CORRESPONDENCE

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January 9, 2023

Tom Nies, Executive Director
New England Fishery Management Council
50 Water Street, Mill 2
Newburyport, MA 01950

Dear Tom:

As you know, the Council's 2023 Implementation Plan includes the development of the omnibus Essential Fish Habitat (EFH) Amendment (initiated October 2022). This action will concurrently conduct the 5-year EFH review required under the Magnuson Stevens Act while amending fishery management plans for the Council, as needed. This action is an opportunity to utilize the best available fish habitat science to improve EFH designations and support the Council's fish habitat conservation efforts while supporting the EFH consultation process.

At this stage, we are forming a fishery management action team (FMAT) to support development of this action. We believe Michelle Bachman has a tremendous amount of EFH knowledge and expertise to contribute, having recently completed major fish habitat actions for your Council. Please let us know by January 31 if you are willing to have her participate as a member. We expect the first FMAT meeting to occur in early 2023.

Please call me or Jessica Coakley of my staff if you have any questions.

Sincerely,

Christopher M. Moore, Ph.D.
Executive Director

cc: J. Coakley, M. Luisi, W. Townsend

January 9, 2023

Eric Reid, Chairman
New England Fishery Management Council
50 Water Street, Mill 2
Newburyport, MA 01950

Dear Chairman Reid,

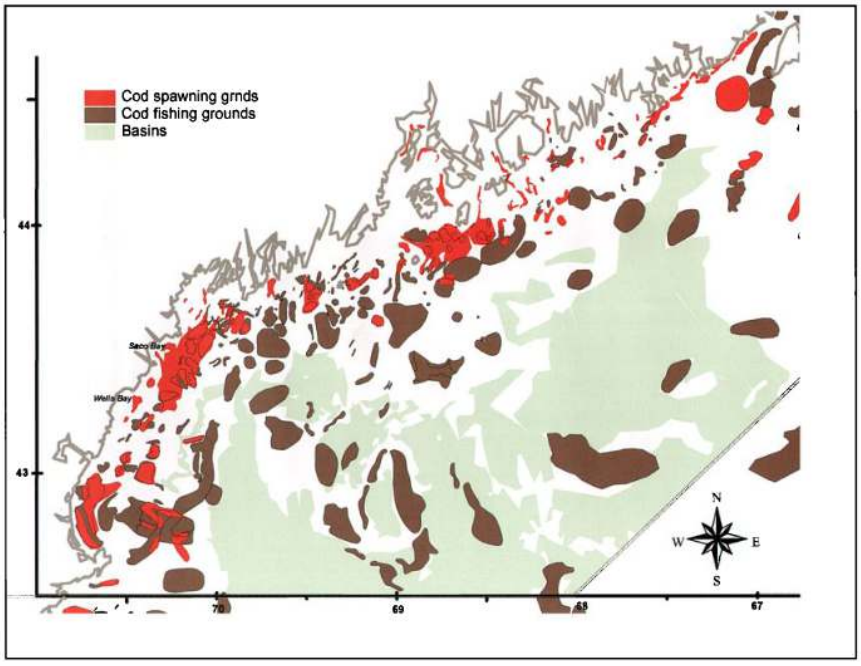
I write over my concerns about the effects of sea-based wind turbine power transmission cables and their effects on the behavior of larvae. I believe the federal government's push to install offshore wind turbines may come at the expense of rebuilding groundfish.

A recent study from Norway, which I have included in this letter, finds that the magnetic fields produced by subsea power transmission cables reduce the swimming activity of haddock larvae. It found for most larvae, called "nonexploratory," their swimming speed was reduced by 60%, and their swimming acceleration was reduced by 38%.

The study said that these changes could have "population-scale implications for haddock in the wild." It noted the magnetic fields "might alter the spatial distribution of haddock larvae, which could result in them drifting to different areas, potentially areas with less food and more predation compared to their usual dispersal routes and nursery areas."

Cod and haddock are somewhat similar. In 2004, Ted Ames published a study called "Atlantic Cod Stock Structure in the Gulf of Maine." In that, he plotted the locations of cod spawning grounds in the area (the locations came from interviews with many fishermen). Here is a map of those locations, with spawning grounds shown in red.

Figure 2a. Historical fishing grounds and spawning areas of Atlantic cod in the Gulf of Maine were used to create an X-Y plot for tracking Atlantic cod movements.



My concern is that no one is talking about the routing of the cables that will transmit power from the wind turbines to shore. As the map shows, to reach much of the coastline of the Gulf of Maine, cables would have to pass through cod spawning grounds.

I am speculating that cod larvae's reaction to cable magnetic fields would be similar to haddock's. The slower fish can swim and accelerate, the easier it is for a predator (including me) to catch them. During the summer, another predator - the abundant dogfish stock - moves inshore, as close as three miles off the coast. They will have a feeding frenzy on any slow-swimming fish. And I know that Gulf of Maine cod is a depleted stock, and the Gulf of Maine haddock quota is taking a massive cut because of concerns it could become depleted as well.

So as the Council takes actions like cutting quotas to rebuild fish stocks, no one seems to be asking what the effect of introducing new, unnatural magnetic fields into the ocean will be on the behavior and survival of groundfish larvae. Improper cable routing could work directly against your measures to rebuild stocks. I believe the Science Center should study this and report back to the Council, before any decisions on cable routing are made.

This wouldn't be the first time science was ignored in the push to install wind turbines. Bloomberg News recently reported that government scientists warned that a wind farm development off Rhode Island threatened cod in southern New England, but the project was approved anyway. You can read the article here:

https://phys.org/news/2022-12-scientists-atlantic-farm.html.

Fishermen cannot do this alone. We need the Council to protect depleted stocks from all unnatural sources of mortality, not just from fishing effort.

Sincerely,

Jerry Leeman, captain
F/V Teresa Marie IV

PNAS Nexus, 2022, 1, 1–7
https://doi.org/10.1093/pnasnexus/pgac175
Advance access publication date: 27 August 2022
Research Report

Magnetic fields produced by subsea high-voltage direct current cables reduce swimming activity of haddock larvae *Melanogrammus aeglefinus*

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Edited By: Karen E. Nelson

Abstract

High-voltage direct current (HVDC) subsea cables are used to transport power between locations and from/to nearshore and offshore facilities. HVDC cables produce magnetic fields (B-fields) that could impact marine fish. Atlantic haddock (*Melanogrammus aeglefinus*) is a demersal fish that is at risk of exposure to anthropogenic B-fields. Their larvae drift over the continental shelf, and use the Earth's magnetic field for orientation during dispersal. Therefore, anthropogenic magnetic fields from HVDC cables could alter their behavior. We tested the behavior of 92 haddock larvae using a setup designed to simulate the scenario of larvae drifting past a B-field in the intensity range of that produced by a DC subsea cable. We exposed the larvae to a B-field intensity ranging from 50 to 150 μT in a raceway tank. Exposure to the B-field did not affect the spatial distribution of haddock larvae in the raceway. Larvae were categorized by differences in their exploratory behavior in the raceway. The majority (78%) of larvae were nonexploratory, and exposure to the artificial B-field reduced their median swimming speed by 60% and decreased their median acceleration by 38%. There was no effect on swimming of the smaller proportion (22%) of exploratory larvae. These observations support the conclusion that the swimming performance of nonexploratory haddock larvae would be reduced following exposure to B-field from HVDC cables. The selective impact on nonexploratory individuals, and the lack of impact on exploratory individuals, could have population-scale implications for haddock in the wild.

Keywords: subsea cables, renewable energy, offshore wind, anthropogenic magnetic field, fish larvae

Significance statement:

This study reports impacts of anthropogenic magnetic fields (B-fields) in the intensity range of those produced by high voltage direct current (DC) subsea cables on larval fish behavior. The findings have implications for marine spatial planning and engineering of marine renewable energy devices such as offshore wind farms. Atlantic haddock (*Melanogrammus aeglefinus*) larvae disperse through areas where DC subsea cables are present or planned, and impacts of anthropogenic magnetic fields could alter their dispersal. These results show that following exposure to anthropogenic B-fields, the swimming speed and acceleration of 78% of the tested haddock larvae are significantly reduced. The study also provides insights about magnetosensitivity in marine larval fish, which remains poorly understood.

Introduction

High-voltage direct Current (HVDC) subsea cables are used to transport electricity over long distances. They transport power between islands, connect islands to the coast, and transport electricity to/from nearshore and offshore structures, such as oil platforms and marine renewable energy devices (1, 2). HVDC cables are a valuable and cost-effective solution to support the expansion of offshore marine renewable energy facilities, including offshore wind farms (2, 3). The number and size of offshore wind facilities are increasing rapidly to meet the increasing demand for renewable energy (4, 5). HVDC cables have a relatively low loss over long distance and are expected to become the most used type of subsea cables connecting marine renewable energy devices (5).

When electricity moves through an HVDC subsea cable, it generates a static magnetic field (B-field) in the proximity of the cable (6, 7). HVDC-induced B-field intensity varies with the power being transmitted through the cable and with the type of cable (8). The B-field intensity, which can reach 100 s of microtesla (μT) (2, 6), extends radially from the cable, and is highest at the cable surface, decreasing inversely with distance from it (7, 8). However, the decrease in magnetic field intensity with distance from the cable is nonlinear; it drops off sharply (7, 8). Due to the development of offshore sectors such as renewable energy facilities, the number and length of HVDC cables associated with marine renewable energy devices will increase, causing concern over potential effects that the exposure to anthropogenic B-fields could have on marine

Competing interest: The authors declare no competing interest.
Received: April 29, 2022. **Accepted:** August 25, 2022

organisms residing near, or drifting by, subsea cables (3, 6), since anthropogenic B-fields can impact behaviors that influence spatial distribution, such as swimming and orientation (9). For marine fish, the risk of exposure is particularly relevant during the early life stages, when fish have limited swimming capacity and they are still developing.

Several marine fish can sense the Earth's geomagnetic field and use it to orient during migration, including during the larval stages (10–12). Impacts of B-fields on larval swimming or orientation behavior would have consequences for their dispersal (13, 14), with possible downstream effects on survival and recruitment (15). The expansion of renewable energy facilities further offshore, with a concomitant increase in the length and number of subsea cables, increases the risk of exposure to anthropogenic B-fields for dispersing fish larvae. Previous studies demonstrated that anthropogenic B-fields and electromagnetic fields can alter the swimming and spatial distribution of marine species (16–18). However, there is very limited knowledge on the possible effects of B-fields from anthropogenic sources (such as HVDC) on the behavior of marine fish larvae that reside in, or disperse through, areas where HVDC is present.

Atlantic haddock (*Melanogrammus aeglefinus*) is a species of commercial and ecological importance in Europe (19). One of its largest stocks is located in the North Sea (20). Larval and juvenile habitats for haddock are associated with the continental shelf (21). In the North Sea, haddock larvae disperse for a period of 2 to 3 months in mid-water and close to the sea bottom (21, 22), in areas where facilities connected by HVDC cables (such as offshore wind farms) are operating or are planned (https://www.equinor.com/no/what-we-do/floating-wind.html). Moreover, haddock larvae are magneto-sensitive and use the geomagnetic field to guide their horizontal swimming at sea, relying on a magnetic compass mechanism for orientation (11). For all of these reasons, Atlantic haddock are at risk of being impacted by anthropogenic B-fields generated by HVDC cables. Whether B-fields generated by HVDC subsea cables affect the swimming behavior and spatial distribution of Atlantic haddock larvae is unknown.

We conducted an experiment on Atlantic haddock larvae to assess the potential impact of static magnetic fields in the intensity range of those emitted by HVDC subsea cables. We used an electric coil system to modify the B-field in a manner that simulated the scenario of fish larvae swimming or drifting through a B-field in the intensity range of that produced by a DC subsea cable. We tested the null hypothesis that an artificially modified B-field where a high-intensity area is followed by a sharp drop in intensity toward a low-intensity area has no impact on spatial distribution or swimming behavior of Atlantic haddock larvae.

Methods

Experimental animals

Haddock broodstock were collected locally from the waters near Austevoll (60.085 N, 5.261 E), Norway and two females were used as the source of eggs, which were then fertilized. Eggs were placed into one 500 L tank at a density of 100 eggs/L. Water exchange was set at 4 L/min. During the spring at high latitudes, larvae have enough light to feed at sea for most of the day. Thus, the photoperiod was set to 24 h under 2 × 25 w, 12 V halogen lamps. The larvae were reared in green water (*Nannochloropsis*, Reed Mariculture) at a temperature of 11 to 12°C and a salinity of ca. 35 PSU. Larvae were fed first on a diet of rotifers (*Brachionus* sp.) and natural plankton (mainly *Acartia nauplii*), and then (25 days post hatch) on Artemia and natural plankton copepod (primarily *Acartia* sp.). Eggs hatched on 2021 March 19 and larvae started feeding on March 22.

Ninety-two larvae were used in the experiments on larval behavior. The larvae were 31 to 33 days post hatch and were 8.2 ± 1.2 mm standard length (mean ± SD). Developmentally, larvae were at the beginning of the flexion stage, which in haddock occurs at approximately 10 mm standard length (23).

Experimental setup and exposure to B-field

The experimental setup used in this study was designed to expose Atlantic haddock larvae to a B-field in the intensity range of that produced by a DC subsea cable (Fig. 1), and followed the outline of the setup described in (24, 25). To accomplish this, we used two square Helmholtz coils (65×65 cm; 30 wraps of copper wire for each coil) connected to a BK Precision 1745 A DC power supply (0 to 10 A), and generated a B-field intensity (50 to 150 μT) in a tank with two separate raceways (Fig. 1) (24). The raceway tank was produced using a 3D printer (Ultimaker Cura S5–material white Tough PLA) (24), and was placed halfway inside the coils and filled with filtered seawater (Fig. 1A) (24). With the raceway positioned in this way, running a current through the coils generated a high B-field intensity on side 1 of the raceways, and a low B-field intensity on side 2 (see Fig. 1B) (24). The B-field was highest (150 μT) on one side of the raceway, sharply dropped in intensity, and was lowest at the other end of the raceway (approximately 50 μT). A similar pattern in B-field intensity is found in proximity of DC subsea cables (7, 26). The B-field intensities produced were also in the range of those produced by HVDC subsea cables associated with facilities such as offshore wind farms (2, 6). The experimental coils were parallel to the ground and modified the vertical component of the geomagnetic field, which had a total intensity (F) of 50 μT (73° Inclination and deviation of <1°) (24). The intensity of the B-field was recorded using a MLX90393 Triaxis Magnetic Node magnetometer from Melexis Inspired Engineering (Belgium) (24).

Larvae could swim freely from the high to the low B-field intensity area and vice versa in the raceway—50 cm long, 7 cm wide, and 3.5 cm deep. To minimize possible attraction-aggregation areas, the raceway was designed so that there were no sharp edges and the corners were rounded (Fig. 1A) (24). All the experiments were conducted in the dark to eliminate any possible visual cues for the larvae. A GOPRO HERO 7, modified for night vision and positioned above the raceway looking down onto it, was used to video record fish larvae during the experiments. The two DC 12 V 96 LED infrared illuminators were placed beside the camera. The room temperature was set at 11°C, which was the same temperature as the water in the rearing tanks of the larvae (24).

Behavioral observations and data analysis

The experiment, and all handling of animals at the start/end of every test, was conducted in the dark. This was to minimize the exposure to any other external cue other than the magnetic field. The day of the experiment, larvae were transferred in filtered seawater in 6.3 L tanks at a density of 3 larvae/L. The tanks were in the dark. Larvae were transferred to the dark tanks 1 h before the experiments (24). Larvae were tested individually. A single larva was placed in the middle of the raceway using a small cup and was allowed 5 min to acclimate to the raceway, after which its behavior was recorded for 10 min. To eliminate possible disturbance to the larva in the raceway tank, the observer started and stopped the GOPRO recording from outside the room using a remote control (24).

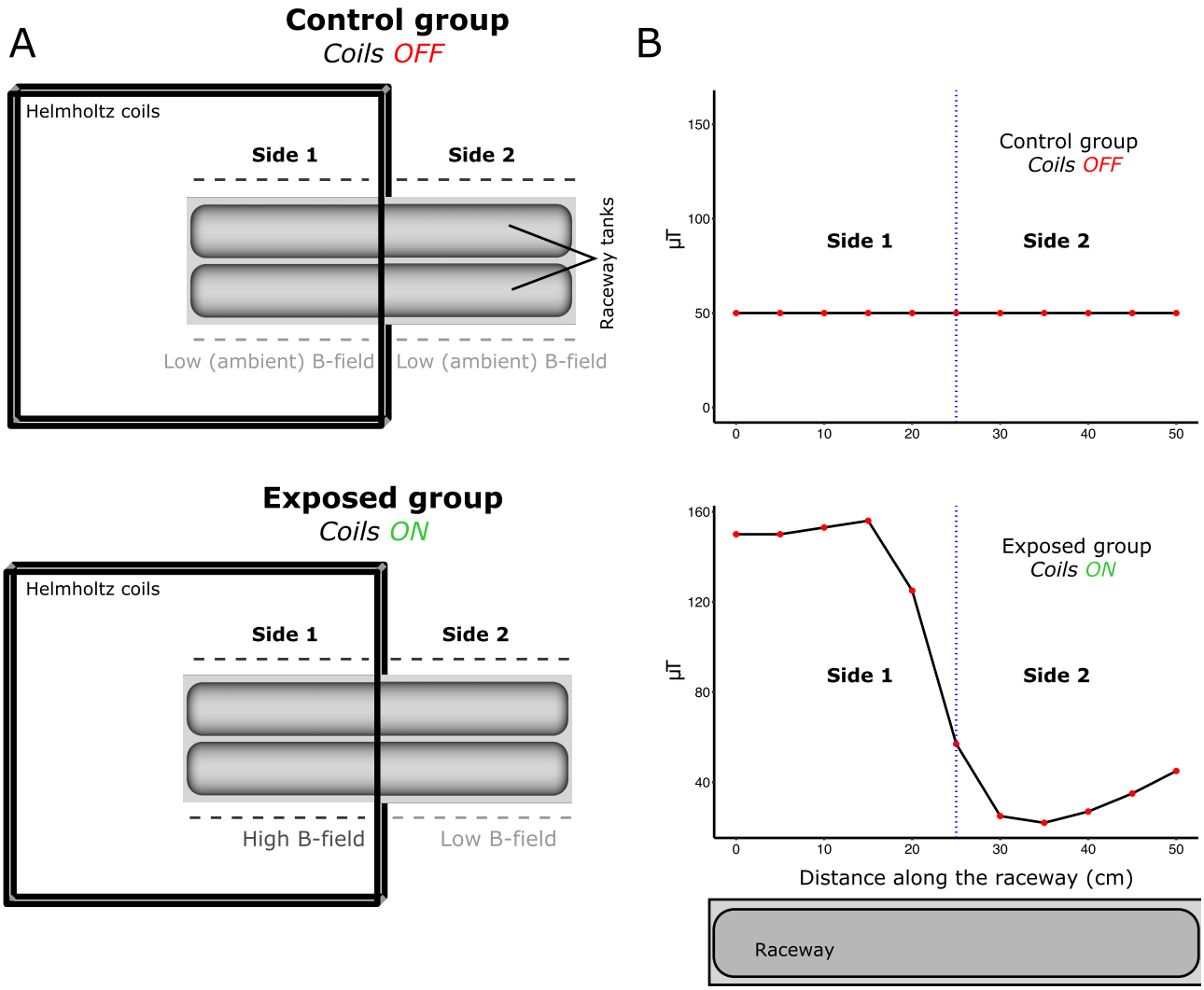

Fig. 1. (A) Experimental setup (top view) used to expose Atlantic haddock (*M. aeglefinus*) larvae to a static magnetic field (B-field) gradient. The black squares are a pair of parallel Helmholtz coils. The two gray rectangles with smoothed corners are two raceways in which larvae were swimming. Black dashed lines show the two sides of the raceway (side 1 inside the coils; side 2 outside the coils). Light and dark gray dashed lines show the intensity of the B-field on each side of the raceway. In the Control group (coils OFF), there was an ambient geomagnetic field in both sides of the raceway. In the Exposed group (coils ON), there was higher B-field intensity on side 1, and lower intensity (close to the geomagnetic field intensity) on side 2. (B) B-field intensity along the raceway (x-axis) with coils ON and coils OFF. In the Control group, the geomagnetic field had the same value along the whole raceway (50 μT). In the Exposed group, the B-field intensity had a gradient going from 150 μT on Side 1, decreasing toward the end of side 2, to settle at approximately 50 μT at the right end of half 2. Haddock larvae were free to swim along the whole raceway during the experiment. Figure modified from Cresci et al., 2022 (24).

We replicated the protocol for one larva at a time in each of the two raceways, replacing the larvae with new individuals at the end of each 15 min test (Fig. 1A). A total of 92 haddock larvae were tested. Half of these (Controls, $N = 46$ replicates) were video recorded in the raceway with the electric coils switched OFF (Fig. 1). The other half of the larvae (Exposed, $N = 46$ replicates) were recorded with the coils switched ON and were, therefore, exposed to a B-field intensity ranging from 50 to150 μT with a sharp drop in intensity in the middle of the raceway (Fig. 1B) (24).

Atlantic haddock larvae in the videos were tracked manually using Tracker 5.1.5. (Copyright© 2020 Douglas Brown, https://physlets.org/tracker). We tracked the position of each larva, every second, for the 10-min observation period (600 data points per haddock larva) (24). The tracks were used to calculate the position of larvae along the raceway and to measure their swimming kinematics (median and maximum speed, and acceleration) (24).

Data on fish length, position along the x-axis, and median and maximum swimming speed and acceleration were tested for normality using the Shapiro-Wilk test. As data were not normally distributed, comparisons between experimental groups (B-field ON and OFF) were conducted using the nonparametric Wilcoxon test. Values for each group are reported as median (Inter Quartile Range; IQR).

Results

Behavior of Atlantic haddock larvae in the raceway

Individual Atlantic haddock larvae exhibited distinct interindividual differences in exploratory and swimming behavior. After the 5-min habituation period, 20 out of 92 larvae (22%) were actively swimming along the raceway without settling on either

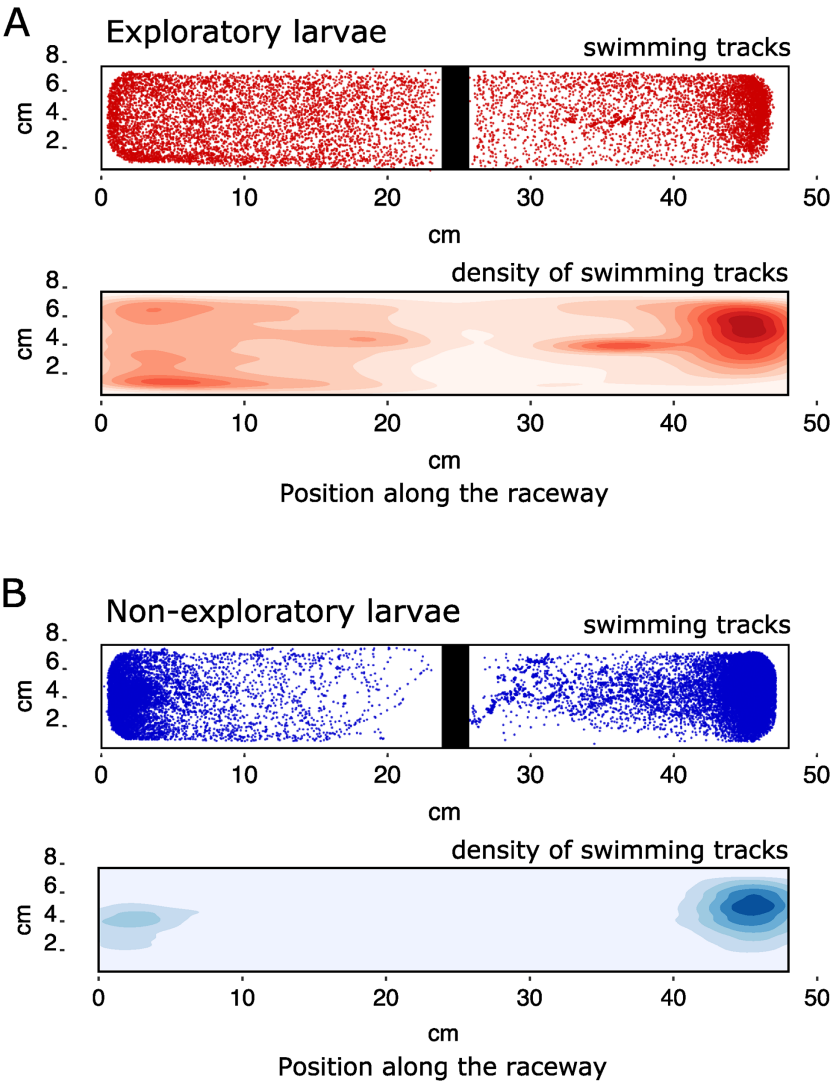

Fig. 2. Swimming tracks of Atlantic haddock (*M. aeglefinus*) larvae. The black rectangle represents the raceway. The vertical dark rectangle in the middle of the raceway represents the electric coil passing between the camera and the raceway. (A) Tracks of exploratory haddock larvae recorded every second, and density of the tracks in the raceway. The density is calculated as a 2D kernel density estimation on a square grid (function geom_density_2d_filled, ggplot2 package, R). (B) Tracks of nonexploratory haddock larvae and density of the tracks in the raceway.

side, exploring the entire space available to them (Fig. 2A). These larvae crossed the middle of the raceway at least once during the 10-min-long test and were categorized as "exploratory." The rest of the larvae, which represented the majority of the individuals (72 out of 92; 78%), settled on one of the two sides of the raceway and never crossed the middle of it during the test (Fig. 2B). These larvae were categorised as "nonexploratory" (Fig. 2B).

Exploratory larvae had a median speed of 0.92 (0.54) cm/s [median (IQR)], which was significantly higher ($W = 1259.5$, $P < 0.01$) than the median speed of 0.27 (0.42) cm/s displayed by nonexploratory larvae. During the 10 min observation period, exploratory larvae swam on average 6.3 ± 3.2 m (mean ± SD), while nonexploratory fish swam on average 2.3 ± 1.4 m. Exploratory larvae had median standard length of 9.0 (1.5) mm, which was significantly greater ($W = 1170$, $P = 0.38$) than the median length of 7.8 (1.3) mm of nonexploratory individuals.

Impact of B-field

Exposure to B-field did not affect the spatial distribution (position along the x-axis of the raceway) of larvae along the raceway ($W = 634$, $P = 0.89$). Nor was there an effect of B-field on spatial distribution when exploratory larvae ($W = 41$, $P = 0.62$) or nonexploratory larvae ($W = 634$, $P = 0.90$) were assessed as categories.

