, J., Robinson, W.E., editors. The decline of fisheries resources in New England: evaluating the impact of overfishing, contamination and habitat degradation. Cambridge (MA): MIT Sea Grant College Program; Publication No. MITSG 05-5. p 67-96.

Deese, H. 2005. Atlantic Cod Spawning Aggregations within Southern New England, Georges Bank, and Gulf of Maine. Appendix A to "Utilizing Genetic Techniques to Discriminate Atlantic Cod Spawning Stocks in U.S. waters: a Pilot Project.

Degraer, S., Brabant, R., Rumes, B., (Eds.). 2012. Offshore wind farms in the Belgian part of the North Sea: Heading for an understanding of environmental impacts. Royal Belgian Institute of Natural Sciences, Management Unit of the North Sea Mathematical Models, Marine ecosystem management unit. 155 pp. + annexes.

De Mesel, I., Kerckhof, F., Norro, A., Rumes, B., and Degraer, S. 2015. Succession and seasonal dynamics of the epifauna community on offshore wind farm foundations and their role as stepping stones for non-indigenous species. Hydrobiologia, 756(1), 37-50. doi:10.1007/s10750-014-2157-1

de Soto, N., Delorme, N., Atkins, J., Howard, S., Williams, J., and Johnson, M. 2013. Anthropogenic noise causes body malformations and delays development in marine larvae. Scientific Reports, 3, 2831. doi:DOI: 10.1038/srep02831

Duarte, C.M. and D. Krause-Jensen. 2017. Export from seagrass meadows contributes to marine carbon sequestration. Front. Mar. Sci., 17.

FGDC, Federal Geographic Data Committee. 2012. "Coastal and Marine Ecological Classification Standard (CMECS)" Edited by Marine and Coastal Spatial Data Subcommittee. Federal Geographic Data Committee.

FHWG, Fisheries Hydroacoustic Working Group. 2008. Agreement in Principal for Interim Criteria for Injury to Fish from Pile Driving Activities. Memorandum of agreement between NOAA Fisheries, U.S. Fish and Wildlife Service, U.S. Federal Highways Administration, and the California, Oregon, and Washington State Departments of Transportation. 8p.

Feist, B., Anderson, J. J., and Miyamoto, R. 1992. Potential Impacts of Pile Driving on Juvenile Pink (*Oncorhynchus gorbuscha*) and Chum (*O. keta*) Salmon Behavior and Distribution.

Floeter, J., van Beusekom, J. E. E., Auch, D., Callies, U., Carpenter, J., Dudeck, T., . . . Mollmann, C. 2017. Pelagic effects of offshore wind farm foundations in the stratified North Sea. Progress in Oceanography, 156, 154-173. doi:10.1016/j.pocean.2017.07.003

Fogarty, F., Borden, D., and Russell, H. 1980. Movements of tagged American lobster, *Homarus americanus*, off Rhode Island. Fishery Bulletin, 78(3).

Fonseca M.S. and Cahalan I.A. 1992. A preliminary evaluation of wave attenuation by four species of seagrass. Estuarine, Coastal and Marine Science 35: 565-576.

Fourqurean, J.W. et al. 2012. Seagrass ecosystems as a globally significant carbon stock. Nature Geoscience 5:505-509.

Fraser, S., Gotceitas, V., and Brown, J. A. 1996. Interactions between age-classes of Atlantic cod and their distribution among bottom substrates. Canadian Journal of Fisheries and Aquatic Sciences 53 (2):3 0 5 -3 1 4.

Friedland, K.D., McManus, M.C., Morse, R.E., and Link, J.S. 2019. Event scale and persistent drivers of fish and macroinvertebrate distributions on the Northeast US Shelf. – ICES Journal of Marine Science, doi:10.1093/icesjms/fsy167.

Friedland, K.D., E.T. Methratta, A.B. Gill, S.K. Gaichas, T.H. Curtis, E.M. Adams, J.L Morano, D. P. Crear, M.C. McManus and D.C. Brady. 2021. Resource occurrence and productivity in existing and proposed wind energy lease areas on the Northeast US shelf. Frontiers in Marine Science 8: 19 pp.

Gerstner, C. 1998. Use of substratum ripples for flow refuging by Atlantic cod, *Gadus morhua*. Environmental Biology of Fishes 51: 455-460.

Gervelis, B. and D.A. Carey. 2020. South Fork wind farm observational cod spawning survey, December 2018-April 2019 Final Report. Inspire Environmental, Newport, RI.

Gill, A., Huang, Y., Gloyne-Philips, I., Metcalfe, J., Quayle, V., Spencer, J., and Wearmouth, V. 2009. COWRIE 2.0 Electromagnetic Fields (EMF) Phase 2: EMF-sensitive fish response to EM emissions from sub-sea electricity cables of the type used by the offshore renewable energy industry. Commissioned by COWRIE Ltd (project reference COWRIE-EMF-1-06), 68.

Glasby, T., Connell, S., Holloway, M., & Hewitt, C. 2007. Nonindigenous biota on artificial structures: could habitat creation facilitate biological invasions? Marine biology, 151(3), 887-895.

Gotceitas, V., Fraser, S., and Brown, J. A. 1997. Use of eelgrass beds (*Zostera marina*) by juvenile Atlantic cod (*Gadus morhua*). Canadian Journal of Fisheries and Aquatic Sciences 54(6):1306-13 19.

Gotceitas, V., and Brown, J. A. 1993. Substrate selection by juvenile Atlantic cod (*Gadus morhua*): effects of predation risk. Oecologia 93(1): 3l-31.

Gotceitas, V., Fraser, S., & Brown, J. A. 1995. Habitat use by juvenile Atlantic cod (Gadus morhua) in the presence of an actively foraging and non-foraging predator. Marine Biology, 123(3), 421-430.

Grant, S. M., and Brown, J. A. 1998. Nearshore settlement and localized populations of age 0 Atlantic cod (*Gadus morhua*) in shallow coastal waters of Newfoundland. Canadian journal of fisheries and aquatic sciences 55(6): l3l7 -1327.

Guarinello, M.L. and D.A. Carey. 2020. Multi-modal approach for benthic impact assessments in moraine habitats: a case study at the Block Island Wind Farm. Estuaries and Coasts.

Guida, V., A. Drohan, H. Welch, J. McHenry, D. Johnson, V. Kentner, J. Brink, D. Timmons, E. Estela-Gomez. 2017. Habitat Mapping and Assessment of Northeast Wind Energy Areas. Sterling, VA: US Department of the Interior, Bureau of Ocean Energy Management. OCS Study BOEM 2017-088. 312 p.

Hastings, M. C., and Popper, A. 2005. Effects of Sound on Fish (Final Report # CA05-0537). Sacramento, CA.

Hawkins, A. D. 2014. Examining fish in the sea: a European perspective on fish hearing experiments. In Perspectives on Auditory Research, pp. 247–267. Ed. by A. N. Popper, and R. R. Fay. Springer, New York.

Hawkins, A., and Popper, A. 2017. A sound approach to assessing the impact of underwater noise on marine fishes and invertebrates. ICES Journal of Marine Science, 74(3), 635-651.

HDR. 2019. Benthic Monitoring during Wind Turbine Installation and Operation at the Block Island Wind Farm, Rhode Island – Year 2. Final Report to the U.S. Department of the Interior, Bureau of Ocean Energy Management, Office of Renewable Energy Programs. OCS Study BOEM 2019-019. 318 pp.

HDR. 2020. Benthic and Epifaunal Monitoring During Wind Turbine Installation and Operation at the Block Island Wind Farm, Rhode Island – Project Report. Final Report to the U.S. Department of the Interior, Bureau of Ocean Energy Management, Office of Renewable Energy Programs. OCS Study BOEM 2020-044. Volume 1: 263 pp; Volume 2:380 pp.

Hoffmann, E., Astrup, J., Larsen, F., Munch-Petersen, S., and Støttrup, J. 2000. Effects of marine windfarms on the distribution of fish, shellfish and marine mammals in the Horns Rev area: DFU.

Hutchison, Z. L., Sigray, P., He, H., Gill, A. B., King, J., and Gibson, C. 2018. Electromagnetic Field (EMF) Impacts on Elasmobranch (shark, rays, and skates) and American Lobster Movement and Migration from Direct Current Cables. U.S. Department of the Interior, Bureau of Ocean Energy Management, Office of Renewable Energy Programs.

Hutt, C., Lovell, S., and Steinback, S. 2015. The Economics of Independent Marine Recreational Fishing Bait and Tackle Retail Stores in the United States, 2013. U.S. Department of Commerce, NOAA Tech. Memo. NMFS-F/SPO-151a, 123 p.

ICES, International Council for the Exploration of the Sea. 2005. Spawning and life history information for North Atlantic cod stocks. ICES Cooperative Research Report, 274, 1-152.

Karnofsky, E.B., J. Atema, and Elgin, E. 1989. Field observations of social behavior, shelter use and foraging in the lobster, *Homarus americanus*. Biol. Bull. 176:234-246.

Keats, D.W., Steele, D.H., and South, G.R. 1987. 'The role of fleshy macroalgae in the ecology of juvenile cod (*Gadus morhua* L.) in inshore waters off eastern Newfoundland', Canadian Journal of Zoology, 65: 49-53.

Kenworthy, W.J., Thayer, G.W., and Fonseca M.S. 1988. The utilization of seagrass meadows by fishery organisms. In: Hook, D.D., McKee, W.H., Smith, H.K., Gregory, J., Burrell, V.G., DeVoe, M.R., Sojka, R.E., Gilbert, S., Banks, R., Stolzy, L.H., Brooks, C., Matthews, T.D., and Shea, T.H., editors. The Ecology of Wetlands: Volume 1. pp. 548-560.

Kerckhof, F., Rumes, B., and Degraer, S. 2018. Chapter 6. A closer look at the fish fauna of artificial hard substrata of offshore renewables in Belgian waters, in: Degraer, S.; Brabant, R.; Rumes, B.; Vigin, L. (Ed.), Environmental Impacts of Offshore Wind Farms in the Belgian Part of the North Sea: Assessing and Managing Effect Spheres of Influence. Royal Belgian Institute of Natural Sciences, OD Natural Environment, Marine Ecology and Management Section, Brussels, pp. 79–89.

Kimber, J. A., Sims, D. W., Bellamy, P. H., and Gill, A. B. 2011. The ability of a benthic elasmobranch to discriminate between biological and artificial electric fields. Marine biology, 158(1), 1-8.

Klimley, A.P,, N.F. Putman, B.A. Keller, and D. Noakes. 2021. A call to assess the impacts of electromagnetic fields from subsea cables on the movement ecology of marine migrants. Conservation Science and Practice. 2021. https://doi.org/10.1111/csp2.436

Langan, J.A., M.C. McManus, D.R. Zemeckis, and J.S. Collie. 2020. Abundance and distribution of Atlantic cod (*Gadus morhua*) in a warming southern New England. Fish. Bull. 118:145–156 (2020), 145-156. doi: 10.7755/FB.118.2.4.

Lazzari, M.A. and Stone, B.Z. 2006. Use of submerged aquatic vegetation as habitat by young-of-the year epibenthic fishes in shallow Maine nearshore waters. Estuarine Coastal and Shelf Science 69: 591-606.

Lefaible, N., Braeckman, U, and Moens, T. 2018. Chapter 5. Effects of wind turbine foundations on surrounding microbenthic communities, in: Degraer, S.; Brabant, R.; Rumes, B.; Vigin, L. (Ed.), Environmental Impacts of Offshore Wind Farms in the Belgian Part of the North Sea: Assessing and Managing Effect Spheres of Influence. Royal Belgian Institute of Natural Sciences, OD Natural Environment, Marine Ecology and Management Section, Brussels, pp. 57-77.

Lengyel, N. L., Collie, J. S., and Valentine, P. 2009 . The invasive colonial ascdian *Didemnum vexillum* on Georges Bank - Ecological effects and genetic identification. Aquatic Invasions, 4(1), 143-152.

Leonhard, S.; Stenberg, C.; Støttrup, J. 2011. Effect of the Horns Rev 1 offshore wind farm on fish communities: follow-up seven years after construction. Report by Danish Hydraulic Institute (DHI). Report for Vattenfall.

Lindeboom, H. J., Kouwenhoven, H. J., Bergman, M. J. N., Bouma, S., Brasseur, S., Daan, R., ... Scheidat, M. 2011. Short-term ecological effects of an offshore wind farm in the Dutch coastal zone; a compilation. Environmental Research Letters, 6. doi:doi:10.1088/1748-9326/6/3/035101

Lindholm J., Auster P.J., and Kaufman L. 1999. Habitat-mediated survivorship of juvenile (0-year) Atlantic cod (*Gadus morhua*). Marine Ecology Progress Series 180:247-255.

Lindholm, J., P.J. Auster, M. Ruth and L. Kaufman. 2001. Modeling the effects of fishing and implications for the design of marine protected areas: juvenile fish responses to variations in seafloor habitat. Conservation Biology 15: 424-437.

Linehan, J. E., Gregory, R. S., and Schneider, D. C. 2001 Predation risk of age-O cod (*Gadus*) relative to depth and substrate in coastal waters. Journal of Experimental Marine Biology and Ecology 263(l):25-44.

Lough, R. G., P. C. Valentine, D. C. Potter, P. J. Auditore, G. R. Bolz, J.D. Neilson, and Perry, R.I. 1989. Ecology and distribution of juvenile cod and haddock in relation to sediment type and bottom currents on eastern Georges Bank. Mar. Ecol. Prog. Ser. 56:1-12.

MacKenzie, C., and Moring, J.R. 1985. Species profiles: life histories and environmental requirements of coastal fishes and invertebrates (North Atlantic) - American lobster. U.S. Fish Wildl Serv. Biol. Rep. 82(11.33). U.S. Army Corps of Engineers, RI EL-82-4. 19 pp.

Methratta, E., and Dardick, W. 2019. Meta-Analysis of Finfish Abundance at Offshore Wind Farms. Reviews in Fisheries Science and Aquaculture, 27(2), 242-260.

Methratta, E.T. and Link, J.S., 2006. Evaluation of quantitative indicators for marine fish communities. Ecological Indicators, 6(3), pp.575-588.

Mieszkowska,N., M.G. Genner, S.J. Hawkins, and D.W. Sims. 2009. Effects of climate change and commercial fishing on Atlantic cod *Gadus morhua*. Advances in Mar. Biol. 56:213-273.

Mooney, T. A., Hanlon, R. T., Christensen-Dalsgaard, J., Madsen, P. T., Ketten, D. R., and Nachtigall, P. E. 2010. Sound detection by the longfin squid (*Loligo pealeii*) studied with auditory evoked potentials: sensitivity to low-frequency particle motion and not pressure. J Exp Biol, 213(Pt 21), 3748-3759. doi:10.1242/jeb.048348

Mooney, T. A., Hanlon, R., Madsen, P. T., Christensen-Dalsgaard, J., Ketten, D. R., and Nachtigall, P. E. 2012. Potential for sound sensitivity in cephalopods. Adv Exp Med Biol, 730, 125-128. doi:10.1007/978-1-4419-7311-5_28

Mooney, A., Samson, J. E., Schlunk, A. D., and Zacarias, S. 2016. Loudness-dependent behavioral responses and habituation to sound by the longfin squid (*Doryteuthis pealeii*). J Comp Physiol A. doi:DOI 10.1007/s00359-016-1092-1

Morris, J., and Carman, M. 2012. Fragment reattachment, reproductive status, and health indicators of the invasive colonial tunicate *Didemnum vexillum* with implications for dispersal. Biological Invasions, 14(10), 2133-2140.

Mueller-Blenkle, C., McGregor, P.K., Gill, A.B., Andersson, M.H., Metcalfe, J., Bendall, V., Sigray, P., Wood, D.T. and Thomsen, F. 2010. Effects of Pile-driving Noise on the Behaviour of Marine Fish. COWRIE Ref: Fish 06-08, Technical Report 31st March 2010

NMFS, National Marine Fisheries Service. 2021. Fisheries of the United States, 2019. U.S. Department of Commerce, NOAA Current Fishery Statistics No. 2019. Available at: https://www.fisheries.noaa.gov/resource/document/fisheries-united-states-2016-report

NRC, Natural Research Council. 2002. Effects of trawling and dredging on seafloor habitat. National Academy Press, Washington, District of Columbia.

Nedelec, S. L., Campbell, J., Radford, A. N., Simpson, S. D., and Merchant, N. D. 2016. Particle Motion: the missing link in underwater acoustic ecology. Methods in Ecology and Evolution, 7, 836-842. doi:10.1111/2041-210X.12544

Nedelec, S. L., Simpson, S. D., Morley, E. L., Nedelec, B., and Radford, A. N. 2015. Impacts of regular and random noise on the behavior, growth and development of larval Atlantic cod (*Gadus morhua*). Proceedings of the Royal Society B, 282. doi:http://dx.doi.org/10.1098/rspb.2015.1943

Nedwell, J., Langworthy, J., and Howell, D. 2003. Assessment of sub-sea acoustic noise and vibration from offshore wind turbines and its impact on marine wildlife; initial measurements of underwater noise during construction of offshore windfarms, and comparison with background noise.

NEFSC (Northeast Fisheries Science Center). 2021. An interdisciplinary review of Atlantic Cod (*Gadus morhua*) stock structure in the western North Atlantic Ocean. R.S. McBride and R.K Smedbol (Editors). NOAA Technical Memorandum NMFS-NE-XXX.

Newcombe, C.P. and Jenson, O.T. 1996. Channel suspended sediment and fisheries: a synthesis for quantitative assessment of risk and impact. North American Journal of Fisheries Management 16: 693-727.

Newcombe C.P. and MacDonald D.D. 1991. Effects of suspended sediments on aquatic ecosystems. North American Journal of Fisheries Management 11:72-82.

Normandeau, E., Tricas, T. and Gill, A. 2011. Effects of EMFs from Undersea Power Cables on Elasmobranchs and Other Marine Species. U.S. Dept. of the Interior, Bureau of Ocean Energy Management, Regulation, and Enforcement, Pacific OCS Region, Camarillo, CA. OCS Study

Norro, A. 2018. Chapter 2. On the effectiveness of a single big bubble curtain as mitigation measure for offshore wind farm piling sound in Belgian waters, in: Degraer, S.; Brabant, R.; Rumes, B.; Vigin, L. (Ed.), Environmental Impacts of Offshore Wind Farms in the Belgian Part of the North Sea: Assessing and Managing Effect Spheres of Influence. Royal Belgian Institute of Natural Sciences, OD Natural Environment, Marine Ecology and Management Section, Brussels, pp. 19–25.

Ogren L., Chess, J., Lindenberg, J. 1968. More notes on the behavior of young squirrel hake, *Urophycis chuss*. Underwater Naturalist 5(3):38-39.

Öhman, M. C., Sigray, P., and Westerberg, H. 2007. Offshore windmills and the effects of electromagnetic fields on fish. AMBIO: A journal of the Human Environment, 36(8), 630-633.

Orth, R.J., Carruthers,T.J.B., Dennison,W.C., and Duarte, C.M. 2006. A global crisis for seagrass ecosystems. BioScience 56,987–996.

Petersen, J. K., and Malm, T. 2006. Offshore Windmill Farms: Threats to or Possibilities for the Marine Environment. Ambio, 35(2), 75-80.

Popper, A., Hawkins, A., Fay, R., Mann, D., Bartol, S., Carlson, T. J., . . . Tavolga, W. 2014. Sound Exposure Guidelines for Fishes and Sea Turtles: A Technical Report prepared by ANSI-Accredited Standards Committee S3/SC1 and registered with ANSI.

Popper, A. N., and Hastings, M. C. 2009. The effects of anthropogenic sources of sound on fishes. J Fish Biol, 75(3), 455-489. doi:10.1111/j.1095-8649.2009.02319.x

Popper, A., and Hawkins, A. 2016. The Effects of Noise on Aquatic Life II. New York, USA: Springer.

Popper, A., and Hawkins, A. 2018. The importance of particle motion to fishes and invertebrates. Journal of Acoustical Society of America, 143(1), 470-488. doi:DOI: 10.1121/1.5021594

Popper, A. and Hawkins, A. 2019. An overview of fish bioacoustics and the impacts of anthropogenic sounds on fishes. Journal of fish biology.

Reubens, J. T., Braeckman, U., Vanaverbeke, J., Van Colen, C., Degraer, S., and Vincx, M. 2013. Aggregation at windmill artificial reefs: CPUE of Atlantic cod (*Gadus morhua*) and pouting (*Trisopterus luscus*) at different habitats in the Belgian part of the North Sea. Fisheries Research, 139, 28-34. doi:10.1016/j.fishres.2012.10.011

Roberts, L., and Elliott, M. 2017. Good or bad vibrations? Impacts of anthropogenic vibration on the marine epibenthos. Sci Total Environ, 595, 255-268. doi:10.1016/j.scitotenv.2017.03.117

Samson, J. E., Mooney, T. A., Gussekloo, S. W. S., and Hanlon, R. 2014. Graded behavioral responses and habituation to sound in the common cuttlefish Sepia officinalis. Journal of Experimental Biology, 217, 4347-4355. doi:doi:10.1242/jeb.113365

Shepard A.N., Theroux, R.B., Cooper, R.A., Uzmann, J.R. 1986. Ecology of Ceriantharia (Coelenterata, Anthozoa) of the northwest Atlantic from Cape Hatteras to Nova Scotia. Fishery Bulletin 84:625-646.

Short, F.T., Burdick, D.M., Wolf, J.S. and Jones, G.E. 1993. Eelgrass in estuarine research reserves along the East Coast, USA.

Short, F.T. and Burdick, D.M., 1996. Quantifying eelgrass habitat loss in relation to housing development and nitrogen loading in Waquoit Bay, Massachusetts. Estuaries, 19(3), pp.730-739.

Siceloff, L., and W.H. Howell. 2013. Fine-scale temporal and spatial distributions of Atlantic cod (*Gadus morhua*) on a western Gulf of Maine spawning ground. Fisheries Research, 141: 31–43.

Slotte, A., Hansen, K., Dalen, J., and Ona, E. 2004. Acoustic mapping of pelagic fish distribution and abundance in relation to a seismic shooting area off the Norwegian west coast. Fisheries Research, 67, 143-150. doi:doi:10.1016/j.fishres.2003.09.046

Solé, M., Sigray, P., Lenoir, M., Van Der Schaar, M., Lalander, E., and André, M. 2017. Offshore exposure experiments on cuttlefish indicate received sound pressure and particle motion levels associated with acoustic trauma. Scientific Reports, 7, 45899.

Stanley, DJ. 1971. Fish-produced markings on the outer continental margin east of the Middle Atlantic states. Journal of Sedimentary Petrology 41:159-170.

Stevenson, D., 2004. Characterization of the fishing practices and marine benthic ecosystems of the northeast US shelf, and an evaluation of the potential effects of fishing on essential fish habitat. National Oceanic and Atmospheric Administration Technical Memorandum NMFS NE 181. Northeast Fisheries Science Center. Woods Hole, Massachusetts, USA.

Tamsett A, Heinonen KB, Auster PJ, Linholm J. 2010. Dynamics of hard substratum communities inside and outside of a fisheries habitat closed area in Stellwagen Bank National Marine Sanctuary (Gulf of Maine, NW Atlantic). Marine Sanctuaries Conservation Series ONMS-10-05. U.S. Department of Commerce, National Oceanic and Atmospheric Administration, Office of National Marine Sanctuaries, Silver Spring, MD.

Steimle, F. W. 1999. Essential fish habitat source document. Black sea bass, Centropristis striata, life history and habitat characteristics. DIANE Publishing.

Taormina, B., Bald, J., Want, A., Thouzeau, G., Lejart, M., Desroy, N., and Carlier, A. 2018. 'A review of potential impacts of submarine power cables on the marine environment: Knowledge gaps, recommendations and future directions', Renewable and Sustainable Energy Reviews.

Thayer, G. W., Wolfe, D. A., & Williams, R. B. 1975. The Impact of Man on Seagrass Systems: Seagrasses must be considered in terms of their interaction with the other sources of primary production that support the estuarine trophic structure before their significance can be fully appreciated. American Scientist, 63(3), 288-296.

Thayer, G. W., Bjorndal, K.A., Ogden, J.C., Williams, S. L., and Zieman, J. C. 1984. Role of larger herbivores in seagrass communities. Estuaries, 7(4), 351-376.

Thomsen, F., Gill, A., Kosecka, M., Andersson, M. H., Andre, M., Degraer, S., . . . Wilson, B. 2015. MaRVEN - Environmental Impacts of Noise, Vibrations and Electromagnetic Emissions from Marine Renewable Energy.

Thomsen, F. L., K; Kafemann, R; Piper, W. 2006. Effects of offshore wind farm noise on marine mammals and fish. Hamburg, Germany.

Thomsen, F., Ludemann, K., Piper, W., Judd, A., and Kafemann, R. 2008. Potential Effects of Offshore Wind Farm Noise on Fish. Bioacoustics, 17(1-3), 221-223. doi:10.1080/09524622.2008.9753825

Tougaard, J., Madsen, P.T., and Wahlberg, M. 2008. Underwater Noise from Construction and Operation of Offshore Wind Farms. Bioacoustics, 17(1-3), 143-146. doi:10.1080/09524622.2008.9753795

Tupper, M. and R.G. Boutilier. 1995. Effects of habitat on settlement, growth and post settlement survival of Atlantic cod (*Gadus morhua*). Can. J. Fish. Aquat. Sci. 52: 1834-1841.

van Berkel, J., H. Burchard, A. Christensen, A, G. L.O. Mortensen, O.S. Petersen, and F. Thomsen. 2020. The effects of offshore wind farms on hydrodynamics and implications for fishes. Oceanography 33(4):108-117..

Vanhellemont, Q., and Ruddick, K. 2014. Turbid wakes associated with offshore wind turbines observed with Landsat 8. Remote Sens Environ 145:105–115.

Vidal, E.A.G., DiMarco, F.P., Wormuth, J.H., and Lee, P.G. 2002. Optimizing rearing conditions of hatchling lologinid squid. Marine Biology 140:117-127.

Walsh, H. J., and Guida, V. G. 2017. Spring occurrence of fish and macro-invertebrate assemblages near designated wind energy areas on the northeast U.S. continental shelf. Fishery Bulletin, 115(4), 437-450. doi:10.7755/fb.115.4.1

Wahlberg, M., and Westerberg, H. 2005. Hearing in fish and their reactions to sounds from offshore wind farms. Marine Ecology Progress Series, 288, 295-309.

Wenner, E.L., Barans, C.A., and Ulrich, G.F. 1992. Population structure and habitat of the Jonah crab, *Cancer borealis* Stimpson 1859, on the continental slope off the southeastern United States. Journal of Shellfish Research 11(1):95-103.

Wicklund R. 1966. Observations on the nursery grounds of young squirrel hake, *Urophycis chuss*. Underwater Naturalist 4(1):33-34.

Wilber, D.H., and Clarke D.G. 2001. Biological effects of suspended sediments: a review of suspended sediment impacts on fish and shellfish with relation to dredging activities in estuaries. North American Journal of Fisheries Management 21:855-875.

Wilding, T. A., Gill, A. B., Boon, A., Sheehan, E., Dauvin, J. C., Pezy, J.-P., . . . De Mesel, I. 2017. Turning off the DRIP ('Data-rich, information-poor') – rationalizing monitoring with a focus on marine renewable energy developments and the benthos. Renewable and Sustainable Energy Reviews, 74, 848-859. doi:10.1016/j.rser.2017.03.013

Wilhelmsson, D., and Malm, T. 2008. Fouling assemblages on offshore wind power plants and adjacent substrata. Estuarine, Coastal and Shelf Science, 79(3), 459-466. doi:10.1016/j.ecss.2008.04.020

Wilhelmsson, D., Malm, T., and Ohman, M. 2006. The influence of offshore wind power on demersal fish. ICES Journal of Marine Science, 63(5), 775-784. doi:10.1016/j.icesjms.2006.02.001

Zemeckis, D. R., D. Martins, L.A. Kerr, and S.X. Cadrin. 2014a. Stock identification of Atlantic cod (*Gadus morhua)* in US waters: an interdisciplinary approach – ICES Journal of Marine Science, 71: 1490–1506.

Zemeckis, D. R., W.S. Hoffman, M.J. Dean, M.P. Armstrong, and S.X. Cadrin. 2014b. Spawning site fidelity by Atlantic cod (*Gadus morhua*) in the Gulf of Maine: implications for population structure and rebuilding. – ICES Journal of Marine Science, 71: 1356–1365.

Zemeckis, D.R., M.J. Dean, and S. X. Cadrin (2014c) Spawning Dynamics and Associated Management Implications for Atlantic Cod, North American Journal of Fisheries Management, 34:2, 424-442.

New England Fishery Management Council

MID-ATLANTIC FISHERY MANAGEMENT COUNCIL

June 1, 2021

Program Manager, Bureau of Ocean Energy Management
Office of Renewable Energy Programs
45600 Woodland Road (VAM-OREP)
Sterling, Virginia 20166

Re: Notice of Intent to Prepare an EIS for the Ocean Wind project

Dear Sir/Madam,

Please accept these comments from the New England Fishery Management Council (New England Council) and Mid-Atlantic Fishery Management Council (Mid-Atlantic Council) regarding the Notice of Intent to prepare an Environmental Impact Statement (EIS) for the Construction and Operations Plan (COP) for the Revolution Wind Farm and Revolution Wind Export Cable project off Rhode Island. The COP proposes to install up to 100 turbines, up to two offshore substations, one onshore connection point at Quonset Point, and up to two submarine export cables through one corridor. Up to 205 miles of cables (155 miles inter-array, 50 miles export) would connect the turbines, substations, and onshore connection points.

The New England Council has primary management jurisdiction over 28 marine fishery species in federal waters and is composed of members from Maine to Connecticut. The Mid-Atlantic Council manages more than 65 marine species[1] in federal waters and is composed of members from the coastal states of New York to North Carolina (including Pennsylvania). In addition to managing these fisheries, both Councils have enacted measures to identify and conserve essential fish habitats (EFH), protect deep sea corals, and sustainably manage forage fisheries. The Councils also support policies for U.S. wind energy development and operations that will sustain the health of marine ecosystems and fisheries resources. While the Councils recognize the importance of domestic energy development to U.S. economic security, the marine fisheries throughout New England and the Mid-Atlantic, including within the Revolution Wind project area and in surrounding areas, are extremely important to the social and economic well-being of coastal communities in the Northeast U.S. and provide numerous benefits to the nation, including domestic food security.

General Comments

The pace and number of offshore wind projects in development in our region pose challenges for thorough analysis of potential impacts, informed public input, and adopting lessons learned from each project. Surveys, design work, and environmental reviews are already occurring for over a dozen projects and multiple additional areas in the New York Bight are planned to be leased. Work on these projects is already taxing available resources in the fishing, fishery management, and fishery science communities, and we expect at BOEM as well. Consistency in approaches

[1] Fifteen species are managed with specific Fishery Management Plans, and over 50 forage species are managed as "ecosystem components" within the Mid-Atlantic Council's FMPs.

and adopting lessons learned from one project to the next would benefit stakeholders who seek to engage in the review process for these complex projects.

We have significant concerns about the suitability of this specific lease area for offshore wind energy development given the amount of complex habitat found throughout the area and the potential for negative impacts to those habitats during construction of the turbines and cables. These concerns are described in more detail below.

Section 1.4 of the COP (Regulatory Framework) is useful for understanding permitting and environmental review requirements at the federal, state, and local levels. This section should be revised as appropriate to ensure that current federal frameworks are referenced (e.g., One Federal Decision has been rescinded).

As the impacts analysis is developed, clear terminology will be important for readers to understand the complexity of the alternatives considered and the large number of impact-producing factors and environmental resources evaluated. It also would be useful to specify both magnitude and direction when characterizing impacts, and for the EIS to define short and long term in the context of impacts. The COP appears to do an effective job of distinguishing between the two timeframes.

Purpose and Need and Alternatives

The maximum operating capacity is identified in the COP as 704-880 MW and Rhode Island and Connecticut have procured 704 MW total from the Revolution Wind project. The project design envelope considers turbines ranging from 8-12 MW. We assume that turbines on the upper end of this range will be used, given recent advances in the industry. This suggests that 59 turbines are needed to fulfill the existing procurements and that 74 turbines would be needed to achieve 880 MW. We are concerned that this wide range of maximum operating capacities combined with multiple possible turbine sizes will make it difficult for the meaningful consideration of impacts within the EIS. For example, 74 turbines could have a much different impact than 59 turbines. If this wide of a range is considered in the EIS, it may be helpful to analyze separate alternatives for the lower and higher realistic bounds for the maximum operating capacity, expected turbine size, and number of turbines. This will allow the Councils and other interested parties to provide better informed comments on which alternatives may best minimize impacts to habitat, marine species, and fisheries, while still meeting the purpose and need of the action, as the impacts will scale with the location and number of turbines installed.

The COP suggests that all 100 potential turbine locations might not be used. As BOEM works with the developer to determine which of the potential 100 turbine locations to drop from the array, we recommend considering at least one habitat impacts minimization alternative, a fisheries impacts minimization alternative, and a transit lane alternative, in addition to the no action alternative and the proposal outlined in the COP. The EIS should clearly state the extent to which a reduction in the proposed number of turbines is feasible, given the segmentation of the lease (leaving less space available to move turbine locations) and existing procurements.

A habitat impacts minimization alternative would identify turbine locations that could be eliminated to minimize the impacts of both turbine placement and installation of inter-array cabling on complex benthic habitats in the project area, while still meeting the purpose and need of the action. For example, the EIS should consider minimization of impacts on Atlantic cod habitat. The Atlantic Cod Stock Structure Working Group concluded that there are more than two stocks of Atlantic cod, including a likely separate Southern New England stock, which overlaps with the project area and Cox Ledge. This area could be greatly beneficial for stock rebuilding given this and other surrounding complex habitat areas are important for cod spawning and survival of juvenile cod. The EIS should develop alternatives and mitigation measures to minimize impacts to complex fish habitats and fishing grounds, including Cox Ledge. While we recognize the turbines and associated scour protection create structured habitat, we are very concerned about the destruction of natural hard bottom in the project area. We note that the Rhode Island Ocean Special Area Management Plan, which applies within the project area, requires offshore developers to avoid areas of particular concern, namely glacial moraine, and if this is not feasible, developers must minimize and mitigate any impacts to this resource.[2]

We also have concerns about impacts to habitats along the export cable corridor, especially as the COP suggests that the cable corridor crosses a significant amount of structured habitat and many boulders in the corridor may need to be relocated. For clarity, it might be appropriate for the export cable to have its own habitat impacts minimization alternative where alternative routes that avoid complex habitat are considered. Thorough pre-construction survey work will be necessary to accurately assess the habitat types in the cable corridor areas.

Micrositing of both turbines and cables may be useful for minimizing impacts on complex habitats. The EIS should indicate the extent to which micrositing is likely to mitigate negative effects. Where micrositing is insufficient to mitigate impacts, removal of a turbine location or more significant rerouting of the cable should be considered. The EIS should clearly indicate how seafloor habitats are being characterized using available data and include specific criteria that would result in a preferred turbine or cable location being moved or removed to minimize habitat impacts.

A fisheries impacts minimization alternative would use information about the relative importance of different locations to fishing to prioritize potential turbine locations for elimination. All available data on fisheries use patterns in the area, including transiting, should be evaluated. The limitations of each data set should be clearly and repeatedly acknowledged and input from the fishing industry should be sought to gain an understanding of use patterns not captured in the data.

A transit lane alternative would eliminate entire rows or columns of turbines to facilitate transit across the project area for all types of vessels. The location of potential transit lanes should be informed by available data on vessel traffic (which are not available for all fishery vessels) and input from the fishing community. The habitat, fisheries, and transit lane alternatives could be used in combination to minimize impacts associated with the project. We recognize that there may be tradeoffs between these and other objectives in determining the final project design.

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[2] McCann, Jennifer and Sarah Schumann 2013. Ocean SAMP. The Rhode Island Ocean Special Area Management Plan: Managing Ocean Resources Through Coastal and Marine Spatial Planning. http://www.crmc.ri.gov/samp_ocean/reports/Ocean_SAMP_Practioners_Guide.pdf.

For all alternatives, the EIS should also be clear on which mitigation measures will be required as opposed to discretionary. Only required mitigation measures should influence the impact conclusions in the EIS.

Fisheries and Habitat Considerations

BOEM should coordinate early and often with NOAA Fisheries on the most appropriate data for analysis of potential impacts to fisheries, including fishing and transiting locations, as well as socioeconomic impacts. Summary information on Council-managed fisheries is also available on the Council websites, www.mafmc.org, and www.nefmc.org, at fishery management plan-specific links, typically via annual fishery information reports (MAFMC) or recent plan amendment or framework documents (both councils). The EIS should clearly and repeatedly acknowledge the limitations of each data set.

Commercial and recreational fisheries provide a wide range of benefits to coastal communities, and not all of these are captured by looking only at financial metrics. The EIS should not overly rely on ex-vessel value when assessing and weighting impacts across various fisheries. Focusing on ex-vessel value can mask other important considerations such as the number of impacted fishery participants, the use of a low-value species as bait for a high-value species, or a seasonally important fishery. For example, skates are typically a low revenue, high volume fishery that supplies bait to the lobster fishery; however, this level of fishery dependence and impacts on other fisheries are not readily apparent in the COP, though some information is provided in Appendix CC. These types of relationships should be described in the EIS.

Models exist to estimate the amount of fisheries revenue generated from within the project area, but it is important to acknowledge that changes in transit patterns will also have economic impacts and the associated economic impacts will be challenging to accurately quantify.

Multiple aspects of wind farm construction and operations involve noise production, and noise can negatively affect biological processes for many fish, invertebrate, and marine mammal species. The COP (page 145) states that the noise from operation of offshore substation is naturally muted by the ocean; however, no reference or evidence is provided. Given the amount of hard bottom in this area, in particular glacial moraine substrate, pile driving noise impacts could be greater compared to those in sandy habitats, especially if pile driving durations are longer due to geological conditions. If noise impacts affect the biological processes of or temporarily displace species targeted by commercial or recreational fisheries, those fisheries will experience negative impacts. Therefore, if the EIS concludes there is no impact from noise, it should clearly explain why.

The COP translates the US Coast Guard's policy that vessels will have the freedom to navigate in a wind farm into the conclusion that fishing vessels will be successfully able to fish, including with mobile, bottom-tending gears (page 642). This is a superficial conclusion that ignores the differences between transit and fishing. The proposed layout may limit the ability of fishing vessels to operate with some gears, even if they can safely transit through the areas. The COP and the Navigation Safety Risk Assessment (Appendix R) assume that intended cable burial will mitigate certain risks to vessels using mobile, bottom-tending gears, but these conclusions should also draw on the Cable Burial Risk Assessment, which is redacted from the public version of the

COP. If substantial areas of the cable cannot be buried due to seabed conditions, fishing activity may be negatively impacted.

The COP states that electromagnetic fields (EMF) are not likely to affect fishery resources (positively or negatively) (page 644), however, elasmobranchs (namely skates and spiny dogfish) and other species exhibited a strong behavioral response to EFM in a field study conducted by University of Rhode Island and BOEM[3] and are “likely to have more frequent contact with the Project’s cable routes” (Appendix Q1). Potential EMF impacts are a concern to the fishing community and the extent to which EMF may or may not impact marine species should be thoroughly described in the EIS. These impacts should be included in the characterization of potential impact tables (e.g., Table 4.6.5-5), given EMF is listed as an impact-producing factor in Figure 4.6.5-1.

Boulders can serve as habitat for certain structure-oriented species. Recreational vessels (private and for-hire) sometimes fish off boulders for this reason. Relocation of boulders for cable laying will cause disruptions in recreational fishing activity, as it could take several trips to find their new locations. While the relocated boulders may continue to attract recreational fishery species and function as a substrate for sessile fauna, relocation is not a negligible impact given the movement will likely damage or destroy the attached fauna. As such, there will be a recovery period for both recreational fishing and habitat impacts associated with relocation of boulders.

In the context of both cable and turbine installation, any place where the bottom sediments will be disturbed must be evaluated for sediment contamination to understand the potential for environmental effects associated with contaminant release. Two obvious sources of contamination are dredged spoils from inshore, nearshore, or harbor maintenance and disposal of onshore materials (including waste). For many years, such disposal was not evaluated carefully and not regulated as it is today. As a result, sediments and other material with unacceptable levels of heavy metals and persistent organic pollutants (POPS) were disposed in ocean waters and may remain in locations where they could be disturbed. These sources of contamination need to be assessed and managed as part of the offshore wind development process.

Commercial, for-hire recreational, and private recreational fishing should be considered separately, but in the same or adjacent sections of the document. It seems that the COP categorizes recreational fishing as charter boat, party boat, private boat, or shore, which is appropriate, and is an improvement on previous offshore wind EIS documents we have reviewed. As the Councils have stated in comment letters on other wind projects, the grouping of private recreational fishing with recreation and tourism, rather than with commercial and for-hire fisheries, is not intuitive and makes it challenging for readers to understand the full picture of potential impacts on all fishery sectors. If fishery species are affected by the project, this will affect both for-hire and private recreational fishing. Describing both types of recreational fishing in the same section of the document would make linkages between biological and fishery conditions easier to explain and understand. Additionally, aquaculture, which is referenced in the COP, is distinct from commercial and recreational fisheries and should be considered separately.

[3] https://espis.boem.gov/final%20reports/5659.pdf.

We recognize that data on the locations of private angler fishing effort in federal waters are very limited and available data on the locations of for-hire fishing effort (i.e., vessel trip report data) are not precise. Therefore, it will be important to clearly articulate the limitations of the available data and work with local fishermen to understand how the project area is used by recreational fisheries.

Turbine foundations and their associated fouling communities will create artificial reefs, which are expected to attract certain fishery species (e.g., black sea bass). The EIS should acknowledge that the artificial reef effects will have different impacts for different species. In addition, this area already contains a substantial amount of hard bottom habitat. Therefore, the presence of turbine foundations will not create new habitat types and associated benefits to fisheries and marine species to the same extent as they might in an area with less complex habitat. For example, any benefit to anglers targeting highly migratory species (e.g., tunas and sharks) could be offset by the inability to anchor or to drift throughout the area. If operators shift their effort outside the project area during construction or long-term operations, this will potentially put them in areas of higher vessel traffic and gear conflict. Also, depending on operating conditions at sea, commercial and recreational fishermen cannot always reap the benefits of any increased catchability of target species due to safety concerns of fishing in swells around the turbines. These safety considerations will be different than the existing artificial reefs in the Greater Atlantic region which, except for the Block Island Wind Farm turbine foundations, are all submerged structures.

Given the amount of hard bottom in the project area, we assume that burial of both the inter-array and export cables will be challenging. Unburied cables present fisheries concerns, especially for mobile gear fisheries. The effects of cable protection materials on fishing operations should be accounted for when estimating fishery impacts of the project. The New England Council's submarine cables policy recommends that when cable burial is not possible, cables should be protected with materials that mimic natural, nearby habitats where possible. It would be helpful to identify the characteristics of any cable protection materials, should burial depths of 4-6 feet not be achieved, because these materials contribute to the net amount of complex habitat that would exist in the area once the project is constructed.

The COP states that during decommissioning, all facilities will be removed to a depth of 15 ft below the mudline, unless otherwise authorized by BOEM. This should include all cables. Abandoned, unmonitored cables would pose a significant safety risk for fisheries that use bottom-tending gear and the long-term risks to marine habitats are unknown.

Cumulative Impacts

The EIS must include a thorough cumulative impacts assessment. We supported the criteria used in the Vineyard Wind EIS for defining the scope of reasonably foreseeable future wind development; however, that scope should now be expanded to include the anticipated New York Bight lease areas. Several fisheries operate in both the New York Bight and Southern New England.

Cumulative impacts and risks need to be evaluated for species that are widely distributed on the coast. Species such as bluefish, summer flounder, black sea bass, and others that migrate along the coast could be affected by multiple offshore wind projects, and well as other types of coastal development.

We continue to have significant concerns about the cumulative impacts of offshore wind development on fishery independent surveys. Major negative impacts to these surveys would translate into greater uncertainty in stock assessments, the potential for more conservative fisheries management measures, and resulting impacts on fishery participants and communities. We are encouraged by BOEM's commitment to working with NOAA on long term solutions to this challenge through the regional, programmatic, Federal Survey Mitigation Program, described in the Record of Decision for the Vineyard Wind 1 project.

Coordination Between Adjacent Projects

The Councils are pleased that projects throughout the Southern New England lease areas will be developed using standardized turbine layouts. Coordination and consistency in other regards, including around fisheries surveys before, during, and after construction, between neighboring projects would improve our ability to understand project impacts on fisheries. In addition, using shared or adjacent cable routes to the extent possible would help to minimize impacts to the seabed and potential interactions between cables and bottom-tending fishing gear. Coordination between projects will provide efficiencies for analysis and development and will also help minimize impacts to commercial and recreational fishing, vessel transit, and habitats.

Conclusion

We appreciate the opportunity to provide comments to ensure that issues of social and ecological importance are considered in the EIS for the Revolution Wind COP. We look forward to working with BOEM to ensure that any wind development in our region minimizes impacts on the marine environment and can be developed in a manner that ensures coexistence with our fisheries.

Please contact us if you have any questions.

Sincerely,

Thomas A. Nies

Thomas A. Nies
Executive Director, New England Fishery Management Council

C M Moore

Dr. Christopher M. Moore
Executive Director, Mid-Atlantic Fishery Management Council

cc: J. Beaty, M. Luisi, W. Townsend, J. Bennett, A. Lefton

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
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GREATER ATLANTIC REGIONAL FISHERIES OFFICE
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June 1, 2021

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Sterling, VA 20166

RE: Docket Number BOEM-2021-0029
Scoping Comments for the Notice of Intent to Prepare an Environmental Impact Statement for Revolution Wind LLC's Proposed Wind Energy Facility Offshore Rhode Island

Dear Ms. Morin:

We have reviewed the April 30, 2021, *Federal Register* Notice of Intent (NOI) to prepare an Environmental Impact Statement (EIS) for Revolution Wind LLC's proposed wind energy facility off the coast of Rhode Island within the Bureau of Ocean Energy Management (BOEM) Renewable Energy Lease Area OCS-A 0486. This letter responds to your request for information as a cooperating agency on this project with legal jurisdiction and special expertise over marine trust resources, and as a consulting agency under the Magnuson-Stevens Fishery Conservation and Management Act (MSA), the Fish and Wildlife Coordination Act (FWCA) and the Endangered Species Act (ESA). We are also an action agency for this project to the extent NOAA provides Incidental Take Authorizations (ITAs) under the Marine Mammal Protection Act (MMPA). If deemed sufficient to do so, we will rely on and adopt your Final EIS to satisfy our independent legal obligations to prepare an adequate and sufficient analysis under the National Environmental Policy Act (NEPA) and the regulations published by the Council on Environmental Quality (CEQ regulations (2020)) in support of our proposal to issue the MMPA ITA for the proposed project.

In our role as a Cooperating Agency under NEPA, we offer the following comments and technical assistance related to significant issues, information, and analysis needs for the EIS related to resources in the project area over which we have special expertise or legal jurisdiction, including associated consultation and authorization requirements. Data related to the occurrence and status of these resources, evaluation of effects to them, and development of responsive mitigation are critical elements of the NEPA process, which require early identification of such issues in the scoping process and full evaluation throughout the NEPA process.

As we understand the NOI, BOEM intends to prepare an EIS to consider whether to approve, approve with modifications, or disapprove a Construction and Operations Plan (COP) submitted by Revolution Wind LLC and analyze the proposed construction and operation of a commercial scale wind energy facility on the outer continental shelf (OCS) approximately 15 miles off the coast of Rhode Island. The proposed project would include the construction, operation, and eventual decommissioning of up to 100 wind turbine generators (WTGs) connected by a network of inter-array cables and up to two offshore substations connected by an offshore substation-link cable. The proposed facility would be connected to shore by up to two submarine export cables (approximately 50 miles in length), up to two underground transmission circuits located onshore, and an onshore substation inclusive of up to two onshore interconnection circuits connecting to North Kingstown, Rhode Island. The project may use several existing port facilities located in Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Virginia, and Maryland to support offshore construction, assembly and fabrication, crew transfer and logistics, but no final determination has been made on those port locations. The project would be located on Cox Ledge and the surrounding area in water depths ranging from approximately -25 to -50 meters. According to information provided in the COP, the proposed project would involve WTGs spaced in a grid approximately 1.15 miles (1.0 nautical mile) apart in a north-south and east-west orientation within the lease area, consistent with the layout proposed for other adjacent projects.

The NOI commences the public scoping process for identifying issues and potential alternatives for consideration in the Revolution Wind COP EIS. Through the NOI, you are requesting information on significant resources and issues, impact-producing factors, reasonable alternatives (e.g., size, geographic, seasonal, or other restrictions on construction and siting of facilities and activities), and potential mitigation measures to be analyzed in the EIS. As we have noted previously, we have serious concerns that the high number of projects moving through the NEPA process between now and 2024 make it very difficult for us to provide the detailed level of review and interagency cooperation we have provided in the past. The extensive interagency cooperation we have invested with you to improve the NEPA documents for previous wind energy projects will no longer be feasible, and we will be required to take a more limited role in the process. Nonetheless, with respect to the Revolution Wind NOI, we offer some general comments as well as a number of detailed comments on specific issues of concern. To ensure we can continue to meet our collective objectives and your ambitious timelines, it is imperative that we capitalize and build upon our successful collaboration on recent projects and integrate lessons learned into future project development and review. This will improve the quality of this and future projects, expedite review, and maximize the utility of available resources.

General Comments

Construction and Operations Plan (COP)

We rely on the information in the Revolution Wind COP to help inform the comments and technical assistance provided during the scoping process. As the COP was made available to our agency shortly after the release of the NOI, we have not had the opportunity to fully review the contents of the document. As a result, our comments related to the COP are limited, but we plan to follow up with additional technical assistance as we further review the COP and as you prepare documents associated with our agency consultations.

We understand that during the NEPA process, you allow applicants to make modifications and updates to their COPs. We request that should the COP be updated or changed at any time during the regulatory process, you notify the agencies immediately and make the most updated COP available to the agencies and the public. In addition, you should provide a description of what sections and information in the COP have been updated. This description should specifically outline any changes to the proposed action and other information that may affect consultation with our agency. BOEM must understand that updates to the COP that occur after initiation of consultation with our agency may affect our consultation timelines. We may need to provide additional comments and technical assistance upon review of any updated information, including potential alternatives to minimize and mitigate impacts of the project on marine and estuarine resources. To reduce the potential need for multiple reviews, supplemental consultation and comment, and project delays, we recommend you ensure that project information is complete before initiating a project or continuing to advance the process for existing projects. Should unexpected revisions to the project occur, coordination with us as soon as possible is essential to help prevent inefficiencies and confusion that can result from multiple reviews, as well as delays that may affect timelines and consultation initiation and conclusion.

Cox Ledge

As noted in the COP, the lease area and proposed project are located on and around Cox Ledge, an area with particularly complex and unique habitat conditions that support a wide range of marine resources. This area provides habitat for feeding, spawning, and development of federally managed species, and supports commercial and recreational fisheries and associated communities. Of particular concern, this area is also known to support spawning aggregations of Atlantic cod. As indicated in the COP, the project is proposing a full build out of the lease area, including development within highly complex habitats. Based on our initial review, a large portion of the lease area contains highly complex habitats, particularly areas in the southern portion of the lease surrounding the proposed South Fork Wind Farm project.

In our past correspondence (October 3, 2011 and August 2, 2012) related to identification of this particular wind energy area, we recommended Cox Ledge and associated complex habitats be removed from consideration for leasing. While a portion of Cox Ledge was removed from leasing based on fishing data compiled through the RI Ocean Special Area Management Plan (SAMP) process, much of the existing lease area still overlaps with Cox Ledge and associated complex habitats. We remain concerned with construction within this unique area and expect some areas within the lease may not be appropriate for development. New data and information on the importance and role this area plays in the life history of Atlantic cod further supports and highlights the concerns we previously raised regarding inclusion of this area for project development. It will be critical for the NEPA document to provide a comprehensive and impartial assessment of project impacts to this important area as well as a meaningful evaluation of a reasonable range of alternatives. A thorough analysis of baseline environmental conditions that accurately characterizes and presents the complexity of this area will be necessary for the development of a sufficient analysis and set the stage to compare impacts among alternatives.

Alternatives Analysis

The "Alternatives" section of the EIS should consider and evaluate the full range of reasonable alternatives to the proposed action, including those that would minimize damage to the environment. The analysis must include development of potential mitigation measures - these should follow the sequence of avoidance, minimization, and compensation, or offsetting, of adverse impacts. For more vulnerable and difficult-to-replace resources such as natural hard bottom complex substrates (particularly those with macroalgae and/or epifauna), submerged aquatic vegetation (SAV), and shellfish habitat and reefs, alternatives that avoid impacts to these habitats should be evaluated and given full consideration. Similar to the structure of the draft COP, to facilitate efficient review of the alternatives, we recommend the EIS discussion of the alternatives and comprehensive analyses associated with each be grouped into the three corresponding elements of the proposed project: (1) wind farm area; (2) offshore export cable routes and associated corridors; and (3) inshore export cable routes and associated corridors and landfall points. The proposed project should have multiple alternatives for each element that could be "mixed and matched" in the final selection of the single and complete project.

Fisheries Habitat Impact Minimization Alternative for the Lease Area
The proposed Revolution Wind project would be located on Cox Ledge, with a substantial portion of the proposed development overlapping with hard bottom complex habitat that is Essential Fish Habitat (EFH) for a number of managed fish species and trust resources for which NMFS has conservation responsibilities. While the minimization of impacts should be considered in the development of all alternatives, given the particular complexity of habitat in this lease area and the importance of Cox Ledge as a spawning location for Atlantic cod, it will be critical for you to consider a discrete alternative that reduces impacts to fisheries habitats that are more sensitive and vulnerable to impacts. Complex habitats are particularly sensitive and vulnerable to impacts as disturbances or alterations to these habitats can impact both the physical and biological components of these habitats that provide complexity. Impacts to the physical (e.g. three-dimensional structure, crevices) and biological (e.g. epifauna) may be permanent or long-term, typically taking years to decades for recovery. Therefore, an alternative that minimizes effects of the project on complex habitats should be considered in the EIS.

This alternative should not only consider specific turbine locations for removal, but large portions of the lease dominated by highly complex areas that provide important functions for associated living marine resources, such as Atlantic cod, a species that is culturally and economically significant to the region. Cox Ledge is an important area for fishing activity, and any adverse impacts to fish habitat or recruitment of economically valuable species may result in subsequent impacts on commercial and recreational fishing opportunities and associated communities. It will be especially important for this alternative to consider both impacts to complex habitats and habitat use by Atlantic cod. Because cod stocks region-wide are depleted in part due to low recruitment in recent years, any adverse impacts to the spawning and recruitment of Atlantic cod associated with this project may result in significant long-term cumulative impacts to this stock. It will be critical to fully evaluate measures to avoid and minimize impacts to spawning aggregations and habitats where larval cod settle to the bottom and transform to juveniles. All these measures should be considered as components of a fisheries habitat impact minimization alternative. Given the unique habitat features within this lease area, and the important fisheries that rely on these habitats, we consider this to be a reasonable alternative that should be considered in the NEPA document.

Fisheries Habitat Impact Minimization Alternative for Cable Corridor Routing
A full range of reasonable alternatives to the proposed offshore and inshore export cable corridors should also be considered and evaluated, including an alternative to avoid and minimize impacts to important, sensitive, and complex habitats located in the project area. Such sensitive habitats include, important commercial and recreational fishing areas, rocky habitats, SAV, shellfish reefs, biogenic habitats, coastal marshes, subtidal and intertidal flats (e.g., mudflats), and designated Habitat Areas of Particular Concern (HAPC). HAPCs are designated as high priorities for conservation due to the important ecological functions they provide, their vulnerability to anthropogenic degradation and development stressors, and/or their rarity. The project area includes areas designated as HAPC for juvenile cod. Under the Omnibus Essential Fish Habitat Amendment 2[1], the New England Fishery Management Council (NEFMC) has designated HAPC for juvenile cod in southern New England as far west as the Rhode Island - Connecticut border from the mean high water line up to depths of 20 meters (m) to include rocky habitats (pebble, cobble, and boulder) with and without attached macroalgae or emergent epifauna, SAV, and sandy habitats adjacent to rocky or SAV habitats, which are used for foraging. The COP also identifies a number of complex habitats and benthic features along the cable route offshore and in the West Passage of Narragansett Bay, such as Brenton Reef and other rocky seafloor conditions and bedrock outcrops, as well as ripples, megaripples, and irregular seafloors. Such habitats in depths up to 20 m would be consistent with the cod HAPC and any potential impacts to these habitats should be fully evaluated. BOEM should consider an alternative that evaluates how cable installation and operation may impact these different habitat types and identify ways to avoid and minimize impacts to sensitive and complex habitats.

While the COP highlights alternatives considered for cable landing sites within Narragansett Bay, given the location of this project, and complex habitats that occur along the cable route, it would be reasonable to evaluate ways to minimize impacts to sensitive habitats along both the offshore and inshore cable routes. This may include evaluating modification or expansion of the cable corridors to ensure cables can be routed around complex and sensitive habitats. This alternative should also consider methods used to lay the cable within, or adjacent to, complex habitats for both the offshore and inshore landing locations. Options for avoiding and minimizing impacts related to the methods of construction and routes, that allow for full cable burial to minimize permanent habitat impacts and potential interactions with fishing gear, should be also considered. This is a reasonable alternative that should be considered in the NEPA document as an individual alternative that may be mixed or matched with other alternatives.

Coordinated Cable Routing
Offshore export cable routing alternatives that use common corridors with adjacent projects should be evaluated and discussed. For lease areas that are adjacent to one another, BOEM should develop common cable corridors to both increase efficiency and predictability and reduce resource impacts. Specifically, common cable corridors would lead to efficiencies in planning, project development, and benthic habitat mapping, more predictability and time savings for applicants and resource agencies. In addition, establishing common cable corridors would facilitate comprehensive avoidance and minimization of impacts to marine resources by reducing the number of corridors and allowing for programmatic-level review and comment.

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[1] https://www.nefmc.org/library/omnibus-habitat-amendment-2

Affected Environment

The "Affected Environment" section of the EIS should cover a sufficient geographic area to fully examine the impacts of the proposed project and support an analysis of the cumulative effects. It is important that the geographic area encompass all project related activities, including the lease area, cable corridors, landing sites, and the use of ports outside of the immediate project area. This analysis should also include any necessary landside facilities and the staging locations of materials to be used in construction. You should ensure that findings for each effect/species are supported by references where possible and in context of the proposed project to allow for a well-reasoned and defensible document.

The description of the "Affected Environment" should recognize the ocean environment as dynamic, not static, and acknowledge that the environment, and species within the environment, vary over time and seasons. This section should include information on the physical (temperature, salinity, depth, and dissolved oxygen) and biological (e.g. plankton) oceanography. It is important that the EIS discuss seasonal changes and long-term trends in the environment as well as hydrodynamic regimes and how they influence the distribution and abundance of marine resources. Within this section, the EIS should include results of on-site surveys, site-specific habitat information, and characterization of benthic and pelagic communities. Additional details should be provided related to Cox Ledge and complex habitats in the project area, as described above.

The "Affected Environment" section should also include all of the biological, cultural, and socioeconomic issues related to fisheries and marine resources that may be affected by this project, including species that live within, or seasonally use, the immediate project area and adjacent locations. For benthic resources, fish, and invertebrate species, this section should include an assessment of species status and habitat requirements, including benthic, demersal, bentho-pelagic, and pelagic species and infaunal, emergent fauna, and epifaunal species living on and within surrounding substrates. The discussion of commercial and recreational (party/charter and private angler) fisheries affected should assess landings, revenue, and effort; fishery participants, including vessels, gear types, and dependency upon fishing within the project area; potential impacts beyond the vessel owner level (e.g., shoreside support services such as dealers, processors, distributors, suppliers, etc.); and coastal communities dependent on fishing. Our offshore wind socioeconomic impacts page (available at: https://www.fisheries.noaa.gov/resource/data/socioeconomic-impacts-atlantic-offshore-wind-development?utm_medium=email&utm_source=govdelivery) can help identify important commercial and recreational fisheries, while the status of many species can be found on our individual species pages (available at: https://www.fisheries.noaa.gov/find-species), and recent trends can be found on our Stock SMART page (available at: https://www.st.nmfs.noaa.gov/stocksmart?app=homepage). Information that can help characterize communities engaged in fishing activity can be found on our website describing social indicators for coastal communities (available at: https://www.fisheries.noaa.gov/national/socioeconomics/social-indicators-coastal-communities) and should be integrated into the EIS.

The section describing the "Affected Environment" for protected species should include information on the seasonal abundance and distribution of marine mammals, sea turtles, ESA-listed marine fish, anticipated habitat uses (e.g., foraging, migrating), threats, and the habitats and prey these species depend on throughout the area that may be directly or indirectly impacted by the project. The status of marine mammal stocks (see our stock status reports[2]), population trends, and threats should also be identified. Similar information should also be provided for all ESA listed species (see relevant status reviews on our ESA Species Directory, https://www.fisheries.noaa.gov/species-directory/threatened-endangered).[3] As the EIS is developed, specificity between species groups (e.g., low frequency vs. mid frequency cetaceans) of marine mammals and sea turtles should be incorporated. A broad grouping approach (e.g., all marine mammals) creates uncertainty and gaps in the analysis and does not fully represent the variability of impacts amongst different taxa. As species within these taxa have different life histories, biology, hearing capabilities, behavioral and habitat use patterns, distribution, etc., project effects may not have the same degree of impact across all species. Thus, the impact conclusions (e.g., minor, moderate) are clearer and better supported if the document describes the degree of impacts to each species (e.g., green sea turtle vs. hawksbill) or groups of species (e.g., mysticetes, odontocetes, pinnipeds). Additionally, for some marine mammal species (e.g., harbor porpoise), data from European wind farms can be used to support each determination. This approach also allows the analysis to better identify the ability of those species or groups to compensate when exposed to stressors and better identify the benefit from mitigation and monitoring measures. This approach would ensure the analysis reduces uncertainty and reflects the best available scientific information. Also, wherever possible, we encourage you to identify effects to individuals (e.g., injury, behavioral disturbance, disrupted foraging), as well as impacts at the population level.

Environmental Consequences

The "Environmental Consequences" section of the EIS must consider impacts resulting from the construction, operation and maintenance, and decommissioning of the proposed facility, including survey and monitoring activities that are anticipated to occur following approval of a COP. Impact descriptions should include both magnitude (negligible, minor, moderate, major) and direction (beneficial or negative) of impacts and, where applicable, duration. This section should consider all of the individual, direct, and indirect effects of the project, including those impacts that may occur offsite as a result of the proposed project, such as construction of landside facilities necessary to construct and support operations of the Revolution Wind project. Impact producing factors from each phase of development should be considered, including site exploration, construction, operation and maintenance, and decommissioning.

All activities included in construction of the project should be considered, including the deposition of fill material, dredging, water withdrawals, pile driving, increased vessel traffic, anchoring, and transmission cable installation. All relevant impact producing factors affecting marine resources should be evaluated, including, but not limited to, elevated noise levels, increased vessel traffic, turbidity and sedimentation, electromagnetic fields (EMF), habitat alteration, presence of structures (WTGs, substations, and cables), and localized changes in

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[2] https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessments

[3] Please note that NOAA Fisheries biological opinions should not be used as a reference unless referring to specific conclusions for which the particular project that the biological opinion was issued. We do not recommend relying on NOAA Fisheries Biological Opinions to support conclusions reached by BOEM for other projects that were not the subject of that Opinion.

currents. The document should also evaluate the potential impacts of chemical emission, including the release of chemical residues from wind farm operating materials and corrosion protection systems. The ecological impacts resulting from the loss of seabed and the associated benthic communities and forage base should be evaluated. This should include a discussion of the ecological and economic impacts associated with habitat conversion from WTG installation, offshore substations, cable installation, and scour protection. This analysis should also include site-specific benthic data collection and an evaluation of impacts of the project on different habitat types and fisheries resources that rely on them. Impacts associated with decommissioning of the project should also be included, with details on how decommissioning would occur and the environmental consequences associated with project removal. The assessment of these impacts should be completed at scales relevant to each impact type to enable meaningful comparisons between alternatives.

It is important that the analysis provides a sufficient evaluation of baseline conditions and uses the best available information to evaluate the alternatives and support the analysis of effects. Any conclusions related to the level and direction of project impacts should be fully supported by the analysis in the EIS and be consistent with impact definitions identified in the EIS. Importantly, the significance criteria definitions identifying the level of impacts from the project (e.g., negligible, minor, moderate, major) should not embed terms defined by other statutes (e.g., the definition of minor should not refer to the MMPA definition of "level A harassment") or apply other statute definitions to the impact criteria used for NEPA purposes. Rather, these definitions should be written in a way that it is clear to a reader how these impact determinations consider the spectrum of effects to individual animals (e.g., temporary behavioral disturbance, injury). We also encourage you to use definitions that are appropriate for the resource being considered (e.g., benthic habitat vs. marine mammals). To the extent that any conclusions are based on inclusion of mitigation measures, those measures must be clearly defined and include an indication as to whether the measure is considered part of the proposed action and will be required upon approval, or an option that may be implemented by the developer at their own discretion. In preparation of the NEPA document for Revolution Wind, we strongly recommend you review and incorporate comments we have made on previous BOEM documents to ensure a robust and sufficient analysis of NOAA trust resources.

Using the best scientific information available for all marine trust resources is critical to analyzing the impacts resulting from this project. Data used should include a sufficient range of years to reflect natural variability in resource conditions and fishery operations, but also current conditions. We recommend that fisheries and marine resource survey analyses consider at least 10 years of data up to and including data within the past two years. This is especially important for marine mammals given recent distribution and habitat utilization shifts.

Temporary, long-term, and permanent direct and indirect impacts to water quality, protected species, habitats, and fisheries (ecological and economic) throughout construction, operation, and decommissioning should be addressed in the EIS. The temporal classification (e.g., short-term or long-term) should be appropriate for the species, habitat types and impacts considered and should be clearly and consistently defined. The time of year that construction activities occur is also an important factor in evaluating potential biological, economic, and social impacts of the project.

In addition to focused evaluations on protected species, fish, invertebrates, and habitats, the "Environmental Consequences" section of the EIS should include a subsection evaluating impacts to commercial and recreational fisheries. The EIS should discuss biological impacts to marine species caused by the temporary or permanent loss/conversion of bottom habitat (i.e., resource distribution, productivity, or abundance changes) and direct or indirect socioeconomic impacts to commercial and recreational fishing activities and support businesses from project construction and operation such as loss of access to important fishing areas due to the presence of structures (WTGs, substations, cables, scour protection). This evaluation should also include any potential displacement of fishing activities and resulting increased gear conflicts, bycatch, catch rates, and fishing pressure in other locations. When structuring the fishery socioeconomic impact evaluation, you should address all of the elements identified in the checklist we provided in January 2021, or explain why specific elements on that checklist were not included in the EIS. As noted above, our fishery socioeconomic impact summaries can and should serve as the foundation for this analysis in the EIS, although additional project-specific analysis may be necessary to address particular impacts or mitigation/compensation arrangements with affected fisheries.

It is vital that all costs and benefits of available alternatives, including the no action alternative, are considered in a cost-benefit analysis. Costs and benefits should include both quantifiable measures (to the fullest extent that these can be usefully estimated) and qualitative measures of costs and benefits that are difficult to quantify, but nevertheless essential to consider (including potential economic, environmental, public health and safety, distributive impacts, equity, etc.).

The NEPA document should address effects of the project on Environmental Justice, including those specific to fishing communities with minority and low-income populations. We anticipate Environmental Justice concerns will be included as required under Executive Order 12898 (E.O. 12898, 59 FR 7629; February 16, 1994) Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations. This E.O. requires that "each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations in the United States and its territories…" and take into account E.O. 13985 (86 FR 7009; January 20, 2021) On Advancing Racial Equity and Support for Underserved Communities Through the Federal Government. In addition, for coastal communities that include tribal nations who value the sea and fish to sustain Native American life, projects should also consider E.O. 13175 (65 FR 67249; November 6, 2000), which requires federal agencies to establish regular and meaningful consultation and collaboration with tribal officials where tribal implications may arise.

Mitigation

NEPA requires consideration of potential mitigation from adverse impacts resulting from the construction and operation of the wind energy facility and associated cable installation. The EIS must clearly identify what mitigation measures are included as part of the proposed action and thus evaluated in the analysis, which measures are proposed as required, and measures that are optional and could be implemented by the developer to potentially reduce impacts. The document should provide information on how mitigation measures are considered in the context of the definition of effects levels (e.g. negligible, minor, moderate, major), and how mitigation would offset those levels of effect. An analysis of the effectiveness of any proposed mitigation should also be evaluated in the NEPA document. Measures to avoid and minimize impacts such as speed restrictions for project vessels, soft start procedures, noise dampening technologies, construction timing, anchoring plans, or micro-siting should be discussed in detail, including what resources would benefit from such mitigative measures and how/when such benefits (or impact reductions) would occur. The EIS should analyze temporary effects and anticipated recovery times for marine resources within the impacts analysis.

While the project should be planned and developed to avoid and minimize adverse effects to marine resources and existing uses (fishing and NMFS scientific survey operations) to the greatest extent practicable, compensatory mitigation should be proposed to offset unavoidable permanent and temporary impacts. Compensatory mitigation for social and economic losses and ecological losses should be discussed in the EIS, including any loss of fisheries revenue resulting from the construction and operation of the project and conservative quotas set in response to reduced scientific survey access and associated increasing uncertainty in stock assessments along with any potential proposed measures to compensate for such losses. Additionally, the potential for bycatch measures resulting from protected species interactions due to shifts in fishing activity and increased uncertainty in protected species assessments should be analyzed and discussed. Details of compensation plans describing qualifying factors, time constraints, allowed claim frequency, etc. should also be included when possible, particularly if used as mitigation measures to reduce economic impacts from access loss/restriction, effort displacement, or gear damage/loss. Finally, mitigation necessary to offset negative impacts to longstanding marine scientific survey operations (e.g., loss of access to project areas, changes to sampling design, habitat alterations, and reduced sampling due to increased transit time) and fisheries dependent data collections must also be considered and evaluated in the document (see description of scientific survey impacts below) .

Cumulative Effects

The EIS should include a complete analysis of the cumulative impacts of the project. This analysis should describe the effects of the proposed project, which in combination with any past, present, and reasonably foreseeable future actions, may result in cumulative impacts on the ecosystem and human environment. This analysis should include a broad view of all reasonably foreseeable activities, including but not limited to, energy infrastructure (including future wind energy projects), sand mining, aquaculture, vessel activity, fisheries management actions, disposal sites, and other development projects. Consistent with efforts to evaluate the cumulative effects for both the Vineyard Wind and South Fork Wind projects, offshore wind development projects that have been approved and those in the leasing or site assessment phase should also be evaluated. Specifically, the cumulative effects analysis should consider all 16 COPs BOEM recently announced it plans to process by 2025. We encourage you to use the final cumulative impact analysis from the Vineyard Wind project to help inform discussions of cumulative effects on marine resources from other offshore wind development projects for this EIS. However, for this project, additional focus on cumulative impacts of development on Cox Ledge should also be incorporated. Although lease auctions for the New York Bight have not yet been conducted, consideration of the impacts from potential projects in the New York Bight Wind Energy Areas are warranted, particularly if the lease areas are defined and auctions completed before the EIS for this project has been finalized.

The EIS should evaluate cumulative impacts of project construction, operation and decommissioning. Consideration of impacts from multiple projects is particularly important for migrating species, such as marine mammals, sea turtles, fish, and invertebrates that may use or transit multiple proposed project areas. The potential cumulative impacts on the migration and movements of these species resulting from changes to benthic and pelagic habitats and potential food sources due to the presence of multiple projects should be evaluated in the cumulative effects analysis.

Assessment of Hydrodynamics and Oceanographic Conditions
An assessment of the potential impacts of the Revolution Wind project-specific (turbine level) and the full build-out/cumulative offshore wind scenario on hydrodynamics and oceanographic and atmospheric conditions will help evaluate impacts on species distribution and the effects to hydrodynamic conditions. The potential impact of offshore wind development is not well known, but large scale energy extraction from wind farms and the physical presence of wind turbine foundations could have a significant impact on stratification in this region and therefore the ecology, habitat, and egg/larvae and prey distribution of a number of federally managed fish species and protected species. We recognize there is uncertainty regarding the scope and scale of impacts that may result from the introduction of new structures into the offshore environment and related energy extraction from the wind turbines; however, it is critical that this issue is thoroughly addressed and that the EIS considers the best available scientific information to support any conclusions regarding these impacts. In particular, the EIS should contain a robust assessment of the potential effects of both the Revolution Wind project and the full build-out scenario on prey resources for North Atlantic right whales and other species. Potential impacts to plankton distribution should be clearly discussed as their distribution, aggregation, and possible abundance may shift, and this could have a significant impact on North Atlantic right whales, along with other large whales and numerous species of planktivorous pelagic fish, as zooplankton are the primary source of prey for many higher trophic level organisms. In addition, consideration of impacts to species recruitment and larval distribution due to changes to ocean stratification and circulatory patterns resulting from the development of wind projects should be discussed in this section.

Assessment of Overlapping Activities
The EIS should evaluate, in detail, the cumulative impacts on protected species and fisheries resources associated with overlapping construction activity of adjacent projects, including elevated noise levels, displaced fishing effort, cable routing and burial, and changes in species abundance, among other impacts. Specific information related to the timing of the construction activity and the expected number of proposed construction seasons is important, particularly for evaluating cumulative impacts to marine mammals, sea turtles, and spawning activity of fish and invertebrates. Additional focused analysis should assess the effects of cumulative development and associated activities on Cox Ledge and the marine resources that depend on this unique area. Vessel strikes are a documented threat to a number of protected species including Atlantic sturgeon, sea turtles, and large whales, including critically endangered North Atlantic right whales. The EIS should evaluate, in detail, the cumulative effects of increased vessel traffic during all phases of the project. In addition, an assessment of cumulative impacts of existing and

proposed transmission cables should also be considered. Based on the proposed wind development projects in this region, there is the potential for substantial additive impacts associated with the number of required cables. As part of the cumulative effects analysis, measures to minimize the additive impacts should be considered, including the evaluation of designated cable routes and coordination and consolidation with adjacent projects to minimize cumulative impacts.

Assessment of Regional Fishery Impacts
The EIS should evaluate the cumulative impacts of multiple projects on fishing operations, such as changes to time and area fished, gear type used, fisheries targeted, and landing ports. Some fishing vessels operate in multiple areas that may be subject to wind project development. While some may choose to continue to fish in these areas, others may be displaced from one or more project areas and fish in different areas outside the project areas. Therefore, it is important to evaluate how all existing and potential future wind projects could affect overall fishing operations due to effort displacement, shifts from one fishery to another, changes to gear usage and frequency, changes to fishery distribution and abundance, and increased fishing effort due to fishing in less productive areas. The EIS should consider the socio-economic impacts on fishing communities that cannot relocate fishing activity due to cultural norms (fishing grounds claimed or used by others), cost limitations (too expensive to travel greater distances to other fishing areas), and other relevant limiting factors. Shifts in fishing behavior, including location and timing, may result in cumulative impacts to habitat as well as target and bycatch species (both fish and protected species) that have not been previously analyzed in fishery management actions. Finally, reduced regional scientific survey access to project areas could increase uncertainty in associated stock assessments and result in more conservative quotas that would negatively impact fishery operations in all fisheries. Accordingly, the analysis should also consider cumulative impacts of all wind projects in the context of existing fisheries management measures.

Project-specific Monitoring Programs and Regional Surveys
Given the extent of potential offshore wind development on the OCS and in this region in particular, the cumulative effects analysis will be a critical component of the EIS. Establishing a regional monitoring program will be important to help understand potential impacts of wind energy projects and identify potential mitigation measures for any future projects. As you are aware, we have been working with state agencies, developers, and research institutions through the Responsible Offshore Science Alliance to develop a regional scientific research and monitoring framework, including project-specific monitoring plan/study guidance to better identify and understand cumulative impacts and interactions between marine resources, fisheries, and offshore wind energy. Similarly, we are engaged in the development of the Regional Wildlife Science Entity in an effort to address regional science and monitoring of impacts to wildlife and protected species. It is imperative that project-specific monitoring efforts are integrated into existing regional monitoring programs throughout the outer continental shelf, unless there is a project or location specific research question explicit to characteristics and dynamics unique to the site and relevant to trust resources management. We request that you require monitoring at multiple scales and take an ecosystem-based approach to assessing monitoring needs of fisheries, habitat, and protected species. This will be important to not only assess the cumulative impacts of project development; it will also help inform any future

development. We recommend you coordinate with our agency early in the process related to any potential effects of monitoring activities on NOAA trust resources; we note that survey or monitoring activities may require permits or authorizations from us.