The swimming speed of Exposed nonexploratory larvae ($N = 34$, median = 0.13 cm/s, IQR = 0.36) was 60% lower than the median speed of Control nonexploratory larvae ($N = 38$, median = 0.34 cm/s, IQR = 0.31) ($W = 862$, $P = 0.01$) (Fig. 3A). B-field Exposed nonexploratory larvae also had significantly lower acceleration ($W = 844.5$, $P = 0.02$) ($N = 34$, median = 0.09 cm/s^2, IQR = 0.17) compared to Control nonexploratory larvae ($N = 38$, median = 0.15 cm/s^2, IQR = 0.14) (Fig. 3B). Median speed and acceleration of exploratory larvae were unaffected by exposure to B-field (Wilcox. $P > 0.05$) (Fig. 3A and B). Exposure to B-field did not impact the maximum swimming speed (Fig. 3C) and maximum acceleration (Fig. 3D) of exploratory and nonexploratory larvae

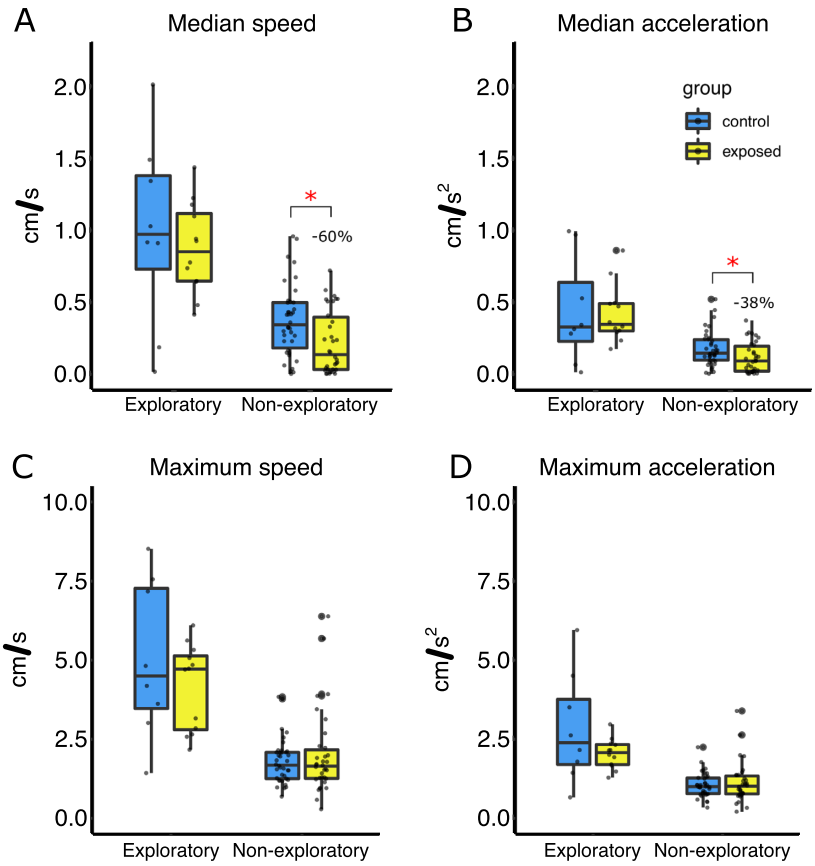

Fig. 3. Swimming speed and acceleration of Atlantic haddock (*M. aeglefinus*) larvae in the raceway (Control and Exposed to magnetic field). Boxplots show minimum, 25th percentile, median, 75th percentile, and maximum values. Data points in the boxplots show the value for each individual larva and are separated out along the x-axis for visualization purposes only (to avoid overlap). Red asterisks show statistically significant differences ($\alpha = 0.05$) between Control and Exposed larvae. Data are displayed according to the exploratory behavior of haddock larvae (Exploratory; Nonexploratory). (A) Median speed. (B) Median acceleration. (C) Maximum speed. (D) Maximum acceleration.

(Wilcox. $P > 0.05$). Data are available in the Supplementary Material file.

Discussion

A simulated static B-field of intensity ranging between 50 and 150 μT did not influence the spatial distribution of Atlantic haddock larvae (*M. aeglefinus*) in a raceway. B-field exposure did not cause attraction to either side of the raceway. These findings suggest that haddock larvae would not actively swim toward or away from B-fields in the intensity range of those produced by HVDC cables. However, more research is needed to address whether haddock larvae would be attracted to or repelled from HVDC cables in situ.

Exposure to B-field in the intensity range of that produced by subsea DC cables did not affect the behavior of all haddock larvae equally. The effect depended upon interindividual variability in exploratory behavior (Figs. 2 and 3). Specifically, haddock larvae exhibited two distinct exploratory behaviors after being introduced into the raceway (Fig. 2): exploratory larvae (22% of the total number of individuals observed) explored the whole space available to them and displayed much higher swimming speeds compared to nonexploratory larvae (which were 78% of the total number of individuals observed). Exposure to a B-field intensity in the range of that produced by HVDC cables reduced the swimming speed of nonexploratory haddock larvae by 60% and their acceleration by 38% (Fig. 3). This suggests that nonexploratory haddock larvae drifting in proximity of HVDC subsea cables would swim slower if exposed to these B-field levels. Exposure to B-field had no effect on the swimming of exploratory haddock larvae. However, this could be due to the smaller sample size of that group ($n = 20$) that might have been insufficient to identify a B-field-related difference in swimming speed.

Although exploratory larvae were the same age as nonexploratory larvae, they were significantly larger by 0.8 mm (on average). This difference might account for part of the difference in speed between exploratory and nonexploratory larvae. Exploratory larvae had a median speed of 0.92 cm/s, which was 240% higher than the median speed of nonexploratory larvae. Gadoid larvae 4.5 to 9.5 mm long display an increase in routine swimming speed of ∼35% within each 1 mm increase in total body length (27). Thus, the large difference in swimming speed between exploratory and nonexploratory larvae observed in this study is likely to depend on interindividual differences in locomotory activity rather than on a difference in body size.

The differences in exploratory behavior reported in this study, as well as the proportion of individuals in each category, are consistent with literature categorizing individual fish based on differences in locomotory activity and exploratory behavior as "proactive" and "reactive" (28, 29). Proactive–reactive differences have

been reported in many fish species, such as zebrafish (*Danio rerio*) (30), cod (*Gadus morua*) (29), northern pike (*Esox lucius*) (31), and gilthead seabream (*Sparus aurata*) (32). Proactive–reactive differences in behavior have also been reported during the larval stages in fish (31). Most of the haddock larvae (78%) observed in the raceways could be considered reactive individuals. This is consistent with other studies in which reactive individuals typically predominate (>70%) (33); (34); (29). The higher sensitivity to B-fields displayed by nonexploratory larvae is consistent with previous work showing that reactive fish respond to changes in B-field intensity and direction, but proactive fish do not (33, 35). This selective impact of B-field could have important implications for cohorts of larvae interacting with subsea cables, as reactive fish tend to be risk-averse (36) and are more adaptable to changes in the environment (37).

A reduction in swimming activity could have consequences for the dispersal ecology of this species because it would decrease the active swimming component of their horizontal drifting trajectory, increasing the relative importance of passive transport (powered by ocean currents) (13, 14, 38). This might alter the spatial distribution of haddock larvae, which could result in them drifting to different areas, potentially areas with less food and more predation compared to their usual dispersal routes and nursery areas (15). In addition, Atlantic haddock larvae are magneto-sensitive: anthropogenic B-field could alter their drifting trajectory by interfering with the magnetic compass that they use to orient *in situ* (11). Whether exposure to B-field from HVDC cables has long-term impacts on the magnetic orientation abilities of haddock larvae has yet to be investigated.

The observed effects of exposure to static B-field on haddock larvae are consistent with those reported for other marine species (9). High-intensity B-field (2.8 mT) affected the spatial distribution of the crab *Cancer pagurus*, which was attracted to areas with strong B-field intensity (39). Similarly, exposure to small increases in B-field intensity (10 μT higher than the background geomagnetic field) influenced electrosensitive fish, such as the little skate *Leucoraja erinacea*, which spent less time in the center of an experimental arena when exposed to altered B-field (16). However, not all aquatic species are affected by changes in B-field. For example, B-fields (up to 200 μT) did not affect spatial preference and shelter-seeking behavior in juvenile European lobsters (*Homarus gammarus*) (25). Similarly, rainbow trout (*Oncorhynchus mykiss*) juveniles did not show direct avoidance of either static or time varying strong B-field of 10 mT (40).

Future work should investigate how long the effects of exposure to B-field last and on estimating the threshold of B-field intensity, causing impacts on haddock larvae. That additional information would support estimating a risk area around facilities that are connected to HVDC subsea cables. Future research should investigate movement patterns of later life stages of Atlantic haddock around subsea cables using high-resolution acoustic telemetry technology. This approach would provide details on the habitat use of this species (41) in areas where subsea cables are planned and, later, be compared to when they are present.

Acknowledgments

Thanks to Stig Ove Utskot for carefully and successfully rearing the haddock larvae used in this study.

Ethical Statement

The Austevoll Research Station has a permit to operate as a Research Animal facility for fish (all developmental stages), under code 93 from the national Institutional Animal Care and Use Committee (IACUC); NARA. We did not require specific approval for these experiments because they are behavioral observations of a nonintrusive potential stimulus.

Conflict of Interest

The authors declare no conflict of interest.

Supplementary Material

Supplementary material is available at *PNAS Nexus* online.

Funding

This work was funded by the Norwegian Institute of Marine Research's project "'Assessing the effects of offshore wind power generating facilities on the early life stages of fish"' (project # 15655) to H.I.B.

Authors' Contributions

A.C. designed the study, collected, analyzed, and interpreted the data, and wrote the paper. C.M.F.D. designed the study, interpreted the data, and wrote the paper. T.L. analyzed, and interpreted the data. R.B. designed the study, interpreted the data, and wrote the paper. A.B.S. designed the study, interpreted the data, and wrote the paper. H.I.B. designed the study, interpreted the data, wrote the paper, and is the leader of the project that funded the research.

Data Availability

All data are included in the manuscript and/or supporting information.

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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
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December 23, 2022

Todd Schaible, Chief
Regulatory Branch
Philadelphia District
US Army Corps of Engineers
Attn: CENAP-OPR
100 South Independence Mall West
Philadelphia, PA 19106-3400

Dear Mr. Schaible:

We have reviewed Public Notice NAP-NJSPGP-17, dated September 13, 2022, which describes the US Army Corps of Engineers (USACE), Philadelphia District's proposal revalidate and extend the expiration date of Department of the Army General Permit NJSPGP-17. This general permit was first issued in December 1982. It authorizes the construction of structures, work, and the discharge of dredged material in substantially developed lagoons in the State of New Jersey. NJSPGP-17 is applicable to all appropriate navigable waters within the geographic boundaries of both the Philadelphia and New York Districts of the USACE. The current permit expires on December 31, 2022. Since its first issuance, we have worked collaboratively with the Philadelphia District on the development of the Terms of Authorization (TOAs) and Special Conditions in the general permit so that impacts to NOAA trust resources, including essential fish habitat are avoided and minimized. As a result, we have no objections to the revalidation and extension of the expiration date of the NJSPGP-17.

The Magnuson Stevens Fishery Conservation and Management Act (MSA) requires federal agencies such as the Corps to consult with us on projects that may adversely affect EFH. 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. In addition, the Fish and Wildlife Coordination Act (FWCA) requires all federal agencies to consult with us when proposed actions might result in modifications to a natural stream or body of water. It also requires that federal agencies consider the effects that these projects would have on fish and wildlife and 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. Because the activities authorized by NJSPGP-17 may adversely affect EFH and other NOAA Fisheries trust resources, consultation with us under these two authorities is required.

Based upon our evaluation of the NJSPGP-17, its TOAs and Special Conditions, and the

extensive coordination between our agencies over the years, we are able to issue a General Concurrence for this general permit. A General Concurrence identifies specific types of federal actions that may adversely affect EFH, but for which no further consultation is required because we have determined, through an analysis of that type of action, that the action will likely result in no more than minimal adverse effects both individually and cumulatively. For actions to qualify for General Concurrence, we must determine that the actions meet all of the following criteria pursuant to 50 CFR 600.920(9): 1) The actions must be similar in nature and similar in their impact on EFH; 2) The actions must not cause greater than minimal adverse effects on EFH when implemented individually, and; 3) The actions must not cause greater than minimal cumulative adverse effects on EFH.

Our EFH regulations require that actions qualifying for General Concurrence must be tracked to ensure that their cumulative effects are no more than minimal. Tracking should include numbers of actions and the amount and type of habitat adversely affected, and should specify the baseline against which the actions will be tracked. This information should be provided to us on an annual basis, generally at the end of each fiscal year. We will reach out to your staff near the end of each fiscal year so that the information can be included in our required internal reporting on programmatic consultations and General Concurrences.

Conclusion

Thank you and your staff for all of their efforts to work with us to develop TOAs and Special Conditions that avoid and minimize adverse effects to EFH and other NOAA trust resources. These efforts have allowed us issue this General Concurrence for NJSPGP-17, which eliminates the need for individual coordination and consultation between our agencies on actions that qualify for the general permit. This improves consultation and permitting efficiencies while still protecting aquatic resources. Should you have any questions or to discuss this matter further, please contact Karen Greene at (978) 559 9871 (karen.greene@noaa.gov).

Sincerely,

Louis A. Chiarella
Assistant Regional Administrator
for Habitat and Ecosystem Services

cc: USACE NAP – D. Caplan
USACE - NAN – S. Ryba
NOAA PRD – M. Murray-Brown
MAFMC – C. Moore
NEFMC – T. Nies

UNITED STATES DEPARTMENT OF COMMERCE
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December 28, 2022

Todd Schaible, Chief
Regulatory Branch
Philadelphia District
US Army Corps of Engineers
Attn: CENAP-OPR
100 South Independence Mall West
Philadelphia, PA 19106-3400

Dear Mr. Schaible:

We have reviewed Public Notice NAP-2022-01006-85, dated November 29, 2022, which describes the US Army Corps of Engineers (USACE), Philadelphia District's proposal revalidate and extend the expiration date of Department of the Army General Permit Delaware-SPGP-18 (DESPGP-18) until December 31, 2027. This general permit was first issued in November 1987. It authorizes the construction of structures, work, and the discharge of dredged material in substantially developed lagoons in the State of Delaware. The current permit expires on December 31, 2022. Since its first issuance, we have worked collaboratively with the Philadelphia District on the development of the Terms of Authorization (TOAs) and Special Conditions in the general permit so that impacts to NOAA trust resources, including essential fish habitat are avoided and minimized. As a result, we have no objections to the revalidation and extension of the expiration date of the DESPGP-18.

The Magnuson Stevens Fishery Conservation and Management Act (MSA) requires federal agencies such as the Corps to consult with us on projects that may adversely affect EFH. 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. In addition, the Fish and Wildlife Coordination Act (FWCA) requires all federal agencies to consult with us when proposed actions might result in modifications to a natural stream or body of water. It also requires that federal agencies consider the effects that these projects would have on fish and wildlife and 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. Because the activities authorized by DESPGP-18 may adversely affect EFH and other NOAA Fisheries trust resources, consultation with us under these two authorities is required.

Based upon our evaluation of the DESPGP-18, its TOAs and Special Conditions, and the extensive coordination between our agencies over the years, we are able to issue a General

Concurrence for this general permit. A General Concurrence identifies specific types of federal actions that may adversely affect EFH, but for which no further consultation is required because we have determined, through an analysis of that type of action, that the action will likely result in no more than minimal adverse effects both individually and cumulatively. For actions to qualify for General Concurrence, we must determine that the actions meet all of the following criteria pursuant to 50 CFR 600.920(9): 1) The actions must be similar in nature and similar in their impact on EFH; 2) The actions must not cause greater than minimal adverse effects on EFH when implemented individually, and; 3) The actions must not cause greater than minimal cumulative adverse effects on EFH.

Our EFH regulations require that actions qualifying for General Concurrence must be tracked to ensure that their cumulative effects are no more than minimal. Tracking should include numbers of actions and the amount and type of habitat adversely affected, and should specify the baseline against which the actions will be tracked. This information should be provided to us on an annual basis, generally at the end of each fiscal year. We will reach out to your staff near the end of each fiscal year so that the information can be included in our required internal reporting on programmatic consultations and General Concurrences.

Conclusion

Thank you and your staff for all of their efforts to work with us to develop TOAs and Special Conditions that avoid and minimize adverse effects to EFH and other NOAA trust resources. These efforts have allowed us issue this General Concurrence for DESPGP-18, which eliminates the need for individual coordination and consultation between our agencies on actions that qualify for the general permit. This improves consultation and permitting efficiencies while still protecting aquatic resources. Should you have any questions or to discuss this matter further, please contact Karen Greene at (978) 559 9871 (karen.greene@noaa.gov).

Sincerely,

For

Louis A. Chiarella
Assistant Regional Administrator
for Habitat and Ecosystem Services

cc: USACE NAP – M. Yost
NOAA PRD – M. Murray-Brown
MAFMC – C. Moore
NEFMC – T. Nies

UNITED STATES DEPARTMENT OF COMMERCE
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December 27, 2022

Natalie Jennings
Research Biologist
Coonamessett Farm Foundation, Inc.
277 Hatchville Road
East Falmouth, MA 02536

Dear Ms. Jennings,

We have reviewed your most recent application for an Exempted Fishing Permit (EFP) for a project to conduct a benthic habitat assessment in the Davis Bank East exemption area of the Great South Channel Habitat Management Area (GSC HMA) on Nantucket Shoals. This project would be a follow up to the EFP that we approved in May 2020 (EFP #19066). The 2020 EFP was intended to be a proof-of-concept project to determine if the proposed methods addressed Council research objectives[1] for the area, and future phases of the project would be considered based on how well Phase 1 addressed these objectives. Because of the importance of this area and the intended research objectives, we consulted with the Council to help evaluate the utility of the Phase 1 methods and results and inform our review of your new application. After reviewing input and findings from the New England Fishery Management Council, its Habitat Plan Development Team (PDT), and Habitat Committee, we encourage you to revise your EFP application and modify the project methods and sampling design to incorporate these findings.

CFF outlined several objectives for the pilot project, including the use of dredge-mounted cameras to document substrate, habitat features (e.g., sand waves, mussel beds), fishes, and invertebrates within the Rose and Crown area of the HMA and to create spatiotemporal distributions of biotic and abiotic habitat features to be used to inform future management actions regarding the HMA. The final report for the pilot project indicated that complex habitat is widespread throughout the project area, that clam dredges operate in areas with complex pebble-cobble bottom, and that the habitat is very heterogenous, even on small spatial scales. Catch per unit effort of clams during the study also increased with increased habitat complexity.

Based on a review of the Phase 1 results, and feedback from the PDT, the Habitat Committee, and the Council, this project provided limited information that the Council was looking for to address the research objectives for the area. While the project provided some information, and can help inform the design of future research, the limitations of the study design and sampling approach reduce the utility of this information, and the potential to characterize and map habitat, which is necessary to inform future management decisions. Feedback from the PDT and Habitat Committee on the Final Report for EFP #19066 noted concerns about the methods and sampling design that make these results difficult to use for understanding habitat complexity. The PDT noted, and we agree, that fishery-dependent data collection is not ideal as a sampling method to

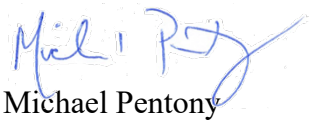
[1] https://s3.amazonaws.com/nefmc.org/190612-GSC-HMA-Research-Planning-Document.pdf

achieve the Council's research objectives, given that it is biased towards locations where clams are more abundant, and because the act of fishing alters the habitats sampled (i.e., future mapping of habitat should not be done with clam dredges). The Committee concluded, and the Council concurred, that future projects should focus more on fishery-independent sampling.

While the new EFP application includes a slightly improved sampling design to incorporate randomized sampling, it still relies heavily on the same fishery-dependent methods used in the pilot project. These methods are not effective to generate habitat maps for this area and do not fully address the Council's research objectives or the data and information needed to inform future management decisions. We are also concerned about the potential impacts of these methods on habitat that the HMA was designed to protect. Further, based on the results and outcome of Phase 1, it is unclear how the new EFP application could sufficiently support or achieve the proposed fisheries-independent sampling. We acknowledge the funding challenges in completing more fishery-independent sampling, and we encourage you to continue to seek additional funding sources to support necessary work. Demonstrating that sufficient funding will be available to complete the proposed fisheries-independent sampling is important in order to evaluate the need, scope, and appropriateness of any fisheries-dependent sampling, and likely success of research, which should rely primarily on fisheries-independent methods. We encourage you to consider all of these trade-offs when revising and re-submitting your EFP application, balancing the amount and location of any compensation fishing based on Phase I results and the Council, Committee, and PDT feedback.

We attached the recommendations and feedback on the pilot project (EFP #19066) from the Habitat PDT, the Habitat Committee, and the Council for your reference. For the reasons outlined above, and based on EFP regulations at 50 CFR 600.745 (b)(3)(i), I encourage you to revise the application consistent with the Council and PDT input, as well as secure external funding to ensure completion of fishery-independent research. At this time, our staff is extremely resource limited and will not be able to provide the level of engagement we provided for the formulation of EFP #19066. If you have any questions, please contact Jay Hermsen at jerome.hermsen@noaa.gov or 978-281-9137.

Sincerely,



Michael Pentony
Regional Administrator

cc: Eric Reid, NEFMC Chair
Tom Nies, NEFMC Executive Director

Attachments

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

December 20, 2022

Ms. Jessica Stromberg
Acting Chief, Environmental Branch for Renewable Energy
Bureau of Ocean Energy Management
45600 Woodland Road VAM–OEP
Sterling, VA 20166

RE: Essential Fish Habitat Assessment, Mayflower Wind
Lease Area OCS-A-0521, Rhode Island/Massachusetts Wind Energy Area

Dear Ms. Stromberg:

We reviewed the draft Essential Fish Habitat (EFH) assessment, received October 21, 2022, for the proposed Mayflower Wind offshore wind energy project within Lease Area OCS-A-0521, located within the Massachusetts Wind Energy Area. Mayflower Wind includes the construction, operation, and eventual decommissioning of up to 149 wind turbine generator (WTG) positions and offshore substation platforms (OSPs). The WTGs will be supported by up to two different types of foundations, which could include monopile, piled jacket, suction-bucket jacket, or gravity-based structures. The WTGs would be connected by a network of inter-array cables and export cables to shore. There are several export cables locations considered, including connection to either the eastern or western shoreline of Brayton Point, an Aquidneck Island onshore cable with intermediate landfall in Portsmouth, Rhode Island, or three options for landing locations in Falmouth, Massachusetts. In addition to the EFH assessment, we have also reviewed the Preliminary Draft Environmental Impact Statement (PDEIS) for cooperating agency review, and portions of the Construction and Operation plan (COP). However, the comments in this letter are focused on the draft EFH assessment.

The draft EFH assessment is incomplete and requires substantial revisions before consultation can be initiated, as it does not include critical information necessary for our review. Although we have tried to provide a comprehensive review of the draft EFH assessment, our review was complicated by the significant deficiencies in the document and the lack of an analysis of the effects of project impacts to EFH. Please be aware that the condition of the EFH assessment as well as the current schedule of multiple overlapping reviews and solicitations increases the likelihood that additional issues (not identified herein) may arise throughout the early coordination or consultation process. Comments and additional information needs are outlined below and in Attachment A.

Consultation Responsibilities
BOEM is the lead federal agency for offshore wind development activities and, as such, you are responsible for consulting with us under the Magnuson Stevens Fishery Conservation and Management Act (MSA), the Fish and Wildlife Coordination Act (FWCA), and the Endangered Species Act (ESA). However, we also recognize the U.S. Army Corps of Engineers' (USACE)

jurisdiction and responsibilities under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act. We understand that our comments and concerns related to activities proposed in nearshore waters (inside 3 miles), are also of concern to the USACE as part of their regulatory review, including their obligation to ensure that the proposed actions adhere to the Clean Water Act Section 404 (b)(1) Guidelines. Further, we also recognize the U.S. Environmental Protection Agency (EPA) jurisdiction and responsibilities under the Clean Water Act of 1972 to address in-water discharges under the National Pollutant Discharge Elimination System (NPDES) permit process. Therefore, USACE and EPA will also be using BOEM's EFH assessment to fulfill their regulatory responsibilities. It is our understanding that any appropriate EFH and FWCA recommendations we make to BOEM as part of the MSA and FWCA consultations will be incorporated as special conditions to any Department of the Army permit issued by the USACE for the proposed activity and considered by the EPA for inclusion in their permit. As a result, it is essential that the USACE and EPA also review the EFH assessment and concur with its analysis and conclusions, particularly since it will be their responsibility to respond to any EFH conservation recommendations issued for actions under their jurisdiction.

Information Needs for the EFH Assessment

The provided draft EFH assessment does not include the mandatory elements required for such assessments pursuant to 50 CFR 600.920(e). As a result, we do not have enough information to evaluate the effects of the proposed project on living marine resources or to provide recommendations to avoid, minimize, and mitigate adverse effects on EFH and other NOAA trust resources. Consequently, substantial revisions to the assessment are required before EFH consultation can be initiated. Given the extent of revisions, and supporting analyses, necessary for us to deem the assessment complete, we recommend that you coordinate with us as soon as feasible.

While specific comments and examples are outlined in Attachment A, below we identify some of our more significant concerns with the current draft, which includes a lack of the following information and analysis:

(1) **A complete description of the entire proposed action.** In order to initiate consultation, we must have a complete and accurate description of the proposed action (including all potential parameters outlined in the project design envelope [PDE]) and an analysis of the potential adverse effects of the action on EFH and the managed species including the necessary habitat data and information to support the consultation. For example, the EFH assessment should include an analysis of impacts from all foundation types considered as well as the anticipated number and location of HVDC converter stations/open loop cooling systems. As part of the proposed action, the updated EFH assessment should also include plans associated with the proposed action, including but not limited to; boulder removal and relocation, UXO removal and relocation procedures, vessel anchoring plans, benthic monitoring and mitigation plans

(2) **An accurate description of Habitat Areas of Particular Concern (HAPC) in the project area and a thorough analysis of the impacts of the proposed action on HAPCs.** Currently, the document does not acknowledge or discuss the overlapping HAPC for summer flounder or the recently approved HAPC for Atlantic cod. In addition, the document incorrectly suggests HAPC for juvenile cod is only found at the export cable

landing locations. The extent of overlap should be corrected based on the definitions and known habitat in the project area. As you know, the New England Fisheries Management Council recently approved a Habitat Area of Particular Concern (HAPC) for Atlantic cod spawning and complex habitats that overlap with the project area. The EFH assessment should provide an evaluation and detailed discussion of the project's proximity with documented Atlantic cod spawning activity and evaluate impacts to Atlantic cod spawning and sensitive life history stage EFH (i.e., egg and larvae) that would occur as a result of the proposed project. Additionally, the project overlaps with HAPC for summer flounder and impacts to this HAPC should be discussed and evaluated in detail in the document.

(3) **Site-specific surveys and site-specific analyses**. Please note that the EFH assessment should be a stand-alone document and all survey and impact assessment reports used to develop the EFH assessment should be included with the submission of the document. Further, such reports should be described and summarized in detail within the EFH assessment where they are used to identify and assess project impact effects to EFH. Site-specific surveys and analyses include, but are not limited to, benthic survey data, SAV surveys for the Falmouth landing location, turbidity modeling, and impingement and entrainment impact assessment for Atlantic cod eggs and larvae. Additionally, we have reviewed the pop-up viewer and request additional information be added to facilitate our review, including bathymetry contours (5 m preferable) so we understand the depths in the project area as well as the delineated of SAV beds, including results of project specific SAV surveys, specifically at the Falmouth landing locations.

(4) **Project-specific survey data incorporated into the impact analysis and evaluation of the effects of the proposed project to EFH**. This analysis should evaluate impacts based on conditions of the project area. For example, the project is proposing to impact estuarine environments as well as varying offshore habitats and HAPCs, but the analysis does not analyze the impacts to these different environments. Additionally, a number of samples along the cable route into Falmouth identify the invasive tunicate *Didemnum* but the assessment provides no analysis of impacts to EFH from disturbing these areas. While limited site-specific benthic survey data was incorporated into the "Existing Environment" section, this information was not used to support the "Adverse Effects" section beyond generalizations of potential impacts.

(5) **Results of the turbidity modeling for the Sakonnet River and Mount Hope Bay.** The EFH assessment does not sufficiently describe and analyze anticipated impacts to habitats within these estuarine environments. Results of the turbidity modeling, including figures and associated reports should be incorporated and associated impact to EFH described and analyzed in the text.

(6) **Clear and comprehensive project-specific descriptions of proposed activities and sub-activities**. The EFH assessment should address all proposed project activities and construction methodologies, not just the maximum impact scenario considered in the project design envelope. As stated in our scoping comments, limiting evaluation of project impacts to the maximum impact scenario is inconsistent with the EFH regulations. All potential construction parameters, methods, and associated impacts should be evaluated in the EFH assessment.

(7) **Analysis of potential alternatives to the proposed action that would minimize impacts to EFH and managed species.** While the EFH assessment includes a description of alternatives considered in the NEPA document, there is no analysis of how the alternatives

would avoid, minimize, or mitigate adverse effects of the proposed project on NOAA trust resources in the project area. For example, the proposed cable route through Mount Hope Bay appears to cross the estuary at the widest point and there is no discussion of how impacts to EFH in this waterbody would be avoided or minimized. In addition, potential mitigation measures (e.g., minimizing the number of WTGs to those necessary to meet the existing power purchase agreement, time of year restrictions for construction activities) that would minimize adverse impacts to EFH are not included in the EFH assessment

(8) **An evaluation of impacts to EFH from all potential project related effects**. This should include a description and analysis of impacts to EFH from wind wake effects. The draft assessment only currently considers hydrodynamic effects from the presence of the turbines and does not address effects to pelagic habitats from wind wake effect. This evaluation should discuss potential effects to oceanographic processes associated with Nantucket Shoals.

(9) **A comprehensive and robust evaluation of potential effects of the project, including direct, indirect, individual, cumulative, and synergistic effects.** This should include an independent analysis of effects supported by the best available science. The current draft EFH assessment includes conclusions that are not supported by the current analyses, appear to have been largely copied from the COP and COP appendices, and do not include updated literature or tables and figures to support the analyses. This should be rectified in the revised document through the inclusion of more robust analyses that fully supports conclusions.

A complete EFH assessment is a prerequisite to begin the EFH consultation process as specified in 50 CFR 600.920(i)(2). For all projects, but especially for a project of this size and complexity, each distinct project action and discrete component must be specifically identified and described. The potential direct, indirect, individual, cumulative and synergistic effects of those actions and components on EFH, federally managed species and their prey, and other NOAA trust resources must then be fully and completely evaluated. We recommend that you review our EFH assessment needs technical assistance document and comments submitted on other projects in the region, with a particular focus on our recent comments on New England Wind, Sunrise Wind and Revolution Wind, and past comments on South Fork Wind as the resources in these project areas are most similar. While we appreciate the efforts that you have made to mirror the structure of this draft EFH assessment to the EFH Assessment Template for Offshore Wind Energy Projects (currently being developed by our staff with the assistance of the Volpe Institute), the content of the current draft document is incomplete, as it does not adequately describe the proposed action, nor does it fully evaluate the potential adverse effects of the proposed action, or action alternatives under consideration, on EFH, federally-managed species and their prey, and other NOAA trust resources.

Information Needs for the Biological Assessment

Staff from our Protected Resources Division (PRD) have reviewed the October 21, 2022, draft Biological Assessment (BA). The BA is incomplete and requires substantial revision before ESA consultation can be initiated. Detailed comments are being transmitted via e-mail; we note that many of the significant issues in the BA are similar to those highlighted above regarding the EFH assessment. For additional information regarding the ESA consultation and our comments on the BA, please contact Julie Crocker (Julie.Crocker@noaa.gov or 978-282-8480).

Conclusion
As discussed above, the EFH and Biological Assessment provided to us are incomplete and require substantial revisions before they can support initiation of these consultations. Given the extent of revisions and additional analyses and surveys necessary, we recommend further coordination occur prior to the submission of the final EFH assessment to ensure all of the information necessary to evaluate the effects of the proposed actions on our resources is included so that consultation with us can be initiated.

Upon receipt of a complete EFH assessment, our consultation can be initiated and we will review the assessment and develop EFH conservation recommendations. Consistent with the timeline under FAST 41, we expect you to provide us with an updated EFH assessment with the Notice of Availability of the DEIS and, provided this assessment has the information necessary to do so, we expect to initiate our consultation no later than April 19, 2023. We note that given the current condition of the EFH assessment, we have concerns that there will not be sufficient time to incorporate the outstanding information and analysis into the EFH assessment by February 17, 2023 to allow the April 19, 2023 initiation data to be met. To avoid delays in the consultation process for this project, BOEM will need to address the comments above, incorporate information consistent with the EFH assessment information needs document and in Appendix A, review and refer to the content requirements of the EFH template, and work with us to help ensure that the analysis is complete and sufficient to initiate consultation on schedule. If BOEM cannot substantially update the consultation documents by February 17, 2023, we should discuss potential pushback of the milestone dates. We hope the information provided herein will help inform and guide you as the lead federal agency to ensure that we are able to receive the necessary information to complete our consultations in a timely and effective manner. We look forward to working collaboratively with you to address the information needs described in the attached appendices. If you have any questions regarding the EFH consultation process, please contact Sue Tuxbury at susan.tuxbury@noaa.gov.

Sincerely,

Karen M. Greene
Mid-Atlantic Branch Chief
Habitat and Ecosystem Services Division

Attachment:

Cc: Christine Crumpton, BOEM
Brian Hooker, BOEM
Naomi Handell, USACE/NAD
Christine Jacek, USACE
Ruthann Brien, USACE

Cheri Hunter, BSEE
Michele Desautels, USCG
Timothy Timmerman, USEPA
David Simmons, USFWS
Mary Krueger, NPS
Thomas Nies, NEFMC
Christopher Moore, MAFMC
Robert Beal, ASMFC
Julie Crocker, NMFS
Andy Lipsky, NEFSC

APPENDIX A
Mayflower Wind, Lease Area OCS-A-0521, Massachusetts
NOAA Fisheries Comments on the draft EFH Assessment dated December 20, 2022

As discussed in the attached letter, the draft EFH assessment provided to us is incomplete and does not contain all of the mandatory and additional information requirements for such assessments pursuant to 50 CFR 600.920(e). As a result, consultation cannot be initiated at this time and substantial revision to the document will be necessary in order for us to consider the assessment complete. The information provided below is intended to assist you in these revisions.

Definition of Life of the project
The life of the project should be defined up to decommissioning, as another consultation will be required for decommissioning. The document should be revised to ensure it accurately states where permanent impact (life of the project-up to decommissioning) versus long-term impacts (2 years to less than the life of the project) would occur.

Proposed Action
Table 2.1 provides the summary of the Mayflower Wind construction and O&M project components within the PDE; however, the document does not describe and analyze the impacts of these components. In some cases, they are listed or described in the document, but the analysis of impacts from these actions are not analyzed in Section 5. The analysis of impacts from the proposed action in the assessment does not match up with the components described in this table. Below are some examples of additional details needed:

- An analysis of impacts to EFH from all four foundation types under consideration - and how impacts to EFH would be minimized.
- Information on where the offshore substations and HVDC converter stations would be located (the table suggests there will be up to five). A description of the components of these converter stations, including the open loop cooling system, as well as impacts from both construction and operation and how these impacts would be minimized.
- Identification of the location and habitat type found at the nine locations, which will require additional scour protection due to cable crossings as well as an analysis of the effects to EFH.
- Information on where cofferdams will be installed and where HDD will begin, including distance from SAV or other sensitive habitats.
- Information on cable installation methods and their impacts to EFH.
- *Boulder Relocation Plan* -Identification of areas where boulder relocation would occur, including extent of boulder relocation required, identification of areas where this would occur *from* as well as areas where boulders are expected to be relocated *to*, and any engineering constraints that may factor into how far the boulders can be moved or relocated. This should include boulder relocations from both grapnel runs and other removal/relocation equipment. The following statement in the EFH assessment is not a sufficient description of the action -"Any boulders discovered in the pre-installation surveys that cannot be easily avoided by micro-routing could be removed with a grab lift or plow, as needed". Because boulder relocation activities adversely affect EFH, they must be fully described and their effects analyzed in the EFH assessment.

- *Anchoring Plan* - Identification of proposed areas where anchoring may occur along the cable route and within the lease area, including overlays with habitat data (backscatter data) and proposed methods considered for minimizing impacts to HAPC. Additional information on vessel activity and its impacts to cod spawning activity should be included. Because vessel anchoring adversely affects EFH, it must be fully described and their effects analyzed in the EFH assessment.
- *SAV Survey* - Results of recent SAV surveys along the landing location at Falmouth, including specifics on how these beds will be avoided and a plan should frack out occur (given the proposal to HDD under the SAV bed). In addition, the distance of the SAV bed from the proposed HDD exit pit, sediment type (sand, silt, etc.,), and information on any proposed dredging should be provided. Simply suggesting it is "adjacent" to the bed is not sufficient to analyze potential effects to SAV.
- Under section 2.2.1, the assessment identifies three OSP designs under consideration, but the document does not analyze the impacts to EFH from these three options. That should be included in the updated assessment if all three options are considered part of the proposed action.
- There are repeated references to the COP and, in some cases, areas that have been copied and pasted. The EFH assessment should be an independent assessment and a stand-alone document that would allow the reader to understand the proposed action and impacts to EFH from that proposed action.
- Pile driving -The total time period anticipated for pile driving is unclear based on the description. For example, is it anticipated to be two hours per pile - so that would be six to eight hours required for one jacket pile installation? What is the timing for monopile installation? More specifics, including the estimated time and area affected for the different piles considered in the proposed action.
- There is very limited information related to UXO for the project area. The updated EFH assessment should include more specifics, including a plan for how UXOs identified during construction will be avoided, removed or relocated.

Project Area/Existing Environment

- The EFH assessment does not discuss the specific habitats in the project area or effects to those habitats, including HAPC for juvenile Atlantic cod, summer flounder, and spawning Atlantic cod. The document only describes juvenile cod HAPC at the landing location; however, it is found throughout the Sakonnet River and Mount Hope Bay, as evidenced by the sampling data reviewed in the pop up viewer.
- The EFH assessment does not describe the overlap of the project with the tidal front/areas of upwelling associated with Nantucket Shoals. The pelagic habitat within the lease area varies based on location in the lease, as the northern portion is in much closer proximity to Nantucket Shoals. This should be described in the EFH assessment and impacts analyzed.
- The EFH assessment does not distinguish between impacts anticipated in the estuarine environment (Sakonnet River and Mount Hope Bay) compared to the offshore environment. Impacts to EFH will vary depending on the location where the impacts will occur and habitat types present; that should be fully analyzed in the document.
- The estimated areas in acreage are highlighted throughout the document; it is not clear how these areas were calculated or if they are accurate.

- Table 3-1 is not an exhaustive list of literature around impacts to fish habitats and we recommend that this be clarified in the document.
- For Table 3-2, it would be helpful to refer to specific reports or the pop up viewer for more information here. It is unclear how many replicate samples were conducted per station or where these samples are located.
- Table 3-4 - it is unclear how the estimated acreage in this table was calculated or what base maps were used to delineate the different habitat areas.

Construction and Installation

- The EFH assessment should provide more details related to the proposed schedule for project construction, as it does not appear that any time of year restrictions were considered. Time of year restrictions for construction are standard measures for avoiding and minimizing impacts to EFH and should be evaluated. Below are time of years for sensitive life stages in the project area:
    - Atlantic cod spawning: November through April
    - Sakonnet River (winter flounder/shellfish/cod settlement): February 1-October 15
    - Mount Hope Bay (winter flounder/shellfish/cod settlement) :January 15-October 15
    - Longfin squid spawning: May- August, squid eggs are most prevalent in July and August (it should be noted that egg mops are demersal and vulnerable to project impacts-this analysis should be included in the updated EFH assessment)
- When evaluating impacts to EFH the assessment should consider the time of year when construction would occur and what that means for EFH and federally managed species.
- The assessment incorrectly states that mobile species can simply swim out of the way. EFH for mobile species would still be affected by the project, and mobile species that are spawning, particularly those that aggregate to spawn, including Atlantic cod and longfin squid could be particularly vulnerable. The EFH assessment should evaluate impacts to those species and sensitive life stages. There is currently no analysis of impacts to spawning.
- More details should be provided related to construction and impacts associated with seabed preparation, including a clear description of the action and impacts to EFH based on habitats present in the project area. This analysis should also include impacts of disturbing seabed occupied by the invasive tunicate *Didemnum*, as based on the samples collected, it appears prevalent in portions of the export cable corridor.
- Turbidity Modeling: Turbidity modeling results for cable installation in the estuarine and offshore environments should be provided and explained. The document does not sufficiently describe impacts of cable installation within Sakonnet River and Mount Hope Bay. It simply states that modeling of sediment deposition associated with the Proposed Action has been limited to cable emplacement and HDD activities; however, those modeling results are not provided, outside some distances in the text. The turbidity modeling report should be provided and the document should incorporate this analysis (for both estuarine and offshore environments) in the EFH assessment.
- The EFH assessment should discuss and analyze measures to avoid, minimize and mitigate impacts to EFH and federally managed fish species. Currently the document focuses on minimization and mitigation measures specific to marine mammals.
- Information included related to seabed preparation for suction bucket foundations

suggests "water and air would be pumped out of the bucket to create a negative pressure, which embeds the foundation bucket into the seabed". The document does not describe the impacts to EFH associated with this activity and this should be included in the updated EFH assessment

- The seabed preparation section suggests that dredging is required for gravity based foundations, but does not discuss the extent of dredging and where and how the dredge material will be disposed. If this is part of the proposed action, it should be analyzed and described in the document.
- A number of different scour protection materials are listed; however, the EFH assessment must also describe the effects to EFH from these different materials. The conditions that would require each type of scour protection should also be described. Describe what a self-deploying umbrella system is and how it would affect EFH. Additional locations within the project where certain types of scour measures are likely to be placed due to variations in habitat type should be described and analyzed.
- Inter-array cable: The EFH assessment should include a graphic of the proposed inter-array cable layout and should describe the extent of area within the cable corridors where impacts are expected to occur and not simply the width of the cable. This should overlay benthic habitat maps that identify the different habitat types present.
- Describe in detail the equipment and methods for a pre-lay grapnel run and specifically where along the project this is proposed, as well as the anticipated effects to EFH.
- While different methods for cable installation are described, the impacts to EFH from these different methods are not described. The EFH assessment suggests that the studies to identify the appropriate methods have not yet been completed. If all potential methods are considered part of the proposed action, their impacts on EFH should be analyzed.
- Pile driving: It is unclear what foundation type is considered in the analysis of impacts from pile driving. This should be clarified in the EFH assessment and a discussion of how this may vary from other foundations under consideration should also be included. If multiple pile driving methods are being considered, then they should all be described as part of the proposed action and the effects of each should be analyzed in the EFH assessment.

Operation and Maintenance

- This section references the COP, but relevant information should be incorporated into the EFH assessment.
- Provide information on how the target burial depth for cables will be verified.
- The EFH assessment does not describe and analyze all potential impact producing factoring, including impacts of Wind Wake Effects. The document only appears to consider hydrodynamics from the turbine structure itself. This is a significant omission and should be analyzed in the updated document. There are recent papers[1] that discuss

[1] Christiansen, N,. U. Daewel, B. Djath, and C. Schrum. 2022. Emergence of large-scale hydrodynamic structures due to atmospheric offshore wind farm wakes. Frontiers in Marine Science 9:818501. doi: 10.3389/fmars.2022.818501

Daewel, U., N. Akhtar, N. Christiansen, and C. Schrum . 2022. Offshore wind farms are projected to impact primary production and bottom water deoxygenation in the North Sea. Communications Earth & Environmental 3, Article number: 292. doi.org/10.1038/s43247-022-00625-0 | www.nature.com/commsenv

Dorrell, R.M., C.J. Lloyd, B.J. Lincoln, T.P. Rippeth, J.R. Taylor, C.P. Caulfield, J. Sharples, J.A. Polton, B.D.

these effects that should be reviewed and discussed in the EFH assessment, particularly given the proximity of Nantucket Shoals.

- The document should provide an analysis of estimated intake of eggs and larvae from operation of HVDC converter stations and the associated open loop cooling system. The document should also provide an evaluation of impact from the heated effluent associated with these cooling systems. This is a significant omission, as they will be operating for the life of the project. The location and number of these cooling systems should also be included in the EFH assessment and the analysis. Measures to avoid or minimize adverse effects should be discussed.
- The document should discuss effects from AC and DC cables since both are considered as part of the proposed action. Conclusions related to EMF do not consider some more recent papers related to potential effects to larvae[2]

Alternatives to the Proposed Action

- The EFH assessment only lists alternatives considered in the NEPA document. The EFH assessment should include an analysis of how these alternatives would reduce impacts to EFH.
- Alternative F - see our comments on the preliminary DEIS related to your description and analysis of this alternative. It is unclear where the HVDC converter station would be located or the tradeoffs of this alternative, including how this would reduce the size of the current cable corridor and the effects of the operation of an open loop cooling system for the life of the project.

Adverse Effects

- The analysis of adverse effects does not include all activities included under the proposed action. This section should be updated to reflect all potential impacts from activities under the PDE.
- In several sections, conclusions related to adverse impacts to EFH are either unsupported by the text or not based on the most up to date scientific literature available. More current literature should be consulted for the updated EFH assessment.
- The analysis of adverse effects should consider the specific habitats/environments in the project area (Nantucket Shoals, Muskeget Channel, Sakonnet River, Mount Hope Bay, etc.)
- Throughout the document, adverse effects are only described by area or acreage, but the analysis should also discuss what those impacts mean for the project specific habitats/EFH and life stages for federally managed species that used them. What are the consequences of those adverse effects?

Scannell, D.M. Greaves, R.A. Hal and J.H. Simpson. 2022. Anthropogenic mixing in seasonally stratified shelf seas by offshore wind farm infrastructure. Frontiers in Marine Science 9:830927.doi: 10.3389/fmars.2022.830927. Floeter, J,. T. Pohlmann, A. Harmer, and C. Möllmann. 2022. Chasing the offshore wind farm wind wake- induced upwelling/downwelling dipole. Frontiers in Marine Science 9:884943. doi: 10.3389/fmars.2022.8849432022. Raghukumar, K., C. Chartrand, G. Chang, L. Cheung, and J. Roberts. 2022. Effect of floating offshore wind turbines on atmospheric circulation in California. Frontiers Energy Research. 10:863995. doi: 10.3389/fenrg.2022.863995 2022

[2]Cresci, A., Durif, C., Larsen, T., Bjelland, R., Skiftesvik, A.B. and Browman, H.I. 2022. Magnetic fields produced by subsea high-voltage direct current cables reduce swimming activity of haddock larvae *Melanogrammus aeglefinus*. PNAS Nexus, 1: 1–7.

- Conclusions related to the duration of impacts appear to confuse the duration of the effect (i.e. pile driving) and the duration of the impact. For example, while pile driving may be a “short-term” activity (or effect), the impact of that activity may be long-term or permanent, especially if the impact results in injury or death or impacts to reproduction and recruitment. While the "effect" of pile driving may be limited to two years, the "impact” may be long term to permanent for species using this area to spawn. This should be clarified in the EFH assessment.
- Overall, the document suggests habitat conversion or reef effect is a benefit. There are only two species in the project area where artificial substrates are considered EFH. The document should describe what habitat conversion may mean for species that do not use this habitat or for eggs, larvae and juveniles that may be more vulnerable to predation.
- The assessment should clarify how the areas identified as adverse effects were calculated.
- The updated assessment should include an analysis and estimate of eggs/larvae entrainment as well as the effects of heated effluent from the open looping cooling systems.
- The project monitoring section simply references monitoring plans in the COP; there is no analysis of impacts to EFH. This should be included.
- A benthic monitoring plan should be provided for our review and comment.
- Cumulative and synergistic effects should discuss what these impacts mean for the Southern New England area, including multiple projects and impact to complex habitats, HAPCs, Muskeget Channel, Nantucket Shoals upwelling, and cod spawning activity.

Avoidance, Minimization Measures

- This section appears to only include a list of proposed measures by the applicant, but it does not describe how these proposed measures would reduce impacts to EFH.
- The mitigation measures listed appear to be identified to mitigate impacts on the North Atlantic right whale. This section should include mitigation measures to reduce impacts to EFH.

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

December 16, 2022

Ms. Karen Baker
Chief, Office of Renewable Energy Programs
Bureau of Ocean Energy Management
45600 Woodland Road VAM–OEP
Sterling, VA 20166

RE: Draft Wind Energy Areas for commercial wind energy leasing on the Central Atlantic outer continental shelf (OCS)

Dear Ms. Baker:

We have reviewed the November 16, 2022, *Federal Register* (FR) notice requesting comments on the Draft Wind Energy Areas (WEA) proposed by BOEM for potential leasing offshore the U.S. Central Atlantic coast, which include eight areas covering approximately 1.75 million acres. We understand that BOEM will consider information received in response to this notice to identify Final WEAs as part of the Area Identification process. A draft report titled *Development of the Central Atlantic Wind Energy Areas*[1] (Draft Report) was also made available, which provides background, methods, results, and next steps for the development of the Central Atlantic Draft WEAs, including information on a spatial site suitability model developed for the WEA identification process by BOEM with technical support by the National Oceanic and Atmospheric Administration's (NOAA)'s National Centers for Coastal Ocean Science (NCCOS). BOEM is soliciting information and feedback on site conditions, resources, and multiple uses in close proximity to or within the eight Draft WEAs identified.

We appreciate the opportunity to comment on the suitability model and the Draft WEAs, and offer information related to NOAA trust resources, including habitat, protected species, fisheries, and NOAA scientific surveys for your consideration as you finalize WEAs in the Central Atlantic outer continental shelf (OCS). The comments and information provided herein were prepared in coordination with NOAA's National Marine Fisheries Service (NMFS) Southeast Region. We also provided written comments on June 24, 2022, in response to BOEM's Call for Information; these are included as an attachment to this letter. Those comments remain relevant to these Draft WEAs, including resources of concern, areas identified as unsuitable for development, and scientific recommendations, including the recommendation to implement a federal survey mitigation program prior to leasing to address unavoidable impacts to NOAA fisheries surveys. We recommend your continued consideration of those comments, as well as the information herein, as you work to finalize WEAs for future leasing in the Central Atlantic.

[1]Available at: https://www.boem.gov/sites/default/files/documents/renewable-energy/state-activities/BOEM_NCCOS_JointReport_DraftWEAs_FINAL.pdf

Draft WEA Siting Suitability Model Comments

Both BOEM and NOAA recognize the value of using Marine Spatial Planning tools to inform siting decisions[2]; these tools use rigorous scientific data to inform decisions and promote the transparency of decision-making. We commend BOEM's decision to work with NCCOS in implementing spatial modeling to inform their area identification process. NMFS staff from the Greater Atlantic Region (GAR) and the Southeast Region (SER) advised NCCOS regarding available data, information, and resources of concern off the Central Atlantic for BOEM's consideration in its spatial modeling efforts. NMFS identified scientific data sets for resources under our jurisdiction, including fisheries, habitat, protected species, and our scientific surveys[3]. As described below, key datasets from the model were excluded, making the results incomplete for the identification of habitat and fisheries resources. This works against the intent of marine spatial planning by reducing the objectivity and transparency of information used in decision-making. BOEM's ability to use the spatial model to make fully-informed, objective decisions would be improved by including these data sets, and we provide additional comments and feedback related to the model below to inform BOEM's finalization of the WEAs

Frank R. Lautenberg Deep-Sea Coral Protection Area and Priority Habitats

Through our coordination with NCCOS, NMFS identified priority vulnerable/sensitive habitats and available habitat datasets. In addition to the data layers identified in the Draft Report, NMFS provided the data layer for the Frank R. Lautenberg Deep-sea Coral Protection Area and recommended this data layer be considered as a constraint, or, at a minimum, an area poorly suited for development in the model. However, BOEM did not include the Coral Protection Area in the current site suitability model. We recommend this data layer be included to ensure that the model yields results that reflect the best available information and accurately represent the value of the coral protection area. We are concerned that areas we identified as the highest priority for protection appear to be identified by the siting model as most suitable for development. We understand and appreciate that there are plans to reexamine this issue, particularly related to how the coral habitat suitability data were integrated; however, we also recommend BOEM rerun the model to incorporate the entire Frank R. Lautenberg Deep-sea Coral Protection Area. While NMFS recommends this area be incorporated as a constraint in the siting model, BOEM could, alternatively, include the information and weight the data layer to be commensurate with the degree of consideration given to the Deep-sea Coral Protected Area. While the former approach is preferred, either alternative would provide greater transparency to

[2] https://www.boem.gov/newsroom/notes-stakeholders/boem-enhances-its-processes-identify-future-offshore-wind-energy-areas

[3] The Draft Joint BOEM/NCCOS report "Development of the Central Atlantic Wind Energy Areas at footnote 1 clarifies, "1. NCCOS is providing BOEM with technical assistance to support BOEM's spatial planning in relation to offshore wind projects. This support is being provided with funding resources from NCCOS and through reimbursable support from BOEM to NCCOS. NMFS is providing technical assistance to NCCOS regarding available science (i.e. data layers and modeling methods) for BOEM's consideration in their spatial modeling efforts. These efforts are supporting BOEM's ocean and coastal planning activities related to siting of call areas, wind energy areas, and transmission cable routing. The information provided by NMFS to NCCOS is purely technical in nature and does not reflect or constitute an official agency policy, position, or action. Official NMFS positions related to spatial planning for offshore wind activity will be submitted by NMFS through written comments to BOEM during the planning and review processes for each activity." This letter constitutes NMFS's official views on the notice of Draft Wind Energy Areas for commercial wind energy leasing on the Central Atlantic outer continental shelf (OCS).

the area identification process and better reflect the importance of this habitat. Additionally, we recommend BOEM eliminate Draft WEAs E-1 and E-2 from further consideration due to their overlap with the Coral Protection Area and with priority hard bottom and coral habitats that are highly vulnerable to impacts and that NMFS does not consider compatible with development.

Greater Atlantic Region Fishing Logbook Data

As described in the Draft Report, only vessel monitoring system (VMS) and NMFS SER headboat survey data were used in the siting model; fishing vessel logbook data for vessels permitted by NMFS GAR were not integrated into the model to inform BOEM's decision on draft Central Atlantic WEAs. BOEM staff recently informed NMFS that they considered historic (2007-2012) vessel logbook data during the development of the initial Central Atlantic Call Area published in April 2022. We appreciate BOEM's consideration of logbook data given that VMS data does not include all fishing operations that may occur in these areas. However, as noted in our information needs to assess fisheries impacts document[4], we suggest using the most recent 10 years of data, including data from the latest 2 years. Based on comments made during the December 1, 2022, public hearing on the draft WEAs, we understand that BOEM plans to consider more recent (i.e., through 2020) commercial and party/charter logbook data that NMFS provided to both BOEM and NCCOS; we support inclusion of these data to help ensure that the model accurately reflects all relevant fishing operations and is consistent with a best available science standard. We, therefore, recommend including logbook data through 2021 (NMFS will provide BOEM with the 2021 data which recently became available) and re-running the model to help inform BOEM's determination of final WEAs. If BOEM integrates the logbook data into the model, we recommend BOEM identify how it was used and the weighting criteria, if any, applied to this data source. We are happy to further assist NCCOS and BOEM in interpreting the results.

Sea Turtle Density Data

The current representation of sea turtles in the site suitability model for the Central Atlantic simply presents the GAR and SER Section 7 Mapper layers for sea turtles, which provide only general presence-absence data for sea turtles, but do not facilitate the identification of high-use and low-use areas. In general, these layers are not spatially informative for WEA siting recommendations. New sea turtle spatial density models are currently being finalized for use by the U.S. Navy and are expected to be available in the coming months. These new models will allow us to apply the same approaches used for other protected species (marine mammals and giant manta ray) where density models were available, resulting in more informative siting recommendations for ESA-listed sea turtles. NMFS recommends re-running the site suitability model once the new sea turtle density data are available; this would allow for more refined siting guidance and more informed consideration of potential impacts on sea turtles from development in these areas. We are available to further assist NCCOS and BOEM in considering the timing and availability of these new models for inclusion.

Additional Considerations

It is important to recognize that the site suitability model considered separate and distinct inshore (A, B, C, D) and offshore areas (E, F), as the initial Call Area had been identified prior to

[4] Available at: https://media.fisheries.noaa.gov/2022-02/Socioeconomic-InfoNeeds-OSW-GARFO.pdf

initiating the spatial planning analysis. Breaking the Call Area into four inshore and two offshore areas prior to evaluation, with the intent of identifying suitable areas within each previously identified area, removes the very informative relative comparisons *across* locations and restricts the analysis to siting *within* locations, rather than identifying the most suitable areas for development within all draft WEAs collectively. Doing so results in identification of suitable areas in both inshore and offshore areas, even if certain areas may be far less suitable than others for various affected resources. We recommend re-running the model to look at Areas A-F collectively, rather than inshore/offshore separately, to be more consistent with an integrated ecosystem approach. For example, the protected species data layer is valid to inform relative comparisons between Areas A-F, but by presenting suitability based on ranked outcomes in each area separately, the relative comparative value to inform siting to fully minimize protected species conflicts is not considered. As such, NMFS recommends proactively removing the areas with the highest potential conflict. Additionally, we recommend the model be re-run to include a ranking and clustering approach for identifying WEAs carried out *across* locations rather than *within* locations. This would provide a more accurate depiction of 'suitability' across the entire Central Atlantic WEAs and should be considered prior to finalizing the WEAs.