Endangered Species Act

The following listed species may be found in the Revolution Wind lease area: Endangered North Atlantic right (*Eubalaena glacialis*), fin (*Balaenoptera physalus*), sei (*Balaenoptera borealis*), and sperm (*Physeter macrocephalus*) whales; endangered Kemp's ridley (*Lepidochelys kempii*) and leatherback (*Dermochelys coriacea*) sea turtles; threatened North Atlantic distinct population segment (DPS) of green (*Chelonia mydas*) sea turtles and Northwest Atlantic DPS of loggerhead (*Caretta caretta*) sea turtles; and five DPSs of Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*). Sea turtles are present in the lease area seasonally, with occurrence largely limited to May - November. Additionally, oceanic whitetip shark (*Carcharhinus longimanus*) and giant manta ray (*Manta birostris*) may occasionally occur in the more offshore portions of the project area. More information on these species is available on our regional ESA information site[4]. North Atlantic right whale sightings are available at our NOAA Right Whale Sightings Map page[5]. Please note, a tech memo[6] was recently published with the new population estimate (368 individuals) for North Atlantic right whales, which was significantly lower than the previous estimate. Additionally, we would like to alert you that the 2020 draft marine mammal Stock Assessment Reports[7] are available, and we aim to publish the final drafts in June 2021. There is no designated critical habitat that overlaps with the lease area. We do not have sufficient information on the project to determine if any vessel transit routes would overlap with any designated critical habitat. Depending on vessel traffic routes, additional ESA species may occur in the project area. Please see Attachment 1 to this letter for a list of recommended scientific references for consideration related to the presence of ESA-listed species in or near the lease area.

ESA Section 7 Consultation

Under section 7(a)(2) of the ESA, each Federal agency is required to ensure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of any endangered or threatened species. Because the activities that are reasonably certain to occur following the proposed approval of the Revolution Wind COP (including surveys, construction, operation, and decommissioning) may affect ESA-listed species and/or designated critical habitat, section 7 consultation is required. It is our understanding BOEM will be the lead Federal agency for this consultation, and that you will coordinate with any other Federal agencies that may be issuing permits or authorizations for this project, as necessary, so that we can carry out one consultation that considers the effects of all relevant Federal actions (e.g., issuance of permits by the U.S. Army Corps of Engineers and/or the U.S. Environmental Protection Agency and issuance of any

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[4] https://www.fisheries.noaa.gov/new-england-mid-atlantic/consultations/section-7-species-critical-habitat-information-maps-greater

[5] https://apps-nefsc.fisheries.noaa.gov/psb/surveys/MapperiframeWithText.html

[6] Pace, RM. 2021. Revisions and Further Evaluations of the Right Whale Abundance Model: Improvements for Hypothesis Testing. NOAA Tech Memo NMFS-NE-269; 49 p. Available online at https://apps-nefsc.fisheries.noaa.gov/rcb/publications/tm269.pdf

[7] https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessment-reports

MMPA take authorization by NOAA's National Marine Fisheries Service (NMFS)) regarding any wind energy facility proposed in the lease area.

Considerations for the EIS

We expect that any environmental documentation regarding a proposed wind facility in the lease area will fully examine all potential impacts to our listed species, the ecosystems on which they depend, and any designated critical habitat within the action area. We have developed a checklist (ESA Information Needs document) to identify information needs for considering effects of wind projects on ESA-listed species and critical habitats and we strongly encourage you to use that as you develop the EIS. We also strongly urge you to carefully consider the information we have provided for the Vineyard Wind and South Fork NEPA documents and to incorporate that into this EIS as appropriate.

The construction and operation of a wind energy facility and installation of subsea electrical cables have the potential to impact listed species and the ecosystems on which they depend. Potential effects of offshore wind energy development on listed species that should be considered by BOEM when making any determinations about construction and operation in the Revolution Wind project area include:

- Potential for an increased risk of vessel strike due to increases in vessel traffic and/or shifts in vessel traffic patterns due to the placement of structures;
- Impacts of elevated noise during any geophysical and geotechnical surveys, pile driving, wind turbine operations, and other activities;
- Any activities which may displace species from preferred habitats, alter movements or feeding behaviors, increase stress and/or result in temporary or permanent injury or mortality;
- Disruption of benthic habitats during construction and conversion of habitat types that may affect the use of the area, alter prey assemblages or result in the displacement of individuals;
- Impacts to water quality through sediment disturbance or pollutant discharge; project lighting as a potential attractant;
- Effects from electromagnetic fields and heat from inter-array and export cable to listed species and their prey (i.e. ability to forage, attraction, etc.); and
- Potential changes to pelagic habitat resulting from the presence of wind turbines.

The EIS should also consider how any proposed wind farm may displace or alter fishing or existing vessel activity that may change the risk to protected species from interactions with fisheries or vessels either within or outside the lease area, including potential risks of interactions with recreational fishing activity around foundations and entanglement in marine debris that may become ensnared on the foundations. Additionally, the EIS should consider effects of any surveys that may occur following potential COP approval that may affect listed species (e.g., gillnet or trawl surveys to characterize fisheries resources), as well as any pre- or post-construction monitoring that may affect listed species. For further information on effects to consider, please refer to the ESA Information Needs document.

It is our understanding BOEM will develop a Biological Assessment (BA) to support your eventual request for ESA section 7 consultation. While we understand that you intend to prepare the BA as a stand-alone document (i.e., you are not planning for the EIS to serve as the BA), we anticipate and expect that the BA will be an appendix to the EIS. We are not opposed to an approach whereby the EIS would serve as the BA, provided sufficient detail and analyses can be included. We understand the BA and the NEPA document are likely to evaluate effects of activities consistent with a design envelope and are likely to take a "maximum impact scenario" approach to assessing impacts to listed species that may occur. We encourage early coordination with us to determine which impact-producing factors should be analyzed based on a "worst case" or "maximum impact" scenario and which parts of the design envelope would need to be narrowed to carry out a reasonable analysis that would support your request for section 7 consultation.

Through the EIS, you should consider requiring the development of minimization and monitoring measures that minimize the risk of exposure to potentially harassing or injurious levels of noise to marine mammals, sea turtles, and Atlantic sturgeon. Mitigation measures should be required during pile driving that will act to reduce the intensity and extent of underwater noise and avoid exposure of listed species to noise that could result in injury or behavioral disturbance. The use of protected species observers to establish and monitor clearance zones prior to pile driving is essential and project scheduling should take into account the need for adequate visibility during the pre-pile driving clearance period, as well as for the duration of pile driving activities. Real-time and archival passive acoustic monitoring should also be used as a secondary detection/monitoring system during construction, to increase situational awareness in vessel corridors and around the project area, and to monitor the distribution of marine mammals in the lease area during construction and operations. We encourage you to work with Revolution Wind to develop a project schedule that minimizes potential impacts to North Atlantic right whales. Specifically, you should consider time of year restrictions for pile driving that would avoid pile driving during the months when the density of North Atlantic right whales is highest in the lease area and the development of robust measures for other times of year that would minimize the exposure of right whales to noise that could result in behavioral disturbance. Marine mammal responses to sound can be highly variable, depending on the individual hearing sensitivity of the animal, the behavioral or motivational state at the time of exposure, past exposure to the noise which may have caused habituation or sensitization, demographic factors, habitat characteristics, environmental factors that affect sound transmission, and non-acoustic characteristics of the sound source, such as whether it is stationary or moving (NRC 2003)[8]. While BOEM and Revolution Wind will need to consider effects to all listed species, given the imperiled status of North Atlantic right whales, implementing measures to ensure that no right whales are injured or killed as a result of the Revolution Wind project is critical.

Mitigation measures should also be included that minimize the risk of vessel strike for whales, sea turtles, and Atlantic sturgeon, including consideration of vessel speed restrictions regardless of vessel size and robust measures to monitor vessel transit routes for North Atlantic right whales. Recent events and new information (see, https://doi.org/10.1111/mms.12745) demonstrate that large whales are susceptible to lethal vessel strikes from vessels of all sizes. Any surveys or monitoring that are carried out related to the project (e.g., gillnet or trap surveys

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[8] National Research Council (NRC). 2003. Ocean noise and marine mammals. National Academy Press; Washington, D.C.

to document fisheries resources) must carefully consider the effects to North Atlantic right whales and other ESA-listed species, and mitigation measures should be considered to eliminate the potential for entanglement of whales and to minimize risk to sea turtles and Atlantic sturgeon during such activities.

Marine Mammal Protection Act
Section 101(a) of the MMPA (16 U.S.C. 1361) prohibits persons or vessels subject to the jurisdiction of the United States from taking any marine mammal in waters or on lands under the jurisdiction of the United States or on the high seas (16 U.S.C. 1372(a)(1), (a)(2)). Sections 101(a)(5)(A) and (D) of the MMPA provide exceptions to the prohibition on take, which give us the authority to authorize the incidental but not intentional take of small numbers of marine mammals, provided certain findings are made and statutory and regulatory procedures are met. IITAs may be issued as either (1) regulations and associated Letters of Authorization (LOA) or (2) an Incidental Harassment Authorization (IHA). LOAs may be issued for up to a maximum period of five years; IHAs may be issued for a maximum period of one year. We also promulgated regulations to implement the provisions of the MMPA governing the taking and importing of marine mammals (50 Code of Federal Regulations (CFR) part 216) and published application instructions that prescribe the procedures necessary to apply for an ITA. U.S. citizens seeking to obtain authorization for the incidental take of marine mammals under NMFS's jurisdiction must comply with these regulations and application instructions in addition to the provisions of the MMPA.

Information about the MMPA and 50 CFR part 216 is available on our website at https://www.fisheries.noaa.gov/topic/laws-policies#marine-mammal-protection-act. Information on the application process is available at https://www.fisheries.noaa.gov/node/23111 and the application along with detailed instructions is available at https://www.fisheries.noaa.gov/national/marine-mammal-protection/apply-incidental-take-authorization.

Because activities associated with the construction of Revolution Wind have the potential to result in the harassment[9] of marine mammals, we anticipate that a request for an ITA pursuant to section 101(a)(5) of the MMPA may be submitted to us by the project proponent. NMFS's proposal to issue an ITA that would allow for the taking of marine mammals, consistent with provisions under the MMPA and incidental to an applicant's lawful activities, is a major federal action under 40 CFR 1508.1(q)[10], requiring NEPA review. Rather than prepare a separate NEPA document, NMFS, consistent with the CEQ regulations at 40 CFR 1506.3, intends to adopt BOEM's Final EIS to support its decision to grant or deny Revolution Wind LLC's request for an ITA pursuant to section 101(a)(5)(A) or (D) of the MMPA. When we serve as a cooperating agency and we are adopting another agency's EIS, we ensure all resources under our jurisdiction

[9] Harassment, (as defined in the MMPA for non-military readiness activities (Section 3(18)(A)), is any act of pursuit, torment, or annoyance that has the potential to injure a marine mammal or marine mammal stock in the wild (Level A harassment) or any act of pursuit, torment, or annoyance that has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns (Level B harassment). Disruption of behavioral patterns includes, but is not limited to, migration, breathing, nursing, breeding, feeding or sheltering.
[10] All references to the Council on Environmental Quality NEPA regulations included in this letter apply to the 2020 regulations effective September 14, 2020.

by law and over which we have special expertise are properly described and the effects sufficiently evaluated, documented, and considered by the lead agency EIS. Of particular importance is that the Draft and Final EIS address comments and edits NMFS provides in developing the documents. As a cooperating agency per 40 CFR 1501.8, we must determine that the Final EIS properly addresses our comments and input in order for NMFS to determine the EIS is suitable for adoption per 40 CFR 1506.3 and NOAA's NEPA procedures[11]. A summary of NOAA's adoption requirements is below, and the procedures are available at https://www.nepa.noaa.gov/docs/NOAA-NAO-216-6A-Companion-Manual-01132017.pdf.

We may adopt all or portions (e.g., specific analyses, appendices, or specific sections) of the NEPA document prepared by another federal agency, regardless of cooperating agency status, if the action addressed in the adopted document (or portion) is substantially the same as that being considered or proposed by NOAA, and NOAA determines the document (or portion) satisfies 40 CFR 1506.3. Subsequently, we must determine your EIS addresses the following to be considered adequate for adoption for the issuance of ITAs:

- The other agency EIS (or portion thereof) fully covers the scope of our proposed action and alternatives and environmental impacts;
- An adequate evaluation of the direct, indirect, and cumulative impacts on marine mammals and the marine environment, including species listed under the ESA;
- An adequate discussion of the MMPA authorization process necessary to support implementation of the action;
- A reasonable range and evaluation of alternatives to the proposed action, including a no action alternative and alternatives to mitigate adverse effects to marine mammals, including species listed under the ESA;
- There is a thorough description of the affected environment including the status of all marine mammals species likely to be affected;
- There is a thorough description of the environmental impacts of the proposed action and alternatives, including direct, indirect, and cumulative impacts on marine mammals and projected estimate of incidental take;
- Identification and evaluation of reasonable mitigation measures to avoid or minimize adverse impacts to marine mammals, including species listed under the ESA; and
- The listing of agencies consulted.

As part of our review, we must also determine if your EIS meets the requirements of 40 CFR Part 1500-1508, specifically basic requirements for an EIS as described in 40 CFR 1506.3. Therefore, the EIS must contain an adequate evaluation of the impacts on all marine mammals that may be present in the project area. In order to take a requisite "hard look" at environmental impacts, the analysis should consider the affected environment and degree of impact on each resource which involves an evaluation of direct and indirect effects, as well cumulative effects; the duration of the impact; whether it is beneficial or adverse and the geographic scale in which the action is occurring (e.g., local, regional). Specifically, the EIS must include an analysis of

[11] NOAA Administrative Order (NAO) 216-6A "*Compliance with the National Environmental Policy Act, Executive Orders 12114, Environmental Effects Abroad of Major Federal Actions; 11988 and EO 13690, Floodplain Management; and 11990, Protection of Wetlands*" issued April 22, 2016 and the Companion Manual for NAO 216-6A "*Policy and Procedures for Implementing the National Environmental Policy Act and Related Authorities*" issued January 13, 2017.

the impacts of elevated underwater noise on marine mammals resulting from pile driving, site characterization surveys, and other project-related activities; the risk of vessel strike due to increases in vessel traffic and/or changes in vessel traffic patterns; any activities that may increase the risk of entanglement; any activities that may result in the displacement of individuals or changes to migratory behavior; any activities that may result in altered prey assemblages or changes in feeding behavior; and any other activities that may result in harassment, injury or mortality to marine mammals.

Magnuson-Stevens Fishery Conservation and Management Act
As currently described in the NOI, this facility (inclusive of the wind farm area, offshore and inshore export cables and corridors, and shoreside landing points) will be constructed, operated, and maintained in areas designated EFH for various life stages of species managed by the New England Fishery Management Council (NEFMC), Mid-Atlantic Fishery Management Council (MAFMC), and NMFS. Species for which EFH has been designated in the project area include, but are not limited to, Atlantic cod (*Gadus morhua*), ocean pout (*Zoarces americanus)*, summer flounder (*Paralichthys dentatus*), pollock (*Pollachius virens)*, silver hake (*Merluccius bilinearis)*, winter flounder (*Pseudopleuronectes americanus*), Northern longfin squid (*Doryteuthis pealii*), winter skate (*Leucoraja ocellata*), little skate (*Leucoraja erinacea*), windowpane flounder (*Scophthalmus aquosus*), bluefish (*Pomatomus saltatrix*), black sea bass (*Centropristis striata*), red hake (*Urophycis chuss*), scup (*Stenotomus chrysops*), yellowtail flounder (*Limanda ferruginea*), Atlantic sea scallop (*Placopecten magellanicus*), and Atlantic surfclam (*Spisula solidissima*). The proposed project area is also designated EFH for several Atlantic highly migratory species (tuna, swordfish, billfish, small and large coastal sharks, and pelagic sharks) including, but not limited to, Atlantic angel shark (*Squatina dumeril*), blue shark (*Prionace glauca*), bluefin tuna (*Thunnus thynnus*) sandbar shark (*Carcharhinus plumbeus*) and sand tiger shark (*Carcharias taurus*). The sand tiger shark has been listed as a Species of Concern by NOAA. As mentioned above, a portion of the project area is also designated as a Habitat Areas of Particular Concern (HAPC) for juvenile cod.

The most up-to-date EFH and HAPC designations should be used in your evaluation of impacts to EFH. HAPCs are a subset of EFH that are especially important ecologically, particularly susceptible to human-induced degradation, vulnerable to developmental stressors, and/or rare. EFH and HAPC for species managed by the NEFMC have been modified under the Omnibus Amendment which was approved and implemented in 2018. The EFH mapper should be used to query, view, and download spatial data for the species managed by the New England, Mid-Atlantic, and South Atlantic Councils and for Highly Migratory Species. The EFH mapper can be accessed from our habitat website at https://www.habitat.noaa.gov/protection/efh/efhmapper/. You should also be aware that the Final Amendment 10 to the 2006 Consolidated Atlantic Highly Migratory Species (HMS) Fishery Management Plan (FMP) went into effect on September 1, 2017. This amendment contains several changes to the EFH designations for sharks and other highly migratory species. More information can be found on our website at https://www.fisheries.noaa.gov/topic/atlantic-highly-migratory-species.

Considerations for the EIS
As discussed throughout our comments, the Revolution Wind project is proposed to be constructed on Cox Ledge and overlaps with unique and complex habitats, including known cod

spawning locations. The NEPA document, and the EFH, benthic resources, finfish and invertebrates sections, in particular, should accurately describe the project area and the resources that rely on Cox Ledge and adjacent complex habitat areas that are susceptible to project impacts. The document should fully describe the distinct habitat features of the entire project area and the importance of different habitat types for providing structure and refuge, not only from the presence of large boulders and megaclasts, but also pebbles, cobbles, and small boulders that are important habitat for eggs, larvae, and juveniles. The evaluation of project impacts should not only consider impacts of the project against the cumulative geographic scope (e.g. the OCS), but also clearly evaluate anticipated impacts of project construction and operation to Cox Ledge and the distinct habitat types found in the lease area, along the export cable route, and inshore landfall locations. The document should analyze the effects to the physical habitat features and the biological consequences of those effects. It will be important to consider impacts of the project on all life stages (adults, juveniles, larvae, eggs), and we recommend focusing on species and life stages that may be more vulnerable to impacts.

We would also note that impacts to complex habitats, such as those found in the project area, are known to result in long recovery times and are potentially permanent. Such impacts may result in cascading long term to permanent effects to species that rely on this area for spawning and nursery grounds and the fisheries and communities that target such species. The evaluation of impacts from project construction and operation should evaluate the potential for recovery and the anticipated recovery times based on the habitat type and components that would be impacted. Based on our initial review of the COP, the document appears to describe installation associated with the WTGs and cables to largely be short-term in nature. However, complex habitats may be permanently impacted or take years to decades to recover from certain impacts and this variability in recovery times by habitat type and components should be fully discussed and analyzed in the document.

The analysis should include a broad discussion of the potential effects of habitat alteration from construction and operation of the project using the best available scientific information. The analysis should address the potential impact of converting smaller-grained hard habitats that support early life history stages of finfish to artificial reefs that may attract larger predator species. While the WTGs may create a reef effect, the document should clearly distinguish the difference between man-made structures and the natural complex habitat present in the project area. Specifically, artificial habitats are only a component of the EFH designation for two managed fish species (black sea bass and red hake) in the region. The distinction between the natural and man-made structures should be incorporated into the analysis.

In addition to the complexity of the habitat, Cox Ledge supports known spawning aggregations of Atlantic cod. The southern New England spawning population represents the southernmost spawning contingent of this species along the Atlantic coast and contributes to the availability of the species throughout Southern New England waters. Recent information indicates these fish comprise a unique spawning population and suggests they may be more tolerant of warming waters. The protection of this spawning population enhances genetic diversity and may increase the potential for the species as a whole to adapt to climate change. Preliminary results from a BOEM-funded acoustic and telemetry study demonstrate a clear overlap of the project with cod spawning activity[12]. Atlantic cod spawn in this area between November and April, with preliminary results suggesting peak spawning times occur between November and January. Spawning aggregations can be easily disturbed by in-water activities and disruptions to spawning aggregations may affect reproductive success, which could result in significant long-term effects to the stock. Further, cod stocks are currently depleted in part due to low recruitment in recent years. The importance of specific habitat features (e.g. the presence of epifauna) has been demonstrated to increase the survivorship of juvenile cod. The loss or alteration of such features may result in decreased recruitment and success of juveniles resulting in long term effects for this spawning population. The NEPA document should fully evaluate potential impacts of project construction and operation on Atlantic cod, including potential impacts to early life stages (e.g. habitats that support early stage juveniles after they settle to the bottom) and spawning activity from pile driving and ground disturbing activities. Specific measures to avoid and minimize these impacts should also be analyzed and discussed in the NEPA document.

In addition to Atlantic cod, spawning activity and sensitive life stages (eggs, larvae and juveniles) of other managed species are present throughout both the lease area and export cable corridor. The EIS should discuss impacts to sensitive life stages that may be more vulnerable to impacts. For example, both winter flounder and longfin squid (two species with designated EFH in the project area) have demersal eggs that are particularly vulnerable to sedimentation and burial. Potential impacts of the project on vulnerable life stages such as this, including potential impacts to recruitment, should be discussed in detail and specific measures for avoiding and minimizing impacts should be identified in the document.

EFH Consultation

In the MSA, Congress recognized that one of the greatest long-term threats to the viability of commercial and recreational fisheries is the continuing loss of marine, estuarine, and other aquatic habitats. Congress also determined that habitat considerations should receive increased attention for the conservation and management of fishery resources of the United States. As a result, one of the purposes of the MSA is to promote the protection of EFH in the review of projects conducted under federal permits, licenses, or other authorities that affect or have the potential to affect such habitat.

The MSA requires federal agencies to consult with the Secretary of Commerce, through NMFS, with respect to "any action authorized, funded, or undertaken, or proposed to be authorized, funded, or undertaken, by such agency that may adversely affect any essential fish habitat identified under this Act," 16 U.S.C. § 1855(b)(2). This process is guided by the requirements of our EFH regulation at 50 CFR 600.905. Pursuant to the MSA, each FMP must identify and describe EFH for the managed fishery, and the statute defines EFH as "those waters and substrates necessary to fish for spawning, breeding, feeding or growth to maturity" 16 U.S.C. § 1853(a)(7) and § 1802(10). NOAA's regulations further define EFH adding, "waters" include aquatic areas and their associated physical, chemical, and biological properties that are used by fish and may include aquatic areas historically used by fish where appropriate; "substrate" includes sediment, hard bottom, structures underlying the waters, and associated biological communities; "necessary" means the habitat required to support a sustainable fishery and the

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[12] Van Parijs pers.comm. related to ongoing study - Mapping the distribution of habitat use of soniferous fish on Cox's ledge, with a focus on Atlantic cod spawning aggregations (BOEM. Award #M19PG00015)

managed species' contribution to a healthy ecosystem; and “spawning, breeding, feeding, or growth to maturity” covers a species' full life cycle.

The EFH final rule published in the *Federal Register* on January 17, 2002, defines an adverse effect as: “any impact which reduces the quality and/or quantity of EFH.” The rule further states that:

> An adverse effect may include direct or indirect physical, chemical, or biological alterations of the waters or substrate and loss of, or injury to, benthic organisms, prey species and their habitat and other ecosystems components, if such modifications reduce the quality and/or quantity of EFH. Adverse effects to EFH may result from action occurring within EFH or outside EFH and may include site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions.

As stated above, adverse impacts to EFH may result from actions occurring within or outside of areas designated as EFH. In addition, the EFH final rule also states that the loss of prey may be an adverse effect on EFH and managed species. As a result, actions that reduce the availability of prey species, either through direct harm or capture, or through adverse impacts to the prey species' habitat may also be considered adverse effects on EFH. The EFH regulations state that for any Federal action that may adversely affect EFH, Federal agencies must provide NMFS with a written assessment of the effects of that action on EFH (50 CFR 600.920(e)). This EFH Assessment should include analyses of all potential impacts, including temporary and permanent and direct and indirect individual, cumulative, and synergistic impacts of the proposed project.

The EFH assessment must contain the following mandatory elements: (i) a description of the action, (ii) an analysis of the potential adverse effects of the action on EFH and the managed species, (iii) the federal agency’s conclusions regarding the effects of the action on EFH, and (iv) proposed mitigation, if applicable (50 CFR 600.920(e)(3)). Due to the potential for substantial adverse effects to EFH from the proposed project, an expanded EFH consultation as described in 50 CFR 600.920(f) is necessary for this project. As part of the expanded EFH consultation, the EFH Assessment for the proposed project, the assessment should also contain additional information, including: (i) the results of an on-site inspection to evaluate the habitat and the site specific effects of the project, (ii) the views of recognized experts on the habitat or species that may be affected, (iii) a review of pertinent literature and related information, (iv) an analysis of alternatives to the action, and (v) other relevant information.

The EFH expanded consultation process allows the maximum opportunity for NMFS and the Federal action agency - in this case, BOEM - to work together to review the action's impacts on EFH and federally managed species, and for our agency to develop EFH conservation recommendations (EFH CRs). Although the EFH consultation is a separate review mandated pursuant to the MSA, our EFH regulations encourage the consolidation of the EFH consultation with other interagency consultation, coordination, and environmental review procedures required by other statutes, such as NEPA, where appropriate. Because the information contained within the EIS is needed to support a complete EFH Assessment, we request you use the NEPA document as the vehicle within which to present the EFH assessment. The EFH Assessment should be included within a separate section or appendix of the document and be clearly identified as an EFH assessment.

Considerations for the EFH Assessment
We understand you permit the use of a Project Design Envelope (PDE) in the preparation of a COP, and the NEPA document will focus on analysis of the maximum impacts that would occur from the range of design parameters. However, for purposes of the EFH consultation, the EFH Assessment should be consistent with the EFH regulations under the MSA. Specifically, you are required to include in your assessment an analysis of the potential adverse effects on designated EFH, including the site-specific effects of the project, and measures that can be taken to avoid, minimize, or offset such effects (CFR 600.920(d-e)). You must assess the potential adverse impacts that would occur as a result of the range of design parameters under consideration in the PDE, rather than a maximum impact scenario. Should the EFH assessment provide insufficient details to assess impacts of the project, we may consider the assessment incomplete or provide more precautionary conservation recommendations.

The expanded EFH Assessment should include full delineation, enumeration, and characterization of all habitat types in the project area including the lease areas, cable corridors and landing sites. Particular attention should be paid to HAPCs, sensitive life stages of species, ecologically sensitive habitats, and difficult-to-replace habitats such as SAV, natural hard bottom substrates, particularly substrates with attached macroalgae and epifauna (including corals), and shellfish habitat and reefs. The habitat mapping data should also be shared directly with us in usable GIS format for review, apart from the body of the EFH Assessment and maps and figures contained therein. To aid BOEM and project applicants in the development of comprehensive and complete EFH Assessments, we have published our *Recommendations for Mapping Fish Habitat*[13], dated March 2021. This document is an updated version, which was previously submitted to you on May 27, 2020. To further streamline the consultation process, we also shared a technical assistance document with you in January of 2021, titled *Essential Fish Habitat (EFH) Information Needs for Offshore Wind Energy Projects in the Atlantic* which provides a checklist of information that should be incorporated into the EFH Assessment.

As stated in our habitat mapping recommendations, EFH checklist, and through regular communication with you, early coordination in the consultation process, particularly for projects at the size and scale of offshore wind development, is essential. We are concerned about the limited early coordination and communication for the Revolution Wind project, particularly the lack of coordination on habitat mapping and data collection in this unique habitat area. As we have previously discussed, early coordination on proposed habitat mapping procedures, including: 1) data collection (sampling design and methodologies); 2) data processing and interpretation (including habitat characterization); and 3) the development of maps that accurately delineate fish habitat, benefits all parties and will help avoid unnecessary delays in project development and consultations. It is critical that the data being collected can be used to accurately characterize and delineate fish habitat within the lease area and cable corridors to ensure we can differentiate and distinguish between, and within, areas of sensitive and complex habitats to provide appropriate conservation recommendations. This is particularly important for

[13] https://static1.squarespace.com/static/511cdc7fe4b00307a2628ac6/t/60637e9b0c5a2e0455ab49d5/1617133212147/March292021_NMFS_Habitat_Mapping_Recommendations.pdf

an area such as Cox Ledge which is dominated by complex habitats and unique features. Accurate characterization of these complex habitats and features at a fine scale will be critical to ensure our recommendations are appropriate and able to reflect any heterogeneity that may exist across what appears to be vast areas that collectively would be classified as complex. Adjustments to early survey plans based on our input will likely result in significantly better habitat data, which will streamline project review. Moving forward with habitat mapping efforts without appropriate coordination may result in the need for additional field seasons/sampling to collect and interpret additional data to accurately map fish habitat for consultation purposes.

In the absence of fine-scale and accurate fish habitat characterization and delineation, we must take a conservative approach to our assessment of project impacts and development of conservation recommendations for the project. Particularly given the complexity of habitat and associated data for this project area, we request all data related to habitat mapping (acoustic survey results, seafloor sampling data, GIS data, figures/maps, etc.) be shared with us as soon as practicable (once it is processed), so we can begin reviewing and providing comments, which will allow for more streamlined project review and consultation. Upon review of this information, we would recommend a habitat mapping-specific meeting be scheduled with us for the Revolution Wind Project.

Fish and Wildlife Coordination Act

The FWCA provides authority for our involvement in evaluating impacts to fish and wildlife from proposed federal actions that may affect waters of the United States. The FWCA requires that wildlife conservation be given equal consideration to other features of water resource development programs through planning, development, maintenance and coordination of wildlife conservation and rehabilitation. The Act does this by requiring federal action agencies to consult with us "with a view to the conservation of wildlife resources by preventing loss of and damage to such resources as well as providing for the development and improvement thereof in connection with such water-resource development" (16 USC 662.) One of the reasons that Congress amended and strengthened the FWCA in 1958 was that it recognized that "[c]ommercial fish are of major importance to our nation[,]" and that federal permitting agencies needed general authority to require "in project construction and operation plans the needed measures for fish and wildlife conservation" S.Rep. 85-1981 (1958). As a result, our FWCA recommendations must be given full consideration by federal action agencies. Your consultation with us under the FWCA may occur concurrently with the EFH consultation under the MSA.

Under the FWCA, our authority extends to numerous other aquatic resources in the area of the proposed project, including, but not limited to, the following species and their habitats: American lobster (*Homarus americanus*), striped bass (*Morone saxatilis*), American shad (*Alosa sapidissima*), alewife (*Alosa pseudoharengus*) and blueback herring (*Alosa aestivalis)* (collectively known as river herring), Atlantic menhaden (*Brevoortia tyrannus*), Atlantic silversides (*Menidia menidia*), oyster (*Crassostrea virginica*), blue mussel (*Mytilus edulis*), tautog (*Tautoga onitis*), weakfish *(Cyanoscion regalis)* and other assorted fish and invertebrates. NOAA jointly manages a number of these species through Interstate FMPs with the Atlantic States Marine Fisheries Commission. A list of Commission species and plans can be found on their website at http://www.asmfc.org.

We anticipate all of these species will be included in your impact assessments, both in the EFH Assessment and NEPA document. We also expect the assessment to include impacts to the recreational and commercial fishing communities that rely on these species. The behaviors and habitat needs of diadromous and estuary-dependent fishes (associated with cable route locations) may not be represented by a discussion solely of the surrounding marine fishes in the WTG area. The discussion for FWCA species should be designed around an ecological guild model that uses locally important species to evaluate the project impacts to organisms or populations associated with the various trophic levels and life history strategies exhibited by FWCA species known to occupy the project area as residents or transients. Focus should be on issues surrounding particular species, life history stages, or habitat components that would be most susceptible to the various potential project impacts.

Fisheries Management Comments

Species important to both commercial and recreational interests are found within the project area and associated cable corridors. The COP adequately identifies most species and fisheries that may be affected by the proposed operations. As noted in our socioeconomic impact summary report (available at https://www.greateratlantic.fisheries.noaa.gov/ro/fso/reports/WIND/WIND_AREA_REPORTS/Revolution_Wind.html) for this project, skates, Atlantic herring, silver hake (whiting), monkfish, longfin squid, scup, and American lobster are the primary commercial fisheries affected in terms of landing amounts, while Atlantic sea scallops are also important in terms of affected revenue. Because lobster vessels are only required to submit vessel trip reports (VTRs) if they are issued a Federal permit for another species (many are not), lobster and Jonah crab operations are not fully captured in available VTR data and are underrepresented in our socioeconomic impact summary report. Similarly, information on highly migratory species catch are only partially captured in VTRs available from the Greater Atlantic Regional Fisheries Office and are instead found in VTRs available from our Southeast Regional Office and the large pelagics survey (available at https://www.fisheries.noaa.gov/recreational-fishing-data/recreational-fishing-data-downloads). Such sources should be consulted when preparing the EIS. We recently developed summaries of party/charter recreational fishing operations similar to those created for commercial fishing vessels, which are posted on our website, and can distribute the data upon request. However, private angler recreational catch data are not collected with sufficient area precision to determine the amount of catch inside a particular wind project area. Despite this limitation, the project area is likely to affect important regional recreational fisheries and a discussion of private angler catch should be included in the EIS. Any requests for fishery data should be submitted to nmfs.gar.data.requests@noaa.gov.

BOEM should use information from all available and appropriate sources to characterize fishing operations and evaluate the potential impacts of the proposed project on private anglers, commercial and party/charter fishing vessels, and associated communities. As noted above, consideration of data across a broad time frame (10 years or more), including data from the most recent 2 years, is necessary to reflect both recent operations and annual fluctuations in fishing operations due to changing environmental conditions, market price, and management measures. As such, the COP and future EIS should include the most recent information available. We rely on VTRs as the best source of area-based data for all federally-managed commercial and party/charter fisheries. Both vessel monitoring system (VMS) and automatic identification system (AIS) data provide higher resolution spatial data, but such sources are not adequate to provide information on all commercial fisheries or fishing vessels. In evaluating the use of existing data sources, please refer to the list of data limitations provided in our January 2021 socioeconomic checklist. When using these data to analyze the impacts of the proposed project, BOEM should recognize such limitations and tailor impact conclusions based on the data used. Care should be taken to put operations into the proper context in future analysis to avoid mischaracterizing fishing operations and potential impacts associated with the proposed project.

Like many wind projects, it is important to recognize that fishing operations in any one area are not necessarily limited to vessels operating in adjacent ports. Our summary reports indicate that vessels from Massachusetts, Rhode Island, and New York are primarily operating within the project area, but vessels from New Jersey, Virginia, and North Carolina also fish in this area in smaller amounts. Operations and associated landings in all ports and states should be considered in future evaluations of this project as part of the EIS.

A quantitative analysis of the potential biological, social and economic costs of the project to fishing industries and their communities must be included in the EIS. As noted above, we have provided a checklist outlining the elements we expect to be included in an analysis of the socioeconomic impacts of this project. Our previously referenced socioeconomic impact summaries address nearly all of the elements on the checklist and can be used as the foundation of such an analysis. The analysis should also address potential costs associated with reduced fishing revenues as a result of short or long-term effort displacement, impacts on catch rates, changes to species composition, potential impacts of construction activity on spawning success and future recruitment, and permanent or short-term changes to EFH during construction, operation, and decommissioning the project. Vessels may experience increased operational costs from increased insurance rates to fish within wind farms or additional fuel required to transit around wind farms or search for new fishing locations. Opportunity costs such as revenue lost by fishing effort that is displaced into less productive areas, including vessels displaced out of the project area and those already fishing in an area into which displaced vessels move, and the potential for poor recruitment resulting from construction activities should be assessed. This is a critical analysis, as even marginal changes in costs could be impactful for some fisheries. Similarly, analysis of the affiliated non-market social impacts of such activities should be included in the EIS, including impacts to cultural norms, fishermen or fishing community social relationships, and health and well-being (see Fisheries Social Impact Assessment Guidance Document https://media.fisheries.noaa.gov/dam-migration/01-111-02.pdf and Practitioner's Handbook https://spo.nmfs.noaa.gov/sites/default/files/TM212_0.pdf). Finally, the EIS should consider and discuss any mitigation measures contemplated to reduce any adverse impacts to fishing operations, particularly those due to loss of area access or gear damage/loss.

Presence of structures is an impact producing factor relevant to commercial and recreational fishing that should be addressed in the EIS. While “visible structures” are listed as an impact producing factor in Section 4.1 of the current version of the COP, this does not incorporate the presence of non-visible structures that may affect marine resources and fisheries operations. For example, inter-array and export cables could affect both fish species and fishery operations directly and indirectly even though they are not “visible” when buried. The text throughout the COP seemingly dismisses the potential impacts of these non-visible structures, however.

Commercial fisheries using dredge gear, particularly hydraulic dredges in the surfclam fleet that dig further into the sediment, will likely limit fishing operations in and around all cables. In addition, the text on page 282 of the COP incorrectly and misleadingly suggests that physical oceanography resources will not be impacted from visible structures despite information documenting the effects of turbines and scour protection, ocean circulation, and mixing, all of which have both direct and indirect impacts on marine resources and fishing operations. The effects of these components of the project's infrastructure should not be discounted or ignored in the EIS. Instead, the EIS should provide a detailed analysis of how the presence of all project structures, both visible and non-visible (e.g., WTGs, substations, and cables), including layout and spacing, would affect marine resources and fishing operations, including the ability for vessels to maintain maneuverability and minimize risk of fouling gear with other gear or with such structures. Specifications of all gear types operating in the project area should be compiled and incorporated into this analysis. This analysis should consider both fishing vessels and survey vessels, including state and federal fisheries surveys.

Federal Fisheries Surveys, Fisheries Dependent Data, & Stock Assessments
As noted for other wind development projects, the Revolution Wind Project is anticipated to have major adverse impacts on NMFS Northeast Fisheries Science Center scientific surveys, which will, in turn, result in adverse impacts on fishery participants and communities, conservation and recovery of protected species, and on the American public. This project would have direct impacts on the federal multi-species bottom trawl survey conducted on the FSV Henry Bigelow, the surfclam and ocean quahog clam dredge surveys conducted on chartered commercial fishing platforms, the integrated benthic/sea scallop habitat survey, ship and aerial-based marine mammal and sea turtle surveys, and the shelf-wide Ecosystem Monitoring Survey (Ecomon). Based on standard operating practices conducted by the NOAA Office of Marine and Aviation Operations, WTG arrays would preclude safe navigation and safe and effective deployment of mobile survey gear on NOAA ships. The impacts to our scientific surveys from this project will be driven by four main mechanisms: 1) exclusion of NMFS sampling platforms from the wind development area, 2) impacts on the random-stratified statistical design that is the basis for data analysis and use in scientific assessments, advice, and analyses; 3) the alteration of benthic, pelagic, and airspace habitats in and around the wind energy development; and 4) potential reductions in sampling outside wind areas caused by potential increased transit time by NOAA vessels. Adverse effects on monitoring and assessment activities would directly impact the critical scientific information used for fisheries management and the recovery and conservation programs for protected species. These impacts would result in increased uncertainty in the surveys' measures of abundance, which could potentially lead to lower quotas for commercial and recreational fishermen and lower associated fishing revenue based on current fishery management council risk policies. These impacts will occur over the lifetime of wind energy operations at the project area and in the region (to at least 2050).

Given the anticipated development of offshore wind in our region, it is critical to expeditiously establish and implement a regional federal scientific survey mitigation program to address this significant issue. Such a survey mitigation program would include the following elements:

1. Evaluation of scientific survey designs;
2. Identification and development of new survey approaches;
3. Calibration of new survey approaches;

4. Development of interim provisional survey indices;
5. Integration of project-specific monitoring plans to address regional survey needs; and
6. Development of new data collection, analysis, management, and dissemination systems.

Information from project-specific mitigation plans could be critical inputs to the development and implementation of any future regional survey mitigation program. Project-level impacts on scientific surveys should require project-level mitigation measures for each of the seven scientific surveys disrupted by Revolution Wind. As project monitoring plans are further considered and developed, these approaches should be standardized, meet existing scientific survey protocols and develop new methods using independent-peer review processes, and methods should be calibrated to and integrated with federal regional scientific surveys, and annual data collections implemented for the operational life span of the project, or until such time as a programmatic federal scientific survey mitigation program is established. Text provided in documents prepared for other projects with similar impacts can be used to inform the assessment of scientific survey impacts for this project. Consistent with work we have done with you in the past, the NEPA document should include a full description of scientific surveys to be impacted, the history of each time series, and relative importance of the impacted scientific surveys on management advice, decision-making, and other end-users. We encourage you to work closely with us to ensure potential impacts to our scientific survey operations and consequent effects to fisheries stock assessments, fishery management measures, and protected species conservation efforts are evaluated in the EIS for this and other projects, including any efforts to mitigate such impacts.

In addition to impacts on fisheries independent survey data collections, analysis of impacts on fisheries dependent data collections, e.g., landings, biological samples, and observer data, due to potential changes in effort should also be required. This assessment should consider potential changes in mortality rates for target and non-target species and potential fisheries interactions with marine mammals and threatened and endangered species. This analysis should also consider the potential changes in fisheries dependent data collections on stocks expected to be impacted by offshore wind development impact producing effects and on the anticipated displacement of fishing operations. How these effects impact specific stock assessments should also be evaluated in addition to how these changes may impact the effectiveness of fishery management measures in meeting their objectives.

Conclusion

Thank you for the opportunity to provide comments during this important scoping process. We will continue to support the Administration's efforts to advance offshore renewable energy through our participation in the offshore wind development regulatory and planning processes. As we engage in these processes, we are committed to implementing our national strategic goals to maximize fishing opportunities while ensuring the sustainability of fisheries and fishing communities, and to recover and conserve protected species while supporting responsible fishing and resource development. To the extent possible, we will continue working with you to provide the necessary expertise, advice, and scientific information to avoid areas of important fishing activity and sensitive habitats; minimize impacts to fisheries and protected species; and support the conservation and sustainable management of our marine trust resources.

As noted earlier, we have serious concerns that the high number of projects moving through the NEPA process between now and 2024 will make it very difficult for NMFS to provide the detailed level of review and interagency cooperation we have provided to date given limited existing resources. The extensive interagency coordination we have done with you to improve the NEPA documents for other wind projects will no longer be feasible, and we will be required to take a more limited cooperating agency role in the process. To ensure we can continue to meet our collective objectives and ambitious timelines, it is imperative that we capitalize and build upon our successful collaboration on recent projects and integrate lessons learned into future project development and review. This will improve the quality of this and future projects, expedite review, and maximize the utility of available resources.

Should you have any questions regarding these comments, please contact Sue Tuxbury in our Habitat and Ecosystem Services Division at (978) 281-9176 or susan.tuxbury@noaa.gov. For questions regarding the EFH consultation for this project, please contact Alison Verkade in our Habitat and Ecosystem Services Division at (978) 281-9266 or alison.verkade@noaa.gov. For questions regarding ESA and section 7 comments, please contact Julie Crocker in our Protected Resources Division at (978) 282-8480 or Julie.Crocker@noaa.gov. For questions regarding MMPA Incidental Take Authorizations, please contact Jaclyn Daly in the Office of Protected Resources at (301) 427-8438 or jaclyn.daly@noaa.gov.

Sincerely,

Michael Pentony
Regional Administrator

cc: Brian Hooker, BOEM
JT Hesse, BOEM
Tom Nies, NEFMC
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Brian Thompson, CTDEEP
Peter Aarrestad, CTDEEP Fisheries
Jon Hare, NEFSC
Greg Power, NMFS APSD
Candace Nachman, NMFS Policy

Attachment 1

Suggested Scientific References (Not Exhaustive) Regarding Use of the Project Area by ESA-Listed Species

Atlantic sturgeon

Breece, M. W., Fox, D. A., Dunton, K. J., Frisk, M. G., Jordaan, A., & Oliver, M. J. (2016). Dynamic seascapes predict the marine occurrence of an endangered species: Atlantic Sturgeon Acipenser oxyrinchus oxyrinchus. *Methods in Ecology and Evolution*, *7*(6), 725-733.

Dunton, K. J., Jordaan, A., McKown, K. A., Conover, D. O., & Frisk, M. G. (2010). Abundance and distribution of Atlantic sturgeon (Acipenser oxyrinchus) within the Northwest Atlantic Ocean, determined from five fishery-independent surveys. *Fishery Bulletin*, *108*(4), 450.

Dunton, K. J., Jordaan, A., Conover, D. O., McKown, K. A., Bonacci, L. A., & Frisk, M. G. (2015). Marine distribution and habitat use of Atlantic sturgeon in New York lead to fisheries interactions and bycatch. *Marine and Coastal Fisheries*, *7*(1), 18-32.

Erickson, D. L., Kahnle, A., Millard, M. J., Mora, E. A., Bryja, M., Higgs, A., ... & Pikitch, E. K. (2011). Use of pop-up satellite archival tags to identify oceanic-migratory patterns for adult Atlantic sturgeon, Acipenser oxyrinchus oxyrinchus Mitchell, 1815. *Journal of Applied Ichthyology*, *27*(2), 356-365.

Ingram, E. C., Cerrato, R. M., Dunton, K. J., & Frisk, M. G. (2019). Endangered Atlantic Sturgeon in the New York Wind Energy Area: implications of future development in an offshore wind energy site. *Scientific reports*, *9*(1), 1-13.

Johnson, J. H., Dropkin, D. S., Warkentine, B. E., Rachlin, J. W., & Andrews, W. D. (1997). Food habits of Atlantic sturgeon off the central New Jersey coast. *Transactions of the American Fisheries Society*, *126*(1), 166-170.

Kazyak, D. C., White, S. L., Lubinski, B. A., Johnson, R., & Eackles, M. (2021). Stock composition of Atlantic sturgeon (Acipenser oxyrinchus oxyrinchus) encountered in marine and estuarine environments on the US Atlantic Coast. *Conservation Genetics*, 1-15.

Rothermel, E. R., Balazik, M. T., Best, J. E., Breece, M. W., Fox, D. A., Gahagan, B. I., ... & Secor, D. H. (2020). Comparative migration ecology of striped bass and Atlantic sturgeon in the US Southern mid-Atlantic bight flyway. *PloS one*, *15*(6), e0234442.

Stein, A. B., Friedland, K. D., & Sutherland, M. (2004). Atlantic sturgeon marine distribution and habitat use along the northeastern coast of the United States. *Transactions of the American Fisheries Society*, *133*(3), 527-537.

Wippelhauser, G. S., Sulikowski, J., Zydlewski, G. B., Altenritter, M. A., Kieffer, M., & Kinnison, M. T. (2017). Movements of Atlantic sturgeon of the Gulf of Maine inside and outside of the geographically defined distinct population segment. *Marine and Coastal Fisheries*, *9*(1), 93-107.

Sea Turtles

Griffin, D. B., Murphy, S. R., Frick, M. G., Broderick, A. C., Coker, J. W., Coyne, M. S., ... & Witt, M. J. (2013). Foraging habitats and migration corridors utilized by a recovering subpopulation of adult female loggerhead sea turtles: implications for conservation. *Marine Biology*, *160*(12), 3071-3086

Hawkes, L. A., Broderick, A. C., Coyne, M. S., Godfrey, M. H., & Godley, B. J. (2007). Only some like it hot—quantifying the environmental niche of the loggerhead sea turtle. *Diversity and distributions, 13(4), 447-457.*

Massachusetts/Rhode Island Wind Energy Area Marine Mammal and Sea Turtle Surveys. https://www.masscec.com/marine-mammal-and-sea-turtle-surveys

Patel, S. H., Winton, M. V., Hatch, J. M., Haas, H. L., Saba, V. S., Fay, G., & Smolowitz, R. J. (2021). Projected shifts in loggerhead sea turtle thermal habitat in the Northwest Atlantic Ocean due to climate change. *Scientific Reports*, *11*(1), 1-12

Winton, M. V., Fay, G., Haas, H. L., Arendt, M., Barco, S., James, M. C., ... & Smolowitz, R. (2018). Estimating the distribution and relative density of satellite-tagged loggerhead sea turtles using geostatistical mixed effects models. *Marine Ecology Progress Series, 586, 217-232.*

Whales

Chavez-Rosales, S., Palka, D.L., Garrison, L.P. *et al.* Environmental predictors of habitat suitability and occurrence of cetaceans in the western North Atlantic Ocean. *Sci Rep* **9,** 5833 (2019). https://doi.org/10.1038/s41598-019-42288-6

Davis, G. E., Baumgartner, M. F., Corkeron, P. J., Bell, J., Berchok, C., Bonnell, J. M., ... & Van Parijs, S. M. (2020). Exploring movement patterns and changing distributions of baleen whales in the western North Atlantic using a decade of passive acoustic data. *Global change biology*, *26*(9), 4812.

Leiter, S. M., Stone, K. M., Thompson, J. L., Accardo, C. M., Wikgren, B. C., Zani, M. A., ... & Kraus, S. D. (2017). North Atlantic right whale Eubalaena glacialis occurrence in offshore wind energy areas near Massachusetts and Rhode Island, USA. *Endangered Species Research*, *34*, 45-59.

Massachusetts/Rhode Island Wind Energy Area Marine Mammal and Sea Turtle Surveys. https://www.masscec.com/marine-mammal-and-sea-turtle-surveys

Roberts JJ, Best BD, Mannocci L, Fujioka E, Halpin PN, Palka DL, Garrison LP, Mullin KD, Cole TVN, Khan CB, McLellan WM, Pabst DA, Lockhart GG (2016) Habitat-based cetacean density models for the U.S. Atlantic and Gulf of Mexico. *Scientific Reports* 6: 22615. doi: 10.1038/srep22615.

Stone, K. M., Leiter, S. M., Kenney, R. D., Wikgren, B. C., Thompson, J. L., Taylor, J. K., & Kraus, S. D. (2017). Distribution and abundance of cetaceans in a wind energy development area offshore of Massachusetts and Rhode Island. *Journal of Coastal Conservation*, *21*(4), 527-543.

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May 28, 2021

Program Manager
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Re: Revolution Wind COP EIS; Docket No. BOEM–2021–0029

To Whom It May Concern,

The Rhode Island Coastal Resources Management Council (RICRMC) is providing the following comments as a cooperating agency in the preparation of the above referenced EIS for the Revolution Wind offshore project located within BOEM Lease Area OCS-A 0486.

1. Pertaining to the current Revolution Wind project, BOEM should be aware of the RICRMC enforceable policies for Areas of Particular Concern (APC) that presumptively exclude all offshore development, as defined at 650-RICR-20-05-11.10.1(A), within APC. The RICRMC has preliminarily identified multiple turbines located within areas of the Revolution project boundary that meet the characteristics and definition of APC as identified in state waters. Specifically, these preliminarily identified turbines are located in areas identified as glacial moraine. Accordingly, the RICRMC believes that the project can be modified to avoid the installation of offshore development within these areas of glacial moraine and still meet the purpose and need for the proposed project as described within the Revolution Wind Construction and Operations Plan (COP).

The RICRMC enforceable policy at § 11.10.2(B) states in part "*All large-scale, small-scale, or other offshore development, or any portion of a proposed project, shall be presumptively excluded from APCs.*" The Revolution Wind project is partly located on a terminal glacial moraine which is defined as a high boulder hazard area. See Revolution Wind COP at section 4.2.3. In accordance with Ocean SAMP enforceable policy § 11.10.2(C)(3) glacial moraine are defined as APC because they contain valuable habitats for fish and other marine life that are important to commercial and recreational fishermen. See APC definition at § 11.10.2(A). CRMC staff have tentatively identified upwards of 28 Revolution Wind turbine foundations and associated inter-array cables located within glacial moraine as shown in Figure 1 (Appendix A). Figure 1 is based on the proposed Revolution Wind turbine foundation layout, which is aligned with the wind industry's

November 2019 proposed 1 x 1 NM uniform grid wind farm layout. The currently proposed Revolution Wind project has not sited foundations and inter-array cables to avoid areas of glacial moraine. All offshore development is presumptively excluded from CRMC designated APC pursuant to the CRMC enforceable policy at § 11.10.2(B). This exclusion, however, is rebuttable if the applicant can demonstrate by clear and convincing evidence that there are no practicable alternatives that are less damaging in areas outside of the APC, or that the proposed project will not result in a significant alteration to the values and resources of the APC.

The project design envelope (PDE) for the project is based on a maximum operating capacity ranging between 704 and 880 megawatts (MW), and includes wind turbine generators (WTG) up to 12 MW. The purpose and need for the proposed Revolution Wind project is to construct and operate a commercial-scale, offshore wind energy facility in Lease Area OCS-A 0486 that is intended to fulfill the three purchase and power agreements (PPA): (1) A 200-MW contract with the State of Connecticut approved in January 2019; (2) A 400 MW contract with the State of Rhode Island approved in June 2019; and (3) a 104-MW contract with the State of Connecticut approved in December 2019. Given that the purpose and need for the Revolution Wind project is to provide 704 MW, it stands to reason that should the 12 MW WTG be selected and installed, then only 59 WTGs are required to meet the purpose and need of the project and fulfill Revolution Wind's contractual obligations to CT and RI under their respective PPAs. Offshore wind industry technology is rapidly changing and larger wind turbine generators are being planned for new projects. In fact, just within the last year Vineyard Wind requested BOEM to consider use of a 14 MW WTG (upgraded from previously planned 9.6 MW units) for the Vineyard Wind 800 MW project. BOEM has now issued its Final EIS and record of decision for the Vineyard Wind project. It is highly likely that Revolution Wind will use the 12 MW WTGs for its project. Therefore, by using the larger 12 MW units for the Revolution Wind project, the developer has a feasible alternative to avoid turbine foundation and inter-array cables within glacial moraine and further reduce impacts within the project area by reducing the overall number of turbine foundations from 100 to less than 60. Even if the Revolution Wind project developer is awarded additional state energy production contracts in the future, the maximum nameplate capacity of the project is 880 MW. Using 12 MW WTG, the number of turbine foundations necessary to meet the PDE is between 59 and 74. Nevertheless, the project purpose is to fulfill Revolution Wind's obligations to both Connecticut and Rhode Island in accordance with the PPAs totaling 704 MW.

The CRMC enforceable policy at § 11.10.2(B) requires the developer to demonstrate that "all feasible efforts have been made to avoid damage to the APC resources and values." Given the currently proposed layout of the 100 turbines, it is our determination that the developer has not demonstrated that "all feasible efforts" have been made to avoid damage to the APC resources and values. There are approximately 28 turbine foundations identified at this time that are proposed within glacial moraine that could be relocated and not impact the developer's ability to meet the project purpose for the Revolution Wind project to provide 704 MW under the current contractual agreements.

2. It is RICRMC's recommendation that a state's federal consistency review process for offshore wind projects should begin with the publication of the Draft Environment Impact Statement (DEIS) or draft Environmental Assessment (DEA) once BOEM issues a Notice of Availability (NOA) for offshore wind projects under Subpart E of 15 C.F.R § 930.

Under existing federal regulations, the NEPA process starts with BOEM's Notice of Intent (NOI) to prepare an Environmental Impact Statement (EIS) for the COP. For renewable energy projects on the outer continental shelf (OCS) the State's Coastal Zone Management Act (CZMA) federal consistency review process begins with receipt of a consistency certification and the COP, which are filed with the State on or about the time BOEM issues an NOI. BOEM's NEPA regulations (codified in 30 C.F.R. § 585.628) state that the NOI and the initiation of the federal consistency reviews begins once the information requirements for the COP are met and BOEM forwards the consistency certification to the state agency. NOAA's federal consistency regulations at 15 CFR 930.58 specifies that "NEPA documents shall not be considered necessary data and information when a federal statute requires a federal agency to initiate the CZMA federal consistency review prior to its completion of NEPA compliance." In the RICRMC's opinion, however, the availability and review of an offshore renewable energy project's DEIS prior to initiation of the federal consistency review period would lead to a more informed and science-driven decision-making process, and provide for a more timely decision for developers.

BOEM states within the current DEIS for the South Fork Wind project (BOEM Docket 2020–0066) that "Cooperating agencies would rely on the DEIS to support their decision making and to determine if the analysis is sufficient to support their decision." See DEIS at i. State CZM agencies are cooperating agencies under the BOEM renewable energy review process. However, as it pertains to federal consistency requirements, the CZMA review process must be completed within 6-months, unless mutually agreed upon by both the agency and the developer for a stay of the state agency's federal consistency decision to provide further time to review necessary data and information. In the case of the South Fork Wind project, BOEM publicly released the DEIS on January 8, 2021 some 2-years following the NOI. Obviously in this case, given the timing between BOEM's issuance of the NOI and the DEIS it would not have been possible for a state agency to review the DEIS and meet the CZMA 6-month review period. It would be more beneficial to the state cooperating agencies if the initiation of the CZMA federal consistency review starts with BOEM's release of the DEIS. We urge BOEM to work with other federal agencies, in particular NOAA, to properly align the CZMA federal consistency review process with the NEPA process so that the DEIS is available to guide and inform the state's CZMA federal consistency decision development.

In order to better align 30 C.F.R. § 585 with 15 C.F.R. § 930, the RICRMC suggests making the following revisions to NOAA's federal consistency regulations (15 C.F.R. § 930) so that the consistency certification is not filed with the state until the DEIS is publically available (generally lining up with BOEM's issuance of the NOA). NOAA's federal consistency regulations should require federal agencies to submit a DEIS or DEA as information required pursuant to the list of necessary data and information so that the state agency can review the consistency certification along with all the alternatives presented in the DEIS/DEA and make a determination within the CZMA 6-month review period. As mentioned, BOEM published a NOA for the South Fork DEIS on January 8, 2021, but issued its NOI to begin preparation of the DEIS on October 19, 2018, which would not have allowed for a fully informed CZMA review to include examination of the DEIS if it was not for the seven stay agreements in the case of South Fork Wind.

The New York State Coastal Management Program recently amended their necessary data and information requirements subject to review pursuant to 15 C.F.R. Part 930, Subpart E (Consistency for Outer Continental Shelf Exploration, Development and Production Activities) by requiring Draft NEPA documentation including DEIS or DEA (when required by a federal agency) rather than final NEPA documentation as is currently listed.

It is the RICRMC's recommendation that NOAA's federal consistency regulations at 15 C.F.R. § 930.76 for OCS projects be amended to include a DEIS or DEA as necessary data and information. Filing of the consistency certification with the state agency should be delayed until the DEIS is made public so that the state CZMA federal consistency review can commence once all the pertinent information is available. In the RICRMC's opinion, the CZMA process should not begin until the NOA is issued for the DEIS. The state agency review of the consistency certification can then begin at the time the state agency receives the certification (amendment to § 930.77 *Commencement of state agency review and public notice*). In addition, the RICRMC recommends modifying BOEM's NEPA regulations at 30 C.F.R. § 585.628) so that DEIS or DEA documents should be considered necessary data and information when BOEM forwards the COP, consistency certification, and associated data and information under the CZMA to the applicable state agency to initiate the CZMA federal consistency review. The RICRMC experience from the two offshore wind projects it has reviewed to date is that the COP and Appendices have been regularly updated during the federal consistency review period. BOEM should reconsider when it initiates the federal consistency review process so that state agency review is not initiated prior to BOEM issuing the DEIS, but rather concurrently to better inform both the CZMA and NEPA processes.

This recommendation is in line with 40 C.F.R. § 1506.2 which specifies "To the fullest extent practicable unless specifically prohibited by law, agencies shall cooperate with State, Tribal, and local agencies to reduce duplication between NEPA and comparable State, Tribal, and local requirements. Such cooperation shall include, to the fullest extent practicable, joint environmental impact statements."

The RICRMC appreciates the opportunity to provide comments on BOEM's NOI regarding Lease Area OCS-A 0486 and the Revolution Wind project. The RICRMC stands ready to assist BOEM further as necessary. Please contact me jwillis@crmc.ri.gov or James Boyd jboyd@crmc.ri.gov should you have any questions concerning these comments.

Sincerely,

Jeffrey M. Willis, Executive Director
Coastal Resources Management Council

/ajt

cc: CRMC Council Members
Anthony DeSisto, CRMC Legal Counsel

Appendix A

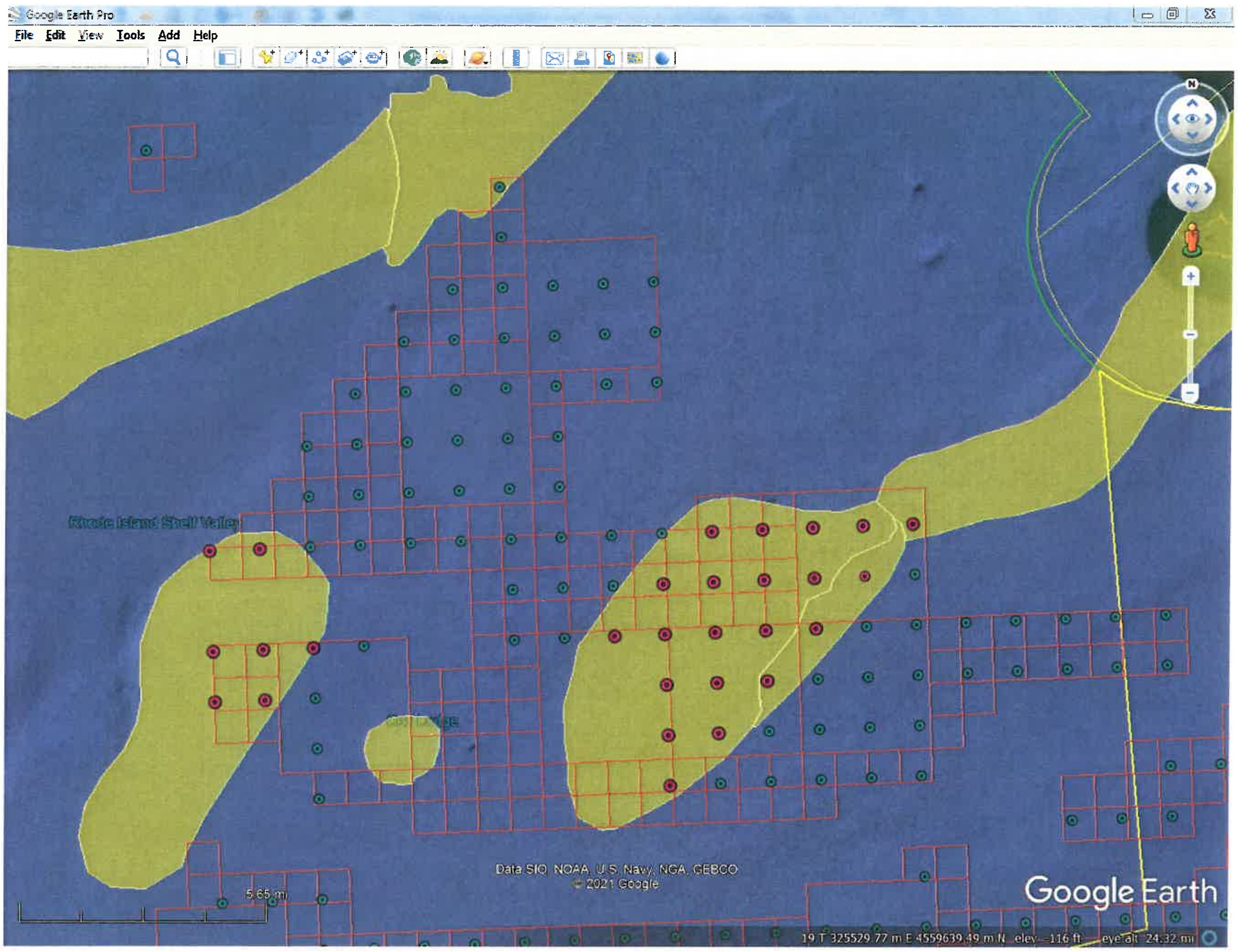

Figure 1. Revolution Wind turbine locations based on offshore wind industry 1 x 1 uniform grid layout provided by Ørsted. The yellow-shaded polygon areas are glacial moraine and meet the definition of CRMC designated Areas of Particular Concern (APC). The Revolution Wind turbine locations intersecting glacial moraine are shown as magenta dots, 28 in total preliminarily identified.

WORKSHOP ON SOCIO-ECONOMIC IMPLICATIONS OF OFFSHORE WIND ON FISHING COMMUNITIES (WKSEIOWFC)

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Contents

i Executive summary

Common, consistent, and accepted frameworks for defining and quantifying the socio-economic impact of offshore wind on fisheries are urgently needed in Europe and in the United States of America. What information do we need to describe the socio-economic, socio-environmental, and socio-cultural complexities involved in fishing fleet behaviour and shore-side activities?

The aim of the ICES Workshop on Socio-Economic Implications of Offshore Wind on Fishing Communities (WKSEIOWFC) was to develop a framework to define the socio-economic effects and impacts of offshore wind on fishing behaviour, fishing communities and coastal communities more broadly. The workshop allowed us to describe, summarise and illustrate the environmental, economic and cultural effects that offshore wind development has on fisheries.

Key results are preliminary conceptual models of cause-and-effect relationships, evidence and data gaps, reflections on the assessment of the cumulative impact from offshore wind on the fishing sector and fishing communities as well as identified perceptions of similarities and differences between European and USA regions.

The workshop demonstrated the importance of improving our understanding of the socio-economic implications of offshore wind and fisheries interactions and highlighted the benefit of coordination with other ICES working groups focussing on topics relevant to offshore wind development and fisheries. Improved understanding can be used to foster the exchange of information and collaboration in addressing science questions, and to support decision-making. These activities are considered to have a very high priority on a global level, especially as wind energy development technology evolves and the wind industry continues to require additional ocean spaces.

ii Expert group information

Expert group name	Workshop on Socio-economic Implications of Offshore Wind on Fishing Communities (WKSEIOWFC)
Expert group cycle	workshop
Chairs	Tara Hooper, UK
	Annie Hawkins, USA
Meeting venue and dates	15-17 March 2021, online meeting (50 participants)

1 Background information

The advancement of offshore renewables such as offshore wind farms (OWF) or wave and tidal stream energy devices is a response to increasing energy demands and a key pillar in the global transition to a carbon-free power sector (GWEC 2019). In 2018, the worldwide installed capacity of marine renewable energy was dominated by offshore wind, which summed up to 23.1 GW with a European contribution of roughly 79% (Stelzenmüller *et al.* 2020) and a US contribution of 30MW. The European development corresponds to 5,047 grid-connected wind turbines across 12 countries (www.windeurope.org) with a current average distance to shore of 59 kilometres and an average water depth of 33 metres (Stelzenmüller *et al.* 2020). In Europe, the development of offshore renewables varies greatly among the different European sea basins (Baltic Sea, North Sea, Atlantic, Mediterranean Sea and Black Sea). Northern European countries such as the UK, Germany, Denmark, Belgium, the Netherlands, and Sweden currently have the highest numbers of installed OWF and turbines (www.oceanenergy-europe.eu). Further, a reduction of greenhouse gas emissions by at least 55% by 2030 (compared to 1990); (https://ec.europa.eu/clima/policies/eu-climate-action/2030_ctp_en), a target adopted under the global Paris Agreement in 2015 and its wider 2030 climate energy framework, is to be implemented via national climate action plans (European Commission 2015, 2018; Europêche 2020; Stelzenmüller *et al.* 2020). A large share of this (at least 32%) will be achieved by the EU Member States through renewable energy (Stelzenmüller *et al.* 2020). The goal for offshore wind in Europe is for between 230 and 450 GW by 2050 to assist in the delivery of climate neutrality by 2050 (European Commission statement 2020). According to the International Energy Agency (IEA), offshore wind is set to become the main source of power generation in Europe by 2042. In the United States, offshore wind development is set to expand across the Atlantic, Pacific, and Gulf of Mexico with recently announced targets of 30 GW by 2030 and 110 GW by 2050 (White House Statement). As a result, the implementation of offshore marine renewables will speed up the race for space in the already heavily used offshore and coastal waters across the world (Halpern *et al.* 2019, Stelzenmüller *et al.* 2020). In the United States, ongoing and planned actions are expected to result in the installation of over 2000 turbine foundations that "would increase the risk of highly localized, periodic short-term or long-term, moderate to major impacts on commercial fisheries" (Bureau of Ocean Energy Management, 2021). In addition, proposed U.S. development will result in major adverse impacts on fisheries scientific research and surveys that "may result in more conservative quota and effort management measures" (Bureau of Ocean Energy Management, 2021). Some fisheries could be at risk of losing access to traditional fishing grounds due to safety requirements imposed by OWF development leading to potentially decreased landings. Existing knowledge on the impact of OWF on fisheries is focused mainly on ecological impacts, assessments of economic and socio-cultural effects are lacking in recent empirical studies (Stelzenmüller *et al.* 2020). Further, current publications on impacts often neglect assessment of proposed future expansions of OWF (Stelzenmüller *et al.* 2020).

No common, consistent, and accepted framework for defining and quantifying socio-economic impacts exist in Europe nor the United States. The Working Group on Offshore Wind Development and Fisheries (WGOWDF) focuses on the interactions between fisheries and offshore wind energy. While there are distinct differences in the scale and scope of fisheries between the North American and European wind development areas, there is an opportunity to identify common issues and promote research to address these issues. The aim of the ICES Workshop on Socio-economic Implications of Offshore Wind on Fishing Communities (WKSEIOWFC) was to develop a framework to define the socio-economic effects and impacts of OWF on fishing behaviour, fishing communities, and coastal communities; identify research gaps and lessons learnt; and generate recommendations for research to address these issues. Results feed directly in Term of Reference (ToR) A "Review and report on fishing industry interactions with offshore wind development and document lessons learnt including the effects on the distribution of fishing operations."

2 Workshop Introduction

The aim of WKSEIOWFC was to develop a framework to define the socio-economic effects and impacts of OWF on fishing behaviour, fishing communities and coastal economies. This report provides a general summary of the workshop, and primarily describes the activities that took place. Some preliminary results are presented to illustrate some of the outcomes and the input received from workshop participants; as such, some statements represent subjective and, at times, differing viewpoints. More comprehensive reporting and analysis of the data generated will occur as part of the deliverables for ToR A of the WGOWDF. The list of participants and the workshop resolution are given in Annexes 1 and 2.

Due to current challenges resulting from the Covid-19 pandemic, the workshop was conducted remotely using Zoom software (https://zoom.us/zoomrooms/software). Participants were requested to prepare for the workshop in order to use the workshop time most effectively. As the workshop received support from other ICES working groups working on the topic of OWF development, participants were invited to watch the recorded presentations from WGSOCIAL, WGECON, WGMARS, WGMBRED, and WGMPCZM (see Annex 3) and to take part in a discussion round with the presenters. Further, they were asked to write a short bio about themselves in order to shorten a lengthy round of introductions and still give participants the opportunity to network with each other. Finally, they were invited to take part in a pre-workshop survey to identify the key issues for OWF and fishery interactions (see Section 3).

The workshop focused on three themes relevant to the interaction between fisheries and OWF:

1. Environmental – how both ecological change and the presence of infrastructure affect fishing activities;
2. Economic – the economic implications of changes in fishing activity (at the level of individual businesses, the industry and more widely); and
3. Social/Cultural – the wider interactions between fishing, coastal communities and society, and how these might be affected (Figure 1).

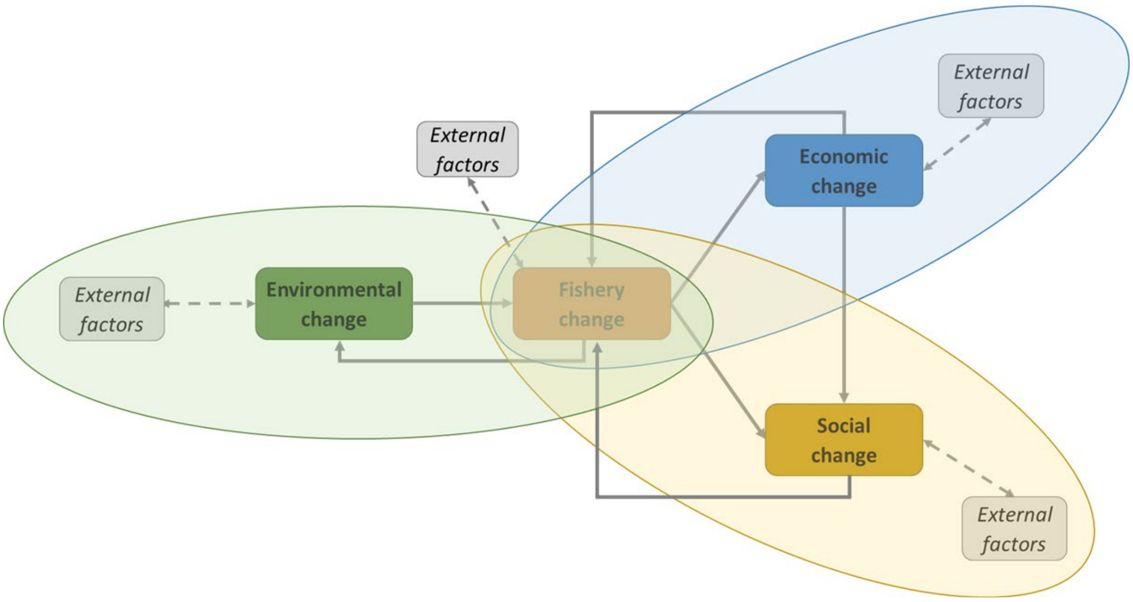

Figure 1. A conceptual representation of the interactions between environmental, fishery, economic and social/cultural changes, and how these different elements were partitioned into the three main workshop themes.

To ensure everyone could participate actively, these themes were discussed in small group break-out sessions that ran in parallel during Days 1 and 2 of the workshop (see Section 4). Across the break-out groups and the wider workshop, the following objectives were pursued:

- To determine the routes by which the development of OWF could cause change in fishing practices;
- To understand the implications of this behaviour change at individual, community and societal levels;
- To determine the extent, and sources, of current evidence;
- To identify methods for filling data gaps;
- To develop recommendations for generating evidence to support management decisions related to OWF and fishery interactions.

The workshop also included plenary sessions for feedback and full group discussion (see Section 5). This included discussion of additional cross-cutting topics, particularly around similarities and differences between the European and US contexts, as well as evidence and data gaps and introducing the need for better understanding of cumulative socio-economic impacts. Further, the final session of the workshop during Day 3, to discuss recommendations (see Section 6), was opened up to a wider audience/guests. At the start of the workshop and the open session with guests, moderators drew the attention to the ICES Code of Conduct and the ICES Conflict of interest statement.

3 Pre-Workshop Survey

In order to use the workshop time most effectively, we invited our participants to take part in a pre-workshop survey to identify the key issues for OWF and fishery interactions, and also to place these interactions in the context of other factors affecting both industries. The survey was conducted using the Mentimeter software (https://www.mentimeter.com/). The survey was open for about two weeks (24.02–08.03) and focussed on three interrelated topics, namely socio-economic, socio-cultural and socio-ecological topics, that are covered by multiple questions in three separate sections.

The aim of the questions from the environmental dimension of impact was to gather initial opinions on what changes associated with OWF (both ecological and from the presence of infrastructure) may affect fisheries. The focus was on capturing the perspectives of participants to questions on: 1) What are the environmental changes associated with OWF that could affect individual fishing behaviour?; 2) How might fishing activity change in response to these environmental changes?; the participants were also asked to provide suggestions relating to 3) What other environmental factors, not connected to OWF development, might lead to fisheries changes (e.g. climate change)?

In order to define the economic changes for the fishing sector due to OWF, the questions were structured in such a way that the effect on a single individual was considered as well as the effect on the wider sector and value chain: 1) How could the costs and income generation opportunities for individual boats change in response to OWF development?; 2) What changes in costs/income generation opportunities could occur at the scale of the fishing sector?; 3) What are the potential economic consequences for the wider value chain onshore?; and 4) What other economic changes for the fishing sector are impacting fisheries that are important to understand within the context of OWF development?