Comments on the Draft Wind Energy Areas

We provided extensive comments on the Central Atlantic areas in our June 24, 2022, letter which identified portions of the Call Area that should be removed due to high conflicts with sensitive marine resources, habitats, and fishing activity. Based on the eight draft WEAs identified, it does not appear all of the areas that we identified as most conflicting for sensitive habitats and fishing activity have been eliminated from further consideration. We recommend you fully consider our June 24, 2022 (attached hereto) comments, in addition to comments herein, before finalizing the WEAs for leasing. Below we provide recommendations and information for draft WEAs that should be removed from consideration for leasing or further refined.

Frank R. Lautenberg Deep-sea Coral Protection Area and Priority Habitats

As previously stated in our comments to you in November 2021 and June 2022, the entire Frank R. Lautenberg Deep-sea Coral Protection Area should be fully removed from further consideration for leasing. We request that BOEM reach out directly to NMFS for further discussion in advance of a decision to choose to include any portion of the Frank R. Lautenberg Deep-sea Coral Protection Area in the final WEA designations. Draft WEAs E-1 and E-2 both overlap with the coral protection area and should not be included in any final WEAs. We recommend areas E–1 and E-2 be removed for the following reasons:

1. <u>Opening this coral protection area to development undermines the transparent, stakeholder driven process that was involved in designating this area.</u> Additional comments are provided in our June 24, 2022, letter and we also refer you to the Mid-Atlantic Fishery Management Council's Deep Sea Corals Amendment (Amendment 16 to the Mackerel, Squid, Butterfish Fisheries Management Plan[5]) for maps and more

[5] https://static1.squarespace.com/static/511cdc7fe4b00307a2628ac6/t/5dd6bf48f2b0f9308f2f64ae/1574354783071/DeepSea+Corals+EA_Signed+FONSI.pdf

information as well as resources[6] found on the Council's website that highlights the scientific research and collaborative efforts that went into identifying this as an area warranting protection.

2. <u>These Draft WEAs overlap with highly sensitive hard bottom habitats and corals.</u> Corals provide habitat for other species and because they grow and reproduce at very slow rates (with some estimated to be hundreds of years old), they are highly susceptible to anthropogenic impacts making mitigation impossible and their recovery from disturbances difficult over short time periods. We provide more information related to these vulnerable habitats in our June 24, 2022, letter.

3. <u>There is insufficient coral data in these offshore areas.</u> As we have highlighted in our previous comments, the coral habitat suitability model is based on presence data only, and only a small percentage of the total protected area has actually been surveyed for corals. Thus, it is important to stress that there are insufficient data to suggest other areas within the coral broad zone (E-1 and E-2) are absent of corals or hard bottom habitats. To ensure these vulnerable habitats are protected, more investment in research and surveys is needed prior to identifying areas to lease.

4. <u>Removal of vulnerable habitat areas should occur during the Area Identification Process and should not be deferred to the Construction and Operation Plan (COP) stage.</u> Given the status of information available in the Coral Protection Area, we recommend that these habitat areas be removed during the WEA identification process, and discourage an approach that would rely on coral habitats being identified and later avoided at the COP stage. The benthic habitat surveys currently conducted at the COP stage to inform the regulatory process do not meet the level of data collection necessary to ensure corals would not be impacted by project development. Full coverage surveys - the standards for which extend well beyond those included as part of the regulatory process - would be necessary to ensure corals would not be impacted. These would include video surveys, with equipment sufficient to collect these data at depths found offshore of the shelf break. In the *Federal Register* notice, you request information on the technological and economic viability of development within Draft WEAs E-1, E-2, and F. The physical and biological surveys necessary to adequately map and characterize these deep-sea habitats to inform the regulatory process should be considered in determining the technical and economic feasibility of development in these areas.

Integration of Offshore Transmission Planning and Siting

We understand that NCCOS is working with BOEM on the development of a cable siting model. We support the development of a model to inform cable siting and recommend it be integrated into any lease area model. This would allow for a more holistic approach to the area identification process. Consideration of export cable routing, in conjunction with identification of areas for leasing, would help reduce environmental impacts and user conflicts at the start of

[6] https://www.mafmc.org/actions/msb-am16; https://www.mafmc.org/newsfeed/2016/noaa-fisheries-announces-final-rule-on-mid-atlantic-councils-frank-r-lautenberg-deep-sea-coral-protection-area

the process. Such an approach would also help create a more efficient and streamlined regulatory process as individual projects are developed.

This integration of cable siting and lease area modeling is particularly important for areas offshore the continental shelf where extensive energy transmission infrastructure would be required. We recommend all areas offshore of the continental shelf break be removed from consideration for leasing at this time. This includes Draft WEAs E-1, E-2, and F. Leasing offshore the shelf break would result in overlap of extensive energy transmission infrastructure with biologically sensitive areas, including canyons, methane seeps, and upwelling areas that serve as biodiversity hotspots for chemosynthetic communities, deep-sea coral and sponges, highly migratory fish species, and marine mammals. Substantial surveys and analysis, which have not yet been conducted, would be necessary to identify potential suitable transmission corridors. We recommend this analysis be done at the siting phase in concert with area identification for leasing. A transparent and science-based approach to transmission planning and route identification should be developed prior to identifying WEAs offshore the continental shelf.

Areas with High Fisheries Overlap (Area A and the Central Portion of Area C)

As noted in our June 2022 comment letter, we continue to recommend BOEM exclude Area A and the central portion of Area C from consideration for future offshore wind leasing due to substantial overlap with historic and existing fishing operations and NMFS surveys. Specifically, we refer you to Appendix B2 and B9 of our June 2022 Call for Information comment letter, which provides detailed information on historic commercial and party/charter fishing operations within Area A. As noted, Area A accounted for nearly 3 million lb of total fishery landings each year valued at over $4 million. This area is particularly important to the surfclam and historic scallop fishery operating out of New Jersey and Virginia ports, with some vessels dependent upon this area for up to 86 percent of annual fishery revenue. Surfclam operations in Area A represent up to 13 percent of total regional surfclam annual landings and up to 12 percent of total regional annual surfclam revenue. VMS data indicate that many surfclam and scallop vessels transit Area A from Ocean City, Maryland, Cape May, New Jersey, and other ports further north. In addition, over 50 percent of historic party/charter catch and revenue within the Central Atlantic Call Area came from Area A, with party/charter trips increasing in Area A since 2008. Recently, a historic surfclam fishery has reemerged within the central portion of Area C that shows promise of future fishing opportunities based on evidence of younger clams from recent surveys in the area.

Available data, including information identified in the Draft Report, suggest significant conflicts with the fishing community if Area A and portions of Area C move forward for leasing. Specifically, figures 3.16 and 3.17 of the Draft Report indicate Area A and the central portion of Area C overlap with the highest amounts of fishing effort. These figures indicate that up to 12,000 commercial trips were taken in these areas, with the fisheries submodel categorizing these areas as low to moderately low suitability for offshore wind development. Figure 3.10 of that report indicates both areas also overlap with 10-12 NMFS surveys. Based on available information showing substantial overlap of Area A with historic fishing operations, we recommend BOEM avoid future development in Area A (both primary and secondary areas) to minimize fishery impacts. We also recommend BOEM work more closely with the fishing

industry related to fishing operations and potential conflicts within Area C prior to finalizing the WEAs.

Areas with High Protected Species Overlap

Overall, the Central Atlantic WEAs provide important habitat for many protected species, ranging from sea turtles to deep diving marine mammal species and thus have high areas of species overlap (Figure 2 of Appendix B of the Draft Report). Since our June 2022 comment letter, where we noted that information on the fine scale distribution, abundance, and habitat use of protected species in the Central Atlantic Call Area is limited, two new data sources have been developed to help understand species occurrence and overlap with these areas (updates to Roberts et al. 2016 marine mammal density models and the GARFO/SERO combined protected species layer). The new data sources received since June 2022 demonstrate Areas A, B, and C have high areas of species overlap. Areas A and B overlap more significantly with the modeled distribution of endangered North Atlantic right whales along the OCS, compared to the other Central Atlantic WEAs under consideration. North Atlantic right whales traveling through these areas may be pregnant females traveling south to the calving area and mother calf pairs traveling north to foraging areas. Both of these are essential life stages of the population and their protection is critical to the recovery of the species. Area C has significant overlap with many protected species, evident by the average site suitability scores for protected species in Areas C-1 and C-2, which are an order of magnitude lower than any other areas under consideration (Figure 2 of Appendix B of the Draft Report). Although thorough fine scale information is still unavailable, based on this more current information, we recommend that careful consideration be given to the scope of proposed leasing in Areas A, B, and C to avoid and minimize potential impacts to protected species including North Atlantic right whales. Given the potential conflicts with protected species in a substantial portion of the draft WEAs, we request BOEM actively coordinate with NMFS, as areas are refined and prior to finalizing the WEAs, to work to avoid high value habitat and to minimize impacts of siting and development on protected species including North Atlantic right whales.

As noted in our June 2022 comment letter, Areas D and F are directly adjacent to critical habitat designated for the Northwest Atlantic Distinct Population Segment (DPS) of loggerhead sea turtle, specifically migratory habitat and Sargassum habitat. As such, a careful assessment should be carried out of the potential impacts to the physical and biological features (PBF) of each habitat type, and their primary constituent elements. Appropriate buffers should be considered to minimize the impact of development on the PBFs of this designated critical habitat. Additionally, consistent with the terms of a Settlement Agreement, by June 30, 2023, NMFS will submit to the Office of the Federal Register for publication a proposed determination concerning the designation of critical habitat for the six distinct population segments (DPS) of green sea turtles, including the North Atlantic and South Atlantic DPSs, whose ranges overlap with the Central Atlantic WEAs. Once the determination is available, we would be happy to identify any additional coordination that may be required by ESA section 7(a)(4).

Conclusion

NMFS recognizes the urgency to mitigate climate change, and we support the Administration's goal of deploying offshore wind energy while also protecting biodiversity and promoting ocean co-use. To meet these goals, we must work diligently to ensure any planning and development is

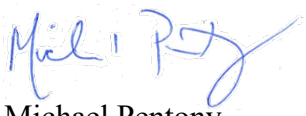
conducted with the best scientific information available to better inform decision makers and the public of how to avoid and minimize adverse impacts to marine resources and to reduce conflict with ocean uses and communities that rely on these areas for their livelihood.

We appreciate the opportunity that BOEM is providing agencies and the public to comment on the Draft WEAs prior to BOEM's final decisions on the identification of areas for future leasing. We recognize the value of BOEM's work with NCCOS to integrate spatial modeling into the area identification process, and we look forward to continuing to provide technical assistance to NCCOS as they further refine the siting model to support BOEM's decision making process. As outlined in our comments, there are several Draft WEAs that in whole or in part present conflicts with marine resources and existing ocean uses. In addition to recommending areas for removal, we request BOEM further coordinate with NMFS to refine the draft WEAs, and consider transmission planning prior to finalizing the WEAs.

We continue to advocate that a robust comprehensive scientific analysis be conducted for area identification/selection in consideration of the issues discussed above to avoid and minimize adverse impacts on NOAA trust resources early in the process, and before developers are economically tied to specific locations. A programmatic NEPA analysis would allow for such an evaluation, as well as up front identification of avoidance, minimization and mitigation measures, and we recommend such an analysis be conducted for the Central Atlantic to inform area identification and the potential leasing process.

We appreciate the opportunity to comment and look forward to seeing how you address the comments and recommendations put forward in this letter and the enclosed June 2022 letter. 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.

Sincerely,



Michael Pentony
Regional Administrator

Enclosures: June 24, 2022, NMFS comment letter

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Rachael Peabody, VMRC
David Stormer, DEDFW
F/SER, Strelcheck, Fay, Bernhart, Wilber

Attachment

NMFS Comments on the Central Atlantic Call for Information June 24, 2022

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

June 24, 2022

Ms. Bridgette Duplantis
Project Coordinator
Office of Leasing and Plans
Leasing and Financial Responsibility Section
Bureau of Ocean Energy Management
1202 Elmwood Park Boulevard
New Orleans, LA 70123

RE: Call for information and nominations (Call or notice) for possible commercial wind energy leasing on the outer continental shelf (OCS) offshore the U.S. central Atlantic coast

Dear Ms. Duplantis:

We have reviewed the April 29, 2022 *Federal Register* (FR) Notice requesting information related to possible commercial wind energy leasing offshore the U.S. central Atlantic coast. While this is not a leasing announcement, the areas described in the FR Notice may be available for future leasing. BOEM is soliciting information and feedback on site conditions, resources, and ocean uses in close proximity to or within the identified Call Area, which comprises approximately 4 million acres offshore the Commonwealth of Virginia and the States of Delaware, Maryland, and North Carolina. In the FR Notice, you specifically request information on resources within our jurisdiction, including commercial and recreational fisheries, federally designated (or proposed) critical habitat, essential fish habitat, protected species, and areas that are environmentally sensitive or crucial to marine productivity and are state or federally managed for their conservation value. You are requesting feedback on this area in an effort to understand potential use conflicts, identify factors that should be considered in determining the size and number of wind energy areas (WEAs), and receive relevant socioeconomic, cultural, biological, and environmental data and information.

We appreciate the opportunity to offer information related to NOAA trust resources, including habitat, protected species, fisheries, and NOAA scientific surveys for you to consider when identifying potential WEAs in the Central Atlantic outer continental shelf (OCS). The comments and information provided herein were prepared in coordination with the Southeast Regional Office of NOAA's National Marine Fisheries Service (NMFS). As an agency with a direct understanding of the challenges associated with refining lease areas through the regulatory process, we underscore the need for a deliberative, science-based approach to identifying WEAs in the Central Atlantic. The Call Areas overlap with a number of sensitive habitats, areas of high biodiversity, and substantial fishing operations that warrant special consideration for avoidance, minimization, and, if necessary, mitigation as this process moves forward. We ask that you fully consider these comments as you work to identify areas for future leasing in the Central Atlantic.

Coordination to Date

As an agency with legal jurisdiction and special expertise related to marine resources, we provided input into your process at the earlier planning stages through a November 1, 2021, letter and during the Central Atlantic Task Force meeting on February 16, 2022. We acknowledge and appreciate the fact that some of the resource areas of concern raised during that earlier coordination have been removed from further consideration. Much of these areas were in the southern portion of the planning areas where you removed overlap with snapper/grouper Habitat Areas of Particular Concern (HAPCs), critical habitat designated for loggerhead sea turtles under the Endangered Species Act, the mean north wall of the Gulf Stream, as well as some of the canyons and methane seeps. We expect refining the Call Areas to avoid overlap with these resources will benefit future regulatory processes and project review.

The Call Areas identified in the FR Notice contain additional reductions from earlier planning areas, specifically at the south edge of Area B and the north edge of Area D. Compared to the original planning areas, the proposed Call Areas reduce overlap with several fisheries, including alewife, Atlantic chub mackerel, Atlantic croaker, bluefish, blueline tilefish, *Illex* squid, spot, and weakfish fisheries based on federal data. This is mostly due to the removal of inshore portions of Area B. However, despite these refinements, significant sensitive marine resources remain present in the proposed Call Areas. To move forward with responsible development in the Central Atlantic, we strongly encourage BOEM take a deliberative, science-based approach to both further refine potential wind energy areas and develop robust lease stipulations with the goal of avoiding or reducing the potential for adverse impacts to marine resources, including fisheries, and the fishing communities that rely on them.

Resources in the Call Area

Appendix A of this letter provides further details specific to NOAA trust resources that may be affected by potential future development in the Call Areas, including habitat resources, protected species, fisheries and fishing communities, and NOAA scientific surveys. Appendix B includes detailed socioeconomic impact reports for both commercial and party/charter vessel operations in each Call Area and all Call Areas combined.

The identified Call Areas overlap extensively with important habitat areas, including deep-sea coral habitats. Deep-sea corals are fragile and slow growing, making them particularly vulnerable to anthropogenic impacts. BOEM is still considering the Frank R. Lautenberg Deep-Sea Coral Protection Area for offshore wind development; we request the coral protection area be removed from further consideration. This area was identified for protection through a transparent and extensive stakeholder-driven process led by the Mid-Atlantic Fishery Management Council, and it is being considered for inclusion in the Administration's atlas documenting areas that are conserved to achieve the "30 by 30" goal of conserving 30 percent of the Nation's lands and waters by the year 2030. It includes deep-sea coral habitats that have been identified in and around submarine canyons that extend beyond the edge of the continental shelf into deeper water within Call Area E and portions of Call Area F. Outside of the coral protection area, the south end of Call Area F overlaps with canyons and valuable coral habitats along the shelf break.

In addition to corals, other sensitive complex habitats and benthic features important to supporting fisheries occur in the Call Areas. Portions of the Call Areas A and B, and E overlap with prime fishing grounds that have been identified and mapped by the State of New Jersey; these areas may include complex hard bottom habitats, live bottom habitats and/or benthic features such as sand ridges and troughs. These habitat areas should be removed from further consideration, as leasing and potential follow-on development would cause unacceptable levels of adverse effects. The eastern edge of some inshore Call Areas, particularly Call Areas B, C, and D, are immediately adjacent to the shelf break, canyons, and designated HAPCs for tilefish, and may overlap with coral habitats. Conservation buffers between these habitats and any potential lease areas should be established to avoid or minimize adverse impacts from potential future development. It is also important to note that most of the Call Areas have not been fully mapped, and we expect there to be additional sensitive habitats in these Call Areas. BOEM should conduct extensive mapping and habitat data collection prior to finalizing WEAs for leasing to help identify sensitive habitat areas so that these habitats can be excluded from leasing; this will reduce conflicts and delays during the regulatory process.

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 Central Atlantic Call Areas and surrounding waters that will be used for transmission corridors and/or project vessels. See Appendix A for more details. As you continue through this process, we strongly encourage you to consider all available options to avoid and minimize risk to these species and their habitats. Options include, but are not limited to, limiting the extent of leasing and development in areas used by these species, and implementing robust lease stipulations to avoid or minimize effects to these species and the ecosystems on which they depend. For example, given the presence of protected species and their habitats in the Call Areas, it would be especially beneficial to identify lease stipulations in the proposed lease sale notice that would avoid, minimize, and document the effects on them due to in-water activities that occur prior to submission of any Construction and Operations Plans. As noted above, the Call Areas now under consideration no longer overlap with any designated critical habitat. However, please note that, consistent with the terms of a Settlement Agreement, by June 30, 2023, NMFS will submit to the Office of the Federal Register for publication a proposed determination concerning the designation of critical habitat for the six distinct population segments (DPS) of green sea turtles, including the North Atlantic and South Atlantic DPSs, whose ranges overlap with the Central Atlantic Call Areas. Once the determination is available, we would be happy to identify any additional coordination that may be required by ESA section 7(a)(4).

While we recognize that BOEM's recent revisions of the planning areas have reduced overlap with several fisheries, the Call Areas identified in the FR Notice remain a concern for key regional fisheries. Vessels fishing in all of the Call Areas combined landed an average of 6.6 million pounds (lb) of all species, valued at $11 million each year, with surfclams, scallops, and squid comprising the majority of the landings and revenue. Vessels from Massachusetts to North Carolina operate in the Call Areas, with Areas A and B particularly important to vessels operating out of Atlantic City, Ocean City, and Cape May, NJ; New Bedford, MA; and Newport News, VA. When combined with existing lease areas, the Call Areas overlap with up to 26 percent of annual surfclam revenue, 19 percent of annual black sea bass revenue, and 17 percent of annual scallop revenue based on historic fishing operations and similar proportions of annual

landings for each species (see Appendix A, Table 6). Accordingly, offshore wind development in all of these areas could result in substantial cumulative economic and social impacts to important regional fisheries and associated fishing communities. Fishing communities such as Atlantic City, NJ, New Bedford, MA, Newport News, VA, as well as smaller fishing communities of Hobucken and Engelhard, NC, are highly dependent on commercial fishing and the potential for wind farm development in these areas raises Environmental Justice concerns. These communities have vulnerable populations with high rates of poverty and/or minority populations that may have less personal capacity to adapt to changes. NMFS is committed to support and advance equity and opportunities for these communities and encourages BOEM to consider the impacts of the Call Areas as well as cumulative development to these communities. The social and economic impacts from offshore wind development in the Call Areas will not only impact vulnerable coastal communities and those that rely on commercial and recreational fishing for their livelihood; they also will have direct impacts on domestic food production that could limit the availability of sustainable sources of protein. Avoiding, minimizing, and mitigating the impacts of offshore wind in the Call Areas will help to ensure that Americans have access to abundant, healthy, affordable, and sustainably-managed seafood. Based on fishery surveys, vessel monitoring system data, and fishing footprint analysis, Call Areas A and B are important to the scallop, surfclam, and *Illex* squid fisheries, with Area C reemerging as an important area for the surfclam fishery in recent years based on information provided by the fishing industry. We recommend BOEM consider removing these areas from future offshore wind development to minimize localized and regional impacts to existing fishery uses, associated marine resources, and the Nation's food supply.

As stated in previous environmental impact statements, major adverse impacts to NMFS scientific research and surveys would occur from offshore wind development on the OCS. These impacts could potentially affect fisheries management through lower quotas for commercial and recreational fishermen due to increased uncertainty in the surveys' measures of abundance. Effects to NMFS scientific surveys would also result in adverse effects on monitoring and assessment activities associated with recovery and conservation programs for protected species, including the critically endangered North Atlantic right whale. The interaction of the Call Areas with Northeast Fisheries Science Center (NEFSC) and Southeast Fisheries Science Center (SEFSC) scientific surveys are described in Appendix A.

Recommended Areas to be Removed from Further Consideration

There are some proposed Call Areas or portions of Call Areas that substantially overlap with important marine resources, fishing operations, and scientific surveys (see Appendix A for more detailed information). The following areas should be removed from further consideration due to the anticipated substantial adverse impacts from potential development of these areas:

- Frank R. Lautenberg Deep-Sea Coral Protection Area (overlaps with all of Area E and portions of Area F);
- The southern portion of Area F overlapping the canyon BOEM refers to as "The Point" in *Large Submarine Canyons of the United States Outer Continental Shelf Atlas* (OCS Study BOEM 2019-066);
- All Call Areas that overlap with or occur within close proximity of the edge of the continental shelf, the continental slope, canyons, methane seeps, and HAPC, particularly

the eastern edge of the inshore Call Areas B, C and D. We recommend BOEM work with us to identify a suitable buffer to minimize impacts of any future development on benthic and pelagic habitats along the shelf break; and

- Areas A and C and eastern portions of Area B to minimize conflict with fisheries and habitats that support these fisheries, including areas identified as Prime Fishing Areas by the state of NJ.

In summary, we recommend: 1) Areas A, C, and E be completely eliminated from further consideration; 2) Call Area F should be significantly reduced both at the northern and southern end where overlap with coral protection areas and offshore canyons occur; 3) Inshore Call Areas (particularly B, C (if not wholly excluded), and D) be reduced along the eastern edge to minimize overlap and conflicts with canyons, coral habitats, and HAPC; and, 4) the eastern portion of Area B be reduced to minimize conflict with fisheries and sensitive habitats. More information on the rationale for our recommendations is provided in the enclosed Appendices.

Scientific Recommendations for Site Identification

Given the important marine resources and potential user conflicts in the Central Atlantic Call Areas, we strongly recommend BOEM take a deliberative ecosystem-based management approach to evaluating and identifying areas within the Central Atlantic that may be eligible for leasing. Currently, BOEM's process for identifying Wind Energy Areas and then identifying and refining lease areas is not clearly understood. A science-based planning approach would provide greater transparency and clarity to the process by better informing the public on potential resource impacts and user conflicts, whether they occur prior to COP approval or as a result of it, the importance of reducing conflicts, and how they may be reduced. Below we outline recommended steps that should be taken prior to issuing additional leases on the OCS.

1. **Design and apply ecosystem-based management and marine spatial planning approaches to considering leasing and any wind energy development in the Central Atlantic.**

   The Central Atlantic Call Areas cover approximately 4 million acres of the OCS, in addition to the 1.75 million acres already leased and the approximately 811,000 acres recently leased in the New York Bight and Carolina Long Bay areas. Given the extensive area eligible or proposed for development on the Atlantic OCS, we request that you take this opportunity to establish a method for estimating cumulative impacts upfront in the planning process. This should include the development of decision-support tools to analyze and predict the aggregated and cumulative impacts from multiple stressors, including offshore wind development and associated activities in the context of climate change. Such modeling exercises and tool development are reliant on rigorous and sustained systematic data collection on various ecosystem parameters and would be important for informing the identification of future lease areas. This approach would include an integrated ecosystem assessment or application of best available ecosystem-based management tools to incorporate a cumulative impact analysis of additive impacts to inform the planning process, rather than waiting to consider such effects on a project-by-project basis. This analysis should include the evaluation of potential transmission corridors rather than simply focusing on the lease areas alone. This is particularly

important given BOEM's proposal to designate WEAs beyond the continental shelf break. Such an approach can help inform the wind energy area identification process to weigh, if not reduce, resource impacts and user conflicts, while providing more transparency to the process of wind energy area identification.

We understand BOEM is working with NOAA's National Centers for Coastal Ocean Science (NCCOS) to conduct marine spatial planning in the Central Atlantic Call Areas to inform your decision on area identification. This is an important step to better inform area identification and it will be important to use the results of this effort to inform final lease areas within the Central Atlantic. However, we are concerned that the timeline to effectively and transparently conduct such a process will limit our ability to fully take advantage of such an approach. We encourage you to work with NCCOS to take a comprehensive approach and incorporate the best available data and consider existing data gaps to inform any marine spatial model. In an effort to assist in this process, we are also working with NCCOS to provide a list of existing data sets and models that we recommend be considered in your spatial planning efforts for the Central Atlantic. We welcome the opportunity to work with you and NCCOS to help inform any marine spatial planning efforts.

2. **Design and execute research and test performance of pilot-scale floating wind technologies.**

Prior to considering areas beyond the continental shelf break as eligible for leasing, we recommend BOEM further study and evaluate the potential effects of floating technology on marine resources, including associated inter-array and export cables. Such studies can support the development of science to be applied to the commercial leasing process in order to ensure that our offshore wind energy goals can be met with increased predictability of development opportunities. Studies should examine floating wind turbine and inter-array/export cable effects on habitats, corals, marine mammals, and benthic and pelagic fishing operations. A full evaluation of the transmission of energy from floating wind to shore should be incorporated into these studies, particularly how the cables will be transported through the continental shelf and associated habitats. Research study topics can be informed by recent efforts such as Maine's Offshore Wind Roadmap, RODA's Synthesis of the Science Report, Responsible Offshore Science Alliance discussions, and the National Renewable Energy Laboratory's data needs recommendations. Pilot scale testing should be conducted prior to large- scale commercial development to inform siting and operational development for future wind energy areas.

3. **Establish and implement a federal survey mitigation program with funds to apply mitigation to existing and future leasing.**

In March 2022, NOAA and BOEM released a draft Federal Survey Mitigation Implementation Strategy to address our agencies' efforts to mitigate the impacts on NMFS scientific surveys and the risks posed to living marine resource management. The strategy outlines actions that need to be taken in order to develop and implement regional

survey mitigation programs, including identifying and securing the necessary resources to implement mitigation activities. Prior to leasing in the Central Atlantic, key elements of the strategy should be completed, including developing and resourcing Northeast and Southeast Regional Federal Survey Mitigation Programs. This will provide certainty to developers, NMFS, and the public who depend on NMFS scientific survey enterprise.

4. **Establish and begin collecting region-wide baseline monitoring, including passive acoustic monitoring and habitat surveys of sufficient spatial and temporal resolution.**

   In order to effectively perform environmental assessments of future project impacts on the marine environment, it is critical to understand resource and human use conditions of areas being considered for development. No standardized baseline monitoring requirements exist that allow sufficient resolution for assessing the resource conditions of proposed development areas. While guidelines and best practices have been developed, there are major gaps in our understanding of habitat conditions, fisheries use patterns, protected species distribution and habitat use, and ecosystem conditions; without consistent standardized approaches, it is not possible to effectively evaluate project impacts. It is important to establish and begin a baseline region-wide monitoring program to help inform wind energy area identification and provide more certainty to future regulatory processes.

5. **Establish pre-construction, construction, and post-construction fisheries and wildlife monitoring requirements.**

   Prior to WEA identification and leasing, it is critical to establish certainty for all parties with regards to scientific needs and regulatory requirements for monitoring fisheries, wildlife, and ecosystem conditions. In the absence of monitoring requirements, individual projects will continue to implement narrowly defined monitoring strategies that do not follow standardized protocols, procedures, methods, and data sharing arrangements. As part of the development of uniform monitoring methods, we encourage early collaboration with NMFS scientists in the Northeast and Southeast regions to maximize the utility of any monitoring efforts.

6. **Establish standardized regional requirements for mitigating impacts of offshore wind development.**

   Consistent with the Council on Environmental Quality regulations, we encourage BOEM to avoid and minimize impacts to existing users and marine resources at all stages in the process and mitigate adverse impacts that cannot be avoided. Given the importance of the Call Areas to marine trust resources, BOEM, in partnership with state and federal agencies and affected stakeholders, should develop a consistent, equitable, and science-based mitigation process to address unavoidable impacts on wildlife, including protected species, habitats, and fishing industries and communities. Such a process should be required as a lease stipulation when any leases are issued, but also employed throughout project development. Developing consistent and equitable regional mitigation standards

following transparent scientific-based processes are an essential element in increasing the certainty and predictability for developers, conservation interests, and fishing communities. It is critical that fair and equitable processes are established to address any foreseeable or unforeseen impacts of offshore wind development on the marine ecosystem and this should be developed prior to additional leasing. NMFS continues to assert that the foregoing objectives could be achieved through preparation of programmatic environmental analyses to inform the identification of WEAs and develop avoidance, minimization and mitigation measures that could be incorporated and applied in future decision making such as disclosure of proposed lease stipulations prior to lease issuance.

Early Engagement and Enhanced Coordination

The recommendations put forward in this letter and the enclosed Appendix are intended to help inform BOEM's process for wind energy area identification. Taking an enhanced scientific approach to area identification, as recommended, will significantly improve the process of weighing and reducing impacts to marine resources, weighing and reducing conflicts with existing ocean uses, and providing more certainty to the regulatory process. Stakeholder coordination throughout the process, including at the earliest stages, is also key to helping ensure conflicts are minimized. Below are some recommendations for points in the process to coordinate early with our agency and other relevant stakeholders as you work toward area identification and future leasing in the Central Atlantic.

- *Interagency Coordination:* We welcome open communication with our agency as you work through this area identification process and future leasing. We would be happy to follow up with you and further discuss the information, comments, and recommendations put forward in this letter prior to finalizing any wind energy areas. Once areas are identified for future leasing, we would appreciate the opportunity to work with you to ensure future lease stipulations include measures to promote responsible development that avoids or minimizes adverse impacts to marine resources, existing ocean uses and the communities that rely on these resources, including incorporation of standard mitigation and monitoring requirements and ensuring funds to support such programs are available. We encourage frequent coordination and communication with our agency early and often throughout the process.

- *Early and Continued Engagement:* As we have indicated on several occasions, we recommend coordination with our agency occur at the earliest possible point in the process, at the earliest stages of project scoping, and prior to finalizing any project design. Frequent and continued engagement between BOEM, resource agencies, and developers will reduce the potential for resource conflicts to disrupt or delay project plans. The efforts underway to use NOAA's expertise in marine spatial planning to refine planning areas, including the Central Atlantic Call Area, into potential lease areas is a significant step forward and provides an ideal forum for early and continued engagement.

- *Stakeholder Engagement*: We recommend you coordinate with all affected stakeholders and maintain an open and transparent process as you work toward area identification in the Central Atlantic. In addition to soliciting and considering input from stakeholders,

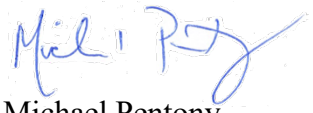
BOEM should provide a clear explanation of how that input was considered and incorporated into any final wind energy area selection decisions.

Conclusion

As a science agency, we recognize the urgency to mitigate climate change, and we support the Administration's goal of deploying offshore wind energy while also protecting biodiversity and promoting ocean co-use. However, it is crucial that, in that effort, we must not lose sight of the need to recognize the impacts associated with large scale development of the OCS. We must work diligently to ensure any planning and development is conducted in a responsible manner, with the benefit of scientific information that aims to better inform decision makers and the public of how to avoid and minimize adverse impacts to marine resources and to reduce conflict with ocean uses and communities that rely on these areas for their livelihood, and ensure that the nation has access to a sustainable and healthy source of seafood. As we have suggested from the beginning of our involvement with offshore wind development, a robust scientific comprehensive analysis should be conducted for area identification/selection in consideration of the issues discussed above to avoid and minimize adverse impacts on NOAA trust resources early in the process, and before developers are economically tied to specific locations. A programmatic NEPA analysis would allow for such an evaluation and we recommend it be developed for the Central Atlantic to inform area identification.

We appreciate the opportunity to comment and look forward to seeing how you address the comments and recommendations put forward in this letter and the enclosed Appendices. 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.

Sincerely,



Michael Pentony
Regional Administrator

cc: David Macduffee, BOEM
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Rachael Peabody, VMRC
David Stormer, DEDFW
F/SER, Strelcheck, Fay, Bernhart, Wilber

APPENDIX A
NOAA Trust Resources in the Proposed Central Atlantic Call Areas

Habitat Resources

The identified Call Areas overlap extensively with ecologically important and sensitive habitat areas. Numerous resources[1] are available to aid BOEM in their understanding of many of these areas, though they are also discussed at length herein. Specifically, Figure 1 depicts known important habitat areas, and illustrates extensive overlap of the proposed Call Areas with the Frank R. Lautenberg Deep-Sea Coral Protection Area as well as areas identified as suitable habitats for corals. See Deep Sea Corals Amendment (Amendment 16 to the Mackerel, Squid, Butterfish Fisheries Management Plan) for maps and more information.

Frank R. Lautenberg Deep-Sea Coral Protection Area
The mid-Atlantic Frank R. Lautenberg Deep-Sea Coral Protection Area, recommended by the Mid-Atlantic Fishery Management Council and approved by NOAA in 2016, covers a 99,000 km^2 (~38,000 square mile) area on the outer continental shelf (OCS), slope, and canyons to the outer boundary of the EEZ and includes two types of zones. 'Discrete' zones protect defined areas of canyons and canyon complexes based on known coral distributions or outputs of predictive models that rank the likely presence of suitable coral habitats. Discrete canyons within and adjacent to the Call Areas, from north to south, include Wilmington, North Heyes-South Wilmington, South Vries, Baltimore, Warr-Phoenix Canyon Complex, Accomac-Leonard Canyons, Washington, Norfolk Canyons. A precautionary 'broad' zone protects a large area of deepwater habitats extending from approximately 450 m on the slope to the outer limits of the U.S. EEZ. The objective of designating the coral protection area was to protect corals by limiting future expansion of bottom fishing in an area that is largely outside the footprint of current fishing activity. Both zones restrict most bottom-tending gears, with a few exceptions. Due to its unique role protecting important coral habitat, the Frank R. Lautenberg Deep-Sea Coral Protection Area should not be considered for development and Call Areas that overlap with it should be excluded from further consideration. The entire Call Area E should be eliminated, as well as the northern portion of Call Area F due to their overlap with the Coral Protection Area.

Coral Habitat Suitability Model
A coral habitat suitability model was developed by NMFS and NOS to inform the coral protection area designation process. This coral suitability model has been peer reviewed and ground-truthed and is the best available model for predicting coral habitat in the mid-Atlantic. Both the discrete and broad zones of the Frank R. Lautenberg Deep-Sea Coral Protection Area were defined based on coral habitat suitability modeling, occurrence/detection data from coral surveys, and historical observations, as well as areas of high slope. It is important to note that only a small portion of the overall protected area was actually surveyed, and coral data from both zones used in the suitability model are presence data only. Absence of coral data does not mean

[1] https://www.mafmc.org/actions/msb-am16; https://www.mafmc.org/s/DeepSea-Corals-EA_Signed-FONSI.pdf; https://portal.midatlanticocean.org/resources-data-links/

absence of corals; thus extensive and full coverage habitat mapping, far more extensive than currently conducted in existing lease areas, would be necessary to determine the extent at which corals could be impacted by future development. Removing the coral protection area and other areas identified as suitable coral habitat areas from further consideration is the most appropriate measure to ensure sensitive coral habitats remain protected.

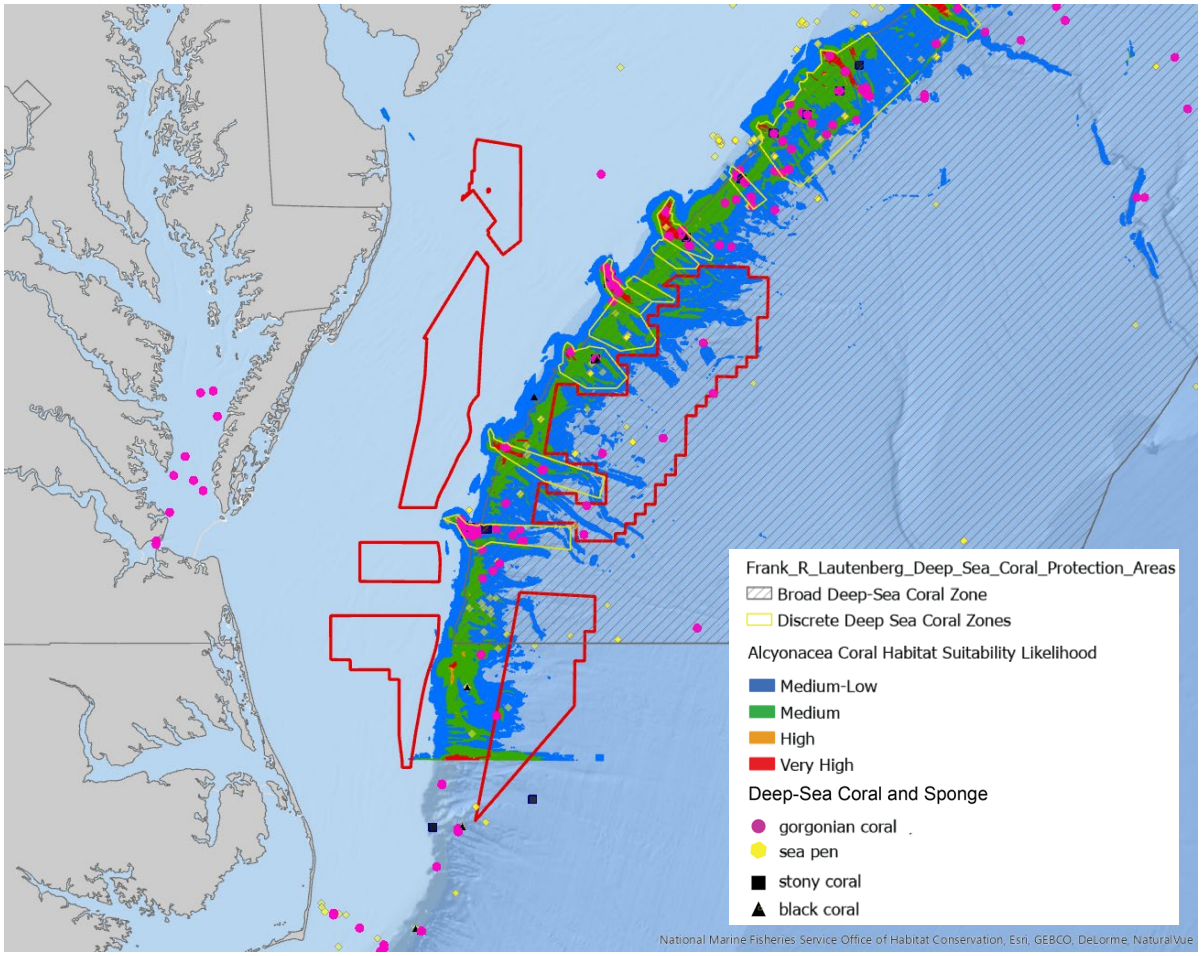

Figure 1. Frank R. Lautenberg Deep Sea Coral Protection Area: This dataset depicts the discrete and broad zone boundaries of the Frank R. Lautenberg Deep-Sea Coral Protection Area. Deep Sea Corals and Sponges (observed): This layer represents NOAA's Deep-Sea Corals and Sponges point location data.[2] NOAA's Deep-Sea Coral Research and Technology Program (DSCRTP) oversees a geodatabase of the known locations of deep-sea corals and sponges in U.S. territorial waters and beyond. The figure also displays the model output for alcyonacean deep-sea coral habitat suitability in the U.S. North and Mid-Atlantic.[3] and BOEM Central Atlantic Call Areas.

[2] NOAA National Database for Deep Sea Corals and Sponges (Database version: 20220426-0). https://deepseacoraldata.noaa.gov/. NOAA Deep Sea Coral Research & Technology Program.

[3] Kinlan, B.; Poti, M.; Dorfman, D.; Caldow, C.; Drohan, A.; Packer, D.; Nizinski, M. (2016). Model output for deep-sea coral habitat suitability in the U.S. North and Mid-Atlantic from 2013 (NCEI Accession 0145923).

Deep-Sea Corals and Habitats along the Continental Shelf Break

Corals and other sensitive benthic habitats areas extend beyond the designated coral protection area and overlap with portions of Call Area F (see suitability model results in Figure 1). The Keller Canyon and Hatteras Canyon occur in the southern portion of Call Area F and overlap an area known as "The Point," which the South Atlantic Fishery Management Council designates a Habitat Area of Particular Concern (HAPC) under four fishery management plans (coastal migratory species; snapper-grouper complex, coral; and dolphin and wahoo). The Point also overlaps an area the Council designates an HAPC for tilefish. The Council's essential fish habitat users guide[4] and on-line GIS should be consulted for precise description of these areas. While these canyons and The Point are not as well studied as the Frank R. Lautenberg Deep-Sea Coral Protection Area, this portion of the Call Area F has the same geomorphic features as the northeastern planning area, including rare methane-seep habitats[5] which could not be mitigated, repaired, or replaced should they be damaged by development. Accordingly, this southern portion of Call Area F should not be considered further for development.

In the FR Notice, BOEM acknowledges that deep-sea corals are likely to occur in the Call Areas in deeper waters and references a recent BOEM funded study that synthesized data and modeled deep-sea coral and hardbottom habits on the OCS offshore the U.S. Southeast Atlantic coast. We request more information related to which study is referenced here. We understand BOEM conducted a deep-sea coral study that focused on the Baltimore and Norfolk canyons (2012-2013), but we are unclear which study and modeling effort is referenced in the FR Notice. We recommend BOEM consider all available data, including the extensive work that was done to designate the Frank R. Lautenberg Deep-Sea Coral Protection Area and subsequent deep-sea coral surveys since then, that are in the DSCRTP database. This information should be considered in the area identification process and any spatial planning model developed for the Central Atlantic.

Bottom habitats in these shelf, slope, canyon, and methane seep areas are hotspots of biodiversity that warrant protection because they support diverse biological communities that include rare, fragile, and vulnerable species of deep-sea corals and sponges. Chemosynthetic communities near methane seeps are unique and include microbial mats, mussels, and tube worms, as well as commercial, recreational, and protected species. The upper slope areas are ecotones and upwelling areas used by many highly migratory fish species, whales, and other marine mammals for migration and feeding. The deep-sea coral and sponge habitats provide important three-dimensional structure for many deep-water bottom communities and have been identified as habitat for certain commercially important fish and shellfish species. Many deep-sea corals have a complex, branching form of growth that makes them very fragile. Because they grow and reproduce at very slow rates (with some estimated to be hundreds of years old) they are highly susceptible to anthropogenic impacts that makes mitigation impossible and their recovery from disturbances difficult over short time periods. This vulnerability has stimulated intensive research, monitoring, mapping, and conservation efforts to protect deep-sea corals and their

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Threshold Logistic Outputs for Alcyonacea. NOAA National Centers for Environmental Information (NCEI). https://www.ncei.noaa.gov/archive/accession/0145923.

[4] https://safmc.net/download/SAFMCEFHUsersGuideAugust21.pdf

[5] https://oceanexplorer.noaa.gov/explorations/17atlantic-margin/welcome.html

habitats.

These vulnerable habitats are not suitable for development and we request BOEM avoid leasing areas for development that may overlap with, or otherwise impact these areas. Additionally, sufficient buffers should be implemented around the continental shelf break to avoid and minimize impacts from construction and operation of future offshore wind projects. Conservation buffers should be designed in consideration of both impacts to the benthos as well as affects to persistent fronts and areas of upwelling that sustain the biodiversity of these areas. Given the vulnerability of habitats along the shelf break, we recommend the inshore Call Areas be modified along the eastern edge to ensure an adequate buffer between any potential wind energy area and the edge of the continental shelf, the slope, the canyons, methane seeps, and designated HAPC. Of particular concerns are Call Areas B, C, and D which are located in close proximity to the shelf break. Prior to identifying the wind energy areas, BOEM must consider potential effects to oceanographic processes along the shelf break, including effects from the wind turbine structures themselves, as well as oceanographic effects from extraction of energy from the atmosphere during operation. Given the uncertainties around the impacts to oceanographic processes from offshore wind, and the unique and vulnerable nature of the resource, we recommend a conservative approach to identifying a suitable conservation buffer. A conservation buffer zone between any potential development and these shelf, slope, canyon, and methane seep areas is necessary to ensure these areas of high biodiversity are not adversely impacted, directly or indirectly, by construction or operation of wind facilities. We can work with you to review best available information and develop a suitable buffer zone for this area; we note that recent studies have indicated strongest oceanographic effects occur within 20-30 km of a wind field (Christiansen et al. 2022[6]).

Energy Transmission from Call Areas

BOEM's considerations for wind energy area identification should not be confined to the Call Areas where future leasing may occur. In addition to effects to habitats within and adjacent to the Call Areas, BOEM should consider potential transmission corridors, particularly for the Call Areas beyond the shelf break. We recommend BOEM conduct a comprehensive evaluation of potential cable routes and available onshore connection locations prior to finalizing the designation of wind energy areas. Based on the location of the Call Areas, we expect export cable transmission to require extra booster stations and/or AC/DC converter stations, which require water intakes and discharge at elevated temperatures; creating unmitigated impacts throughout the life of a project. Any leasing of areas east of the shelf break may result in impacts to canyons, corals, methane seeps, or other sensitive habitats along the shelf break and slope as a result of energy transmission to shore. Potential transmission routes should be considered to help identify appropriate areas for leasing and minimize adverse impacts from any future development.

New Jersey Prime Fishing Areas

The Call Areas also overlap with numerous New Jersey (NJ) Prime Fishing Areas, particularly in

[6] Christiansen, N., U. Daewel, B. Djath, and C. Schrum. 2022. Emergence of Large-Scale Hydrodynamic Structures Due to Atmospheric Offshore Wind Farm Wakes. Frontiers in Marine Science., 03 February 2022 | https://doi.org/10.3389/fmars.2022.818501.

the inshore Call Areas A and B, with some overlap in Call Area E. Prime Fishing Areas are identified and designated by NJ and include "...areas that have a demonstrable history of supporting a significant local intensity of recreational or commercial fishing activity. These areas include features such as artificial reefs, rock outcroppings, sand ridges or lumps, rough bottoms, aggregates such as cobblestones, coral, shell and tubeworms, slough areas and offshore canyons" (N.J.A.C 7:7-9.2). Example areas that overlap with, or are entirely within, the Central Atlantic Call Areas include, but are not limited to, "Triple Wrecks," "Parking Lot," and "'Doc' Lummis Slough," within Call Area A, and the two "T Cups." within Call Area B. A map of all overlaps with Prime Fishing Areas is shown in Figure 2. We recommend these areas be removed from further consideration since they likely include important benthic features and complex habitat areas that are not suitable for development. In addition to the Prime Fishing Areas, numerous fish havens and other named features (on charts), such as lumps, banks, and shoals, are present in the Call Areas. Many of these habitat areas are also important for commercial and recreational fishing; specifically, the naming of features is typically the result of the area being important to various marine users, primarily commercial and recreational fishing communities. These areas, inclusive of the NJ Prime Fishing Areas are likely characterized by high fish production, high benthic faunal density, and species diversity; dense aggregations of fish are supported by high local primary production. Therefore, named areas on charts, fish havens, and NJ Prime Fishing Areas should be removed from consideration for future wind energy areas.

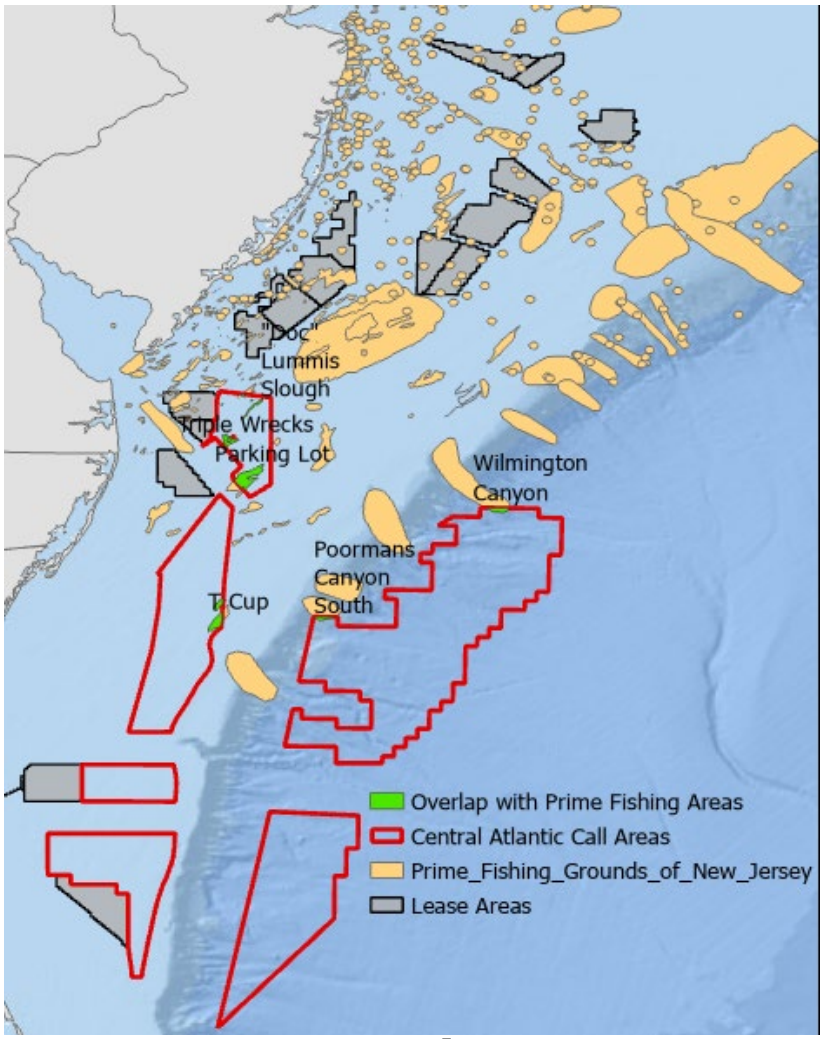

Figure 2. New Jersey (NJ) Prime Fishing Areas[7] identified and mapped in the mid-Atlantic and overlap with the BOEM Central Atlantic Call Areas.

Other Habitats of Concern

In addition to the habitats and protected areas described above, other ecologically sensitive habitats exist within the Call Areas. High-resolution site-specific information will be needed to precisely identify where these habitats are located in order to avoid and minimize adverse impacts from any future offshore wind development. For example, we know that discrete "live bottom" areas consisting of rock outcrops, ledges, boulders, and cobbles with dense aggregations of vulnerable, structure-forming biota (e.g., gorgonian corals and anemones) that support abundant fish populations, exist on the continental shelf in the Mid-Atlantic, and are likely to occur within expansive areas encompassing the Central Atlantic Call Areas. Other valuable and sensitive habitats in the Call Areas may include shellfish beds (e.g., Atlantic surfclams) and large topographic features (e.g., shoals and shoal complexes, scarps, sand ridges, and sand waves, and their associated troughs and depressions). Broader scale mapping efforts will be necessary to identify complex habitats and benthic features.

[7] https://gisdata-njdep.opendata.arcgis.com/datasets/njdep::prime-fishing-grounds-of-new-jersey/about

Habitat Mapping and Data Collection Needs
Site-specific habitat data collection is necessary to identify all areas that may not be suitable for development. If sensitive areas are not removed or identified at the site identification stage, we will recommend their removal during the regulatory process. We have concerns that the level of habitat mapping that has been conducted for recent projects would not be sufficient to detect some sensitive habitat types found in these Call Areas, such as corals; thus, substantially more mapping efforts and aerial coverage are necessary to ensure these vulnerable habitats are not impacted. To reduce potential conflict later in the process, we recommend BOEM initiate large-scale habitat mapping in the Call Areas, in consultation with our agency, prior to leasing. This may help identify sensitive areas early in the planning process and provide more certainty and efficiencies for the regulatory process.

BOEM should consult satellite oceanography to assess frontal regions that may overlap with or be adjacent to the Call Areas, particularly along the shelf break, and should remove these areas, which provide important habitat for fisheries and protected species, from further consideration. Once the wind energy areas are established, BOEM should conduct regular physical and biological oceanographic sampling in the areas and adjacent waters to collect baseline data on the pelagic environment. Such sampling should begin prior to lease issuance as a component of region-wide baseline monitoring. Sampling should occur three to five years prior to construction and should be designed to assess seasonal characteristics of the water column, including the formation and breakdown of the Cold Pool, the Gulf Stream, and prey resources (i.e., plankton, forage fish). BOEM's research design should consider recent efforts to assess ecological metrics and sampling strategies, such as a 2021 workshop held by Rutgers University and a related workshop held in 2019 on offshore wind and the Cold Pool[8]. BOEM should use the information collected prior to construction to provide a baseline to assess the impacts of offshore wind development. Sampling should occur such that results can be used to assess effects of wind turbines on the oceanographic and atmospheric environment. The studies should also be used to inform the development of lease areas to minimize effects to oceanographic features (and subsequently habitats and protected species) by limiting placement of structures which may overlap with identified features (i.e., frontal activity) that may aggregate a high diversity of species and prey or unique features to the region (i.e., Gulf Stream, Cold Pool) that support ecosystem function.

Summary
In summary, we recommend the following steps be taken to avoid and minimize impacts to vulnerable habitats in the Central Atlantic Call Areas:

- Remove Frank R. Lautenberg Deep-Sea Coral Protection Area (overlaps with all of Area E and portions of Area F) from further consideration for development;
- Remove the southern portion of Area F overlapping the canyon BOEM refers to as "The Point" in *Large Submarine Canyons of the United States Outer Continental Shelf Atlas*

[8] 2021 Partners in Science Workshop: Identifying Ecological Metrics and Sampling Strategies for Baseline Monitoring During Offshore Wind Development, 2019 Partners in Science Workshop: Offshore Wind and the Mid-Atlantic Cold Pool (https://rucool.marine.rutgers.edu/wp-content/uploads/2020/10/PartnersWorkshop_WhitePaper_Final.pdf)

(OCS Study BOEM 2019-066) from further consideration;

- Remove designated prime fishing grounds that have been identified and mapped by the State of New Jersey from further consideration. These areas overlap with portions of the Call Areas A, B, and E;
- Work with NMFS to identify an appropriate conservation buffer to avoid and minimize impacts to benthic and pelagic habitats located along the shelf break and slope, including deep-sea corals, methane seeps, canyons, and designated HAPCs, from construction and operation of future offshore wind development. This should include reduction of the eastern edges of inshore Call Areas B, C, and D, which occur within close proximity to continental shelf break;
- Conduct an analysis of potential offshore wind transmission corridors and onshore connection sites. This information should be used to inform siting of any final wind energy areas to help minimize adverse effects of future development on habitats in the Central Atlantic; and
- Conduct habitat mapping and begin baseline physical and biological oceanographic sampling in and around the Call Areas prior to issuing any leases to help identify sensitive habitats and unique benthic features unsuitable for development early in the process and to begin critical baseline monitoring to inform any future development.