The cultural dimension of impact was dedicated to discussing the consequences for coastal communities and society: 1) In what ways is fishing important to coastal communities and wider society?; 2) What types of changes in fisheries would affect those interactions with coastal communities and wider society?; and 3) Apart from OWF development, what else might be affecting seafood consumption and public perceptions of fisheries?

Preliminary Survey Results

From our pool of 50 workshop participants (i.e., experts from the fields of natural and social science (e.g., oceanography, biology, economics, anthropology) and governance (e.g., policy, nature conservation, and administration), altogether 36 participants took part in our pre-workshop survey and sent in responses. Each participant could submit multiple responses to each of the survey questions (leading to more individual responses than the number of participants). The responses were then coded (following qualitative content analysis principles) to identify themes within them, and define uniform terms to facilitate subsequent analyses. The number of responses and themes for each of the survey questions are summarised in Table 1. The outcomes of the pre-workshop survey were presented to participants in a series of graphs, which ranked each theme according to the number of responses related to it (see the example in Figure 2, and the complete set in Annex 4).

Table 1. The number of respondents, individual responses and main themes within those responses for each of the pre-workshop survey questions.

Workshop theme	Question	Number of respond-ents	Number of individual responses	Number of main themes within the responses
Environmental	What are the environmental changes associated with offshore wind farms that could affect individual fishing behavior?	36	122	29
Environmental	How might fishing activity change in response to these environmental changes?	36	71	23
Environmental	What other environmental factors, not connected to OWF, might lead to fisheries changes?	36	70	15
Economic	How could the costs and income generation opportunities for individual boats change in response to OWF development?	36	86	13
Economic	What changes in cost/income generation opportunities could occur at the scale of the fishing sector?	33	51	15
Economic	What are the potential economic consequences for the wider value chain onshore?	34	44	22
Economic	What other economic changes, not connected to OWF development, are impacting fisheries?	33	83	16
Cultural	In what ways is fishing important to coastal communities and wider society?	33	124	14
Cultural	What types of changes in fisheries would affect those interactions with coastal communities and wider society?	28	57	14
Cultural	Apart from OWF development, what else might be affecting seafood consumption and public perception of fisheries?	33	97	15

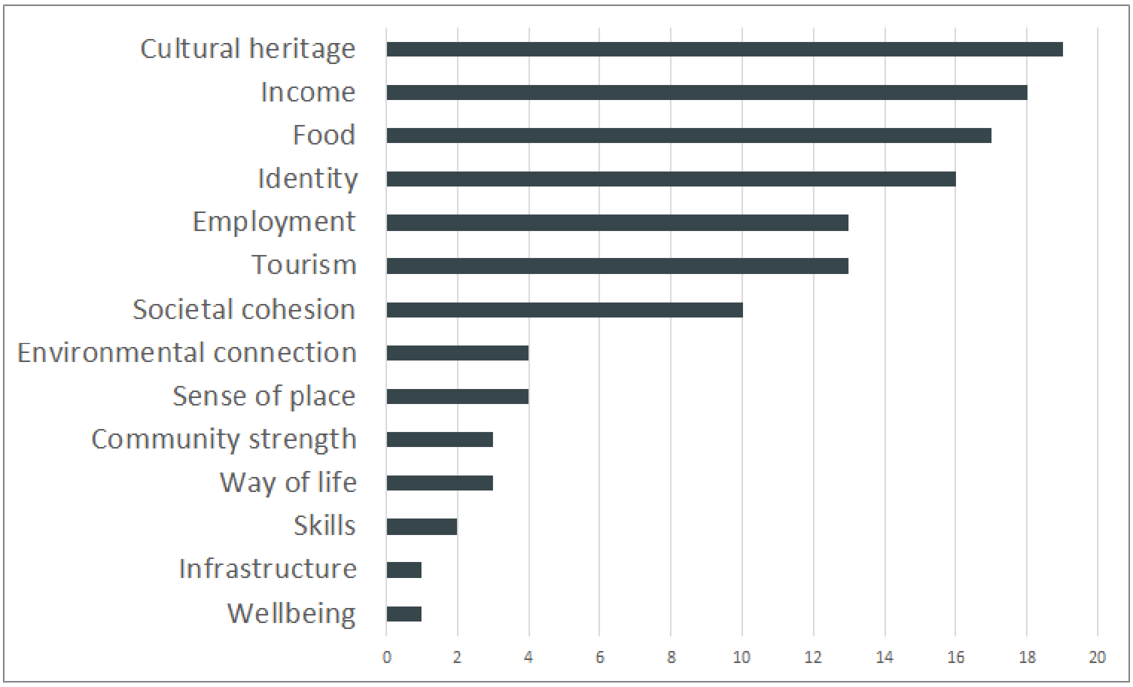

Figure 2. The number of responses in each of the main themes identified within responses to the question "In what ways is fishing important to coastal communities and wider society?"

4 The World Café

All participants were prompted to indicate which sessions they expected to attend and their relative preference for the three main workshop themes. Based on that, participants were allocated to break-out groups ensuring that the groups were made up of an equal number of representatives from the US and European regions. The workshop chairs further dictated the order in which they join the discussion about each theme. All break out group discussions were moderated and recorded. After welcoming the participants, the moderator and the participants introduced themselves although all material was handled anonymously. After 90 minutes of discussion and a brief summary of what was said, the moderator ended the discussion.

The main activity that took place during the break-out groups was brainstorming participants' perspectives on the linkages between different factors to illustrate how changes in the environment could lead to changes in fishing behaviour and hence implications for wider society and the economy. These linkages, hereafter described as "cause-effect relationships" were mapped to provide a visual summary of the multiple factors involved and their interdependencies. The supporting narrative from the discussions undertaken during the mapping exercise was the key information collected during the workshop. Details from these discussions were captured as notes attached to the individual 'nodes' within the maps and the connections between them, within the Mental Modeler software (http://www.mentalmodeler.org/) that was used to create the maps.

4.1 Preliminary results from the breakout groups

Figures 3–5 illustrate, respectively, the maps created in the environmental, economic and cultural break-out groups, and highlight the complexity and interconnectedness of the issues under discussion. These maps are not intended as a final output, but to support the ongoing work within ToR A of the WGOWDF. The summaries below reflect the comments made at the time by workshop participants.

4.1.1 Environmental theme

The environmental subgroup considered both ecological and physical changes that are expected to occur with OWF in relation to the potential effects on fishers. This meant that there were two main perspectives: the change to the fisheries resource species (e.g. distribution and abundance) and access to the fishing grounds. Regardless of perspective, the focus was centred on the effects on an individual fisher. We asked participants to offer suggestions on electronic post-it notes using Jamboard (https://jamboard.google.com) and supplemented this with information summarised from the pre-workshop survey questions. We looked for themes and topics within the themes to begin mapping linkages and interconnections/ interdependencies.

Emergent themes were the physical presence of the wind turbine(s), scour protection and any mooring (particularly relevant for floating offshore wind - which is seen as a potentially big cause for concern given the areal extent over which catenary mooring systems will exclude fishing). The physical presence is seen by some workshop participants as leading to varying degrees of displacement of fishers because of safety issues, insurance questions or legislative exclusion (as occurs in some European countries) - issues that link with the other subgroups. The presence of an OWF is expected to change local abundance and distribution of fish, potentially altering target fisheries species availability. Participants also recognized that there may be new opportunities for fishers presented by OWF development. The subgroup also discussed the biological effects (e.g., habitat alteration, spill-over, productivity change, larval considerations) and more broadly non-biological effects (e.g., bathymetry, turbidity, sedimentation, cold pool). These themes feed into changes to sub-topics such as stock, abundance, and distribution. Cause-effect relationships and linkages between the themes along with their specific sub-topics were discussed and mapped. The groups then considered potential fishing activity changes in relation to these expected environmental changes affecting the fisheries resource species. Spatial and temporal effects on the fishing activity emerged as key aspects with a very clear differentiation between fixed and mobile gear and the different consequences (for example, in terms of catch per unit effort (CPUE), the types of vessel and gear that could/couldn't be used, transit times to fishing grounds and loss of fishing grounds). Finally, the participants highlighted the socio-economic effects - thereby highlighting the links to the other two subgroups.

Towards the end of the subgroup sessions other factors not directly connected to OWF, but which could affect fisheries, were offered. These centred on wider effects, such as climate change impacts, water quality changes, other ecological changes (such as non-native species, predator-prey impacts, food web trophic changes), emerging diseases, cumulative effects and other offshore activities, changes to prices and costs and management of the coastal and offshore environment, and longer-term COVID effects. Participants recognized that this is a complex and multi-faceted topic and should focus on the fishers set within the context of existing governance, appropriate timescales, data considerations (i.e., scale, accuracy, data availability and modelling into the future) and the wider environmental changes (such as climate change).

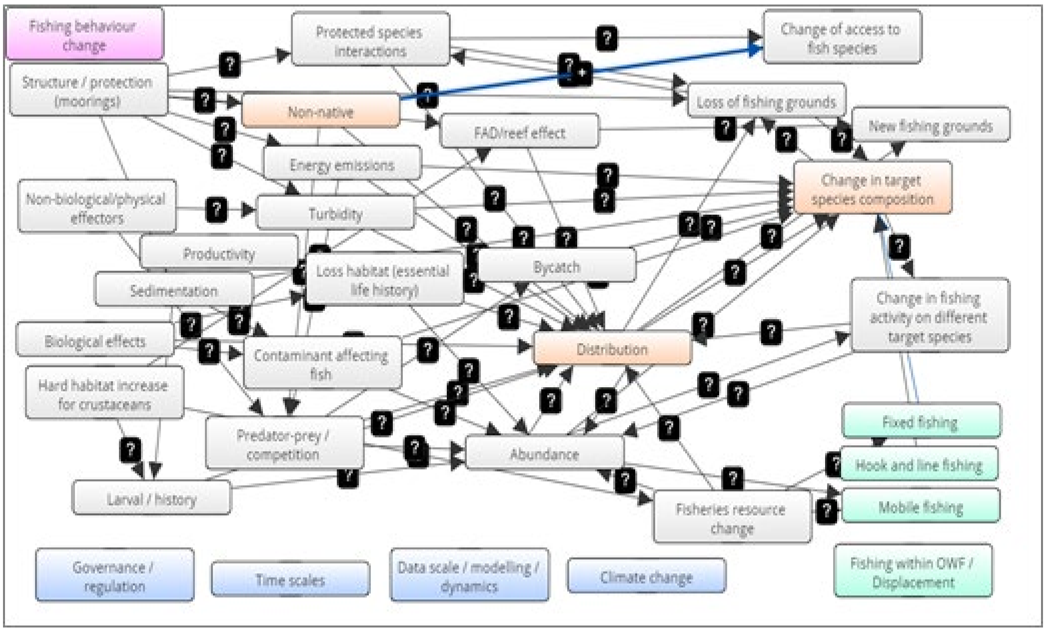

Figure 3. Cause effect maps describing interrelationships between changes in fishing behaviour, OWF development, and environmental impacts.

4.1.2 Economic theme

The economic subgroup discussed the effects on individual fishers, fishing sectors and the wider value chain. The starting components for the indicator mapping exercise originated from the most common themes mentioned in the economic pre-workshop survey questions. Observations on potential access to fishing grounds within OWF areas, potential displacement, and how these link to catch efficiency, costs, business risk and uncertainty, adaptability and government frameworks were key portions of the session. Gear types (fixed vs mobile) or the type of fishing ("metier") can impact the cause-effect directions , as some participants noted that mobile gear may lose access to OWF based on spatial needs and operational risk. Insurance availability and cost could lead to OWF areas acting as de-facto closures, thereby making it an important component in the cause-effect models related to access to fishing grounds. Fishermen adaptability is dependent on government frameworks and fishermen's ability to switch target species and gears. This also connects to the (capital) expense of new gear and permits. The cause-effect mapping exercise highlighted the complexity in capturing how temporal, spatial and regional differences could change the direction of the effects within the model. For example, on a temporal scale, CPUE could decrease during the construction phase of an OWF, then increase during the operation phase. Coastal fisheries experience different effects than offshore fisheries. Regional differences within Europe, within the U.S., and between Europe and the U.S., as highlighted in Section 5.1, also play a significant role There are also differences in connections based on the type of mooring used in offshore wind development (e.g., fixed vs. floating).

The final economic subgroup session was focused on the wider industry and value chain relationship. Connections between cause effect model components were solidified. For example, effort and catch efficiency connect to fleet reduction, loss of employment opportunities, and market changes. The footprint and cumulative scale of OWF development was identified as an important factor for consideration.

The second and third sub-group discussed relevant existing economic data, identifying data gaps and best practices to rectify those gaps. The cooperative approach used in the U.S. surfclam fishery economic model (Munroe *et al.*, in prep.) and the Fishermen's Knowledge Trust (https://roda-fisheries.org/portfolio/fisheries-knowledge-trust/) were identified as good examples of more inclusive fisheries assessments and data sharing frameworks. Data deficiencies (e.g., lack of vessel monitoring system data, VMS) for capturing displacement and differentiating when vessels are transiting rather than fishing (viable fishing areas vs. pass-through areas) were identified as data gaps. Possible best practices included using small trackers to reduce VMS deficiencies and building trust between the fishing industry and fisheries liaisons to cooperate in collecting data and understanding fishing operations, although these approaches include their own limitations or challenges.

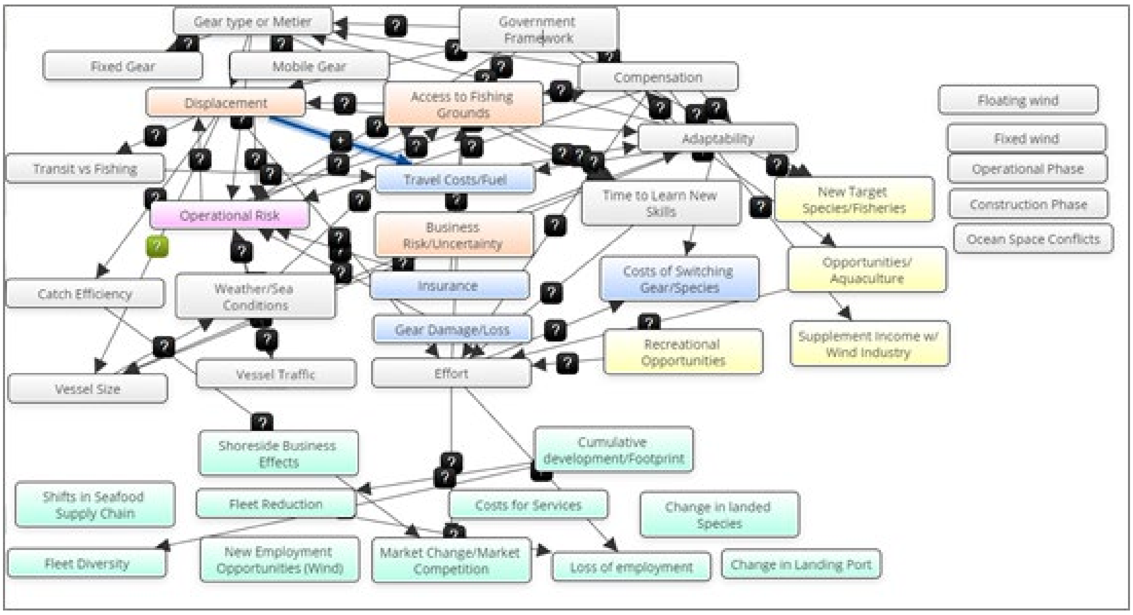

Figure 4. Cause effect maps describing interrelationships between changes in fishing behaviour, OWF development, and economic impacts.

4.1.3 Cultural theme

The wide-ranging discussions within the cultural theme included observations on management, governance and the perceived distribution of power, as well as how this links to the creation of social capital through the organisation of community and industry networks. Resilience and the willingness or ability of fishers and the community to adapt was also discussed, including the role of wider fisheries policy (particularly spatially-specific licensing) in affecting opportunities for diversification. Connections between fisheries, the wider 'working waterfront' and tourism were discussed, as well as issues around safety, identity and social cohesion. The cause-effect mapping exercise highlighted how the implications of changes in fishing behaviour are context-dependent. In the cultural theme, for example, the severity of knock-on effects for coastal communities would depend on factors such as the type of fishing (the "metier") and the reliance of the community and wider industries on the fishery, as well as the social and economic wellbeing or, conversely vulnerability, of individual fishing communities.

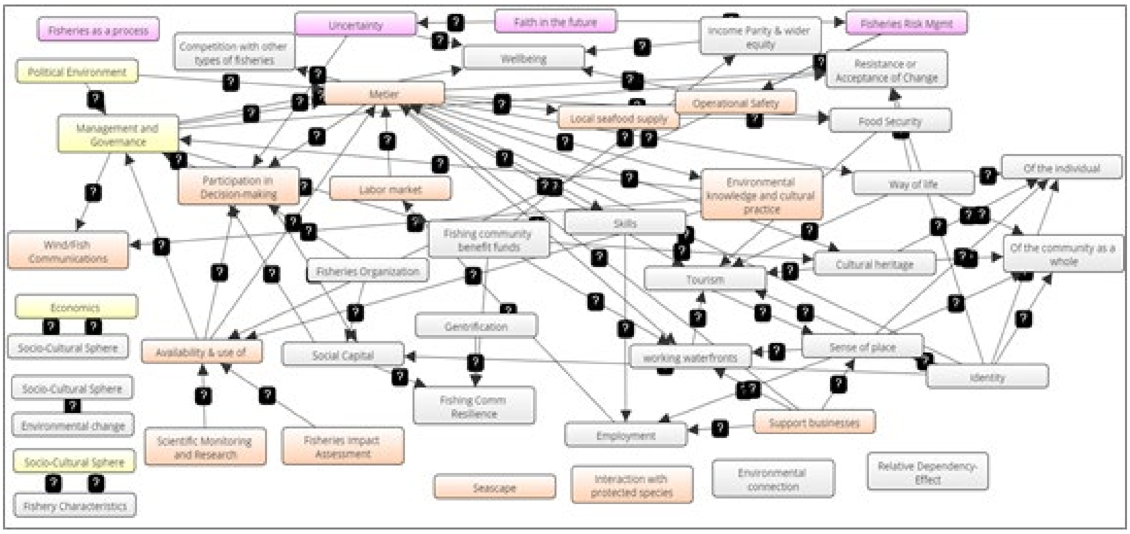

Figure 5. Cause effect maps describing interrelationships between changes in fishing behaviour, OWF development, and cultural impacts.

In order to illustrate how the generic cause-effect maps might be used to evaluate a specific situation, the second cultural theme break-out group began to work through two particular examples. The first was the experience of a partnership between Ørsted and crab/lobster fishers in Bridlington, UK, which showed how the pursuit of best practices in impact assessment led to positive outcomes in a number of areas including social capital, research capability and capacity, and the provision of new infrastructure, which attracts tourism (Figure 6). The second example (Figure 7) related to the concerns about possible socio-cultural effects from potential displacement of the surfclam fishery in the US. This fishery has only a limited ability to diversify due to specialised equipment and the centralised location of processing facilities. Many of the boats are owned by the processors, creating the risk of losing a whole sector if a business is no longer profitable. Losing fleets will likely affect the support businesses including cold storage providers, with implications for other fishing fleets.

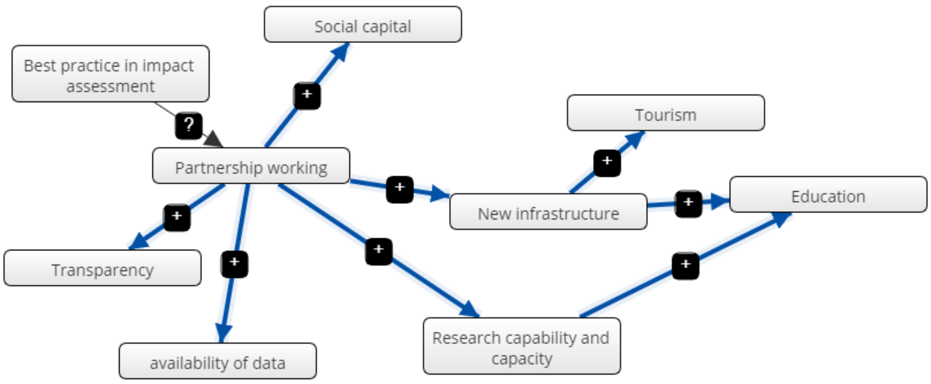

Figure 6. Cause effect map on cultural benefits from partnership working between Ørsted and crab/lobster fishers in Bridlington, UK.

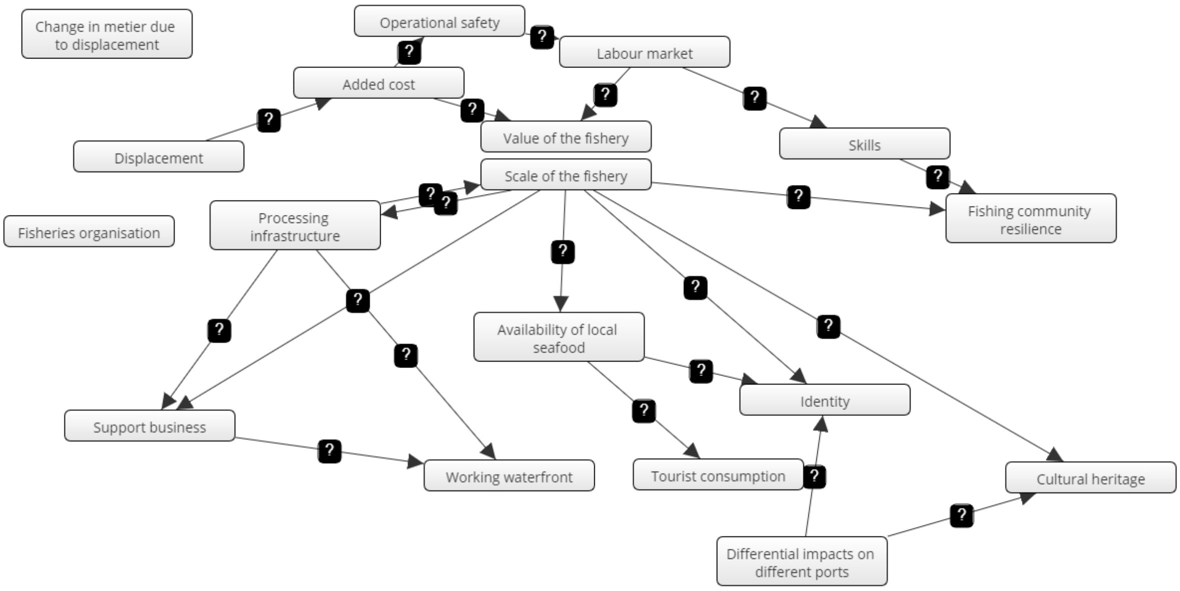

Figure 7. Cause effect map on concerns about possible socio-cultural effects from potential displacement of the surfclam fishery in the US.

5 Plenary sessions on cross-cutting themes

The plenary sessions were used for feedback and full-group discussions. This included discussing similarities and differences between the European and US contexts, evidence and data gaps, as well as the need for a better understanding of cumulative socio-economic impacts.

5.1 Identified common issues and differences between European and US regions

A focused plenary session compared and contrasted the European and US contexts. The facilitator presented a summary of some key issues that had been raised as part of the break-out sessions. These were identified in the presentation as:

System-wide characteristics

- Fisheries have deep-rooted (often centuries old) histories that define communities;
- Global & regional & local market forces have complex relationships to fisheries;
- Offshore wind is a new ocean use (U.S.)/newer use (Europe/U.K.);
- Societal demand for offshore wind energy is rapidly increasing;
- Fixed and floating wind technologies are rapidly changing;
- Fisheries are transboundary- spatially and temporally dynamic by nature, while wind development is fixed by location; and, thus, stationary systems are being imposed on those that are not stationary and not-managed as such (the ecological, bio-physical, and fisheries governance and human economy).

Similarities identified across regions and impact categories

- Lack of an integrated appropriately-scaled and commonly-defined fisheries assessment framework;
- Scientific uncertainty associated with survey/assessment displacement and understanding fisheries ecological effects/impacts especially beyond the turbine scale;
- "Graying" of fishing fleets/new entrants (i.e. increasing average age of fishermen);
- Power imbalances in decision-making and communication processes Examples of when collaborative science/ventures have had some positive inter-industry outcomes;
- Fisheries adaptations to wind are dependent on many factors including policies, technologies, capital, and cultural/social/demographic characteristics;
- Displacement may occur by policy, operational constraints, or both;
- Challenges associated with insurance; these were stated to vary by degree and detail across countries (and in U.S. are still speculative);
- Need for regional data collection (or spatially relevant data collection); for example, flatfish in the southern North Sea have different life history stages within different countries' waters and highly migratory species in U.S. will need assessment across full migratory route beyond state waters;
- Value of fisheries knowledge & expertise.

Differences identified across regions and impact categories

- Offshore wind policy/governance structures (e.g., planning, permits, compensatory mitigation);
- Fisheries policy/governance structures;
- Fisheries-dependent data collections;

- Factors outside of wind (e.g., spatial conflicts with vessel traffic in Antwerp, Rotterdam, Hamburg);
- Major oceanographic features such as hydrographic boundaries and bathymetry (e.g., Mid-Atlantic cold pool);
- Geographic boundaries and bathymetry, and whether fixed foundations or floating (e.g., US east vs. west coast);
- Differences in fisheries spatio-temporal management;
- Foreign vessel competition.

During the session, participants discussed the issues raised and were also given the opportunity to provide additional input on the respective regional situations through an anonymous mentimeter poll. Additional input from participants was received for the following two open-ended questions and is listed verbatim below (edited only for typographical errors):

1. *Are we missing any key similarities between US and Europe (recognizing there are differences within Europe and differences within the US)?*

- Motivation of fishers to be engaged in finding solutions [to conflict]
- Pace of development
- Lack of respect for fishers data and knowledge
- Available marine space
- Scale of development
- Scientifically we do not properly understand fishing behaviour, making it difficult to make predictions
- Extent of Marine Protected Areas?
- There are differences within Europe that are important to recognize. [This exercise is a simplification that may not be useful]
- Power imbalances between fishers and new users such as wind development
- Shifting baselines
- Concerns about assessment of cumulative effects and impacts
- Difference in structure of the fisheries supply chain (vertical vs horizontal integration)
- Difficulties in opportunities for fishers to engage in process, e.g., fishing is not a 9-5 job and the issue of having a voice in a large process vs being able to be part of the process to achieve outcomes
- Both US and Europe have robust sets of baseline fisheries data
- Public perceptions of wind energy and fisheries (likely this is a difference)
- Governance (ed. note: likely this is a difference)
- Similar types of fisheries and their importance to fishing communities
- Climate change and social interest to address mitigation
- Increasing fishing costs, e.g., regulatory and otherwise, outside of offshore wind challenges
- Perceptions of inevitability of having to share space
- Gear conflict
- Uncertainty of how and when OWF will expand
- Need for fishing outreach requirements
- Local negative impacts on fisheries vs regional positive impacts to energy planning
- Benefits of offshore wind development to coastal communities, e.g., port redevelopment

2. *Are we missing any key differences between US and Europe?*

- Level of uncertainty among US fishermen is very high and may be attributed to the lack of experience of OWFD of any significant scale
- Liability differences associated with cable protection, e.g., wilful damages vs. resulting from culpable negligence and fact U.S. is not a signatory to UNCLOS
- Marine space, extent and nature of MPAs
- Litigation risk in U.S. is higher
- Scale and cultural significance of fisheries is greater in U.S. legal systems (ed. note: may depend on specific state, country, etc.), fisheries management, and types & vulnerabilities of fisheries, e.g., shellfisheries in U.S.; and level of fisheries organization (perceived to be higher in U.S.)
- Public perception of the importance or value of fisheries, recreational fisheries importance, and cultural cohesion of public perception in Europe
- Coastal community differences, e.g., population densities in coastal zone
- Climate change mitigation policies
- Scale of development, U.S. wind will be far from shore and much larger installations than how wind development emerged in Europe
- Maturity of industry and experience of industry over time
- Public engagement process is more extensive in U.S.
- Lack of other offshore energy co-uses in U.S. Atlantic such as oil and gas in North Sea (but similarity in the U.S. Gulf of Mexico)
- Greater protected species management issues in U.S.
- Minimum energy density requirements (MW/Km2) that apply in Europe may not apply to U.S.
- Potential impacts from invasive species colonizations (but this may also be a concern in U.S.)
- Europe array grids are not 1 by 1 nm layouts
- There are large differences within European countries as well (e.g., UK) Rochdale Envelope Case Law, e.g. applications define worst case scenarios at planning stage in UK but this means that key issues like cable and layout are post consent.
- Perception that fishers in Europe may be more open to co-existence than those in U.S., depending on jurisdiction, and maybe more willing to negotiate on mitigation /compensation.

5.2 Evidence and data gaps

As time limitations prevented detailed discussion on the issues of evidence and data gaps, a further menti-meter survey was used to allow participants' input on this topic. For each issue participants wished to raise, they were asked to answer four connected questions:

1. What information do we need to understand better the socio-economic implications of offshore wind/fisheries interactions?
2. Why?
3. Is this information already collected? By whom?
4. What are the needs/challenges associated with obtaining this information?

Thirty-nine responses were received during the workshop, which covered topics including: identifying thresholds for positive and negative impacts; the acceptability and feasibility of co-location; fishers' responses to displacement (and improved understanding of their behaviour more generally); the socio-economic drivers behind compensation; and the level of community dependence on fisheries. The need to document the baseline situation was also highlighted. This survey remained open after the workshop, as did a related set of questions in which participants were asked to identify the key 'pinch points' for which evidence was required for each of the three themes. These 'pinch points' were those key factors in the cause-effect relationships on which other effects were particularly dependent. There were a total of 84 entries for the environmental theme 'pinch points' during the workshop, with the most common being distribution (N=15), abundance (N=9), loss of fishing grounds (N=6) and fishing behavior change (N=6). Out of 80 entries for the Economic theme 'pinch points', displacement (N=16), access to fishing grounds (N=9), and business risk/uncertainty (N=8) were the most frequent entries. For the cultural theme 'pinch points,' participation in decision making (N=9), metier (N=8), management and governance (N=7) and fishing community resilience (N=7) were the most frequent responses out of 72 entries.

5.3 How to assess the cumulative impact from OWFs on the fishing sector and fishing communities?

One of the most important tasks for the future will be to address the cumulative impacts of OWF development, researching and understanding biological, physical, and geological changes linked to OWF infrastructure, and the economic, social and cultural implications of changes in fishing activity with the wider interactions between fishing, coastal communities and society.

One OWF may not have large negative impacts, but multiple wind farms together, along with associated cabling infrastructure, collectively may have severe negative impacts (Berkenhagen *et al.* 2010). Therefore, an assessment of cumulative effects, taking all existing and proposed OWF globally into account, is essential in the future (Stelzenmüller *et al.* 2020).

Another effect to consider would be the cumulative pressure those wind farms have together with other human activities, especially where direct and indirect effects (positive/negative) on the marine environment are common across different uses (Gimpel, 2015). Such pressures can even be strengthened by external factors such as climate change or the COVID-19 pandemic (see Figures III, VII and X in Annex 4).

As the analysis of cumulative effects would have gone beyond the scope of the workshop, we foresee a strong link to other ICES working groups such as the Working Group on Cumulative Effects Assessments in Management (WGCEAM), which will work towards a common framework for cumulative effect assessment in order to evaluate the spatio-temporal scale of such effects in different ecosystem regions.

6 Conclusion and Recommendations - Developing best practices in managing fisheries & OWF interactions

WKSEIOWFC demonstrated the importance of improving our understanding of the socio-economic implications of OWF and fisheries interactions. The event was attended by participants from nine countries who represented policy/regulation, the fishing and OWF industries, consultants and academia.

The workshop allowed us to describe, summarise and illustrate perceptions of the various potential environmental, economic and cultural effects that offshore wind development may have on fisheries. Moreover, we were able to highlight the complexity and interconnectedness of the issues under discussion.

We further explored common issues between European and US regions such as complex interactions of new OWF technologies in combination with traditional fisheries that are strongly linked to the identity of coastal communities. Similarities identified across regions such as lacking integrated, appropriately-scaled and commonly-defined fisheries assessment frameworks, as well as the scientific uncertainty associated with surveys beyond the turbine scale, helped us to define issues that need to be addressed in the future. In addition, key differences were identified between European and US regions, noting that intra-regional differences exist within European jurisdictions and within US regions. Notable key differences include the policy and governance structures both for offshore wind permitting and for fisheries management; fisheries in Europe have a longer history of interacting with installed wind projects than fisheries in the US and this may contribute to greater perceived uncertainty in US; further, the scale and cultural significance of fisheries in general is much greater in some geographic regions than in others.

Evidence and data gaps were mostly related to identifying thresholds for positive and negative impacts, the acceptability and feasibility of co-location and the fishers' responses to displacement. The latter is particularly important as the fishers' behaviour can be driven by social factors such as working rhythm (Schadeberg *et al.* 2021), which need to be understood in order to assess the real impact of OWF development on fisheries.

An expanded, future effort should further explore the three-dimensionality of effects we describe in our conceptual representation of the interactions between environmental, economic and social/cultural changes, and how these different elements were partitioned into the three main workshop themes (Fig. 1). Further, it needs to address the effect of multiple OWF, the effects of OWF in combination with other human and external drivers of change (while likely not an exhaustive list, some examples provided during the workshop included shipping and transport, climate change, or the COVID-19 pandemic).

In conclusion, more research is needed to assess potential impacts of the development of OWF on the fishing sector, fishing communities and economic activities onshore. The results of this workshop will be carried further as the WGOWDF addresses its ToR A. This will include the following efforts: further analyse, review and summarise the results of mental models, identify linkages between different model dimensions, evaluate and identify metrics for measuring important factors and conditions for each of the sub-models, and identify and prioritise where there are data gaps requiring new research. This understanding can be used to foster information exchanges, collaboratively address science questions, and support decision-making. These activities are considered to have a very high priority on a global level, especially as offshore wind energy expands.

Here, we foresee a strong link to other ICES working groups focussing on topics related to our WKSEIOWFC:

- Working group on Marine Benthal and Renewable Energy Developments (WGMBRED), that works on the assessment of benthic effects of offshore wind farms;
- Working Group on Economics (WGECON), that works among others on economic indicators and the challenge of bringing fisheries economics into ICES science and advice;
- Working Group Marine Planning and Coastal Zone Management (WGMPCZM), that works among others on the assessment of conflicts, the potential of coexistence and synergies;
- Working Group on Maritime Systems (WGMARS), that works among others on bringing together social and natural scientists to inform integrated ecosystem assessment;
- Working Group on Social Indicators (WGSOCIAL), that works among others on the development of cultural indicators, the definition of fishing communities in ICES regions and the social and cultural significance of commercial fishing;
- Working Group on Cumulative Effects Assessments in Management (WGCEAM), that works on the development of a common framework for cumulative assessments to be applied in the context of ecosystem-based management.

7 Acknowledgements

We would like to thank all the WKSEIOWFC participants who gave input during the Workshop and contributed to this report.

8 References

Berkenhagen, J., Döring, R., Fock, H.O., Kloppmann, M.H.F., Pedersen, S.A. and Schulze, T. (2010), "Decision bias in marine spatial planning of offshore wind farms: Problems of singular versus cumulative assessments of economic impacts on fisheries", *Marine Policy*, Vol. 34 No. 3, pp. 733-36.

Bureau of Ocean Energy Management (2021), "Vineyard Wind 1 Offshore Wind Energy Project Final Environmental Impact Statement Volume II", OCS EIS/EA BOEM 2021-0012. https://www.boem.gov/sites/default/files/documents/renewable-energy/state-activities/Vineyard-Wind-1-FEIS-Volume-2.pdf. Retrieved April 29 2021.

European Commission. (2015), "European Commission, Paris Agreement. https://ec.europa.eu/clima/policies/international/negotiations/paris_en. Retrieved May the 5th 2020. 10:50".

European Commission. (2018), "2030 climate & energy framework. https://ec.europa.eu/clima/policies/strategies/2030_en. Retrieved: 5th of May 2020. 11:15".

Europêche. (2020), "Fishermen losing grounds. http://europeche.chil.me/post/fishermen-losing-grounds-266098. Retrieved May the 5th 2020. 11:00".

Gimpel, A. (2015), "Evaluation of spatial management strategies in the German Bight: How to balance sustainable use and ecosystem health? Dissertation", *Hamburg: Universität*, pp. 303 pp.

GWEC. (2019), "Global Wind Energy Council. Global wind report 2018. https://gwec.net/wp-content/uploads/2019/04/GWEC-Global-Wind-Report-2018.pdf. Retrieved: July 8th 2020, 13:25".

Halpern, B.S., Frazier, M., Afflerbach, J. *et al.* (2019), "Recent pace of change in human impact on the world's ocean", *Sci Rep*, Vol. 9.

Munroe, D., Powell, E., Klinck, J., Hofmann, E., and Scheld, A. "Understanding Economic Impacts to the Commercial Surfclam Fishing Industry from Offshore Wind Energy Development". Bureau of Ocean Energy Management (in prep).

Schadeberg, A., Kraan, M., and Hamon, K. G. Beyond me´tiers: social factors influence fisher behaviour. – ICES Journal of Marine Science, doi:10.1093/icesjms/fsab050.

Stelzenmüller, V. *et al.*, 2020, Research for PECH Committee – Impact of the use of offshore wind and other marine renewables on European fisheries. European Parliament, Policy Department for Structural and Cohesion Policies, Brussels.

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Annex 2: Workshop resolution

A **Workshop on the Socio-economic implications of offshore wind on Fishing Communities (WKSEIOWFC)**, initiated by the Working Group on Offshore Wind Development and Fisheries (WGOWDF), and chaired by Tara Hooper, UK; and Annie Hawkins, USA, will hold an online meeting, 15–17 March 2021 to:

a) Define the impact from offshore wind development for fishing behaviour, fishing communities and coastal economies;

b) Review and report on fishing industry interactions with offshore wind development and document lessons learnt including effects on the distribution of fishing operations (Science Plan codes: 2.2; 2.3; 2.7)

WKSEIOWFC will report by 1 May 2021 for the attention of SCICOM.

Supporting information

Priority	The activities of this workshop will lead ICES into issues related to the socio-economic effects of offshore wind farms on fisheries. In regard to the rapid expansion of the wind energy sector, these activities are considered to have a very high priority.
Scientific justification	Term of Reference a) Europe has been operating offshore wind energy facilities for 20 years. North America is on the verge of large-scale development. The European experience can be used to document the effects of offshore development on fishery operations, fishing communities, and fishery economics. Existing knowledge on the impact of wind energy on fisheries is focused mainly on ecological impacts, there is a clear knowledge gap on the economic and socio-cultural impact of the expansion on the fishing behaviour, fishing communities and coastal economies While there are distinct differences in the scale and scope of fisheries between the North American and European wind development areas; there is also the opportunity to identify common issues and promote research to address these issues. Defining and describing the effects and impacts from offshore wind development on fisheries and fishing communities will ultimately support to understand the fishing industry interactions with offshore wind development.
Resource requirements	No specific resource requirement beyond the need for members to prepare for and participate in the meeting, this will provide the main input to this worksho
Participants	The workshop is expected to attract 25-30 WGOWDF members and guests from the field of fisheries economics, social science, fisheries, wind energy development, licencing/permitting authorities and other relevant stakeholders.
Secretariat facilities	Standard support.
Financial	No financial implications.
Linkages to advisory committees	There are no obvious direct linkages, but developing the expertise could link to ACOM in the future.
Linkages to other committees or groups	There is a very close working relationship with the WGMPCZM, WGECON, WGSOCIAL, WGMRE, WGMBRED, WGSEDA and WGMARS.
Linkages to other organizations	There are linkages to fishing organizations and wind developers in the USA anc similar linkages in Europe, including wider links to licencing/permitting authorities and other relevant stakeholders.

Annex 3: Presentations from other ICES Working Groups

- *Marloes Kraan* from the Working Group on Social Indicators (WGSOCIAL) about the Development of cultural indicators, the definition of fishing communities in ICES regions and the social & cultural significance of commercial fishing.
- *Arina Motova & Eunice Pinn* from the Working Group on Economics (WGECON) about Regulatory Requirements for Wind Farms and Socio-Economic Impact Assessments in the Up, economic data and future challenges (incl. indirect effects on the wider fishing community).
- *Arina Motova* from Working Group on Economics (WGECON) about the work of this expert group and the challenge of bringing fisheries economics into ICES science and advice.
- *Patricia Clay* from the Working Group on Maritime Systems (WGMARS) about the multidimensionality of the term "Stakeholder" and about bringing together social and natural scientists to inform integrated ecosystem assessments.
- *Andrew B. Gill* from the Working Group on Marine Benthal and Renewable Energy Developments (WGMBRED) about the 'Cause-Effect' relationship analysis developed in WGMBRED to assess benthic effects of offshore wind farms.
- *Kira Gee & Andrea Morf* from the Working Group for Marine Planning and Coastal Zone Management (WGMPCZM) about Conflicts, coexistence and synergies in MSP and how to assess them.

Annex 4: Results from the pre-workshop survey

Environmental

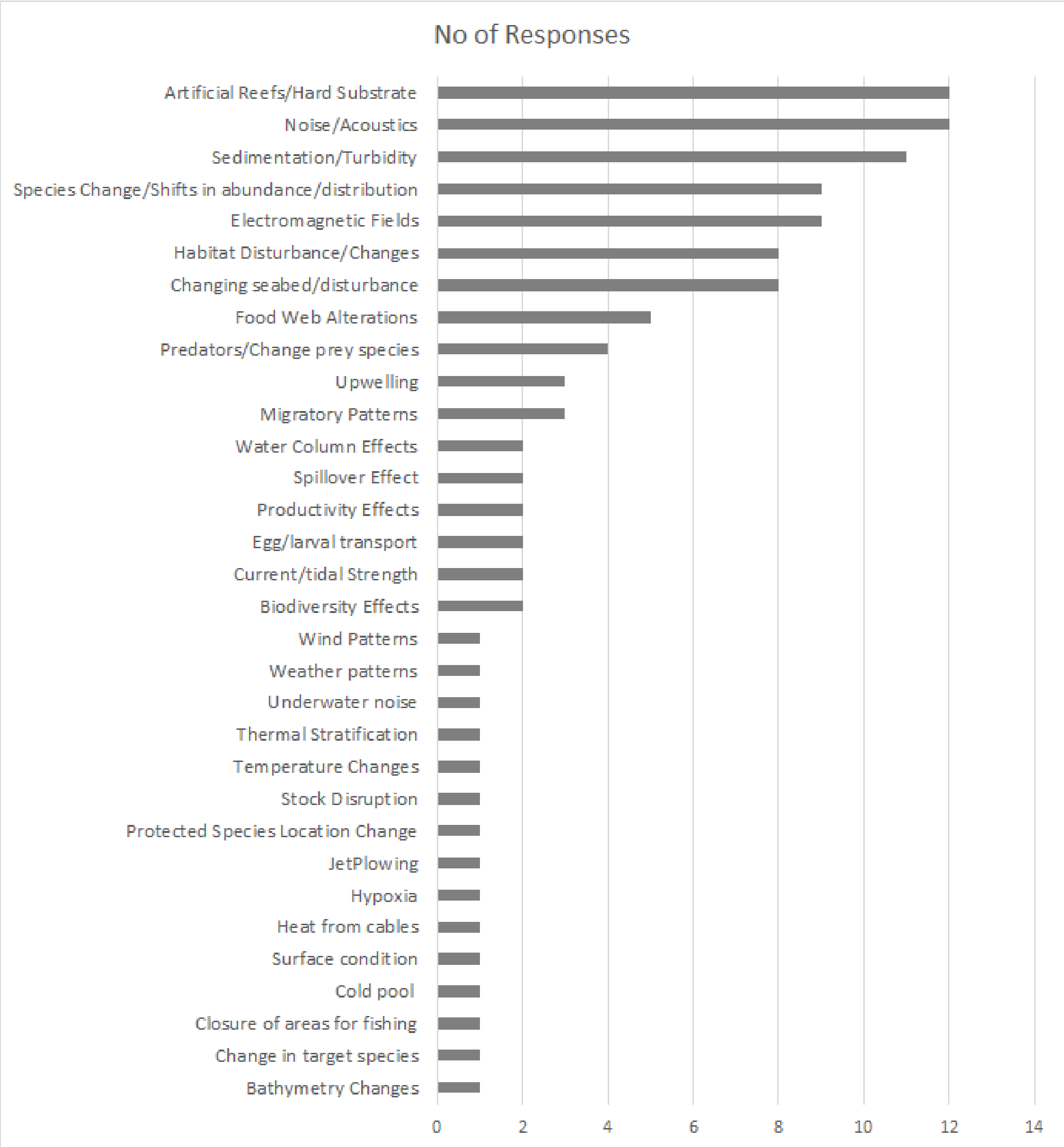

Figure I. The number of responses for each theme identified within responses to the question "What are the environmental changes associated with offshore wind farms that could affect individual fishing behavior?"

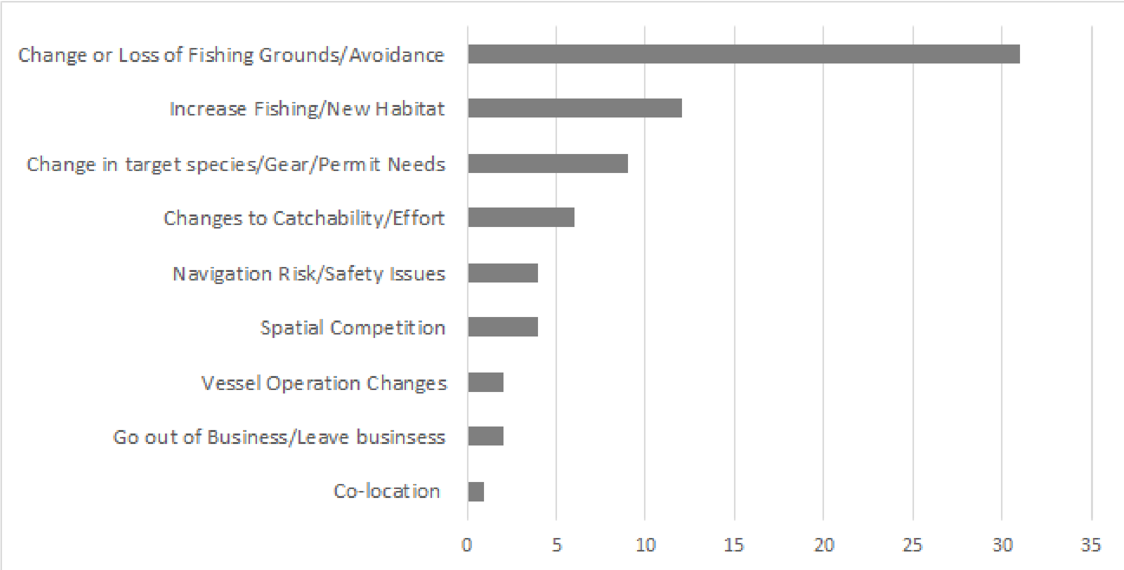

Figure II. The number of responses for each theme identified within responses to the question "What are the environmental changes associated with offshore wind farms that could affect individual fishing behavior?"

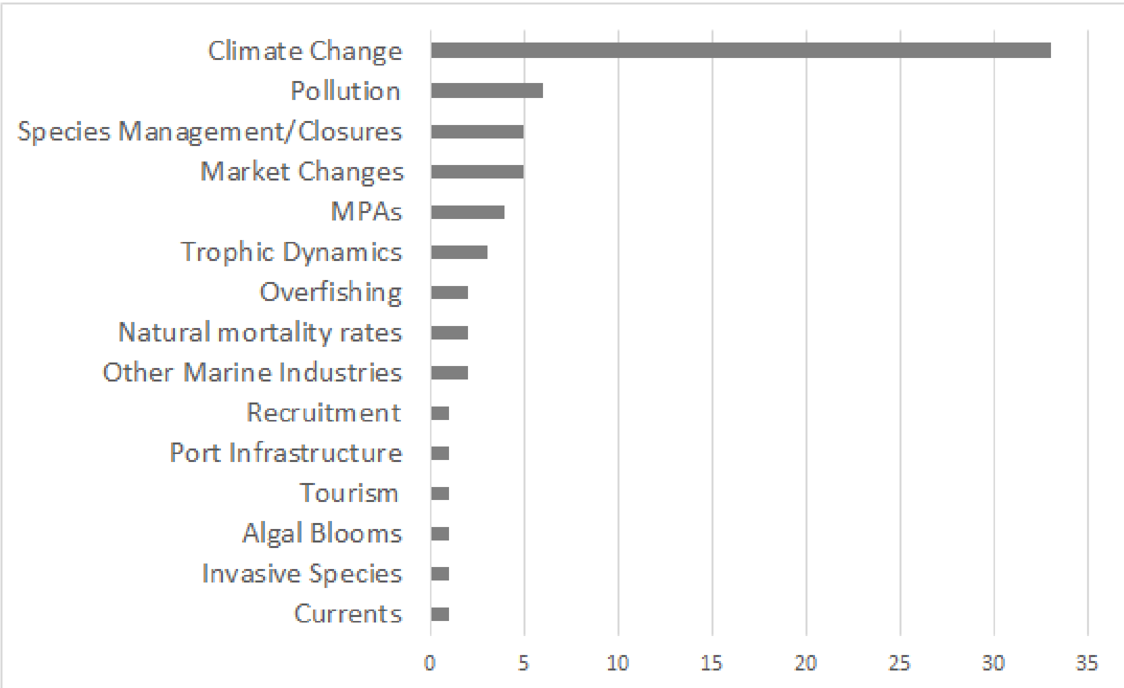

Figure III. The number of responses for each theme identified within responses to the question "What other environmental factors, not connected to OWF development, might lead to fisheries changes?"

Economic

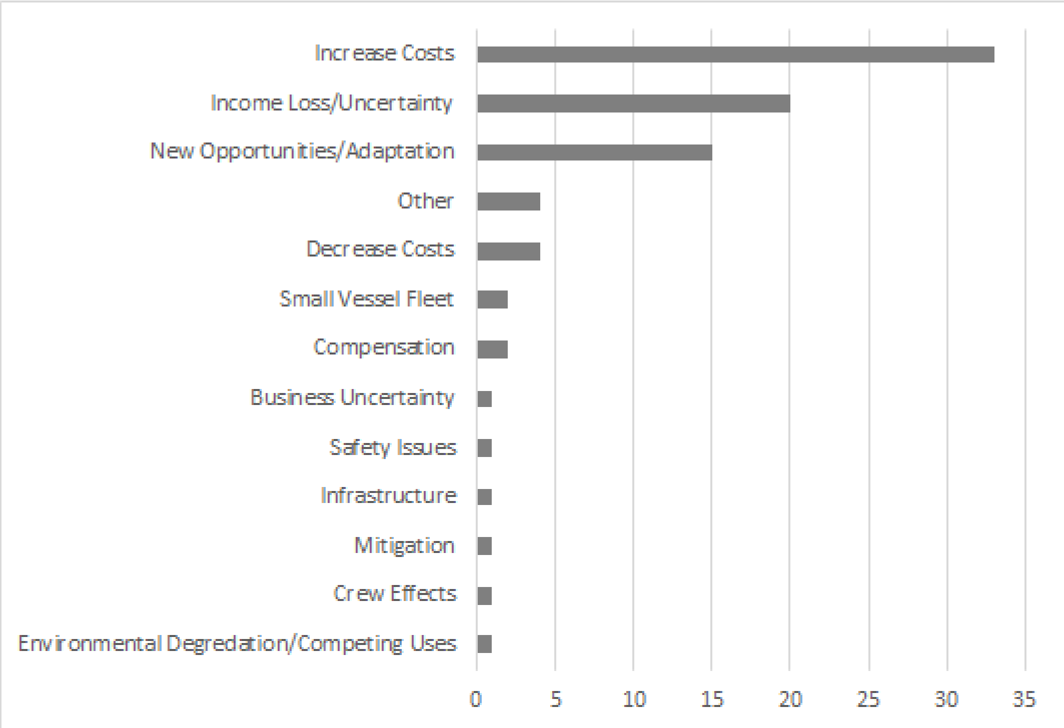

Figure IV. The number of responses in each of the main themes identified within responses to the question “How could the costs and income generation opportunities for individual boats change in response to OWF development?”

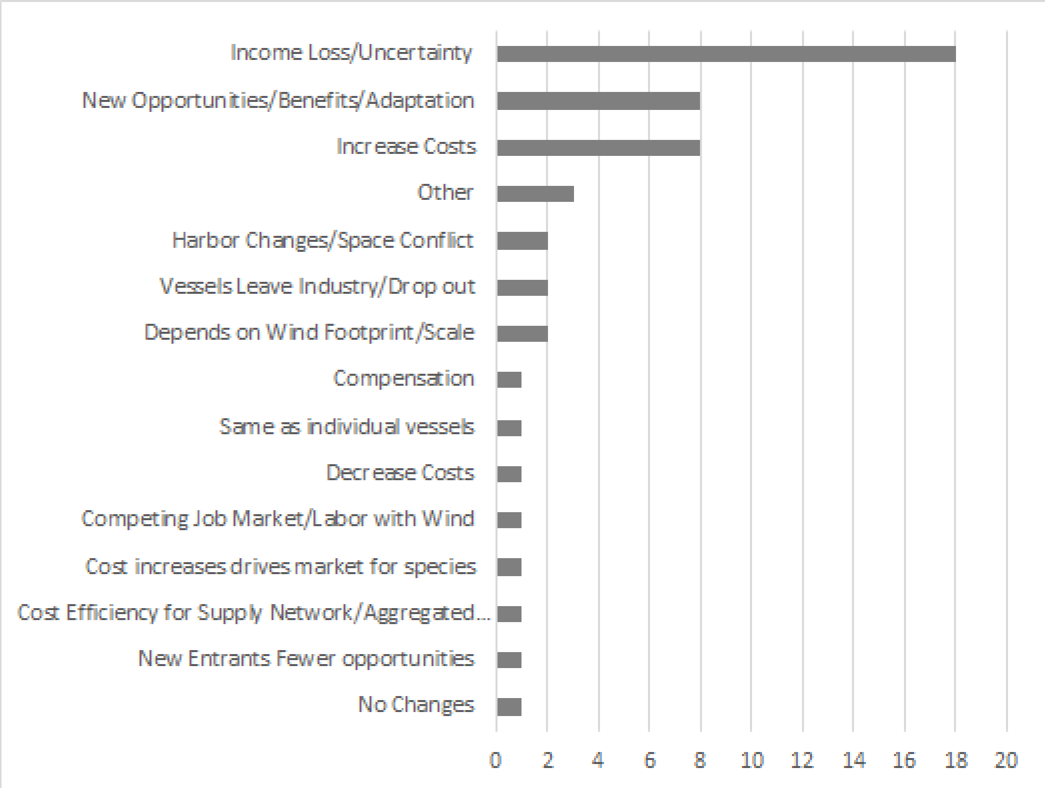

Figure V. The number of responses in each of the main themes identified within responses to the question "What changes in costs/income generation opportunities could occur at the scale of the fishing sector?"

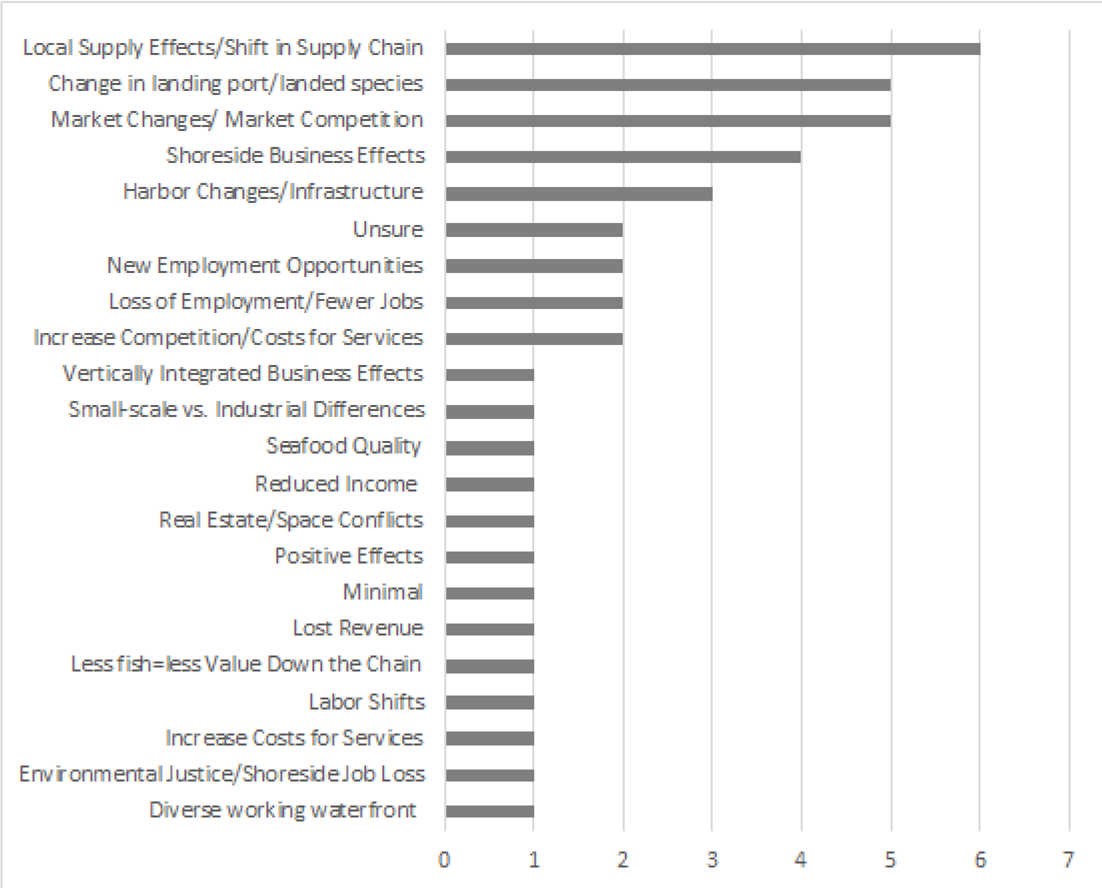

Figure VI. The number of responses in each of the main themes identified within responses to the question "What are the potential economic consequences for the wider value chain onshore?"

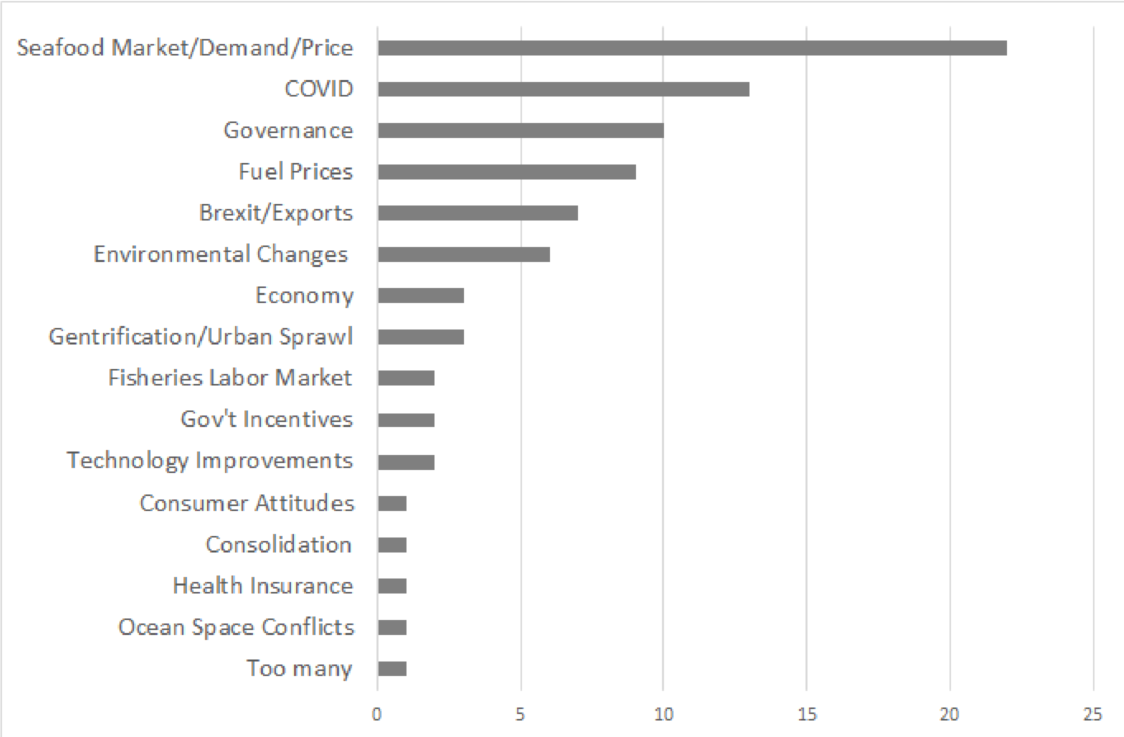

Figure VII. The number of responses in each of the main themes identified within responses to the question "What other economic changes, not connected to OWF development, are impacting fisheries?"

Cultural

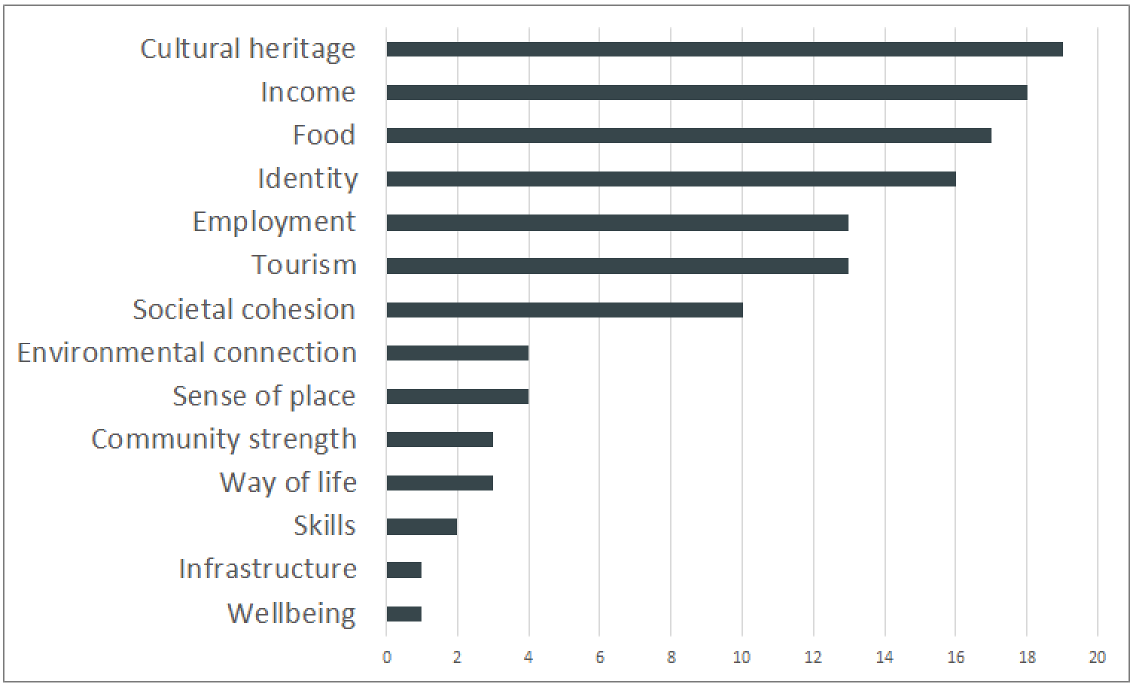

Figure VIII. The number of responses in each of the main themes identified within responses to the question "In what ways is fishing important to coastal communities and wider society?"

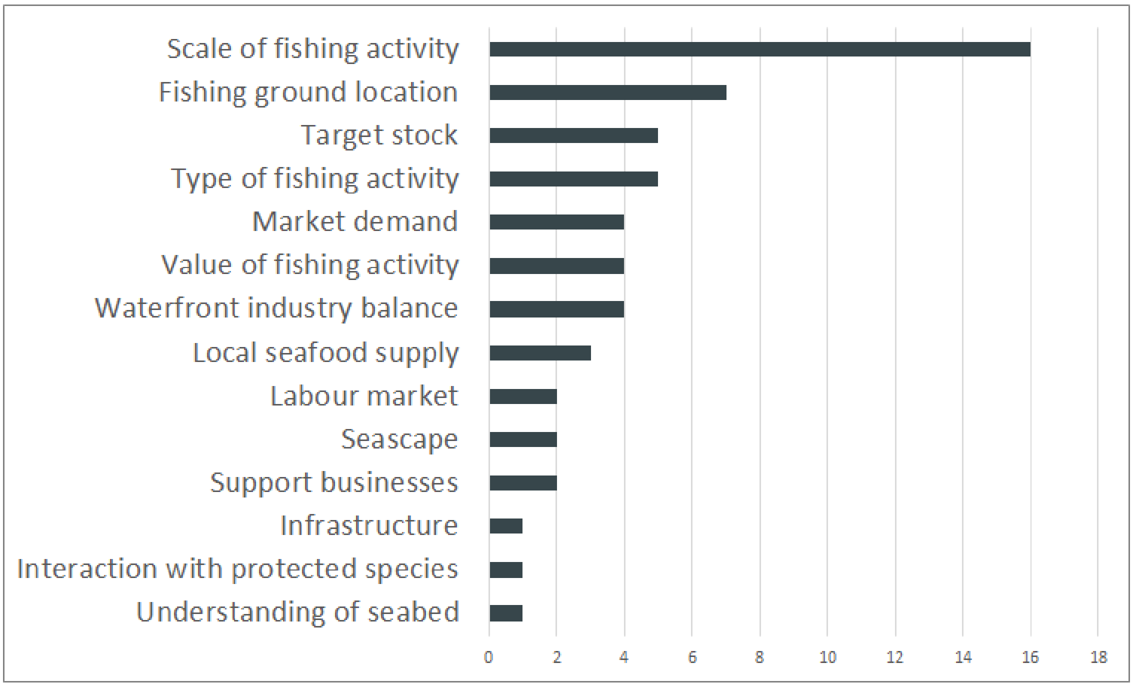

Figure IX. The number of responses in each of the main themes identified within responses to the question "What types of changes in fisheries would affect those interactions with coastal communities and wider society?"

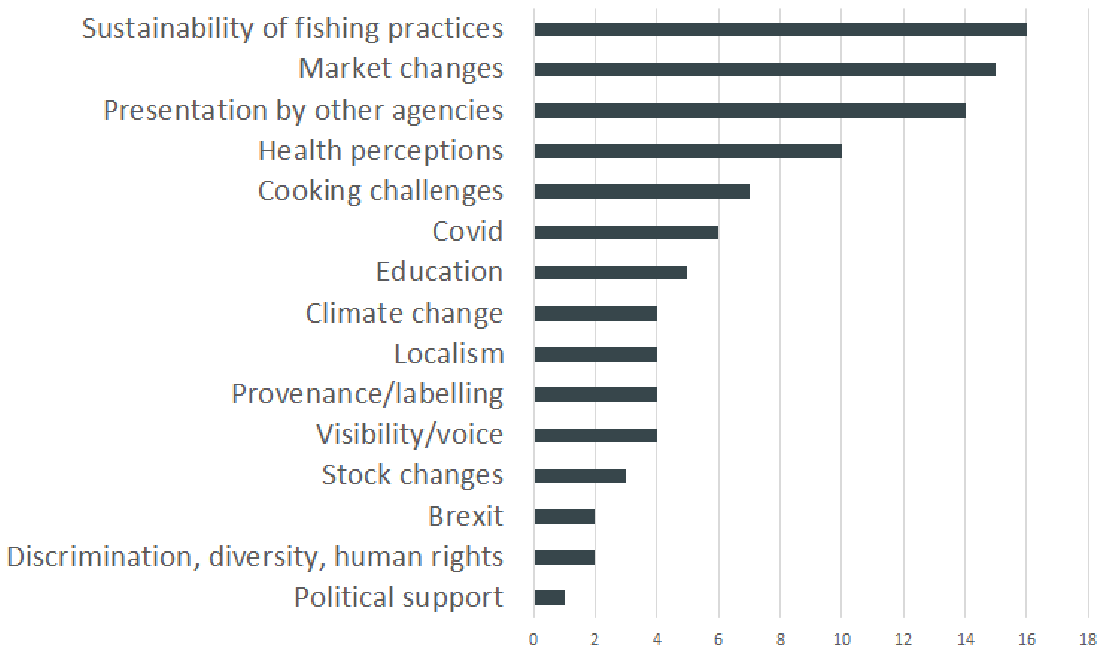

Figure X. The number of responses in each of the main themes identified within responses to the question "Apart from OWF development, what else might be affecting seafood consumption and public perception of fisheries?"

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James Murley *(Chair)*

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About the Academy

The National Academy of Public Administration is a non-profit, non-partisan, and independent organization of top public management and organizational leaders who tackle the nation's most critical and complex public management challenges. With a network of more than 950 distinguished Fellows and an experienced professional staff, the Academy is uniquely qualified and trusted across government to provide objective advice and practical solutions based on systematic research and expert analysis.

Established in 1967 and chartered by Congress in 1984, the Academy continues to make a positive impact by helping federal, state and local governments respond effectively to current circumstances and changing conditions. Learn more about the Academy and its work at www.napawash.org.

Foreword

In 2022, the Office of National Marine Sanctuaries (ONMS) will conclude a half century of service to the Nation. A relatively small Agency embedded in the Department of Commerce's National Oceanic and Atmospheric Administration, the ONMS currently manages a network of 14 national marine sanctuaries and two marine national monuments, encompassing more than 600,000 square miles of ocean and Great Lakes waters. The Agency is established to protect the extraordinary scenic beauty, biodiversity, historical connections, and economic productivity of these areas so they may continue to serve as the basis for the thriving recreation, tourism, and commercial activities that drive coastal economies.

The ONMS contracted with the National Academy of Public Administration (the Academy) to evaluate major achievements during its first 50 years, and to consider recommendations on how the Agency might prepare to address dynamic challenges and opportunities in the marine environment during the next 10-15 years. This assessment by an Academy Panel provides to ONMS actionable recommendations that, when implemented, will serve to enhance marine environmental conservation.

As a congressionally chartered, independent, non-partisan, and non-profit organization with over 950 distinguished Fellows, the Academy has a unique ability to bring nationally-recognized public administration experts together to help government agencies address challenges. I am deeply appreciative of the work of three Academy Fellows who served on this Panel.

I also commend the Academy Study Team that contributed valuable insights and expertise throughout the project. We greatly appreciate the constructive engagement of ONMS employees as well as many other individuals who provided important observations and context to inform this report.

Given the critical importance of the health and safety of the marine environment to the Nation's future, I trust that this report will be useful to ONMS as it considers organizational changes that will enhance its ability to more effectively achieve its mission.

Teresa W. Gerton

President and Chief Executive Officer

National Academy of Public Administration

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Acronyms and Abbreviations

Acronym or Abbreviation	Definition
30 by 30 Initiative	Target to protect 30 percent of the world's land and ocean by the year 2030
Academy	National Academy of Public Administration
AUV	Autonomous Underwater Vehicles
BAC	Business Advisory Council
BEA	Bureau of Economic Analysis
Bureau of Land Management	BLM
CEQ	Council of Environmental Quality
CFFP	Cooperative Forest Fire Prevention Program
Fiscal Year	FY
FTE	Full-time Equivalent Employees
FWS	Fish and Wildlife Service
GDP	Gross Domestic Product
IUCN	International Union for Conservation of Nature
Marine Environment	All oceans and lakes

MPA	Marine Protected Area
MPA Center	National Marine Protected Areas Center
MPA FAC	Marine Protected Area Federal Advisory Committee
NASA	National Aeronautics and Space Administration
NERRS	National Estuarine Research Reserve System
NEP	National Estuary Program
NFMS	National Fisheries Management Service
NMSA	National Marine Sanctuaries Act
NOAA	National Oceanic and Atmospheric Administration
NOS	National Ocean Service
NPS	National Park Service
ONMS	Office of National Marine Sanctuaries
PRSA	Public Relations Society of America
SAC	Sanctuary Advisory Council
SUCAR	Sanctuary Use Characterization, Assessment and Research
The System	National Marine Sanctuary System

UN	United Nations
USFS	United States Forest Service

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Executive Summary

The Office of National Marine Sanctuaries (ONMS), an agency within the National Oceanic and Atmospheric Administration (NOAA), will celebrate 50 years of service to the Nation during 2022. This brief report looks back on its major achievements. More important, it also looks forward to several critical challenges and opportunities that lie ahead over the next 10-15 years. The Panel concludes that ONMS has contributed in significant ways to advance its complicated mission and can make important short-term and medium-term changes to play a more decisive role in marine environmental protection in the next 10-15 years.

There are few other federal agencies that have a fully comparable task of environmental conservation and protection of the magnitude that faces ONMS (a discussion on benchmarking is provided in Section 3). To provide context, one only need turn to the amount of area under management, along with comparable budget figures. As discussed in Section 3, ONMS is responsible for more than 620,000 square miles of ocean and Great Lakes covered by 14 national marine sanctuaries and two national marine monuments. While not entirely comparable, the amount of area under ONMS authority dwarfs other important federal agencies with similar missions. Two comparable federal agencies are the National Park Service (NPS) and U.S. Wildlife Refuge System (The Refuge System). The NPS manages a total land area of about 131,000 square miles, and The Refuge System manages about 21,000,000 square acres. There are even greater disparities between ONMS, NPS, and The Refuge System if one considers budgets. ONMS has an operating annual budget in Fiscal Year (FY)2020 of $55.5 million for programs and $3 million for construction, while NPS and The Refuge System had FY2020 budgets amounting to $2.7 billion and $525 million respectively.[1] Given this context, ONMS is tasked to monitor a complex marine environment – one that is characterized by unique features – and to do so with significantly fewer resources.

Looking back since its establishment in 1972, the Panel focuses on seven major achievements. Summarized below, each is expanded upon more fully in Section 4.

1. <u>Innovation:</u> The National Marine Sanctuary System (the System) was among the first of its kind in creating a large scale Marine Protected Area (MPA) conservation system at a national level using adaptive management. The resource protection-driven work of the System has been shared globally.
2. <u>Protection of Marine Resources:</u> The fact that the System is made up of such a wide range of sites covering an enormous area is an impressive achievement and contributes directly to the goal and purpose of the system as defined in the National Marine Sanctuaries Act. Not only has the System been able to expand to new sites, but it has also expanded the reach of existing sites.
3. <u>Conservation and scientific research:</u> Scientific research that occurs within the System has directly contributed to the conservation and preservation of these sites. The science in the

[1] This report refers to funding budgeted under NOAA's Operations, Research, and Facilities accounts as "program" funds, and funding under its Procurement, Acquisitions, and Construction accounts as "construction" funds. Together, these two broad accounts comprise discretionary appropriations. See https://crsreports.congress.gov/product/pdf/IF/IF11185.

System includes important data collection such as site assessments and characterization. Establishing these data sets allows for an increased understanding of these sites and in turn allow for more informed decisions about how to protect and preserve them.

4. National heritage: The exploration of the maritime heritage in its multiple dimensions at some sites within the System has helped to unlock, better define, and preserve some of the nation's important historical milestones.
5. Management: The development of a dedicated and mission-driven staff capable of addressing the myriad of challenges within this enormous marine geography is not only impressive in its own right, but also has contributed to the System being able to realize significant achievements despite inadequate resources.
6. Community engagement: The formal mechanisms for community engagement that the System employs are regarded as a gold standard by many of its external stakeholders. The System has established a comprehensive framework in which local communities are treated as important stakeholders who have a say in the current and future management of the sites in and near their communities.
7. Positive externalities for partners and stakeholders: Numerous secondary positive benefits have accrued to sanctuary communities, partners, and stakeholders. Secondary benefits coming from the System include positive contributions to local economies and increased yields for stakeholders in the fishing industry.