Protected Resources

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 Central Atlantic Call Areas and surrounding waters. Tables 1 through 3 detail the ESA-listed species whose range overlaps with at least some portion of the Central Atlantic Call Areas. As currently identified, none of the areas overlap with designated critical habitat. As noted above, critical habitat for the North Atlantic DPS of green sea turtle may be proposed in a future rulemaking. All ESA-listed marine mammals are also protected under the MMPA. More information on these species, including links to relevant regulatory and planning documents, are available on the NMFS webpage (https://www.fisheries.noaa.gov/species-directory/threatened-endangered).

As the potential lease sites in the Call Areas are further defined, it will be critical to fully consider both project-specific and cumulative effects of offshore development (including activities that occur prior to construction) on all species listed under the ESA and MMPA and the habitats and ecosystems on which they depend, and to evaluate ways to avoid and minimize adverse impacts to these species and their habitats. We strongly encourage you to consider all available options to minimize risk to these species and their habitats including limiting the extent of leasing and development in areas used by these species and implementation of robust lease stipulations. Additionally, before leases are issued (or at the latest, before construction), a robust monitoring program should be implemented in any Central Atlantic Call Areas to collect information to refine these areas and inform further development; please see our comments below about recommended baseline monitoring.

Note the abbreviations used in the following tables are: DPS = distinct population segment; E = an "endangered" listing under the ESA; FR = Federal Register; T = a "threatened" listing under the ESA.

Table 1. ESA-Listed Marine Mammals Occurring in the Central Atlantic Call Area

Species	ESA Listing Status	Listing Rule/Date	Most Recent Recovery Plan/Outline Date
Blue whale	E	35 FR 18319/December 2, 1970	November 2020
Fin whale	E	35 FR 12222/December 2, 1970	August 2010
North Atlantic right whale	E	35 FR 18319/December 2, 1970	June 2005
Sei whale	E	35 FR 12222/December 2, 1970	December 2011
Sperm whale	E	35 FR 12222/December 2, 1970	December 2010

Table 2. ESA-Listed Sea Turtles Occurring in the Central Atlantic Call Area

Species	ESA Listing Status	Listing Rule/Date	Most Recent Recovery Plan/Outline Date
Green sea turtle (North Atlantic DPS)	T	81 FR 20057/April 6, 2016	October 1991
Green sea turtle (South Atlantic DPS)	T	81 FR 20057/April 6, 2016	October 1991
Kemp's ridley sea turtle	E	35 FR 18319/December 2, 1970	September 2011
Leatherback sea turtle	E	35 FR 8491/June 2, 1970	April 1992
Loggerhead sea turtle (Northwest Atlantic DPS)	T	76 FR 58868/September 22, 2011	December 2008
Hawksbill sea turtle*	E	35 FR 8491/June 2, 1970	December 1993

*Hawksbill sea turtles are rare north of Florida but could occasionally occur in association with hard bottom habitat in southern portions of the call areas.

Table 3. ESA-Listed Fishes Occurring in the Central Atlantic Call Area

Species	ESA Listing Status	Listing Rule/Date	Most Recent Recovery Plan/Outline Date
Atlantic sturgeon (Carolina DPS)	E	77 FR 5914/February 6, 2012	N/A
Atlantic sturgeon (South Atlantic DPS)	E	77 FR 5914/February 6, 2012	N/A
Atlantic sturgeon (Chesapeake Bay DPS)	E	77 FR 5914/February 6, 2012	N/A

Atlantic sturgeon (New York Bight DPS)	E	77 FR 5914/February 6, 2012	N/A
Atlantic sturgeon (Gulf of Maine DPS)	T	77 FR 5914/February 6, 2012	N/A
Giant manta ray	T	83 FR 2916/January 22, 2018	2019
Oceanic whitetip shark	T	83 FR 4153/January 30, 2018	2018

In addition to the five stocks of ESA-listed marine mammals, 15 protected cetacean species occur in the Central Atlantic Call Area, six of which are considered "strategic" under the MMPA (Table 4, grouped by hearing frequency). Descriptions of all marine mammal stocks under NMFS jurisdiction can be found in the final 2020 and draft 2021 Stock Assessment Reports[9].

Table 4. MMPA-Protected Marine Mammal Species Occurring in the Central Atlantic Call Area

Common Name	Status	Occurrence[10]
Low Frequency Cetaceans (baleen whales)		
Blue whale	MMPA protected, ESA endangered	Year-round
Fin whale	MMPA depleted, MMPA strategic, ESA endangered	Year-round[11]
Humpback whale (West Indies DPS); Gulf of Maine MMPA stock)	MMPA protected	Year-round
Minke Whale	MMPA protected	Low likelihood, potentially year round [12]

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

[10] Habitat-based density models (https://seamap.env.duke.edu/models/Duke/EC/) have been developed for all marine mammals in the Atlantic. These models are updated periodically; therefore, NMFS recommends referencing these models for occurrence throughout the planning process.

[11] Edwards et al. (2015) and Davis et al. (2020) found evidence to confirm the presence of humpback, fin and sei whales in every season throughout much of the U.S. Exclusive Economic Zone (EEZ) north of 35° N; however, densities vary seasonally.

[12] Per the 2020 SAR, minke whales are typically most abundant in New England waters during the spring-to-fall period. Records based on visual sightings and summarized by Mitchell (1991) suggest a possible winter distribution in the West Indies, and in the mid-ocean south and east of Bermuda, a suggestion that has been validated by acoustic detections throughout broad ocean areas off the Caribbean from late September through early June (Clark and Gagnon 2002; Risch et al. 2014).

North Atlantic right whale	MMPA depleted, MMPA strategic, ESA endangered	Fall/winter/spring, possibly summer
Sei whale	MMPA depleted, MMPA strategic, ESA endangered	Low likelihood; Spring[12]
Mid-frequency Cetaceans (dolphins, toothed whales, beaked whales, bottlenose whales)		
Atlantic Spotted Dolphin	MMPA protected	Year-round
Beaked whales (various spp.)[13]	MMPA protected	Year-round
Harbor porpoise	MMPA protected	Fall/winter/spring[14]
Pilot whale, long-finned	MMPA protected	Low likelihood
Pilot whale, short finned	MMPA protected	Year-round
Risso's dolphin	MMPA protected	Year-round
Short-beaked Common Dolphin	MMPA protected	Winter/spring[15]
Sperm Whale	MMPA protected, ESA endangered	Year-around
Western North Atlantic Bottlenose Dolphin, Offshore stock	MMPA protected	Year-round
Western North Atlantic Bottlenose Dolphin, Northern and Southern Migratory Stocks	MMPA protected, MMPA depleted, MMPA strategic	Year-round[16]

[13] Beaked whale species occurring in the Atlantic include Cuvier's beaked whale and several *Mesoplodon spp*. (Blainville's, Gervais, Sowerby's, True's beaked whales).

[14] Per the 2020 SAR, during fall (October–December) and spring (April–June), harbor porpoises are widely dispersed from New Jersey to Maine, with lower densities farther north and south. During winter (January to March), intermediate densities of harbor porpoises can be found in waters off New Jersey to North Carolina, and lower densities are found in waters off New York to New Brunswick, Canada.

[15] Per the 2020 SAR, the species is less common south of Cape Hatteras, although schools have been reported as far south as the Georgia/South Carolina border (32° N) (Jefferson et al. 2009). They exhibit seasonal movements, where they are found from Cape Hatteras northeast to Georges Bank (35˚ to 42˚N) during mid-January to May (Hain et al. 1981; CETAP 1982; Payne et al. 1984).

[16] These stocks make broad-scale, seasonal migrations in coastal waters from the shoreline to the 20-m isobath. See the SARs for more detailed information.

High Frequency Cetaceans (true porpoises, Kogia)		
Kogia spp.	MMPA protected	Year-round
Pinnipeds		
Gray Seal	MMPA protected	Low likelihood
Harbor Seal	MMPA protected	Fall/winter/spring[17]

Overall, information on the fine scale distribution, abundance, and habitat use of protected species in the the Central Atlantic Call Areas is limited. Broad-scale distribution data for these species is available; however, continued data collection on seasonal distribution, density, abundance, behavior, movements, and habitat use for these species is needed to better understand the consequences of leasing and development in the Central Atlantic Call Areas. Moreover, as described above, an assessment of the cumulative impacts of leasing these areas in combination with previously leased areas or other planned lease areas (e.g., Gulf of Maine) should be undertaken prior to finalizing any Wind Energy Areas and additional leases. This is particularly important as many protected species are migratory in nature and are likely to be exposed to effects of offshore wind projects in multiple lease areas. Please see our comments below about recommended baseline monitoring to inform the further development of the Central Atlantic Call Areas.

The overlap with critical habitat designated for the Northwest Atlantic DPS of loggerhead sea turtles has been removed; however, we note that Call Areas D and F are directly adjacent to the constricted migratory corridors and *Sargassum* habitat of the Northwest Atlantic DPS of loggerhead sea turtle. As such, careful assessment of the potential impacts to the physical and biological features (PBFs) of each habitat type and the primary constituent elements that support the PBFs of each habitat type should be carried out and appropriate buffers should be considered to minimize the potential impact of development on the features of this habitat.

Endangered North Atlantic right whales occur year round, albeit in varying densities, in the Central Atlantic Call Areas, as well as along the potential cable corridors and anticipated vessel transit routes. The status of this species is extremely poor and distribution and habitat-use in this region is not particularly well known. The consequences of leasing these areas on North Atlantic right whales needs to be carefully considered. This species will be exposed to effects of offshore wind development in every lease area identified on the Atlantic OCS to date. The lack of a cumulative assessment of development of these lease areas on North Atlantic right whales, their designated critical habitat, and the areas in between, severely limits full consideration of the consequences to this severely depleted and sensitive species. According to Krzystan et al.

[17] Per the 2020 SAR, recent studies demonstrate that various age classes utilize habitat along the eastern seaboard throughout the year with occurrence within the call areas from September through May.

(2018),[18] North Atlantic right whales are not just migrating southward during fall and northward during spring; sightings data suggest they are occurring throughout the calving season along the Mid-Atlantic. As the population continues to decline[19] and in the midst of a protracted Unusual Mortality Event[20] the development of fixed and floating offshore wind facilities presents additional risk to the species from stressors such as noise exposure, vessel traffic, increased energy expenditure by individuals due to displacement, habitat changes, and displaced fishing effort. The identification of any areas eligible for leasing, pre-construction activities, and ultimate development of wind energy facilities must be done in a way that avoids and minimizes effects to North Atlantic right whales and their habitat, with particular consideration of risks to migrating pregnant right whales and their newborn calves.

It is important to recognize that many protected species range along the East Coast and thus are likely to be exposed to effects of multiple offshore wind projects. As mentioned elsewhere, leasing in the Central Atlantic should be informed by an assessment of the anticipated effects on protected species that occur in the area, including consideration of operational impacts (e.g., turbine noise, physical presence of turbines, vessel traffic, habitat modifications); this analysis should consider project-specific and cumulative effects that may occur before, during and after construction. It is also important to consider how development in this area may affect the availability and quality of habitat as well as vessel traffic and fishing use patterns which may affect the risk that these activities pose to protected species.

Additional information on the species that occur in the Central Atlantic Call Area can be found at:

- Greater Atlantic Regional Fisheries Office (GARFO) Section 7 Mapper[21]
- Southeast Regional Office (SERO) Section 7 Mapper[22]
- Ocean Biodiversity Information System Spatial Ecological Analysis of Megavertebrate Populations[23]
- Passive Acoustic Cetacean Map[24]
- WhaleMap[25]
- Atlantic Marine Assessment Program for Protected Species (AMAPPS)
    - AMAPPS reports[26]
    - AMAPPS Mammal Mammal Model Viewer[27]

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[18] Krzystan, A.M., Gowan, T.A., Kendall, W.L., Martin, J., Ortega-Ortiz, J.G., Jackson, K., Knowlton, A.R., Naessig, P., Zani, M., Schulte, D.W., and Taylor, C.R. (2018). Characterizing residence patterns of North Atlantic right whales in the southeastern USA with a multistate open robust design model. Endangered Species Research, 36:279–295.

[19] Pace, R. M. 2021. Revisions and Further Evaluations of the Right Whale Abundance Model: Improvements for Hypothesis Testing. NOAA Technical Memorandum NMFS-NE-269. National Marine Fisheries Service, Northeast Fisheries Science Center, Woods Hole, MA. April 2021.

[20] https://www.fisheries.noaa.gov/national/marine-life-distress/2017-2022-north-atlantic-right-whale-unusual-mortality-event

[21] https://www.fisheries.noaa.gov/resource/map/greater-atlantic-region-esa-section-7-mapper

[22] https://www.arcgis.com/home/item.html?id=b184635835e34f4d904c6fb741cfb00d

[23] https://seamap.env.duke.edu/

[24] https://apps-nefsc.fisheries.noaa.gov/pacm/#/

[25] http://whalemap.org

[26] https://www.fisheries.noaa.gov/new-england-mid-atlantic/population-assessments/atlantic-marine-assessment-program-protected

[27] https://apps-nefsc.fisheries.noaa.gov/AMAPPSviewer/

- Marine Mammal Stock Assessments[28]
- Habitat-based Marine Mammal Density Models for the US Atlantic: Latest Versions[29]
- DOE Mid-Atlantic Baseline Studies[30]
- New York State Dept. of Conservation NY Bight Passive Acoustic Monitoring, Aerial, Shipboard Surveys[31,32]

We would also like to bring your attention to two other NOAA efforts related to protected species: The Biologically Important Areas (BIAs)[33] effort and updates to the North Atlantic right whale vessel speed rule (50 CFR § 224.105). The two efforts are discussed below.

BIAs identify areas and times within which cetacean species or populations are known to concentrate for specific behaviors, or be range-limited, and provide additional context within which to examine potential interactions between cetaceans and human activities. Specific to anthropogenic sound and marine mammals, there is compelling evidence indicating that a variety of contextual factors, including behavioral state and life stage, can influence the probability, nature, and extent of a marine mammal's response to noise. The BIAs provide some of this important contextual information for cetaceans and can augment the cetacean density, distribution, and occurrence data typically used in marine mammal impact assessments. BIAs are compilations of the best available science and have no inherent or direct regulatory power. They have been used by NOAA, other federal agencies, and the public to support planning and marine mammal impact assessments, and to inform the development of conservation measures for cetaceans. Importantly, NOAA, with the support of the U.S. Navy, has convened a working group of regional cetacean experts who have begun updating and revising the BIAs identified in Van Parijs et al. (2015), identifying the full extent of any BIAs that overlap U.S. waters, adding new BIAs where appropriate, and now scoring each BIA. The use of a new BIA scoring and labeling system will improve the utility and interpretability of the BIAs by designating an overall Importance Score for each BIA. Finalization of the updated website and database is scheduled for December 2022. The locations, timing, and Importance Scores of the updated and revised BIAs in the Central Atlantic, once this information becomes available, should be considered as lease areas are identified. Until then, the previously recognized North Atlantic right whale migratory corridor BIA that extends along the East Coast establishes the importance of the Central Atlantic to migrating mothers and their newborn calves. As noted previously, given how little is known about North Atlantic right whale habitat utilization in the Central Atlantic, this BIA should be carefully considered when refining Call Areas.

In June 2020, NMFS completed an assessment[34] of its vessel speed rule (50 CFR § 224.105). This assessment included an evaluation of mariner compliance with the rule's Seasonal

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[28] www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessments

[29] https://seamap.env.duke.edu/models/Duke/EC/

[30] http://www.briloon.org/mabs

[31] https://www.dec.ny.gov/lands/113647.html

[32] https://remote.normandeau.com/nys_aer_overview.php

[33] https://oceannoise.noaa.gov/biologically-important-areas

[34] National Marine Fisheries Service. 2020. North Atlantic Right Whale (Eubalaena glacialis) Vessel Speed Rule Assessment. National Marine Fisheries Service, Office of Protected Resources, Silver Spring, MD.

Management Area (SMA) vessel speed restrictions and cooperation with the voluntary Dynamic Management Area (DMA) program. The evaluation found that compliance with the rule (all vessels over 65 feet are required to reduce speed to 10 knots or less in SMAs) reached 81% across all SMAs and called for revising SMA timing and boundaries to better match current North Atlantic right whale habitat use and distribution. Cooperation with DMAs was generally low, and the assessment recommended that the DMA program be terminated or modified. NMFS is currently considering the recommendations of the assessment and related public comments as we explore potential options for further reducing vessel strikes of North Atlantic right whales. All potential measures to further reduce the risk of vessel strike for North Atlantic right whales, including the recommendations of the assessment, and any information provided in any future rulemaking, should be considered as potential lease areas and lease conditions are identified.

Recommendations for Monitoring to Inform Area Refinement
To inform the further refinement of the Central Atlantic Call Areas, and in respect to our suggestion of taking an ecosystem approach to identifying areas and conducting a cumulative impact analysis, we recommend the following monitoring efforts below be completed before leases are issued (or at the latest, before construction).

Continuous archival Passive Acoustic Monitoring (PAM) and acoustic and satellite telemetry should be conducted in the Call Areas prior to leasing and construction to collect baseline information on the presence, distribution, and seasonality of North Atlantic right whales, other marine mammals, and acoustically tagged species (e.g., highly migratory species such as tunas and sharks, sturgeon, and sea turtles). Additionally, both archival and real-time PAM should be used to collect baseline information on the presence, distribution, and seasonality of marine mammals located in the potential transit routes from ports that may be used to support offshore construction and operations. Archival PAM should also be used to establish baseline noise levels and habitat conditions in the Call Areas and surrounding waters. A coordinated regional PAM approach should be taken which follows the recommendations in Van Parijs et al. 2021.[35] Monitoring using continuous PAM archival recorders should occur three to five years prior to the identification of lease areas, or at least a minimum of three to five years before construction. If conducted prior to leasing, the information from the PAM should be used to inform the location and size of potential lease areas by removing areas which overlap with identified locations with high species diversity, biological importance (i.e. migratory routes), or high individual species presence (i.e. hotspot). If PAM is conducted after leasing, but prior to construction, the information should be used to inform the development of lease areas to minimize effects to protected species by limiting activities, such as construction or placement of structures, which may overlap with identified locations with high species diversity, biological importance (i.e. migratory routes), or high individual species presence (i.e. hotspots).

Systematic aerial surveys should be conducted in the Call Areas and adjacent waters to collect baseline data on the presence, abundance, distribution, and seasonality of marine megafauna prior to leasing and construction. Surveys should follow a similar protocol to the aerial surveys

[35] Van Parijs, S.M., Baker, K., Carduner, J., Daly, J., Davis, G.E., Esch, C., Guan, S., Scholik-Schlomer, A., Sisson, N.B. and Staaterman, E., 2021. NOAA and BOEM Minimum Recommendations for Use of Passive Acoustic Listening Systems in Offshore Wind Energy Development Monitoring and Mitigation Programs. *Frontiers in Marine Science*, *8*, p.760840.

conducted in the Massachusetts/Rhode Island Wind Energy Areas[36] and should be flown on a regular basis. Aerial surveys should occur three to five years prior to the identification of lease areas, or at least a minimum of three to five years before construction. If conducted prior to leasing, the information from the aerial surveys should be used to inform the location and size of potential lease areas by removing areas which overlap with identified locations with high species diversity, biological importance (i.e. migratory routes), or high individual species presence (i.e. hotspot). If aerial surveys are conducted after leasing, but prior to construction, the information should be used to inform the development of lease areas to minimize effects to protected species by limiting activities, such as the construction or placement of structures, which may overlap with identified locations of high species diversity, biological importance (i.e. migratory routes), or high individual species presence (i.e. hotspots). Studies that provide a better understanding of behavioral impacts to marine mammals from noise sources such as pile driving and concentrated vessel traffic, with particular attention to baleen whales, should also be undertaken.

Fisheries Operations and Resources

The following summarizes information derived from evaluating the Call Areas using the fishing footprint method based on vessel logbook data. Tables and figures provided below reflect revenues in 2019 dollars, but the same data presented in the Appendix B reports reflect revenues adjusted to 2020 dollars. Therefore, the numbers in the tables below will not match similar data in the reports. Information presented here was compared to other sources such as vessel monitoring data and resource surveys for key species to corroborate findings.

We appreciate revisions to the western inshore planning area (Call Areas A and B), which reduced overlap with several important regional fisheries. However, the Call Areas continue to overlap with historic operations in several important regional fisheries. Based on the updated Call Areas, Appendix B1 provides summary information on historic fishing operations that could be affected by future wind development projects within the Call Areas as currently proposed. Since 2008, up to 581 vessels have fished nearly 6,000 trips in these Call Areas each year, with most fishing occurring in Areas A and B. Such trips landed in ports within Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Maryland, Virginia, and North Carolina. During 2008-2020, over 89 million pounds (lbs) of fish were landed from these planning areas at a value of over $169 million. Average annual fishing revenue from trips within all of the Call Areas combined exceeded $1 million for important fishing communities such as Cape May, NJ, New Bedford, MA, and Newport News, VA (see Table 5). For some species, fishing operations in these areas represent a substantial portion of annual landings and associated revenue. For example, average annual sea scallop landings (836,856 lbs) were valued at $7.2 million, while surfclam and *Illex* squid annual landings averaged 2.2 million lbs and 1.7 million lbs worth $1.4 million and $650,000, respectively (see Table 6).[37] Many vessels depended upon these planning areas for more than 50 percent of annual fishing revenue in all years, with several entities reliant on these areas for over 75 percent of annual landings in several years (see Figure 8.1 in

[36] https://www.masscec.com/marine-mammal-and-sea-turtle-surveys

[37] *Illex* squid landings and revenue are likely overestimated based on comparing vessel monitoring system data to data derived on singular fishing locations reported in logbooks.

Appendix B1). Thus, these planning areas are important to existing fisheries and represent substantial contributions to annual regional fishery landings and revenue.

Cumulatively, current and anticipated offshore wind development areas, including all existing and proposed lease areas and the Call Areas, would impact significant amounts of regional commercial fishery operations. For 11 species managed by GARFO and the Atlantic States Marine Fisheries Commission (ASMFC), over 10 percent of annual landings and revenue in certain years came from areas proposed for wind energy development. Relative to total annual regional landings and revenue, fishing operations in these areas represented up to 26 percent of annual landings and 25 percent of annual revenues for Atlantic surfclams; 22 percent of annual Atlantic chub mackerel landings and revenues; 19 percent of annual *Illex* squid landings and revenues; 19 and 18 percent of annual black sea bass landings and revenues, respectively; 17 and 16 percent of annual sea scallop landings and revenue, respectively;and over 12 percent of annual ocean quahog and red crab landings and revenue (see Table 7). If vessel operators choose not to fish within wind energy areas, this could result in substantial adverse economic impacts to many of the region's most important fisheries and associated fishing communities. This could also disrupt the supply of a healthy and sustainable food source to both domestic and international markets, reduce the availability of bait used to target other fish, and increase costs for fishery products worldwide. Together, these impacts could potentially compromise the economic viability of individual fishing businesses and food security for the nation at large.

Of the Call Areas, Areas A and B overlap the most with existing commercial fishery operations under the management of GARFO (see Figure 3 and the reports in Appendix B). Over 80 percent of surfclam revenue from the Call Areas during 2008-2020 ($19 million) was from Area A, while over 64 percent of scallop revenue from the Call Areas during 2008-2020 ($60 million) comes from Area B. Up to 506 vessels took up to 4,400 trips annually in Area A since 2008, while up to 450 vessels took up to nearly 2,900 trips annually into Area B since 2008. Vessel dependence varies by area, but many vessels were dependent upon Areas A and B for over 25 percent of annual fishing revenue during this time, with a few dependent upon this area for over 50 percent of annual fishing revenue in some years. Based on industry input, surfclam fishing has increased in the eastern portions of Area C. Although such an increase is not reflected in the area-specific reports in Appendix B, NMFS surfclam survey data indicate concentrations of surfclams in this area supporting industry input. Survey data also confirm the presence of high quantities of surfclams in Area A and most of Area B, particularly the northern and western portions of these areas. While fishing footprint data suggest a high degree of overlap with the *Illex* fishery in Areas B, E, and F, the spatial resolution of the underlying vessel logbook data likely overestimates the degree of impact on this fishery based on comparisons with vessel monitoring system data. The eastern portion of Areas B and C closest to the shelf break and canyons likely overlap with the *Illex* squid fishery to the greatest degree among Call Areas, however. This area also corresponds to historic scallop activity as well as represented by survey and vessel monitoring system data. As a result, we recommend BOEM avoid placing offshore wind projects within Areas A and C, and the eastern portion of Area B to minimize overlap with historical and anticipated commercial fishing operations.

Similar to commercial operations, Areas A and B include the vast majority of for-hire recreational (party/charter vessels) operations for GARFO-managed species within the Call

Areas. For-hire activity in Areas C and D were very similar in terms of total revenue and fish count, with operations in Area E slightly lower in fish caught, but higher in total revenue due to substantially higher revenue reported in 2019. Operations in Area F are minimal during 2008-2020, although this is likely reflective of the limited reporting of more southerly and highly migratory species in fishery logbooks submitted to the Greater Atlantic Regional Fisheries Office. Black sea bass dominated the catch in Areas A, B, and C, while dolphin fish (Mahi-mahi), yellowfin tuna, bluefin tuna, and other species, mostly highly migratory species such as whiate marlin, skipjack tuna, and wahoo dominated the catch in Areas D, E, and F.[38] Based on vessel logbook data for party/charter permits issued by GARFO, over 50 percent of the total number of fish caught within the Call Areas between 2008-2020 (174,000 fish) was caught in Area A (92,000 fish) (see Appendix B8 and B9). Similarly, Area A is responsible for nearly 50 percent of revenue from ticket sales, valued at over $2.6 million from 2008-2020, or approximately an average of $95,000 per year. For-hire trips into the planning areas, particularly Area A, have been generally increasing since 2008. For-hire vessels operated primarily out of ports in Maryland (Ocean City), Delaware (Indian River and Lewes), and Virginia, although Cape May, New Jersey also operated in the Call Areas. Over 1,000 angler trips were taken out of individual ports, with several ports (e.g., Ocean City, Cape May, taking over 200 angler trips into the Call Areas each year. Generally, angler trips have increased since 2008, with over 3,200 trips taken in Call Areas in 2020 alone. Many of the GARFO-permitted party/charter vessels operating in the Call Areas relied upon Areas A and B for over 20 percent of annual revenue from angler trips.

[38] Due to existing reporting requirements, species catch within the Central Atlantic Call Areas may be reported through multiple logbook reports to different NMFS offices. The summary reports in Appendix B are based on catch reported through Greater Atlantic Region (ME-NC) logbooks and likely underrepresent catch of more southerly species, including highly migratory species, which are reported separately.

Table 5: Average Annual Landings (All Species) within the Central Atlantic Call Areas by Landing Port.

Port	Average annual landings (lb)							Average annual revenue (2019 dollars)						
	All Call Areas Combined	Area A	Area B	Area C	Area D	Area E	Area F	All Call Areas Combined	Area A	Area B	Area C	Area D	Area E	Area F
ALL_OTHERS	732,978	133,086	294,162	112,915	234,570	225,741	157,890	$1,497,696	$416,419	$823,504	$129,886	$154,399	$270,912	$99,172
ATLANTIC CITY	1,325,173	1,187,324	196,873			1,525		$862,328	$767,527	$134,047			$8,770	
BARNEGAT	36,893	12,899	48,529			7,742		$288,968	$116,277	$390,177			$35,343	
BEAUFORT	27,611	2,679	12,619	1,502	6,476	13,403	1,300	$81,687	$14,438	$49,389	$2,791	$12,023	$25,539	$2,034
CAPE MAY	1,747,677	677,394	323,820	26,839	42,378	743,680	45,368	$2,238,418	$840,818	$976,258	$15,670	$36,258	$415,392	$22,365
CHINCOTEAGUE	219,601	2,682	205,665	8,287	2,182	10,057		$408,088	$4,427	$379,746	$34,091	$3,427	$17,099	
DAVISVILLE	786,360	3,716	103,912	92,088	324,702	112,807	216,450	$377,906	$2,831	$57,390	$43,239	$166,452	$61,861	$108,215
ENGELHARD	57,257				15,926		2,029	$118,297				$26,232		$3,551
FALL RIVER	76,838		6,448			45,044		$116,472		$13,796			$61,569	
HAMPTON	232,301	22,924	111,678	24,071	22,408	46,023	17,685	$589,957	$153,067	$359,396	$12,788	$25,186	$79,041	$11,549
HOBUCKEN	10,045	1,980						$24,998	$7,344					
INDIAN RIVER	18,730	14,734	2,229					$48,942	$36,020	$8,552				
LEWES	13,358	12,017						$29,747	$25,626					
LONG BEACH	17,069	16,149						$115,876	$114,683					
MONTAUK	30,456	2,903	9,883			12,455		$49,376	$4,566	$39,016			$16,848	
NEW BEDFORD	399,640	79,547	203,999	10,926		111,400	42,610	$2,372,458	$632,782	$1,625,125	$19,456		$280,415	$62,978
NEW LONDON	18,525	4,844	18,188			2,197		$145,659	$35,432	$161,056			$9,594	
NEWPORT NEWS	284,761	45,752	153,160	10,844	30,971	45,685	24,146	$1,542,292	$331,918	$1,081,016	$15,303	$31,215	$98,780	$22,343
NORTH KINGSTOWN	1,592,564	63,908	243,817	89,020	266,395	589,627	223,306	$893,374	$34,259	$201,707	$50,099	$153,267	$303,774	$123,666
OCEAN CITY	1,071,930	627,158	432,256	1,003		10,733		$882,934	$486,395	$368,335	$2,284		$27,210	
ORIENTAL	34,423	2,807	12,051		130	19,705		$56,395	$5,673	$24,546		$368	$31,264	
POINT JUDITH	68,546	6,202	18,392	1,649	2,427	43,023	3,664	$88,297	$10,834	$35,021	$1,843	$2,418	$43,209	$3,221
POINT PLEASANT	19,853	6,090	25,857			1,501		$128,498	$24,940	$198,986			$11,287	
SEA ISLE CITY	27,256	17,520	584			8,166		$69,774	$47,731	$2,513			$13,166	
STONINGTON	7,905	2,355	11,102			1,106		$49,653	$17,913	$82,297			$4,639	
VIRGINIA BEACH	58,464		1,287	34,775	26,887			$123,660		$1,923	$105,582	$25,224		
WACHAPREAGUE	2,398		1,502					$4,756		$3,337				
WANCHESE	89,448	3,599	25,009	7,427	47,325	24,460	17,390	$95,715	$6,157	$34,956	$12,578	$42,998	$35,849	$7,867
WILDWOOD	23,391	22,353						$83,765	$78,686					

Table 6: Average Annual Species Landings and Revenue from All Central Atlantic Call Areas Combined during 2008-2020 (revenues in 2019 dollars).

Species	Average Annua Landings 2008-2020 (lb)	Average Annua Revenue 2008-2020 (2019 dollars)
Atlantic sea scallop	836,856	$7,252,217
Atlantic surfclam	2,256,640	$1,463,883
Illex squid	1,740,029	$650,624
Longfin squid	438,393	$490,532
Black sea bass	126,330	$381,502
Summer Flounder	190,698	$342,918
Red crab	215,901	$214,548
Monkfish	129,178	$196,804
Ocean quahog	133,619	$111,466
American lobster*	18,983	$93,182
Atlantic menhaden*	441,790	$39,342
Bluefish	40,545	$30,862
Atlantic chub mackerel	106,684	$25,835
Atlantic croaker*	45,932	$23,889
Atlantic herring	164,050	$17,523
Jonah crab*	18,934	$16,829
Skate wings	39,950	$15,739
Spiny dogfish	92,265	$15,597
Golden tilefish	3,060	$12,551
Blueline tilefish*	4,962	$11,937
Scup	17,225	$9,842
Atlantic mackerel	35,036	$8,455
Butterfish	17,457	$8,168
Striped bass	3,161	$7,170
Tautog	1,103	$3,708
Silver hake	3,837	$2,611
American eel*	370	$1,335
Atlantic cod	621	$1,163
Witch flounder	713	$1,105
Horseshoe crab	1,477	$973
Spot**	576	$659
Ocean pout	773	$641
Red hake	864	$472
Weakfish	204	$296
Offshore hake	149	$196
White hake	104	$192
Spanish mackerel	113	$126
Black drum*	279	$113
Cobia*	37	$67
Redfish	16	$18
Red drum*	8	$15
Pollock	6	$7
*Landings/revenue for these species are underestimated due to limited coverage of these fisheries in Greater Atlantic logbooks.		

Table 7: The maximum percentage of total annual regional landings and revenues for species managed by GARFO and the ASMFC caught within existing and proposed offshore wind lease areas and the Central Atlantic Call Areas.

GARFO and ASMFC Managed Species	Maximum Annual Percent Total Regional Species Landings	Maximum Annual Percent Total Regional Species Revenue
American eel**	22%	31%
Blueline tilefish**	26%	28%
Atlantic surfclam	26%	25%
Atlantic chub mackerel	22%	22%
Illex squid	19%	19%
Atlantic menhaden**	20%	19%
Black sea bass	19%	18%
Black drum**	19%	18%
Atlantic croaker**	14%	17%
Atlantic sea scallops	17%	16%
Yellowtail flounder	14%	15%
Offshore hake	14%	14%
Spot**	15%	13%
Ocean quahog	14%	13%
Red crab	12%	12%
Red drum**	11%	11%
Alewife	9%	10%
Bluefish	9%	10%
Skate wings	10%	10%
Atlantic mackerel	9%	10%
Cobia**	18%	9%
Longfin squid	9%	9%
Scup	8%	9%
Monkfish	10%	8%
Weakfish	8%	7%
Summer flounder	7%	7%
Red hake	11%	7%
Spanish mackerel	6%	6%
Butterfish	7%	6%
Silver hake	7%	6%
Hickory shad	7%	6%
Tautog	6%	6%
Golden tilefish	6%	6%
Blueback herring	5%	6%
Jonah crab*	5%	5%
Horseshoe crab	6%	4%
American shad	6%	4%
Spiny dogfish	4%	4%
Winter flounder	3%	4%
Windowpane flounder	3%	3%
Atlantic herring	3%	2%
American lobster*	1%	2%
*Landings/revenue for these species are underestimated due to limited historic coverage of these fisheries in existing reporting requirements for the Greater Atlantic Region.		
**Landings/revenue percentages for these species are likely overestimated due to limited coverage of these fisheries in existing Greater Atlantic Region reporting requirements.		

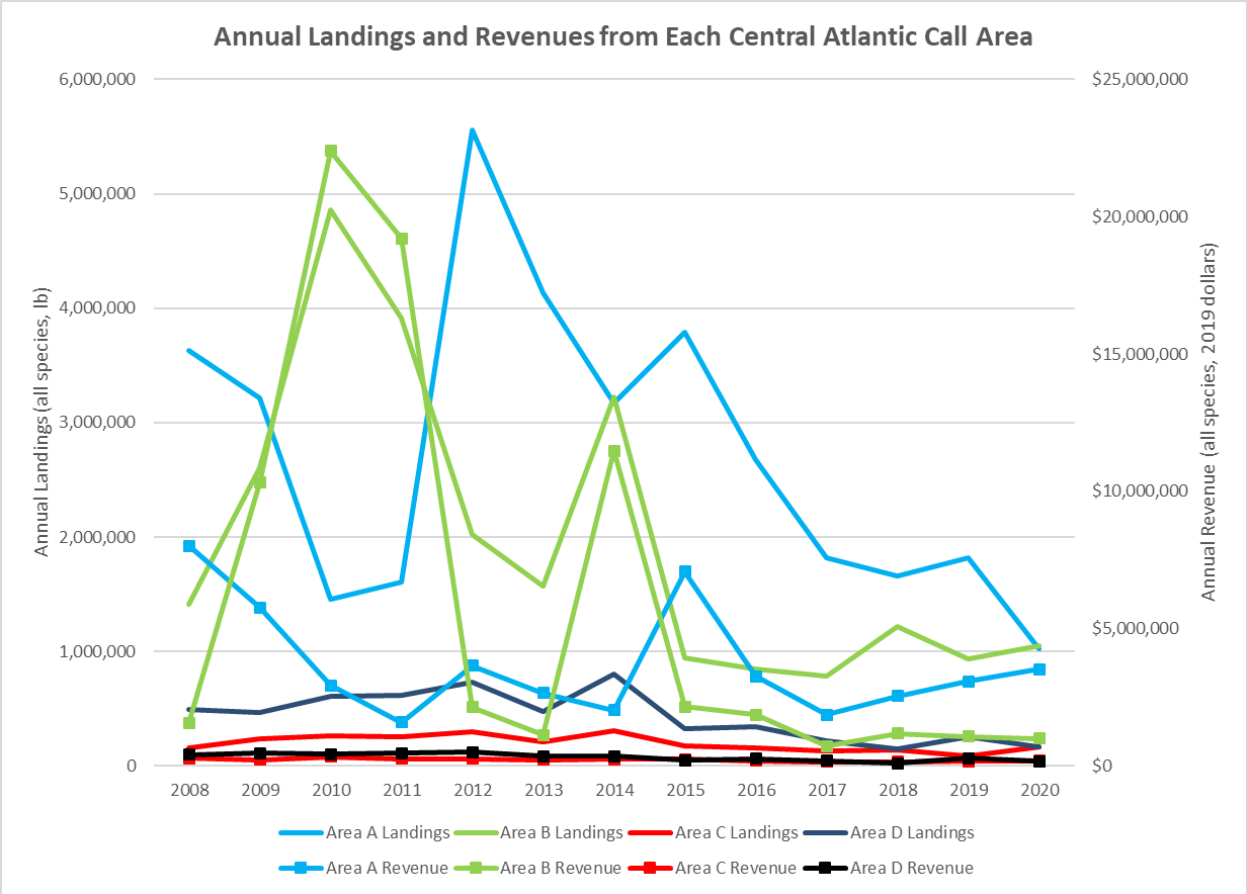


Figure 3. Annual Landings and Revenues from Each Central Atlantic Call Area

The Call Areas are also heavily utilized by recreational and commercial fisheries for Atlantic Highly Migratory Species (HMS), including swordfish, billfishes, tunas, and sharks. Areas offshore of the shelf break (E and F) presumably would be for floating wind. These areas are heavily utilized by commercial HMS longline fishing vessels that primarily target swordfish and tunas. Coastwide, HMS commercial ex-vessel revenues are $30-40 million per year. The shelf-edge and adjacent waters from North Carolina to New Jersey are a heavily fished area by commercial HMS vessels, with the Mid-Atlantic region accounting for approximately 37% of U.S. Atlantic coast HMS pelagic longline effort in recent years (Figure 4). While HMS vessels from Massachusetts to Florida seasonally operate in Mid-Atlantic waters, vessels based in New Jersey, Delaware, Maryland, Virginia, and North Carolina are more reliant on the region and may be disproportionately impacted. Across HMS commercial permits, 19% (902 vessels) are home ported in these states. While effort in the pelagic longline fishery is focused along the shelf-edge, set locations vary depending on oceanographic conditions, including Gulf Stream position, mesoscale eddies and frontal zones, and seasonal and interannual productivity dynamics. HMS bottom longline fishing targeting coastal sharks and gillnet and trawl vessels targeting smooth dogfish also occur over Mid-Atlantic shelf waters (Areas A, B, C, and D). Given that HMS longline sets often exceed 20 miles in mainline length, these vessels would be unable to fish within turbine arrays, or between neighboring arrays, and would be forced to redistribute effort elsewhere. Furthermore, pelagic longline sets may drift over an additional 30 miles with prevailing currents in this region, requiring additional spatial buffers from

installations to prevent gear entanglements.

These areas are also seasonally fished by HMS private and for-hire recreational fishermen, including for numerous highly valuable HMS tournaments (Figure 5). HMS recreational fishing has an estimated annual economic impact exceeding $500 million, supporting approximately 4,500 jobs coastwide (https://www.fisheries.noaa.gov/feature-story/new-report-reveals-economic-impact-recreational-atlantic-highly-migratory-species). HMS recreational fishing in the Mid-Atlantic represents a significant portion of this total. The states adjacent to the Central Atlantic Call Areas (NJ to NC) account for 27% (1081) of HMS charter/headboat permit holders, 36% (8,473) of HMS private angling permit holders, and 26% (333) of HMS-focused fishing tournaments. Unlike recreational fisheries for smaller species, fishing for HMS such as blue marlin, yellowfin and bigeye tunas, thresher sharks, and others, requires thousands of yards of line, and during fights vessels often drift > 1 mile. Therefore, considerable spacing between neighboring vessels or other obstructions (such as wind turbines) is necessary when targeting HMS. Recreational vessels targeting HMS would be unable to fish within turbine arrays due to increased risks of gear entanglements, aggregation of fishing vessels, and resulting losses of hooked fish.

It should be noted that the vast majority of HMS fishing effort is not reported to the GARFO Vessel Trip Report program, but rather through separate logbook programs managed by the SEFSC and is not be well-represented in the attached socioeconomic analyses. Impacts to HMS resources, fisheries, and communities must not be overlooked. Additional information can be found in HMS Stock Assessment and Fisheries Evaluation (SAFE) Reports (https://www.fisheries.noaa.gov/atlantic-highly-migratory-species/atlantic-highly-migratory-species-stock-assessment-and-fisheries-evaluation-reports), and recreational data, including the Large Pelagics Survey, is available at https://www.fisheries.noaa.gov/recreational-fishing-data/recreational-fishing-data-downloads.

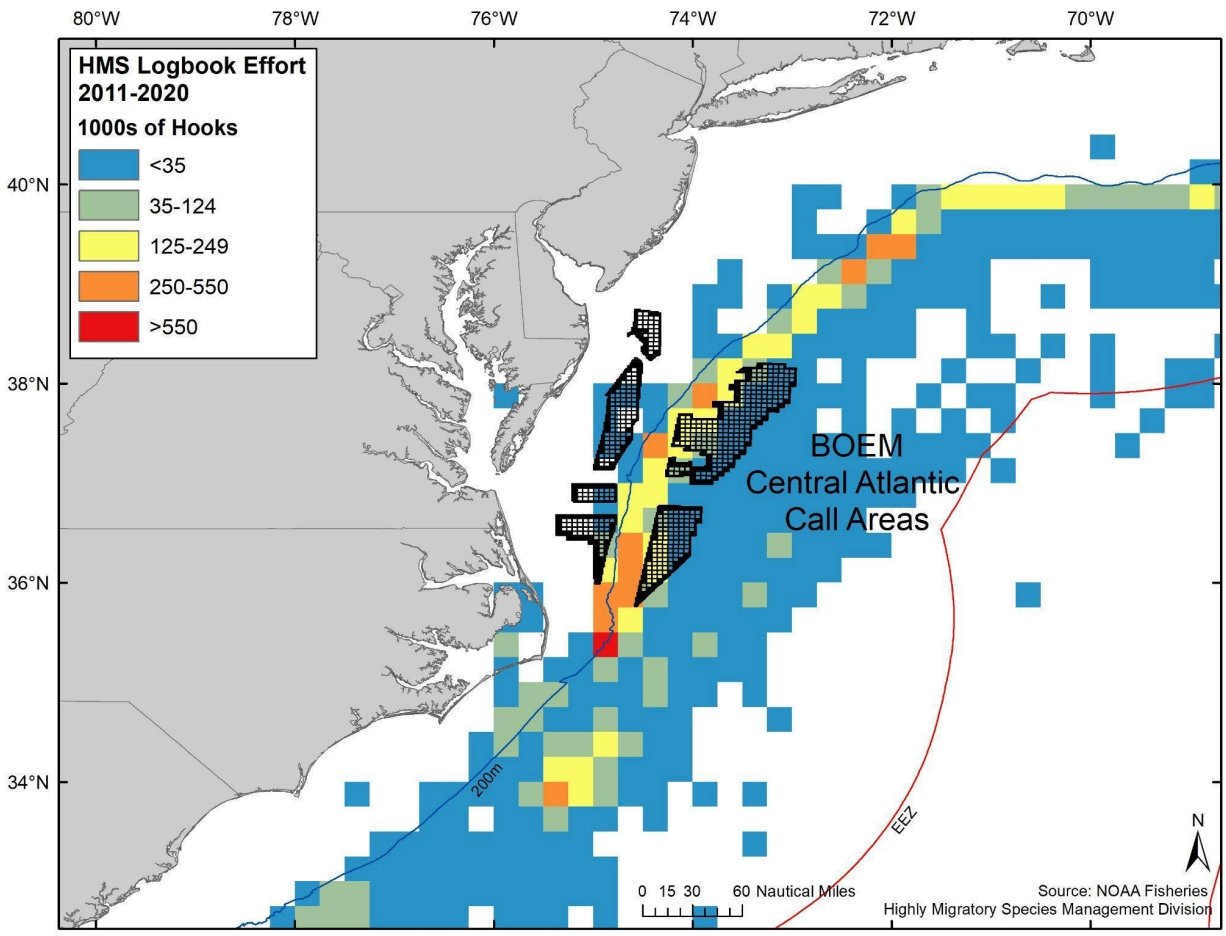


Figure 4. Commercial HMS fishing effort (primarily pelagic longlines targeting swordfish and tunas), 2011-2020, relative to the Central Atlantic Call Areas.

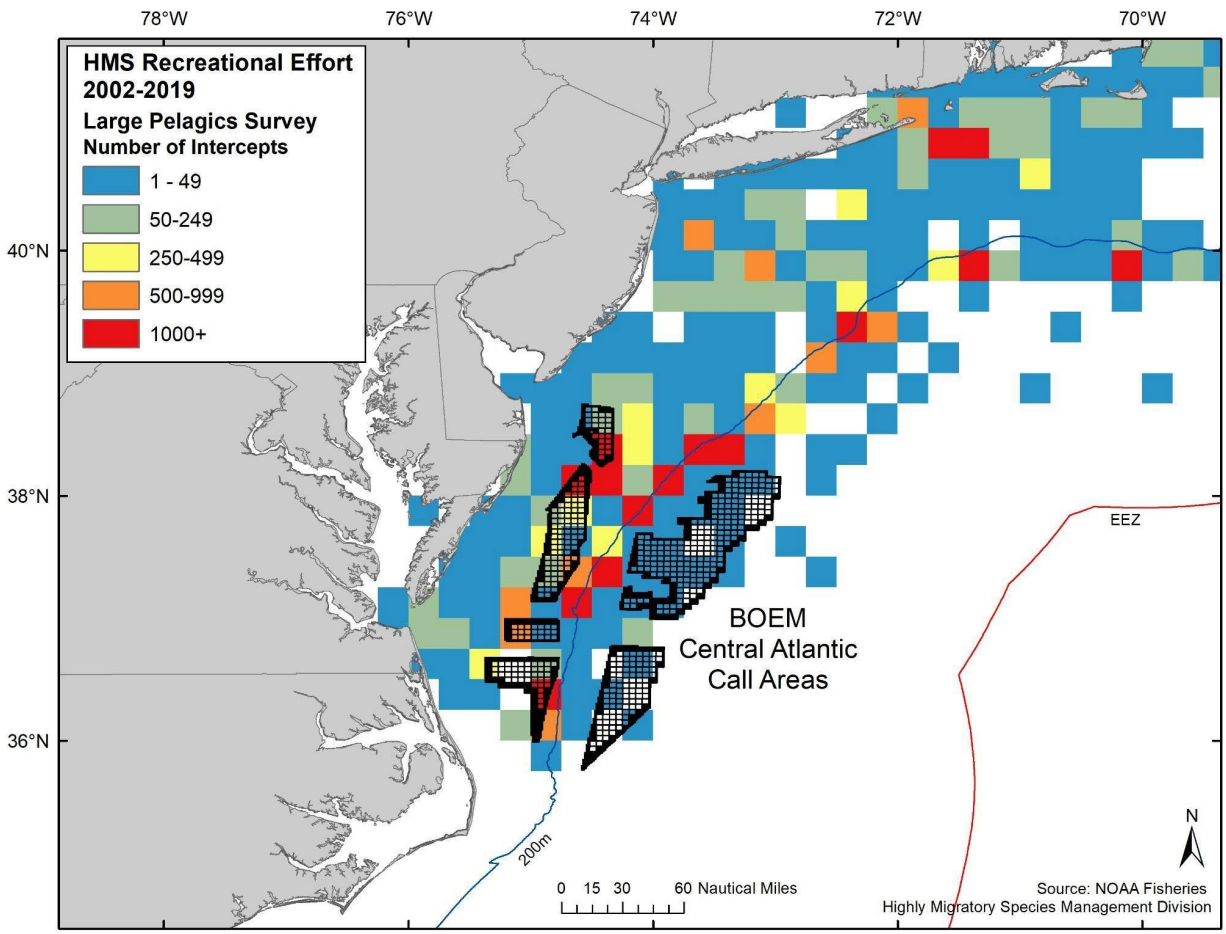


Figure 5. HMS recreational fishing effort sampled by the Large Pelagics Survey (LPS) program, 2002-2019, relative to the Central Atlantic Call Areas. Dockside survey intercepts are conducted from Maine through Virginia during June through October annually. Thus, the lack of effort reported from North Carolina southward is an artifact of the survey design, not a true absence of HMS fishing effort.

A number of the areas cover some of the highly productive recreational and charter fishing locations in the East coast, particularly the area immediately north of Oregon Inlet and the areas just West of the canyons. The areas offshore of Delaware, Maryland and Virginia near the Eastern extent of the Canyons are key fishing locations for HMS as well as for numerous bottom species such as tilefish and seabass.

Fishing Community Dependence and Environmental Justice

The cumulative social effects to coastal communities that are dependent on fishing should be considered before proposing more wind development lease areas. A sample of NOAA Fisheries Community Social Vulnerability Indicators (CSVI) data is provided in this letter, but further community data is found at: https://www.fisheries.noaa.gov/national/socioeconomics/social-indicators-coastal-communities. and data tool here: https://www.st.nmfs.noaa.gov/data-and-tools/social-indicators/. NOAA Fisheries' indices for poverty, population composition, and personal disruption can be used to better identify and understand Environmental Justice communities. The indicators show that fishing communities that are dependent upon commercial fishing are far more likely to have higher levels of poverty, have a larger percentage of minority and tribal populations, and/or have residents with less "personal capacity" to respond to change. Table 8 lists ports that have reported landings from within the Central Atlantic Call Areas (see Table 5) that also have environmental justice concerns or gentrification pressure. Based on the CSVIs, the ports reported score Medium-High in commercial fishing dependence (engagement and reliance) and score Medium-High to High in at least one indicator of environmental justice (poverty, population composition, personal disruption) and gentrification (housing disruption, retiree migration, urban sprawl). Many communities listed here have significant portions of landings from within the Call Areas, including Atlantic City and New Bedford. Many are smaller fishing communities that could be more vulnerable to changes (e.g., Wildwood, Hobucken, Engelhard, Beaufort) and show higher environmental justice scores and higher commercial fishing dependence scores.

Further analyses should be completed to understand the effects on food security, including the underserved populations' access to food supply. Additionally, little is understood on the potential effects of wind development on the already vulnerable seafood industry job market. Further research is needed on the multiplier effects to coastal communities and the regional economy on lost or displaced fishing revenue at all stages of cumulative development. These effects should be analyzed and any impacts expected should have transparent and clear mitigation strategies. BOEM should ensure that distributive justice is practiced with underserved communities given access and resources to participate in all stages of the wind energy development process, including future consideration of these planning areas.

PORT	EJ Concerns	Gentrification Pressure
ATLANTIC CITY, NJ	X	X
BARNEGAT LIGHT, NJ		X
BEAUFORT, NC	X	X
CAPE MAY, NJ		X
CHINCOTEAGUE, VA		X
ENGELHARD, NC	X	
FALL RIVER, MA	X	
HOBUCKEN, NC	X	
LEWES, DE	X	X
MONTAUK, NY		X
NEW BEDFORD, MA	X	X
NEW LONDON, CT	X	
NEWPORT NEWS, VA	X	
OCEAN CITY, MD		X
ORIENTAL, NC		X
POINT JUDITH, RI		X
POINT PLEASANT, NJ		X
SEA ISLE CITY, NJ		X
WILDWOOD, NJ	X	X

Table 8. Ports with landings from within the Central Atlantic Call Areas that are medium to highly dependent on commercial fishing and score medium-high to high in at least one indicator of EJ and Gentrification

NOAA Scientific Surveys

BOEM and NMFS have determined that the proposed offshore wind development would have major adverse impacts on NMFS scientific research and surveys, which will in turn result in adverse impacts on fishery participants and communities and on the American public who consume seafood. These impacts potentially include lower quotas for commercial and recreational fishermen due to increased uncertainty in the surveys' measures of abundance, which will lead to lower associated fishing revenue. Proposed new planning areas would also result in adverse effects on monitoring and assessment activities associated with recovery and conservation programs for protected species, including the critically endangered North Atlantic right whale. The interaction of the draft planning areas with NEFSC and SEFSC scientific surveys are described below.

The proposed 3.9 million acres of the Central Atlantic Call Areas overlap with eight NMFS/NEFSC scientific surveys: Spring and Autumn Bottom Trawl Survey, Atlantic Surfclam Survey, Ocean Quahog Survey, Scallop Survey, Ecosystem Monitoring Survey, North Atlantic Right Whale Surveys, Marine Mammal and Sea Turtle Ship-Based and Aerial Surveys, and the Large Coastal Shark Bottom Longline Survey. The majority of surveys only interact with Call Areas A-D, with the exception of the AMAPPS aerial survey which overlaps with Call Area E

and the AMAPPS shipboard overlaps all Central Atlantic Call Areas. However, it should be noted that submarine cable corridors that will be required remain undefined and these areas will interact with many NEFSC surveys. The minimum and maximum of individual survey strata overlap for all 8 surveys ranges from 1% to 100%. See below for maps of each science survey that intersects with the Central Atlantic Call Areas. The tables within each map provide the overlap for each Central Atlantic Call Area as well as the cumulative ranges of overlap with survey strata and the percent of total survey area overlap with current and anticipated offshore wind development areas (Gulf of Maine Planning Area, SC Call Areas, and existing lease areas) in the region. For example, the Central Atlantic Call Areas overlap with 15 scallop survey strata, ranging from 1-100% overlap. Call Area D interacts with the most strata. The total survey overlap with the Central Atlantic Call Areas represents 5% of the cumulative total (12%) overlap with wind development areas in the region. In addition to the NEFSC surveys, the eastern extent of Central Atlantic Call Area D has minimal overlap with the NMFS/SEFSC South Atlantic Deepwater Longline (SADL) Survey for tilefishes, snappers and groupers (see figures below). In addition, although Call Areas E and F have limited overlap with many fisheries independent surveys, potential changes in pelagic fisheries effort and potential habitat alterations due to offshore wind development may change the distribution, abundance, or vital rates of NMFS managed stocks which may necessitate the need to conduct new and expanded surveys in these offshore areas.

Currently, the NEFSC right whale survey intermittently covers the northernmost part of the inshore Central Atlantic Call Areas. The NEFSC is looking to expand survey efforts along the mid-Atlantic in the near future to support necessary management of this declining species.