Addressing future changes in the marine environment during the next 10-15 years in Section 5, the Panel identifies six important developments which offer both challenge and opportunity for ONMS going forward. Summarized here, these include:

1. Climate change and climate-related issues, such as ocean acidification: The impacts and effects of climate change are the biggest and most prevalent emerging theme providing both a threat and an opportunity to make a positive difference. The impacts of climate change are not just the warming of the oceans and Great Lakes, but include changing weather patterns, ocean acidification, sea level rise, range shifts of marine species, and much more. Each of these phenomena have demonstrable impacts on the sanctuary sites and the resources within them. They also provide the imperative for greater leadership in the ocean protection national and international dialogue. There is a tremendous need for greater resources to be brought to bear on expanding the System and its capacities and its presence as a leader.
2. Blue economy development: Activity in the blue economy involves a "de-coupling of socioeconomic development from environmental degradation… a subset of the entire ocean economy that has regenerative and restorative activities that lead to enhanced human health and well-being, including food security and creation of sustainable livelihoods."[2] Two areas within the blue economy that the System can and should also play a leadership role are aquaculture and the environmentally sensitive development of marine energy.
3. New technologies: New technologies, such as autonomous underwater vehicles (AUVs), have allowed humans to explore new marine areas. While technology itself is not an

[2] Spalding, *The New Blue Economy: The Future of Sustainability*. https://cbe.miis.edu/cgi/viewcontent.cgi?article=1052&context=joce.

answer to many of the questions and issues in the future of the marine environment, new tools to collect data can answer pertinent questions and develop innovative and sound solutions to protecting the marine environment, providing new opportunities for economic development and marine protection to co-exist synergistically.

4. Building personal connection to the marine environment: Beyond more traditional ways to connect to communities, like volunteer programs, visitor centers, signage and exhibits, and even websites and social media, there are emerging approaches and technologies that can help build and strengthen personal connections with the marine environment no matter how far one resides from a coastline. In particular, new technologies create new ways people explore marine environments, and to share that connection widely. Through virtual reality and artificial intelligence, (AI), one can experience the wonders of a sanctuary, and with the continual rise of social media one can virtually travel the world, from wherever they live.
5. Engaging underrepresented and indigenous communities: While the System has had success with community engagement, there are increasing opportunities to bring previously underrepresented voices to the table. Indigenous groups have traditional ecological knowledge and stewardship of these important areas and can offer a unique perspective in helping to create solutions to today's problems. Similarly, other underrepresented communities possess their own knowledge and cultural connections to ocean and coastal areas. Bringing these groups into the conversation and elevating them as important partners is increasingly important as the System adapts to the evolving marine environment.
6. Global movement on marine environment policy: Increasingly, international and domestic policymakers are advancing current scientific understanding of the marine environment and are focusing on better policies to advance the sustainability of the ocean's resources.

Combining these and other challenges and opportunities and based on a respectable ONMS success track record and trusted reputation with large segments of the marine stakeholder community, the Panel urges NOAA and ONMS leaders to act expeditiously and opportunistically to expand the vision and role of the System in the domestic and global movement on marine environment policy. In Section 6, the Panel offers 15 recommendations divided into three categories connected with their sequencing – short-, medium- and long-term recommendations, with supporting sub-recommendations. These recommendations serve to encourage ONMS to broaden its vision and aim higher/further. The recommendations are divided into the following set of six organizational areas that must be bolstered:

- strategy;
- finance;
- management and operations;
- organization;
- communication, outreach, and branding; and
- community engagement.

As ONMS embraces recommendations in each of these areas, the System can be better prepared to carry out the critical, complicated tasks that should be integrated into long-term ONMS goals achieved in consultation with NOAA to achieve greater impact in a world that needs that impact more than ever.

The complete list of report recommendations, discussed in Section 6, is provided below.

Short Term: Setting the Foundation Within the next 12 months	
Strategy	
Refresh Strategic Vision, Focus, Value Proposition, and Impact	
Finance	
Identify Alternative Funding Sources and a Sustainable Financing Model	
Management	
Support Reauthorization of the NMSA	Create Flexible and Adaptable Management Planning Structures
Organization	
Enable and Clarify the Role of the Regions	Evaluate Workforce Planning
Communications	
Enhance Communications Plan	Bolster Support for Communications Team
Community Engagement	
Reach New Communities	

Medium Term: Launching for Growth Next 12-24 months	
Strategy	
Revisit System Protection Levels and Metrics	
Finance	
Support System Economic Valuation and Community Profiles	
Community Engagement	
Effectively Engage Indigenous Communities	Expand Partnerships

Long Term: Becoming a Leader 24 months and beyond
Organization
Expand Role as Collaborator and Convener of Marine Protection
Communications
Create and Implement a Public Outreach Campaign

Figure E.1: Short-, Medium-, and Long-Term Strategy. Figure created by the National Academy of Public Administration.

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Section 1: Project Background

The immense marine environment surrounding our Nation and the Great Lakes that lie within our shores serve as the setting for this report. The term "marine environment" refers to the same definition the National Marine Protected Areas Center provides.[3] In 1972, the Congress passed the National Marine Protection, Research, and Sanctuaries Act (NMSA), thus establishing the National Marine Sanctuary Program that later become the System (hereafter, the System) that is managed by the Office of National Marine Sanctuaries (ONMS). While a relatively small Agency with a modest annual program budget of about $55 million and construction budget of about $3 million, ONMS is embedded in the Department of Commerce's National Oceanic and Atmospheric Administration (NOAA), and has nearly a half century track record of successfully advancing its mission and vision.[4]

The System was established with the following purpose, found in legislative language: "Protect areas of the marine environment with special national significance due to their conservation, recreational, ecological, historical, scientific, cultural, archeological, education or aesthetic qualities as national marine sanctuaries."[5] Simple, and yet profound, its mission statement reads: "We protect treasured places in the ocean and great lakes." Its vision is no less inspiring: "A thriving sanctuary system that protects our nation's underwater treasures and inspires momentum for a healthy ocean."[6]

The System currently manages a network of 14 national marine sanctuaries and two marine national monuments, encompassing more than 620,000 square miles of ocean and Great Lakes waters. The Agency aims to protect the extraordinary scenic beauty, biodiversity, historical connections, recreational value, and economic productivity of these areas so they may continue to serve as the basis for thriving recreation, tourism and commercial activities that drive coastal economies. ONMS is also home to the National Marine Protected Areas Center, authorized by Executive Order 13158 in 2000, and charged with strengthening and connecting U.S. marine protected areas (including Sanctuaries) across all levels of government.

As the System approaches its golden anniversary next year, this report provides a survey of its past major accomplishments. The look-back assessment offers a context for the report's future

[3] "(A) ocean or coastal waters (note; coastal waters may include intertidal areas, bays or estuaries); (b) an area of the Great Lakes or their connecting waters; (c) an area of submerged lands under ocean or coastal waters or the Great Lakes or their connecting waters; or (d) a combination of the above)." See U.S. National Marine Protected Areas Center, *Definitions of MPA and its Key Terms*. https://marineprotectedareas.noaa.gov/aboutmpas/termsdefinitions/.
[4] This report refers to funding budgeted under NOAA's Operations, Research, and Facilities accounts as "program" funds, and funding under its Procurement, Acquisitions, and Construction accounts as "construction" funds. Together, these two broad accounts comprise discretionary appropriations. See https://crsreports.congress.gov/product/pdf/IF/IF11185.
[5] 106th U.S. Congress, *National Marine Sanctuaries Amendments Act of 2000*. https://www.congress.gov/bill/106th-congress/senate-bill/1482/text/pl?overview=closed.
[6] U.S. Office of National Marine Sanctuaries, *Strategic Plan for Fiscal Years 2017-2022.* https://nmssanctuaries.blob.core.windows.net/sanctuaries-prod/media/docs/onms-strategic-plan-2017-2022.pdf.

focus, which prescribes actions the System should take to address future challenges and take advantage of opportunities to increase its impact and value.

1.1 Scope of Work and Methodology

The purpose of this report is to (1) evaluate the impacts and major achievements of the System over the past five decades and (2) provide high-level, long-term (10-15 years) recommendations on how best to seize future opportunities and respond to very real challenges. The results will be used to inform various key documents and projects related to the System's 50th anniversary next year.

The analysis focuses on identifying impacts, achievements, and potential directions that the System should take through focused interviews with ONMS leaders and staff, as well as with former ONMS employees, other NOAA employees, and stakeholders across a wide spectrum. The data gathering expanded to include input from external stakeholders, including other federal agencies, congressional committees, commercial and recreational fishery representatives, other recreational users, conservation groups, and industry groups to gain a fuller picture of both the challenges faced by and opportunities presented to the System. Interviews also focused on other governmental partners and stakeholders, including tribal, state, and local officials.

The analysis also considers insights from other multiple-use and conservation-oriented natural resources management programs, including those of the National Marine Fisheries Service (NMFS), National Wildlife Refuge System, and National Park Service (NPS), the National Estuary Program (NEP), National Estuarine Research Reserve System (NERRS) as well as entities such as state agencies, and conservation groups (a full list of interviewees is provided in Appendix B).

In addition, documentary research included a review of foundational statutes, regulations, and administrative guidance; budgetary and strategic planning documents; scientific articles; best practice literature; and past internal and external assessments of ONMS operations and performance.

Research and drafting of this Academy Panel report was prepared under the leadership of a three-member Panel of Academy Fellows that guided the work of a four-member professional Academy Study Team (biographical information on the Panel and Study Team is provided in Appendix A).

1.2 Building on Previous Academy Reports

The Academy prepared reports for the System on two previous occasions, in the years 2000[7] and in 2006.[8] Those findings and recommendations were positively received and were largely implemented by the Agency, guiding actions to remediate important challenging issues.

Recommendations in the first report focused mainly on the following four topics: (1) taking steps to protect marine resources in the sanctuaries more effectively; (2) working more confidently with

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[7] National Academy of Public Administration, *Protecting our National Marine Sanctuaries*.

[8] National Academy of Public Administration, *Planning and Management at the National Marine Sanctuary Program*. https://s3.us-west-2.amazonaws.com/napa-2021/studies/ready-to-perform-planning-and-management-at-the-national-marine-sanctuary-p/06-11.pdf.

communities; (3) managing for results rather than focusing on planning, capacity-building, or other processes; and (4) investing in building up staff and capacity at the sites.

The second report, in 2006, focused on the following six topics: (1) strategic planning to enhance performance-based management; (2) sanctuary management planning should be informed with community involvement; (3) improved System-wide monitoring and condition reports to focus on important issues at individual sanctuaries; (4) enhancing the connection between annual operating plans and performance; (5) connecting planning and guidance document preparation with results; and (6) a future focus.

This report builds on the previous two studies, with a fresh focus on how to incorporate Agency capacity and skills developed in its first five decades to pivot appropriately to address the potentially significant changes that loom in the 10–15-years. One thing is sure, the marine environment is changing rapidly, and thus provides enormous opportunities and an imperative for ONMS to creatively address those challenges to benefit the Nation and beyond.

1.3 Organization of the Report

Besides this section, the report is organized into five more sections as follows:

Section 2 provides background information and important context for the report sections that follow. This important foundational information serves as a launching point for addressing particular elements of the scope of work.

Section 3 compares several data points connected with the System that can be compared with those of other U.S. federal and several foreign government agencies whose missions are similar. Several insights into the System are drawn in this section.

Section 4 highlights major achievements of the System since its establishment in 1972. These themes are revisited throughout the report as strengths to be built upon.

Section 5 offers important observations into six key challenges and opportunities coming up during the next 10-15 years in the marine environment. These become the context for how the Panel structures the report recommendations.

Section 6 proposes 15 recommendations to the System, divided into short-, medium-, and long-term actions, further classified into six important topics. These serve as an integrated package of actions that, when implemented over time, will prepare the System to continue achieving its mission, and expanding its critical role in protecting the marine environment.

Section 2: Background on the Sanctuary System

This section provides background information on the System, providing context for the findings and recommendations provided in this report.

2.1 Establishing Legislation

In October of 1972, Congress passed the Marine Protection, Research and Sanctuaries Act. Title III was later renamed the National Marine Sanctuaries Act (NMSA).[9] The primary objective of the System is resource protection. The NMSA permits the Secretary of Commerce to "designate any discrete area of the marine environment as a national marine sanctuary and promulgate regulations implementing the designation…" provided the area is of special national significance due to its conservation, recreational, ecological, historical, scientific, cultural, archaeological, education, or aesthetic qualities.[10]

In addition, the NMSA lists nine purposes and policies.[11] These include:

- Identifying and designating as national marine sanctuaries areas of the marine environment which are of special national significance and to manage these areas as the National Marine Sanctuary System;
- Providing authority for comprehensive and coordinated conservation and management of these marine areas, and activities affecting them, in a manner which complements existing regulatory authorities;
- Maintaining the natural biological communities in the national marine sanctuaries, and protecting, and, where appropriate, restoring and enhancing natural habitats, populations, and ecological processes
- Enhancing the public awareness, understanding, appreciation, and wise and sustainable use of the marine environment, and the natural, historical, cultural, and archaeological resources of the System;
- Supporting, promoting, and coordinating scientific research and monitoring of the resources of these marine areas;
- Facilitating all public and private uses of the resources of these marine areas to the extent compatible with the primary objective of resource protection;
- Developing and implementing coordinated plans for the protection and management of these areas with appropriate Federal agencies, State and local governments, Native American tribes and organizations, international organizations, and other public and private interests concerned with the continuing health and resilience of these marine areas;
- Creating models and incentives to conserve and manage these areas; and

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[9] U.S. Office of National Marine Sanctuaries, *Celebrating 45 Years of America's Underwater Parks*. https://sanctuaries.noaa.gov/news/oct17/celebrating-45-yrs-of-americas-underwater-parks.html
[10] 106th U.S. Congress, *National Marine Sanctuaries Amendments Act of 2000*. https://www.congress.gov/bill/106th-congress/senate-bill/1482/text/pl?overview=closed.
[11] Ibid, *page 1*.

- Cooperating with global programs encouraging conservation of marine resources.

Congress has the authority to disapprove the Secretary of Commerce's designation of a sanctuary by adopting a concurrent resolution in both chambers. In the case of a national marine sanctuary that is located partially or entirely within the seaward boundary of any state, the state's governor may certify to the Secretary that the designation or any of its terms are unacceptable.[12] In such instances, the designation or unacceptable term of designation will not take effect in the area in question.[13]

Enforcement of regulations in the System is overseen by the U.S Coast Guard, the NOAA Office of Law Enforcement, and, where Joint Enforcement Agreements are in place, state officers. The NMSA also provides the System with a set of special authorities:

- The Secretary of Commerce is authorized to solicit donations for the program.
- The Secretary may designate a private company or individual as an "official sponsor" and license them to use a logo for the System or for individual sanctuaries.
- The System may create, market, and sell products.

Since 2013, the National Marine Protected Areas Center (MPA Center) has been part of ONMS. Authorized by Executive Order 13158, the MPA Center is charged with implementation of Section 4(a) of the Order, the development of a national system of MPAs.

2.2 Global Movement on Marine Environment Policy

The marine environment is a vast and rapidly changing spatial area with numerous jurisdictional authorities, stakeholders, communities, and users. Since the NMSA was enacted in 1972, oceanographers have made large strides in their scientific understanding and ability to predict changes in the ocean system, owing in large part to advances in monitoring technology like satellites. Oceanographers and natural resource economists have also made strides in understanding the contribution of the ocean system to the global and national economies and ecosystems, as well as coastal communities. About 40 percent of the world's population is concentrated within 100 kilometers of a coast. The Organization for Economic Cooperation and Development estimates that by 2030, $3 trillion of economic output will be generated by ocean sectors each year.[14] As the global coastal population is expected to increase by a billion people by 2050, the rise of the "blue economy" becomes ever more crucial given the importance of ocean

[12] 106th U.S. Congress, *National Marine Sanctuaries Amendments Act of 2000,* page 7. https://www.congress.gov/bill/106th-congress/senate-bill/1482/text/pl?overview=closed.
[13] The terms of designation include the geographic boundaries of the sanctuary, the characteristics of the area that give it conservation, recreational, ecological, historical, research, educational, or aesthetic value, and the activities that will be subject to regulation by the System.
[14] These ocean sectors include transportation, fishing, tourism, and energy. See Organization for Economic Co-operation and Development, *Work in Support of a Sustainable Ocean*. https://www.oecd.org/ocean/OECD-work-in-support-of-a-sustainable-ocean.pdf.

resources for food, energy, jobs, recreation, and other key ecosystem services.[15,16] Still, challenges remain in communicating this information to policy and decision-makers in ways that are actionable and sustainable.

These considerations have led international and domestic leaders to invest in advancing our current scientific understanding, and to consider the natural resources policies that can be brought to bear on the sustainability of the marine environment's resources. To take one illustration, the United Nations (UN) has called for a Decade of Ocean Science for Sustainable Development (2021-2030) to bring together researchers and stakeholders in the ocean community to develop science that will inform policies for a more productive, resilient, and sustainable ocean. In 2019, Costa Rica, France, and Britain's High Ambition Coalition for Nature and People set a target of protecting 30 percent of the world's land and ocean area by the year 2030 (the 30 by 30 initiative). During the same year, UN also proposed the 30 by 30 initiative under the Convention for Biological Diversity, an international binding treaty. Last October, California did so as well.[17] In 2020, about 15 and 7 percent of the globe's land and ocean were considered protected, respectively. By January 2021, 50 countries had committed to the 30 by 30 initiative.

On January 27, 2021, President Biden signed an executive order "Tackling the Climate Crisis at Home and Abroad" which commits the United States to the 30 by 30 conservation goal, among other efforts to address climate change. In addition, on October 20, 2020, a bill referred to as the "Ocean-Based Climate Solutions Act of 2020" was introduced in the U.S. House of Representatives. The Bill would:

> *"direct the Secretary of Commerce [acting through NOAA] … to provide for ocean-based climate solutions to reduce carbon emissions and global warming; to make coastal communities more resilient; and to provide for the conservation and restoration of ocean and coastal habitats, biodiversity, and marine mammal and fish population…".*

The Bill would direct the Secretary of Commerce to initiate the designation process for all of the areas identified in NOAA's Inventory of Successful Nominations as national marine sanctuaries and report back on steps taken within 180 days of its enactment. NOAA's Inventory of Successful Nominations is a list of areas NOAA has accepted for nomination as national marine sanctuaries. Nominations are made by the American public at the local community level. There are currently five areas in the Inventory, and the Bill would constitute a major increase in management

[15] The blue economy refers to a range of economic uses of ocean and coastal resources – such as energy, shipping, fisheries, aquaculture, mining, and tourism. It also includes benefits that may not be marketed, such as carbon storage, coastal protection, cultural values and biodiversity. See Spalding, *The New Blue Economy: The Future of Sustainability*. https://cbe.miis.edu/cgi/viewcontent.cgi?article=1052&context=joce.

[16] See Section 5 of this report for a more detailed discussion on the blue economy.

[17] State of California Office of Governor Newsom, *Governor Launches Strategies to Use Land to Fight Climate Change*. https://www.gov.ca.gov/2020/10/07/governor-newsom-launches-innovative-strategies-to-use-california-land-to-fight-climate-change-conserve-biodiversity-and-boost-climate-resilience/.

responsibility for the System, as NOAA has only designated one sanctuary within the last twenty years and is currently working on the designation of two other sites.[18,19]

2.3 National Marine Sanctuaries and Marine National Monuments

In addition to the national marine sanctuaries, the System shares responsibility for two marine national monuments with multiple government agency partners.[20] As detailed in Section 2, national marine sanctuaries are established under the NMSA. Prospective sanctuaries are subject to examination and approval in NOAA's sanctuary nomination and designation processes. In the nomination process, local communities propose areas to be protected through the creation of a sanctuary for their special ecological significance, maritime heritage resources, or important economic uses. NOAA then examines the proposal against the requirements of NMSA, including those for special national significance, and existing management and regulatory regimes in place at the proposed area. If a nomination successfully passes the review phase, NOAA will notify the community that made the nomination all the requirements have been met. Then, NOAA places the nominated area in its Inventory of Successful Nominations.[21]

With the designation process, NOAA announces its intent to designate a new sanctuary and begins setting the scope for an analysis of the area's resources.[22] During the scoping phase, NOAA requests input from the public on potential geographic boundaries, the resources that should be protected, and other information that should be included in its resource analysis. In the next phase, NOAA prepares a draft environmental impact statement and sanctuary management plan, as well as proposed regulations and boundaries. NOAA then provides for a public review of the draft documents, lasting no less than 30 days. Before final designation, the U.S. Congress and governor of the state in which the sanctuary is proposed have the opportunity to review the documents.

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[18] The five areas are: Chumash Heritage (California, Central Coast), Lake Erie Quadrangle (Pennsylvania), St. George Unangan Heritage (Alaska), Hudson Canyon (New York, Atlantic), and Mariana Trench (Pacific). See U.S. National Oceanic and Atmospheric Administration, *Sanctuary Nominations*. https://nominate.noaa.gov/nominations/.

[19] To organize capacity for this increased responsibility, ONMS would need to engage in a focused effort to share its vision and priorities within NOAA, the Department of Commerce, and across the Federal government. There also is a need for better coordination on sharing capacity, resources, and priorities within NOAA and the Department of Commerce. As a science and research organization, NOAA has significant technical capacity, expertise, and access to resources. Other agencies in the Department also bring expertise in economic development and other areas. Developing and communicating priorities and identifying mutual areas of collaboration and resource-sharing will allow ONMS to leverage the capacity within NOAA and the Department as resource multipliers.

[20] U.S. Office of National Marine Sanctuaries, *Monuments and Sanctuaries*. https://sanctuaries.noaa.gov/about/monuments-and-sanctuaries-whats-the-difference.html.

[21] U.S. National Oceanic and Atmospheric Administration, *Sanctuary Nomination Process Guide*. https://nominate.noaa.gov/guide.html.

[22] U.S. Office of National Marine Sanctuaries, *Road to Sanctuary Designation*. https://nmssanctuaries.blob.core.windows.net/sanctuaries-prod/media/archive/management/pdfs/designation-process.pdf.

Marine national monuments are established under the Antiquities Act of 1906. The Antiquities Act grants the President and Congress authority to designate marine national monuments by executive order, a very different process than those for nominating and designating sanctuaries detailed above. Although NOAA has no formal role in the establishment of monuments, the bureau may support a presidential administration by providing information and technical expertise on the area under consideration. NOAA may co-manage monuments in partnership with the Department of the Interior. Two marine national monuments are co-managed by ONMS with federal. state, and territorial partners: Papahānaumokuākea and Rose Atoll. Three others are co-managed by NMFS and U.S. Fish and Wildlife Service: Pacific Remote Islands, Marianas Trench, and Northeast Canyons and Seamounts; ONMS has no role in the management of these monuments.

2.4 NOAA Office of National Marine Sanctuaries

NOAA headquarters consists of six staff offices, six corporate services, and six line offices.[23] The six line offices are the:

- National Environmental Satellite, Data, and Information Service (NESDIS)
- National Marine Fisheries Service (NMFS)
- National Ocean Service (NOS)
- National Weather Service (NWS)
- Office of Marine and Aviation Operations (OMAO)
- Office of Oceanic and Atmospheric Research (OAR)

NOAA's Office of National Marine Sanctuaries is positioned within NOS. ONMS' mission is to "protect treasured places in the ocean and Great Lakes."[24] ONMS envisions "a thriving sanctuary system that protects our Nation's underwater treasures and inspires momentum for a healthy ocean." According to the agency's strategic plan for fiscal years (FYs) 2017-2022, its goals are to:

1. Ensure thriving sanctuaries and other ocean parks.
2. Safeguard more underwater treasures as national marine sanctuaries.
3. Increase support for sanctuaries.
4. Deepen our understanding of sanctuaries.
5. Ensure ONMS is a great place to work.

[23] U.S. National Oceanic and Atmospheric Administration, *Organization*. https://www.noaa.gov/about/organization.
[24] U.S. Office of National Marine Sanctuaries, *Strategic Plan for Fiscal Years 2017-2022*. https://nmssanctuaries.blob.core.windows.net/sanctuaries-prod/media/docs/onms-strategic-plan-2017-2022.pdf.

Organizational Structure

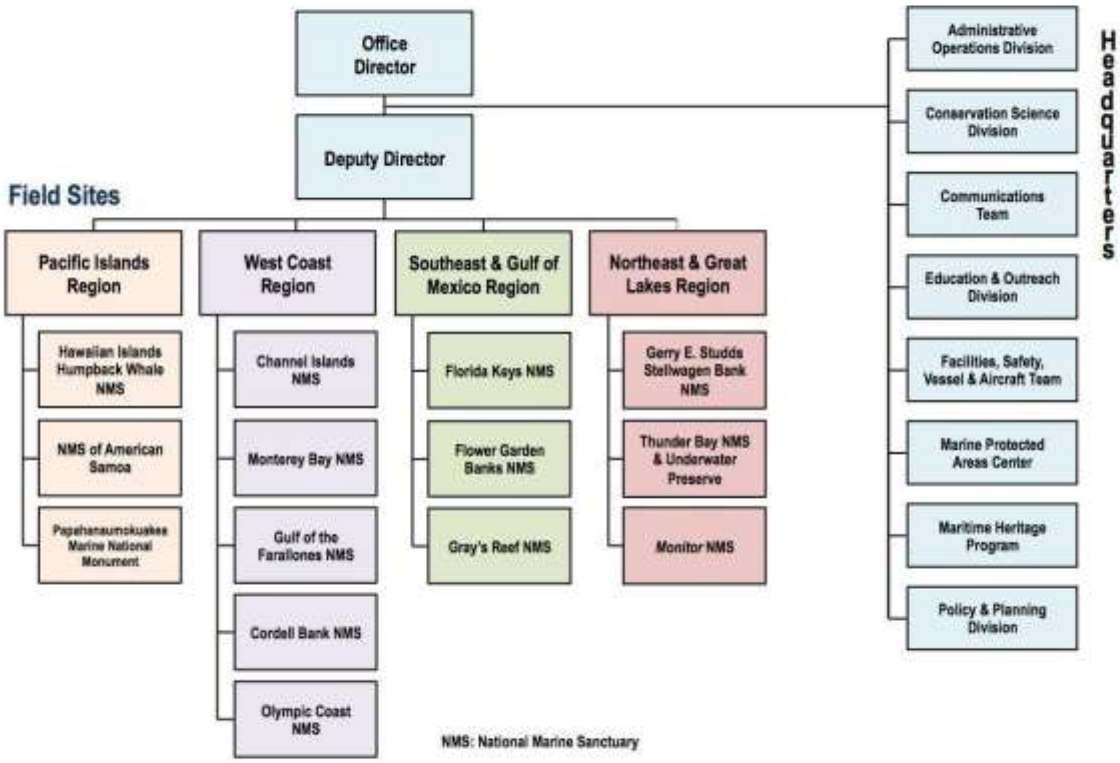

Figure 2.1: National Marine Sanctuary System Organization Chart. (Source: https://sanctuaries.noaa.gov/about/org-chart.html)[25]

[25] ONMS is reviewing their current organizational structure for potential updates and streamlining options.

Headquarters

In 2001, NOAA elevated its Marine Sanctuaries Division to the office level under the National Ocean Service line office. At its headquarters in Silver Spring, Maryland, eight divisions and teams comprise ONMS. Six of the units administer programs, and two provide mission support, as shown in Figure 2.2, below.

Program	**Mission Support**
Communications Team	Administrative Operations Division
Conservation Science Division	Facilities, Safety, Vessel and Aircraft Team
Education and Outreach Division	
Marine Protected Areas Center	
Maritime Heritage Program	
Policy and Planning Division	

Figure 2.2: ONMS Headquarters Units. Figure created by the National Academy of Public Administration. (Source: https://sanctuaries.noaa.gov/about/org-chart.html).

Regions

Northeast and Great Lakes	**West Coast**
Lake Ontario*	Channel Islands
Mallows Bay-Potomac River	Cordell Bank
Monitor	Greater Farallones
Stellwagen Bank	Monterey Bay
Thunder Bay	Olympic Coast
Wisconsin Shipwreck Coast*	
Pacific Islands	**Southeast, Gulf of Mexico, and Caribbean**
American Samoa	Florida Keys
Hawaii Humpback Whale	Flower Garden Banks
Papahānaumokuākea	Gray's Reef

**Site currently in the process of sanctuary designation.*
Figure 2.3: National Marine Sanctuary System Regions. Figure created by the National Academy of Public Administration. (Source: https://sanctuaries.noaa.gov/about/org-chart.html).

The System's regional layer is a relatively new addition to the organization, first established in 2001 when ONMS was elevated from NOAA's division level to its office level under the National Ocean Service. ONMS's regional offices are responsible for providing policy, operational, and day-to-day administrative support to the leadership and staff of all national marine sanctuaries or marine national monuments in the region. The regions also address issues of broad regional concern and are responsible for assisting the ONMS Director and Deputy Director in the administration of all regional resources and providing input to the administration of the ONMS as a whole. The regions also oversee the analyses and public processes required for designating a new sanctuary in their region.

Sanctuary Sites

Figure 2.4: Map of the National Marine Sanctuary System. (Source: https://monitor.noaa.gov/about/sanctuary-map.html)[26]

Management in each sanctuary and monument is led by a Superintendent and, in some cases, an Assistant Superintendent. Sanctuary staff levels and funding vary by site, but generally sanctuaries employ program and mission support staff with expertise in science, research, education, communications, resource protection, maritime heritage, administration, facilities, and vessel operations. The enforcement of laws and ONMS regulations is split between the government agencies of jurisdiction in any given area, typically the U.S. Coast Guard, NOAA Office of Law Enforcement, and state fish and wildlife agencies. The System also leverages a large number of volunteers as a force multiplier. At some sites, volunteers can outnumber ONMS employees. In the case of the Channel Islands National Marine Sanctuary, the Channel Islands Naturalist Corps is an organization of volunteers that is shared between the National Park Service and ONMS.

Site staff are required to prepare both a condition report and management plan following the designation of any new sanctuary, and to review and potentially revise each approximately every five years following that designation. A condition report "provide[s] a standardized summary of resources in NOAA's sanctuaries; drivers and pressures on those resources; current conditions and trends for a resources and ecosystem services; and describe existing management responses to the pressures that threaten the integrity of the marine environment." Management plans "summarize existing programs and regulations; guide preparation of annual operating plans;

[26] The proposed "Wisconsin" sanctuary shown in Figure 2.4 will be named the "Wisconsin Shipwreck Coast National Marine Sanctuary", as shown in Figure 2.3.

articulate visions, goals, objectives, and priorities; guide management decision making; guide future project planning; ensure public involvement in management processes; and contribute to the attainment of system goals and objectives." Each Sanctuary Advisory Council (SAC) provides recommendations and stakeholder input to the sanctuary and their administrators on condition reports, management plans, and other issues in their sanctuary (refer to section on Advisory Councils below).

Advisory Councils

Business Advisory Council

The Sanctuaries Business Advisory Council (BAC), first charted in 2013, is a national-level body that provides advice and recommendations to the Director of ONMS on the sustainable management of national marine sanctuaries and ways in which the business community may help advance ONMS' goals. It focuses on engaging the private sector and non-traditional partners with mutual interest in resource conservation, assessing and expressing the value of sanctuaries and other marine protected areas (MPAs), and developing joint initiatives and projects to support the sustainability and protection of special marine places.[27] Members of the BAC liaise with the private sector on behalf of ONMS, and have the ability to form working groups with outside individuals. The council is to consist of no more than 15 voting members, appointed by the Director of ONMS. The 15 seats represent a wide variety of stakeholder interests including recreation, tourism, ocean commerce, commercial and recreational fishing, natural and cultural resource management, marketing, and conservation. Council members serve staggered two and three-year terms and may not be serve for more than three consecutive terms. The BAC meets no more than once during each fiscal quarter, and those meetings are open to the public.

In early 2021, ONMS held the first meeting of its reconstituted BAC, following expiration of a previous BAC charter in 2018. The reconstituted BAC will move forward with a particular focus on sustainable recreation and tourism for a minimum of five years. Currently, ONMS seeks to fill four seats on the council with members that have marketing experience.

Sanctuary Advisory Councils

In 1990, Congress enacted the Florida Keys National Marine Sanctuary and Protection Act, designating the Florida Keys as a marine sanctuary and requiring ONMS to establish an advisory committee for the site.[28] Seeing its positive impact in the Keys, NMSA was amended in 1992 to authorize advisory councils for each sanctuary. The SACs advise site Superintendents and leadership on management actions in the sanctuaries. SAC members serve as a liaison between a sanctuary and its community and identify potential partners and constituent groups that the Sanctuary should engage. They identify and resolve issues and conflicts in the sanctuaries and validate the accuracy and quality of information the sanctuaries use for decision-making. Most important, SACs review and provide input on sanctuary plans, proposals, and products.

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[27] The United States Executive Order 13158 defines a marine protected area as "Any area of the marine environment that has been reserved by Federal, State, territorial, tribal or local laws or regulations to provide lasting protection for part or all of the natural and cultural resources therein."
[28] 101st U.S. Congress, *Florida Keys National Marine Sanctuary and Protection Act*. https://www.congress.gov/bill/101st-congress/house-bill/5909.

Membership is limited to 15 members for sanctuaries designated after 2000, and seats may be filled by representatives from federal or state agencies, regional fishery management councils, and representatives from local user groups, conservation or public interest organizations, scientific or educational organizations, or others interested in the protection of sanctuary resources. SACs generally meet publicly on a monthly, bimonthly, or quarterly basis.

Budget

In FY2020, Congress enacted a $55,500,000 appropriation for ONMS for programs, and $3,000,000 for construction.[29] This covers a current retinue of 168 full-time equivalent employees (FTEs).[30] NOAA and the National Ocean Service (NOS) take about 12 percent of the total appropriated funds each year to cover overhead costs, including headquarters facilities.

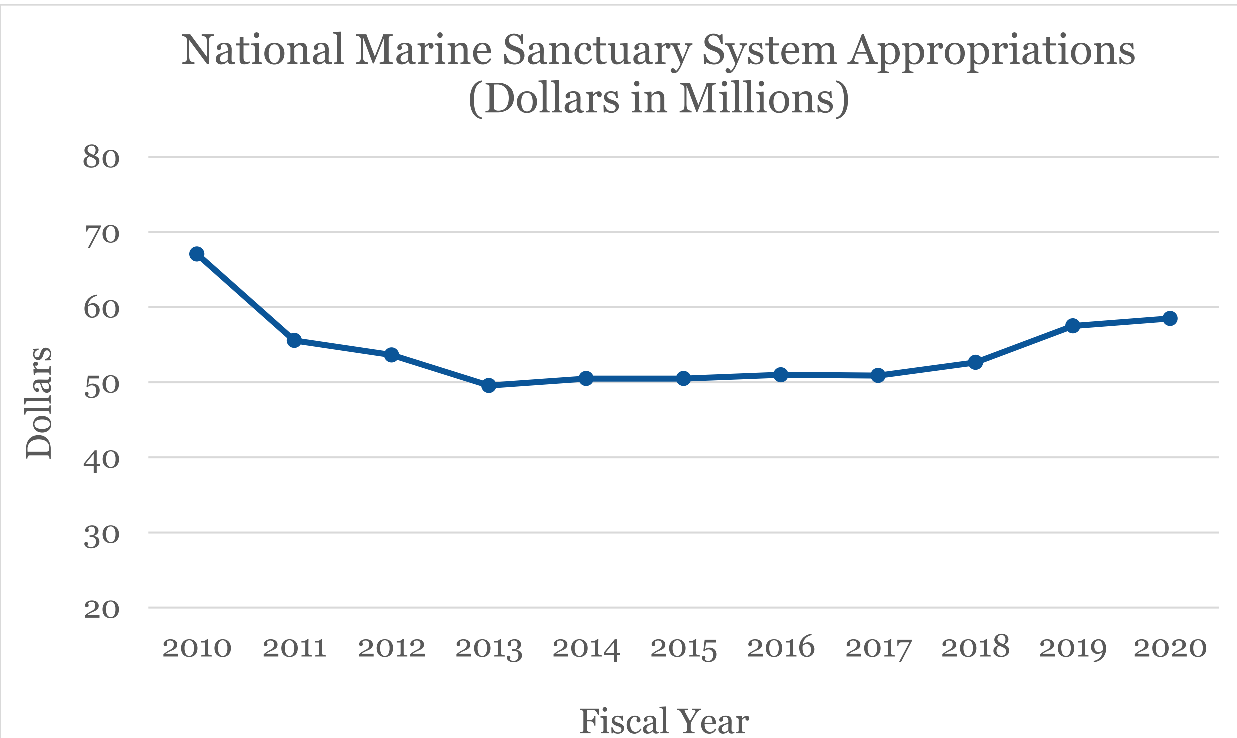

Figure 2.5: National Marine Sanctuary System Appropriations (Fiscal Year 2010-2020). Figure created by the National Academy of Public Administration. (Source: https://www.noaa.gov/organization/budget%2C-finance-performance/budget-archive).

Appropriated funding for ONMS for both programs and construction is shown in Figure 2.5, above. ONMS' budget has remained relatively flat over the last ten years, with an enacted program

[29] As noted in Section 1, this report refers to funding budgeted under NOAA's Operations, Research, and Facilities accounts as "program" funds, and funding under its Procurement, Acquisitions, and Construction account as "construction" funds. Together, these two broad accounts comprise discretionary appropriations. See https://crsreports.congress.gov/product/pdf/IF/IF11185.

[30] U.S. National Oceanic and Atmospheric Administration, *Congressional Budget Justification for Fiscal Year 2021.* https://www.noaa.gov/sites/default/files/atoms/files/508%20Compliant_FY21%20NOAA%20CJ.pdf.

appropriation of $53,070,000 in FY2010.[31] While about $14 million were appropriated for construction in FY2010, appropriations for construction have not exceeded $6 million since that time. When accounting for inflation, there is an effective decrease in resources, as $53,070,000 in January 2010 would translate to roughly $63,794,110 in buying power for programs in December 2020.[32] Note that the dollar amounts shown in Figure 2.5 do not include funding for the MPA Center. Before the MPA Center was integrated with ONMS in 2013, its operating budget ranged from about $1 million to $3 million. The two organizations were integrated during federal budget sequestration under the Obama Administration, and the merger did not result in an increase in appropriations for ONMS.[33]

Socioeconomic Analysis

ONMS' team of economists, in partnership with site staff; local, state, and federal agencies; academic institutions; and NGOs across the System, conduct studies on socioeconomics in the sanctuaries to identify users, determine factors driving their behavior and changes to that behavior, and estimate the socioeconomic impacts of those changes. ONMS also estimates the benefits derived from sanctuaries in order to compare them with negative impacts, particularly in the form of cost-benefit analysis. Socioeconomic analysis serves as an important tool for the System to help managers and policymakers to make informed decisions on natural resources management. To date, no holistic valuation across the System has been compiled which OMB considers validated and rigorous enough for public use.

While many of the socioeconomic studies in this area are upwards of ten years old, ONMS is making efforts to update older valuation studies, and undertake new ones. One new initiative is called the Sanctuary Use Characterization, Assessment and Research (SUCAR) program. With SUCAR, ONMS is particularly interested in understanding the profiles of communities in the sanctuaries, and the factors impacting non-users of the System, often (but not always) located in inland areas of the country, whose behavior is shaped by factors related to access, cost, preference, and awareness.

Conservation Science

ONMS' scientific enterprise is conducted by a team of HQ, region, and site-based experts in a variety of fields and an extensive network of partners from universities and other research institutions. The System's approach is to focus its science investments on the conservation issues affecting sanctuary resources and communities, such as losses in biodiversity, vessel traffic, invasive species, and pollution. Research (and other purposes) is supported by the ONMS Small Boat Fleet consisting of more than 40 vessels from small utility boats to vessels up to 85 feet in length.

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[31] U.S. National Oceanic and Atmospheric Administration, *Congressional Budget Justification for Fiscal Year 2011*. https://www.noaa.gov/sites/default/files/atoms/files/FY2011_Congressional_Budget.pdf
[32] U.S. Bureau of Labor Statistics, *CPI Inflation Calculator*. https://www.bls.gov/data/inflation_calculator.htm
[33] 112th U.S. Congress, *Budget Control Act of 2011*. https://www.congress.gov/112/plaws/publ25/PLAW-112publ25.pdf. ; 112th U.S. Congress, *American Taxpayer Relief Act of 2012*. https://www.congress.gov/bill/112th-congress/house-bill/8/text.

Among the most important synthesis products that come from the System's science team are condition reports, which are sanctuary-specific documents that provide a summary resources in each sanctuary, pressures on those resources, the current condition and trends, and management responses to the pressures that threaten the integrity of the marine environment. Specifically, the reports include information on the status and trends of water quality, habitat, living resources and maritime archaeological resources and the human activities that affect them. Condition reports are used by the System to prepare for management plan reviews and revisions, and for other research, outreach, and management purposes.

Communications, Outreach, Education, and Branding

ONMS leverages two strategic documents at the headquarters level to guide its communications, outreach, and education programs, its communications plan and education strategic plan. The communications plan summarizes the challenges facing the System, and lays out its primary communications goals:

- Expand recognition of the sanctuary brand
- Promote engagement with sanctuaries
- Increase the value we bring to our communities

The communications plan also articulates the System's key messages, in short form, and lists goals and strategies by target audience, as well as tools such as social media to reach those audiences.

The education strategic plan for FY 2010-2020 sets out the following goals:[34]

- Demonstrate education management excellence
- Enhance ocean and climate literacy through national marine sanctuaries
- Develop and strengthen strategic education partnerships

Each goal is accompanied by a set of objectives and strategies for implementation. The education strategic plan also places emphasis on leveraging partners to further its educational efforts, like aquariums, and includes rigorous evaluation procedures across most education efforts. The System also maintains its internal Best Practices Guide to Outreach and Communication, which provides guidance, templates, and other material to staff to help ensure that the sanctuary brand is used consistently across products and convey communications best practices to staff.

The education strategic plan also places emphasis on pursing additional funding opportunities with the Marine Sanctuary Foundation and other external partners. One part of this effort is utilizing ONMS' authority under the NMSA to permit sponsors of the System to use and market its brand and logo.[35] ONMS' logo takes the form of a whale tail, an integral part of the sanctuary brand. Under the NMSA, the System can use its authority to sell merchandise imprinted with the

[34] U.S. Office of National Marine Sanctuaries, *Education Strategic Plan for Fiscal Years 2010-2020*. https://nmssanctuaries.blob.core.windows.net/sanctuaries-prod/media/archive/education/pdfs/onms_educ_strategic_2010_2020.pdf
[35] 106th U.S. Congress, *National Marine Sanctuaries Amendments Act of 2000*. https://www.congress.gov/bill/106th-congress/senate-bill/1482/text/pl?overview=closed.
; U.S. Office of National Marine Sanctuaries, *Sanctuary System Sponsorship Program*. https://sanctuaries.noaa.gov/involved/sponsorship.html

whale tail logo and permits authorized and official external sponsors, such as the National Marine Sanctuary Foundation, to do the same.

ONMS' website serves as a platform for many resources, including some of the materials it uses to engage its partners and the public. The Earth is Blue campaign brings vivid photos, videos, and engaging articles via an annual magazine to connect people to the sanctuaries.[36] ONMS posts virtual dives to the website, which are 360-degree videos of the sanctuaries, to allow the public to view them from the comfort of their homes. ONMS offers a variety of both formal and informal education programs through field-based classroom visits, visitor center programs, classroom visits, lesson plans and curricula, teacher workshops and virtual webinars. In addition, nationwide programs such as the Ocean Guardian Program work to build environmental stewardship projects into schools and communities. Of the over 73,000 students in formal programs and 65,000 additional youth and adults through informal learning opportunities, ONMS reaches 24,000 youth from underserved areas. ONMS also uses social media to reach the public, with approximately 111,000 followers on Instagram, 75,000 on Twitter, 142,000 on Facebook, and nearly 4,000 subscribers on YouTube as of February 26, 2021.[37] The System garners billions of media impressions each year.

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[36] U.S. Office of National Marine Sanctuaries, *Earth is Blue Magazine*. https://sanctuaries.noaa.gov/magazine/

[37] U.S. Office of National Marine Sanctuaries, *Official Instagram Account:* https://www.instagram.com/noaasanctuaries/?hl=en; *Official Twitter Account:* https://twitter.com/sanctuaries?ref_src=twsrc%5Egoogle%7Ctwcamp%5Eserp%7Ctwgr%5Eauthor; *Official Facebook Account:* https://www.facebook.com/NOAAOfficeofNationalMarineSanctuaries/; *Official YouTube Channel:* https://www.youtube.com/user/sanctuaries

Section 3: Comparison Between ONMS and Other Similar Agencies, Domestic and Foreign

Benchmarking (comparing organizations to their peers) can help to understand relative performance, identify gaps and opportunities to improve, and identify relevant and applicable strategic, management and operational best practices. In this section, the focus of benchmarking is aimed broadly – to understand how other resource management systems are organized and managed, with a particular focus on identifying innovative and/or best practices.

An important element of benchmarking is to identify the right set of peer groups for comparison – a critical aspect to obtain useful insights. In this respect, it is challenging to find domestic organizations with a similar marine environment protection mission similar to the System. Though terrestrial and marine resource systems have their own unique characteristics, and managing them involve different techniques and processes, there are several reasons why they can still be used as valid comparables. First, there are a number of similar functional activities that both terrestrial and marine systems include, such as resource stewardship, research and monitoring, education and outreach, and law enforcement. Another is the very act of preserving special places in nature for the benefit of current and future generations. [38]

In terms of differences, there are distinctive aspects to managing marine ecosystems, such as inability to cordon off or add physical boundaries to marine resource systems, with resulting challenges to surveillance of species or law enforcement. In addition, the vertical dimension associated with marine resources (management down to the ocean floor) adds vast complexity in multiple dimensions, including challenging restoration activities.

Figure 3.1 below summarizes the chosen peer group of resource management systems, including an international (comparable developed country) system.[39] The comparison included various dimensions including Strategy, Finance, Management and Operations, Organizations, Communication and Outreach and Community Engagement. Note: In many cases, systems are managed across multiple agencies. As a result, the comparison is limited to identifying the area and budget within a single agency's purview.

[38] Carr et al., *Comparing Marine and Terrestrial Ecosystems*. http://www.ghub.org/wp-content/uploads/2020/09/09-Comparing-marine-and-terrestrial-ecosystems-implications-for-the-design-of-coastal-marine-reserves.pdf.

[39] Finding international comparable systems was also limited due the lack of available data and information.

System	Managed Natural Resources	Compatible and/or Recreational Uses	Manages Cultural Resources	Geography
National Marine Sanctuary System	Ocean & Great Lakes	Yes	Yes	Domestic (U.S), across 4 regions in 12 states and American Samoa.
National Estuarine Research Reserve System (NERRS)	Estuaries	Yes	Yes	Domestic (U.S), 29 estuaries in 24 states.[40]
National Estuary Program (NEP)	Estuaries	Yes	No	Domestic (U.S) and territories, 28 estuaries across 18 states and territories.
National Landscape Conservation System	Land	Yes	Yes	Domestic (U.S), across 10 states.
National Park System	Land	Yes	Yes	Domestic (U.S), across all states and territories
National Wildlife Refuge System	Marine, Great Lakes & Land	Yes	Yes	Domestic (U.S), across 25 states.
Great Barrier Reef Marine Park	Marine	Yes[41]	Yes	International (Australia)

Figure 3.1: Summary of Peer Groups. Figure created by the National Academy of Public Administration.

The figure below provides an overview of the selected resource management systems, comparing the total managed acres and budget allocated. The System far exceeds the total managed area compared to its peers, albeit with considerably lower funding. As an example, a close comparable, the Great Barrier Reef Marine Park manages ~70 million acres with ~$57 million, compared to the System which manages ~400 million acres with a budget of ~$55 million. A more detailed comparison is provided in the following sub-section.

[40] The Pew Charitable Trusts, *Coastal Areas Benefit from Federal-State Partnerships*. https://www.pewtrusts.org/en/research-and-analysis/articles/2019/08/08/vital-coastal-areas-benefit-from-federal-state-partnerships.

[41] However, a large part of the reef is protected by the Great Barrier Reef Marine Park, which allows recreational use but helps to limit the impact of human use, such as fishing and tourism.

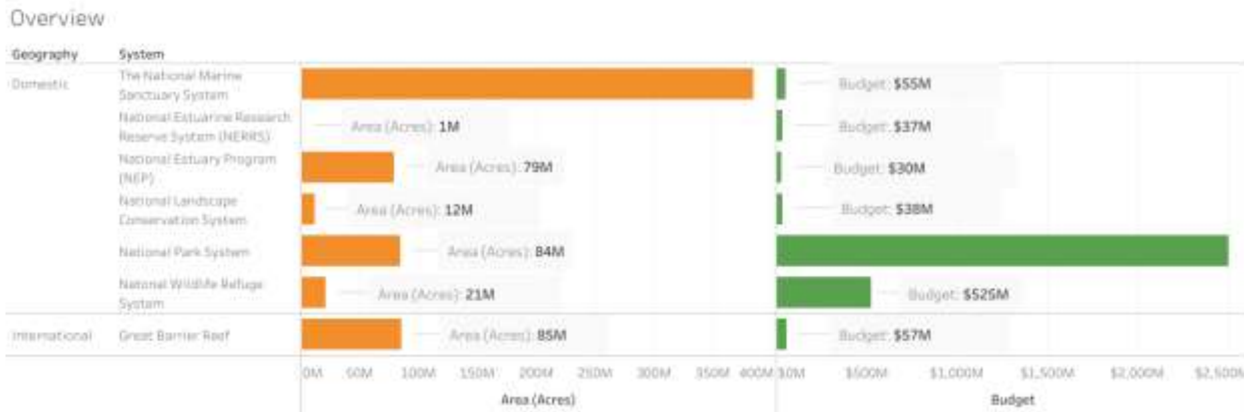

Figure 3.2: Total Managed Area and Budget by Organization. Figure created by the National Academy of Public Administration. (Source: Congressional Budget Justifications for Fiscal Year 2021; Australia Environment and Energy Budget Statements 2019-2020)[42]

3.1 Overview of Peer Groups

The National Marine Sanctuary System

The System serves as the trustee for a network of underwater parks encompassing more than 620,000 square miles (396 million acres) of marine and Great Lakes waters. The network includes 14 national marine sanctuaries and Papahānaumokuākea and Rose Atoll marine national monuments.

National Estuarine Research Reserve System (NERRS)

The National Estuarine Research Reserve System is a network of 29 coastal sites designated to protect and study estuarine systems covering over 1.3 million acres and are focused on the following: stewardship, research, training and education.[43]

The reserves represent a partnership between NOAA and coastal states with NOAA's Office for Coastal Management responsible for administering the reserve system. Each reserve is managed on a day-to-day basis by a lead state agency or university, with input from local partners.

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[42] U.S. National Oceanic and Atmospheric Administration, *Congressional Budget Justification for Fiscal Year 2021*. https://www.noaa.gov/sites/default/files/atoms/files/508%20Compliant_FY21%20NOAA%20CJ.pdf.; U.S. Environmental Protection Agency, *CBJ for FY 2021*. https://www.epa.gov/sites/production/files/2020-02/documents/fy-2021-congressional-justification-all-tabs.pdf.; U.S. Bureau of Land Management, *CBJ for FY 2021*. https://www.doi.gov/sites/doi.gov/files/uploads/fy2021-budget-justification-blm.pdf.; U.S. National Park Service, *CBJ for FY 2021*. https://www.doi.gov/sites/doi.gov/files/uploads/fy2021-budget-justification-nps.pdf.; U.S. Fish and Wildlife Service, *CBJ for FY 2021*. https://www.fws.gov/budget/2021/FY2021-FWS-Budget-Justification.pdf.; Australian Government, *Environment and Energy Department Budget Statements 2019-2020*. https://www.awe.gov.au/sites/default/files/2020-01/pbs-2019-20-environment-and-energy.pdf.

[43] Estuaries and their surrounding wetlands are bodies of water usually found where rivers meet the sea. See https://coast.noaa.gov/nerrs/.

National Estuary Program (NEP)

The National Estuary Program is a place-based program, run by the U.S Environmental Protection Agency (EPA). The Program's mission is to protect and restore the water quality and ecological integrity of estuaries of national significance. Currently, 28 estuaries located along the Atlantic, Gulf, and Pacific coasts and in Puerto Rico are designated as estuaries of national significance. In overseeing and managing the national program, EPA provides annual funding, national guidance and technical assistance to the local NEPs.[44]

National Landscape Conservation System ("National Conservation Lands")

The National Conservation Lands offer the American people exceptional opportunities for hunting, solitude, wildlife viewing, fishing, history exploration, scientific research and a wide range of traditional uses. The Bureau of Land Management 's (BLM) National Monument and National Conservation Areas program encompasses over 11.9 million acres. Currently, there are: 28 BLM National Monuments, 17 National Conservation Areas, and 6 Similarly Designated lands. An estimated 9.6M visitors come to National Monuments and National Conservation Areas.[45]

National Park System

The National Park Service preserves unimpaired the natural and cultural resources and values of the National Park System for the enjoyment, education, and inspiration of this and future generations.

The National Park System has expanded to 423 units (often referred to as parks), more than 150 related areas, and numerous programs that assist in conserving the nation's natural and cultural heritage for the benefit of current and future generations. The National Park Service manages 423 individual units covering more than 85 million acres in all 50 states, the District of Columbia, and US territories.[46]

National Wildlife Refuge System

The National Wildlife Refuge System is a system of diverse landscapes set up with the primary purpose to conserve native species dependent on its lands and waters while allowing recreational uses which must be compatible with the primary purpose of conservation. It includes 568 national wildlife systems. The U.S. Fish and Wildlife Service manages almost 21 million acres of wilderness in the National Wildlife Refuge System, with 75 wilderness areas on 63 Refuge System units across 25 states. NOAA and the Fish and Wildlife Service cooperatively manage four marine national monuments in the Pacific Ocean and one in the Atlantic.[47]

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44 U.S. Environmental Protection Agency, *Overview of the National Estuary Program*. https://www.epa.gov/nep/overview-national-estuary-program#overview.
45 U.S. Bureau of Land Management, *Congressional Budget Justification for Fiscal Year 2021*. https://www.doi.gov/sites/doi.gov/files/uploads/fy2021-budget-justification-blm.pdf.
46 U.S. National Park Service, *About Us*. https://www.nps.gov/aboutus/national-park-system.htm.
47 U.S. Fish and Wildlife Service, *About Us*. https://www.fws.gov/refuges/about/faq.html. See 'Hope Spots' in the Ocean.

Great Barrier Reef Marine Park

The Great Barrier Reef is a vast and spectacular ecosystem and one of the most complex natural systems on Earth. It covers more than 70 million acres and includes the world's largest coral reef ecosystem. It comprises almost 3,000 individual reefs, about 10 percent of the world's coral reefs.[48] It is managed by the Great Barrier Reef Marine Park Authority – a regulator that is entrusted with the responsibility of managing the park.

Key Insights

Figure 3.3 below provides a comparison of relative spend per acre of the selected peer groups. As it can be seen from the below graphic, the average budget spending per acre of the System is much lower ($0.14) compared to the Great Barrier Reef Marine Park ($0.67), and much lower compared to other domestic systems, which spend an average that ranges from $3 up to $30 per acre.

Extending the concept of spend per acre, and using a hypothetical scenario - if the System was to be funded at the same level (avg. spend per acre) as its closest comparable (the Great Barrier Reef), it would be an approximately $250 million program, as compared to its current budget of $55 million.

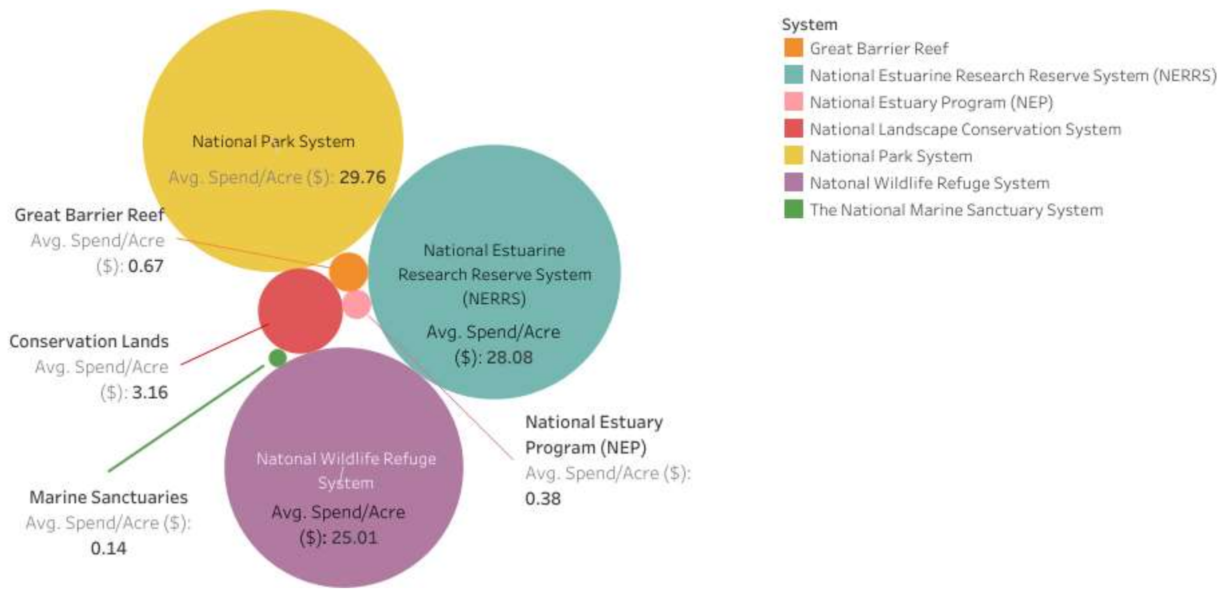

Figure 3.3: Comparison of Spend Per Acre by Organization. Figure created by the National Academy of Public Administration.

In addition to the above peer group, the Academy Study Team identified a few other comparable organizations – many of which were highlighted by stakeholders as organizations that had some innovative and/or best practice considerations. These organizations include the Audubon Society, UK's Blue Belt Programme, The Nature Conservancy, the National Estuary Program (managed by EPA) and others to examine potential practices which are summarized in the Figure 3.4 below. It

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[48] Australian Government Great Barrier Reef Marine Park Authority, *Reef Facts*. https://www.gbrmpa.gov.au/the-reef/reef-facts.

highlights some key practices of select resource management and protection organizations which can inform the System's management and planning.

Category	Examples
Strategy	● The Great Barrier Reef developed a Blueprint that involved 70 regional, national and international delegates and key stakeholders
Finance	● The Wildlife Refuge System has established a Duck Stamp Program not only to generate additional revenues but increase public awareness. In 2017, the most recent year with complete information, Duck Stamp sales totaled more than $38 million. ● The National Estuary Program raises an average of $22 for every $1 provided by EPA, by raising additional funding through annual membership appeals, license plate revenues, fines and penalties, state appropriations and intergovernmental agreements. [49]
Management and Operations	• The Great Barrier Reef, in addition to most other domestic systems, capture visitation data, allowing it to track direct and indirect visitors. • The National Park System has 28 different types of designations which offer varying degrees of resource management and protection. • The National Estuarine Research and Reserve System is managed as a partnership between NOAA and the coastal states. NOAA provides funding and national guidance, and each site is managed by a state agency or university. • The Audubon Society's organization is aligned with bird 'flyways" – inspired by how birds travel in spring and fall, a similar organizing principle relevant in a marine environment could be a potential model for management and/or organization. • Technology - The Blue Belt Programme uses technology (drones, underwater sensors, satellite data etc.) to assist in management and enforcement

[49] U.S. Environmental Protection Agency, *Financing Strategies Used by the National Estuary Program*. https://www.epa.gov/nep/financing-strategies-used-national-estuary-program.

Organization	• Talent - Audubon Society's fellows are leaders-in-training in the disciplines of environmental communications, conservation education, field organizing, field biology, public policy, geospatial information systems, and much more. • NPS, along with the US Fish and Wildlife Service has established a NPS Academy which is an innovative program that introduces diverse undergraduate and graduate students, ages 18 to 30, from across the country to careers in the NPS.
Communications and Outreach	• The National Park Service is considered as a leader in branding – a recent book called 'Parks' describes their progressive design approach, eventually establishing a well-established brand.
Community Engagement	• The Audubon Society has established a huge volunteer network, connected to nature centers, that operate largely independently but are efficient in activating communities to engage with them on a consistent and regular basis. • Many organizations, such as the National Park Service and The Nature Conservancy, make effective use of public-private partnerships.

Figure 3.4: Strategic, Management, and Operational Considerations. Figure created by the National Academy of Public Administration.

In summary, it is clear that the System's budget is far lower than its peer groups. In fact, based on an internal funding model, the estimated funding needs of the program in FY2013 was estimated to be about $136 million. While many programs and agencies face funding constraints, the magnitude of the gap is noteworthy and points to a need to address this issue for the System to meet its potential.

Section 4: Major Achievements Since 1972

In the nearly 50 years of its existence, the System has worked to gain congressional approval for the designation of new sites and the protection of marine environment areas that have special national significance.[50] This section notes the success and some of the major achievements for the System, identifying major milestones that the System has been able to reach since its inception.

At the outset, it is helpful to examine good practices to employ in evaluating organizational achievements. Success must be appropriately defined to measure and communicate achievements against a larger set vision. Enduring success is not one-dimensional, but rather it is a complex framework of smaller visions of success. Within this framework, measures of achievement come together to paint a kaleidoscope of a larger vision of an enduring legacy.[51]

4.1 Major Achievements of the System

The NMSA defines the purpose of the System as to "protect areas of the marine environment with special national significance due to their conservation, recreational, ecological, historical, scientific, cultural, archeological, educational or aesthetic qualities as national marine sanctuaries."[52] This establishing legislation emphasizes resource conservation and facilitating multiple-uses of the System that are compatible with resource protection. As mentioned above, properly defined success is multi-dimensional which the System embodies by promoting this dual mandate. Major achievements of the System can be defined as the building blocks towards both overarching visions of success. Moreover, each site within the System has its reason for establishment and defined purpose. Achievements of the System can be measured and communicated by first looking at progress towards a site's specific purpose and then fitting that progress into the overarching resource protection and compatible use framework of the System.

4.2 Challenges of Measuring System Achievements

While the NMSA creates a definition of success for the System, there have been extenuating circumstances and challenges that have hindered the System's ability to adequately measure and communicate its major achievements. Three challenges are raised in this sub-section.

First, the System is decentralized, and locations have unique features that do not lend themselves to easy across-the-System evaluation. Each site has a unique reason for establishment and definition of success. With each site striving for somewhat different goals, it is a challenge for the System to bring together the array of achievements and turn that set into a comprehensive narrative that communicates the achievements of the System as a whole.

Second, the goals and strategies to accomplish resource protection have changed in the past 50 years due to evolving threats and measures of success. For example, when the System was first

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[50] 106th U.S. Congress, *National Marine Sanctuaries Amendments Act of 2000*. https://www.congress.gov/bill/106th-congress/senate-bill/1482/text/pl?overview=closed.
[51] Nash, Laura and Howard H. Stevenson, *Success That Lasts*. https://hbr.org/2004/02/success-that-lasts
[52] 106th U.S. Congress, *National Marine Sanctuaries Amendments Act of 2000*. https://www.congress.gov/bill/106th-congress/senate-bill/1482/text/pl?overview=closed.

established, oil spills were seen as one of the main threats to the conservation of MPAs, and the protection against these disasters was a driving measure of success. The threats to the System have since changed to include new focuses on climate change and adapting to emerging technologies (see Section 5 for further details on the future outlook of the marine environment) and measures of success should adapt commensurately.

Third and moreover, achievements and success in the cross-cutting fields of conservation and promoting multiple-use are often seen as zero-sum. There is a perception that one can either achieve adequate conservation, or promote multiple-use, but not promote both simultaneously. This presents a difficulty in measuring the success of the System and can be difficult to communicate in the larger conversation about the conservation of MPAs in a way that is universally accepted. Given the broad language in the NMSA and the potential perception of conflicting interests, the System's achievements exist within a multi-dimensional comprehensive framework that looks at gradual and continual progress and evolution, rather than a static question of yes or no.

4.3 Major Achievements of the System in the Past 50 Years

Despite these challenges in defining, measuring, and communicating achievements, the System has been able to make significant strides in many areas within its mission. The following touches on seven major accomplishments of the System since its inception in 1972.

Innovation

When the System was first established in 1972 it was among the first of its kind in the world to create a large-scale MPA conservation system at a national level. The establishment of the System helped to lead the way for other similar initiatives and the adaptive management and sustainably focused work of the System have been transferred to other spheres of conservation across the globe. The System has also been engaged in many international efforts related to the conservation of MPAs. ONMS is a key member of international partnerships and has established the International MPA Capacity Building Team as part of the MPA Center that aims to connect protected areas across the globe to encourage the sharing of best practices and expertise.[53] The System is viewed as having a legacy of innovation that is held in high regard by many of its international counterparts and is still considered to be a leader in many fields within protected area management despite its lack of robust funding for a program of its scope (see Section 3).

Protection of Marine Resources

The System has achieved a broad physical reach of defined spaces designated as sanctuaries and monuments that span over 620,000 square miles across 14 different sanctuaries and two monuments.[54] The System also encompasses a variety of diverse sites that protect vulnerable ecosystems as well as important cultural heritage sites across the nation and its territories. The fact that the System is made up of such a wide range of sites that cover an expansive area is an

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[53] U.S. National Marine Protected Areas, *International Partnerships for Marine Protected Areas*. https://marineprotectedareas.noaa.gov/nationalsystem/international/
[54] U.S. Office of National Marine Sanctuaries, *About*. https://sanctuaries.noaa.gov/about/

achievement in and of itself and contributes directly to the goal and purpose of the system as defined in the NMSA.

The System has continued to grow, an attribute of its dedication to the mission outlined by its defining legislation, although it has the potential to do far more with greater resources. In 2019, Mallows Bay-Potomac River was designated as a sanctuary site, adding an important site of historical significance to the System's inventory. Although this designation was the first in nearly 20 years, the success of the designation process shows a continual commitment to mission and potential for further expansion. The System also has been able to expand the reach of existing sites. In January 2021, following earlier successful site expansions, the Flower Garden Banks National Marine Sanctuary expanded its reach from 56 to 160 square miles adding 14 additional reefs and banks to the sanctuary, contributing to a larger ability to conserve the vulnerable ecosystems.[55]

Conservation and Scientific Research

The conservation of marine areas with national significance is the main purpose of establishing the System as outlined in the NMSA. To take one example, in 1953 a major collision between two vessels occurred within the boundaries of the future Greater Farallones National Marine Sanctuary, resulting in a massive oil spill and two shipwrecks that continually leaked oil. Due to the site's designation as a sanctuary and the good work of the System and its partners, 80 percent of the sunken oil from the Luckenbach spill has been removed from the site and has resulted in the decline of oiled ocean wildlife by over 80 percent.[56] Scientific research that occurs within the System has also directly contributed to the conservation and preservation of these sites. The scientific work of the System includes important data collection such as site assessments and characterization. Establishing these data sets allows for an increased understanding of these sites and, in turn, allows for more informed decisions about how to protect and preserve them. While preservation, protection, and in some cases restoration, in each site can look differently, the establishment of a baseline of understanding of these important environmental areas is a major achievement of the System. This understanding also grows increasingly important as the nature of the marine environment changes every more rapidly (discussed further in Section 5).

The System is sometimes criticized for not prohibiting all fishing and promoting multi-use from some conservation groups. However, the NMSA directs a complex multi-use mandate that the System must navigate. A recent study published in the Marine Policy Journal examined MPA sites off the California coast and found that many multiple-use MPAs like sanctuaries that do not regulate fishing contain areas that prevent harmful fishing practices through overlapping

[55] U.S. Office of National Marine Sanctuaries, *Flower Garden Banks National Marine Sanctuary Triples In Size*. https://sanctuaries.noaa.gov/news/jan21/flower-garden-banks-expansion.html
[56] U.S. Office of National Marine Sanctuaries, *Conservation Science in NOAA's National Marine Sanctuaries: Descriptions and Recent Accomplishments* *https://nmssanctuaries.blob.core.windows.net/sanctuaries-prod/media/archive/science/conservation/pdfs/accomplishments.pdf*

regulations by partner agencies.[57] The achievements in conservation have also led to achievements in positive externalities for System stakeholders and partners as discussed later in this section.

Maritime Heritage

Not only does the System preserve biological and ecological sites of importance in the nation; it also preserves important sites of maritime and cultural heritage. The Maritime Heritage Program, established in 2002, is an initiative that came from ONMS that aims to add a further dimension to the understanding and acknowledgment of the national maritime legacy that allows these places and their stories to be shared with future generations.[58] The preservation of historical sites also gives insight into people's interaction and connection with nature and can lead to increased support and buy-in for the program as a whole.

Maritime Heritage within the System sites is multi-faceted. For example, Stellwagen Bank National Marine Sanctuary is not only home to sunken ships that help illustrate the seafaring history of the nation, but it also shows and celebrates the connection of people to place. The site also is an important connector to the history of the marine populations in the area through the History of Marine Animal Populations, a project made possible by NOAA and ONMS funding.[59] Research done within the site has helped to unravel the history of marine animal populations in the area, contributing to a complex story of how this site has impacted and shaped the local community.[60] The exploration of the maritime heritage in the multiple dimensions at Stellwagen and other sites within the System has helped to illuminate some of the important milestones of the country and preserve national and natural heritage.

Management

A major achievement regarding the management of the System is the development of a professional management class responsible for monitoring wide-ranging environmental and economic resources. ONMS' staff is consistently seen as a strength within the System. The development of a dedicated and mission-driven staff is a great and recognized accomplishment and has contributed to the System being able to realize other significant achievements. Despite having limited funding, especially when compared to comparable systems as described in Section 3, the System's management system has allowed ONMS staff to be resource savvy and accomplish much with little – a considerable achievement. ONMS has forged a reputation that is referenced as a model by other countries with similar agencies.

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[57] Jennifer Sletten, Mimi D'Iorio, Mary G. Gleason, Alex Driedger, Timothé Vincent, Claire Colegrove, Dawn Wright, Virgil Zetterlind, *Beyond the Boundaries: How Regulation-Centered Marine Protected Area Information Improves Ocean Protection Assessment*. https://www.sciencedirect.com/science/article/pii/S0308597X20309908

[58] U.S. Office of National Marine Sanctuaries, *Why Maritime Heritage?* https://sanctuaries.noaa.gov/maritime/aboutmhp.html

[59] Stellwagen Bank National Marine Sanctuary, *History of Marine Animal Populations*. https://stellwagen.noaa.gov/maritime/history-of-marine-animal-populations.html

[60] Stellwagen Bank National Marine History, *Maritime Heritage*. https://stellwagen.noaa.gov/maritime/welcome.html

Community Engagement

Community engagement is one of the cornerstones of the System. ONMS looks to local communities as important stakeholders in the management of sites from the designation process to the continual planning and management processes. While the engagement can vary site by site, by working with a variety of external stakeholders, the System has been able to increase buy-in and community support in numerous ways. Previous Academy reports have touched on expanding the involvement of local communities in the planning process and making public involvement part of the mission of the System.[61] The formal mechanisms for community engagement that the System employs is regarded as a gold standard by many of its external stakeholders. The System has established a comprehensive framework in which local communities are treated as essential stakeholders who have a say in the current and future management of the sites. Through local engagement at the sites through SACs and national engagements such as roundtables and the BAC, the System has placed itself directly within the community of stakeholders that have a vested interest in the areas under its protection.

Through community engagement, the System also has been able to recruit a dedicated class of volunteers that contribute greatly to its success. In 2020, volunteers contributed the equivalent work hours of 36 full-time federal employees, amounting to $1.78 million going to the System. These numbers were lower than 2019's totals—nearly 12,000 volunteers delivering labor valued at $3 million and equivalent to 66 employees—because of impacts from the Covid-19 pandemic. The engagement and buy-in from communities, as exhibited by the number of volunteers, is a major achievement for the System and an important resource multiplier that helps the System ensure that the sites are being adequately conserved and managed. ONMS also engages local communities through its network of visitor centers, signage, and exhibits. In 2020, the System reached about 130,000 visitors through 10 of their visitor centers, and millions more with exhibits and signage with its partners, such as aquariums, science centers, and signage along the coast. In addition, the system reached over 73,000 students through formal education programs as well as 65,000 additional youth and adults through informal learning opportunities including 24,000 youth from underserved areas.[62]

Positive Externalities for Partners and Stakeholders

The System's achievements in preservation and conservation, in addition to its community engagement and buy-in, have resulted in secondary achievements and numerous positive externalities and benefits to sanctuary communities, partners, and stakeholders.

There is a symbiotic effect between community engagement and positive externalities; when the community embraces and cares for the sanctuary site, that investment can benefit the communities. For example, a study by the National Marine Sanctuary Foundation found that the

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[61] National Academy of Public Administration, *Protecting our National Marine Sanctuaries.*; National Academy of Public Administration, *Planning and Management at the National Marine Sanctuary Program.* https://s3.us-west-2.amazonaws.com/napa-2021/studies/ready-to-perform-planning-and-management-at-the-national-marine-sanctuary-p/06-11.pdf.

[62] Office of National Marine Sanctuaries, *Reaching Far & Wide.* https://nmssanctuaries.blob.core.windows.net/sanctuaries-prod/media/docs/20200116-education-infographic-2019.pdf

Florida Keys National Marine Sanctuary contributes $4.4 billion and 43,000 jobs annually to Florida's greater economy.[63] These positive externalities are largely a result of the tourism and recreation community that the sanctuary site attracts. This effect is not limited to the Keys, it is found throughout the System. To take another example, the Thunder Bay National Marine Sanctuary's Great Lakes maritime heritage center welcomed 80,287 visitors in 2018 which helped to contribute to over $28 million being spent in the region annually, supporting over 400 jobs.[64]

These positive externalities are not limited to direct monetary benefit, but also impact the businesses and interests of important stakeholders in other ways. Studies have revealed that increased protection and conservation of marine areas can benefit the fishing industry. MPAs, particularly highly protected areas such as certain zones within sanctuaries, can enhance and extend fish stocks and catch yields.[65] These benefits largely come from a "spillover effect." Protecting fish species and their necessary habitat allows for the species to survive and thrive, which can lead to an increase in fish population size, which further benefits the fisheries community outside of the protected area.[66] The System not only works with important stakeholders but provides benefits to and complements the work of others involved in the marine environment.

In conclusion, the System has numerous achievements both at the site and national level since its inception in 1972, only a few of which were selected to be featured in this report. The System has built a vision of conserving the marine areas of importance within the Nation and facilitating the use of these sites in a way compatible with both conservation and human use. These achievements lay the foundation for further advancement and achievement in the future, which are discussed in the next sections of the report.

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[63] National Marine Sanctuary Foundation, *Foundation Study Finds Florida Keys National Marine Sanctuary Contributes $4.4 Billion Annually to Florida's Economy*. https://marinesanctuary.org/news/foundation-study-finds-florida-keys-national-marine-sanctuary-contributes-4-4-billion-annually-to-floridas-economy/

[64] Information was shared by the U.S. Office of National Marine Sanctuaries at the Business Advisory Council meeting on January 14, 2021.

[65] Center for American Progress, *How Marine Protected Areas Help Fisheries and Ocean Ecosystems*. https://www.americanprogress.org/issues/green/reports/2019/06/03/470585/marine-protected-areas-help-fisheries-ocean-ecosystems/

[66] Halpern, Benjamin, Sarah Lester, and Julie B. Kellner, *Spillover from marine reserves and the replenishment of fished stocks*. https://darchive.mblwhoilibrary.org/bitstream/handle/1912/3891/Halpern_etal_2010_EnvCons.pdf?sequence=1

Section 5: Future Outlook for the Marine Environment

The larger marine environment in which the System exists is remarkably dynamic, and in a constant state of change since its inception. Given that the characteristics and the complex plant and animal life of this vast environment are in constant flux, the challenges and opportunities that might be expected to arise during the next 10-15 years are also remarkably daunting. The System faces a huge range of emerging challenges and opportunities as the marine and Great Lake environments continue to evolve at an increasingly rapid pace. It is thus essential for the System to be able to identify key trends and emerging issues to adequately plan for and adapt to this changing world. This section identifies some of the major topic areas that will influence the future outlook for the System to help prepare it for the future. The topics described in this Section are not intended to be an exhaustive review of future marine challenges and opportunities, but rather to suggest important ones that influence the Panel's recommendations to ONMS.

5.1 Methodology Used to Identify Key Elements Likely to Affect the System's Future

While it is impossible to predict the nature of the future of the marine environment with precision, key points in this section surfaced by identifying some salient issues and pressing topics that appear most likely. The methodology relied, in large part, on interviews conducted with a wide variety of stakeholders holding a range of viewpoints from within the marine environment community (see Appendix B for a full list of interviewed individuals). Research also included examining articles that focused on the future of the marine environment in detail. By this method, common patterns and key topic issues surfaced and are incorporated in this section. The graphic to the right is representative of this distillation. Common descriptors and issues from notes and articles were input to a computer program that counts the number of appearances of specific words and key phrases related to the future of the marine environment. The graphic displays the most prevalent topics that arose from this exercise, with topics that came up more frequently appearing larger. While this exercise is by no means meant to be a comprehensive look at all the System's future challenges or opportunities, or even to be predictive of the future, the Panel is confident that the following list outlines some of the major factors that will affect the future of the System.

Figure 5.1: Major Themes in Future Outlook Methodology. Figure created by the National Academy of Public Administration.

5.2 List of Key Future Outlook Factors

There are six key issues that the Panel wishes to highlight as ONMS looks to the future:

- climate change and climate-related issues;
- blue economy developments including the growth of aquaculture and marine energy development;
- new technologies;
- new ways to connect individuals with the marine environment;
- engagement with indigenous communities; and
- global movements to support conservation of marine environments.

While other factors could perhaps be added to this list, these factors constitute a discrete, representative set that relate to ONMS going forward.

Climate Change and Climate-Related Issues

The impacts and effects of climate change are the biggest and most prevalent emerging themes to be encountered and expected in the future. The impacts of climate change are not just the warming of the oceans and Great Lakes but include the changing of weather patterns, ocean acidification, sea-level rise, range shifts of marine species, and much more. Each of these phenomena has demonstrable impacts on the sanctuary sites and the resources within them, and they should motivate the System to expand its vision and up its game.

As the effects of climate change continue to grow, the marine waters will warm and the ocean will become more acidic.[67] These changes can have negative impacts on marine species, making it harder for them to reproduce, build habitats, and more. More than 80 percent of the earth's species are migrating and changing their breeding and feeding patterns due to climate change, and ocean species, in particular, are experiencing these changes 10 times faster than their terrestrial counterparts.[68] This presents a very real threat to sanctuary sites that help protect marine species. For example, the Hawaiian Islands Humpback Whale National Marine Sanctuary was established to protect the mating and breeding grounds of humpback whales. If the whale's migratory patterns change due to climate change, there is potential that the established boundaries of the site may no longer serve their purpose. Sea-level rise due to climate change can impact the shoreline and the animals that rely on the sanctuary sites' ecosystems such as mammals and birds. Not only is sea level rise a direct threat to the System's natural resources and its facilities such as offices and visitor centers, but it also impacts the communities surrounding the sanctuaries and the human activities that occur within the sanctuaries. Sea level rise can threaten communities and impact existing businesses that rely on the sanctuary sites such as

[67] The University of California at Davis, *Science & Climate: Ocean Acidification*. https://climatechange.ucdavis.edu/science/ocean-acidification/

[68] National Environmental Education Foundation, *Marine Species on the Move*. https://www.neefusa.org/weather-and-climate/marine-species-movehttps://www.neefusa.org/weather-and-climate/marine-species-move#:~:text=More%20than%2080%25%20of%20earth's,times%20faster%20than%20land%20species.&text=80%25%20of%20ocean%20pollution%20comes%20from%20the%20land.

fishermen, whale watch companies, or diving communities.[69] While ocean acidification, species range shifts, and sea level rise are just three of the many effects of climate change, climate change is an overarching prevalent threat to the System and the System has already seen impacts. In 2013, a weather pattern of unusually high pressure off the coast of Alaska led to a pool of persistently warm water that eventually made its way to the California Coast, raising temperatures in West Coast sanctuaries to over 7 degrees above normal in some locations. This had harmful impacts on sanctuary resources.[70] The effects of climate change are not just limited to the natural resources within the marine environment. Cultural resources and maritime heritage also face negative impacts from climate change, impacting how people connect, view, and preserve the important cultural stories and relationships of the sites. As climate change progresses these changes will only continue to happen more frequently and to a more extreme degree.

While climate change is undoubtedly the biggest challenge for the marine environment, there are several other critical issues that ONMS leaders must also consider, and balance as discussed below. As such, targeted efforts must be made to balance the distinct interests of stakeholders and capitalize on emerging opportunities, all with the underlying driving force of promoting sustainability and actions that combat climate change. When the array of emerging issues in the marine environment are approached with this mindset, opportunities exist for the System to help shape a more healthy, diverse, and sustained positive impact on the future marine environment.

Blue Economy Developments

The blue economy refers to a range of economic uses of ocean and coastal resources – such as energy development, shipping, fisheries, aquaculture, mining, recreation, and tourism. In addition to these "market" economic values, it includes benefits that are considered "nonmarket" values, such as carbon storage, coastal protection, cultural values, and biodiversity.[71] Activity in the blue economy involves a "de-coupling of socioeconomic development from environmental degradation… a subset of the entire ocean economy that has regenerative and restorative activities that lead to enhanced human health and well-being, including food security and creation of sustainable livelihoods."[72] While the Blue Economy is wide-ranging and multi-faceted, the Panel wishes to highlight two emerging opportunities that ONMS might capitalize on: expanding aquaculture and the rise of marine energy development.

Potential Expansion of Sustainable Aquaculture

The world relies on marine flora and fauna as key pieces in local communities' sustainability and the industrial food supply chain beyond. However, over 80 percent of fisheries around the world

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[69] U.S. Office of National Marine Sanctuaries, *Climate Impacts*. https://sanctuaries.noaa.gov/management/climate/climate-impacts.html

[70] This heatwave created a harmful algal bloom off the coast of California that killed marine species and impacted the larger ecosystem. The Cordell Bank National Marine Sanctuary experiences some of the negative effects of this algal bloom in their waters. U.S. Office of National Marine Sanctuaries, *Climate Change Impacts: Cordell Bank National Marine Sanctuary*. https://nmssanctuaries.blob.core.windows.net/sanctuaries-prod/media/docs/20200820-climate-change-impacts-cordell-bank-national-marine-sanctuary.pdf

[71] Spalding, *The New Blue Economy: The Future of Sustainability*. https://cbe.miis.edu/cgi/viewcontent.cgi?article=1052&context=joce.

[72] Ibid.

are either being fished at full capacity or are already overexploited.[73] As the world's population continues to grow, so will the strains on the supply chain, and in some cases, complete disruption of local food supplies.[74] The expansion of sustainable aquaculture presents a potential solution to this global problem while factoring in the effects of climate change. Aquaculture, the farming of marine plants and animals for food, is the fastest-growing food production system in the world.[75] Sustainable aquaculture is a dynamic concept that factors the environmental, economic, and social and community sustainability into production.[76] While aquaculture can be a solution to increasing sustainability in the food supply chain, including helping repopulate depleted species, it can also put a strain on the environment, which is why future expansion of aquaculture must be designed and executed sustainably and with active oversight. MPAs, such as the sanctuary sites, can be potential locations for future aquaculture development because of their previously established levels of preservation and relatively healthy ecosystems. The System also has the potential capacity to protect native or wild fish stocks in the process, which can be harmed by poorly managed aquaculture. Sustainably managed and monitored aquaculture can in turn provide benefit to MPAs both inside and outside their boundaries by helping to enhance biodiversity and providing positive socio-economic impacts to local communities.[77] As the strain on global resources continues to grow both from population increases and due to the negative impacts from climate change, the expansion of aquaculture can become an increasingly viable solution, but it needs to be managed with oversight and care.

Growing Marine Energy Development

As the world looks to new and sustainable ways to develop energy there is an increasing focus on the expansion of marine energy, such as offshore wind and hydrogen fuel production.[78] The oceans cover over 70 percent of the Earth's surface and many populated areas are located close to water resources, creating a great potential for a previously untapped energy development source.[79] While marine energy technologies are still relatively new, the field continues to grow with electricity generation from marine technologies estimated to have grown by 13 percent in 2019 alone.[80] As new technologies develop and the global emphasis on alternative energy sources

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[73] Le Gouvello, R, Hochart, L-E, Laffoley, D, et al. *Aquaculture and marine protected areas: Potential opportunities and synergies*. https://onlinelibrary.wiley.com/doi/full/10.1002/aqc.2821
[74] Dulal, Youwaraj, *Impacts of climate change on food security in third world countries*. https://www.omicsonline.org/proceedings/impact-of-climate-change-on-food-security-in-third-world-countries-106827.html
[75] Broitman BR, Halpern BS, Gelcich S, Lardies MA, Vargas CA, Vásquez-Lavín F, Widdicombe S and Birchenough, *Dynamic Interactions among Boundaries and the Expansion of Sustainable Aquaculture*. https://www.frontiersin.org/articles/10.3389/fmars.2017.00015/full
[76] The World Bank, *Sustainable Aquaculture*. https://www.worldbank.org/en/topic/environment/brief/sustainable-aquaculture#:~:text=Environmental%20sustainability%20%E2%80%94%20Aquaculture%20should%20not,with%20good%20long%2Dterm%20prospects
[77] Le Gouvello, R, Hochart, L-E, Laffoley, D, et al. *Aquaculture and marine protected areas: Potential opportunities and synergies*. https://onlinelibrary.wiley.com/doi/full/10.1002/aqc.2821
[78] Stanford University, *Stanford researchers create hydrogen fuel from seawater*. https://news.stanford.edu/2019/03/18/new-way-generate-hydrogen-fuel-seawater//
[79] The National Renewable Energy Laboratory, *Ocean Energy Basics*. https://www.nrel.gov/research/re-ocean.html
[80] International Energy Agency, *Ocean Power*. https://www.iea.org/reports/ocean-power#tracking-progress

continues to grow, there is the opportunity for production to increase tenfold. Some estimates suggest that gradual developments in offshore wind on the East Coast could generate enough energy to power over 115 million households over the next 20 years.[81] Sustainable offshore wind energy developments can also contribute to conservation efforts, as the divestment from fossil fuels has the potential to slow many of the ongoing effects of global warming. While there is concern that building new offshore wind energy infrastructure could harm ecosystems, conservation and energy groups can work together with other relevant stakeholders, such as fisheries managers, to develop sustainable and mutually beneficial solutions for the future.[82] The System has the opportunity to serve as a convener for these solutions.

The Organization for Economic Cooperation and Development estimates that by 2030, $3 trillion in economic output will be generated by ocean sectors each year.[83] In the coming decades, the blue economy will be key to ensuring international and domestic needs for food, energy, and jobs are met. The System will need to understand the interactions of such new developments, like offshore wind energy generation, with the sanctuary sites. There is also the opportunity for the System to continue to conduct socioeconomic research on the value of sanctuaries, their economic impact, and their non-market values including ecosystem services.

New Technologies

As the marine environment changes, fortunately so have the technologies used to explore and comprehend it. New technologies, such as autonomous underwater vehicles (AUVs), have allowed humans to explore new marine areas. Remote sensing capability with satellites and sensors are undergoing a revolution in ability and cost-reduction that allows people to have "eyes and ears" on the marine environment above and below the surface. This allows for more precise management, greater visualization opportunities for the public, and greater capacity for enforcement and protection. People are thinking of new creative ways to use the marine environment while protecting it. While technology itself is not an answer to many of the questions and issues facing the future of the marine environment, it is a useful tool that can help collect data to answer pertinent questions and facilitate creative and sound solutions.

Building Personal Connections to the Marine Environment

People are inextricably connected to marine environments, as they supply people with oxygen, food, medicine, transportation, recreation, and much more. Humans have been benefiting from and connecting to, the marine environment for millions of years.[84] Despite this historical

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[81] Oceana, *Offshore Energy By The Numbers*. https://oceana.org/sites/default/files/offshore_energy_by_the_numbers_report_final.pdf

[82] British Ecological Society Journal of Applied Ecology, *Marine Renewable Energy: Potential Benefits to Biodiversity? An Urgent Call for Research*. https://besjournals.onlinelibrary.wiley.com/doi/full/10.1111/j.1365-2664.2009.01697.x

[83] Organization for Economic Co-operation and Development, *Work in Support of a Sustainable Ocean*. https://www.oecd.org/ocean/OECD-work-in-support-of-a-sustainable-ocean.pdf.

[84] The University of Hawai'i at Manoa, *Exploring Our Fluid Earth: The oceans and humans are inextricably interconnected*. https://manoa.hawaii.edu/exploringourfluidearth/standards-alignment/ocean-literacy-principles-olp/olp-6-ocean-and-humans-are-inextricably#:~:text=Humans%20have%20a%20complex%20relationship,for%20food%20and%20transportation%20(Fig.

connection, not all people in the U.S. have ready access to a marine environment. However, as noted above, there are emerging approaches and technologies that are helping to build and strengthen those personal connections. With the emergence of new technologies in the ways people explore marine environments, there are also new ways to share that connection. Through virtual reality and AI, one can experience the wonders of a sanctuary, and with the continual rise of social media, one can virtually travel the world, all from the comfort of their own home. This can allow a person in Omaha to connect with a sanctuary site such as Papahānaumokuākea in Hawaii in a way that was not possible before.

When talking about the future of how people interact with sites like the sanctuaries, one must factor in the impacts of the COVID-19 pandemic. A study from the UK showed that people have been spending more time outdoors and in natural spaces since the global restrictions and lockdowns began and are likely to continue that behavior following the lift of restrictions.[85] This shows the promise of a new wave of visitors and people interested in natural spaces like the sanctuary sites. However, COVID-19 has fundamentally changed how people visit these sites with many people being hesitant about traveling and visiting crowded areas in the wake of the pandemic. There is a global movement that is examining the future of the world following the pandemic and raising the idea of "building back greener," which envisions the opportunity to adopt sustainable and safe practices in everyday life in the new world post-pandemic.[86] The System and other MPAs have an opportunity to capitalize on this movement and rethink their visitor and community engagement strategy, redesigning it to fit the new world post COVID-19.

Engaging Indigenous Communities

As the world surrounding the marine environment changes and new solutions are needed, it grows increasingly important to bring new voices to the table. While one of the System's strengths has been community engagement, there are opportunities to further expand those conversations and engage with previously underrepresented communities. While some work has been done by the System to engage indigenous communities, it has not been consistent or methodical (see Section 6). Indigenous groups have long-standing connections to sanctuaries and other ocean spaces and hold valuable traditional ecological knowledge, described as "the primary indigenous ways of understanding relationships among species, ecosystems, and ecological process."[87] This knowledge can be a key piece in informing initiatives to adapt to the future threats of the environment by offering a differing perspective than Western science. Engaging respectfully with indigenous communities and working with them as important partners and managers of these sites is a growing opportunity to help the System combat and respond to emerging and growing threats, engage affected communities, and address historic injustices.

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[85] DiscoverWildlife, *COVID-19 strengthens our connection with nature.* https://www.discoverwildlife.com/news/covid-19-strengthens-our-connection-with-nature/
[86] Bloomberg, *How to Build Back Greener After the Pandemic.* https://www.bloomberg.com/news/articles/2020-10-29/how-to-build-back-greener-after-the-pandemic
[87] U.S. Forest Service. *Exploring the Role of Traditional Ecological Knowledge in Climate Change Initiatives.* https://www.fs.fed.us/pnw/pubs/pnw_gtr879.pdf

Global Movement on Marine Environment Policy

As discussed in more detail in Section 2, considerations related to the rapidly changing ocean system change and developing blue economy have led international and domestic policymakers to invest in advancing our current scientific understanding of the marine environment and to develop better natural resources policies that can help the sustainability of the ocean's resources. While this report does not provide an exhaustive list of actions in this movement, it does provide examples of a larger set of efforts to focus on marine and terrestrial conservation. Internationally, the movement includes the UN's Decade of Ocean Science for Sustainable Development and the 30 by 30 Initiative. In addition, it includes widespread movements to limit marine debris and plastic pollution of all kinds, prevent overfishing, and limit damage from bottom trawling and longline fishing gear.[88] Domestically, it includes President Biden's Executive Order on "Tackling the Climate Crisis at Home and Abroad" and the U.S. House of Representatives' bill, the Ocean-Based Climate Solutions Act of 2020.

5.3 The Sanctuary System Looking Forward

The above presents a snapshot of what the future could hold for the System. Within this outlook, not only are there potential threats that the System should prepare for, but there are also opportunities that the System can capitalize upon. The NMSA calls for sanctuaries to pioneer and incentivize innovative conservation management techniques, the following section presents recommendations and pivot points for the System to be able to better prepare for and help build on this potential more sustainable future.

[88] National Geographic, *A running list of action on plastic pollution*. https://www.nationalgeographic.com/environment/article/ocean-plastic-pollution-solutions; Oceana, *Impacts of Bottom Trawling on Fisheries, Tourism, and the Marine Environment*. https://oceana.org/sites/default/files/reports/Trawling_BZ_10may10_toAudrey.pdf

Section 6: Recommendations to the Sanctuary System

With a new presidential administration and the many challenges and opportunities converging within the marine environment, this report comes at an auspicious time. This section offers actionable recommendations on how the System could better prepare to address a dynamic future in its enormous operating habitat.

This section is divided into four segments. First, there is a summary description of the key themes that the report recommendations offer for the future. This narrative reveals how the Panel approaches the analysis and describes future opportunities for ONMS leaders to enhance the effectiveness of the System. Second a high-level framework for the recommendations is introduced, enumerated by sequencing the report's recommendations as either short-term, medium-term, or long-term. In the third segment of this section, the report's 15 recommendations are listed and organized into six sequenced and distinct key topics. The distinction of recommendations into these two different dimensions – by key topics and by sequencing – is an important element in the Panel's suggestions as to how implementation should proceed. Fourth, the section ends with a conclusion to the report.

6.1 Summary Themes

Given a strong track record of accomplishment as it nears the first half-century of existence, and the propitious, if challenging, opportunities presenting themselves with both changes in the marine environment and a new federal administration, the time is right for ONMS to take demonstrable steps to significantly expand its role and ambition to protect the marine environment. The world is at a critical crossroads. As noted in Section 5, there are many important issues that must be carefully and comprehensively addressed. Calls for immediate action to protect the marine environment more effectively and more broadly are ever louder and more earnest. These warnings are embraced by the Panel and this report. Now is the time for important steps by the United States to play a greater constructive role with partners. ONMS has a critical role to play in these collaborative efforts, both domestically and internationally.

This report outlines 15 actions that will enhance the System's ability to position itself to play more of a leading role than it has in the past, both within NOAA, across federal agencies, and with private industries and community partners, to advance critical environmental protection goals. There are three key themes on which this report is constructed.

The first key theme of this report is: The System must have an expanded vision and long-term goal to build itself into a more balanced, focused, and better-resourced actor that can take a leading role in NOAA and across the U.S. government in protecting the marine environment. This leading role is appropriate for ONMS to take given its mission and reputation. That said, a series of interim steps are required for ONMS to be able to perform this critical and enormous task well. Increased funding for the System will enhance this vital effort.

Second theme: As the future unfolds, with new scientific discoveries, ever scarcer resources, population growth, and new uses of the marine environment, it is essential that ONMS expand its engagement with non-traditional external stakeholders. A few examples of these stakeholders might include sea-based shipping companies, marine-based extraction industries, commercial fisheries, and renewable energy companies. While engagement of ONMS leaders with marine conservation groups is an organizational strength and should be expanded, the future challenges and opportunities in the marine environment call for an "all hands on deck" approach, to include creative dialog and inclusion of what may be deemed as competing industries that operate at scale in the ocean or Great Lakes to achieve their missions. In addition, there are opportunities to enhance effective and respectful engagement with indigenous communities. At this critical juncture in the coming 10-15 years, it is imperative that more robust engagement with a full range of stakeholders, particularly non-traditional ones, is required to guarantee a healthy marine environment.

Third theme: ONMS in its present condition is not adequately resourced to take on this pivotal role for NOAA or the federal government generally. The Panel thus identifies several elements of the System's operations and culture that offer opportunity for improvement to build a more robust organization more capable of taking on an expanded role in NOAA and beyond. To that end, the Panel outlines several critical interim building steps required of the System in order to construct a suitable launching pad that can cement its effective long-term leadership position.

As such, this report proposes a comprehensive set of recommendations that are distinguished by subject category on one hand, and yet are interconnected in an organizational sense. These recommendations are sequenced with respect to the timing of implementation to underscore how the Panel envisions the building blocks that can assist the System to ready itself to take on a more effective role in protecting the System and the marine environment. There are short-, medium-, and long-term recommendations. As a rule, short-term recommendations are intended for implementation during the next 12 months. Medium-term recommendations are intended to be implemented during the 12-24 months following the report submission, and long-term recommendations should be embarked upon after 24 months. The precise timing connected with addressing each recommendation may vary as progress in implementation takes shape.

Even given the limited resources of ONMS over the years, the Panel is convinced that the System can and should serve as a national and global leader. One thing is certain, there is little time to waste in making the required organizational pivot. Combining particular actions to enhance performance in the immediate future will serve to prepare ONMS to effectively execute an expanded vision in close collaboration with other federal agencies.

6.2 Phased Approach to Recommendations

ONMS must adopt a phased approach to achieve its long-term vision. As illustrated below in Figure 6-1, it needs to build a solid foundation that will serve as a launching pad for growth and expansion so that it can become more of the leader needed in these times.

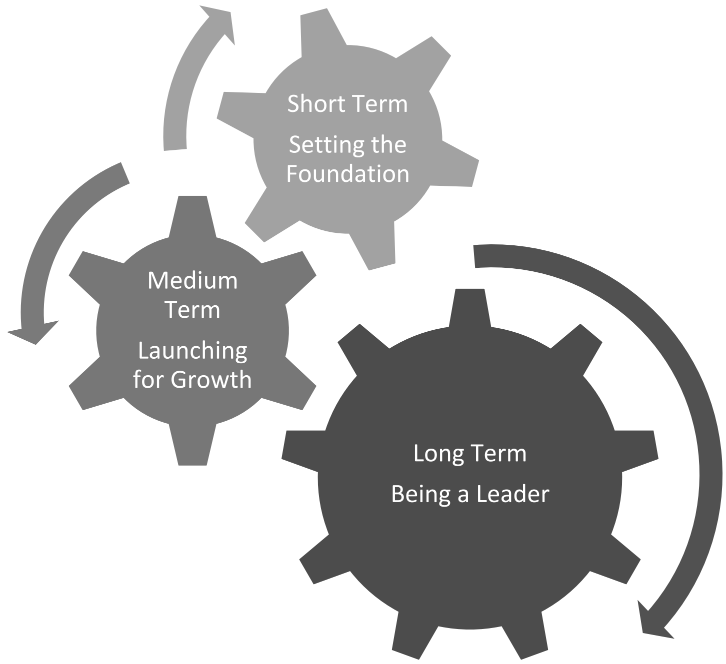

Figure 6.1: Framework of Recommendations. Figure created by the National Academy of Public Administration.

Short-Term Recommendations – Setting the Foundation (*Next 12 Months*): As a starting point, it is vital to establish the foundation on which ONMS may assume an expanded role protecting the marine environment. Building on its strengths, ONMS must prioritize key areas such as:

- securing additional funding,
- developing a more inclusive community engagement strategy/plan,
- and growing its network of partners.

The Panel recognizes that ONMS has to work in concert with NOAA leadership to address its budget constraints. In support of its growth plans, ONMS must streamline its operations, including a simplified designation and nomination process, and agile management planning. It includes better defining the role of its regional network offices and developing a workforce plan that accounts for the evolving concept of work and workforce. Finally, it must embed technology in its operating model which will work as a resource multiplier for the System.

Medium-Term Recommendations – Launching for Growth *(Next 12-24 Months)*: This phase involves continued preparation for, and good execution on its growth and expansion, building on outcomes from the previous phase. It includes expanding its partnerships, detailed budget and resource planning, and better quantifying the socio-economic value-add of the System to communities, including its role in the blue economy.

Long-Term Recommendations – Being a Leader *(24 Months and Beyond)*: Successful outcomes from the previous phases will position ONMS to be a leader in marine protection, both on a domestic and global level. In this phase, the Panel sees the System as a growing and connected network of MPAs, making significant progress in sustained resilience and adaptation to a changing environment.

In many instances, individual recommendations are followed by suggested intermediary and subsequent steps to help implement those recommendations effectively.

6.3 Recommendations by Focal Areas

Recommendations are organized into six focal areas that address different elements of organizational performance. These key elements include: Strategy, Finance, Management and Operations, Organization, Communications, Outreach and Branding and Community Engagement. While each can be categorized into a distinct element of organizational performance, and thus can be considered individually, this report argues that they should be seen as a cohesive whole. To that end, they are inextricably intertwined. In order to enhance success, ONMS should address them together.

Figure 6.2 below lists the recommendations at a high level, offering them in a manner that highlights the two-dimensional approach taken in this report: implementation phases and key areas where recommendations are addressed. In doing so, the Panel offers a sequenced, holistic proposal to ONMS to serve as a guide to next steps. The recommendations are not listed in order of priority, but as an amalgamation of actions that should be included in a comprehensive action plan.

<table>
<tr><th colspan="2">Short Term: Setting the Foundation
Within the next 12 months</th></tr>
<tr><th colspan="2">Strategy</th></tr>
<tr><td colspan="2">Refresh Strategic Vision, Focus, Value Proposition, and Impact</td></tr>
<tr><th colspan="2">Finance</th></tr>
<tr><td colspan="2">Identify Alternative Funding Sources and a Sustainable Financing Model</td></tr>
<tr><th colspan="2">Management</th></tr>
<tr><td>Support Reauthorization of the NMSA</td><td>Create Flexible and Adaptable Management Planning Structures</td></tr>
</table>

Organization	
Enable and Clarify the Role of the Regions	Evaluate Workforce Planning
Communications	
Enhance Communications Plan	Bolster Support for Communications Team
Community Engagement	
Reach New Communities	

Medium Term: Launching for Growth Next 12-24 months	
Strategy	
Revisit System Protection Levels and Metrics	
Finance	
Support System Economic Valuation and Community Profiles	
Community Engagement	
Effectively Engage Indigenous Communities	Expand Partnerships

Long Term: Becoming a Leader 24 months and beyond
Organization
Expand Role as Collaborator and Convener of Marine Protection
Communications
Create and Implement a Public Outreach Campaign

Figure 6.2: Short-, Medium-, and Long-Term Strategy. Figure created by the National Academy of Public Administration.

Focal Area 1: Strategy

As described in above, the System stands at a critical juncture: the combination of a rapidly evolving future, opportunity presented by a renewed focus by the current Administration on climate change and ocean conservation, and changing stakeholder demands require it to rethink its future role in marine resource management.

Short-Term

Refresh Strategic Vision, Focus, Value Proposition, and Impact

ONMS has an ambitious strategic plan, and as one of its goals, the strategic plan emphasizes increasing support for sanctuaries. To support this goal, the plan calls for building a strategic vision for the next 50 years.[89] Since the current strategic plan runs through the year 2022, ONMS must develop a new strategic plan that includes building its long-term vision. The Panel posits this vision should reflect a more ambitious agenda in the long term: an expanded view of marine protection - a better networked connection between sanctuaries and other types of MPAs; expanded levels and types of protection; increased accessibility and reach of marine areas; an established national brand and identity; and a redefined future role – as a coordinator and leader in domestic marine protection, and a pioneer in the international environment. Though the System is limited in funding and resources, an inspiring vision will spur ONMS to innovate, identify resource multipliers, and rally its stakeholders and partners – placing a renewed focus on the important role of the ocean and the Great Lakes in marine protection.

To get to this long-term vision, ONMS needs to be better prepared, focusing on incremental steps and priorities to build its internal capacity to position itself well. However, it does not communicate the System's progress, impact, and accomplishments in a consistent manner to its stakeholders. Many stakeholders – partners and communities express a lack of clarity on its role and purpose, including its impact. In fact, the NMSA emphasis on protection and compatible uses

[89] U.S. Office of National Marine Sanctuaries, *Strategic Plan for Fiscal Years 2017-2022*. https://nmssanctuaries.blob.core.windows.net/sanctuaries-prod/media/docs/onms-strategic-plan-2017-2022.pdf.

can erroneously be perceived as a zero-sum proposition, and the word "sanctuary" has a variety of connotations that can create an inaccurate perception of the System and its purpose.

While it is essential to set a strategic vision, ONMS must also use its strategic plan to prioritize its limited resources in support of its vision. This will require intentional choices of focus areas on one hand, and reliance on its partners to fulfill other areas as well. As part of its strategic planning, it must expand to include voices and engagement from non-traditional partners/champions. As an important step, it must effectively communicate its value proposition to its stakeholders – the benefits that sanctuaries accrue to both coastal and inland areas.

Recommendation 1: Refresh ONMS' strategy to expand its vision and role, communicate the value proposition in a more clear, unambiguous, inclusive, and inspiring manner, and measure and communicate the System's environmental, social, and economic impact. It should develop a clear roadmap and plan of short-term, medium-term, and long-term priorities, align resources, and monitor progress and performance.

Medium-Term

Revisit System Protection Levels and Metrics

The System has the potential to better utilize a scheme which categorizes and characterizes various protection and regulation levels among its sanctuaries, and to apply the scheme more holistically within and across the sanctuaries. The public is generally unaware of the sanctuaries, let alone the types of protection, regulation, and management activities that take place in them. The System's MPA Center notes "the official programmatic names of many U.S. MPAs (such as sanctuaries, parks, preserves, or natural areas) rarely convey the area's actual conservation purpose, allowable uses, or management approach."[90] External stakeholders and partners also experience difficulty in acquiring a complete understanding of such features. To address this issue, the MPA Center created a classification system which provides a more straightforward explanation of MPAs in functional terms. It also lists and explains six levels of protection ranging from uniform multiple-use to no access. These protection levels are relatively easily understandable. However, they are not made prominent on the System's website and among communications geared toward the public.

While the System applies these protection levels to the sanctuary sites, and they align with the International Union for Conservation of Nature's (IUCN) protected area categories, there are limitations.[91] The System has established some "no-take" zones, like in the case of Florida Keys and Channel Islands national marine sanctuaries, but they only make up part of a larger protected areas.[92] Furthermore, a lack of accessibility in data collected among the sanctuary sites, and the

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[90] U.S. National Marine Protected Areas Center, Definitions and Classification System for U.S. Marine Protected Areas. https://nmsmarineprotectedareas.blob.core.windows.net/marineprotectedareas-prod/media/docs/20200715-mpa-classification.pdf.
[91] International Union for Conservation of Nature, *Protected Area Categories*. https://www.iucn.org/theme/protected-areas/about/protected-area-categories.
[92] No-take zones totally prohibit the extraction or significant destruction of natural or cultural resources. "No-take zones are often part of multiple-use MPAs, where different levels of activity are allowed in different zones. No-take zones within multiple-use MPAs usually protect the spawning grounds of many

lack of common metrics collected centrally at headquarters, hampers ONMS' efforts to communicate progress on its resource protection mission to its domestic and international counterparts. Sites use a uniform set of performance measures phrased as questions to characterize the condition of their resources.[93] However, they are technical in nature, and can emphasize the negative impacts of activities outside of the System's jurisdiction. The System can better balance emphasis on what is also going well. For example, pollution from a source neighboring a sanctuary impacting water quality in the sanctuary would be listed, but the measures might not include a description of actions the System has taken to improve water quality that are within its span of control.

These factors create a potential obstacle for the System in participating in initiatives like the 30-by-30 initiative in a more meaningful way.[94] In other words, it can more ambitiously manage its protected areas as a system rather than a collection of nationally significant areas. An easily understandable categorization scheme designating various levels of protection, along with a set of more accessible and System-wide performance metrics, could enable ONMS to better communicate to stakeholders the actions taken in the sanctuaries that contribute toward its mission. They could also help the System to present itself as an ecosystem-based management organization, as opposed to a place-based one.

Relatedly, the System does not track sanctuary site visitation data at present. However, it does have work underway to organize its capabilities for collecting and tracking that visitation data. ONMS is partnering with researchers at West Virginia University to conduct a pilot study at two sites, Gray's Reef and the Florida Keys Sanctuaries, to analyze and evaluate methods for measuring site traffic, as well as to understand the economic activities the public engages in when visiting them. With a robust system for tracking site visitation data, the System will be able to better communicate its value proposition and justify its budget and make more informed decisions on how it will allocate staff, funding, and other resources across the sites.

Recommendation 2: Revisit the System's established levels of protection and authorities to designate sanctuaries and MPAs in the System as such. This examination should consider whether the levels, and the geographic scale at which they can be applied, meet the System's needs to move from place-based management to ecosystem and System-based management. ONMS should support the inclusion of such a toolset in a reauthorized NMSA. The determination on what these categories entail should be informed by the instructive examples employed by the U.S. Department of the Interior and National Forest System for terrestrial environments, as well as the MPA Center's classification system, and the International Union for Conservation of Nature's

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aquatic species." See National Geographic, *Encyclopedic Entry: No-take zone*. https://www.nationalgeographic.org/encyclopedia/no-take-zone/.; Murray and Hee, *A Rising Tide: Monitoring, Managing, and Enforcing Marine Protected Areas*. https://www.sciencedirect.com/science/article/pii/S0964569119301206?via%3Dihub.

93 U.S. Office of National Marine Sanctuaries, *National Marine Sanctuary System Condition Report 2013*. https://nmssanctuaries.blob.core.windows.net/sanctuaries-prod/media/archive/library/pdfs/ncr2013_high.pdf

94 Sletten et al., *Beyond the Boundaries*. https://www.sciencedirect.com/science/article/pii/S0308597X20309908.

(IUCN) protected area categories.[95] Establishing a level of protection akin to that of the Bureau of Land Management's wilderness areas, for example, would allow the System to set aside no-take zones with clearer legal authority. Additionally, it could help to balance disparities in the way marine protections are valued in comparison to terrestrial protections. The System can feature more accessible information on protection levels and performance on its website, sanctuary site signage, and through other communication channels and mediums.

- As an initial step toward this outcome, consider leveraging academic institutions, scientific panels, and the potentially reestablished MPA Federal Advisory Committee as described in Recommendation 9 below to conduct an examination on prospective categories, as well as the performance measures and metrics described below.
- Develop a set of common and accessible performance metrics for the System, including sanctuaries and other protected areas under its authority, to monitor and evaluate mission progress, communicate that progress to the public and stakeholders, and to compare to domestic and international counterparts. This set of metrics can be used in complement to the performance questions used for System-wide condition reports. ONMS should also refer to the guidebook of natural and social indicators for evaluating marine protected area management effectiveness created by IUCN, NOAA and its partners as a starting point to develop and track common performance metrics across the System.[96] Some illustrative examples of what may be included are:
    - Amount of area protected
    - Types of activities restricted
    - Number of species the System is taking action to protect
    - Estimated whale strikes avoided
    - Amount of ocean floor mapped
    - Number of external partners
    - Number of educational activities or projects conducted
    - System economic valuation
- Track, report, and monitor site visitation data to inform System decision-making, justify the budget, and provide a basis for comparison to other resource management agencies.

Focal Area 2: Finance

Funding is critical for ONMS to achieve its objectives and will provide much needed resources to the System. It has an opportunity to explore alternative revenues sources and must pursue to ensure long-term sustainability of the System.

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95 International Union for Conservation of Nature, *Protected Area Categories*. https://www.iucn.org/theme/protected-areas/about/protected-area-categories.

96 International Union for Conservation of Nature, *Guidebook of Indicators for Evaluating Marine Protect Area Effectiveness*. https://nmsmarineprotectedareas.blob.core.windows.net/marineprotectedareas-prod/media/archive/pdf/national-system/mpadoing.pdf.

Short-Term

Identify Alternative Funding Sources and a Sustainable Financing Model

ONMS has four potential sources of revenue: (a) appropriations; (b) fees from products and services; (c) external funding it raises on its own; and (d) funds raised by the National Marine Sanctuary Foundation.

The primary source of funding for ONMS is appropriations. Our research points to considerable resource constraints in the System. Despite these constraints and an ambitious mission, appropriations have been relatively flat over the last several years. ONMS has not communicated its need for additional funding to Congress and to pursue additional incremental appropriations, it will need to justify its progress, impact and value proposition clearly.

While greater appropriations are necessary, NMSA also provides a number of flexibilities to seek additional funding and raise revenues. It provides the Secretary authority to issue permits and charge fees, and to use fees for sanctuary management. Referring to NMSA, SEC. 316. [16 U.S.C. 1445B] includes several mechanisms to enhance support for the System, including developing products and services, marketing these products and services, and soliciting contributions.[97] The System is an outlier as a Federal agency to have such considerable flexibility in the use of such funding options and yet not employ them. However, ONMS has not been successful in raising any substantial revenues using these mechanisms. Interviewees suggest that a primary challenge to leveraging these potential sources effectively could be unfamiliarity, discomfort, or risk aversion within NOAA and Department of Commerce.

As an example, the USFS uses Passes and Permits. While many are free, some require fees or permits to help maintain, manage, and improve national forests and grasslands.[98] Similarly, the National Wildlife Refuge System has established the Migratory Bird Hunting and Conservation Stamp (commonly known as the Duck Stamp) and in 2017, Duck Stamp sales totaled more than $38 million and over $1 billion since 1934.[99]

Finally, one of goals of the National Marine Sanctuary Foundation was to develop potential revenue streams to help support the System. While it has made some progress in its effort, it has a significantly greater potential. The above-mentioned opportunities represent a significant untapped potential for ONMS. In order to achieve its priorities, and given the System's resource constraints, it is vital for ONMS to seek and pursue all avenues of additional funding sources. It must better leverage its existing authorities, in addition to seeking additional increased appropriations. Furthermore, it must reexamine its working relationship with the Foundation, starting with a shared view of priorities at each site, and across the System.

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97 106th U.S. Congress, *National Marine Sanctuaries Amendments Act of 2000*. https://www.congress.gov/bill/106th-congress/senate-bill/1482/text/pl?overview=closed.
98 U.S. Forest Service, *Passes and Permits*. https://www.fs.usda.gov/visit/passes-permits.
99 A "Duck Stamp" is required for waterfowl hunters 16 years of age and older. The Federal Duck Stamp program supports conservation of important migratory bird habitat through the purchase of wetland and associated upland habitats within the National Wildlife Refuge System. See U.S. Fish and Wildlife Service, *Duck Stamp Dollars at Work*. https://www.fws.gov/birds/get-involved/duck-stamp/duck-stamp-dollars-at-work.php.

<u>Recommendation 3:</u> Identify and pursue additional funding streams, including requesting additional appropriations (with a solid business case justification) and alternative and sustainable financing models.

- ONMS should assess the feasibility of collecting royalties and fees associated with services and products it provides currently, similar to those collected by the U.S. Forest Service, and pursuant to its special authorities under the NMSA. It should consider additional opportunities for providing services that can generate income while protecting the marine environment.

Medium-Term

Support System Economic Valuation and Community Profiles

Over the last ten years and beyond, many economic analyses have been conducted by the federal government, universities, and other researchers to assign market values to the benefits derived from sanctuaries.[100] Much work has been done to assign economic value to the preservation of natural resource systems, both to people who visit protected areas, or even to those who never will.[101] Economic analyses of benefits derived from the System help to inform decision-makers in natural resources management and convey the value of the System to a wide array of stakeholders. However, they focus on targeted activities in individual sanctuaries, and no holistic valuation of the entire System exists.[102] Many of the existing studies are ten years old or more. ONMS' economists are updating some of these studies and moving forward with a variety of new ones. Notably, ONMS is in the early phases of its SUCAR program. The focus of the SUCAR program is to deepen ONMS' profiles of local communities surrounding the sanctuary sites. It centers on understanding the factors that influence the behavior of non-users of the System, such as cost, access, awareness, and their preferences to engage in activities unrelated to sanctuaries.

<u>Recommendation 4:</u> Continue efforts to value economic benefits derived from targeted areas of the System and deepen its community profiles to understand non-users. Expand efforts to understand non-users beyond the local communities in the immediate areas of sanctuary sites, as well as for non-users comprised of underrepresented demographic groups. More targeted economic assessment activities should be consistent with the statistical methods and categories of the National Accounting Framework, which BEA uses to measure GDP. Integrate economic analyses into ONMS strategic planning and communicate the value of the System to stakeholders. In addition:

- Examine and emphasize the positive impacts, or "spill-over effects", of limited take and no-take zones on fish stocks and other marine resources in adjacent areas to stakeholders like commercial and recreational fishing groups.

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[100] U.S. Office of National Marine Sanctuaries, *Socioeconomics Research*. https://sanctuaries.noaa.gov/science/socioeconomic/research.html.
[101] Schaefer et al., *Nature as Capital*. https://www.pnas.org/content/112/24/7383
[102] The Bureau of Economic Analysis (BEA), in partnership with NOAA, is measuring the economic impact of the ocean economy on U.S. gross domestic product (GDP). ONMS contributes to this effort by providing data on the System to NOAA and BEA. Though, ONMS' data on the System is still incomplete.

- Aggregate targeted assessments over time to estimate the value of benefits derived from the System as a whole.

Focal Area 3: Management and Operations

Management and operations are the processes by which ONMS plans for and facilitates the multi-faceted dimensions of the System. The recommendations within this key topic focus on creating agility within the System and capitalizing on opportunities to streamline processes to create efficiencies.

Short-Term

Support Reauthorization of the National Marine Sanctuaries Act

As mentioned in previous sections of this report, when the System was established in 1972 there was a much different view of the marine environment than what is widely held today. The marine environment is not only vastly different than it was nearly 50 years ago, but it is constantly changing. However, the management and operations processes of the System have not kept up with these changes and are largely outdated, hindering the System's ability to react and adapt to the current movements within MPA conservation.

A major contributing factor to the System's inability to be agile and adapt to the modern marine environment is the nature of its defining legislation. The NMSA was enacted in 1972 with clarifications and changes being added on in the following years. However, the last revisions to the NMSA were passed in 2000, meaning that it has been over 20 years since the defined authority of the System has been revisited. With a lack of updated defining authority that matches the issues of today, ONMS has not been able to fully capitalize on available opportunities or quickly adapt to emerging threats. For example, the idea of energy generation and extraction has changed dramatically. When the System was first created, one of the main goals was to prevent oil drilling at these sites, leading to sweeping bans on engaging in energy development in many of the sites. With the development of renewable marine energy technologies combined with technology, there are opportunities for the System to combine conservation and economic use such as energy generation in a more sophisticated manner in appropriate areas. However, current legislation, including the Energy Policy Act of 2005 which prohibits BOEM from conducting lease sales for wind energy projects in sanctuaries, prevents ONMS from doing so.

There is also the opportunity to streamline the legislation to increase the efficiencies of processes and promote agility. The designation process as currently defined by the NMSA is fairly onerous and requires extensive time and resources which can be a strain on ONMS. The difficulty and the bottlenecking that has occurred in the designation process can be illustrated by that the fact that it takes many years to complete a designation even when greatly supported. This process can be reinvigorated through changes in the NMSA that will not only relieve some of the burdens from ONMS but contribute to the national and international movements on marine environment protection and the initiative to have 30 percent of national waters protected by 2030.

Recommendation 5: Support congressional efforts to reauthorize the NMSA to reflect the current state of the marine environment and ensure that the System will be able to continue to conserve places of national significance in the modern world. Reauthorization that looks towards the future of the marine environment can give ONMS the tools to be more directed and focused in their actions such as supporting partnerships across all functional areas; allowing for different levels of protection and classification within the system; and allowing for adaptive management to address climate and other impacts. The reauthorization of the NMSA will not only have impacts on the designation process but can be adapted in a way that can pave the way for other recommendations in this report.

Create Flexible and Adaptable Management Planning Structures

Certain processes within ONMS' management structure should be reexamined and evaluated for possible opportunities to streamline with agility to be able to adapt to the current marine environment. Government and management focused on agility is, "mission centric, customer focused, communication and collaboration enabled, and continually demonstrates success to customers and the public. Agile government involves small teams and customer participation, empowered by leaders to take rapid action to deliver timely, transparent results."[103] Adapting agile, flexible, and adaptable management structures will enable the System to adapt to the needs of today in a timely and efficient manner.

Management plans are site-specific documents that are created to manage the individual sanctuary sites. They communicate the vision, goals, and objectives of a site; outline ongoing programs and regulations; direct management decisions at the site; and more.[104] Management plans are updated every five to ten years by the site and the planning process requires extensive research and input from the local communities and relevant stakeholders. However, at current, the management planning process is not designed to react dynamically to the present and ongoing threats and opportunities that MPAs face. The management planning process is resource-consuming, requiring extensive time from the already strained System. While the formal process for updating management plans is 5-10 years, there is a perception that the management planning process is in a continual cycle of creation, receiving comments from the community, and implementation with little opportunity for strategic foresight, prioritization, or implementation. There is also a sense that while the process is amenable to the addition of new ideas and goals to the plan, there is a reluctance to jettison old pieces of the plan that might no longer be relevant to create a streamlined and intelligible vision that can inspire.

Due to the multi-faceted nature of the System and the different activities that the sites are involved in it can also be difficult for a site to prioritize and be able to fulfill all aspects of a management plan in the amount of time set in the plan. For example, the Flower Garden National Marine Sanctuary has recently completed an extensive expansion process. This process took nine years, and many other aspects of the previously existing management plan were dropped to prioritize focus on the expansion. Given the rigid nature of the planning process and the limited resources of the System, the difficulties encountered by sites to achieve all that they set out to do in a management plan can give the appearance of a lack of success or ability, when the challenge is a lack of an adequate timeframe with built-in metrics to measures steps towards overarching goals

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[103] The National Academy of Public Administration, *Defining Agile Government*. https://www.napawash.org/grandchallenges/blog/defining-agile-government

[104] U.S. Office of National Marine Sanctuaries, *Management 101*. https://sanctuaries.noaa.gov/management/mgt101.html

within the plan, or a lack of resources to implement the plan. Some improvements have already been made to the management planning processes, such as adding in sequencing steps that a condition report at the sites must be completed before the management planning process, to ensure that the plan is reacting to current conditions. However, there is still work that can be done, such as streamlining community engagement components, prioritizing different components of the plan, incorporating further sequencing, and adding performance goals and feedback loops.

Recommendation 6: Create flexible and adaptable approaches to the management planning process so that the System can address the problems of the future with more agility. These processes should balance future implementation challenges and updated planning processes. If reauthorized, the NMSA should update the requirements of the management planning cycle, moving away from a 5-10 year cycle to a focus on flexible and agile planning.

- Create a list of priorities for management plans and use that list to establish a flexible and adaptive management plan to address them.
    - The management planning processes should take place gradually with components being updated as they are prioritized and the plan itself should be deemed a "living" document, with regular updates that reflect material changes, and which include both additions and removals to respond to the current environment.
    - The management plans should have a roadmap to meet clear overarching goals with built-in and defined metrics.
- Create a regular and systematic feedback loop between the sites, regions, and headquarters to share best practices in this new flexible approach. The regional offices and headquarters should also coordinate with sites and provide a tool kit that includes templates, training, and sequencing timelines for these processes.

Focal Area 4: Organization

While the System has made strides towards the mission set forth by the NMSA since its inception, there are opportunities for ONMS to strengthen organizational health, address emerging threats, and grow in the current global environment.

Short-Term

Enable and Clarify the Role of the Regions

ONMS is a relatively decentralized organization, which allows its sites to be more responsive to issues and considerations unique to their respective environments. This flexibility is an important and necessary characteristic - however, it can also contribute to the misalignment of actions and the lack of a central unifying vision across the System as a whole.

ONMS created four regions (Southeast, Northeast, West Coast and Pacific Islands) to account for the System's growth. It was part of the reorganization effort that elevated ONMS, as a division of the former Office of Ocean and Coastal Resource Management, to its current level as an office, under the NOS. This move also reduced the direct reports to the Director of ONMS, as the site Superintendents report now to the Regional Director. However, the role of the regions has not been clearly defined. As a result, there is a lack of clarity at the staff level on the role of regions, which is not surprising in this evolution of an organization structure but does require attention and action.

There is an additional important role for the regions in addition to serving as a coordinator between headquarters and the sites. First, the regions can play a critical role in serving as a connector to MPAs at state and regional levels, and with other state government partners. Such broader, systematic engagement will not only help in aligning actions and priorities but also help amplify the System's branding and messaging. Second, it can help in efficient management and operations by coordinating resources and needs across sites and regions. For example, regions can help to look broadly across needs and priorities common to sites and devise efficient methods for sharing infrastructure and resources. Finally, it can help in systematic sharing of best practices and lessons learned across the sites and regions.

Recommendation 7: Clearly define the role of the regions in the System with a particular emphasis on playing the role of regional connectors and coordinators, leading improvements in regional management and operations, and sharing of best practices and lessons learned across the System. The regions must play the important role of coordinating both regional and site-level activities to align with, and advance priorities identified in, the new strategic plan.

- Headquarters and the regions, working as a team, need to better coordinate and prioritize partnerships with other NOAA, federal agencies, and non-federal government agencies at the national and regional level to develop shared actions and priorities based on the new and revised strategic plan.
- Better utilize the regions to enhance System branding, messaging, and outreach beyond local, site-specific awareness.
- Share management best practices and lessons learned across the System, including coordination of resources.

Evaluate Workforce Planning

As discussed in Section 4, the development of a professional management class and dedicated workforce is one of the major achievements of the System. ONMS staff is dedicated to the mission set out by the NMSA and has exhibited several innovative practices and resource sharing among sites which have helped the System be seen as a network rather than individual sites. However, when the potential future of the marine environment is compared to the current characteristics and breakdown of the workforce, certain threats and opportunities begin to appear on the horizon.

ONMS' workforce is aging. By the end of 2023 over 36 percent of its workforce is eligible to retire in the current and two upcoming Fiscal Years.[105] With this potential wave of retirements, the System stands to lose a large amount of institutional knowledge as many staff have been with ONMS for long tenures and have played major roles in the creation and development of the System's management process. There is a need to update the workforce planning model, not only to address this issue at present but also to plan for the future and give the next generation a sense of career path and growth within the organization. Given the changing nature of the marine

[105] Based on information provided to the National Academy of Public Administration from the U.S. Office of National Marine Sanctuaries on November 18, 2020.

environment, the skills that ONMS' workforce needs to operate in the future are most likely different than the skills that the workforce currently possesses. With the continual development and growing dependence on new technologies, the workforce will turn to a more analytical framework, moving away from performing traditional tasks to focusing on critical decision making.[106] There is also the need to focus on sustainable development and having a workforce that can develop a new green infrastructure that is equipped to handle and combat the growing impacts of climate change.[107] All of this is underscored by the growing need to increase diversity in the workforce and the recent changes in the work environment that have been brought on by the COVID-19 pandemic, e.g., being able to balance a flexible work model while maintaining the importance of connection to place.[108]

Related to workforce planning, a strength ONMS can capitalize on is the willingness and passion of volunteers who work in the System. In 2020, volunteers contributed the equivalent work hours of 36 full-time federal employees, amounting to $1.78 million going to the System.[109] While there is a strong interest from community members to volunteer at sites, the System cannot fully capitalize on this interest, demonstrated by many sites having waitlists for volunteers. Volunteers must receive training and resources to effectively communicate and care for the System. With limited resources, the volunteer training that ONMS can provide is also limited. The Community Engagement sub-section of Section 6 goes into further detail about ONMS's ability to connect with the community, but when thinking about the future of workforce planning, the potential capacity of volunteers should not be discounted.

Recommendation 8: Reexamine workforce planning with an eye toward the future. Workforce skills of the future should be focused on creating an analytical framework, optimizing the use of new technologies, and building sustainable infrastructure. The skills the ONMS invests in should be aligned with the System's specific goals and strategic planning.

- During workforce planning, particular attention should be paid to the potential benefits of increased focus and resource devotion to volunteer programs. There should be a focus on leveraging volunteers in new ways that can complement future workforce planning and alleviate the transition to a new workforce planning strategy.

Long-Term

Expand Role as Collaborator and Convener of Marine Protection

ONMS is a global leader in marine resource management, with a history of innovation owing to the NMSA of 1972. Given the increasing interest in ocean conservation and management globally with the UN Decade of Ocean Science and the growing worldwide support for 30 by 30, there is an opportunity for ONMS, with NOAA's approval, to become a leader and convener in these global

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[106] World Economic Forum, *The Future of Jobs: Employment, Skills and Workforce Strategy for the Fourth Industrial Revolution*. http://www3.weforum.org/docs/WEF_Future_of_Jobs.pdf
[107] Jobs for the Future, *Exploring the Green Infrastructure Workforce*. https://www.voced.edu.au/content/ngv:75924
[108] Jobs for the Future, *The Future of Work Grand Challenge*. https://www.jff.org/what-we-do/impact-stories/future-work-grand-challenge/
[109] Volunteer numbers from 2020 are impacted by the COVID-19 pandemic. See U.S. Office of National Marine Sanctuaries, *Volunteer*. https://sanctuaries.noaa.gov/involved/volunteer_future.html.

movements and use its expertise to promote these initiatives both domestically and globally. As described in Section 2, the establishment of the System has helped to lead the way for other similar initiatives across the globe. ONMS continues to lead a number of international MPA conservation efforts; the National MPA Center (within ONMS) is a key member of international partnerships such as the IUCN Marine and Polar Program and the North American MPA Network.

In order to achieve this vision, ONMS must work on a focused effort to share its vision and priorities within NOAA, the Department of Commerce, and across the Federal government. Most important, it must understand the priorities of its Federal partners and work with them to develop a clear value proposition for all parties. This type of collaboration previously existed on a large scale with the Marine Protected Areas Federal Advisory Committee (MPA FAC). The Committee was chartered in 2003 to advise NOAA and the Department of the Interior on ways to strengthen the national system of MPAs. The Committee was made up of representatives from a diverse group of stakeholders and had a designated federal officer from ONMS to help facilitate these conversations.[110] The prior administration did not renew the Committee in 2019. While this type of collaboration has continued to occur to some extent, it is based on personal relationships and across a few sites – the System can benefit from better and better structured strategic partnerships.

There also is a need for better coordination on sharing capacity, resources, and priorities within NOAA and the Department of Commerce. As a science and research organization, NOAA has significant technical capacity, expertise, and access to resources. Other agencies in the Department also bring expertise in economic development and other areas. Developing and communicating priorities and identifying mutual areas of collaboration and resource-sharing will allow ONMS to leverage the capacity within NOAA and the Department as resource multipliers. In addition, there are opportunities to leverage the resources of other federal partners that have overlapping and adjacent mission priorities. Examples include co-locating visitor centers, sharing research data and resources etc. While these may occur on a one-off basis, ONMS can benefit from a more systematic, strategic approach. A true partnership model and lens (identifying benefits to all partners) can help ONMS to leverage resources of its federal partners.

Recommendation 9: Expand role as a collaborator and convenor within NOAA, the Department of Commerce, and the larger federal community (and internationally) to establish and champion a shared agenda of marine protection that considers the mission objectives of its partner agencies.

- Reinstate the MPA FAC to provide a mechanism for stakeholder input to the U.S. MPA programs at a national scale and promote alignment of actions and efforts across all domestic MPAs and Federal partners.
- Work with NOAA and Department of Commerce Leadership to develop a shared agenda of priorities for marine protection and work with NOAA partners on shared actions and activities, including working to reinstate the National Ocean Policy Committee (formerly, the National Ocean Council).

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[110] U.S. National Marine Protected Areas, *MPA Federal Advisory Committee*. https://marineprotectedareas.noaa.gov/fac/.

- Build on its initial foundation to expand its global focus and take a leadership role in international marine protected areas; share best practices and lessons learned with the global community.
- Work with Federal partners and Regional Fisheries Management Councils to better delineate management responsibilities for federal marine national monuments.

Focal Area 5: Communications, Outreach, and Branding

One key challenge - and opportunity - for ONMS is increasing awareness and appreciation of the System among its non-users. Non-users are often (but not always) located in inland areas of the country, who do not utilize the System due to factors related to access, cost, preference, or awareness. ONMS is particularly interested in understanding the profiles of these groups because their engagement would better fulfill its mission and also create a more robust constituency and engagement for the System.

Short-Term

Enhance Communications Plan and Bolster Support for Communications Team

ONMS' Communications Plan was prepared in 2017 and is still in use; it has not been updated four years later. It has a clear link to the mission. However, while it lists ONMS' strategic goals, it lacks a clear connection to the current ONMS Strategic Plan. Even though it includes varied strategies according to target audiences, no organizational units or staff members are named or assigned to the communications strategies. An overarching finding of this report is that communicating with, convening, collaborating, and aligning stakeholders is a core competency of the System. As noted in Recommendation 2, ONMS needs to develop a new Strategic Plan, before the current one expires in 2022. ONMS' Strategic, Communications, and Education Plans should thus be the foundation for undertaking the expanded efforts prescribed in this arena. In order to build a strong foundation for the System in the face of its future outlook, the communications plan should adhere to best practices in the discipline of external communications (not to be confused with the System's internal Best Practices Guide to Outreach and Communication). Just as OMB Circular A-11 promotes increasing sophistication in strategic planning to improve government performance, greater sophistication in its communications plans and incorporation of contemporary best practices in the field can improve ONMS' mission performance across its programs.[111] A strong and well-supported communications team will be necessary to make the most effective use of the communications plan, and to implement its objectives. Enhanced communications planning taken together with a strengthened communications team will provide a launching point for the public outreach campaign the Academy Study Team prescribes below. In the present day and age, communications are not simply a good practice, but are foundational to achieving the System's mission.

<u>Recommendation 10:</u> Update and revise ONMS' communications plan using contemporary best practices for communications and communications planning, in tandem with its

[111] U.S. Office of Management and Budget, *OMB Circular A-11, Part 6*. https://obamawhitehouse.archives.gov/sites/default/files/omb/assets/a11_current_year/a11_2016.pdf.

development of a new strategic plan beyond 2022.[112] Focus attention on the following practices, in particular. Expand detail on the connections between goals in ONMS' communications plan and its strategic plan. The communications plan should emphasize the impacts of the System consistent with its strategic goals. Establish clear communications goals and objectives to guide its communications plan strategies, which are specific, measurable, accountable, realistic, and time bound. Assign task owners responsible for carrying out the strategies for various target audiences, as detailed in its communications plan. Create and integrate performance metrics to monitor and evaluate progress on these goals, objectives, and activities. There are a number of resources available which provide guidance on what to measure and how to do so. For example, the Public Relations Society of America (PRSA) convened a Measurement Task Force to identify standard approaches for measuring the impact of public relations in 2009, which have been updated since that time. These approaches may be applied to public communications, outreach, and engagement strategies.[113] PRSA also provides a framework by which to select metrics and tie them to outcomes.[114]

Recommendation 11: Elevate the priority level of System communications, and direct greater support and resources to ONMS' communications efforts and focus such efforts on priority projects. The ongoing integration of the Communications Team with the Education and Outreach Division is a welcome step and will facilitate the public outreach campaign the Panel prescribes below, and efforts to convene and partner with stakeholders in the ocean community.

Long-Term

Create and Implement a Public Outreach Campaign on Behalf of the Marine Environment and the System

A key mission area for the System is making contact with, educating, and engaging the public. The System also contributes to an important component of NOAA's mission to share knowledge and information with others by providing a gateway into local communities for its other agencies and line offices, more broadly. In the future outlook, the System looks to expand existing sanctuaries, designate new sanctuaries, and move from place-based management to ecosystem-based management. The success of these efforts will rely on the System broadening the constituency for sanctuaries and communicating a more complex set of information in a rapidly changing world. There are current and future opportunities for the System to expand its audience among non-users of the sanctuaries, people that live in areas isolated from the sanctuaries (in inland areas of the United States, for example), and underrepresented demographic groups. While much work has been done in this area, opportunities also remain to increase engagement with indigenous

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[112] Examples of contemporary best practices include Cornell University, *Communications Plans' Best Practices Checklist*. https://hr.cornell.edu/sites/default/files/communication_best_practices.pdf.; SpriggHR, 10 Internal Communications Best Practices. https://sprigghr.com/blog/hr-professionals/10-internal-communications-best-practices/.

[113] Public Relations Society of America Measurement Task Force, *Measurement Standardization*. https://apps.prsa.org/Intelligence/BusinessCase/MeasurementStandarization/.

[114] The International Association for the Measurement and Evaluation of Communication, *Public Relations Metrics Framework*. https://apps.prsa.org/intelligence/BusinessCase/Documents/AMEC/ValidPublicRelationsMetricsFramework.pdf; Jeffrey, *Consider the AMEC Framework!*. https://prsay.prsa.org/2013/05/16/confused-about-how-to-tie-pr-outputs-to-organizational-outcomes-consider-the-amec-framework/.

nations and groups. Communications campaigns offer opportunities to engage new audiences and increase public interest.[115]

Academic reviews of climate change communications campaigns offer lessons that are also applicable to communications campaigns in the marine environment, and often have substantial overlap with issues relevant to the ocean. Traditionally, climate change communications have been statistical and factual in nature.[116] While valuable for the provision of information and have shown some impacts on behavioral intentions, they have not addressed cultural and political values to inspire the level or speed of action necessary to mitigate climate change. Narrative communications, however, can have greater impact on values because they are in a more easily relatable format. "Narratives have a beginning, middle, and end and present conflicts that may be resolved by the characters in the story." Contemporary literature suggests that identifiable characters and imagery are critical to engage audiences and in impacting values.

Narrative delivery is an equally important component of narrative communications. With climate change campaigns, celebrities are frequently messengers for narratives. Fictional characters and popular culture have been used to great effect in similar domains like in natural resources management. Perhaps the most widely known and longest running example of this is the USFS Smokey Bear Wildfire Prevention Campaign. Even before Smokey Bear, USFS organized the Cooperative Forest Fire Prevention Program (CFFP).[117] After *Bambi* was released by the Walt Disney Company in 1942, CFFP requested and received permission to use the movie's characters on its materials for forest fire protection.

Other government agencies, like the National Aeronautics and Space Administration (NASA) have had well-recognized success in branding and brand awareness.[118] Various case studies seek to distill the elements of NASA's efforts which make its brand so wide-reaching. Observations include NASA's understanding that its brand is about how the public sees them, feels about them, and talks about them, which drives NASA to deliver an emotional connection to their public products.[119] It also personalizes its content to reach more audiences. One example is the "benefits to you" page on its website.[120] The page is populated with content which explains the benefits NASA provides to households, cities, and across Earth more generally. Additionally, NASA provides opportunities for two-way engagements with private businesses on its website.

One key element of NASA's success in this area is its use of its public affairs office to leverage the press and journalists in the private sector to support its public outreach campaigns, particularly

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115 Bieniek-Tobasco, *The Narrative Impacts of Climate Change Storytelling*. https://search.proquest.com/openview/11e1f4d305f8c0a43a61d144078b8c38/1?pq-origsite=gscholar&cbl=18750&diss=y.

116 Ibid, *page 74*.

117 The Ad Council and U.S. Forest Service, *About the Campaign*. https://smokeybear.com/en/smokeys-history/about-the-campaign.

118 NASA typically spends about .026 percent of its budget, or roughly $5 million, on external communications to the public each year. See https://www.nasa.gov/sites/default/files/512594main_10-09_PromotingNASAforSeptember2010.pdf.

119 Digital Spark Marketing, *Major Secrets to the NASA Success*. https://digitalsparkmarketing.com/innovative-marketing-ideas/.

120 U.S. National Aeronautics and Space Administration, *Benefits to You*. https://www.nasa.gov/topics/benefits/index.html.

for ongoing projects.[121] For example, during the Apollo-era, NASA public affairs staff distilled stories and narratives from its own engineers, producing press releases meant to be copied verbatim by news outlets, as well as preparing pre-packaged segments that could be easily broadcast on television.

In the modern era, NASA has combined outreach for ongoing exploration missions with characters and narrative storytelling. On February 18, 2021, NASA landed its Perseverance rover on the surface of Mars.[122] NASA publicly chronicled Perseverance's journey to great effect, while humanizing it to make it relatable, before and after the landing. Part of the effort included creating a dedicated Twitter account for Perseverance in February 2020, throughout which NASA posts information from the perspective of the rover, and through an anthropomorphic lens.[123] As of February 26, 2021, Perseverance has a following of over 2.4 million on the popular social media platform.

Observers of NASA's public engagement strategy cite the Space Act of 1958 as the impetus for its success, which mandates that NASA "provide for the widest practicable and appropriate dissemination of information concerning its activities and results thereof."[124] Thus, there is an essential part of NASA's mission to disseminate, inform, and educate the American public. The System has a similar charge and authority to educate the American Public under the NMSA.

Within the last couple of decades, there has been a proliferation in mass media focused on climate change programming. By extension, programming on the marine environment has proliferated through mediums like films and documentaries. These recent trends are occurring contemporaneously with the global movement on marine environment policy described in Sections 2 and 5 of this report. The System has an opportunity to use this momentum to make sanctuaries relevant to a broader audience than ever before. Additionally, there are numerous opportunities for the System to engage with external organizations it has not collaborated with yet for partnership. These include, but are not limited to trade associations, non-governmental scientific and educational organizations, and museums and aquariums. While the potential for expanding engagement among marine conservation groups is an important organization strength of the System, the future challenges and opportunities in the marine environment call for an "all hands on deck" approach, to include inclusion of stakeholders that have apparent and/or even openly competing interests and objectives.

At the local level, increased public awareness of sanctuaries, and the rules that apply therein, can contribute significantly to compliance with those rules. Interviewees stated that it is easy for sanctuary users to be unaware they are in a sanctuary, citing a lack of signage in bordering communities as one example.

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[121] Digital Spark Marketing, *Major Secrets to the NASA Success*. https://digitalsparkmarketing.com/innovative-marketing-ideas/.
[122] U.S. National Aeronautics and Space Administration, *2020 Mission Perseverance Rover*. https://mars.nasa.gov/mars2020/.
[123] U.S. National Aeronautics and Space Administration, *Official Perseverance Rover Twitter Account:* https://twitter.com/NASAPersevere?ref_src=twsrc%5Egoogle%7Ctwcamp%5Eserp%7Ctwgr%5Eauthor.
[124] U.S. National Aeronautics and Space Administration, *Promoting NASA*. https://www.nasa.gov/sites/default/files/512594main_10-09_PromotingNASAforSeptember2010.pdf.

<u>Recommendation 12:</u> Mount a public outreach campaign similar to the Smokey Bear Wildfire Prevention campaign, while using the instructive experiences of an agency like NASA to ensure its appropriate use of outreach techniques to expand public awareness of the System. Use the value proposition prescribed in Recommendation #1 to communicate the System's benefit and relevance in an intelligible, accessible, and appealing way. Include the use of narratives, characters, and collaboration with private partners to amplify the System's resources and message, while avoiding jargon and technical explanations that relate to its operations. Pursue opportunities to integrate the System's branding and value proposition with elements of popular culture, like in the example of USFS and the Walt Disney Company.

- Enhance the physical visibility of individual sanctuaries by increasing the quantity of signage in local communities, interpretive exhibits at partner facilities, and at sanctuary access points on the coasts.
- Recruit interns and volunteers to work with staff on the System's social media campaigns, and to generate innovative ideas for reaching younger and more diverse generations of the public in the context of evolving media and communications technologies such as three-dimensional videography (virtual dives).
- Additional suggestions and effective practices are provided by organizations like OneCause, which help other organizations to amplify their message and raise additional funding for their programs.[125] While resources of this nature typically focus on nonprofit or for-profit entities, they can be adapted and applied to a public outreach campaign by government entities. This guidance includes suggestions on when to begin a public awareness campaign, what communications channels to utilize, and how to engage partners.[126]

Focal Area 6: Community Engagement

Community engagement has been a large success of the System, however, there are additional opportunities for ONMS to capitalize on in this area. There are underrepresented and underserved communities that the System has not previously reached out to, as well the opportunity to build and strengthen the connection to the ocean with the broader American and global public.

Short-Term

Reach New Communities

As mentioned in Section 4 of this report, people have long been connected to the marine environment and the specific sanctuary sites. There is an opportunity to increase this connection, through partnerships and beyond to reach new people to build new connections to the System and in new ways.

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[125] OneCause, *About Us*. https://www.onecause.com/about-us/.
[126] OneCause, *Nonprofit Awareness Campaigns: The Complete Guide for 2021*. https://www.onecause.com/blog/awareness-campaigns/.; Rushing, *Five Steps to Creating Public Outreach Campaigns*. https://www.prnewsonline.com/five-steps-to-creating-public-outreach-campaigns-that-engage-and-inspire/.

There is a clear interest from communities to engage with the System, demonstrated by the number of adults and students ONMS reaches each year in person or virtually, the visitation numbers that the System has begun to collect, the waiting list to become volunteers, and the economic impact of the visitors on the local communities. However, related to the Communication and Outreach piece above, visitors of sanctuaries often do not know much about the System or that they are even in or beside a sanctuary. Increasing communication and outreach efforts will help to increase awareness in some ways but there are other opportunities for the System to take in increasing community engagement. Education is a key tool in connecting people to the marine environment and building community engagement. Environmental education not only encourages environmental stewardship by connecting people's actions to the sites they enjoy but benefits communities by creating a deeper connection to place.[127] Education also can build a new generation of advocates for the System. A Gallup Poll found that 67 percent of people aged 18 to 29 say that global warming is a real, man-made, and serious threat compared to the 49 percent of people aged 30 to 49. The System can capitalize on the invigoration of the younger generations to environmental issues and bring the System into this conversation through expanded education efforts, helping to build a generation of champions. Education can also connect the System, the communities, and NOAA as a whole. The System is a gateway into communities and can use education to spread the message of and connect people not only to the System but to the greater NOAA landscape. Currently ONMS offers a variety of both formal and informal education programs through field-based classroom visits, visitor center programs, classroom visits, lesson plans and curricula, teacher workshops and virtual webinars. In addition, nationwide programs such as the Ocean Guardian program build environmental stewardship projects into schools and communities. ONMS currently reaches 73,000 students in formal programs and 65,000 additional youth and adults through informal learning opportunities including 24,000 youth from underserved areas.[128]

There is also the opportunity to reach new, diverse, and underserved communities. Going to visit a sanctuary site is not widely accessible to everyone as it requires resources to travel and time and therefore a large portion of the national community is not being currently reached by the System. A recent study by the Center for American Progress exploring the "Nature Gap" found that people of color are more likely to live in an area that is nature deprived and low-income communities are more likely to experience nature deprivation.[129] While this report does not dive into specifics in this area, as the nation looks to expand the reach of preserved areas through the 30 by 30 initiative and others, there is an opportunity to ensure that all have access to these areas and look to how the System fits into this picture.

In the wake of the COVID-19 pandemic, how people interact with the System has and will continue to change (see Section 5). The System can adapt its approach to community engagement to encompass these global changes, as well as capitalize on the growing movement of "building back

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[127] The National Environmental Education Foundation, *Benefits of Environmental Education.* https://www.neefusa.org/education/benefits.

[128] Office of National Marine Sanctuaries, *Reaching Far & Wide.* https://nmssanctuaries.blob.core.windows.net/sanctuaries-prod/media/docs/20200116-education-infographic-2019.pdf

[129] Center for American Progress, *The Nature Gap.* https://www.americanprogress.org/issues/green/reports/2020/07/21/487787/the-nature-gap/.

greener" following the pandemic. Technology is a key tool that the System can use to help build this new approach to connecting people to the System. While the System has already engaged in creating videos and virtual experiences of the System, there are opportunities to build on what has previously been done with new technologies augmented reality or virtual reality.

Recommendation 13: Devise new ways to engage communities. ONMS should create localized community campaigns that target previously untapped community groups and should work with previously established organizations and businesses (community groups, restaurants, hotels, etc.) to build connection with communities. The System should document successes and failures in community engagement and house them in a central location to build upon and make necessary engagements.

- Use the latest technologies when appropriate and explore new ways to connect people to the sanctuaries virtually.
- The new approach to community engagement should focus on education and educating the wider public about the sanctuaries and their extensive benefits along with the threats to and imperative of better protecting the marine environment generally.
- Further research should be done to examine how the System can best serve and engage underrepresented and diverse communities.

Medium-Term

Effectively Engage Indigenous Communities

The lands and waters surrounding many of the sanctuary sites are the traditional lands of indigenous peoples. These groups have been using these sites as a part of their culture for thousands of years and depend on their resources.[130] While the System does try to engage with indigenous people, engagement has varied from site to site.

Certain sanctuary sites have strong relationships with their local indigenous communities. The Olympic Coast National Marine Sanctuary's waters are encompassed by the treaty ocean areas of four coastal tribes: the Makah, Quileute, and Hoh Tribes, and the Quinault Indian Nation.[131] These sovereign governments have had a strong interest in the management of the site ever since its designation. In 2007, the Intergovernmental Policy Council, the first of its kind in the nation, brought the four treaty tribes, the State of Washington, and NOAA together to discuss policy matters pertaining to the sanctuary's waters.[132] While the relationship between the four treaty tribes and ONMS is extensive, it is also an outlier. While NOAA provides broad guidance on tribal consultation, most sites within the System do not have a formal mechanism or guidance to engage with their local indigenous communities. The importance of engaging these communities is growing as there is a focus on cultural heritage in the System and engaging with indigenous

[130] U.S. Office of National Marine Sanctuaries, *Earth is Blue Magazine: Indigenous Cultures*. https://sanctuaries.noaa.gov/magazine/1/indigenous-cultures.
[131] U.S. National Marine Protected Areas, *Olympic National Marine Sanctuary's Intergovernmental Policy Council*. https://marineprotectedareas.noaa.gov/toolkit/olympic-coast-intergov-policy-council.html#:~:text=The%20Olympic%20Coast%20National%20Marine,and%20the%20Quinault%20Indian%20Nation.
[132] Ibid

communities is an important aspect of telling the stories of the sites. Engaging with these communities also recognizes their rights and interests as stewards of the resources and allows the System to integrate their traditional ecological knowledge in managing its sites most effectively, including dealing with climate change effects. Engaging indigenous communities is also an important component of combatting the effects of climate change. Indigenous communities have firsthand knowledge of how the environment and natural resources have been impacted due to climate change and can play a critical role in implementing sustainable reform to impede the detriments to the sites.

Recommendation 14: Broaden official representation of indigenous groups in sanctuary designation and management processes including strategic planning. To enhance its outreach efforts, ONMS should provide sites with guidelines on how to properly engage with local indigenous groups and include expert training to their staff on how to respectfully engage with both federally recognized tribes and non-formally recognized indigenous groups.

Expand Partnerships

There is a wide variety of organizations and companies that have a vested interest in the marine environment. Examples include commercial and recreational fishing interests, travel companies, energy corporations, and conservation-focused non-profits. While the System has already engaged many of these groups through established forums such as the site-focused SACs and the Systemwide BAC, there are many groups that the System has yet to engage with. This lack of engagement is not due to a lack of interest from the outside organizations but can be partially attributed to the fact that the System has not established or communicated a clear value proposition as to why organizations should partner with the System. A clear value proposition that defines the mutually beneficial relationship of partnering with the System can entice new groups and help expand the System's outreach to external partners. This in turn benefits the System through the resource multipliers that the partners can provide, including in the communications arena. Expanding partnerships is increasingly important given the current state of the marine environment. New technologies are developing that have created new ways to explore the ocean and Great Lakes (see New Technologies in Section 5) and the System has the opportunity to capitalize on these technologies through expanding partnerships.

Increased partnerships can also lead to increased buy-in and advocacy on behalf of the System. Although there is a perception that certain stakeholders in the marine environment have conflicting interests, such as conservation-focused groups and extracting groups, there is common ground to be found between most groups (see Positive Externalities in Section 4). Through increasing partnerships and bringing different voices to the table, the System can create a forum of champions of the System where that common ground is established and then built on by different groups to support the System. Expanding partnerships can also help expand the System's strategic planning processes. As mentioned earlier in this section of the report many partners and stakeholders express a lack of clarity on the System's role and purpose, including its impact. By expanding partnerships and bringing stakeholders into the strategic planning processes the System can better define its strategic intent. Given that the future outlook of marine environments is so vast and rapidly changing, bringing in partners to plan for and face the future is a resource multiplier for the System.

<u>Recommendation 15</u>: Establish and communicate a clear value proposition as to why organizations should partner with the System. Continue to explore leveraging public-private and public-NGO partnerships in partners' areas of skill.

- Bring different partners together to engage in collective advocacy, and help champions coalesce around a set of actions to increase not only resources but potential funding to the System in the long term.
- Expand outreach to include non-traditional partners/champions of sanctuaries in strategic planning for the System, as well as in planning for site-specific activities.

6.4 Conclusion

Water is vital to the earth's natural balance; after all, it gives us life. This report is prepared at an opportune time, with a confluence of dynamic impactful changes and threats observed and accelerating in the marine environment. Others are forecasted to emerge in the next 10-15 years that will require coordinated and decisive action. These challenges and opportunities provide a context and urgency that cries out for an expanded ONMS vision of its future role in this ecosystem. The increasing material threats to the seas must be adroitly addressed to protect further deterioration of this precious resource. Sylvia Earle, perhaps the most world-renowned oceanographer, said with respect to the care of marine resources: "Our past, our present, and whatever remains of our future, absolutely depends on what we do now."

This report commends ONMS for significant positive contributions to advance its statutory goals. It also calls for a substantial broadening of ONMS engagement, not only within the U.S. government, but also among stakeholders, and global bodies working in the seas.

This report also calls for ONMS, in close consultation with NOAA, to systematically expand engagement with the widest variety of stakeholders that share the marine environment, particularly with indigenous communities and those stakeholders that have apparent and/or even openly competing interests and objectives. In addition, ONMS must continue on a successful trajectory that has been well traveled over several decades to work closely with conservation and research groups - traditional partners for collaboration. More must be done to communicate the clear value-add that ONMS programs contribute to protect, expand, and project its overwhelmingly critical services in such a vast scale. Safe advancing of the blue economy is a key factor in this equation.

In order for ONMS to take on these long-term goals, this report outlines several recommendations that can be embraced and implemented in the short- and medium-term to build the capacity to take on these major objectives with aplomb. The report speaks to the following set of six organizational areas that must be bolstered – and where Panel recommendations are proffered as a launch point: Strategy; Finance; Management and Operations; Organization; Communication, Outreach, and Branding; and Community Engagement. As ONMS embraces recommendations in these areas, the System will be better prepared to carry out the more complicated tasks that are within its reach and commensurate with the report's long-term goals.

Clearly, time is needed to build up the necessary organizational skills and infrastructure for any organization to create great things. Given its successful first half century, the Panel sees ONMS as the appropriate vehicle within both NOAA and in the broader government to play a significant role as principal convener and guide for multi-agency effort, and in an international context, that engages with private and public sector actors, including research organizations. As Jacques Yves Cousteau, the great oceanographer who shaped an entire generation of thinking about the marine environment, has said: “I said the oceans are sick, but they aren’t going to die. There is no death possible in the oceans – there will always be life – but they’re getting sicker every year.” There is no time to wait.

Appendices

Appendix A: Panel (or Expert Advisory Group) and Study Team Member Biographies

Panel of Academy Fellows

James Murley (Chair), James F. Murley has recently been appointed the Chief Resiliency Officer for Miami Dade County, which is a participant in the Rockefeller 100 Resilient Cities Program. Murley was also recently appointed to the City of Miami Sea Level Rise Committee, and has spent over 10 years with the Florida Atlantic University, where he oversaw research on urban and environmental issues. He is a founding Board member of the American Society for Adaptation Professionals and a Fellow at the National Academy of Public Administration. Murley has served as the Secretary of the Department of Community Affairs, chaired the Florida Energy and Climate Commission, and served as the Executive Director of 1000 Friends of Florida and the Executive Director of the South Florida Regional Planning Council. He is a former Vice-Chair of the Miami-Dade County Sea Level Rise Task Force, and is a veteran of the planning side of government. Mr. Murley also has a significant history in the federal government, having served as the Director of the Coastal Program Office at NOAA.

Felicia Marcus, Felicia Marcus is the William C. Landreth Visiting Fellow at Stanford University's Water in the West Program, an attorney, consultant and member of the Water Policy Group. She most recently served as chair of the California State Water Resources Control Board, implementing laws regarding drinking water and water quality and state's water rights, hearing regional board water quality appeals, settling disputes and providing financial assistance to communities to upgrade water infrastructure. Before her appointment to the Water Board, Marcus served in positions in government, the non-profit and private sector. In government, Felicia served as the regional administrator of the Environmental Protection Agency's Pacific Southwest region. Preceding the EPA, Marcus served as the president of the board of Public Works for the City of Los Angeles. In the non-profit world, she was the western director for the Natural Resources Defense Council, and prior to that the executive vice president and chief operating officer of the Trust for Public Land.

Sally Selden, Brig. Gen. Sally Selden, Ph.D., is the provost and dean of The Citadel. As the college's chief academic officer and second ranking official, she leads strategic planning for the college's academic mission and ensures academic programs are world-class and aligned with the college's core values. Prior to serving as provost at The Citadel, Selden spent 18 years at the University of Lynchburg where she served as provost, associate provost, director of the MBA program, department chair of management, director of the Masters in Nonprofit Leadership, faculty chair (elected), and professor of management. Prior to joining the University of Lynchburg, she was an assistant professor at the Maxwell School of Citizenship at Syracuse University. Selden is a distinguished scholar and teacher of nonprofit management, human resource management and leadership studies. She has published extensively and her work has appeared in multiple public administration journals.

Study Team

Brenna Isman, *Director of Academy Studies.* Ms. Isman has worked at the Academy since 2008 and oversees the Academy studies, providing strategic leadership, project oversight, and subject matter expertise to the project study teams. Prior to this, Ms. Isman was a Project Director managing projects focused on organizational governance and management, strategic planning and change management. Her research engagements have included working with the National Aeronautics and Space Administration, the Environmental Protection Agency, the Social Security Administration, the Department of Veterans Affairs, as well as multiple regulatory and Inspector General offices. Prior to joining the Academy, Ms. Isman was a Senior Consultant for the Ambit Group and a Consultant with Mercer Human Resource Consulting. Ms. Isman holds a Masters of Business Administration (MBA) from American University and a Bachelor of Science (BS) in Human Resource Management from the University of Delaware.

Roger Kodat, *Senior Project Director.* Mr. Kodat has led more than 30 projects for the Academy. He brings twenty years of commercial and investment banking experience with JPMorgan Chase, and six years of senior level federal government experience at the Department of the Treasury. Appointed by President George W. Bush in 2001 to serve as Deputy Assistant Secretary of Treasury, he was responsible for Federal Financial Policy. Some of his tasks at Treasury included policy formulation for the 2006 Postal Accountability and Enhancement Act; rule making and oversight of Federal loan and loan guarantee programs; and management of the Federal Financing Bank (a $32 billion bank at that time). Mr. Kodat holds a BS in Education from Northwestern University and both an MBA in Finance and Masters of Arts (MA) in Political Science from Indiana University.

Sukumar Rao, *Senior Advisor.* Mr. Rao is President of the Parnin Group and has specialized in cross-agency program implementation, performance improvement, IT strategy, digital transformation, and information architecture and data management. Previously, he was a Principal at SRA International. He served as the project manager for a number of OMB-led cross-agency initiatives to evaluate the performance of operations and service delivery of the 24 CFO ACT agencies, including mission areas, IT and mission-support/administrative operations. He brings a depth of IT strategy experience that includes evaluation of government-wide high risk IT projects, assessment of cloud computing and shared services, and design and implementation of digital transformation initiatives. He also served as Program Manager for a Homeland Security Science and Technology Program, leading and managing the strategic planning process to design 108 a $30 million R&D program to improve a nationwide emergency alert system. Mr. Rao has an MBA from Columbia University and Master of Science and Bachelor of Engineering degrees in Telecommunications. He is a Project Management Professional (PMP) and Certified Technology Business Management Executive (CTBME).

Kyle Romano, *Senior Research Associate.* Mr. Romano has provided research support for several Academy studies. Most recently, he has served on Academy projects assessing the value of a potential non-profit foundation for the Department of Energy, and the U.S. Forest Service's research and development enterprise. He graduated from the Indiana University School of Public and Environmental Affairs where he earned a Master of Public Affairs. He attended the University of Central Florida for his undergraduate studies where he earned a B.A. in Political Science and a B.S. in Legal Studies.

Gillian Townsend, *Senior Research Associate*. Ms. Townsend joined the Academy in November 2019. She has served on several Academy studies, including work with the National Oceanic and Atmospheric Administration, the National Park Service, and the Department of Commerce Office of Inspector General. Most recently, she has served on the Academy project assisting the Department of Homeland Security in developing a strategic plan. Ms. Townsend attended the College of William & Mary where she earned a B.A. in Government and History.

Appendix B: List of Interviewees

National Oceanic and Atmospheric Administration (NOAA)

- **RADM Timothy Gallaudet,** Ph.D, Deputy Administrator and Assistant Secretary of Commerce for Oceans and Atmosphere
- **Nicole LeBoeuf,** Acting Assistant Administrator, NOAA's National Ocean Service
- **Letise LaFeir,** PhD, Senior Advisor, Office of the Under Secretary of Commerce for Oceans and Atmosphere
- **RDML Nancy Hann,** Deputy Director for Operations, NOAA's Office of Marine and Aviation Operations

Office of National Marine Sanctuaries

Headquarters and Regional Offices

- **John Armor**, Director
- **Ellen Brody,** Regional Management Analyst, Northeast and Great Lakes Region and Proposed Lake Ontario Sanctuary
- **Matt Brookhart,** Regional Director, Northeast and Great Lakes Region and Acting for the Southeast and Gulf of Mexico Region
- **William Douros,** Regional Director, West Coast Region
- **Russ Green,** Assistant Superintendent, Thunder Bay National Marine Sanctuary and Regional Management Analyst, Proposed Wisconsin Shipwreck Coast Sanctuary
- **Rebecca Holyoke,** Deputy Director
- **Joseph Hoyt,** National Maritime Heritage Program Coordinator
- **Kristina Kekuewa,** Regional Director, Pacific Islands Region
- **Jessica Kondel,** Chief, Policy and Planning Division
- **Ed Lindelof,** Senior Policy Analyst
- **Elizabeth Moore,** Senior Policy Advisor
- **Danielle Schwarzmann,** Chief Economist
- **Matthew Stout,** Communications Director and Acting Chief of Staff
- **Mitchell Tartt,** Chief, Conservation Science Division
- **Kate Thompson,** Chief, Outreach and Education Division and Acting Communications Director
- **Hans K Van Tilburg**, PhD, Maritime Heritage Coordinator
- **Lauren Wenzel,** Director, National MPA Center

National Marine Sanctuaries Foundation

- **Kris Sarri,** President and CEO

National Marine Sanctuary Site Staff and Sanctuary Advisory Council (SAC) Members

Channel Islands National Marine Sanctuary

- **Chris Mobley,** Superintendent

Cordell Bank National Marine Sanctuary

- **Dan Howard,** Superintendent

Florida Keys National Marine Sanctuary

- **Sarah Fangman,** Superintendent
- **George Garret,** SAC Chair
- **Joe Weatherby**, SAC Member

Flower Garden Banks National Marine Sanctuary

- **GP Schmahl,** Superintendent
- **Scott Hickman,** SAC Chair
- **Mark Belter,** SAC Member

Greater Farallones National Marine Sanctuary

- **Maria Brown,** Superintendent
- **John Berge,** SAC Member

Gray's Reef National Marine Sanctuary

- **Stan Rogers**, Superintendent

Hawaii Humpback Whale National Marine Sanctuary

- **Sol Kaho'ohalahala,** SAC Chai

Mallows Bay-Potomac River National Marine Sanctuary

- **Paul Orlando**, Superintendent

Monterey Bay National Marine Sanctuary

- **Brian Nelson,** SAC Chair

Olympic Coast National Marine Sanctuary

- **Carol Bernthal,** Superintendent
- **Lee Whitford,** SAC Chair
- **Joel Kawahara,** SAC Member

Stellwagen Bank National Marine Sanctuary

- **Pete DeCola,** Superintendent

Thunder Bay National Marine Sanctuary

- **Jeff Gray**, Superintendent

USS Monitor National Marine Sanctuary

- **Dave Alberg,** Superintendent

United States Congress

Senate Committee on Commerce, Science, and Transportation

- **Fern Gibbons,** Deputy Policy Director
- **Alexis Rudd**, Knauss Sea Grant Fellow

House Committee on Natural Resources

- **Lora Snyder**, Staff Director

Congressional Offices

- **Anthony Ching,** Policy Advisor, Office of Congressman Ed Case (Hawaii-01)

Appropriations Committees

- **Darren Benjamin**, Professional Staff
- **TJ Lowdermilk**, Professional Staff
- **Blaise Sheridan,** Professional Staff
- **Matt Womble**, Professional Staff

External Stakeholders and Interest Groups

- **Illeana Alexandar,** Project Assistant, Meridian Institute*
- **Mónica Alvarez Malvido,** Coordinator of Interinstitutional Affairs**,** National Commission of Protected Natural Areas (CONANP) Mexico
- **Phil Anderson,** At-large representative, Pacific Fishery Management Council
- **Michelle Bachman,** Fishery Analyst, New England Fishery Management Council
- **Stephanie Bailenson,** Senior Policy Advisor for Oceans and Coasts, The Nature Conservancy
- **Brian Baird,** (Retired), Former Marine Protected Areas Federal Advisory Committee Chair
- **Dan Basta,** (Retired), Former Director of the Office of National Marine Sanctuaries
- **Jack Belcher,** Managing Director, National Ocean Policy Coalition
- **Robert C. Burns,** Ph.D. Professor and Director, Division of Forestry and Natural Resources, WVU College of Agriculture, Natural Resources and Design
- **VADM Scott Buskirk**, (USN, ret), Blue Economy Subcommittee Member
- **Sarah Chasis,** Senior Strategist, Oceans Division, Nature Program, Natural Resources Defense Council
- **Noah Chesnin,** Policy Program Manager, Wildlife Conservation Society
- **Jim Connaughton**, Chief Executive Officer, Nautilus Data Technologies and former Chairman of the White House Office of Environmental Quality
- **Valerie Craig**, Interim Chief Science and Innovation Officer, National Geographic
- **David Dipre,** Captain, Florida Fish and Wildlife Conservation Commission
- **Catherine French,** Volunteer, Channel Islands Naturalist Corps
- **Mike Friis**, Program Manager, Wisconsin Coastal Management Program
- **Brent Greenfield,** Executive Director, National Ocean Policy Coalition
- **David Gutierrez Carbonell**, Managing Director, National Commission of Protected Natural Areas (CONANP) Mexico
- **Kristen Hislop,** Director, Marine Conservation Program, Environmental Defense Center
- **Tom Ingram,** President and CEO, The Diving Equipment & Marketing Association
- **Ed Johnstone,** Fisheries Policy Spokesperson, Quinault Indian Nation
- **Amy Kenney**, Executive Director, National Ocean Protection Coalition
- **Dan Laffoley**, Principal Advisor on Marine Science and Conservation, IUCN's World Commission on Protected Areas, IUCN's Global Marine and Polar Program
- **Dr. Jane Lubchenco**, University Distinguished Professor at Oregon State University, Former NOAA Administrator (and now White House Science Advisor)
- **Meghan Massaua,** Senior Mediator, Meridian Institute*

- **Roderic Mast,** President and CEO, Oceanic Society
- **Laura Morton,** Senior Director, Policy and Regulatory Affairs Offshore, American Clean Power
- **Tom Nies**, Executive Director, New England Fishery Management Council
- **Steve Olson**, Senior Vice President of Government Affairs, Association of Zoos and Aquariums
- **Ryan Orgera,** Chief Executive Officer, Sanibel Captiva Conservation Association
- **Becky Ota,** Environmental Program Manager, California Department of Fish and Wildlife
- **Secretary Leon Panetta,** Chairman, The Panetta Institute for Public Policy and Former Secretary of Defense
- **Ruth Perry,** PhD, Marine Science and Regulatory Policy Specialist, Shell Exploration & Production Company
- **Millicent Pitts,** CEO and Executive Director, Ocean Exchange
- **Catherine Reheis-Boyd**, President, Western States Petroleum Association (WSPA)
- **Claire Richer,** Federal Affairs Director, American Clean Power
- **Dr. Jerry Schubel**, (Retired), Former President of the Aquarium of the Pacific
- **Mark Spalding**, President and Chair of the Board of Directors, The Ocean Foundation
- **Eileen Sobeck,** Executive Director, California State Water Resources Control Board
- **Pete Stauffer,** Environmental Director, Surfrider Foundation
- **Nicole Vasilaros,** Senior Vice President, Governmental and Legal Affairs, National Marine Merchants Association
- **Richard Vevers,** Founder and CEO**,** The Ocean Agency
- **Tom Vinson,** Vice President, Policy and Regulatory Affairs, American Clean Power
- **Mike Weber,** (Retired), Former Program Officer of Resources Legacy Fund
- **Joshua Berger,** Founder and President/CEO, Washington Maritime Blue

Appendix C: Bibliography

106th U.S. Congress. 2000. "National Marine Sanctuaries Amendments Act of 2000." Washington, DC, November 13. https://www.congress.gov/bill/106th-congress/senate-bill/1482/text/pl?overview=closed.

112th U.S. Congress. (2011). *Budget Control Act of 2011*. Washington, DC. Retrieved from https://www.congress.gov/112/plaws/publ25/PLAW-112publ25.pdf

112th U.S. Congress. (2013). *American Taxpayer Relief Act of 2012*. Washington, DC. Retrieved from https://www.congress.gov/bill/112th-congress/house-bill/8/text

Australian Government, Department of the Environment and Energy. 2019. "Portfolio Budget Statements 2019-2020." https://www.awe.gov.au/sites/default/files/2020-01/pbs-2019-20-environment-and-energy.pdf.

Australian Government: Great Barrier Reef Marine Park Authority. n.d. Reef Facts. https://www.gbrmpa.gov.au/the-reef/reef-facts.

Bienick-Tobasco, Ashley. 2019. "The Narrative Impacts of Climate Change Storytelling: A Case Study Evaluation of Climate Change Documentary Series." August 31. https://libguides.wvu.edu/c.php?g=418946&p=2855335.

Bradford, Nick. n.d. Marine Species on the Move. National Environmental Education Foundation. https://www.neefusa.org/weather-and-climate/marine-species-move.

Broitman, Bernardo R., Benjamin S. Halpern, Stefan Gelcich, Marco A. Lardies, Cristian A. Vargas, Felipe Vasquez-Lavin, Stephen Widdicombe, and Silvana N.R. Birchenough. 2017. "Dynamic Interactions among Boundaries and the Expansion of Sustainable Aquaculture." Frontiers Marine Science. doi:https://doi.org/10.3389/fmars.2017.00015.

Carr, Mark H., Joseph E. Neigel, James A. Estes, Sandy Andelman, Robert R. Warner, and John L. Largier. 2003. "Comparing Marine and Terrestrial Ecosystems: Implications for the Design of Coastal Marine Reserves." Ecological Applications. http://www.ghub.org/wp-content/uploads/2020/09/09-Comparing-marine-and-terrestrial-ecosystems-implications-for-the-design-of-coastal-marine-reserves.pdf.

Clinton, William. 2000. "Executive Order 13158 - Marine Protected Areas." Washington, DC, May 26. https://www.govinfo.gov/content/pkg/WCPD-2000-05-29/pdf/WCPD-2000-05-29-Pg1230.pdf.

Cooney, Margaret, Miriam Goldstein, and Emma Shapiro. 2019. How Marine Protected Areas Help Fisheries and Ocean Ecosystems. Center for American Progress. https://www.americanprogress.org/issues/green/reports/2019/06/03/470585/marine-protected-areas-help-fisheries-ocean-ecosystems/.

Day, Jon, Nigel Dudley, Marc Hockings, G. Holmes, Dan Laffoley, Sue Stolton, Sue Wells, and Lauren Wenzel. 2019. Guidelines for applying the IUCN protected area management categories to marine protected areas. International Union for Conservation of Nature. https://www.iucn.org/content/guidelines-applying-iucn-protected-area-management-categories-marine-protected-areas-0.

2020. Defining Agile Government. May 1. https://www.napawash.org/grandchallenges/blog/defining-agile-government.

Digital Spark Marketing. 2017. Innovative Marketing Ideas: Major Secrets to the NASA Success. August 9. https://digitalsparkmarketing.com/innovative-marketing-ideas/.

Doshi, Jenny Rowland-Shea and Sahir Doshi. 2020. "The Nature Gap." Center for American Progress. July 21. https://www.americanprogress.org/issues/green/reports/2020/07/21/487787/the-nature-gap/.

Dudley, Nigel, Peter Shadie, and Sue Stolton. 2013. "Guidelines for applying protected area management categories including IUCN WCPA best practice guidance on recognising protected areas and assigning management categories and governance types." International Union for Conservation of Nature. https://portals.iucn.org/library/node/30018.

Dulal, Youwaraj. 2019. "Impact of climate change on food security in third world countries." Journal of Earth Science and Climatic Change. https://www.omicsonline.org/conference-proceedings/2157-7617-C1-057-009.pdf.

Flanders, Stephanie, and Lucy Meakin. 2020. How to Build Back Greener After the Pandemic. October 29. https://www.bloomberg.com/news/articles/2020-10-29/how-to-build-back-greener-after-the-pandemic.

Garcia de Jesus, I. E. (2019, March 18). *Stanford researchers create hydrogen fuel from seawater*. Retrieved from Stanford University: https://news.stanford.edu/2019/03/18/new-way-generate-hydrogen-fuel-seawater/

Halpern, Benjamin S., Sarah E. Lester, and Julie B. Kellner. 2010. "Spillover From Marine Reserves and the Replenishment of Fished Stocks." Environmental Conservation. https://doi.org/10.1017/S0376892910000032

Howard, B. C., Gibbens, S., Zachos, E., & Parker, L. (2019, June 10). *A running list of action on plastic pollution*. Retrieved from National Geographic: https://www.nationalgeographic.com/environment/article/ocean-plastic-pollution-solutions

Inger, R., Attrill, M. J., Broderick, A. C., Grecian, W. J., Hodgson, D. J., Cheryle, M., . . . Godley, B. J. (2009). Marine renewable energy: potential benefits to biodiversity? An urgent call for research. *Journal of Applied Ecologu*.

International Energy Agency. (2020, June). *Ocean Power*. Retrieved from https://www.iea.org/reports/ocean-power#tracking-progress

International Union for Conservation of Nature. n.d. Protected Area Categories. https://www.iucn.org/theme/protected-areas/about/protected-area-categories.

Jeffrey, Angela. 2013. "Consider the AMEC Framework!." https://prsay.prsa.org/2013/05/16/confused-about-how-to-tie-pr-outputs-to-organizational-outcomes-consider-the-amec-framework/.

Jobs for the Future. (2017). *Exploring the green infrastructure workforce*. Retrieved from https://www.voced.edu.au/content/ngv%3A75924

Jobs for the Future. (n.d.). *The Future of Work Grand Challenge*. Retrieved from https://www.jff.org/what-we-do/impact-stories/future-work-grand-challenge/

Le Gouvello, Raphaela, Laure-Elise Hochart, Dan Laffoley, Francois Simard, Carlos Andrade, Dror Angel, Myriam Callier, et al. 2017. "Aquaculture and marine protected areas: Potential opportunities and synergies." Aquatic Conservation: Marine and Freshwater Ecosytems. doi:https://doi.org/10.1002/aqc.2821.

Morton, Ted. 2019. Vital Coastal Areas Benefit From Federal-State Partnerships. Washington, DC: The Pew Charitable Trusts. https://www.pewtrusts.org/en/research-and-analysis/articles/2019/08/08/vital-coastal-areas-benefit-from-federal-state-partnerships.

Murray, Samantha, and Tyler T. Hee. 2019. "A rising tide: California's ongoing commitment to monitoring, managing and enforcing its marine protected areas." Ocean and Coastal Management. doi:https://doi.org/10.1016/j.ocecoaman.2019.104920.

Nash, Laura, and Howard H. Stevenson. 2004. Success That Lasts. Harvard Business Review. https://hbr.org/2004/02/success-that-lasts.

National Academy of Public Administration. 2000. "Protecting Our National Marine Sanctuaries: A Report by the Center for the Economy and Environment." Washington, DC.

—. 2006. "Ready to Perform? Planning and Management at the National Marine Sanctuary Program." Washington, DC. https://napawash.org/academy-studies/ready-to-perform-planning-and-management-at-the-national-marine-sanctuary-p.

—. 2020. "Defining Agile Government." Washington, DC. https://www.napawash.org/grandchallenges/blog/defining-agile-government

National Environmental Education Foundation. n.d. Benefits of Environmental Education. https://www.neefusa.org/education/benefits#.

National Geographic. n.d. Encyclopedic Entry: No-take zone. https://www.nationalgeographic.org/encyclopedia/no-take-zone/.

National Marine Sanctuary Foundation. 2019. Foundation Study Finds Florida Keys National Marine Sanctuary Contributes $4.4 Billion Annually to Florida's Economy. July 30. https://marinesanctuary.org/news/foundation-study-finds-florida-keys-national-marine-sanctuary-contributes-4-4-billion-annually-to-floridas-economy/.

National Renewable Energy Laboratory. (n.d.). *Ocean Energy Basics*. Retrieved from https://www.nrel.gov/research/re-ocean.html

Oceana. (2010). *Impacts of Bottom Trawling on Fisheries, Tourim, and the Marine Enviornment*. https://oceana.org/sites/default/files/reports/Trawling_BZ_10may10_toAudrey.pdf

—. (January 2015). *Offshore Energy By The Numbers*. https://oceana.org/sites/default/files/offshore_energy_by_the_numbers_report_final.pdf

Office of Governor Gavin Newsom. 2020. Governor Newsom Launches Innovative Strategies to Use California Land to Fight Climate Change, Conserve Biodiversity and Boost Climate Resilience. October 7. https://www.gov.ca.gov/2020/10/07/governor-newsom-launches-innovative-strategies-to-use-california-land-to-fight-climate-change-conserve-biodiversity-and-boost-climate-resilience/.

OneCause. n.d. About Us. https://www.onecause.com/about-us/.

—. 2021. Nonprofit Awareness Campaigns: The Complete Guide for 2021. https://www.onecause.com/blog/awareness-campaigns/.

Organization for Economic Co-operation and Development. 2020. "OECD Work in Support of a Sustainable Ocean." https://www.oecd.org/ocean/OECD-work-in-support-of-a-sustainable-ocean.pdf.

Price, Jo. 2020. COVID-19 strengthens our connection with nature. October 21. https://www.discoverwildlife.com/news/covid-19-strengthens-our-connection-with-nature/.

Public Relations Society of America Measurement Task Force. 2009. "Measurement Standardization." https://apps.prsa.org/Intelligence/BusinessCase/MeasurementStandarization/.

Rushing, Mark. 20012. Five Steps to Creating Public Outreach Campaigns. https://www.prnewsonline.com/five-steps-to-creating-public-outreach-campaigns-that-engage-and-inspire/.

Schaefer, Mark, Erica Goldman, Ann M. Bartuska, Ariana Sutton-Grier, and Jane Lubchenco. 2015. "Nature as capital: Advancing and incorporating ecosystem services in United States federal policies and programs." Proceedings of the National Academy of Sciences. doi:https://doi.org/10.1073/pnas.1420500112.

Sletten, Jennifer, Mimi D'lorio, Mary G. Gleason, Alex Driedger, Timothe Vincent, Claire Colegrove, Dawn Wright, and Virgil Zetterlind. 2021. "Beyond the Boundaries: How Regulation-Centered Marine Protected Area Information Improves Ocean Protection Assessments." Marine Policy. doi:https://doi.org/10.1016/j.marpol.2020.104340.

Spalding, Mark J. 2016. "The New Blue Economy: the Future of Sustainability." Journal of Ocean and Coastal Economics. doi:https://doi.org/10.15351/2373-8456.1052.

The Ad Council and U.S. Forest Service. 2021. Smokey Bear: About the Campaign. https://smokeybear.com/en/smokeys-history/about-the-campaign.

The International Association for the Measurement and Evaluation of Communication. "Public Relations Metrics Framework." https://apps.prsa.org/intelligence/BusinessCase/Documents/AMEC/ValidPublicRelationsMetricsFramework.pdf.

The World Bank. 2014. Sustainable Aquaculture. February 5. https://www.worldbank.org/en/topic/environment/brief/sustainable-aquaculture#:~:text=Environmental%20sustainability%20%E2%80%94%20Aquaculture%20should%20not,with%20good%20long%2Dterm%20prospects.

U.S. Bureau of Labor Statistics. n.d. CPI Inflation Calculator. Accessed February 2021. https://www.bls.gov/data/inflation_calculator.htm.

U.S. Bureau of Land Management. 2021. "Congressional Budget Justification for Fiscal Year 2021." Washington, DC. https://www.doi.gov/sites/doi.gov/files/uploads/fy2021-budget-justification-blm.pdf.

U.S. Environmental Protection Agency. n.d. Financing Strategies Used by the National Estuary Program. https://www.epa.gov/nep/financing-strategies-used-national-estuary-program.

U.S. Environmental Protection Agency. 2020. "Justification of Appropriation Estimates for the Committee on Appropriations Fiscal Year 2021." https://www.epa.gov/sites/production/files/2020-02/documents/fy-2021-congressional-justification-all-tabs.pdf.

—. n.d. Overview of the National Estuary Program. https://www.epa.gov/nep/overview-national-estuary-program#overview.

U.S. Fish and Wildlife Service. n.d. About Us. https://www.fws.gov/refuges/about/faq.html.

U.S. Fish and Wildlife Service. 2020. "Congressional Budget Justification for Fiscal Year 2021." https://www.fws.gov/budget/2021/FY2021-FWS-Budget-Justification.pdf.

—. n.d. Duck Stamp Dollars at Work. https://www.fws.gov/birds/get-involved/duck-stamp/duck-stamp-dollars-at-work.php.

U.S. Forest Service. n.d. Passes and Permits. https://www.fs.usda.gov/visit/passes-permits.

U.S. National Aeronautics and Space Administration. 2021. 2020 Mission Perseverance Rover. https://mars.nasa.gov/mars2020/.

—. 2018. Benefits to You. September 19. https://www.nasa.gov/topics/benefits/index.html.

—. 2021. Official Perseverance Rover Twitter Account. https://twitter.com/NASAPersevere?ref_src=twsrc%5Egoogle%7Ctwcamp%5Eserp%7Ctwgr%5Eauthor.

—. 2010. Promoting NASA. September 20. https://www.nasa.gov/sites/default/files/512594main_10-09_PromotingNASAforSeptember2010.pdf.

U.S. National Marine Protected Areas Center. 2020. "Climate Change Impacts: Cordell Bank National Marine Sanctuary." Silver Spring. https://nmssanctuaries.blob.core.windows.net/sanctuaries-prod/media/docs/20200820-climate-change-impacts-cordell-bank-national-marine-sanctuary.pdf.

—. 2020. “Definitions and Classification System for U.S. Marine Protected Areas.” Silver Spring. https://nmsmarineprotectedareas.blob.core.windows.net/marineprotectedareas-prod/media/docs/20200715-mpa-classification.pdf.

—. n.d. Definitions of MPA and its Key Terms. Accessed 2021. https://marineprotectedareas.noaa.gov/aboutmpas/termsdefinitions/.

—. n.d. International Partnerships for Marine Protected Areas. https://marineprotectedareas.noaa.gov/nationalsystem/international/.

—. n.d. MPA Federal Advisory Committee. https://marineprotectedareas.noaa.gov/fac/.

U.S. National Marine Protected Areas. n.d. Olympic Coast National Marine Sanctuary's Intergovernmental Policy Council. https://marineprotectedareas.noaa.gov/toolkit/olympic-coast-intergov-policy-council.html#:~:text=The%20Olympic%20Coast%20National%20Marine,and%20the%20Quinault%20Indian%20Nation.

U.S. National Oceanic and Atmospheric Administration. n.d. Budget Archive: Historical Bluebook and Congressional Justifications. https://www.noaa.gov/organization/budget%2C-finance-performance/budget-archive.

U.S. National Oceanic and Atmospheric Administration. n.d. Organization. https://www.noaa.gov/about/organization.

—. n.d. Sanctuary Nomination Process Guide. https://nominate.noaa.gov/guide.html.

—. n.d. Sanctuary Nominations. https://nominate.noaa.gov/nominations/.

U.S. National Park Service. n.d. About Us. https://www.nps.gov/aboutus/national-park-system.htm.

U.S. National Park Service. 2020. "Congressional Budget Justification for Fiscal year 2021." https://www.doi.gov/sites/doi.gov/files/uploads/fy2021-budget-justification-nps.pdf.

U.S. Office of Management and Budget. 2016. "OMB Circular A-11, Part 6." Washington, DC. https://obamawhitehouse.archives.gov/omb/circulars_a11_current_year_a11_toc.

U.S. Office of National Marine Sanctuaries. 2017. 45 Years of America's Underwater Parks. https://sanctuaries.noaa.gov/news/oct17/celebrating-45-yrs-of-americas-underwater-parks.html.

—. 2017. "A Five-Year Strategy for the national Marine Sanctuary System (Fiscal Years 2017-2022)." Silver Spring, Maryland, September. https://nmssanctuaries.blob.core.windows.net/sanctuaries-prod/media/docs/onms-strategic-plan-2017-2022.pdf.

—. n.d. About. https://sanctuaries.noaa.gov/about/.

—. n.d. Climate Impacts. https://sanctuaries.noaa.gov/management/climate/climate-impacts.html.

—. n.d. Earth is Blue Magazine. https://sanctuaries.noaa.gov/magazine/1/.

—. n.d. Earth is Blue Magazine: Indigenous Cultures. https://sanctuaries.noaa.gov/magazine/1/indigenous-cultures/.

—. n.d. "Education Strategic Plan 2010-2020." Silver Spring, Maryland. https://nmssanctuaries.blob.core.windows.net/sanctuaries-prod/media/archive/education/pdfs/onms_educ_strategic_2010_2020.pdf.

—. 2021. Flower Garden Banks National Marine Sanctuary Triples In Size. January. https://sanctuaries.noaa.gov/news/jan21/flower-garden-banks-expansion.html.

—. n.d. History of Marine Animal Populations. https://stellwagen.noaa.gov/maritime/history-of-marine-animal-populations.html.

—. n.d. Management 101. https://sanctuaries.noaa.gov/management/mgt101.html.

—. 2006. "Conservation Science in NOAA's National Marine Sanctuaries: Description and Recent Accomplishments." Marine Sanctuaries Conservation Series, June. https://nmssanctuaries.blob.core.windows.net/sanctuaries-prod/media/archive/science/conservation/pdfs/accomplishments.pdf.

—. n.d. Maritime Heritage. https://stellwagen.noaa.gov/maritime/welcome.html.

—. n.d. Monuments and Sanctuaries: What's the Difference? https://sanctuaries.noaa.gov/about/monuments-and-sanctuaries-whats-the-difference.html.

—.2013. National Marine Sanctuary System Condition Report 2013. https://nmssanctuaries.blob.core.windows.net/sanctuaries-prod/media/archive/library/pdfs/ncr2013_high.pdf.

—. n.d. National Marine Sanctuary System Sponsorship Program. https://sanctuaries.noaa.gov/involved/sponsorship.html.

—. n.d. Official Instagram Account; Official Twitter Account; Official Facebook Account; Official YouTube Channel. https://www.instagram.com/noaasanctuaries/?hl=en; https://twitter.com/sanctuaries?ref_src=twsrc%5Egoogle%7Ctwcamp%5Eserp%7Ctwgr%5Eauthor; https://www.facebook.com/NOAAOfficeofNationalMarineSanctuaries/; https://www.youtube.com/user/sanctuaries.

—. n.d. ONMS Organization Chart. https://sanctuaries.noaa.gov/about/org-chart.html.

—. n.d. "Road to Sanctuary Designation." https://nmssanctuaries.blob.core.windows.net/sanctuaries-prod/media/archive/management/pdfs/designation-process.pdf.

—. n.d. Socioeconomics Research. https://sanctuaries.noaa.gov/science/socioeconomic/research.html.

—. n.d. Volunteer. https://sanctuaries.noaa.gov/involved/volunteer_future.html#:~:text=Sanctuary%20volunteers%20are%20a%20vital,66%20full%2Dtime%20federal%20employees.

—. n.d. Why Maritime Heritage? https://sanctuaries.noaa.gov/maritime/aboutmhp.html.

University of California, Davis. n.d. Ocean Acidification. https://climatechange.ucdavis.edu/science/ocean-acidification/.

University of Hawai'i at Manoa. n.d. "OLP 6: The ocean and humans are inextricably interconnected." https://manoa.hawaii.edu/exploringourfluidearth/standards-alignment/ocean-literacy-principles-olp/olp-6-ocean-and-humans-are-inextricably#:~:text=Humans%20have%20a%20complex%20relationship,for%20food%20and%20transportation%20(Fig.

Vinyeta, Kirsten, and Kathy Lynn. 2013. Exploring the Role of Traditional Ecological Knowledge in Climate Change Initiatives. U.S. Forest Service; Pacific Northwest Research Station. https://www.fs.fed.us/pnw/pubs/pnw_gtr879.pdf.

World Wildlife Fund, U.S. National Oceanic and Atmospheric Administration, International Union for Conservation of Nature. 2004. How is your MPA doing? A Guidebook of Natural and Social Indicators for Evaluating Marine Protected Area Management Effectiveness. https://nmsmarineprotectedareas.blob.core.windows.net/marineprotectedareas-prod/media/archive/pdf/national-system/mpadoing.pdf.

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UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
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55 Great Republic Drive
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May 12, 2021

Natalie Jennings
Coonamessett Farm Foundation, Inc.
277 Hatchville Road
East Falmouth, MA 02536

Dear Ms. Jennings:

We received your application for an Exempted Fishing Permit (EFP) to extend and expand the Coonamessett Farm Foundation's (CFF) project in the Great South Channel Habitat Management Area (HMA). After a review of the application and the information available from the current EFP for this project, we are unable to proceed with this new EFP request at this time.

The initial research plan for this project was submitted in June 2019. The plan was broad in scope, and we expressed our concerns about the potential adverse impacts to the HMA. After several conversations with my staff, and receiving comments and suggestions from the New England Fishery Management Council's Habitat Plan Development Team (PDT), CFF submitted a revised research plan in November 2019, which divided the project into two phases. We included a summary of this revised research plan in the announcement of the EFP application in the *Federal Register* (85 FR 4638; January 27, 2020). We issued the EFP on May 27, 2020, which will expire on May 27, 2021.

As you proposed, Phase I of the project was constrained to a limited area within the Rose and Crown area and was intended to serve as a 'proof of concept' phase. Vessels fishing under the Phase I EFP were to use dredge-mounted cameras to collect data to characterize substrate types where surfclam and mussel fishing occurs. A portion of the funds generated from the fishing trips was intended to support data collection using cameras to examine the habitat impacts of dredging, conduct habitat mapping and analysis, and research the presence of juvenile cod in the HMA. CFF proposed that Phase II of the plan would involve more use of dredge-mounted cameras and increase the geographic scope of compensation fishing to include a portion of the Davis Bank East area in order to fund an expansion of the non-fishing research aspects of the project.

CFF's research plan specified that the transition to Phase II would be based on how well the data collected during Phase I addressed the Council's research priorities for the HMA. In December 2020, CFF submitted an initial progress report that provided summary data from the 34 commercial trips taken at that point in Phase I. The progress report included annotated video data from 8 tows (of the 1,791 tows total conducted), 4 conducted in June and 4 in September. The report anticipated an intensive video survey independent of commercial fishing would begin in February 2021; however, we have not yet received any results from this period. Until more Phase I results are provided to us for review, it is premature to consider moving to Phase II of this project. Once complete Phase I results are available, and before we would authorize a Phase II EFP, we also intend to solicit input from the Council and its Habitat PDT on the utility of the data for evaluating potential new exemption areas within the HMA. This is a key purpose of Phase I, and one that is necessary to evaluate the appropriateness of the proposed Phase II design.

However, even the preliminary data available from Phase I raise concerns about Phase II of this project. The video from only a small fraction of tows has been analyzed, so it is not yet clear how well or consistently a dredge-mounted camera can document the substrates where surfclam and mussel fishing occur. Furthermore, the dredge track data provided in the progress report indicate that surfclam and mussel fishing does occur in complex habitat. In one example provided, up to 80 percent of the tow occurred in what could be considered complex habitat. We do not know how these compare to nearby unfished areas, but it is clear fishing does not solely occur on sandy bottom as was once thought.

We were able to determine that the potential impacts of the Phase I proposal were minor and temporary in nature because Phase I was restricted to a limited area within the Rose and Crown area and for a limited duration, and because it was unclear the extent to which surfclam or mussel fishing gear interacted with complex habitats. As such, the issuance of the Phase I EFP did not require the preparation of an environmental impact statement or environmental assessment under the National Environmental Policy Act. We have not made any determination on what level of analysis might be needed to assess the potential impacts of an expanded Phase II project.

Given the need for additional analysis of Phase I data in order to determine whether a transition to Phase II may be appropriate, please let us know if you would like to discuss a reasonable extension of the Phase I EFP. If you have additional questions please contact Douglas Potts (Douglas.Potts@noaa.gov).

Sincerely,

Michael Pentony
Regional Administrator

Cc: Dr. John Quinn, NEFMC Chairman
Thomas Nies, NEFMC Executive Director

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
GREATER ATLANTIC REGIONAL FISHERIES OFFICE
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May 10, 2021

Randall G. Hintz
Chief, Operations Support Branch
U.S. Army Corp of Engineers
New York District
Jacob K. Javits Federal Building
26 Federal Plaza
New York, NY, 10278-0090

RE: Response to Essential Fish Habitat Conservation Recommendations for the Maintenance Dredging of New York Harbor, Sandy Hook Federal Navigation Channel, New Jersey.

Dear Mr. Hintz:

We have received your April 30, 2021, letter responding to our essential fish habitat (EFH) conservation recommendations for the proposed 2021 maintenance dredging of the Sandy Hook Federal Navigation Channel and placement of the dredged material within the U.S. Army Corp of Engineers' Sea Bright Offshore Borrow Area (SBOBA) located in the Atlantic Ocean offshore of Monmouth County, NJ. Dredging events are expected to take place between 1 September through 28 February of each calendar year and will remove 250,000 cubic yards of sand and gravel material. Your letter documents a reply to one of two essential fish habitat (EFH) conservation recommendations (CRs) we provided by Interagency Comment Form dated March 16, 2021 to avoid and minimize impacts to EFH and other aquatic resources under our purview. We recommended:

1. Avoid dredging from November 15 to March 31 to minimize impacts to incoming adult winter flounder (11/15 to 12/31) and overwintering blue crabs (12/1 to 3/31).

2. Set up a meeting between the Corp and NOAA Fisheries to discuss the management of the SBOBA to determine the best placement area, schedule of use, and how to best foster benthic recovery of areas impacted.

In response to our CRs, you have requested that we waive CR-1, citing numerous Best Management Practices (BMPs) the project incorporates, and have not provided a response to CR-2. In your letter, you refer to incorporating the same 2018 EFH CRs for the dredging and placement at the SBOBA, which did not incorporate a no dredge window for winter flounder and blue crab. Unlike the 2018 EFH consultation, the proposed 2021 dredging and placement include an additional dredge area west of the spit, and two different placement areas within the SBOBA which are open to different CRs. Additionally, it should be noted that CR-1 was specifically addressing the dredge timing and not the placement of the material at the SBOBA, as indicated in BMP-a. CR-1 is also specific to blue crabs and incoming adult winter flounder, not spawning adult winter flounder or their early life stages as indicated in BMP-f.

As we have commented in the past, portions of the channel are overwintering habitat for blue crab. Blue crabs enter channel and slough areas of the project area in November, burrowing into surficial sediments as water temperature declines. Overwintering in a dormant, immobile state until water temperature rises in the spring; they are in a torpid state and would be unable to escape entrainment into the dredge as indicated in BMP-c. Juvenile blue crabs are a food source for several state and federally managed fish species including winter flounder, little skate, winter skate, scup, and summer flounder. The EFH final rule states that the loss of prey may be an adverse effect on EFH and managed species because the presence of prey makes waters and substrate function as feeding habitat. Since the definition of EFH includes waters and substrate necessary to fish for feeding, actions that reduce the availability of prey species, either through direct harm or capture, or through adverse impacts to the prey species' habitat may also be considered adverse effects on EFH. As a result, activities that adversely affect blue crabs and their overwintering habitat can adversely affect the EFH for juvenile winter flounder, little skate, scup and summer flounder by reducing the availability of prey items. While we are currently working with local commercial crabbers to better define the habitat used by overwintering crabs along the federal channels in Raritan and Sandy Hook Bays, we continue to recommend a seasonal restriction on dredging at the proposed western dredge location from December 1 through March 31 to avoid entrainment of overwintering crabs in the dredge. Based upon the spit location at the northern tip of Sandy Hook and the highly dynamic nature of that section of the channel, we do not expect to find overwintering crabs in the area to be dredged, and the seasonal restriction is not needed.

Also indicated in past comments, winter flounder adults use channels to migrate into the estuary to spawn generally when water temperatures decrease in late November and December. The Sandy Hook Channel is a preferred pathway into the estuary because it is deeper and cooler than the surrounding waters. Dredging the channel when the winter flounder enter the estuary could impede their access to spawning areas, reducing their reproductive success. While we agree that the seasonal restriction is not needed for the location of the spit that has migrated into the channel, we continue to recommend that dredging should be avoided in western proposed dredge location of the channel from November 15 to December 31 to minimize adverse effects to reproductive adult winter flounder moving into the estuary to spawn.

We continue to recommend to avoid and minimize adverse impacts to areas designated EFH and other resources under our purview and strongly encourage you to reconsider incorporating both of our CRs into the project as they are related to the dredge location to the west of the spit and the two placement locations within the SBOBA, respectively, to reduce the proposed disturbances at the site. In addition, please note that a distinct and further EFH consultation must be reinitiated pursuant to 50 CRF 600.920 (j) if new information becomes available, or if the project is revised in such a manner that affects the basis for the EFH determination.

As indicated in our March Interagency Comment Form, federally listed species may also be present in the project area and consultation, pursuant to Section 7 of the Endangered Species Act (ESA) of 1973, may be necessary. The Army Corps is responsible for determining whether the proposed action is likely to affect listed species. If the proposed action may affect a listed species, you should submit your determination of effects, along with justification for the determination, and a request for concurrence to nmfs.gar.esa.section7@noaa.gov. After reviewing this information, we would then be able to conduct a consultation under Section 7 of the ESA.

Thank you for the opportunity to provide these comments. Please direct related correspondence to the attention of Jessie Murray at 978-675-2175 or by e-mail (Jessie.Murray@noaa.gov). Should you have any questions about the Section 7 consultation process in general, please contact Edith Carson-Supino at 978-282-8490 or by e-mail (Edith.Carson-Supino@noaa.gov).

Sincerely,

Louis A. Chiarella
Assistant Regional Administrator
for Habitat Conservation

cc:

GARFO PRD – E. Carson-Supino
GARFO HESD – K. Greene, J. Murray
ACOE NAN – J. Yan
NJDEP – S. Biggins, K. Davis
FWS – S. Mars
EPA Region II – M. Finocchiaro
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May 6, 2021

Todd Schaible Chief
Regulatory Branch
Philadelphia District
U.S. Army Corps of Engineers
Wanamaker Building
100 Penn Square East
Philadelphia, PA 19107-3390

RE: CENAP-2021-00067-97, Township of Little Egg Harbor; Graveling Point Beach, Ocean County, New Jersey.

Dear Mr. Schaible:

We have reviewed the public notice (PN), essential fish habitat (EFH) assessment and other information provided to us for the proposed beach restoration/widening and breakwater and jetty construction in Great Bay along Graveling Point Beach in the Township of Little Egg Harbor, Ocean County, New Jersey. The stated purpose of the proposed project is to improve recreation and access for the public, improve habitat for shorebirds and aquatic species, and provide upland protection at Graveling Point Beach. The applicant is requesting authorization to:

- place approximately 11,015 cubic yards of sand fill over a 2.54-acre area below the High Tide Line (HTL),
- construct a 212 linear foot “dog eared” stone jetty on the eastern edge of the shoreline, where estuarine tidal marsh currently exists,
- place ten 10-inch diameter timber piles for warning/navigation purposes, and
- construct four offshore stone breakwaters, each approximately 30-feet wide by 106-feet long, placed 104 linear feet apart and placed parallel to the shoreline.

Breakwater and jetty construction would include 2,225 cubic yards of stone fill over a 0.45-acre area below the HTL; the fill will be sourced from a local quarry. At present, it appears the crest of the breakwaters and jetty will extend above the HTL, but the exact height is unknown.

Based on the information provided, the project will result in permanent impacts to 2.99-acres of subtidal and intertidal flats from beach restoration/widening and breakwater construction activities and 0.1-acre of tidal salt marsh from jetty construction activities. The PN does not indicate whether compensatory mitigation has been proposed. You have determined that the proposed action will adversely affect EFH, but the effects are either no more than minimal, temporary, or that they can be alleviated with minor project modifications or conservation recommendations. We disagree with this conclusion and offer the comments and recommendations below pursuant to the Magnuson-Stevens Fishery Conservation and Management Act (MSA) and the Fish and Wildlife Coordination Act (FWCA).

Alternatives Analysis

As currently designed, the proposed project will result in the conversion of aquatic habitat and estuarine wetlands to upland sand and rock which will adversely affect aquatic resources that depend upon these habitats. It appears some of impacts can be avoided and minimized through design changes. For example, it appears that a small rock toe revetment could provide protection to the existing wetlands while further stabilizing the inlet in the location of the proposed jetty, and smaller breakwaters and less beachfill could meet the applicant's stated project purpose. As a result, a full range of reasonable alternatives to the proposed action should be evaluated to identify the least environmentally damaging practicable alternative. The analysis should consider, in order, avoidance, minimization, and compensation, or offsetting, of adverse impacts. Specifically, the applicant should consider design alternatives that:

- reduce the amount and waterward extent of the sand fill placed below the HTL,
- reduce the amount of fill, distance from shore, and height (above mean high water) of offshore breakwater structures and the jetty, and
- eliminate hard structure altogether or replace the current hard structures with elements such as low-profile shell reefs or similar structures.

These changes could also eliminate the need for compensatory mitigation. However, compensatory mitigation should be required for all unavoidable impacts, including the conversion of aquatic habitat and wetlands to upland sand and rock.

Magnuson Stevens Fishery Conservation and Management Act (MSA)

The Magnuson-Stevens Fishery Conservation and Management Act (MSA) requires federal agencies to consult with us on projects such as this which may adversely affect EFH and other aquatic resources. In turn, we must provide recommendations to conserve EFH. These recommendations may include measures to avoid, minimize, mitigate, or otherwise offset adverse effects on EFH resulting from actions or proposed actions authorized, funded, or undertaken by that agency. This process is guided by the requirements of our EFH regulation at 50 CFR 600.905, which mandates the preparation of EFH assessments and generally outlines each agency's obligations in the consultation process.

The waters of Great Bay, tidal creeks connected to it, and the surrounding estuarine coastal marsh, mudflats, and subtidal and intertidal flats have been designated EFH for a number of federally managed fish species including, but not limited to, bluefish (*Pomatomus saltatrix*), black sea bass (*Centropristis striata*), scup (*Stenotomus chrysops*), summer flounder (*Paralichthys dentatus*), windowpane flounder (*Scophthalmus aquosus*), winter flounder (*Pseudopleuronectes americanus*), winter skate (*Leucoraja ocellata*), and red hake (*Urophycis chuss*). EFH has also been designated for several Atlantic highly migratory species including sandbar shark (*Carcharhinus plumbeus*) and sand tiger shark (*Carcharias taurus*). The sand tiger shark has been listed as a Species of Concern by NOAA due to concerns about population declines.

The project area has also designated Habitat Areas of Particular Concern (HAPC) for sandbar shark and potentially summer flounder. HAPCs are a subset of EFH that are either rare, particularly susceptible to human-induced degradation, especially important ecologically, or located in an environmentally stressed area. HAPC for sandbar shark constitutes important nursery and pupping grounds, which have been identified in shallow areas and at the mouth of Great Bay, and in other specific bays (e.g., the Delaware Bay). HAPC for sandbar shark in the Great Bay includes water temperatures ranging from 15 to 30 °C, salinities at least from 15 to 35 ppt, water depths from 0.8 to 23 meters, and in sand and mud habitats. Summer flounder HAPC is designated as all native species of macroalgae and seagrasses (rooted macroalgae and seagrass are known as submerged aquatic vegetation [SAV]), and freshwater and tidal macrophytes in any size bed, as well as loose aggregations, within adult and juvenile summer flounder EFH. In locations where native species have been eliminated from an area, then exotic species are included.

Great Bay and the estuarine coastal marsh and intertidal and subtidal flats of the proposed project area are especially important for various federally managed species because species aggregate, spawn and pup in these areas (e.g., winter flounder and sandbar shark) and larvae and juveniles concentrate and feed extensively and shelter within these habitats. As a consequence, growth rates are high and predation rates are low, which makes these habitats effective nursery areas. Two managed flounder species that merit special attention due to their reliance on nearshore and inshore estuarine habitats as spawning, egg, and larval habitat and juvenile nursery grounds are summer and winter flounder. Summer flounder is one of the most economically important species in the region due to its importance in commercial and recreational fisheries. In general, various life stages of summer flounder use several estuarine habitats, including salt marsh creeks, SAV beds, subtidal and intertidal flats, open bay, and other areas in water temperatures greater than 2.7 °C and salinities from 10 to 30 ppt range.

The area of the proposed project is also important spawning and nursery habitat for winter flounder. EFH for winter flounder eggs and adults include sub-tidal estuarine and coastal benthic habitats from mean low water to 5 meters in areas of mud, muddy sand, sand, gravel, and SAV. Winter flounder larval and juvenile EFH includes the bottom types and depths found in the project area as well. Adult winter flounder move into nearshore and estuarine-embayment spawning areas within the mid-Atlantic when water temperatures begin to decline in late fall. In the Mid-Atlantic, they typically spawn in the winter and early spring, although the exact timing is temperature dependent. They deposit adhesive eggs in clusters on soft bottom sediments or on near-bottom macrophytes, where they remain for 2 to 3 weeks until they hatch. Metamorphosis begins around 5 to 6 weeks after hatching, and is completed about 8 weeks after hatching at which time the larvae begin to transform into juveniles and settle to the bottom. As currently proposed, this project will result in the loss of habitat for both of these federally managed species whose landings have declined in recent years.

Fish and Wildlife Coordination Act (FWCA)

The FWCA requires that all federal agencies consult with us when proposed actions might result in modifications to a natural stream or body of water. It also requires that they consider the effects that these projects would have on fish and wildlife and must also provide for the improvement of these resources. Under this authority we seek to protect and conserve a wide variety of aquatic resources, but especially those that are not federally managed and do not have designated EFH, such as anadromous fish. The project area is important habitat for anadromous fish such as alewife (*Alosa pseudoharengus*), blueback herring (*Alosa aestivalis*), and striped bass (*Morone saxatilis*), which use these areas as migratory, nursery, resting, and foraging habitat. These species have complex lifecycles where individuals spend most of their lives at sea then migrate great distances to return to freshwater rivers to spawn. Alewife, and blueback herring are believed to be repeat spawners, generally returning to their natal rivers to spawn. These fish are important forage for several federally managed species, providing trophic linkages between inshore and offshore systems and have been identified as prey species for bluefish, windowpane, and summer flounder. The area of the proposed project has also been designated as shellfish habitat and previously overlapped with shellfish leases (according to New Jersey Department of Environmental Protection 1988 maps), and may have active leases today.

As currently proposed, the project will permanently eliminate at least 0.1 acres of estuarine coastal marsh which provides nursery and forage habitat for a variety of aquatic species including Atlantic croaker (*Micropogonias undulatus*), spot (*Leiostomus xanthurus*), striped bass, and others, as well as federally managed bluefish, summer flounder and windowpane flounder. Important forage species such as mummichog (*Fundulus heteroclitus*), Atlantic silverside (*Menidia menidia*), inland silverside (*Menidia beryllina*), striped killifish (*Fundulus majalis*) and bay anchovy (*Anchoa mitchilli*) also use these areas. Mummichog, killifish, anchovies and other small fish and benthic organisms found in estuarine wetlands provide a valuable food source for many of the commercially and recreationally valuable species mentioned above including red hake, scup, striped bass, summer flounder, weakfish (*Cynoscion regalis*), and windowpane flounder.

Wetlands also provide many other important ecological functions and services including fish and wildlife habitat, food chain support, nutrient cycling, and sediment stabilization and retention. The primary production in wetlands forms the base of the food web that supports invertebrates and forage fish that are then prey species for larger fish such as bluefish, summer flounder, black sea bass and other species found in and around the marsh. The water quality services provided by these wetlands retain nutrients, sediments and contaminants and improve water quality, therefore the proposed modification could adversely affect the habitat and water quality of the surrounding waterways by eliminating tidal wetlands that export nutrients and filter runoff from upland sources. Wetlands may also help to moderate global climate change through carbon storage within the plant communities and soil.

The loss of wetlands as a result of this project can adversely affect federally managed species and other species of concern through the reduction in prey species and primary production, as well as water quality degradation from the reduction in sediment retention and pollution filtration. The existing tidal wetlands proposed to be impacted by the jetty appear to be stabilizing the existing inlet, which calls into question the need for the jetty. Additionally, placing hard structures, such as rock, within salt marsh and subtidal and intertidal habitats may result in scour and other erosional effects and may reflect wave energy to adjacent areas, further reducing the quantity and quality of habitat for federally managed species and their prey. As a result, we recommend alternatives that avoid impacting the existing tidal wetlands be evaluated. Following the alternatives analysis and steps to avoid and minimize impacts, compensatory mitigation should be required for all unavoidable impacts to wetlands from the proposed project.

The project area is habitat for various ecologically, economically, and recreational important shellfish species, including hard clam, soft clam, oyster, and others. Hard clam in particular supports important commercial and recreational fisheries and is one of the most valuable aquaculture species on the East Coast. In addition, infaunal species such as clams filter significant volumes of water, effectively retaining organic nutrients from the water column). Shellfish populations and the species that rely on them for food or habitat, can be adversely affected by the proposed project elements, including placing fill material that can lead to the physical destruction of organisms and habitat, increased turbidity and sedimentation (i.e., burial and smothering), interruption of feeding processes and success, and habitat alteration/degradation. Additionally, the project will permanently eliminate shellfish habitat by converting aquatic habitat to upland sand and rock habitat and by permanently covering the benthos with rock structure.

Essential Fish Habitat Conservation Recommendations

As currently proposed, the project will adversely impact coastal marsh and subtidal and intertidal flats, leading to reductions in habitat quality and quantity for federally managed species, their prey, and other aquatic resources under our purview. It appears that these impacts can be avoided and minimized through design changes which should be evaluated as part of an alternatives analysis. The alternatives analysis should consider and evaluate a full range of reasonable alternatives to the proposed action, including those that would cause less damage to the aquatic environment. The analysis should identify measures that avoid and minimize adverse impacts including reducing the amount of fill proposed. Compensatory mitigation should be provided for unavoidable impacts. The alternatives analysis and selection of the preferred alternative should also be coordinated with us and other state and federal resource agencies. Should you determine that an alternatives analysis not be required, we have provided various avoidance and minimization measures below. If an alternatives analysis is required, these recommendations should be incorporated into the development of project alternatives.

Pursuant to Section 305 (b)(4)(A) of the MSA, we recommend the following EFH conservation recommendations:

- Reduce in-water fill/the waterward extent of sand and stone (breakwater and jetty) fill to minimize fill below the HTL.
- Eliminate the jetty entirely or reduce the footprint of the stone jetty and avoid the wetland fill associated with the structure.
- Reduce the height of the breakwaters. The breakwaters should be constructed at or below the mean high water (MHW) line.

- Reduce the height of the jetty (should it remain a component of the project). The jetty should be constructed at or just above MHW line.
- Target elevations for all project components (beach fill, breakwaters, jetty) should be based upon a local tidal datum.
- All sediment used for beach fill should be of the same character (e.g., size, shape, roundness) of grain size [as compared to the native/existing beach].
- Compensatory mitigation should be required for all unavoidable impacts to wetland, intertidal, and subtidal habitat. Need for compensatory mitigation could be reduced by avoiding and minimizing project impacts through design changes and incorporating project elements that provide ecological uplift, such as planting/establishing tidal marsh as part of the proposal.
- Ecological performance standards should be developed to determine if the project is achieving its objectives of expanding/restoring the beach, improving habitat for shorebirds and aquatic species, and providing upland protection. An ecological reference (or references) should be established and should be based on an intact aquatic habitat of the same type within the same watershed.
- Monitoring of the site should be conducted to determine if performance standards are being met or if intervention is necessary. A long-term management plan and adaptive management strategies should also be developed for the proposed project. Monitoring and performance must all relate back to the goals/purpose of the project and should include:
    - Sediment physical and chemical properties and sediment migration; beach, breakwater, and jetty elevations (topography/bathymetry); upland protection;
    - Aquatic species: benthic invertebrates (infauna and epifauna), horseshoe crabs, and nekton (including fisheries); and
    - Shorebird use/occurrence.

Please note that Section 305 (b)(4)(B) of the MSA requires you to provide us with a detailed written response to these EFH conservation recommendations, including the measures adopted by you for avoiding, mitigating, or offsetting the impact of the project on EFH. In the case of a response that is inconsistent with our recommendations, Section 305 (b)(4)(B) of the MSA also indicates that you must explain your reasons for not following the recommendations. Included in such reasoning would be the scientific justification for any disagreements with us over the anticipated effects of the proposed action and the measures needed to avoid, minimize, mitigate or offset such effect pursuant to 50 CFR 600.920 (k).

Please also note that a distinct and further EFH consultation must be reinitiated pursuant to 50 CFR 600.920 G) if new information becomes available, or if the project is revised in such a manner that affects the basis for the above EFH conservation recommendations.

Endangered Species Act

Threatened or endangered species under our jurisdiction including federally listed species Atlantic sturgeon (*Acipenser oxyrhynchus*) and sea turtles may be present in the project area. As the lead federal action agency, you are responsible for determining the nature and extent of effects and coordinating with our Protected Resources Division as appropriate. Our Protected

Resources Division's website (http://www.greateratlantic.fisheries.noaa.gov/section7) contains guidance and tools to assist action agencies with their description of the action and analysis of effects to support their determination. Should you have any questions about the section 7 consultation process, please contact Peter Johnsen at (978) 282-8416 or by e-mail (peter.b.johnsen@noaa.gov).

We look forward to continued coordination with your office on this project as it moves forward. If you have any questions or need additional information, please do not hesitate to contact Keith Hanson in our Annapolis, MD field office at keith.hanson@noaa.gov.

Sincerely,

Louis A. Chiarella
Assistant Regional Administrator
for Habitat Conservation

cc: ACOE – K. Miller, T. Schaible
PRD – P. Johnsen
FWS- E. Schrading, S. Mars
EPA Region II – M. Finocchiaro, R. Montgomerie
NJDEP - K. Dacanay, S. Stueber, K. Davis
MAFMC – C. Moore
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UNITED STATES DEPARTMENT OF COMMERCE
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April 28, 2021

Luke Feinberg
Office of Renewable Energy
Bureau of Ocean Energy Management
45600 Woodland Road
Sterling, Virginia 20166

RE: Docket No. BOEM-2021-0021; New York Bight Wind Energy Area EA

Dear Mr. Feinberg,

This responds to your request for comments on issues and alternatives to be considered in the Environmental Assessment (EA) that the Bureau of Ocean Energy Management (BOEM) will prepare to consider potential environmental consequences of site characterization activities (i.e., biological, archeological, geological, and geophysical surveys and core samples) and site assessment activities (i.e., installation of meteorological buoys) associated with issuing wind energy leases in the newly identified New York Bight Wind Energy Areas (WEA). Here we provide a brief overview of our trust resources in the WEA, information regarding protected species and survey impacts that should be considered in the EA, and information regarding permitting needs for potential survey activities.

NMFS Trust Resources in the New York Bight WEAs

Endangered Species Act

Several species of marine mammals, sea turtles, and marine fish that are listed as threatened or endangered under the Endangered Species Act (ESA) of 1973, as amended, occur in the WEAs. These include the critically endangered North Atlantic right whale (*Eubalaena glacialis*) as well as endangered fin (*Balaenoptera physalus*), sei (*Balaenoptera borealis*), and sperm (*Physeter macrocephalus*) whales; endangered Kemp's ridley (*Lepidochelys kempii*) and leatherback (*Dermochelys coriacea*) sea turtles; threatened North Atlantic distinct population segment (DPS) of green (*Chelonia mydas*) sea turtles and Northwest Atlantic DPS of loggerhead (*Caretta caretta*) sea turtles; and five DPSs of Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*). Threatened giant manta rays (*Manta birostris)* and oceanic whitetip shark (*Carcharhinus longimanusalso)* may occasionally occur in the WEAs. More information on the species that occur in the WEAs is available on our webpage[1]. We also note that while there is no critical habitat designated for any ESA listed species under our jurisdiction in the WEAs, critical habitat is designated in nearby areas (including the Hudson River) and maps of critical habitat should be

[1] *https://www.fisheries.noaa.gov/new-england-mid-atlantic/consultations/section-7-species-critical-habitat-information-maps-greater*

reviewed to determine if any activities considered in the EA may overlap with these areas. Maps of critical habitat are available on the above referenced webpage. Your EA should consider effects of the reasonably foreseeable effects of leasing and any activity that would not occur but for the proposed lease sales, such as site characterization and site assessment activities, on all ESA listed species that occur in the WEA and their habitats. This assessment should include consideration of geophysical and geotechnical surveys, installation of meteorological buoys (including consideration of entanglement risk), and a thorough consideration of potential effects of biological surveys, including but not limited to fisheries surveys, that may result in the incidental take of ESA listed species either directly or indirectly. Types of "take" that should be considered include: capture/collection (including entanglement), harassment, harm (including through habitat changes), injury, and death. The EA should also consider vessel traffic and the risk of vessel strike on ESA listed species that would not occur but for proposed leasing and associated activities. Additionally, the EA should consider effects on listed species of potential displacement of fishing effort and other existing uses as a result of leasing and activities, such as these surveys and site characterization activities, that would not occur but for the lease sales.

Under Section 7(a)(2) of the ESA, each federal agency is required to insure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of designated critical habitat. A number of activities that may affect ESA listed species are reasonably certain to occur as a result of lease issuance, including site characterization and site assessment activities, such as surveys or monitoring to characterize fisheries resources, habitat, and protected species in lease areas. As such, consultation pursuant to section 7 of the ESA on any proposed lease issuance is required. We are in the process of finalizing a programmatic informal ESA consultation on effects of certain site characterization and site assessment activities (i.e., geophysical and geotechnical surveys and deployment and retrieval of meteorological buoys) that may be carried out on the Atlantic OCS. However, that consultation does not consider issuance of leases or all activities that may result from lease issuance. Rather than request individual consultations for any new leases issued for the WEA, we encourage you to work with us to develop a programmatic ESA consultation that would address all consequences of lease issuance within the newly identified New York Bight WEAs. We anticipate that such a consultation would address site characterization and site assessment activities within the WEA, including fisheries surveys and other activities that may affect ESA listed species and/or critical habitat. Following the lease sale, if any Construction and Operations Plans (COPs) are submitted to BOEM, site specific effects of construction, operation, and decommissioning of any future wind projects would be considered in later consultations on BOEM's proposed approval of the COPs.

The EA should consider the effects of the proposed lease sale and activities that would not occur but for lease issuance, as well as a reasonable range of alternatives. One or more alternatives, as appropriate, should include measures that could be include as lease conditions to avoid, minimize, monitor, and report on effects to listed species and their habitats from the lease sale and related, subsequent activities. We would be happy to discuss options for such measures with BOEM.

Marine Mammal Protection Act
All marine mammals receive protection under the Marine Mammal Protection Act (MMPA) of 1972, as amended. The MMPA prohibits the "take[2]" of marine mammals, with certain exceptions. Sections 101(a)(5)(A) and (D) of the MMPA (16 U.S.C. 1361 *et seq*.) direct the Secretary of Commerce (as delegated to NMFS) to allow, upon request, the incidental, but not intentional, taking of small numbers of marine mammals by U.S. citizens who engage in a specified activity (other than commercial fishing) within a specified geographical region if certain findings are made and either regulations are issued or, if the taking is limited to harassment, a notice of a proposed incidental take authorization may be provided to the public for review. Authorization for incidental takings shall be granted if NMFS finds that the taking will have a negligible impact on the species or stock(s) and will not have an unmitigable adverse impact on the availability of the species or stock(s) for taking for subsistence uses (where relevant). Further, NMFS must prescribe the permissible methods of taking and other "means of effecting the least practicable adverse impact" on the affected species or stocks and their habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance, and on the availability of the species or stocks for taking for certain subsistence uses (referred to in shorthand as "mitigation"); and requirements pertaining to the mitigation, monitoring and reporting of the takings are set forth. More information on the MMPA incidental take authorization permitting process is available at https://www.fisheries.noaa.gov/permit/incidental-take-authorizations-under-marine-mammal-protection-.

A number of marine mammal species occur in the WEA. As such, the EA should consider those activities that may result in a take of a marine mammal such as geophysical and geotechnical surveys, installation of meteorological buoys (including consideration of entanglement risk), and biological surveys, including fisheries surveys that may result in the incidental capture (including entanglement), collection, harassment, injury or death of marine mammals. In addition, MMPA permitting needs should be carefully considered by developers and discussed with NMFS well in advance of any planned activities.

Magnuson-Stevens Fishery Conservation and Management Act (MSA)
The MSA requires federal agencies to consult with the Secretary of Commerce, through NMFS, with respect to "any action authorized, funded, or undertaken, or proposed to be authorized, funded, or undertaken, by such agency that may adversely affect any essential fish habitat (EFH) identified under this Act," 16 U.S.C. § 1855(b)(2). This process is guided by the requirements of our EFH regulation at 50 CFR 600.905. The EFH regulations state that for any federal action that may adversely affect EFH, federal agencies must provide NMFS with a written assessment of the effects of that action on EFH (50 CFR § 600.920(e)). This EFH Assessment should include analyses of all potential impacts, including temporary, permanent, direct, indirect individual, cumulative, and synergistic impacts, of the proposed project. The EFH consultation

[2] "Take" means to harass, hunt, capture, or kill, or attempt to harass, hunt, capture, or kill any marine mammal. "Harassment" is statutorily defined as, any act of pursuit, torment, or annoyance which has the potential to injure a marine mammal or marine mammal stock in the wild (Level A harassment); or has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering but which does not have the potential to injure a marine mammal or marine mammal stock in the wild (Level B harassment).

is a separate review mandated pursuant to the MSA, although we request BOEM use the NEPA document as the vehicle within which to present the EFH assessment. The EFH Assessment should be included within a separate section or appendix of the EA and be clearly identified as an EFH assessment.

As currently described, the proposed lease areas and associated site characterization activities will occur in areas designated as EFH for various life stages of nearly every species managed by the New England Fishery Management Council (NEFMC), Mid-Atlantic Fishery Management Council (MAFMC), and NMFS. The area is also designated EFH for species managed by the South Atlantic Fishery Management Council (SAFMC). Species for which EFH has been designated in the project area include, but are not limited to, Atlantic cod (*Gadus morhua*), bluefish (*Pomatomus saltatrix*), black sea bass (*Centropristis striata*), scup (*Stenotomus chrysops*), summer flounder (*Paralichthys dentatus*), windowpane flounder (*Scophthalmus aquosus*), winter flounder (*Pseudopleuronectes americanus*), yellowtail flounder (*Limanda ferruginea*), winter skate (*Leucoraja ocellata*), Atlantic sea scallop (*Placopecten magellanicus*), and Atlantic surfclam (*Spisula solidissima*). The proposed lease areas are also designated EFH for several Atlantic highly migratory species (tuna, swordfish, billfish, small and large coastal sharks, and pelagic sharks) including, but not limited to, blue shark (*Prionace glauca*), bluefin tuna (*Thunnus thynnus*) sandbar shark (*Carcharhinus plumbeus*) and sand tiger shark (*Carcharias taurus*). You can find information on species with designated EFH in the project area at https://www.habitat.noaa.gov/protection/efh/efhmapper.

Ecologically sensitive habitats exist within the proposed lease areas. Habitats affected by the site characterization activities and installation of meteorological buoys or towers should be mapped (characterized and delineated) and impacts to these habitats should be described. Measures taken to avoid and minimize impacts to ecologically sensitive habitats should also be included in both the EA and EFH assessment. To aid BOEM and developers in the development of comprehensive and complete EFH Assessments, we have published our *Recommendations for Mapping Fish Habitat*, dated March 2021. This document is an updated version, the earlier version of which was previously submitted to BOEM on May 27, 2020. Ecologically sensitive habitats within the proposed lease areas include, but are not limited to: shellfish habitat (including Atlantic surfclam areas) and shellfish reefs, areas dominated by complex hard bottom habitats such as rock outcrops, ledge, boulders, and cobbles, submerged aquatic vegetation (SAV; inclusive of rooted macroalgae and seagrasses) beds and habitat, shipwrecks and artificial reef sites, benthic features such as sand ridges and waves and their associated troughs and depressions (oftentimes referred to as ridge and swale complexes), Prime Fishing Areas (defined by the New Jersey Department of Environmental Protection (NJDEP)), and areas known to be favored by the fishing community that are not codified in state rules/regulations (e.g., the "Mudhole"). Furthermore, ecologically important biogenic habitats, including soft bottom habitats with emergent fauna (e.g. octocorals and pennatulids, tube dwelling anemones and structure forming amphipods and polychaetes) should also be identified and impacts resulting from site characterization activities should be avoided and minimized.

Fish and Wildlife Coordination Act (FWCA)
The Fish and Wildlife Coordination Act (FWCA), as amended in 1964, requires that all federal agencies consult with us when proposed actions might result in modifications to a natural stream

or body of water. It also requires that they consider effects that these projects would have on fish and wildlife and must also provide for improvement of these resources. From the information provided, the likely site assessment and site characterization activities will impact areas where aquatic resources that we seek to conserve and enhance under the FWCA occur. These resources include, but are not limited to, American lobster (*Homarus americanus*), striped bass (*Morone saxatilis*), American shad (*Alosa sapidissima*), alewife (*Alosa pseudoharengus*), and blueback herring (*Alosa aestivalis)* (collectively known as river herring), blue crab (*Callinectes sapidus*), Atlantic menhaden (*Brevoortia tyrannus*), killifish (*Fundulus spp.*), Atlantic silversides (*Menidia menidia*), bay anchovies (*Anchoa mitchilli*), horseshoe crab (*Limulus polyphemus*), tautog (*Tautoga onitis*), spot (*Leiostomus xanthurus*), weakfish *(Cyanoscion regalis)* and other assorted fish and invertebrates (e.g., *Neomysis americana, Mysidopsis bigelowi*). Impacts to these resources from site characterization activities should be described in the EA as well as the measures to avoid and minimize those impacts.

Fisheries Survey Considerations

We understand that as part of site characterization, developers may carry out surveys of fisheries resources within the WEA. All offshore wind energy fisheries monitoring plans or survey activities that engage in "fishing" as defined by the MSA[3] must comply with all applicable fishery management regulations. Monitoring or survey activities that carry out scientific research, as defined, from a scientific research vessel (*e.g.,* a vessel chartered and controlled by a university/scientific institution and operating under a scientific research plan)[4] are not considered to be fishing, and are <u>not</u> subject to MSA fishery management regulations. This means that such vessels are not restricted by fishing regulations established under 50 CFR 648 and 697 for regional fisheries, including quotas, gear restrictions, or area closures. The full scope of vessel activity must be consistent with the definition for scientific research, and the scientific research vessel may not conduct fishing and research activities on the same trip. NMFS recognizes, but does not authorize, scientific research activities from a scientific research vessel by providing, upon request, a Letter of Acknowledgment. A Letter of Acknowledgement is not required, but we highly encourage that research programs obtain one to ensure NMFS concurs that the criteria have been met and the vessel is not subject to MSA-based fishing regulations. Obtaining a Letter of Acknowledgement minimizes any delays caused by potential U.S. Coast Guard and law enforcement vessel inquiries. Please note that *a Letter of Acknowledgement is not an authorization* and is separate and distinct from any permit or consultation required under the

[3] *Fishing*, or *to fish* means any activity, other than scientific research conducted by a scientific research vessel, that involves: (1) The catching, taking, or harvesting of fish; (2) The attempted catching, taking, or harvesting of fish; (3) Any other activity that can reasonably be expected to result in the catching, taking, or harvesting of fish; or (4) Any operations at sea in support of, or in preparation for, any activity described in this definition.

[4] A Scientific research vessel means a vessel owned or chartered by, and controlled by, a foreign government agency, U.S. Government agency (including NOAA or institutions designated as federally funded research and development centers), U.S. state or territorial agency, university (or other educational institution accredited by a recognized national or international accreditation body), international treaty organization, or scientific institution. In order for a domestic commercial fishing vessel to meet this definition, it must be under the control of a qualifying agency or institution, and operate in accordance with a scientific research plan, for the duration of the scientific research activity. In order for a vessel that is owned or chartered and controlled by a foreign government to meet this definition, the vessel must have scientific research as its exclusive mission during the scientific activity in question, and the vessel operations must be conducted in accordance with a scientific research plan.

MMPA, the ESA, or any other applicable law. The issuance of a Letter of Acknowledgement is not considered a federal action that triggers ESA section 7 consultation; as such, if the proposed survey may affect one or more species listed under the ESA (inclusive of capture and release without injury), additional coordination with NMFS is necessary.

Monitoring plans or survey activities that do not meet the definition of scientific research by a scientific research vessel that deploy fishing gears similar to typical fishing operations may need an exemption from specific fishing regulations. Depending on the monitoring activities, exemptions may be needed for existing possession limits, minimum fish sizes, closure areas, and gear requirements, among other regulations, to support experimental/monitoring activities during trips conducting monitoring activities. Exemption(s) may be obtained by applying for an Exempted Fishing Permit (EFP) from the Regional Administrator. We developed guidance to assist researchers with understanding whether a Letter of Acknowledgement or an EFP is an appropriate document to obtain prior to beginning a project. Further information can be found online at: [https://www.fisheries.noaa.gov/new-england-mid-atlantic/sustainable-fisheries/scientific-research-and-exempting-fishing-permits.](https://www.fisheries.noaa.gov/new-england-mid-atlantic/sustainable-fisheries/scientific-research-and-exempting-fishing-permits) Issuance of an EFP is a federal action that may require ESA section 7 consultation.

Given the complex issues associated with fisheries surveys, we strongly recommend that developers contact NMFS at least one year prior to planned surveys. This will allow for sufficient time to review plans and obtain necessary permits or authorizations. It is our view that pursuing the programmatic ESA consultation noted above will help to streamline future issuance of permits or authorizations for fisheries survey activities associated with wind energy leases. Site characterization activities have the potential to affect existing fisheries or marine mammal data collections that may coincide during the site characterization process. Site characterization activities may include ensonification of the water column and seafloor with vessel-based side scan and multi-beam sonar, coring, grab sampling, and use of shallow ground penetrating high-resolution seismic systems to map bottom and sub-bottom substrates and benthos. These activities could alter benthic and pelagic habitats as well as the distribution and abundance of fisheries resources and protected species that are monitored by federal survey programs. This issue should be thoroughly addressed in the EA, including the potential nature and magnitude of these impacts to existing fisheries or marine mammal data collections that may be carried out during such activities.

Addressing Impacts to Federal Fisheries Surveys in Wind Lease Areas and Northeast Fisheries Science Center Engagement

Wind farm development will have impacts on NMFS long-term scientific surveys and assessments. The impacts will be actuated through four main mechanisms: 1) exclusion of NMFS sampling platforms from the wind development area; 2) impacts on the random-stratified statistical design that is the basis for data analysis and use in scientific assessments, advice, and analyses; 3) the fundamental alteration of benthic, pelagic, and airspace habitats in and around the wind energy development; and, 4) in combination with adjacent developments, impact of sampling efforts outside developed areas by increasing vessel transit time. This will reduce the accuracy and precision of the biological indices derived from these surveys, which are essential for informing fisheries management decisions and ecosystem level assessments and impact the data critical for conservation and recovery of protected species. This compels a need to develop standardized methodologies within and across lease areas for sampling inside of wind farms that are comparable with the long term monitoring that occurs outside of wind farms. In the absence of an established NMFS federal survey mitigation program, any wind farm monitoring plans and approaches should first be developed with these considerations in mind, including the need for appropriate calibration of methods. This work should be coordinated with NOAA's Northeast Fisheries Science Center (NEFSC). NEFSC scientific staff can provide technical assistance and advice, as appropriate, on measures that can be employed to design and execute research and monitoring programs that consider regional survey considerations and needs. Survey plans should follow standardized regional survey designs and methods.

NMFS understands the need to provide enhanced fisheries data stewardship services that can improve access, understanding, and accessibility of important Science Center fisheries data but are limited by available resources at this time. Requests for NOAA NEFSC Data should follow standard procedures for identifying and accessing NMFS data and metadata. NEFSC scientific data holdings, descriptions, and accessibility can be found at NMFS InPort Website (https://inport.nmfs.noaa.gov/inport/) which serves as NMFS enterprise data management program. For further information regarding coordination with the NEFSC, contact: Andy Lipsky, Northeast Fisheries Science Center, andrew.lipsky@noaa.gov.

Conclusion
NMFS recognizes the importance of identifying additional lease areas in working towards the goal of deploying 30 gigawatts of offshore wind power by 2030 and we look forward to working with BOEM and other partners throughout this process. Based on information provided at the April 14, and 16, 2021 New York Bight Task Force Meeting, we understand that you will be soliciting public comment on the draft EA and that later in 2021 you will invite comments on a proposed sale notice. We anticipate providing additional information and comments as this process moves forward, including potentially recommending additional lease conditions to reduce impacts of future surveys and development on our trust resources. Should you have any questions regarding these comments, please contact Sue Tuxbury at susan.tuxbury@noaa.gov or 978-281-9176.

Sincerely,

Michael Pentony
Regional Administrator

ec: Brian Hooker, BOEM
Tom Nies, NEFMC
Chris Moore, MAFMC
Lisa Havel, ASMFC
Lingard Knutson, EPA
Tim Timmerman, EPA

Greg Lampman, NYSERDA
James Gilmore, NYSDEC
Jeffery Zappieri, NYDOS
Jon Hare, NEFSC
Candace Nachman, Helen Chabot, NMFS

New England Fishery Management Council
MID-ATLANTIC FISHERY MANAGEMENT COUNCIL

April 28, 2021

Program Manager, Bureau of Ocean Energy Management
Office of Renewable Energy Programs
45600 Woodland Road (VAM-OREP)
Sterling, Virginia 20166

Re: New York Bight Wind Energy Areas and Environmental Assessment

Dear Sir/Madam,

Please accept these comments from the New England Fishery Management Council (New England Council) and Mid-Atlantic Fishery Management Council (Mid-Atlantic Council) to support preparation of an Environmental Assessment (EA) to consider potential environmental consequences of site characterization activities and site assessment activities associated with issuing wind energy leases in the New York Bight wind energy areas (WEAs). Our comments should also be considered in the context of the forthcoming proposed sale notice.

The New England Council has primary management jurisdiction over 28 marine fishery species in federal waters and is composed of members from Connecticut to Maine. The Mid-Atlantic Council manages more than 65 marine species[1] in federal waters and is composed of members from the coastal states of New York to North Carolina (including Pennsylvania). In addition to managing these fisheries, both Councils have enacted measures to identify and conserve essential fish habitats (EFH), protect deep sea corals, and sustainably manage forage fisheries. The Councils support policies for U.S. wind energy development and operations that will sustain the health of marine ecosystems and fisheries resources. While the Councils recognize the importance of domestic energy development to U.S. economic security, we note that the marine fisheries throughout New England and the Mid-Atlantic, including within the project area and in surrounding areas, are profoundly important to the social and economic well-being of communities in the Northeast U.S. and provide numerous benefits to the nation, including domestic food security.

BOEM has been largely silent on next steps for the New York Bight WEAs since 2018, and now the process is moving quickly towards establishment of lease areas. We believe additional public dialog is greatly needed, as evidenced by the commercial fishery boycott

[1] Fifteen species are managed with specific Fishery Management Plans, and over 50 forage species are managed as "ecosystem components" within the Mid-Atlantic Council's FMPs.

of the April 14 and 16 New York Bight Task Force meeting. Fishing industry representatives communicated the basis for their boycott to BOEM, largely related to their perception that the WEA identification process inadequately considered fishing interests. We agree that it is unclear to what extent the potential lease areas account for the distribution of federally managed fisheries, NOAA surveys, and protected species.

We are very concerned that the pace and number of offshore wind projects already in development in our region pose challenges for thorough analysis of potential impacts, informed public input, and adopting lessons learned from each project. There are over a dozen projects for which survey, design, and environmental review are already occurring. Work on these projects is already taxing available resources in the fishing, fishery management, and fishery science communities, and we expect at BOEM as well. Given these ongoing challenges, this is not the time to rush into additional leases without a robust and public dialog about the potential effects of development in these areas. We recognize that leasing is many steps removed from issuing a permit to construct and operate a wind farm, but it is a critical early step that has the potential to mitigate adverse impacts on marine resources and users.

While some impacts of renewable energy development can be mitigated through permit conditions on a specific project, other effects will be most easily avoided by not leasing certain areas or by establishing conditions associated with a lease. Therefore, it is especially important to proactively gather recent information and additional public comment before finalizing the areas to be leased. We encourage BOEM to take the time now to work with multiple user groups to fully understand the distribution of other ocean uses, and we urge BOEM to accept NOAA Fisheries' offer of assistance in convening additional meetings with fishery stakeholders.

Wind farms impose costs on other ocean users – whether it is a loss of access for resource surveys, or loss of access to fishing grounds, or other impacts. We were glad to hear New York state express concerns over the Fairways North and South areas, and the state's recognition that these are important fishing grounds. These are not, however, the only important fishing areas identified for possible leasing, and close coordination with the fishing industry and NOAA Fisheries will be essential to understand how fisheries might be affected by development in specific areas. Biological and socio-economic baseline characterizations are part of the site assessment process for wind energy leases. The EA should provide a solid foundation for any future site assessment work and must clearly acknowledge the limitations of available fisheries data.

BOEM's memorandum for area identification emphasizes input from the scallop and surfclam fisheries, but the EA should describe all fisheries that operate in the area and should not overly emphasize fisheries with the highest dollar value at the expense of fisheries that might be important for other reasons (e.g., lower value but higher number of participants, an important seasonal fishery, or use as bait in a higher value fishery). The memorandum for area identification describes the Relative Use Index and weighting approach used to evaluate fisheries data (p. 14-15). The details of this approach should be explained in further detail and could provide a data-driven foundation for near-term conversations with fishermen about usage patterns. We recommend updating this analysis with more recent data to reflect activity since 2015.

In addition to understanding fishing activity in potential lease areas, the EA should document patterns of vessel transit. As we understand it, the transit lanes accounted for in the potential lease areas appear to match the input provided by the fishing industry during the March 2019 New York Bight Transit Workshop organized by NYSERDA and RODA, but it would be useful for BOEM to document this consistency more clearly, since the workshop transit proposals are not available publicly for overlay with the lease areas. Tug and tow fairways under development by the United States Coast Guard overlap with potential lease areas as well, and while this issue is beyond our area of expertise, the need to balance multiple competing uses provides another argument for continued public dialog before lease areas are finalized.

BOEM is expected to divide the New York Bight WEAs into multiple lease areas and to limit the number of lease sales per bidder. If all areas are leased, this will result in multiple different developers carrying out site assessment work and eventually construction and operations in adjacent or nearby areas. Surveys should be coordinated across lease areas so that consistent baseline data are collected, considering the recent recommendations of the Responsible Offshore Science Alliance relative to fisheries assessment, and NOAA Fisheries habitat mapping recommendations for seabed characterization. The EA should acknowledge the impacts of wind energy development on fishery, ecosystem, and protected resource surveys. The EA must also account for the impacts of all types of pre-construction monitoring that are expected to occur during the site assessment phase. This would include estimates of cumulative removals of fishery species during baseline surveys and any takes of protected species. While these removals and takes may be minor at the scale of an individual lease, cumulative effects could be significant for some species.

In addition to site assessment and monitoring, it will be essential to coordinate construction and project design across lease areas, for example through use of a standardized turbine layout, to minimize impacts to other ocean users, including commercial and recreational fisheries, search and rescue operations, and scientific surveys. It will be important to identify any restrictions or conditions during leasing to avoid inconsistent approaches within adjacent lease areas. This will benefit developers because they can consider this information when submitting bids. We strongly encourage shared cable routes for neighboring projects to minimize impacts to habitat and fisheries which use mobile bottom-tending gear. This is especially important in areas of the Mid-Atlantic Bight where large sand waves may pose challenges for cable burial.

We appreciate the opportunity to provide comments to ensure that issues of social and ecological importance are considered as BOEM considers leasing areas of the New York Bight for wind energy development. We look forward to working with BOEM to ensure that any wind development in our region minimizes impacts on the marine environment and can be developed in a manner that ensures coexistence with our fisheries. We would be happy to assist in communicating information to the fishing industry through our respective Council processes.

Please contact us if you have any questions.

Sincerely,

Thomas A. Nies

Thomas A. Nies
Executive Director, New England Fishery Management Council

C M Moore

Dr. Christopher M. Moore
Executive Director, Mid-Atlantic Fishery Management Council

cc: J. Beaty, M. Luisi, W. Townsend, J. Bennett, A. Lefton

New England Fishery Management Council

MID-ATLANTIC FISHERY MANAGEMENT COUNCIL

April 28, 2021

Program Manager, Bureau of Ocean Energy Management
Office of Renewable Energy Programs
45600 Woodland Road (VAM-OREP)
Sterling, Virginia 20166

Re: Notice of Intent to Prepare and EIS for the Ocean Wind project

Dear Sir/Madam,

Please accept these comments from the New England Fishery Management Council (New England Council) and Mid-Atlantic Fishery Management Council (Mid-Atlantic Council) regarding the Notice of Intent to prepare an Environmental Impact Statement (EIS) for the Construction and Operations Plan (COP) for the Ocean Wind project off New Jersey. The COP proposes to install up to 98 turbines, 3 offshore substations, 2 onshore connection points, and 383 miles of cables connecting the turbines, substations, and onshore connection points.

The New England Council has primary management jurisdiction over 28 marine fishery species in federal waters and is composed of members from Maine to Connecticut. The Mid-Atlantic Council manages more than 65 marine species[1] in federal waters and is composed of members from the coastal states of New York to North Carolina (including Pennsylvania). In addition to managing these fisheries, both Councils have enacted measures to identify and conserve essential fish habitats (EFH), protect deep sea corals, and sustainably manage forage fisheries. The Councils support policies for U.S. wind energy development and operations that will sustain the health of marine ecosystems and fisheries resources. While the Councils recognize the importance of domestic energy development to U.S. economic security, we note that the marine fisheries throughout New England and the Mid-Atlantic, including within the Ocean Wind project area and in surrounding areas, are profoundly important to the social and economic well-being of communities in the Northeast U.S. and provide numerous benefits to the nation, including domestic food security.

General comments

The pace and number of offshore wind projects in development in our region pose challenges for thorough analysis of potential impacts, informed public input, and adopting lessons learned from each project. There are over a dozen projects for which survey, design, and environmental review are already occurring and multiple additional areas in the New York Bight are planned to be leased. Work on these projects is already taxing available resources in the fishing, fishery

[1] Fifteen species are managed with specific Fishery Management Plans, and over 50 forage species are managed as "ecosystem components" within the Mid-Atlantic Council's FMPs.

management, and fishery science communities, and we expect at BOEM as well. Consistency in approaches and adopting lessons learned from one project to the next will benefit stakeholders who seek to engage in the review process for these complex projects.

Alternatives considered in the EIS

BOEM should consider if additional alternatives beyond a no action alternative and the proposal outlined in the COP are necessary to mitigate impacts to fisheries and habitat. For example, input from fishermen should be sought regarding if the proposed 1 by 0.8 nautical mile layout is sufficient to allow for safe fishing operations and transiting or if additional transit lanes should be considered. In addition, ongoing habitat data collection and analysis may suggest that certain preferred turbine locations should be removed or relocated to minimize impacts to habitat. The EIS should include specific criteria that would result in a preferred turbine location being moved or removed to minimize habitat impacts.

The EIS should also clearly state the extent to which a reduction in the proposed number of 98 turbines is feasible, especially given the recent segmentation of the lease (leaving less space available to move turbine locations) and existing procurements.

The EIS should also be clear on which mitigation measures will be required as opposed to discretionary. Only required mitigation measures should influence the impacts conclusions in the EIS.

Fisheries and habitat considerations

BOEM should coordinate early and often with NOAA Fisheries on the most appropriate data for analysis of potential impacts to fisheries, including fishing and transiting locations, as well as socioeconomic impacts. The EIS should clearly and repeatedly acknowledge the limitations of each data set. Summary information on Council-managed fisheries is also available on the Council websites, www.mafmc.org, and www.nefmc.org, at fishery management plan-specific links, typically via annual fishery information reports (MAFMC) or recent plan amendment or framework documents (both councils).

Commercial and recreational fisheries provide a wide range of benefits to coastal communities; not all are captured by looking only at financial metrics. The EIS should not overly rely on ex-vessel value when assessing and weighting impacts across various fisheries. Focusing on ex-vessel value can mask other important considerations such as the number of impacted fishery participants, the use of a low-value species as bait for a high-value species, or a seasonally important fishery. Models exist to estimate the amount of fisheries revenue generated from within the project area; however, it is important to acknowledge that changes in transit patterns will also have economic impacts and the associated economic impacts will be challenging to accurately quantify.

Commercial, for-hire recreational, and private recreational fishing should be considered separately, but in the same or adjacent sections of the document. As the Councils have stated in comment letters on other wind projects, the grouping of private recreational fishing with recreation and tourism, rather than with commercial and for-hire fisheries, is not intuitive to us and makes it challenging for readers to understand the full picture of potential impacts on all fishery sectors. If fishery species are affected by the project, this will affect both for-hire and private recreational fishing. Grouping both types of recreational fishing would make linkages between biological and fishery conditions more straightforward to explain.

We recognize that data on private angling are very limited; therefore, it will be important to clearly articulate the limitations of the available data and work with local fishermen to understand how the project area is used by recreational fisheries.

The impacts of the project will not be felt only by fishermen from nearby ports; the EIS should consider commercial and recreational fisheries over a wide geographic area that may be impacted by the project. For example, vessels traveling from ports north and south of the project area may transit through and/or fish in the area. Again, BOEM should coordinate with NOAA Fisheries on the best data regarding fishing and transit, the EIS should clearly acknowledge the limitations of the available data, and local fishermen should be consulted to better understand use patterns not captured in the data.

Turbine foundations and their associated fouling communities will create artificial reefs, which are expected to attract certain fishery species (e.g., black sea bass). The EIS should acknowledge that the benefits of this artificial reef effect will vary by target species. For example, any benefit to anglers targeting highly migratory species (e.g., tunas and sharks) could be offset by the inability to anchor or to drift throughout the area. If operators shift their effort outside the project area during construction or long-term operations, this will potentially put them in areas of higher vessel traffic and gear conflict. Also, depending on operating conditions at sea, commercial and recreational fishermen cannot always reap the benefits of any increased catchability of target species due to safety concerns of fishing in swells around the turbines. These safety considerations will be different than the existing artificial reefs in the Greater Atlantic region which, except for the Block Island Wind Farm turbine foundations, are all submerged structures.

The COP proposes connecting the project to shore via three cables along two distinct cable routes to reduce impacts to the onshore power grid. The EIS should explain why the use of multiple cables is needed, develop and analyze alternatives to this approach, and acknowledge that the use of two cable routes greatly increases offshore impacts, including habitat disturbance and modification, as well as safety concerns for fisheries that use bottom tending mobile gear. Specifically, according to table 6.1.1-10 in Volume 1 of the COP, the northern cable route to Oyster Creek is much longer than the southern route to BL England (71 miles and 32 miles, respectively). The New England Council's submarine cables policy recommends that when cable burial is not possible, cables should be protected with materials that mimic natural, nearby habitats where possible. It would be helpful to identify the characteristics of any cable protection materials, should burial depths of 4-6 feet not be achieved, because these materials contribute to the net amount of complex habitat that would exist in the area once the project is constructed.

The EIS must complete a thorough evaluation of impacts at cable landfall sites, particularly in cases where complex, vegetated coastal habitats occur in both Barnegat Bay and Great Egg Harbor. The northern cable route could disturb 20 acres of submerged aquatic vegetation (SAV; table 2.2.5-6 in Volume 2 of the COP), while the proposed southern cable route is not expected to disturb SAV. Impacts to these habitats should be minimized by choosing burial approaches that limit disturbance of the seabed, and restoration of coastal habitats should occur if mitigation does not eliminate impacts during construction. We are encouraged to note that Ocean Wind surveyed SAV at both sites in 2019/2020, since such habitats can and do change in distribution over time. The Councils recommend that BOEM and Ocean Wind work with NOAA Fisheries and local coastal managers to craft an appropriate range of alternatives to minimize impacts within the estuarine portions of the cable routes.

The COP states that offshore cables may or may not be removed during decommissioning, depending on regulatory requirements at the time. It is essential that cables be removed during decommissioning. Abandoned, unmonitored cables could pose a significant safety risk for fisheries that use bottom-tending gear and the long-term risks to marine habitats are unknown.

Cumulative impacts

The EIS must include a meaningful cumulative impacts assessment. We supported the criteria used in the Vineyard Wind EIS for defining the scope of reasonably foreseeable future wind development; however, that scope should now be expanded to include the anticipated New York Bight lease areas, especially because they are in relatively close proximity to this lease.

We have significant concerns about the cumulative impacts of offshore wind development on fishery independent surveys. Major negative impacts to these surveys could translate into greater uncertainty in stock assessments, the potential for more conservative fisheries management measures, and resulting impacts on fishery participants and communities. We are encouraged by BOEM's commitment to working with NOAA on long term solutions to this challenge.

The EIS should also consider how the Ocean Wind project and the other offshore wind projects planned for the east coast may impact the Mid-Atlantic Cold Pool. Impacts to this unique oceanographic feature have implications for stratification and mixing of the water column, primary productivity, and recruitment and migration of many species, including those targeted by commercial and recreational fisheries, as well as protected species. Climate change will also be an essential consideration in the cumulative effects analysis.

Coordination between adjacent projects

The Councils recommend that BOEM require that this project, future projects in the segmented lease area, and projects in the adjacent Atlantic Shores lease area use standardized turbine layouts, consistent survey methodologies, and shared cable routes to the extent possible. This will provide efficiencies for analysis and development and will also help minimize impacts to commercial and recreational fishing, vessel transit, and habitats. In Southern New England, developers voluntarily agreed to a consistent array configuration spanning all lease areas; in the absence of such an agreement here BOEM must take a strong leadership role.

Conclusion

We appreciate the opportunity to provide comments to ensure that issues of social and ecological importance are considered in the forthcoming EIS for the Ocean Wind COP. We look forward to working with BOEM to ensure that any wind development in our region minimizes impacts on the marine environment and can be developed in a manner that ensures coexistence with our fisheries.

Please contact us if you have any questions.

Sincerely,

Dr. Christopher M. Moore
Executive Director, Mid-Atlantic Fishery Management Council

Thomas A. Nies
Executive Director, New England Fishery Management Council

cc: J. Beaty, M. Luisi, W. Townsend, J. Bennett, A. Lefton

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
GREATER ATLANTIC REGIONAL FISHERIES OFFICE
55 Great Republic Drive
Gloucester, MA 01930-2276

April 27, 2021

Ms. Michelle Morin
Program Manager
Office of Renewable Energy
Bureau of Ocean Energy Management
45600 Woodland Road
Sterling, VA 20166

RE: Docket Number BOEM-2021-0024
Scoping Comments for the Notice of Intent to Prepare an Environmental Impact Statement for Ocean Wind LLC's Proposed Wind Energy Facility Off New Jersey

Dear Ms. Morin:

We have reviewed the March 30, 2021, *Federal Register* Notice of Intent (NOI) to prepare an Environmental Impact Statement (EIS) for Ocean Wind LLC's proposed wind energy facility off the coast of New Jersey within the northern portion of the BOEM Renewable Energy Lease Area OCS-A 0498. The Bureau of Ocean Energy Management (BOEM) intends to prepare an EIS to consider the approval of a Construction and Operations Plan (COP) submitted by Ocean Wind LLC, and analyze the construction and operation of up to a 98 wind turbine generator (WTG) wind energy facility off New Jersey approximately 15 miles southeast of Atlantic City, New Jersey. The WTGs would connect via a transmission cable to a grid in Ocean and Cape May Counties, New Jersey. The project would be located in water depths ranging from 15 to 36 meters (approximately 49 to 118 feet). The project would also include submarine cables between the 98 WTGs (inter-array cables), 3 offshore substations, substation interconnector cables, and 2 onshore substations and an operations and maintenance facility in Atlantic City. According to information provided in the draft COP, the proposed project would involve WTGs spaced approximately 1.5 to 1.9 km (0.8 to 1.0 nautical miles) apart within the lease area. Port facilities in New Jersey, Virginia, or North Carolina could support offshore installation activities and/or cable staging areas.

The NOI commences the public scoping process for identifying issues and potential alternatives for consideration in the Ocean Wind COP EIS. Through the NOI, BOEM is requesting information on significant resources and issues, impact-producing factors, reasonable alternatives (e.g., size, geographic, seasonal, or other restrictions on construction and siting of facilities and activities), and potential mitigation measures to be analyzed in the EIS. This letter responds to your request for information as a cooperating agency on this project with legal jurisdiction and special expertise over marine trust resources, and as a consulting agency under the Magnuson-Stevens Fishery Conservation and Management Act (MSA), the Fish and Wildlife Coordination Act (FWCA) and section 7 of the Endangered Species Act (ESA). We are also an action agency for this project to the extent NOAA provides Incidental Take Authorizations (ITAs) under the Marine Mammal Protection Act (MMPA). If deemed sufficient to do so, we will rely on and adopt your Final EIS to satisfy our independent legal obligations to prepare an adequate and sufficient analysis under the National Environmental Policy Act (NEPA) and the regulations published by the Council on Environmental Quality (CEQ regulations (2020)) in support of our proposal to issue the MMPA ITA for the proposed project.

In our role as a Cooperating Agency under NEPA, we offer the following comments and technical assistance related to significant issues, information and analysis needs for the EIS related to resources in the project area over which we have special expertise or legal jurisdiction, including associated consultation and authorization requirements. Data related to the occurrence and status of these resources, evaluation of effects to them, and development of responsive mitigation are critical elements of the NEPA process, which require early identification of such issues in the scoping process and full evaluation throughout the NEPA process.

General Comments on the COP

We rely on the information in the Ocean Wind COP to help inform the comments and technical assistance provided during the scoping process. Changes and updates to the COP will affect our ability to provide detailed, site-specific information to assist in the development of the EIS and undertake the required consultations. During a March 2, 2021, interagency meeting, BOEM indicated that the March 2021 COP will be updated in August 2021 to include additional information on submerged aquatic vegetation (SAV), marine archeological surveys, and acoustic modeling data. While the absence of this information may be sufficient to meet BOEM's regulations regarding the COP completeness and sufficiency review, this information is a critical component for our consultations and project review and will require additional staff time to evaluate. We may need to provide additional comments and technical assistance upon review of the updated information, including potential alternatives to minimize and mitigate impacts of the project on marine and estuarine resources. To reduce the potential need for multiple reviews, supplemental technical assistance comments, and project delays, we recommend BOEM ensure that project information is complete before initiating future projects or continuing to advance the process for existing projects. Early coordination with us to discuss information needs would help prevent inefficiencies and confusion that can result from multiple reviews.

Critical information is missing from the March 2021 COP that is necessary to evaluate this project and help inform the development of the EIS. For example, WTG capacity is not specifically identified, and the design envelope is not defined (e.g., there is no lower limit to anticipated WTG numbers or WTG foundation size). This limits our ability to assess the number and placement of WTGs necessary to meet the project purpose and need while also minimizing impacts to marine resources and existing fishing operations. Further, this information will help determine foundation diameter for WTGs and substations and inform considerations of impacts to marine resources and potential mitigation needs.

Alternatives Analysis

The "Alternatives" section of the EIS should consider and evaluate the full range of reasonable alternatives to the proposed action, including those that would cause less damage to the environment. The analysis should include development of mitigation measures that follow the sequence of avoidance, minimization, and compensation, or offsetting, of adverse impacts. For difficult-to-replace resources such as submerged aquatic vegetation (SAV; inclusive of attached macroalgae and seagrasses), natural hard bottom substrates with epifauna (including corals), and shellfish habitat and reefs, alternatives that avoid impacts to these habitats should be evaluated and given full consideration. To facilitate efficient review of the alternatives, we recommend the alternatives and comprehensive analyses associated with each be grouped into the three corresponding elements of the proposed project: (1) wind farm area; (2) offshore export cable routes and associated corridors; and (3) inshore export cable routes and associated corridors and landfall points. Each element of the proposed project should have multiple alternatives that could be "mixed and matched" in the final selection of the single and complete project.

Alternative locations within the lease area
A full range of reasonable alternatives should be considered despite restrictions to the project area. On March 26, 2021, BOEM approved the segmentation of the original lease area into two portions, designating OCS-A 0498 as the lease area for this project and reserving OCS-A 0532 as a separate project for future development. Further, the project boundaries described in Section 5.1.5 of the COP narrowly define the project such that few options would be considered viable except the proposed action. Together, these decisions limit the number of alternatives that could be considered for this project. Despite these limitations, alternative locations within the lease area and outside of the project boundary defined in the COP should be considered, particularly if such locations would minimize impacts to ecologically sensitive habitats and other marine resources. As we noted with respect to the South Fork Wind project, we remain concerned about the process by which segmentation of the lease area occurs, particularly with little opportunity for input from cooperating agencies. Such segmentation substantially limits the range of alternatives available for consideration for each project, especially alternative WTG locations within the lease area that may reduce impacts on habitat.

Reduced number of WTG locations
Because the segmented lease restricts the size of the potential development area, BOEM should also consider reducing the number of WTG locations within the lease area to reduce impacts to marine resources and associated habitat, while still meeting the purpose and need of the project. For example, we recommend that you consider an alternative that limits or avoids development within areas of the lease that may adversely impact important benthic features, including ridge and swale complexes (inclusive of sand ridges and waves, and their associated troughs and depressions). The EIS should evaluate the most appropriate location for each project component (e.g., WTG, substations, and cables) siting within the lease area. If alternative locations within the larger lease area are not considered, it will be necessary to provide a detailed explanation and justification as to why other areas within the lease were not evaluated.

Alternative layout, location, and spacing
Commercial and recreational fishing are essential components contributing to the economic viability of many coastal communities that must be preserved in the development of the project. Impacts to such users should be minimized to ensure co-existence between fishing and offshore wind development and prevent interference with existing reasonable uses of the lease area.

Alternatives for WTG layout, location, and spacing, particularly related to impacts on fishing and survey vessel operations and transit, are important considerations for the alternatives analysis in the EIS. To that end, we appreciate efforts to consider such operations in the proposed layout specified in the COP instead of the non-orthogonal layout.

Vessel monitoring system (VMS)[1] data used by BOEM to develop polar histograms of vessel operating courses can be used to inform alternative WTG location, layout, and spacing. These data suggest a similar number of vessels operate along both a roughly southwest-northeast course (similar to the proposed layout) while fishing and a north-south course while transiting within the project area. We recommend BOEM continue to work closely with the commercial and recreational fishing communities and the U.S. Coast Guard to ensure WTG spacing and layout alternatives minimize impacts to existing fishing and NOAA Fisheries survey operations, including vessel transit. Similar to the agreement between developers for adjacent Rhode Island and Massachusetts offshore wind projects, coordination with Atlantic Shores Offshore Wind is necessary to ensure that the WTG layout and spacing alternatives developed for this project do not conflict with and result in hazards and safety issues for vessels operating within or navigating through the adjacent projects. BOEM should consider alternatives that increase WTG layout and spacing consistency between these two adjacent projects.

Alternative cable corridor routes and landing sites

A full range of reasonable alternatives to the proposed offshore and inshore export cable corridors and landing site options should also be considered and evaluated to avoid and minimize impacts to sensitive habitats located in the project area. Such sensitive habitats include, but are not limited to, important commercial and recreational fishing areas, artificial reefs, SAV, shellfish reefs, biogenic habitats, coastal marshes, subtidal and intertidal flats (e.g., mudflats), and bay islands. Options for avoiding and minimizing impacts related to the methods of construction and routes that allow for full cable burial to minimize permanent habitat impacts and potential interactions with fishing gear should be considered.

Currently, both offshore export cable corridors cross through and will impact numerous Prime Fishing Areas. Prime Fishing Areas are tidal water areas and water's edge areas that have a demonstrable history of supporting a significant local intensity of recreational or commercial fishing activity. These areas include, but are not limited to, groins, artificial reefs, and features such as rock outcroppings, sand ridges, rough bottoms, aggregates such as cobblestones, coral, shell and tubeworms, slough areas and offshore canyons. Additionally, the northern offshore export cable route corridor alternative (Oyster Creek route) appears to be sited in close proximity (tens to hundreds of meters) to ecologically valuable, well-known artificial reef sites (and Prime Fishing Areas), including Atlantic City Reef, Little Egg Reef, Garden State South Reef, Garden State North Reef, and Barnegat Light Reef. We recommend BOEM work closely with the commercial and recreational fishing industry on cable corridor route alternatives to minimize impacts to existing fishing areas and operations.

The Oyster Creek route is proposed to cross the Barnegat Bay, north of the Barnegat Inlet, where numerous sensitive habitats such as shellfish habitat, SAV beds and habitat, and subtidal and

[1] VMS data is only required for specific vessels.

intertidal flats (e.g., mudflats), and prominent features (e.g., Tices Shoal) occur. The Barnegat Bay-Little Egg Harbor estuary (Barnegat Bay) is one of 28 estuaries located along the Atlantic, Gulf, and Pacific coasts and in Puerto Rico designated as estuaries of national significance. Alternatives that avoid impacts to these habitats and the Barnegat Bay as a whole should be thoroughly evaluated, discussed, and fully considered. BOEM should also be aware that many aquaculture leases are present in Barnegat Bay and should be considered in determining potential cable routing alternatives.

Coordinated cable routing
Offshore export cable routing alternatives that use common corridors with adjacent projects (Atlantic Shores, OCS-A-0499) should be evaluated and discussed. At present, the proposed Oyster Creek route runs parallel to nearly the entirety of lease area OCS-A-0499 as it heads north-northeast toward the Barnegat Bay. For lease areas such as these that are adjacent to one another, BOEM should develop common cable corridors to both increase efficiency and predictability and reduce resource impacts. Specifically, common cable corridors would lead to efficiencies in planning, project development, and benthic habitat mapping, more predictability and time savings for applicants and resource agencies, and comprehensive avoidance and minimization of impacts to marine resources through reducing the number of corridors and allowing for programmatic-level review and comment.

Affected Environment
The "Affected Environment" section of the EIS should cover a sufficient geographic area to fully examine the impacts of the proposed project and support an analysis of the cumulative effects. It is important that the geographic area encompass all project related activities, including the lease area, cable corridors, landing sites, and the use of ports outside of the immediate project area. This analysis should also include any necessary landside facilities and the staging locations of materials to be used in construction. BOEM should ensure that findings for each effect/species are supported by references where possible and in context of the proposed project to allow for a well reasoned and defensible document.

The description of the "Affected Environment" should recognize the ocean environment is not static, and the environment and species within the environment vary over time and seasons. This section should include information on the physical oceanography (temperature, salinity, depth, and dissolved oxygen). It is important that the EIS discuss seasonal changes in the environment or other factors such as the changes in the "cold pool" due to altered hydrodynamic regimes and how they influence the distribution and abundance of marine resources. Within this section, the EIS should include results of on-site surveys, site-specific habitat information, and characterization of benthic communities. Additional details should be provided related to sensitive habitats in the project area, as described above, particularly once new information is available in the updated COP.

The "Affected Environment" section should also include all of the biological, cultural, and socioeconomic issues related to fisheries and marine resources that may be affected by this project, including species that live within or seasonally use the immediate project area and adjacent locations. For benthic resources, fish, and invertebrate species, this section should include an assessment of species status and habitat requirements, including benthic, demersal, bentho-pelagic, and pelagic species and infaunal, emergent fauna and epifaunal species living on and within surrounding substrates. The discussion of commercial and recreational (party/charter and private angler) fisheries affected should assess landings, revenue, and effort; fishery participants, including vessels, gear types, and dependency upon fishing within the project area; potential impacts beyond the vessel owner level (e.g., shoreside support services such as dealers, processors, distributors, suppliers, etc.); and coastal communities dependent on fishing. Our offshore wind socioeconomic impacts page can help identify important commercial and recreational fisheries, while the status of many species can be found on our individual species pages, and recent trends can be found on our Stock SMART page. Information that can help characterize communities engaged in fishing activity can be found on our website describing social indicators for coastal communities and should be integrated into the EIS.

The section describing the "Affected Environment" for protected species should include information on the seasonal abundance and distribution of marine mammals, sea turtles, ESA-listed marine fish, anticipated habitat uses (e.g., foraging, migrating), threats, and the habitats and prey these species depend on throughout the area that may be directly or indirectly impacted by the project. The status of marine mammal stocks (see our stock status reports), population trends, and threats should also be identified. Similar information should also be provided for all ESA listed species (see relevant status reviews on our ESA Species Directory).[2] As the EIS is developed, specificity between species groups (e.g., low frequency vs. mid frequency cetaceans) of marine mammals and sea turtles should be incorporated. A broad grouping approach (e.g., all marine mammals) creates uncertainty and gaps in the analysis and does not fully represent the variability of impacts amongst different taxa. As species within these taxa have different life histories, biology, hearing capabilities, behavioral and habitat use patterns, distribution, etc., project effects may not have the same degree of impact across all species. Thus, the impact conclusions (e.g., minor, moderate) are clearer and better supported if the document describes the degree of impacts to each species (e.g., green sea turtle vs. hawksbill) or groups of species (e.g., mysticetes, odontocetes, pinnipeds). Additionally, for some marine mammal species (e.g., harbor porpoise), data from European wind farms can be used to support each determination. This approach also allows the analysis to better identify the ability of those species or groups to compensate when exposed to stressors and better identify the benefit from mitigation and monitoring measures. This approach would ensure the analysis reduces uncertainty and reflects the best available scientific information. Also, wherever possible, we encourage you to identify effects to individuals (e.g., injury, behavioral disturbance, disrupted foraging), as well as impacts at the population level.

Environmental Consequences

The "Environmental Consequences" section of the EIS must consider impacts resulting from the construction, operation and maintenance, and decommissioning of the proposed facility, including survey and monitoring activities that are anticipated to occur following approval of a COP. Impact descriptions should include both magnitude (negligible, minor, moderate, major) and direction (beneficial or negative). This section should consider all of the individual, direct,

[2] Please note that NOAA Fisheries biological opinions should not be used as a reference unless referring to specific conclusions for which the particular project that the biological opinion was issued. We do not recommend relying on NOAA Fisheries Biological Opinions to support conclusions reached by BOEM for other projects that were not the subject of that Opinion.

and indirect effects of the project, including those impacts that may occur offsite as a result of the proposed project, such as construction of landside facilities necessary to construct and support operations of the Ocean Wind project. Impact producing factors from each phase of development should be considered, including site exploration, construction, operation and maintenance, and decommissioning.

All activities included in construction of the project should be considered, including the deposition of fill material, dredging, water withdrawals, pile driving, increased vessel traffic, anchoring, and transmission cable installation. All relevant impact producing factors affecting marine resources should be evaluated, including, but not limited to, elevated noise levels, increased vessel traffic, turbidity and sedimentation, electromagnetic fields (EMF), habitat alteration, presence of structures (WTGs, substations, and cables), and localized changes in currents. The ecological impacts resulting from the loss of seabed and the associated benthic communities and forage base should be evaluated. This should include a discussion of the ecological and economic impacts associated with habitat conversion (e.g., soft sediments to artificial reef or man-made structural habitat) from WTG, substation, and cable installation. This analysis should also include site-specific benthic data collection and an evaluation of impacts to higher trophic levels due to the loss of prey species. Impacts associated with decommissioning of the project should also be included, with details on how decommissioning would occur and the environmental consequences associated with project removal.

It is important that the analysis provides a sufficient evaluation of baseline conditions and uses the best available information to evaluate the alternatives and support the analysis of effects. Any conclusions related to the level and direction of project impacts should be fully supported by the analysis in the EIS and be consistent with impact definitions identified in the EIS. Importantly, the significance criteria definitions identifying the level of impacts from the project (e.g., negligible, minor, moderate, major) should not embed terms defined by other statutes (e.g., the definition of minor should not refer to the MMPA definition of "level A harassment") or apply other statute definitions to the impact criteria used for NEPA purposes. Rather, these definitions should be written in a way that it is clear to a reader how these impact determinations consider the spectrum of effects to individual animals (e.g., temporary behavioral disturbance, injury). We also encourage you to use definitions that are appropriate for the resource being considered (e.g., benthic habitat vs. marine mammals). To the extent that any conclusions are based on inclusion of mitigation measures, those measures must be clearly defined and include an indication as to whether the measure is considered part of the proposed action and will be required upon approval, or an option that may be implemented by the developer at their own discretion. In preparation of the NEPA document for Ocean Wind, we recommend you review and incorporate comments we have made on previous BOEM documents to ensure a robust and sufficient analysis of NOAA trust resources.

Using the best scientific information available for all marine trust resources is critical to analyzing the impacts resulting from this project. Data used should include a sufficient range of years to reflect natural variability in resource conditions and fishery operations, but also current conditions. We recommend that fisheries and marine resource survey analysis consider at least 10 years of data up to and including data within the past two years. This is especially important for marine mammals given recent distribution and habitat utilization shifts.

Temporary, long-term, and permanent direct and indirect impacts to water quality, protected species, habitats, and fisheries (ecological and economic) throughout construction, operation, and decommissioning should be addressed in the EIS. The temporal classification (e.g., short-term or long-term) should be appropriate for the species and types of impacts considered and should be clearly and consistently defined. The time of year that construction activities occur is also an important factor in evaluating potential biological, economic, and social impacts of the project.

In addition to focused evaluations on protected species, fish, invertebrates, and habitats, the "Environmental Consequences" section of the EIS should include a subsection evaluating impacts to commercial and recreational fisheries. The EIS should discuss biological impacts to marine species caused by the temporary or permanent loss/conversion of bottom habitat (i.e., resource distribution, productivity, or abundance changes) and direct or indirect socioeconomic impacts to commercial and recreational fishing activities and support businesses from project construction and operation such as loss of access to important fishing areas due to the presence of structures (WTGs, substations, cables, scour protection). This evaluation should also include any potential displacement of fishing activities and resulting increased gear conflicts, bycatch, catch rates, and fishing pressure in other locations. When structuring the fishery socioeconomic impact evaluation, BOEM and its contractors should address all of the elements identified in the checklist we provided in January 2021, or explain why specific elements on that checklist were not included in the EIS. As noted above, our fishery socioeconomic impact summaries can and should serve as the foundation for this analysis in the EIS, although additional project-specific analysis may be necessary to address particular impacts or mitigation/compensation arrangements with affected fisheries.

It is vital that all costs and benefits of available alternatives, including the no action alternative, are considered in a cost-benefit analysis. Costs and benefits should include both quantifiable measures (to the fullest extent that these can be usefully estimated) and qualitative measures of costs and benefits that are difficult to quantify, but nevertheless essential to consider (including potential economic, environmental, public health and safety, distributive impacts, equity, etc.).

Because coastal and fishing communities often have large minority and low-income populations, we anticipate Environmental Justice concerns will be included as required under Executive Order 12898 (E.O. 12898, 59 FR 7629; February 16, 1994) Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations. This E.O. requires that "each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations in the United States and its territories…" and take into account E.O. 13985 (86 FR 7009; January 20, 2021) On Advancing Racial Equity and Support for Underserved Communities Through the Federal Government. In addition, for coastal communities that include tribal nations who value the sea and fish to sustain Native American life, projects should also consider E.O. 13175 (65 FR 67249; November 6, 2000), which requires federal agencies to establish regular and meaningful consultation and collaboration with tribal officials where tribal implications may arise.

Mitigation
NEPA requires consideration of potential mitigation from adverse impacts resulting from the construction and operation of the wind energy facility and associated cable installation. The EIS must clearly identify what mitigation measures are included as part of the proposed action and thus evaluated in the analysis, which measures are proposed as required, and measures that are optional and could be implemented by the developer to potentially reduce impacts. The document should provide information on how mitigation measures are considered in the context of the definition of effects levels (e.g. negligible, minor, moderate, major), and how mitigation would offset those levels of effect. An analysis of the effectiveness of any proposed mitigation should also be evaluated in the NEPA document. Measures to avoid and minimize impacts such as speed restrictions for project vessels, soft start procedures, noise dampening technologies, construction timing, anchoring plans, or micro-siting should be discussed in detail, including what resources would benefit from such mitigative measures and how/when such benefits (or impact reductions) would occur. The EIS should analyze temporary effects and anticipated recovery times for marine resources within the impacts analysis.

While the project should be planned and developed to avoid and minimize adverse effects to marine resources and existing uses (fishing and NOAA Fisheries survey operations) to the greatest extent practicable, compensatory mitigation should be proposed to offset unavoidable permanent and temporary impacts. Compensatory mitigation for social and economic losses and ecological losses should be discussed in the EIS, including. This includes any loss of fisheries revenue resulting from the construction and operation of the project, along with any measures to compensate for such losses. Details of compensation plans describing qualifying factors, time constraints, allowed claim frequency, etc. should also be included when possible, particularly if used as mitigation measures to reduce economic impacts from access loss/restriction, effort displacement, or gear damage/loss. Finally, mitigation necessary to offset negative impacts to longstanding marine survey operations (e.g., loss of access to project areas, changes to sampling design, habitat alterations, and reduced sampling due to increased transit time) must also be considered and evaluated in the document.

Cumulative Effects
The EIS should include a complete analysis of the cumulative impacts of the project. This analysis should describe the effects of the proposed project, which in combination with any past, present, and reasonably foreseeable future actions, may result in cumulative impacts on the ecosystem and human environment. This analysis should include a broad view of all reasonably foreseeable activities, including but not limited to, energy infrastructure (including future wind energy projects), sand mining, aquaculture, vessel activity, fisheries management actions, disposal sites, and other development projects. Consistent with efforts to evaluate the cumulative effects for both the Vineyard Wind and South Fork Wind projects, offshore wind development projects that have been approved and those in the leasing or site assessment phase should also be evaluated. Specifically, the cumulative effects analysis should consider all 16 COPs BOEM recently announced it plans to process by 2025. We encourage BOEM to use the final cumulative impact analysis from the Vineyard Wind and South Fork Wind projects to inform discussions of cumulative effects on marine resources from other offshore wind development projects for this EIS. Although BOEM has not conducted lease auctions for the

New York Bight, consideration of the impacts from potential projects in the New York Bight Wind Energy Areas may be warranted, particularly if the lease areas are defined and auctions completed before the EIS for this project has been finalized.

The EIS should evaluate cumulative impacts of project construction, operation and decommissioning. Consideration of impacts from multiple projects is particularly important for migrating species, such as marine mammals, sea turtles, fish, and invertebrates that may use or transit multiple proposed project areas. The potential cumulative impacts on the migration and movements of these species resulting from changes to benthic and pelagic habitats and potential food sources due to the presence of multiple projects should be evaluated in the cumulative effects analysis, including potential effects on the Mid-Atlantic cold pool from cumulative project development in this region.

Assessment of Hydrodynamics and Oceanographic Conditions
An assessment of the potential impacts of the Ocean Wind project-specific (turbine level) and the full build-out/cumulative offshore wind scenario on hydrodynamics and oceanographic and atmospheric conditions will help evaluate impacts on species distribution and the effects to the Mid-Atlantic cold pool. Offshore habitat for a host of commercial and prey species is defined by the formation and breakdown of the cold pool and the water column stratification associated with this physical oceanographic feature. The potential impact of offshore wind development is not well known, but large scale energy extraction from wind farms and the physical presence of wind turbine foundations could have a significant impact on stratification in this region and therefore the ecology, habitat, and prey distribution of a number of protected species and federally managed fish species. We recognize there is uncertainty regarding the scope and scale of impacts that may result from the introduction of new structures into the offshore environment and related energy extraction from the wind turbines; however, it is critical that this issue is thoroughly addressed and that the EIS considers the best available scientific information to support any conclusions regarding these impacts. In particular, the EIS should contain a robust assessment of the potential effects of both the Ocean Wind project and the full build-out scenario on prey resources for North Atlantic right whales and other species. Potential impacts to plankton distribution should be clearly discussed as their distribution, aggregation, and possible abundance may shift, and this could have a significant impact on North Atlantic right whales, among other large whales and plenty of planktivorous pelagic fish, as zooplankton are the primary source of prey for many higher trophic level organisms. In addition, consideration of impacts to species recruitment and larval distribution due to changes to ocean stratification and circulatory patterns resulting from the development of wind projects should be discussed in this section.

Assessment of Overlapping Activities
The EIS should evaluate, in detail, the cumulative impacts on protected species and fisheries resources associated with overlapping construction activity of adjacent projects, including elevated noise levels, displaced fishing effort, cable routing and burial, and changes in species abundance, among other impacts. Specific information related to the timing of the construction activity and the expected number of proposed construction seasons is important, particularly for evaluating cumulative impacts to marine mammals, sea turtles, and spawning activity of fish and invertebrates. Vessel strikes are a documented threat to a number of protected species including

Atlantic sturgeon, sea turtles, and large whales, including critically endangered North Atlantic right whales. The EIS should evaluate, in detail, the cumulative effects of increased vessel traffic during all phases of the project. In addition, an assessment of cumulative impacts of existing and proposed transmission cables should also be considered. Based on the proposed wind development projects in this region, there is the potential for substantial additive impacts associated with the number of required cables. As part of the cumulative effects analysis, measures to minimize the additive impacts should be considered, including the evaluation of designated cable routes and coordination and consolidation with adjacent projects to minimize cumulative impacts.

Assessment of Regional Fishery Impacts
The EIS should evaluate the cumulative impacts of multiple projects on fishing operations, such as changes to time and area fished, gear type used, fisheries targeted, and landing ports. Some fishing vessels operate in multiple areas that may be subject to wind project development, while others may be displaced from one project area and fish in different areas outside the project areas. Therefore, it is important to evaluate how all existing and potential future wind projects could affect overall fishing operations due to effort displacement, shifts from one fishery to another, changes to gear usage and frequency, changes to fishery distribution and abundance, and increased fishing effort due to fishing in less productive areas. The EIS should consider the socio-economic impacts on fishing communities that cannot relocate fishing activity due to cultural norms (fishing grounds claimed or used by others), cost limitations (too expensive to travel greater distances to other fishing areas), and other relevant limiting factors. Shifts in fishing behavior, including location and timing, may result in cumulative impacts to habitat as well as target and bycatch species (both fish and protected species) that have not been previously analyzed in fishery management actions. Accordingly, the analysis should also consider cumulative impacts of this project in the context of existing fisheries management measures. As noted above, the number, layout, and spacing of WTGs in relation to adjacent projects should also be considered in detail and modifications should be made to minimize cumulative impacts of adjacent projects on fishing operations and vessel transit. This is particularly relevant in the absence of an agreement for uniform WTG orientation and spacing with the Atlantic Shores project to the north of Ocean Wind.

Project-specific Monitoring Programs and Regional Surveys
Given the extent of potential offshore wind development on the outer continental shelf and in this region in particular, the cumulative effects analysis will be a critical component of the EIS. The establishment of a regional monitoring program will be important to help understand potential impacts of wind energy projects and identify potential mitigation measures for any future projects. As BOEM is aware, we have been working with state agencies, developers, and research institutions through the Responsible Offshore Science Alliance to develop a regional scientific research and monitoring framework, including project-specific monitoring plan/study guidance to better identify and understand cumulative impacts and interactions between marine resources, fisheries, and offshore wind energy. Similarly, we are engaged in the development of the Regional Wildlife Science Entity in an effort to address regional science and monitoring around impacts to wildlife and protected species. It is imperative that project-specific monitoring efforts are compatible with and can be integrated into existing regional monitoring programs throughout the outer continental shelf. We encourage BOEM to consider requiring

monitoring at all scales and take an ecosystem-based approach to assessing monitoring needs of fisheries, habitat, and protected species. This will be important to not only assess the cumulative impacts of project development, but also to help inform any future development.

Endangered Species Act

The following listed species may be found in the Ocean Wind lease area: Endangered North Atlantic right (*Eubalaena glacialis*), fin (*Balaenoptera physalus*), sei (*Balaenoptera borealis*), and sperm (*Physeter macrocephalus*) whales; endangered Kemp's ridley (*Lepidochelys kempii*) and leatherback (*Dermochelys coriacea*) sea turtles; threatened North Atlantic distinct population segment (DPS) of green (*Chelonia mydas*) sea turtles and Northwest Atlantic DPS of loggerhead (*Caretta caretta*) sea turtles; and five DPSs of Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*). Sea turtles are present in the project area seasonally, with occurrence largely limited to May - November. Additionally, oceanic whitetip shark (*Carcharhinus longimanus*) and giant manta ray (*Manta birostris*) may occasionally occur in the more offshore portions of the project area. More information on these species is available on our regional ESA information site. North Atlantic right whale sightings are available at our NOAA Right Whale Sightings Map page. Please note, we anticipate that the new population estimate for North Atlantic right whales will be significantly lower than the 2019 estimate. Additionally, we would like to alert you that the 2020 draft marine mammal Stock Assessment Reports are available, and we aim to publish the final drafts in May 2021. Additionally, a tech memo containing the new North Atlantic right whale population number will be available in a similar timeframe. There is no designated critical habitat that overlaps with the lease area. We do not have sufficient information on the project to determine if any vessel transit routes would overlap with any designated critical habitat. Depending on vessel traffic routes, additional ESA species may occur in the project area. Please see Attachment 1 to this letter for a list of recommended scientific references for consideration related to the presence of ESA-listed species in or near the lease area.

ESA Section 7 Consultation

Under section 7(a)(2) of the ESA, each Federal agency is required to ensure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of any endangered or threatened species. Because the activities that are reasonably certain to occur following the proposed approval of the Ocean Wind COP (including surveys, construction, operation, and decommissioning) may affect ESA-listed species and/or designated critical habitat, section 7 consultation is required. It is our understanding BOEM will be the lead Federal agency for this consultation, and that BOEM will coordinate with any other Federal agencies that may be issuing permits or authorizations for this project, as necessary, so that we can carry out one consultation that considers the effects of all relevant Federal actions (e.g., issuance of permits by the U.S. Army Corps of Engineers and/or the U.S. Environmental Protection Agency and issuance of any MMPA take authorization by NOAA Fisheries) regarding any wind energy facility proposed in the lease area.

Considerations for the EIS

We expect that any environmental documentation regarding a proposed wind facility in the lease area will fully examine all potential impacts to our listed species, the ecosystems on which they depend, and any designated critical habitat within the action area. We have developed a checklist (ESA Information Needs document) to identify information needs for considering effects of wind projects on ESA-listed species and critical habitats and encourage you to use that as you develop the EIS. We also strongly urge you to carefully consider the information we have provided for the Vineyard Wind and South Fork NEPA documents and to incorporate that into this EIS as appropriate.

The construction and operation of a wind energy facility and installation of subsea electrical cables have the potential to impact listed species and the ecosystems on which they depend. Potential effects of offshore wind energy development on listed species that should be considered by BOEM when making any determinations about construction and operation in the Ocean Wind project area include:

- Potential for an increased risk of vessel strike due to increases in vessel traffic and/or shifts in vessel traffic patterns due to the placement of structures;
- Impacts of elevated noise during any geophysical and geotechnical surveys, pile driving, wind turbine operations, and other activities;
- Any activities which may displace species from preferred habitats, alter movements or feeding behaviors, increase stress and/or result in temporary or permanent injury or mortality;
- Disruption of benthic habitats during construction and conversion of habitat types that may affect the use of the area, alter prey assemblages or result in the displacement of individuals;
- Impacts to water quality through sediment disturbance or pollutant discharge; project lighting as a potential attractant;
- Effects from electromagnetic fields and heat from inter-array and export cable to listed species and their prey (i.e. ability to forage, attraction, etc.); and
- Potential changes to pelagic habitat resulting from the presence of wind turbines.

The EIS should also consider how any proposed wind farm may displace or alter fishing or existing vessel activity that may change the risk to protected species from interactions with fisheries or vessels either within or outside the lease area, including potential risks of interactions with recreational fishing activity around foundations and entanglement in marine debris that may become ensnared on the foundations. Additionally, the EIS should consider effects of any surveys that may occur following potential COP approval that may affect listed species (e.g., gillnet or trawl surveys to characterize fisheries resources), as well as any pre- or post-construction monitoring that may affect listed species. For further information on effects to consider, please refer to the ESA Information Needs document.

It is our understanding BOEM will develop a Biological Assessment (BA) to support BOEM's eventual request for ESA section 7 consultation. While we understand that you intend to prepare the BA as a stand-alone document (i.e., you are not planning for the EIS to serve as the BA), we anticipate and expect that the BA will be an appendix to the EIS. We are not opposed to an approach whereby the EIS would serve as the BA, provided sufficient detail and analyses can be included. We understand the BA and the NEPA document are likely to evaluate effects of activities consistent with a design envelope and are likely to take a "maximum impact scenario" approach to assessing impacts to listed species that may occur. We encourage early coordination with us to determine which impact-producing factors should be analyzed based on a "worst case" or “maximum impact” scenario and which parts of the design envelope would need to be narrowed to carry out a reasonable analysis that would support your request for section 7 consultation.

Through the EIS, BOEM should consider requiring the development of minimization and monitoring measures that minimize the risk of exposure to potentially harassing or injurious levels of noise to marine mammals, sea turtles, and Atlantic sturgeon. Mitigation measures should be required during pile driving that will act to reduce the intensity and extent of underwater noise and avoid exposure of listed species to noise that could result in injury or behavioral disturbance. The use of protected species observers to establish and monitor clearance zones prior to pile driving is essential and project scheduling should take into account the need for adequate visibility during the pre-pile driving clearance period, as well as for the duration of pile driving activities. Real-time and archival passive acoustic monitoring should also be used as a secondary detection/monitoring system during construction, to increase situational awareness in vessel corridors and around the project area, and to monitor the distribution of marine mammals in the lease area during construction and operations. We encourage BOEM to work with Ocean Wind to develop a project schedule that minimizes potential impacts to North Atlantic right whales. Specifically, BOEM should consider time of year restrictions for pile driving that would avoid pile driving during the months when the density of North Atlantic right whales is highest in the lease area and the development of robust measures for other times of year that would minimize the exposure of right whales to noise that could result in behavioral disturbance. Marine mammal responses to sound can be highly variable, depending on the individual hearing sensitivity of the animal, the behavioral or motivational state at the time of exposure, past exposure to the noise which may have caused habituation or sensitization, demographic factors, habitat characteristics, environmental factors that affect sound transmission, and non-acoustic characteristics of the sound source, such as whether it is stationary or moving (NRC 2003). While BOEM and Ocean Wind will need to consider effects to all listed species, given the imperiled status of North Atlantic right whales, implementing measures to ensure that no right whales are injured or killed as a result of the Ocean Wind project is critical.

Mitigation measures should also be included that minimize the risk of vessel strike for whales, sea turtles, and Atlantic sturgeon, including consideration of vessel speed restrictions regardless of vessel size and robust measures to monitor vessel transit routes for North Atlantic right whales. Recent events and new information (see, https://doi.org/10.1111/mms.12745) demonstrate that large whales are susceptible to lethal vessel strikes from vessels of all sizes. Any surveys or monitoring that are carried out related to the project (e.g., gillnet or trap surveys to document fisheries resources) must carefully consider the effects to North Atlantic right whales and other ESA-listed species, and mitigation measures should be considered to eliminate the potential for entanglement of whales and to minimize risk to sea turtles and Atlantic sturgeon during such activities.

Marine Mammal Protection Act
Section 101(a) of the MMPA (16 U.S.C. 1361) prohibits persons or vessels subject to the jurisdiction of the United States from taking any marine mammal in waters or on lands under the jurisdiction of the United States or on the high seas (16 U.S.C. 1372(a)(1), (a)(2)). Sections

101(a)(5)(A) and (D) of the MMPA provide exceptions to the prohibition on take, which give us the authority to authorize the incidental but not intentional take of small numbers of marine mammals, provided certain findings are made and statutory and regulatory procedures are met. Incidental Take Authorizations (ITAs) may be issued as either (1) regulations and associated Letters of Authorization (LOA) or (2) an Incidental Harassment Authorization (IHA). LOAs may be issued for up to a maximum period of five years; IHAs may be issued for a maximum period of one year. We also promulgated regulations to implement the provisions of the MMPA governing the taking and importing of marine mammals (50 Code of Federal Regulations (CFR) part 216) and published application instructions that prescribe the procedures necessary to apply for an ITA. U.S. citizens seeking to obtain authorization for the incidental take of marine mammals under NOAA Fisheries' jurisdiction must comply with these regulations and application instructions in addition to the provisions of the MMPA.

Information about the MMPA and 50 CFR part 216 is available on our website at https://www.fisheries.noaa.gov/topic/laws-policies#marine-mammal-protection-act. Information on the application process is available at https://www.fisheries.noaa.gov/node/23111 and the application along with detailed instructions is available at https://www.fisheries.noaa.gov/national/marine-mammal-protection/apply-incidental-take-authorization.

Because activities associated with the construction of Ocean Wind have the potential to result in the harassment[3] of marine mammals, we anticipate that a request for an ITA pursuant to section 101(a)(5) of the MMPA may be submitted to us by the project proponent. NOAA Fisheries' proposal to issue an ITA that would allow for the taking of marine mammals, consistent with provisions under the MMPA and incidental to an applicant's lawful activities, is a major federal action under 40 CFR 1508.1(q)[4], requiring NEPA review. Rather than prepare a separate NEPA document, NOAA Fisheries, consistent with the CEQ regulations at 40 CFR 1506.3, intends to adopt BOEM's Final EIS to support its decision to grant or deny Ocean Wind LLC's request for an ITA pursuant to section 101(a)(5)(A) or (D) of the MMPA. When we serve as a cooperating agency and we are adopting another agency's EIS, we ensure all resources under our jurisdiction by law and over which we have special expertise are properly described and the effects sufficiently evaluated, documented, and considered by the lead agency EIS. Of particular importance is that the Draft and Final EIS address comments and edits NOAA Fisheries provides in developing the documents. As a cooperating agency per 40 CFR 1501.8, we must determine that the Final EIS properly addresses our comments and input in order for NOAA Fisheries to determine the EIS is suitable for adoption per 40 CFR 1506.3 and NOAA's NEPA procedures[5].

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[3] Harassment, (as defined in the MMPA for non-military readiness activities (Section 3(18)(A)), is any act of pursuit, torment, or annoyance that has the potential to injure a marine mammal or marine mammal stock in the wild (Level A harassment) or any act of pursuit, torment, or annoyance that has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns (Level B harassment). Disruption of behavioral patterns includes, but is not limited to, migration, breathing, nursing, breeding, feeding or sheltering.

[4] All references to the Council on Environmental Quality NEPA regulations included in this letter apply to the 2020 regulations effective September 14, 2020.

[5] NOAA Administrative Order (NAO) 216-6A "*Compliance with the National Environmental Policy Act, Executive Orders 12114, Environmental Effects Abroad of Major Federal Actions; 11988 and EO 13690, Floodplain Management; and 11990, Protection of Wetlands*" issued April 22, 2016 and the Companion Manual for NAO 216-6A "*Policy and Procedures for Implementing the National Environmental Policy Act and Related Authorities*"

A summary of NOAA's adoption requirements is below, and the procedures are available at https://www.nepa.noaa.gov/docs/NOAA-NAO-216-6A-Companion-Manual-01132017.pdf.

We may adopt all or portions (e.g., specific analyses, appendices, or specific sections) of the NEPA document prepared by another federal agency, regardless of cooperating agency status, if the action addressed in the adopted document (or portion) is substantially the same as that being considered or proposed by NOAA, and NOAA determines the document (or portion) satisfies 40 CFR 1506.3. Subsequently, we must determine BOEM's EIS addresses the following to be considered adequate for adoption for the issuance of ITAs:

- The other agency EIS (or portion thereof) fully covers the scope of our proposed action and alternatives and environmental impacts;
- An adequate evaluation of the direct, indirect, and cumulative impacts on marine mammals and the marine environment, including species listed under the ESA;
- An adequate discussion of the MMPA authorization process necessary to support implementation of the action;
- A reasonable range and evaluation of alternatives to the proposed action, including a no action alternative and alternatives to mitigate adverse effects to marine mammals, including species listed under the ESA;
- There is a thorough description of the affected environment including the status of all marine mammals species likely to be affected;
- There is a thorough description of the environmental impacts of the proposed action and alternatives, including direct, indirect, and cumulative impacts on marine mammals and projected estimate of incidental take;
- Identification and evaluation of reasonable mitigation measures to avoid or minimize adverse impacts to marine mammals, including species listed under the ESA; and
- The listing of agencies consulted.

As part of our review, we must also determine if your EIS meets the requirements of 40 CFR Part 1500-1508, specifically basic requirements for an EIS as described in 40 CFR 1506.3. Therefore, the EIS must contain an adequate evaluation of the impacts on all marine mammals that may be present in the project area. In order to take a requisite "hard look" at environmental impacts, the analysis should consider the affected environment and degree of impact on each resource which involves an evaluation of direct and indirect effects, as well cumulative effects; the duration of the impact; whether it is beneficial or adverse and the geographic scale in which the action is occurring (e.g., local, regional). Specifically, the EIS must include an analysis of the impacts of elevated underwater noise on marine mammals resulting from pile driving, site characterization surveys, and other project-related activities; the risk of vessel strike due to increases in vessel traffic and/or changes in vessel traffic patterns; any activities that may increase the risk of entanglement; any activities that may result in the displacement of individuals or changes to migratory behavior; any activities that may result in altered prey assemblages or changes in feeding behavior; and any other activities that may result in harassment, injury or mortality to marine mammals.

Magnuson-Stevens Fishery Conservation and Management Act
As currently described in the NOI, this facility (inclusive of the wind farm area, offshore and

issued January 13, 2017.

inshore export cables and corridors, and shoreside landing points) will be constructed, operated, and maintained in areas designated Essential Fish Habitat (EFH) for various life stages of nearly every species managed by the New England Fishery Management Council (NEFMC), Mid-Atlantic Fishery Management Council (MAFMC), and NOAA Fisheries. The area is also designated EFH for species managed by the South Atlantic Fishery Management Council (SAFMC). Species for which EFH has been designated in the project area include, but are not limited to, bluefish (*Pomatomus saltatrix*), black sea bass (*Centropristis striata*), scup (*Stenotomus chrysops*), summer flounder (*Paralichthys dentatus*), windowpane flounder (*Scophthalmus aquosus*), winter flounder (*Pseudopleuronectes americanus*), yellowtail flounder (*Limanda ferruginea*), winter skate (*Leucoraja ocellata*), Atlantic sea scallop (*Placopecten magellanicus*), and Atlantic surfclam (*Spisula solidissima*). The proposed project area is also designated EFH for several Atlantic highly migratory species (tuna, swordfish, billfish, small and large coastal sharks, and pelagic sharks) including, but not limited to, Atlantic angel shark (*Squatina dumeril*), blue shark (*Prionace glauca*), bluefin tuna (*Thunnus thynnus*) sandbar shark (*Carcharhinus plumbeus*) and sand tiger shark (*Carcharias taurus*). The sand tiger shark has been listed as a Species of Concern by NOAA. The project area is also designated as EFH for Spanish mackerel (*Scomberomorus maculatus*) and king mackerel (*Scomberomorus cavalla*).

The most up-to-date EFH and Habitat Areas of Particular Concern (HAPC) designations should be used in BOEM's evaluation of impacts to EFH. HAPCs are a subset of EFH that are either rare, particularly susceptible to human-induced degradation, especially important ecologically, or located in an environmentally stressed area. EFH and HAPC for species managed by the NEFMC have been modified under the Omnibus Amendment which was approved and implemented in 2018. The EFH mapper can be used to query, view, and download spatial data for the species managed by the New England, Mid-Atlantic, and South Atlantic Councils and for Highly Migratory Species. The EFH mapper can be accessed from our habitat website at https://www.habitat.noaa.gov/protection/efh/efhmapper/. BOEM should also be aware that the Final Amendment 10 to the 2006 Consolidated Atlantic Highly Migratory Species (HMS) Fishery Management Plan (FMP) went into effect on September 1, 2017. This amendment contains several changes to the EFH designations for sharks and other highly migratory species. More information can be found on our website at https://www.fisheries.noaa.gov/topic/atlantic-highly-migratory-species.

EFH Consultation

The MSA requires federal agencies to consult with the Secretary of Commerce, through NOAA Fisheries, with respect to "any action authorized, funded, or undertaken, or proposed to be authorized, funded, or undertaken, by such agency that may adversely affect any essential fish habitat (EFH) identified under this Act," 16 U.S.C. § 1855(b)(2). This process is guided by the requirements of our EFH regulation at 50 CFR 600.905. Pursuant to the MSA, each FMP must identify and describe EFH for the managed fishery, and the statute defines EFH as "those waters and substrates necessary to fish for spawning, breeding, feeding or growth to maturity" 16 U.S.C. § 1853(a)(7) and § 1802(10). NOAA's regulations further define EFH adding, "waters" include aquatic areas and their associated physical, chemical, and biological properties that are used by fish and may include aquatic areas historically used by fish where appropriate; "substrate" includes sediment, hard bottom, structures underlying the waters, and associated biological communities; "necessary" means the habitat required to support a sustainable fishery and the managed species' contribution to a healthy ecosystem; and “spawning, breeding, feeding, or growth to maturity” covers a species' full life cycle.

The EFH final rule published in the *Federal Register* on January 17, 2002, defines an adverse effect as: “any impact which reduces the quality and/or quantity of EFH.” The rule further states that:

> An adverse effect may include direct or indirect physical, chemical, or biological alterations of the waters or substrate and loss of, or injury to, benthic organisms, prey species and their habitat and other ecosystems components, if such modifications reduce the quality and/or quantity of EFH. Adverse effects to EFH may result from action occurring within EFH or outside EFH and may include site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions.

As stated above, adverse impacts to EFH may result from actions occurring within or outside of areas designated as EFH. In addition, the EFH final rule also states that the loss of prey may be an adverse effect on EFH and managed species. As a result, actions that reduce the availability of prey species, either through direct harm or capture, or through adverse impacts to the prey species' habitat may also be considered adverse effects on EFH. The EFH regulations state that for any Federal action that may adversely affect EFH, Federal agencies must provide NOAA Fisheries with a written assessment of the effects of that action on EFH (50 CFR 600.920(e)). This EFH Assessment should include analyses of all potential impacts, including temporary and permanent and direct and indirect individual, cumulative, and synergistic impacts of the proposed project.

The EFH assessment must contain the following mandatory elements: (i) a description of the action, (ii) an analysis of the potential adverse effects of the action on EFH and the managed species, (iii) the federal agency’s conclusions regarding the effects of the action on EFH, and (iv) proposed mitigation, if applicable (50 CFR 600.920(e)(3)). Due to the potential for substantial adverse effects to EFH from the proposed project, an expanded EFH consultation as described in 50 CFR 600.920(f) is necessary for this project. As part of the expanded EFH consultation, the EFH Assessment for the proposed project, the assessment should also contain additional information, including: (i) the results of an on-site inspection to evaluate the habitat and the site specific effects of the project, (ii) the views of recognized experts on the habitat or species that may be affected, (iii) a review of pertinent literature and related information, (iv) an analysis of alternatives to the action, and (v) other relevant information.

The EFH expanded consultation process allows the maximum opportunity for NOAA Fisheries and the Federal action agency - in this case, BOEM - to work together to review the action's impacts on EFH and federally managed species, and for NOAA Fisheries to develop EFH conservation recommendations (EFH CRs). Although the EFH consultation is a separate review mandated pursuant to the MSA, our EFH regulations encourage the consolidation of the EFH consultation with other interagency consultation, coordination, and environmental review procedures required by other statutes, such as NEPA, where appropriate. Because the information contained within the EIS is needed to support a complete EFH Assessment, we request BOEM use the NEPA document as the vehicle within which to present the EFH assessment. The EFH Assessment should be included within a separate section or appendix of the document and be clearly identified as an EFH assessment.

Considerations for the EFH Assessment

The expanded EFH Assessment and the assessment should include full delineation, enumeration, and characterization of all habitat types in the project area including the lease areas, cable corridors and landing sites. Particular attention should be paid to HAPCs, sensitive life stages of species, ecologically sensitive habitats, and difficult-to-replace habitats such as SAV, natural hard bottom substrates with epifauna (including corals), and shellfish habitat and reefs. However, the habitat mapping data should also be shared directly with us in usable GIS format for review, apart from the body of the EFH Assessment and maps and figures contained therein. To aid BOEM and project applicants in the development of comprehensive and complete EFH Assessments, we have published our *Recommendations for Mapping Fish Habitat*, dated March 2021. This document is an updated version, which was previously submitted to BOEM on May 27, 2020. To further streamline the consultation process, we have also shared a technical assistance document with BOEM in January of 2021, titled *Essential Fish Habitat (EFH) Information Needs for Offshore Wind Energy Projects in the Atlantic* which provides a checklist of information that should be incorporated into the EFH Assessment.

As stated in our habitat mapping recommendations, EFH checklist, and through regular communication with BOEM, early coordination in the consultation process, particularly for projects at the size and scale of offshore wind development, is essential. We are concerned about the lack of early coordination and communication for the Ocean Wind project, particularly the lack of coordination on habitat mapping and data collection. As we have previously discussed, early coordination on proposed habitat mapping procedures, including: 1) data collection (sampling design, sites, replication, and sampling methodology); 2) data processing and interpretation; and 3) the development of maps that accurately characterize and delineate fish habitat, benefits all parties and will help avoid unnecessary delays in project development and consultations. It is critical that the data being collected can be used to accurately characterize and delineate fish habitat within the lease area and cable corridors to ensure we can differentiate areas of sensitive and complex habitats and provide appropriate conservation recommendations. Adjustments to early survey plans based on our input will likely result in significantly better habitat data, which will streamline project review. Moving forward with habitat mapping efforts without appropriate coordination may result in the need for additional field seasons/sampling to collect and interpret additional data to accurately map fish habitat for consultation purposes.

In the absence of accurate fish habitat data, we must take a conservative approach to our assessment of project impacts and development of conservation recommendations for the project. We recommend a habitat mapping-specific meeting be scheduled with us for the Ocean Wind Project as soon as practicable. Additionally, we recommend all data related to habitat mapping (acoustic survey results, seafloor sampling data, GIS data, figures/maps, etc.) be shared with us as soon as practicable (once it is processed), so we can begin reviewing and providing comments, which will allow for more streamlined project review and consultation. To further assist you in the development of a complete and sufficient EFH Assessment and to inform the Fish and Wildlife Coordination Act (FWCA) consultation, we plan to provide additional technical assistance in a separate letter.

Fish and Wildlife Coordination Act

The FWCA provides authority for our involvement in evaluating impacts to fish and wildlife from proposed federal actions that may affect waters of the United States. The FWCA requires that wildlife conservation be given equal consideration to other features of water resource development programs through planning, development, maintenance and coordination of wildlife conservation and rehabilitation. The Act does this by requiring federal action agencies to consult with us "with a view to the conservation of wildlife resources by preventing loss of and damage to such resources as well as providing for the development and improvement thereof in connection with such water-resource development" (16 USC 662.) One of the reasons that Congress amended and strengthened the FWCA in 1958 was that it recognized that "[c]ommercial fish are of major importance to our nation[,]" and that federal permitting agencies needed general authority to require "in project construction and operation plans the needed measures for fish and wildlife conservation" S.Rep. 85-1981 (1958). As a result, our FWCA recommendations must be given full consideration by federal action agencies. BOEM's consultation with us under the FWCA may occur concurrently with the EFH consultation under the MSA.

Under the FWCA, our authority extends to numerous other aquatic resources in the area of the proposed project, including, but not limited to, the following species and their habitats: American lobster (*Homarus americanus*), striped bass (*Morone saxatilis*), American shad (*Alosa sapidissima*), alewife (*Alosa pseudoharengus*) and blueback herring (*Alosa aestivalis)* (collectively known as river herring), blue crab (*Callinectes sapidus*), Atlantic menhaden (*Brevoortia tyrannus*), Atlantic silversides (*Menidia menidia*), bay anchovies (*Anchoa mitchilli*), oyster (*Crassostrea virginica*), blue mussel (*Mytilus edulis*), horseshoe crab (*Limulus polyphemus*), tautog (*Tautoga onitis*), spot (*Leiostomus xanthurus*), weakfish *(Cyanoscion regalis)* and other assorted fish and invertebrates (e.g., *Neomysis americana, Mysidopsis bigelowi*). NOAA jointly manages a number of these species through Interstate FMPs with the Atlantic States Marine Fisheries Commission. A list of Commission species and plans can be found on their website at http://www.asmfc.org.

We anticipate all of these species will be included in your impact assessments, both in the EFH Assessment and NEPA document. We also expect the assessment to include impacts to the recreational and commercial fishing communities that rely on these species. The behaviors and habitat needs of diadromous and estuary-dependent fishes (associated with cable route locations) may not be represented by a discussion solely of the surrounding marine fishes in the wind WTG area. The discussion for FWCA species should be designed around an ecological guild model that uses locally important species to evaluate the project impacts to organisms or populations associated with the various trophic levels and life history strategies exhibited by FWCA species known to occupy the project area as residents or transients. Focus should be on issues surrounding particular species, life history stages, or habitat components that would be most susceptible to the various potential project impacts.

Fisheries Management Comments

Species important to both commercial and recreational interests are found within the project area and associated cable corridors. The COP adequately identifies most species and fisheries that may be affected by the proposed operations. As noted in our socioeconomic impact summary report for this project, Atlantic menhaden, surfclam, scallops, and channeled whelk are the primary commercial fisheries affected. Because lobster vessels are only required to submit vessel trip reports (VTRs) if they are issued a Federal permit for another species (many are not), lobster and Jonah crab operations are not fully captured in available VTR data and are underrepresented in our socioeconomic impact summary report. Similarly, information on highly migratory species catch are only partially captured in VTRs available from the Greater Atlantic Regional Fisheries Office and are instead found in VTRs available from our Southeast Regional Office and the large pelagic survey (available at this link). We are developing summaries of party/charter recreational fishing operations similar to those created for commercial fishing vessels and will post them on our website once available and can distribute the data upon request. However, private angler recreational catch data are not collected with sufficient area precision to determine the amount of catch inside a particular wind project area. Despite this limitation, the project area is likely to affect important regional recreational fisheries and a discussion of private angler catch should be included in the EIS. Any requests for fishery data should be submitted to nmfs.gar.data.requests@noaa.gov.

BOEM should utilize information from all available and appropriate sources to characterize fishing operations and evaluate the potential impacts of the proposed project on private anglers, commercial and party/charter fishing vessels, and associated communities. As noted above, consideration of data across a broad time frame (10 years or more), including data from the most recent 2 years, is necessary to reflect both recent operations and annual fluctuations in fishing operations due to changing environmental conditions, market price, and management measures. As such, the COP and future EIS should include the most recent information available. We rely on VTRs as the best source of area-based data for all federally-managed commercial and party/charter fisheries. Both vessel monitoring system (VMS) and automatic identification system (AIS) data provide higher resolution spatial data, but such sources are not adequate to provide information on all commercial fisheries or fishing vessels. In evaluating the use of existing data sources, please refer to the list of data limitations provided in our January 2021 socioeconomic checklist. When using such data to analyze the impacts of the proposed project, BOEM should recognize such limitations and tailor impact conclusions based on the data used. Care should be taken to put operations into the proper context in future analysis to avoid mischaracterizing fishing operations and potential impacts associated with the proposed project.

Like many wind projects, it is important to recognize that fishing operations in any one area are not necessarily limited to vessels operating in adjacent ports. Our summary reports indicate that vessels from Maryland, Massachusetts, Rhode Island, and Virginia operate in the project area along with vessels from New Jersey and New York. While the COP provides information on some of these states and ports, not all are included. For example, vessels from New Bedford, MA, operate in this area, but that port is not discussed in the description of affected ports. Operations and associated landings in all ports and states should be considered in future evaluations of this project as part of the EIS.

A quantitative analysis of the potential biological, social and economic costs of the project to fishing industries and their communities must be included in the EIS. As noted above, we have provided a checklist outlining the elements we expect to be included in an analysis of the socioeconomic impacts of this project. Our previously referenced socioeconomic impact summaries address nearly all of the elements on the checklist and can be used as the foundation of such an analysis. The analysis should also address potential costs associated with reduced fishing revenues as a result of short or long-term effort displacement, impacts on catch rates, changes to species composition, potential impacts of construction activity on spawning success and future recruitment, and permanent or short-term changes to EFH during construction, operation, and decommissioning the project. Opportunity costs such as revenue lost by fishing effort that is displaced into less productive areas, including vessels displaced out of the project area and those already fishing in an area into which displaced vessels move, and the potential for poor recruitment resulting from construction activities should be assessed. This is a critical analysis, as even marginal changes in costs could be impactful for some fisheries. Similarly, analysis of the affiliated non-market social impacts of such activities should be included in the EIS, including impacts to cultural norms, fishermen or fishing community social relationships, and health and well-being (see Fisheries Social Impact Assessment Guidance Document https://media.fisheries.noaa.gov/dam-migration/01-111-02.pdf and Practitioner's Handbook https://spo.nmfs.noaa.gov/sites/default/files/TM212_0.pdf). Finally, the EIS should consider and discuss any mitigation measures contemplated to reduce any adverse impacts to fishing operations, particularly those due to loss of area access or gear damage/loss.

Presence of structures is an impact producing factor relevant to commercial and recreational fishing that should be addressed in the EIS. This factor is not listed in Section 2.3.4.2 of the current version of the COP. The EIS should provide a detailed analysis of how the presence of project structures (e.g., WTGs, substations, and cables), including layout and spacing, would affect fishing gear operation, including the ability for vessels to maintain maneuverability and minimize risk of fouling gear with other gear or with such structures. Specifications of all gear types operating in the project area should be compiled and incorporated into this analysis. This analysis should consider both fishing vessels and survey vessels, including state and federal fisheries surveys.

Effects and Impacts on Federal Fisheries Surveys & Stock Assessments
As noted for other wind development projects, the Ocean Wind Project is anticipated to have major adverse impacts on NOAA Fisheries Northeast Fisheries Science Center scientific surveys, which will, in turn, result in adverse impacts on fishery participants and communities and on the American public who consume seafood. This project would have direct impacts on the federal multi-species bottom trawl survey conducted on the FSV Henry Bigelow, the surfclam and ocean quahog clam dredge surveys conducted on chartered commercial fishing platforms, the integrated benthic/sea scallop habitat survey, ship and aerial-based marine mammal and sea turtle surveys, and the shelf-wide Ecosystem Monitoring Survey (Ecomon). Based on standard operating practices conducted by the NOAA Office of Marine & Aviation Operations, wind WTG arrays would preclude safe navigation and safe and effective deployment of mobile survey gear on NOAA ships. The impacts to our surveys from this project will be driven by four main mechanisms: 1) exclusion of NMFS sampling platforms from the wind development area, 2) impacts on the random-stratified statistical design that is the basis for data analysis and use in scientific assessments, advice, and analyses; 3) the alteration of benthic, pelagic, and airspace habitats in and around the wind energy development; and 4) potential reductions in sampling

outside wind areas caused by potential increased transit time by NOAA vessels. Adverse effects on monitoring and assessment activities would directly impact the critical scientific information used for fisheries management and the recovery and conservation programs for protected species. These impacts would result in increased uncertainty in the surveys' measures of abundance, which could potentially lead to lower quotas for commercial and recreational fishermen and lower associated fishing revenue based on current fishery management council risk policies. These impacts will occur over the lifetime of wind energy operations at the project area and in the region (to at least 2050).

Given the anticipated development of offshore wind in our region, it is critical to expeditiously establish and implement a regional federal survey mitigation program to address this significant issue. Such a survey mitigation program would include the following elements:

1. Evaluation of survey designs;
2. Identification and development of new survey approaches;
3. Calibration of new survey approaches;
4. Development of interim provisional survey indices;
5. Integration of project-specific monitoring plans to address regional survey needs; and
6. Development of new data collection, analysis, management, and dissemination systems.

Information from project-specific mitigation plans will be critical inputs to the development and implementation of any future regional survey mitigation program. As project monitoring plans are further considered and developed, these approaches should be standardized, meet existing survey protocols, and calibrated to and integrated with federal regional surveys until such time as a programmatic federal survey mitigation program is established. Text provided in documents prepared for other projects with similar impacts can be used to inform the assessment of survey impacts for this project. We encourage BOEM to work closely with us to ensure potential impacts to our survey operations and consequent effects to fisheries stock assessments, fishery management measures, and protected species conservation efforts are evaluated in the EIS for this and other projects, including any efforts to mitigate such impacts.

Conclusion

Thank you for the opportunity to provide comments during this important scoping process. We will continue to support the Administration's efforts to advance offshore renewable energy through our participation in the offshore wind development regulatory and planning processes. As we engage in these processes, we are committed to implementing our national strategic goals to maximize fishing opportunities while ensuring the sustainability of fisheries and fishing communities, and to recover and conserve protected species while supporting responsible fishing and resource development. To the extent possible, we will continue working with you to provide the necessary expertise, advice, and scientific information to avoid areas of important fishing activity and sensitive habitats; minimize impacts to fisheries and protected species; and support the conservation and sustainable management of our marine trust resources.

Moving forward, we have serious concerns that the high number of projects BOEM intends to initiate and potentially approve by the end of 2024 will make it very difficult for NOAA Fisheries to provide the detailed level of review and interagency cooperation we have provided to date given existing resources. The extensive interagency coordination we have done with

BOEM to improve the NEPA documents for other wind projects will no longer be feasible, and we will be required to take a more limited cooperating agency role in the process. To ensure we can continue to meet our collective objectives and ambitious timelines, it is imperative that we capitalize and build upon our successful collaboration on recent projects and integrate lessons learned into future project development and review. This will improve the quality of future projects, expedite review, and maximize the utility of available resources.

Should you have any questions regarding these comments, please contact Sue Tuxbury in our Habitat and Ecosystem Services Division at (978) 281-9176 or susan.tuxbury@noaa.gov. For questions regarding EFH and habitat issues, please contact Keith Hanson in our Habitat and Ecosystem Services Division at (440) 532-9327 or keith.hanson@noaa.gov. For questions regarding ESA and section 7 comments, please contact Julie Crocker in our Protected Resources Division at (978) 282-8480 or Julie.Crocker@noaa.gov. For questions regarding MMPA Incidental Take Authorizations, please contact Jaclyn Daly in the Office of Protected Resources at (301) 427-8438 or jaclyn.daly@noaa.gov.

Sincerely,

Michael Pentony
Regional Administrator

cc: Brian Hooker, BOEM
Mary Boatman, BOEM
Tom Nies, NEFMC
Chris Moore, MAFMC
Lisa Havel, ASMFC
Lingard Knutson, EPA
Tim Timmerman, EPA
Greg Lampman, NYSERDA
James Gilmore, NYSDEC
Jeffery Zappieri, NYDOS
Dan McKiernan, MADMF
Lisa Engler, MACZM
Jeffrey Willis, RICRMC
Julia Livermore, RIDEM
Jon Hare, NEFSC
Greg Power, NOAA Fisheries APSD
Candace Nachman, NOAA Fisheries Policy

Reference

National Research Council (NRC). 2003. Ocean noise and marine mammals. National Academy Press; Washington, D.C.

Attachment 1

Suggested Scientific References Regarding Use of the Project Area by ESA-Listed Species

Atlantic sturgeon

Breece, M. W. (2017). *Habitat utilization of Atlantic sturgeon Acipenser oxyrinchus oxyrinchus in the Delaware River, Bay and coastal Atlantic Ocean* (Doctoral dissertation, University of Delaware).

Breece, M. W., Fox, D. A., Dunton, K. J., Frisk, M. G., Jordaan, A., & Oliver, M. J. (2016). Dynamic seascapes predict the marine occurrence of an endangered species: Atlantic Sturgeon Acipenser oxyrinchus oxyrinchus. *Methods in Ecology and Evolution*, *7*(6), 725-733.

Breece, M. W., Fox, D. A., Haulsee, D. E., Wirgin, I. I., & Oliver, M. J. (2018). Satellite driven distribution models of endangered Atlantic sturgeon occurrence in the mid-Atlantic Bight. *ICES Journal of Marine Science*, *75*(2), 562-571.

Dunton, K. J., Jordaan, A., McKown, K. A., Conover, D. O., & Frisk, M. G. (2010). Abundance and distribution of Atlantic sturgeon (Acipenser oxyrinchus) within the Northwest Atlantic Ocean, determined from five fishery-independent surveys. *Fishery Bulletin*, *108*(4), 450.

Dunton, K. J., Jordaan, A., Conover, D. O., McKown, K. A., Bonacci, L. A., & Frisk, M. G. (2015). Marine distribution and habitat use of Atlantic sturgeon in New York lead to fisheries interactions and bycatch. *Marine and Coastal Fisheries*, *7*(1), 18-32.

Erickson, D. L., Kahnle, A., Millard, M. J., Mora, E. A., Bryja, M., Higgs, A., ... & Pikitch, E. K. (2011). Use of pop-up satellite archival tags to identify oceanic-migratory patterns for adult Atlantic sturgeon, Acipenser oxyrinchus oxyrinchus Mitchell, 1815. *Journal of Applied Ichthyology*, *27*(2), 356-365.

Ingram, E. C., Cerrato, R. M., Dunton, K. J., & Frisk, M. G. (2019). Endangered Atlantic Sturgeon in the New York Wind Energy Area: implications of future development in an offshore wind energy site. *Scientific reports*, *9*(1), 1-13.

Johnson, J. H., Dropkin, D. S., Warkentine, B. E., Rachlin, J. W., & Andrews, W. D. (1997). Food habits of Atlantic sturgeon off the central New Jersey coast. *Transactions of the American Fisheries Society*, *126*(1), 166-170.

Rothermel, E. R., Balazik, M. T., Best, J. E., Breece, M. W., Fox, D. A., Gahagan, B. I., ... & Secor, D. H. (2020). Comparative migration ecology of striped bass and Atlantic sturgeon in the US Southern mid-Atlantic bight flyway. *PloS one*, *15*(6), e0234442.

Stein, A. B., Friedland, K. D., & Sutherland, M. (2004). Atlantic sturgeon marine distribution and habitat use along the northeastern coast of the United States. *Transactions of the American Fisheries Society*, *133*(3), 527-537.

Sea Turtles

Barco, S. G., Burt, M. L., DiGiovanni Jr, R. A., Swingle, W. M., & Williard, A. S. (2018). Loggerhead turtle Caretta caretta density and abundance in Chesapeake Bay and the temperate ocean waters of the southern portion of the Mid-Atlantic Bight. *Endangered Species Research, 37, 269-287.*

Chavez-Rosales, S., Palka, D.L., Garrison, L.P. *et al.* Environmental predictors of habitat suitability and occurrence of cetaceans in the western North Atlantic Ocean. *Sci Rep* **9,** 5833 (2019). https://doi.org/10.1038/s41598-019-42288-6

Griffin, D.B., Murphy, S.R., Frick, M.G. *et al.* Foraging habitats and migration corridors utilized by a recovering subpopulation of adult female loggerhead sea turtles: implications for conservation. *Mar Biol* **160,** 3071–3086 (2013). https://doi.org/10.1007/s00227-013-2296-3

Hawkes, L. A., Broderick, A. C., Coyne, M. S., Godfrey, M. H., & Godley, B. J. (2007). Only some like it hot—quantifying the environmental niche of the loggerhead sea turtle. *Diversity and distributions, 13(4), 447-457.*

Winton, M. V., Fay, G., Haas, H. L., Arendt, M., Barco, S., James, M. C., ... & Smolowitz, R. (2018). Estimating the distribution and relative density of satellite-tagged loggerhead sea turtles using geostatistical mixed effects models. *Marine Ecology Progress Series, 586, 217-232.*

Whales

Chavez-Rosales, S., Palka, D.L., Garrison, L.P. *et al.* Environmental predictors of habitat suitability and occurrence of cetaceans in the western North Atlantic Ocean. *Sci Rep* **9,** 5833 (2019). https://doi.org/10.1038/s41598-019-42288-6

Roberts JJ, Best BD, Mannocci L, Fujioka E, Halpin PN, Palka DL, Garrison LP, Mullin KD, Cole TVN, Khan CB, McLellan WM, Pabst DA, Lockhart GG (2016) Habitat-based cetacean density models for the U.S. Atlantic and Gulf of Mexico. *Scientific Reports* 6: 22615. doi: 10.1038/srep22615.

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
GREATER ATLANTIC REGIONAL FISHERIES OFFICE
55 Great Republic Drive
Gloucester, MA 01930-2276

April 15, 2020

Stephan Ryba, Chief
Regulatory Branch
New York District
U.S. Army Corps of Engineers
Jacob K. Javits Federal Building
26 Federal Plaza
New York, New York, 10278-0090

RE: EFH Consultation for Permit Application Number NAN-2020-00592-WCA by Occidental Chemical Corporation/Glenn Springs Holdings, Inc., Kearny, Hudson County, New Jersey

Dear Mr. Ryba:

We have reviewed the revised essential fish habitat (EFH) assessment and additional supplemental information provided to us in response to our February 10, 2021, technical assistance letter regarding the Occidental Chemical Corporation/Glenn Springs Holdings, Inc.'s proposal to undertake remedial activities at the Occidental Chemical Corporation (OCC) Chromite Ore Processing Residue (COPR) sites within a portion of the Kearny Brackish Marsh and the Hackensack River in the Town of Kearny, Hudson County, New Jersey. The remedial cleanup activities are proposed in accordance with approved New Jersey Department of Environmental Protection (NJDEP) Remedial Action Work Plans (RAWPs) pursuant to a Consent Judgment (Docket No. C-77-05) between the OCC, PPG Industries, and Honeywell International, dated September 2011.

The proposed project includes the excavation, consolidation, and capping of contaminated material; the installation of hydraulic controls, a water treatment system, and a barrier wall; bank stabilization and bulkhead construction/improvements; and the development of a habitat mitigation project in the Kearny Brackish Marsh on New Jersey Sports and Exposition Authority (NJSEA) property. Total anticipated project disturbances include 0.39 acres of open water fill, 0.64 acres of open water creation, 2.68 acres of permanent wetland impacts, and 4.84 acres of temporary open water impacts. The project activities are expected to be completed in two phases. The first phase, identified as the early works phase, is expected to begin in July 2021 and continue for 18 months. According to the EFH assessment, the second phase of work, which is assumed to include the compensatory mitigation, has an unknown schedule and is said to be dependent on an outside and an overlapping bridge construction project.

The Magnuson Stevens Fishery Conservation and Management Act (MSA) and the Fish and Wildlife Coordination Act (FWCA) require federal agencies to consult with us on projects such as this that may adversely affect EFH and other aquatic resources. In turn, we must provide recommendations to conserve EFH and other fishery resources under our jurisdiction. These recommendations may include measures to avoid, minimize, mitigate, or otherwise offset adverse effects on EFH resulting from actions or proposed actions authorized, funded, or undertaken by that agency. This process is guided by the requirements of our EFH regulation at 50 CFR 600.905, which mandates the preparation of EFH assessments and generally outlines each agency's obligations in this consultation procedure.

Magnuson Stevens Fishery Conservation and Management Act

The project area has been designated as EFH for a number of federally managed species including winter flounder (*Pseudopleuronectes americanus*), little skate (*Leucoraja erinacea*), Atlantic herring (*Clupea harengus*), red hake (*Urophycis chuss*), windowpane flounder (*Scopthalmus aquosus*), winter skate (*Leucoraja ocellata*), clearnose skate (*Raja eglanteria*), longfin inshore squid (*Loligo pealeii*), bluefish (*Pomatomus saltatrix*), Atlantic butterfish (*Peprilus triacanthus*), and summer flounder (*Paralichthys dentatus*). The Hackensack River is also a migratory corridor for anadromous fish such as alewife (*Alosa pseudoharengus*), and blueback herring (*Alosa aestivalis*).

While we appreciate the revised EFH assessment and supplemental information you have provided to us, the EFH assessment continues to lack your determination of the effects of the proposed project on EFH. Based on the information provided, we assume that you have determined that the adverse effect on EFH is not substantial and can be alleviated with minor project modifications or conservation recommendations. In addition, although the revised EFH assessment partially addresses some of our issues, others remain unresolved. We continue to be concerned about the proposed compensatory mitigation including the conversion of open water to wetlands as a means to offset the filling of other wetlands, the timing of the construction of the compensatory mitigation at some undetermined time after much of the fill has been completed, and the precedent that may be set within the Meadowlands and elsewhere. As previously discussed at interagency meetings and in our past correspondence, compensatory mitigation must be done concurrent with or prior to impacts according to the Final Rule on Compensatory Mitigation for the Losses of Aquatic Resources (33 CFR 325 and 332 and 40 CFR 230).

As discussed in our previous letter, the proposed project may adversely affect EFH for species such as winter flounder whose eggs are demersal and adhesive. The revised EFH assessment discusses how in-water project activities along the Hackensack River will exceed no farther than intertidal areas which have a substrate dominated by fill, marsh grass, COPR, and other coarse material. Additionally, project activities aim to reduce and minimize impacts through the installation of cofferdams or turbidity barriers. Although unclear which of these measures are intended to be used along the Hackensack River and where they will be installed with respect to the proposed excavation and fill, we agree that the substrate is not appropriate for winter flounder early life stages and that a seasonal work restriction between January 1 and May 31 to minimize impacts to winter flounder eggs and larvae is not necessary.

The revised EFH assessment also includes minimization and avoidance methods protective of migrating anadromous fish, such as alewife and blueback herring. Specifically, the project intends to adhere to protective migratory and spawning windows within the Hackensack River, avoiding work such as vibratory construction, between March and June. Further minimization of impacts includes the use of cofferdams and/or silt curtains to limit suspended sediment dispersal due to dredging. We appreciate that protective work windows will be implemented into the project to reduce the impacts on migrating anadromous fish and agree that the installation of cofferdams and/or turbidity barriers will help to further reduce impacts. While it is unclear which of these measures will be used along the Hackensack River and where, we recommend that these barriers be installed prior to the onset of migration, generally around March 1, and not be removed until after June 30 of any given work year.

Compensatory Mitigation

One of the primary unresolved issues is the proposed compensatory mitigation. The revised permittee-responsible mitigation plan provided, which remains at 30 percent design, includes the following to offset the permanent impacts to aquatic resources:

- discharge fill into 0.39 acres of open water, 2.68 acres of existing wetlands, and on existing riprap;
- create 0.64 acres of open water and 4.64 acres of wetlands, which includes 3.14 acres of low marsh and 1.5 acres of high marsh habitat
- plant low marsh, high marsh, and riparian vegetation;
- placement of living blocks to act as a wave erosion buffer and provide a hard substrate; and
- install an osprey pole with a nesting platform; and
- in-kind replacement of two culverts.

As discussed at interagency meetings, additional benchmark data (i.e., topography, salinity, soils, water levels, benthic invertebrates, reference habitat vegetation) is expected to be collected and incorporated into additional iterations of the mitigation plan until the design is at 100 percent completion. We appreciate that some of our comments have already been incorporated into a revised 30 percent design mitigation plan and that additional details on construction methods, sequencing, and best management practices will be included in the 60% design drawings and specifications. We look forward to receiving this information and the more complete mitigation site design.

While we also appreciate the information provided to us by NJSEA regarding the possible ecological uplift that could result from the proposed compensatory mitigation project by increasing the amount of vegetation within the Kearny Brackish Marsh which is now mostly open water and *Phragmites*, we continue to be concerned about the creation of wetlands through the filling of other important aquatic habitats (i.e., mudflats, shallow open water areas) especially without a detailed evaluation of the habitat tradeoffs. Per the Clean Water Act (CWA) 404(b)(1) Guidelines, when determining compensatory mitigation, the functional values lost by the resource to be impacted must be considered; in this case the conversion of existing mudflat and shallow open water habitats. Additionally, we are concerned that the original EFH assessment included the disturbance of mudflats as part of project activities, but the revised EFH assessment and supplemental information provided now states that mudflats are not present on the site and supporting information for this change in habitat description is lacking.

As we previously requested, the mitigation plan should include identify all of the habitats currently present and quantify and delineate all of the areas that will be affected by the mitigation activities, describe the type or types of compensatory mitigation that are planned, the ratios for each mitigation type, and the ecological uplift and habitat tradeoffs. Per the CWA guidance, compensatory mitigation can include restoration, which may be re-establishment or rehabilitation, establishment (creation), enhancement, and/or preservation. Each of these types of mitigation also require different mitigation ratios (e.g. 2:1 for establishment, 3:1 for rehabilitation or enhancement.)

Schedule

The project schedule, as indicated in the revised EFH assessment, anticipates the early works phase of construction to begin within the third quarter of 2021 with plans to work for 18 months. During this phase, project disturbances include 0.12 acres of open water fill, 0.43 acres of open water creation, 1.77 acres of permanent wetland impacts, and 3.6 acres of temporary open water impacts. The timing of the second phase of the project which includes an additional 0.27 acres of open water fill, 0.21 acres of open water creation, 0.91 acres of permanent wetland impacts, and 1.24 acres of temporary open water impacts is currently unknown and will be determined based upon the timing of an unrelated and overlapping bridge construction project. No other details are provided about the intended delay and how the delay will affect project activities, specifically the compensatory mitigation. As we indicated in our previous correspondence, if the project schedule is anticipated to be altered, a more detailed discussion of reasons for this delay, how the temporal loss of habitation functions will be addressed, alternatives to avoid this temporal loss, and the possible need for additional compensatory mitigation is necessary.

As we previously discussed and continue to endorse, compensatory mitigation timing, in accordance with the Final Rule on Compensatory Mitigation for the Losses of Aquatic Resources (33 CFR 325 and 332 and 40 CFR 230), should be in advance of or concurrent with project activities. Failure to require this would set a poor precedent for the timing of future mitigation within the Meadowlands District and allow for the temporal loss of aquatic resource functions. If compensatory mitigation at the Kearny Brackish Marsh cannot be accomplished prior to or concurrent with the impacts, then an alternate mitigation site should be pursued.

Essential Fish Habitat Conservation Recommendations

Pursuant to Section 305(b)(4)(A) of the MSA we request that you adopt the following EFH conservation recommendations to minimize or offset adverse impacts on EFH:

- Continue to adhere to the seasonal work window along the Hackensack River between March 1 and June 30 to minimize impacts to the upstream migration of river herring to their spawning habitat.
- Provide us with a revised and final mitigation plan which includes a clear description of the project impacts and type of compensatory mitigation proposed (i.e., re-establishment, rehabilitation, establishment, enhancement).
- The revised mitigation plan should also:

    - provide all missing baseline condition information which is expected to be collected (i.e., topography, salinity, soils, water levels, benthic invertebrates, reference habitats);
    - include a discussion on mitigation ratios for the type of compensatory mitigation proposed and should follow 2:1 for establishment, and minimum of 3:1 for rehabilitation or and enhancement;
    - document enhancement/rehabilitation activities and the ecological uplift anticipated for each activity; and
    - include revised plans with the location of each type of compensatory mitigation, best management practices, proposed and final grading, and other helpful information that ties in with the revised discussions.
- Provide compensatory mitigation for unavoidable impacts to wetlands and open water habitats concurrent with or prior to project activities.

Please note that Section 305(b)(4)(B) of the MSA requires you to provide us with a detailed written response to these EFH conservation recommendations, including a description of measures adopted by you for avoiding, mitigating, or offsetting the impact of the project on EFH. In the case of a response that is inconsistent with our recommendations, Section 305(b)(4)(B) of the MSA also indicates that you must explain your reasons for not following the recommendations. Included in such reasoning would be the scientific justification for any disagreements with us over the anticipated effects of the proposed action and the measures needed to avoid, minimize, mitigate, or offset such effects pursuant to 50 CFR 600.920(k). This response must be provided within 30 days after receiving our EFH conservation recommendations and at least 10 days prior to final approval of this action. Please also note that further EFH consultation must be reinitiated pursuant to 50 CFR 600.920(j) if new information becomes available, or if the project is revised in such a manner that affects the basis for the above determination.

Endangered Species Act

As indicated in our previous letter, federally listed species may be present in the project area and consultation, pursuant to Section 7 of the Endangered Species Act (ESA) of 1973, may be necessary. In the additional materials provided with your revised EFH assessment, you indicated that no federally endangered species were identified in the immediate project area, as consulted through the NJ Natural Heritage Program. This is not the appropriate tool to use to determine whether or not federal listed species under our jurisdiction may be present in a particular location. In our February 2021 letter, we provided a link to our ESA Section 7 website (https://www.fisheries.noaa.gov/new-england-mid-atlantic/consultations/section-7-consultations-greater-atlantic-region) which contains our interactive ESA Section 7 Mapper (https://noaa.maps.arcgis.com/apps/webappviewer/index.html?id=1bc332edc5204e03b250ac11f9914a27). According to our mapper, listed species of sturgeon may be present within the Hackensack River and in the vicinity of your proposed project. As state in our February 2021 letter, the Army Corps is responsible for determining whether the proposed action is likely to affect listed species. When project plans are complete, you should submit your determination of effects, along with justification for the determination, and a request for concurrence to nmfs.gar.esa.section7@noaa.gov. After reviewing this information, we would then be able to conduct a consultation under Section 7 of the ESA.

Conclusion
We look forward to continued coordination on this project. If you have any questions or need additional information, please call Jessie Murray at (732) 872-3023 or by e-mail (Jessie.Murray@noaa.gov). Should you have any questions about the Section 7 consultation process in general, please contact Edith Carson-Supino at 978-282-8490 or by e-mail (Edith.Carson-Supino@noaa.gov).

Sincerely,

Louis A. Chiarella

Louis A. Chiarella
Assistant Regional Administrator
For Habitat Conservation

cc:
GARFO PRD – E. Carson-Supino
GARFO HESD – K. Greene, J. Murray
New York District ACOE – R. Miranda, D. Courtois
NJDEP – S. Biggins, K. Davis
FWS – S. Mars
EPA Region II – M. Finocchiaro
NEFMC – T. Nies
MAFMC – C. Moore
ASMFC – L. Havel

Marine Safety Information Bulletin

Commander
First Coast Guard District
Prevention Division
408 Atlantic Ave
Boston, MA 02210

MSIB Number: 21-003
Date: April 14, 2021
Contact: Mr. Craig Lapiejko
E-Mail: Craig.D.Lapiejko@uscg.mil

Port Access Route Study: Northern New York Bight

This bulletin addresses the April 12, 2021 supplemental notice of study; request for comments for the Northern New York Bight Port Access Route Study.

1. On June 29, 2020, the First Coast Guard District published a notice of study; request for comments (85 FR 38907) announcing that the Coast Guard was conducting a Port Access Route Study (PARS) to evaluate the adequacy of existing vessel routing measures and determine whether additional vessel routing measures are necessary for port approaches to New York and New Jersey and international and domestic transit areas in the First District Area of Responsibility (AOR). The Coast Guard stated the Northern New York Bight PARS (NNYBPARS) would consider whether existing or additional routing measures are necessary to improve navigation safety due to factors such as planned or potential offshore development, current port capabilities and planned improvements, increased vessel traffic, existing and potential anchorage areas, changing vessel traffic patterns, effects of weather, or navigational difficulty. Vessel routing measures, which include traffic separation schemes, two-way routes, recommended tracks, deep-water routes, precautionary areas, and areas to be avoided, are implemented to reduce the risk of marine casualties.

2. On April 12, 2021 the First Coast Guard District published a supplemental notice of study; request for comments seeking additional information related to the notice of study that was published on June 29, 2020. Following a review of the comments and materials received, the First Coast Guard District identified several areas of additional inquiry related to the study. We invite your comments and responses to the proposed questions and information requests. In this notice, we also seek responses supplying quantitative data or suggesting other authoritative sources that specifically address the questions posed in the subject notice of study; request for comments.

3. The Notice of Study is available at Federal Register docket number USCG-2020-0278, the federal portal at https://www.regulations.gov/document/USCG-2020-0278-0029.

4. To submit your comment online, go to https://www.regulations.gov, and insert "USCG-2020-0278" in the "search box." Click "Search" and then click "Comment." We will consider all comments and material received on or before May 12, 2021.

5. For questions regarding this Marine Safety Information Bulletin contact Mr. Craig Lapiejko, Waterways Management at First Coast Guard District, telephone (617) 223-8351, e-mail craig.d.lapiejko@uscg.mil.

Captain Richard J. Schultz, First Coast Guard District Chief of Prevention, sends

ATLANTIC OFFSHORE LOBSTERMEN'S ASSOCIATION

Grant Moore, President
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April 14, 2021

Dr. Jon Hare
Director, NOAA NEFSC

Dear Dr. Hare,

I am writing in response to the Northeast Fisheries Science Center's recent publication of the mid-Atlantic and New England 2021 State of the Ecosystem (SOE) reports. The Atlantic Offshore Lobstermen's Association has serious concerns with the reports' characterization of right whale and lobster gear interactions. Notably, the reports erroneously state "Strong evidence exists to suggest that interactions between right whales and the offshore lobster gear in the U.S. and snow crab gear in Canada is contributing substantially to the decline of the species."

The reference cited for that statement is NOAA Technical Memorandum NMFS-NE-247 *North Atlantic Right Whales – Evaluating Their Recovery Challenges in 2018*. This memorandum was rebuked by state resource managers and lobster fishery representatives when it was published for lack of scientific merit and inconsistencies[1]. Unfortunately, NOAA NEFSC never issued a corrected memorandum, despite acknowledging some of the memo's conclusions were merely a "hypothesis" at the October 9-12, 2018 convening of the ALWTRT[2].

Contrary to the reports' "strong evidence" claim, the last confirmed entanglement in U.S. offshore lobster gear was 20 years ago. On the other hand, the last confirmed Canadian snow crab entanglement was 2 months ago. Since the 2010 climatic shift and whale distribution changes noted in the SOE reports, there has been an average of one confirmed U.S. right whale entanglement per year, compared to 2.7 confirmed Canadian gear entanglements (with at least 4 per year in each of the last 4 years). Of the 10 U.S. entanglements confirmed during this period, 0.5 mortalities/serious injuries were assigned to U.S. pot/trap gear and 0 to the lobster trap fishery specifically[3].

The "offshore" component of the U.S. lobster fishery is generally defined as the Lobster Management Area 3 fishery, a fishery that constitutes less than 1% of the vertical lines fished in the Atlantic[4]. This fishery employees longer trawls and larger diameter rope than is typically used

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[1] State of Maine Department of Marine Resources letter to NOAA NEFMC. Oct 3, 2018. and others.
[2] NOAA scientists admit a gaffe on risk to whales of lobster trap lines, Stephen Rappaport, The Ellsworth American, October 26, 2018 https://www.ellsworthamerican.com/maine-news/waterfront/noaa-scientists-admit-a-gaffe-on-risk-to-whales-of-lobster-trap-lines/
[3] Draft Endangered Species Act Section 7 Consultation Biological Opinion for 10 Greater Atlantic Regional Fisheries Office FMPs. Published online January 2021.
[4] Industrial Economics (IEc) 2017 vertical line model 2017 baseline data. Provided to TRT November 2019.

in the inshore and nearshore lobster fisheries, however it is readily distinguishable, by gear experts and fishermen, from the large diameter rope used in Canadian snow crab gear. AOLA representatives have visited the NOAA gear warehouse and did not find any of the gear removed from unattributed entanglements to be consistent with U.S. offshore lobster gear. Other than the cases confirmed to be of Canadian origin, rope in the sizes fished offshore (½" or larger) represent relatively few of the entanglement records that have associated gear descriptions dating back to 2000[5].

Deaths and serious injuries attributable to the domestic lobster fleet have, in fact, been steadily trending downward. US lobstermen have been marking gear and modifying practices to avoid interactions for over 20 years, during which time the right whale population more than doubled in size before the 2010 downturn. In contrast, maritime Canadian fisheries have been subject to gear markings and fishing modifications since 2018.

We request that the Northeast Fisheries Science Center publish corrected 2021 SOE reports which excluded the unfounded assertion that the U.S. offshore lobster fishery is contributing substantially to the decline of North Atlantic Right Whales. We represent a majority of this fishery and our members take conservation seriously. Having such a strongly worded unsubstantiated statement in official government reports serves only to perpetuate harmful misperceptions of the domestic fishery.

Sincerely,

Heidi Henninger
Science & Program Manager

cc:
Mr. Thomas Nies, Director, New England Fishery Management Council
Dr. Christopher Moore, Director, Mid-Atlantic Fishery Management Council

[5] 2000-2018 right whale incident data provided by NMFS to ALWTRT 3-19-19

From: **Anne Hawkins** <annie@rodafisheries.org>
Date: Tue, Apr 13, 2021 at 3:23 PM
Subject: NY Bight Task Force meeting - please distribute
To: Feinberg, Lucas B <Lucas.Feinberg@boem.gov>
Cc: Hooker, Brian <brian.hooker@boem.gov>, Lefton, Amanda B <Amanda.Lefton@boem.gov>, <paul.n.doremus@noaa.gov>

Dear Luke,

Could you please share this email with members of the NY Bight Task Force before tomorrow's meeting? The latest publicly available roster is from 2018 and most of the names I recognize are no longer in those positions, so I can't send it directly. Thank you and please let me know if you'd like to discuss. Thank you!

Dear members of the Intergovernmental Task Force for the New York Bight:

Major fishing community leaders are “sitting out” on the Bureau of Ocean Energy Management’s (BOEM) Task Force meeting this week. As BOEM prepares to auction nearly 1300 square miles of the most valuable fishery grounds on the East Coast, Task Force members must act as responsible administrators of the public trust. Fishermen have shown up for years to “engage” in processes where spatial constraints and, often, the actors themselves are opposed to their livelihood. They have urgently advocated for the survival of their family and communities, in a context where all the rules are set (and changed) by newcomers interested only in a large scale ocean acquisition who often don’t even treat them with common courtesy or basic respect.

This time and effort has resulted in effectively no accommodations to mitigate impacts from individual developers or the supposedly unbiased federal and state governments. Individuals from the fishing community care deeply but the deck is so stacked that they are exhausted and even traumatized by this relentless assault on their worth and expertise.

This meeting boycott is not because fishermen do not wish to be involved in decisions and research efforts about offshore wind--they’ve repeatedly come to the table in good faith and reiterated their commitment to do so in a letter to BOEM just last week. These responsible leaders actively engage in fisheries management processes, partner with environmental non-profit organizations and government agencies, participate in seafood certification and environmental programs, conduct cooperative research to improve fisheries management, provide platforms for scientific research about ecosystem health and climate change, hold positions of authority within their own communities, donate seafood and services to civic charities, work through a pandemic to ensure U.S. food security, employ large numbers of environmental justice populations, and more. They’ve provided time, data, and knowledge to countless offshore wind deliberations, only to see that information misappropriated, discounted, distrusted, or simply disappear. For every time they try to actively participate, there is a new roadblock thrown up in processes that is entirely controlled by those opposed to their interests, in which the overall structure has left no room for them to receive any compromise.

RODA has a Memorandum of Understanding with BOEM and the National Marine Fisheries Service to “effectively engag[e] local and regional fishing interests in the offshore wind development process” and “identify[] the most effective ways to bring fishing industry expertise and information into planning and development processes." In stark contrast to this MoU intended to *improve* fishermen's ability to act as co-stewards of the marine environment, BOEM is now actively eliminating their ability to even participate in public processes.

Fishing Communities Deserve Answers

Last week, nearly 1700 fishing community members representing almost 60,000 employees and members submitted a letter to BOEM suggesting reasonable measures to begin to reduce the impacts to fishing and the ocean environment from offshore wind energy development. They have received no response; instead, BOEM has since announced this Task Force meeting and several other actions to "fast track" offshore wind energy that continue to ignore or marginalize its severe impacts to small businesses and the communities that depend on them. Fishermen are expected to participate in daily meetings and submit written comments on (or, in the common terminology of wind proponents, "react" to) the environmental review of dozens of individual projects that all affect their livelihoods and families. There is still no coherent process for leasing and permitting. Worse still, changes to past practices are now being announced only in specific project announcements, such as that for Ocean Wind off New Jersey, which those most affected cannot reasonably track especially from other regions of the country.

The expectations placed on fishermen, fisheries scientists, and fisheries managers to participate in such processes would be absurd from time and resource constraints alone (of the billions of dollars touted in offshore wind, almost none has ever been earmarked for fisheries science or communications by the government or fishermen). That is especially true when these communities have yet to receive any meaningful response from the thousands of hours and hundreds of thousands of dollars they've already invested in responsible engagement at their own expense. All they ever hear amounts to vague commitments to consider these requests in the future.

The Public Participation Process Is Being Willfully Eroded

BOEM's decision to "fast track" both existing and future lease areas without ever having addressed any of the reasonable, consistent concerns raised by fishermen and other environmentalists threaten the very survival of U.S. seafood production. While professing to "advance ambitious wind energy projects," the actual steps it is taking constitute a major step backward in gutting public participation and transparency laws.

The agency recently announced it will prepare an Environmental Assessment for lease issuance in the NY Bight, which is a component of the National Environmental Policy Act (NEPA) process. NEPA was enacted to consider significant environmental consequences of the government's proposed actions and inform the public about its decision making. A key step in the NEPA process is that of scoping: the public process of identifying the significant issues associated with an action. Scoping occurs when an agency issues a Notice of Intent where they inform the public of the process, decisions made to date, and other relevant information.

In a departure from the letter of the law, past practice at BOEM, and even the steps detailed in the American Wind Energy Association's (now "Clean Power Association") *Public Participation Guide*, BOEM has only published a press release in the Federal Register. This release, in lieu of a Notice of Intent and formal public comment period, is little more than an advocacy piece.

Not only has the public process been eliminated, but the Task Force meeting itself was publicly announced only eight days before its convocation. The timing directly conflicts with a New England Fishery Management Council, scheduled months ago, in which the fisheries oversight entity will utilize participatory governance to deliberate regulations for the Atlantic herring, skate, and scallop fisheries (all of which operate heavily in the Bight), sea turtles, revisions of habitat management areas, and even offshore wind development.

As fisheries managers, scientists, and community members have raised multiple times in the past without recourse, BOEM's Task Force meetings do not allow any opportunity for public comment until the meeting has adjourned. Nor is there adequate representation of fisheries experts, including the regional fishery management councils, in the Task Force membership.

Delegation of Government Responsibility to Multinational Corporations is Indefensible

BOEM and states too often ask the fishing industry to work directly with wind developers to resolve disputes, washing their hands of their oversight duties. The limitations of relying on corporate social responsibility in order to solve natural resource management challenges are well documented and well understood by researchers and the public. Domination of natural resource markets by a small number of transnational corporations is commonly understood to lead to reduced social or environmental standards; it would be foolish to assume a different outcome simply because these projects are occurring under such companies' "renewable" portfolios. Thus it is no surprise that we have not been able to mitigate this governmental abrogation of duty by working directly with offshore wind energy developers despite extensive efforts to do so.

At present most developers have chosen not to engage in transparent conversations with the fishing community. In 2019, at the request of fishery leaders, eight developers joined a Joint Industry Task Force administered by RODA. The goal was to provide a forum to identify areas of cooperation and solutions for areas of conflict. Despite some early focused successes, such as joint recommendations for aids to navigation, the Task Force struggled due to the developers' narrow interest in permitting requirements, disagreements among developers on Task Force scope, and--from some--a desire for public silence from fisheries leaders with concerns about offshore wind. None of the developers extended Task Force agreements in 2021, leaving no regional forum for fisheries problem-solving and ensuring that fishermen can only engage in offshore wind in the exact manners and circumstances dictated by these multinational corporations.

On a project-specific scale, although some instances exist in which developers have proactively tried to partner with fishermen for mutually beneficial outcomes, more often than not these efforts have been frustrated by uncertainty regarding adjacent projects, new leases, political interventions that change permitting rules midstream, or federal-state disagreements.The government needs to utilize its public trust role to provide real leadership and solutions.

Next Steps

Fishing community members now request meaningful responses to the input they have already given, over thousands of collective hours and days taken away from fishing, before devoting more time to one-sided empty "engagement." Again, BOEM has chosen to prioritize only one sector and actively promotes this behavior from others, encouraging developers to meet with fishermen as "stakeholders" of their projects, without requiring them to do anything in particular about it. If the government delegated its duty of managing public trust resources to hedge funds and multinational corporations in any other industry, while erasing opportunities for public comment and sending representatives of those companies to resolve conflict, the public would be outraged. But here, public relations and lobbying campaigns from goliath energy companies hold the government's ear with deeply offensive messaging that fishermen are merely uneducated, environmentally irresponsible, and obstructionist. Nothing could be further from the truth.

The women and men who form the backbone of our coastal communities, economies, and cultures must not be treated as a box to be checked and they deserve better. They demand firm commitments from BOEM, states, and wind developers--in writing--of the steps they will take to recognize their importance as citizens and communities. Absent a clear answer, wind advocates including those in federal and state governments can only expect to see diminished participation in and increasing opposition to this broken system.

--

Annie Hawkins
Executive Director
Responsible Offshore Development Alliance
(307)527-0947
RODA

New England Fishery Management Council
50 WATER STREET | NEWBURYPORT, MASSACHUSETTS 01950 | PHONE 978 465 0492 | FAX 978 465 3116
John F. Quinn, J.D., Ph.D., *Chairman* | Thomas A. Nies, *Executive Director*

April 6, 2021

Mr. Dan Martino
Cottage City Oysters
PO Box 4500
Vineyard Haven, MA 02568

Dear Mr. Martino,

Thank you for your recent email concerning fishing in the Stellwagen Bank National Marine Sanctuary (SBNMS). The Council is well aware of the value of the SBNMS. Indeed, we participate in the Sanctuary Advisory Committee and the Sanctuary Superintendent regularly briefs the Council on relevant issues.

The National Marine Sanctuaries Act (16 U.S.C 1431 et seq., NMSA) does not prohibit fishing within the SBNMS. As noted in the part of the NMSA that you quoted, the prohibition applies to "any sanctuary resource **managed under laws or regulations for that sanctuary**" (emphasis added). When a sanctuary is established, 16 U.S.C. 1434(a)(4), requires a designation document that includes the "…types of activities that will be subject to regulation by the Secretary to protect those characteristics." The SBNMS designation document does not list fishing as an activity subject to regulation under the NMSA, nor is it prohibited.

The Council manages fisheries consistent with the requirements of the Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. 1801 et seq.). We use a variety of measures to promote sustainable fishing activity, including closures. In reference to your suggestion to limit bottom trawling, we have prohibited bottom trawling in an area larger than the state of Connecticut (5,447 sq. miles, six times the size of the Sanctuary), and are waiting for implementation of another closure to bottom-tending gear of about 25,000 square miles. The Western Gulf of Maine Closure Area and Western Gulf of Maine Habitat Closure Area partially overlap SBNMS, and prohibit bottom trawling, among other types of fishing activities.

Each fall the Council identifies its activities for the following year. Should you wish to suggest that the Council initiate a management action to consider a prohibition on bottom trawling in the SBNMS, please submit a recommendation in mid-August and I will present it to the Council for consideration. The final decision for the following year's activities is typically made in December.

Thank you for your interest in fishery management. Please contact me if you have questions.

Sincerely,

Thomas A. Nies

Thomas A. Nies
Executive Director

cc: Pete DeCola, SBNMS

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
GREATER ATLANTIC REGIONAL FISHERIES OFFICE
55 Great Republic Drive
Gloucester, MA 01930-2276

Mr. John Kennelly
Chief, Planning Division
U.S. Army Corps of Engineers
New England District
696 Virginia Road
Concord, MA 01742-2751

Re: Cape Cod Canal and Sandwich Beaches Section 111 Shore Damage Mitigation Study

Dear Mr. Kennelly:

We received your EFH consultation request letter dated March 10, 2021 and Essential Fish Habitat (EFH) Assessment, regarding the Cape Cod Canal and Sandwich Beaches Section 111 Shore Damage Mitigation Study. The project is being conducted under the authority provided by Section 111 (Shoreline Damage Attributable to a Federal Navigation Project) of the Rivers and Harbor Act of 1968. The Town of Sandwich requested the study to investigate the effects of the jetties located at the east entrance of the Cape Cod Canal Federal Navigation Project (FNP) on downdrift beaches which experience continual erosion, especially along Town Neck Beach and Springhill Beach. The study area is the approximately 2.5 miles of directly impacted shoreline, including Scusset Beach, the east entrance to the Canal, Town Neck Beach, Old Harbor Inlet and Springhill Beach. Analysis conducted during the first phase of the study indicated that the jetties located at the east entrance to the Canal interrupt natural longshore sediment transport and starve the downdrift littoral system of sediment needed to maintain a stable shoreline. The current study delineates the extent of erosion impacts directly attributable to the Cape Cod Canal FNP and describes measures and alternatives for mitigating those impacts. Your Recommended Plan includes the construction of an engineered beach at Town Neck Beach using approximately 388,000 cubic yards of beach compatible material. The 388,000 cubic yards of nourishment. has been authorized through the Town of Sandwich permit NAE-2014-00259 and subsequent modification on November 2019. The amount of sand to be dredged from the Scusset beach site is proposed to increase from 224,500 to 388,000 cubic yards. The initial 224,500 cubic yards was authorized through the Town of Sandwich permit NAE-2016-00624. Therefore, conservation recommendations provided as part of this EFH consultation will be specific to the additional 143,500 cubic yards of material to be dredged from the Scusset Beach borrow site. We anticipate that all special conditions resulting from previous EFH consultations[1] (NAE-2016-00624 and NAE-2014-00259) will remain in effect, however, project components that are inconsistent with these recommendations have been identified in the General Comments section of this letter.

[1] See Appendix A for special conditions relevant to prior EFH consultations.

The proposed project includes hydraulic dredge excavation of an additional 143,500 cubic yards of sand and gravel from a 39 acre subtidal borrow site off Scusset Beach, Sandwich, MA, for a total dredge volume of 388,000 cubic yards. However, the work could ultimately include use of a mechanical dredge, if deemed necessary due to cost considerations. The average excavation depth across the site is approximately 5.7 feet with side slopes grading up to a 1V:3H slope to meet the surrounding grade, however, the boundaries and excavation depth are subject to change. The majority of the site will be dredged to an excavation depth of approximately -26 feet NAVD88. The proposed borrow site dredging and nourishment is proposed to be completed between October 1 and December 31 of the years in which funding is received. All dredged material will be transported to Town Neck Beach where it will be hydraulically pumped onto the beach, dewatered, and used for dune and beach nourishment. No mitigation is proposed for these activities.

The Magnuson-Stevens Fishery Conservation and Management Act (MSA) and the Fish and Wildlife Coordination Act require federal agencies to consult with one another on projects such as this. Insofar as a project involves EFH, as this project does, this process is guided by the requirements of our EFH regulation at 50 CFR 600.905, which mandates the preparation of EFH assessments and generally outlines each agency's obligations in the relevant consultation procedure. We offer the following comments and recommendations on this project pursuant to the above referenced regulatory process.

General Comments

Species found within Cape Cod Bay include: striped bass (*Morone saxatilis*), black sea bass (*Centropristis striata*), bluefish (*Pomatomus altatrix*), mackerel (*Scomber scrombrus*), bonito (*Sarda sarda*), tautog (*Tautoga onitis*), scup (*Stenotomus chrysops*), cod (*Gadus morhua*), summer flounder (Paralichthys dentatus), weakfish (*Cynoscion regalis*), pollock (*Pollachius pollachius*), halibut (*Hippoglossus hippoglossus*), yellowfin (*Thunnus albacares*) and bluefin tuna (*Thunnus thynnus*), haddock (*Melanogrammus aeglefinus*), wolffish (*Anarhichas lupus*), winter flounder (*Pseduopleuronectes americanus*), rainbow smelt (*Osmerus mordax*), and shortfin mako (*Isurus oxyrinchus*) and blue sharks (*Prionace glauca*).

Massachusetts Division of Marine Fisheries has identified eelgrass beds in subtidal waters along the western and middle portions of the nourishment area. The U.S. Environmental Protection Agency has designated submerged aquatic vegetation, including eelgrass, as "special aquatic sites" under the Section 404(b)(1) of the federal Clean Water Act, due to its important role in the marine ecosystem for nesting, spawning, nursery cover and forage areas for fish and wildlife. Direct and indirect impacts to this critical habitat should be minimized during nourishment activities.

Intertidal and inshore subtidal mixed sand, gravel, cobble, and boulder habitats with epifauna and attached macroalgae serve as important shelter and forage habitat for a variety of species including Atlantic cod, pollock, black sea bass, ocean pout, red hake, white hake, windowpane flounder, winter skate, little skate, striped bass, cunner, tautog, and scup. The structural complexity of rocky habitats are important for fish in that they provide shelter and refuge from predators (Auster 1998; Auster and Langton 1999; NRC 2002; Stevenson et al. 2004). It is also well established that intertidal zones serve as areas of refuge from predation and foraging habitat for juvenile fish during periods of high tide (Helfman et al. 2009). Multiple managed fish species within the beach nourishment project vicinity have life history stages that are found in the intertidal zone including, Atlantic cod, pollock, ocean pout, red hake, white hake, and windowpane flounder. Of particular concern is the juvenile life history stage for Atlantic cod. Howe et al. and the MA DMF Trawl Surveys revealed high abundance of age 0 cod offshore of the Sandwich nourishment site (2002). In reference to complex rocky habitat found on Sheets #4, #5, #6, #7, #8 and #10 of the original permit, the Main Report states that "according to WHG surveys from 2018, the ecological value of resources in this area is low," however this assumption is not validated based on the scientific literature referenced above. In addition the Main Report states that, "since the primary sediment source to Town Neck Beach has been starved by the Canal jetties, a large portion of the beach is composed of coarse-grained sands, gravel, and cobble." However, it takes 10 years or more for the attached epifauna and macroalgal complexity to develop, which reveals this habitat is not new to this area and also underlines the importance of avoiding impacts since replication of complex rocky habitat with epifauna and macroalgae is difficult.

The project area also provides habitat for winter flounder spawning and juvenile development. Winter flounder eggs, once deposited on the substrate, are vulnerable to sedimentation effects in less than 1 mm of sediment. Decreased hatching success of winter flounder eggs is observed when covered in as little as 1 mm of sediment and burial in sediments greater than 2.5 mm may cause no hatch (Berry et al. 2011). Elevated turbidity can also impact fish species through greater utilization of energy, gill tissue damage and mortality. Egg and larval life stages may be more sensitive to suspended sediments, resulting in both lethal and sub-lethal impacts (Newcombe and Jensen 1996). To avoid such impacts, turbidity producing activities should be suspended during periods when these sensitive life stages are present.

Based on the sediment grain size analyses provided, the majority of the Scusset borrow site material consists of sand, however core 8 contained 17.8% gravel and included 'gravel' in the visual description of the sample. The borrow site should be visually inspected for the presence of natural boulder, cobble, gravel, pebble habitat prior to dredging, and areas containing this material, specifically towards the westernmost edge of the borrow site, in the vicinity of core 8, should be avoided. In addition, NAE-2014-00259 includes special condition 3, the proposed source of beach nourishment material be of a compatible grain size as the existing beach. The Main Report indicates the predominant grain size of the borrow site material is fine to medium grain sand, while the nourishment site contains predominantly medium to coarse grained sand. According to Haney et al. "if the grain size of the source material is finer than the grain size of the receiving beach, it will be more susceptible to erosion. If it is susceptible to an erosion rate greater than the historic rate, then beach fill could drift into adjacent coastal resources. The likelihood of eroded sediment drifting into these resources needs to be quantified as part of the regulatory review process". Supplemental sediment sources should be considered to meet this existing special condition, enhance the longevity of the nourishment project and to avoid potential indirect impacts to nearby eelgrass and complex rocky intertidal habitats.

The Main Report indicates that Section 111 work will comply with the Town of Sandwich permits NAE-2014-00259 (as amended November 2019) and NAE-2016-00624. Extensive EFH coordination and resulting Conservation Recommendations were incorporated into permit special conditions to avoid and minimize impacts to federally managed EFH. The special conditions that relate to our prior EFH consultations with the Town of Sandwich are provided at the end of this document.

The subsequent addition of special condition 10 to the November 2019 NAE-2014-00259 modification contradicts prior special conditions. Special condition 10 calls out specific areas of complex bottom habitat, thereby negating existing special condition 4 which included all complex rocky habitat (see sheets #4, #5, #6, #7, #8 and #10 of the original permit). In addition, the slope of 15:1 has been added to special condition 10, which contradicts the requirements of existing special condition 5 to maintain 10:1 slopes to accommodate piping plover habitat replication. We recommend that language be consistent with earlier special conditions to avoid confusion and avoid additional adverse effects to juvenile cod HAPC.

Essential Fish Habitat

Scusset Beach is designated as EFH under the MSA for multiple managed fish species, including winter flounder, Atlantic cod, and pollock. In addition, this area is designated as a Habitat Area of Particular Concern (HAPC) for juvenile Atlantic cod. As described above, the proposed Cape Cod Canal and Sandwich Beaches Section 111 Shore Damage Mitigation Study may adversely affect EFH by impacting nearby winter flounder habitat, eelgrass beds, complex rocky habitats, and shellfish habitat located within the project area. We recommend pursuant to Section 305(b)(4)(A) of the MSA that you adopt the following EFH conservation recommendations:

1. No dredging should occur from February 1 to June 30, of any calendar year, to protect sensitive life history stage winter flounder EFH.
2. If the proposed dredge footprint includes exposed rocky habitats, as indicated in sediment core 8, the footprint should be modified to avoid all dredging of natural rocky habitats (including gravel).
3. Proposed sources of beach nourishment should be free of contaminants and of a compatible grain size with the existing beach. Supplemental sediment sources should be considered to minimize transport of fine grained material into nearby eelgrass and complex rocky intertidal habitats and to enhance the longevity of the nourishment project.

Please note that Section 305(b)(4)(B) of the MSA requires you to provide us with a detailed written response to these EFH conservation recommendations, including a description of measures you adopt for avoiding, mitigating or offsetting the impact of the project on EFH. In the case of a response that is inconsistent with our recommendations, Section 305(b)(4)(B) of the MSA also indicates that you must explain your reasons for not following the recommendations. Included in such reasoning would be the scientific justification for any disagreements with us over the anticipated effects of the proposed action and the measures needed to avoid, minimize, mitigate or offset such effects pursuant to 50 CFR 600.920(k).

Please also note that a distinct and further EFH consultation must be reinitiated pursuant to 50 CFR 600.920(l) if new information becomes available or the project is revised in such a manner that affects the basis for the above EFH conservation recommendations.

Endangered Species Act

Threatened and endangered species under our jurisdiction may be present in the action area. A consultation pursuant to section 7 of the Endangered Species Act of 1973 is required. If you have any questions regarding the status of this consultation, please contact Roosevelt Mesa at 978-281-9186 or roosevelt.mesa@noaa.gov.

Conclusion

In summary, we recommend that no dredging should occur from February 1 to June 30, of any calendar year, to protect sensitive life history stage winter flounder EFH. We also recommend avoiding gravel substrate identified in the westernmost extent of the dredge footprint (sediment core 8) and that the source material be of a consistent grain size as the existing beach. We look forward to your response to our EFH conservation recommendations, and continued coordination on this project. Please contact Kaitlyn Shaw at 978-282-8457 or kaitlyn.shaw@noaa.gov if you would like to discuss this further.

Sincerely,

for
Louis A. Chiarella
Assistant Regional Administrator
for Habitat Conservation

cc: Grace Moses, US ACOE
Roosevelt Mesa, PRD
John Logan, MA DMF
Bob Boeri, MA CZM
Tom Nies, NEFMC
Chris Moore, MAFMC
Lisa Havel, ASMFC

Appendix A
Town of Sandwich Permit Special Conditions
Resulting from prior EFH consultations

NAE-2016-00624
7. No dredging shall occur from January 1st to June 30th of any year, to avoid impacts to North Atlantic Right Whales and to protect sensitive life history stage winter flounder EFH.

NAE-2014-00259
3. Proposed sources of beach nourishment shall be free of contaminant and of a compatible grain size with existing beach as approved by Army Corps of Engineers.
4. Beach nourishment shall avoid direct impacts to complex bottom habitat which has live growth (macroalgae) to the extent practicable. Complex habitat consists predominantly of cobbles and boulders. Cobbles and boulders are defined as having a grain size greater than 2.52 inches in length.

NAE-2014-00259 (as amended November 2019) Phillip Nimeskern provided the modified permit language on October 11, 2019 and gave 10 days for Alison to reply.
10. The applicant or their agents will use the delineation of complex rocky intertidal habitat as shown on Sheets #11 and #12 and in Transect #8A on Sheet #17 for the placement of beach nourishment sand and avoid the area labeled "Potential Area of No Fill", unless the plans and permit are modified in the future. A 15: 1 slope is proposed for this transect in these plans.
11. The applicants will invite representatives of USA CE-NAE and NOAA to participate in pre-construction surveys for this project. If the survey shows that complex rocky intertidal habitat is extant and the delineation line has not moved, Special Condition # 10 will still apply. If the survey shows that complex rocky intertidal habitat is no longer extant or the delineation line has moved, the applicants and representatives will confer and decide if the line can be moved and more of the "Potential Area of No Fill" can be filled. No change in beach nourishment will be done until the Corps approves the modified plans.

References

Auster, P.J. 1998. A conceptual model of the impacts of fishing gear on the integrity of fish habitats. Conservation Biology 12:1198-1203.

Auster, P.J. and R. Langton. 1999. The effects of fishing on fish habitat. American Fisheries Society Symposium 22:150-187.

Berry, W.J., Rubentstein, N.I., Hinchey, E.K., Klein-Mac-Phee, G. and Clarke, D.G. 2011. Assessment of dredging-induced sedimentation effects on winter flounder (*Pseudopleuronectes americanus*) hatching success: results of laboratory investigations. Proceedings of the Western Dredging Association Technical Conference and Texas A&M Dredging Seminar. Nashville, TN June 5-8, 2011.

Haney, R., Kouloheras, L., Malkoski, V., Mahala, J., & Unger, Y. (2007). MassDEP's guide to best management practices for projects in Massachusetts: Beach nourishment. March 2007. 9 pp.

Helfman, G., Collette, B. B., Facey, D. E., and Bowen, B. W. 2009. The diversity of fishes: biology, evolution, and ecology. John Wiley & Sons.

Howe, A. B., S. J. Correia, T. P. Currier, J. King, and R. Johnston. 2002. Spatial distribution of ages 0 and 1 Atlantic cod (Gadus morhua) off the Eastern Massachusetts coast, 1978-1999, relative to 'Habitat Area of Special Concern'.

Newcombe, C.P. and Jenson, O.T. 1996. Channel suspended sediment and fisheries: a synthesis for quantitative assessment of risk and impact. *North American Journal of Fisheries Management* 16(4):693-727.

Natural Research Council. 2002. Effects of trawling and dredging on seafloor habitat. Washington, District of Columbia: National Academy Press; 136 p.

Stevenson D, Chiarella L, Stephan D, Reid R, Wilhelm K, McCarthy J, Pentony M. 2004. Characterization of the fishing practices and marine benthic ecosystems of the northeast US shelf, and an evaluation of the potential effects of fishing on essential habitat. NOAA Tech Memo NMFS NE 181; 179 p.

New England Fishery Management Council
50 WATER STREET | NEWBURYPORT, MASSACHUSETTS 01950 | PHONE 978 465 0492 | FAX 978 465 3116
John F. Quinn, J.D., Ph.D., *Chairman* | Thomas A. Nies, *Executive Director*

April 1, 2021

Mr. Michael Pentony
Regional Administrator
NMFS, Northeast Regional Office
55 Great Republic Drive
Gloucester, MA 01930

RE: Comments on Sea Watch Surfclam EFP (86 FR 14597)

Dear Mike:

I am writing to express serious concerns with the proposed Sea Watch Surfclam EFP.

The March 17, 2021 Federal Register notice states that the EFP would allow four commercial surfclam and ocean quahog vessels to conduct at-sea paralytic shellfish poisoning testing in the Closed Area II scallop access area in statistical reporting area (SRA) 552. However, SRA 552 is entirely in Canadian waters, with no overlap of Closed Area II. We think they might have intended to fish in area 562, but without a clear understanding of where the fishing would occur, it is difficult to provide meaningful comment on this EFP request. As a result, we recommend that the EFP notice be modified to clearly indicate where the fishing within Closed Area II would be, since impacts may vary depending on when and where dredging occurs. Also, the Council and interested stakeholders should have another opportunity to provide comments after the area is correctly defined.

Our concerns with the EFP extend beyond the inaccurate description of the EFP area. The Council is actively managing several groundfish stocks within Closed Area II, some of which are overfished and in rebuilding plans. This EFP could have serious adverse impacts on Georges Bank cod, Georges Bank yellowtail flounder, Georges Bank winter flounder and northern windowpane flounder mortality and habitat. Beyond closures, the Council has required gear modifications in the groundfish and scallop fisheries to reduce impacts on Georges Bank yellowtail flounder and on northern windowpane flounder. The potential impacts of dredging for surfclams and ocean quahogs on vulnerable stocks should be assessed, particularly for Georges Bank cod and Georges Bank yellowtail flounder, which are managed under the transboundary sharing arrangement with Canada.

Also, the Council has been actively managing several scallop cohorts in the Closed Area II area. The area is no longer considered a single management unit, and includes partial closures to protect incoming year classes, and some open areas with very high densities of scallops that will be fished in the coming year. A broad exemption for Closed Area II that would allow commercial surfclam and ocean quahog fishing is inconsistent with the rotational management program that the Council has developed for this area.

Our evaluation of impacts is constrained by the metrics presented for fishing effort in the notice, which are limited to the number of trips and trip duration. These are cursory and make it difficult to assess what the impacts from fishing will be. 416 trips seem to be a very high level of effort for an experiment to determine whether clams in the area are contaminated with PSP. This high number also ignores broader concerns about impacts on EFH and other species. Information on the number of expected tows, tow duration, and potential bycatch are much more useful to assess for the potential impacts of the activity on managed resources and habitats. We also have concerns that the trip length is underestimated based on the distance of Closed Area II from ports in the Northeast. The steam time to and from Closed Area II is over a day and a half in total.

There is no rationale provided as to why two trips per week landing 4,800 bushels each are required to evaluate the effectiveness of testing for PSP in this new area. Is the purpose of the exempted fishery to determine that clams throughout the area do not contain problematic levels of PSP or is it to support future fishing in this area? Testing for PSP could be conducted with minimal harvest of surfclams and ocean quahogs, and without landing the product. As written, the scale of the EFP would presumably allow a fishery to be prosecuted within Closed Area II, as opposed to just an exploratory testing exercise.

The Council's Fishing Effects Model[1], and its precursor, the Swept Area Seabed Impact Model[2], estimate the effects of different bottom-tending gear types on benthic habitats. These models estimate a greater magnitude of impacts in deeper waters where the seabed is less affected by tidal currents. Some portions of Closed Area II deeper than approximately 80 meters are lower energy and therefore expected to be more vulnerable to fishing gear impacts. This issue is well described in section 6.1 of the Environmental Assessment prepared by NOAA Fisheries when the PSP exemption area was originally authorized[3].

Beyond the concerns about managed species and habitat, fishing industry groups have worked together to reduce gear conflicts in this area, particularly between mobile and fixed gear fishermen, specifically vessels fishing with lobster pots. Gear conflicts that may emerge with this new fishery should be considered.

While not an issue related to NEFMC-managed resources, southeastern Georges Bank is both surfclam and ocean quahog habitat. As we understand it, the fishery is currently restricted to landing one species or the other on a trip. The EFP should explain how mixed surfclam/ocean quahog catches will be accommodated if both species are encountered during the same trip.

Based on these concerns, we recommend that the EFP notice should be modified to clearly define the area that is being proposed for fishing so that the Council and public can better understand the scope of this research and potential impact on resources within the Closed Area II

[1] NEFMC (2011). The Swept Area Seabed Impact approach: a tool for analyzing the effects of fishing on Essential Fish Habitat. New England Fishery Management Council, Newburyport, MA: 257p.

[2] NEFMC (2020). Fishing Effects Model Northeast Region. New England Fishery Management Council, Newburyport, MA: 109p.

[3] National Marine Fisheries Service (2012). Re-Opening a Portion of the Georges Bank Closed Area to Surfclam and Ocean Quahog Harvesting. Environmental Assessment and Regulatory Impact Review. NMFS Northeast Regional Office, Gloucester, MA: 104p.

management unit. There also should be a clear explanation of how concerns over managed species and habitat will be addressed.

If you have any questions, please contact me.

Sincerely,

Thomas A. Nies

Thomas A. Nies
Executive Director

From: Dan Martino <dan-martino@hotmail.com>
Sent: Wednesday, March 31, 2021 8:22 PM
To: comments <comments@nefmc.org>; Janice Plante <jplante@nefmc.org>
Cc: Anne-Marie Runfola - NOAA Federal <anne-marie.runfola@noaa.gov>; hlk@northernatlanticdive.com; Susan Farady <sfarady@une.edu>
Subject: Fishing Regulations within a National Marine Sanctuary

Dr. Quinn and Mr. Nies,
I am an aquaculture farmer, wholesale seafood dealer, Gov. Baker appointee to the Acidification Commission and a new member of the Stellwagen Bank National Marine Sanctuary Council.

As you know, the fisheries management council created the fishing regulations that govern the Stellwagen Marine Sanctuary.
I am deeply troubled to learn that bottom trawling commercial fishing is allowed within the Stellwagen Sanctuary boundaries.

This directly violates the National Marine Sanctuaries Act:
16 U.S.C. § 1436
It is unlawful for ***any*** person to-
(1) destroy, cause the loss of, or injure any sanctuary resource managed under law or regulations for that sanctuary;
(2) possess, sell, offer for sale, purchase, import, export, deliver, carry, transport, or ship by any means any sanctuary resource taken in violation of this section;
A full copy of the Act can be found here:
https://nmssanctuaries.blob.core.windows.net/sanctuaries-prod/media/archive/library/national/nmsa.pdf

I am curious how the current Management Council views this situation and if they would be willing to restrict all bottom commercial fishing within sanctuary boundaries? Surely, we can create one area of the ocean where marine species are not hunted.
Bottom fishing not only destroys the habitat, but also contributes to climate change and warming oceans.
I would be happy to bring this matter to the council's attention in the public forum and would welcome the opportunity to work with you to help change these regulations.
A sanctuary by definition is a place where animals can seek shelter and protection.
Allowing commercial fishing within a Marine Sanctuary completely undermines the intent of a marine sanctuary.
Thank you.
I hope you're well.

Dan Martino
Co-Owner | Captain | Farmer
Martino's Seafood, LLC
Cottage City Oysters / Martha's Vineyard Seaweed
Work: 508-299-7745
Cell: 713-825-5190
www.CottageCityOysters.com

Mid-Atlantic Fishery Management Council
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Phone: 302-674-2331 | FAX: 302-674-5399 | www.mafmc.org
Michael P. Luisi, Chairman | P. Weston Townsend, Vice Chairman
Christopher M. Moore, Ph.D., Executive Director

March 16, 2021

The Honorable Debra Haaland
Secretary of the Interior
Department of the Interior
1849 C. Street, N.W.
Washington, DC 20230

Dear Secretary Haaland:

Please accept these comments on behalf of the Mid-Atlantic Fishery Management Council (Mid-Atlantic Council) regarding your review of the commercial fishing prohibition in the Northeast Canyons and Seamounts Marine National Monument (Northeast Marine Monument). The Mid-Atlantic Council manages fifteen species of fish and shellfish under seven fishery management plans (FMPs), plus more than 50 forage species that are managed as ecosystem component species across all of our FMPs. Although our management area extends from New York through Virginia, a considerable portion of the catch from some of our managed fisheries comes from New England waters.

Section 3 of President Biden's "Executive Order on Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis" requires you to recommend whether a commercial fishing prohibition within the Northeast Marine Monument should be restored. The Mid-Atlantic Council recommends that management of fisheries in marine monument areas should remain under the jurisdiction of the Regional Fishery Management Councils (RFMCs) and NOAA's National Marine Fisheries Service (NMFS). Any fishing restrictions within the Northeast Marine Monument should be developed through the science-based, participatory management process required by the Magnuson-Stevens Fishery Conservation and Management Act (MSA). The Mid-Atlantic Council joins the seven other RFMCs in unanimous opposition to the use of the Antiquities Act of 1906 to implement fishing restrictions in the U.S. Exclusive Economic Zone (EEZ).[1]

Working in partnership with NMFS, the RFMCs have more than four decades of experience successfully managing our nation's fisheries and marine ecosystems. Through implementation of the MSA, the United States is the global leader in the successful conservation and management of fishery resources and associated ecosystems. The RFMCs are charged not only with preventing overfishing and rebuilding overfished stocks but also with achieving optimum yield – the amount of fish which will provide the greatest overall benefit to the Nation. The RFMCs are also required to protect essential fish habitat, minimize bycatch, and comply with protections for species listed under the Endangered Species Act and other Federal laws.

Through our work as stewards of U.S. fishery resources, the RFMCs have become leaders in marine conservation. Each RFMC has developed, or is developing, some form of a fishery ecosystem plan or a fishery-based management plan. In the Mid-Atlantic, we use what is called an "Ecosystem Approach to Fisheries Management." Within the Mid-Atlantic Council's 71,000 square mile management area, about 58%, or 41,428 square miles, is covered by the Frank R. Lautenberg Deep Sea Coral Protection Area. In this area, all bottom-

[1] See comment letters sent to President Obama (6/26/16), President Trump (3/1/17), Secretary Zinke and Secretary Ross (5/16/17), Secretary Ross (5/29/20), and Acting Secretary De la Vega (2/26/21), all available at http://www.fisherycouncils.org/ccc-correspondence

tending fishing gear is prohibited to protect sensitive deep sea habitats. The management measures and specific boundaries for the protection area were approved by the Council in 2015 following an extensive, science-based process in collaboration with the fishing industry. Similarly, the New England Fishery Management Council has approved restrictions on bottom-tending gear within 87% of the monument area through its Deep Sea Coral Amendment. In each region you will find examples of how the RFMCs have carefully crafted spatial management measures and fishing restrictions to protect sensitive habitats and achieve other conservation goals.

The RFMCs are required to make all fisheries management decisions through a transparent, public process. The open forum provided by the Council system allows everyone to have a say in the stewardship of our marine resources and how fisheries are managed. We are concerned that the top-down approach used to designate and implement fishing restrictions within the Northeast Marine Monument did not provide adequate opportunities for public input. While a number of public events and meetings were held, fishermen and other affected stakeholders were not given a formal opportunity to comment on the proposed boundaries or management measures.

Implementation of fishing restrictions under the authority of the Antiquities Act of 1906 subverts the effective and time-tested fisheries management process established by the MSA. The RFMCs have the knowledge, experience, and technical expertise needed to meet conservation objectives while ensuring productive and sustainable fisheries. We recommend that fisheries management responsibility for the Northeast Marine Monument area should be retained by the New England Fishery Management Council.

Thank you for the opportunity to provide comments on this issue. We look forward to working with this Administration to ensure the continued sustainability and conservation of our nation's marine resources.

Sincerely,

C M Moore

Dr. Christopher M. Moore
Executive Director, Mid-Atlantic Fishery Management Council

CC: The Honorable Gina Raimondo, Acting Secretary of Commerce
Mr. Paul Doremus, Acting Assistant Administrator for Fisheries NOAA/NMFS
Mid-Atlantic Fishery Management Council Members
Mr. Tom Nies, New England Fishery Management Council, Executive Director

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March 11, 2021

Mr. Michael Pentony
Regional Administrator
NMFS, Northeast Regional Office
55 Great Republic Drive
Gloucester, MA 01930

RE: Comments on Commercial Fisheries Research Foundation (CFRF) South Fork Wind Farm Gillnet EFP

Dear Mike:

The New England Fishery Management Council has no objection to the CFRF's fishery proposal that would allow two commercial fishing vessels to use large mesh gillnet gear to collect preconstruction data on the abundance, size structure, and distribution of monkfish and winter skate in the South Fork Wind Farm work area and adjacent waters, as published in the *Federal Register* on March 4, 2021.

If you have any questions, please contact me.

Sincerely,

Thomas A. Nies

Thomas A. Nies
Executive Director

New England Fishery Management Council
50 WATER STREET | NEWBURYPORT, MASSACHUSETTS 01950 | PHONE 978 465 0492 | FAX 978 465 3116
John F. Quinn, J.D., Ph.D., *Chairman* | Thomas A. Nies, *Executive Director*

March 11, 2021

Mr. Michael Pentony
Regional Administrator
NMFS, Northeast Regional Office
55 Great Republic Drive
Gloucester, MA 01930

RE: Comments on Commercial Fisheries Research Foundation (CFRF) South Fork Wind Farm Fish Pot EFP

Dear Mike:

The New England Fishery Management Council has no objection to the CFRF experimental fishery proposal that would allow eight commercial fishing vessels to use fish pots to collect pre-construction data on the abundance, size structure, and distribution of scup and black sea bass in the South Fork Wind Farm (SFWF) work area and adjacent waters, as published in the *Federal Register* on March 4, 2021.

If you have any questions, please contact me.

Sincerely,

Thomas A. Nies

Thomas A. Nies
Executive Director