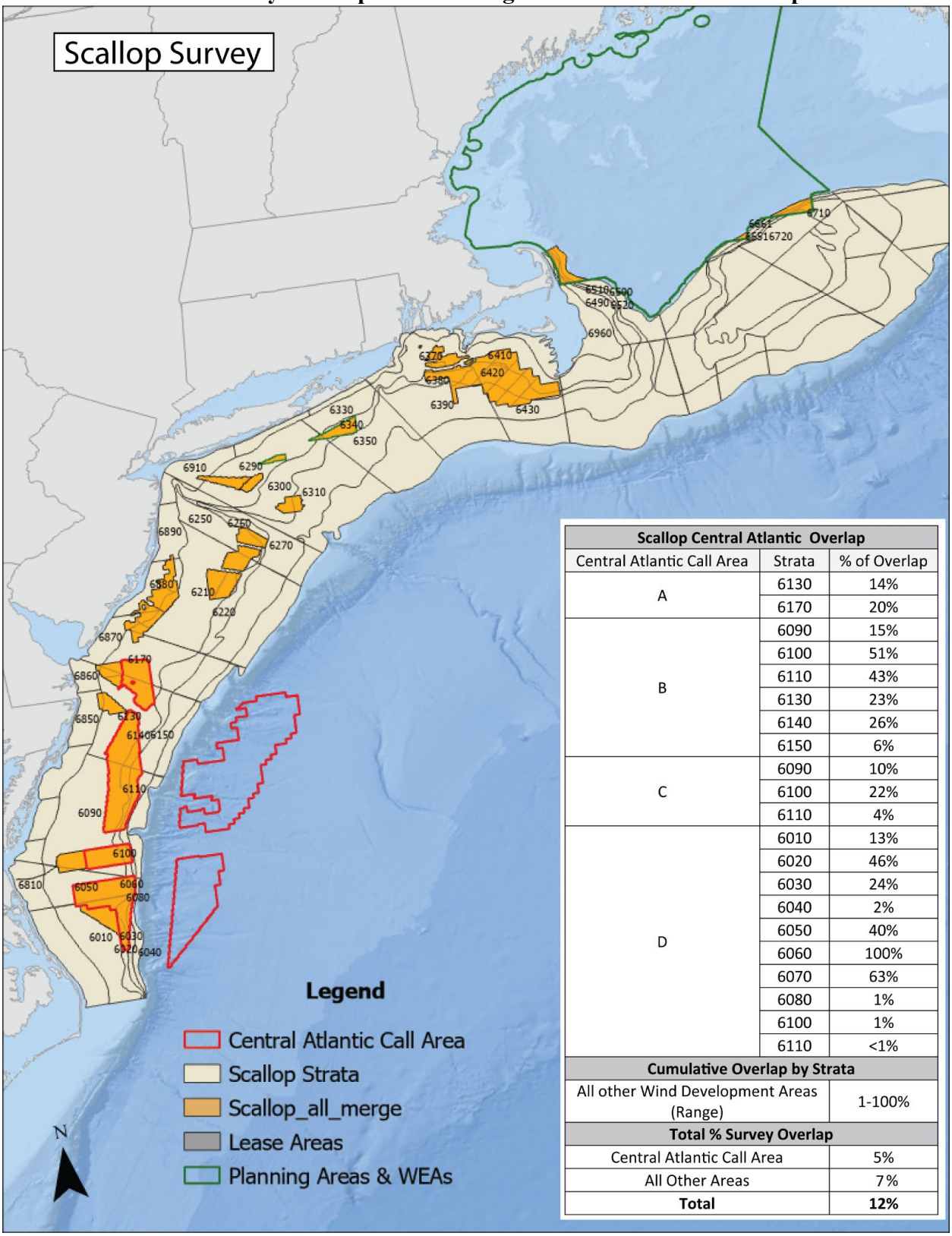
Additional analyses/recommendations:

- BOEM should work with the NMFS NEFSC and SEFSC to understand the full extent of overlaps with scientific surveys along the Atlantic Coast, including in existing and proposed lease areas, the Central Atlantic Call Areas, and future planning areas.

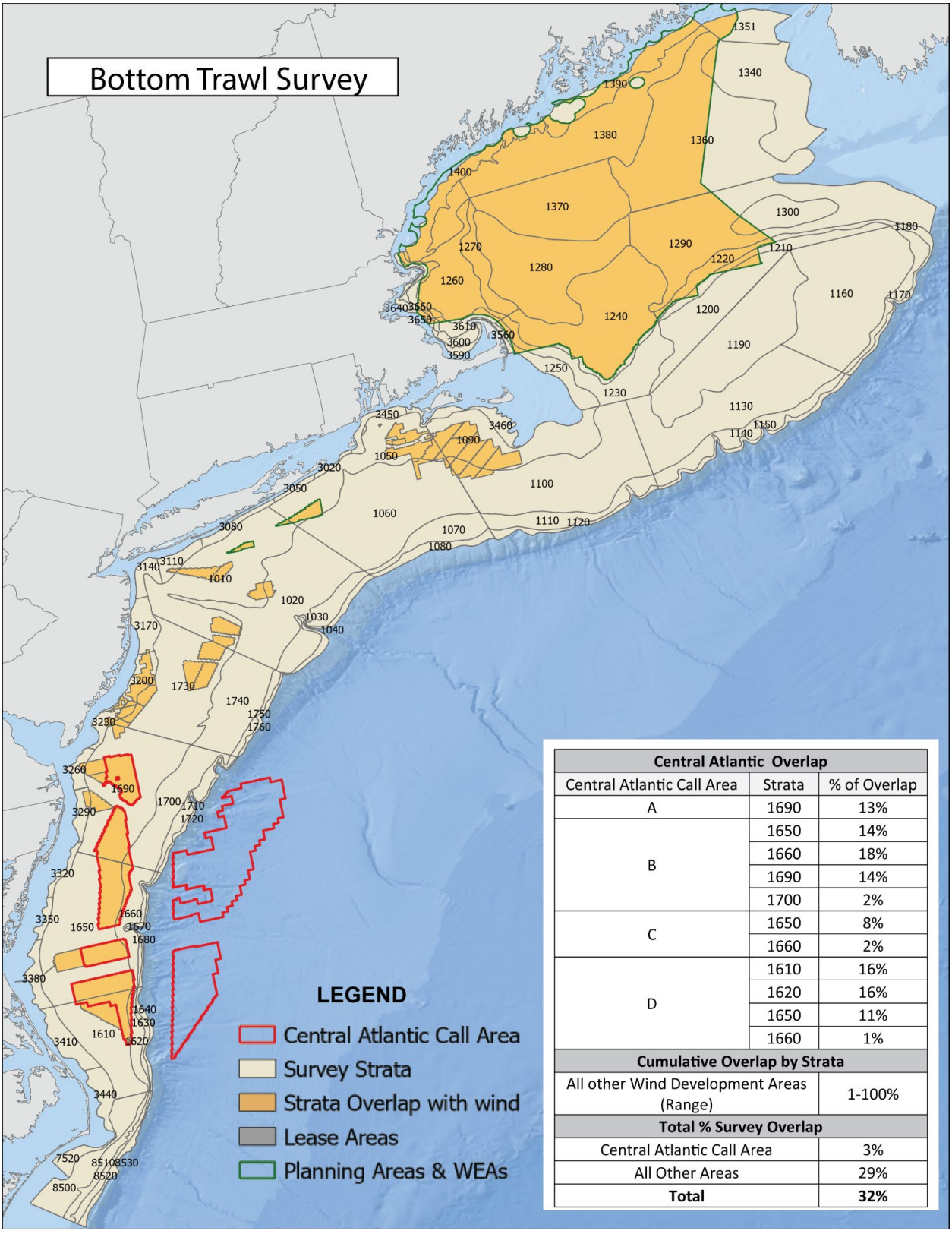
- There are efforts underway to examine the extent of impact on our surveys and determine how to mitigate for those impacts, so we cannot determine at this time if there are specific areas that should be removed from the Call Areas to avoid or minimize survey impacts.

- We encourage BOEM to suspend designation of the planning area boundaries until the establishment of regional survey mitigation programs in the Northeast and Southeast Regions as described in the Joint BOEM and NMFS Draft Federal Survey Mitigation Implementation Strategy. Having certainty on how NMFS regional survey mitigation efforts will be conducted and resourced should be an essential precursor to future wind energy development throughout the Atlantic Coast.

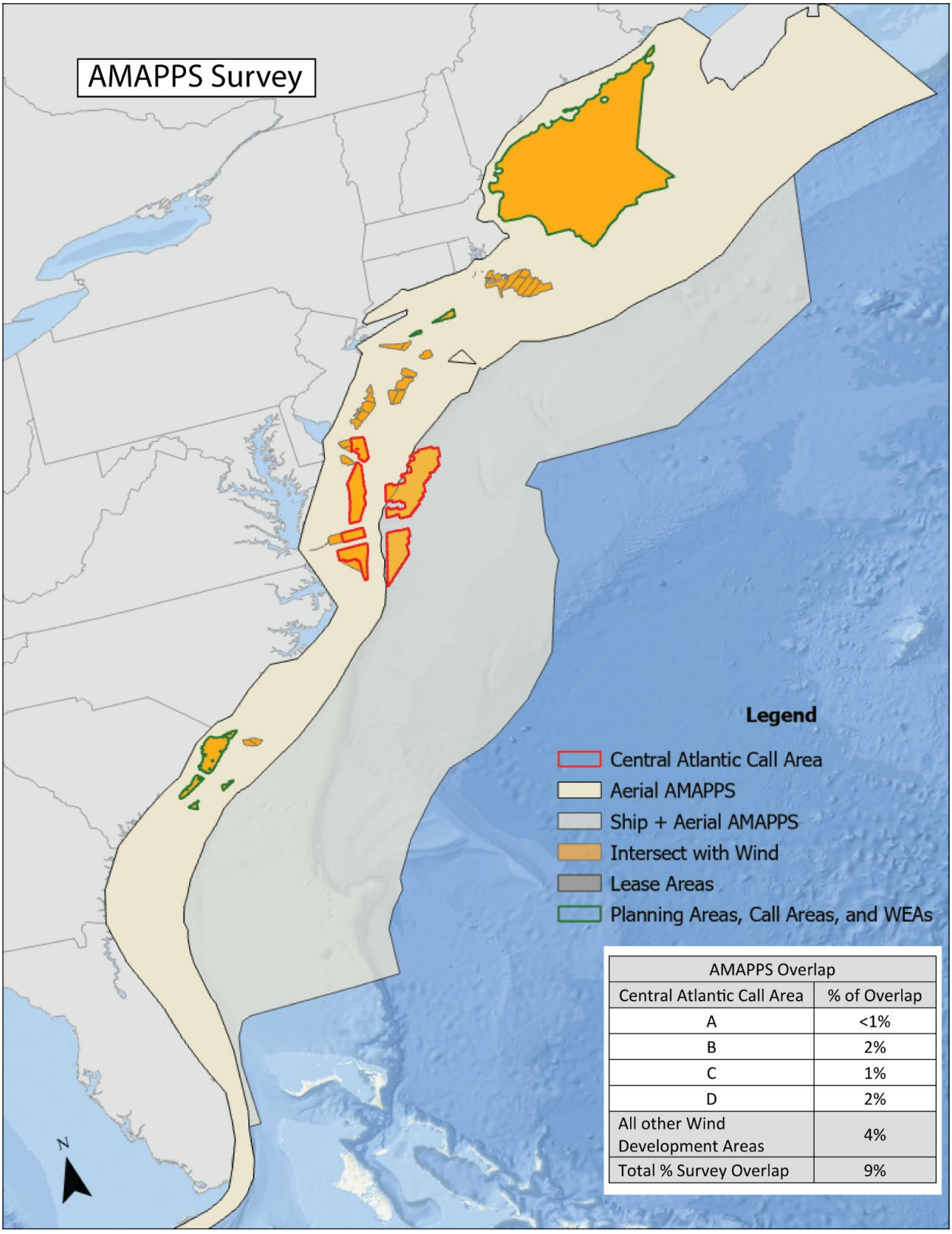
NOAA Scientific Survey Overlap with Existing and Planned Wind Development Areas



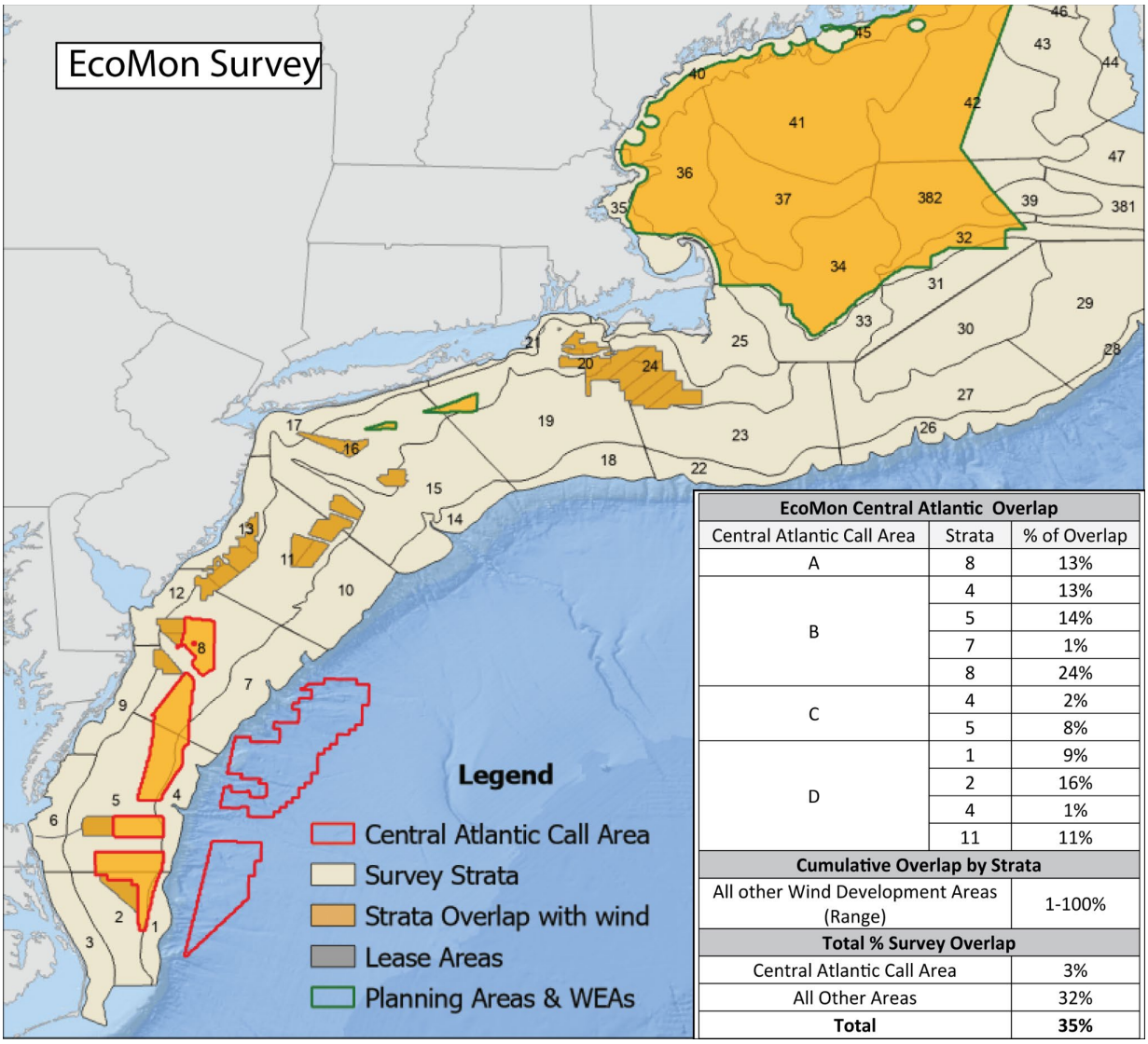
Scallop Central Atlantic Overlap		
Central Atlantic Call Area	Strata	% of Overlap
A	6130	14%
	6170	20%
B	6090	15%
	6100	51%
	6110	43%
	6130	23%
	6140	26%
	6150	6%
C	6090	10%
	6100	22%
	6110	4%
D	6010	13%
	6020	46%
	6030	24%
	6040	2%
	6050	40%
	6060	100%
	6070	63%
	6080	1%
	6100	1%
	6110	<1%
Cumulative Overlap by Strata		
All other Wind Development Areas (Range)		1-100%
Total % Survey Overlap		
Central Atlantic Call Area		5%
All Other Areas		7%
Total		**12%**



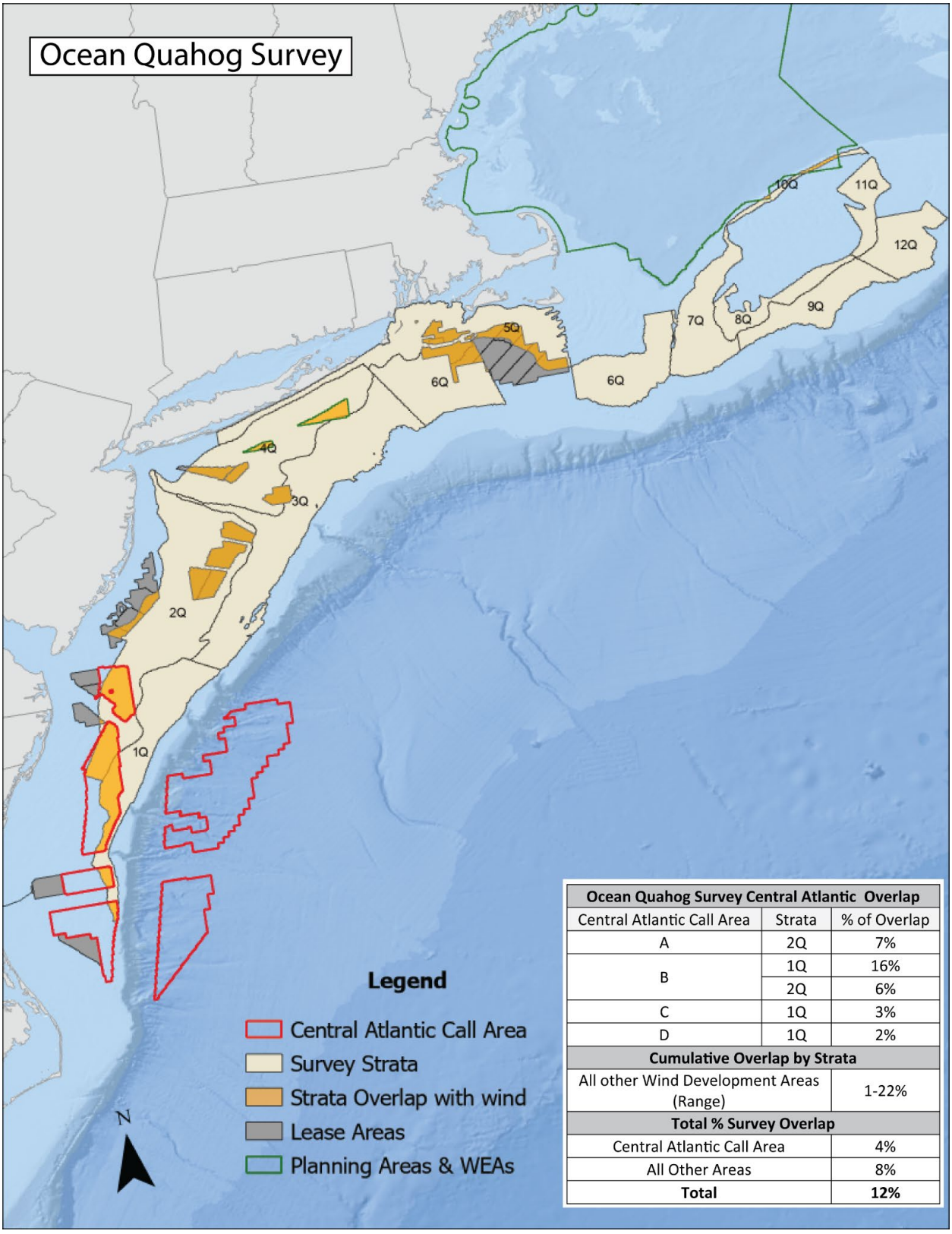
Central Atlantic Overlap		
Central Atlantic Call Area	Strata	% of Overlap
A	1690	13%
B	1650	14%
	1660	18%
	1690	14%
	1700	2%
C	1650	8%
	1660	2%
D	1610	16%
	1620	16%
	1650	11%
	1660	1%
Cumulative Overlap by Strata		
All other Wind Development Areas (Range)		1-100%
Total % Survey Overlap		
Central Atlantic Call Area		3%
All Other Areas		29%
Total		**32%**



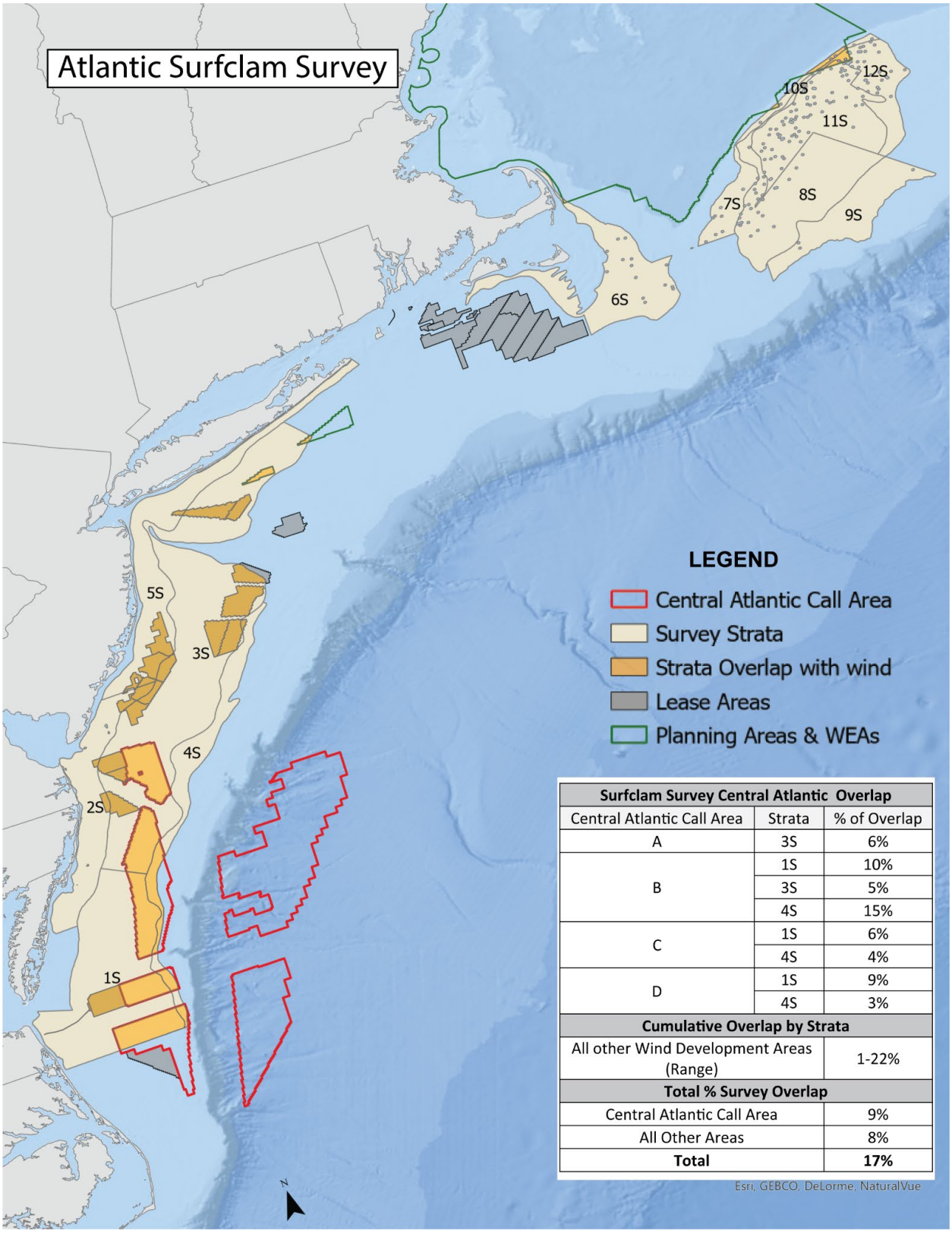
AMAPPS Overlap	
Central Atlantic Call Area	% of Overlap
A	<1%
B	2%
C	1%
D	2%
All other Wind Development Areas	4%
Total % Survey Overlap	9%



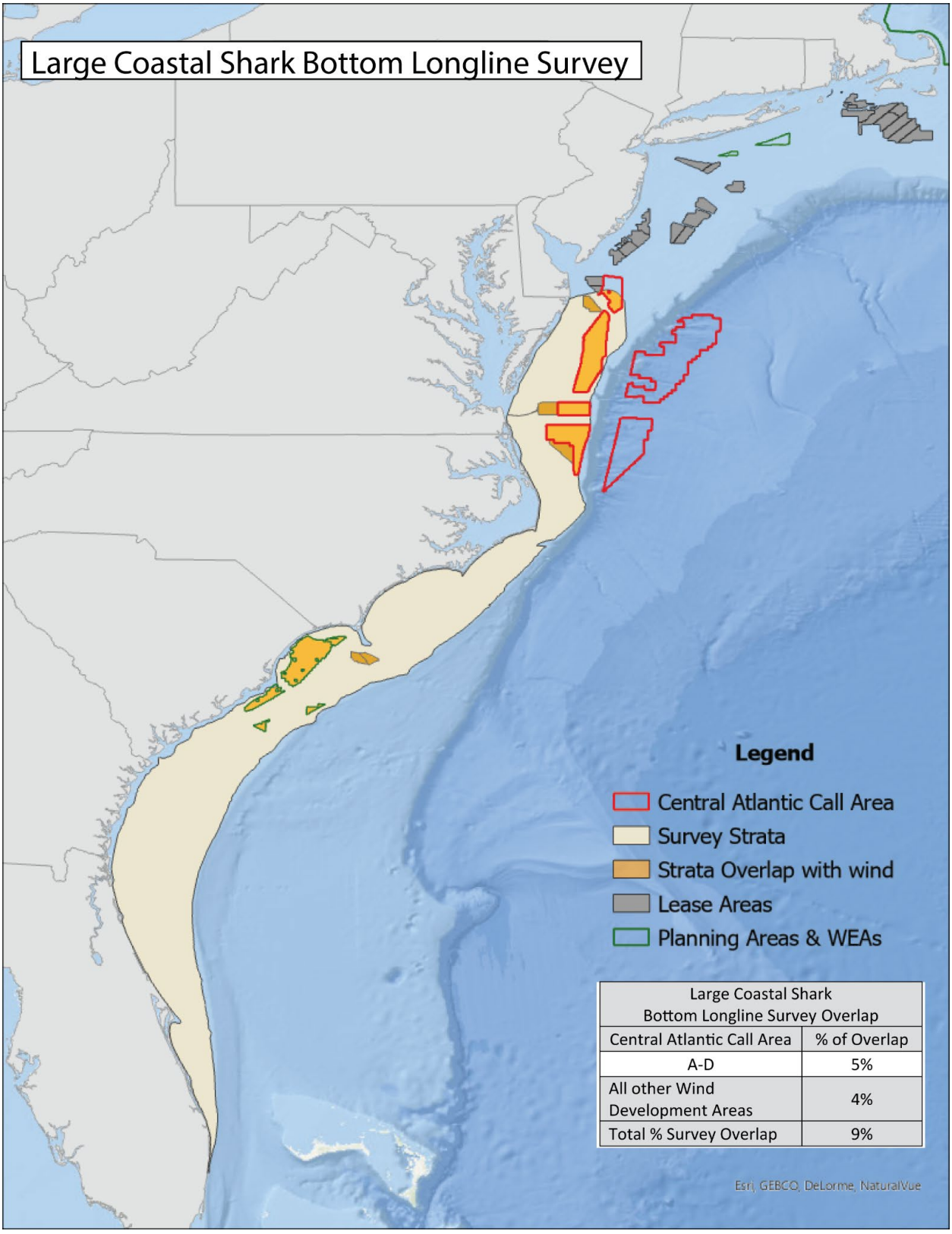
EcoMon Central Atlantic Overlap		
Central Atlantic Call Area	Strata	% of Overlap
A	8	13%
B	4	13%
	5	14%
	7	1%
	8	24%
C	4	2%
	5	8%
D	1	9%
	2	16%
	4	1%
	11	11%
Cumulative Overlap by Strata		
All other Wind Development Areas (Range)		1-100%
Total % Survey Overlap		
Central Atlantic Call Area		3%
All Other Areas		32%
Total		**35%**



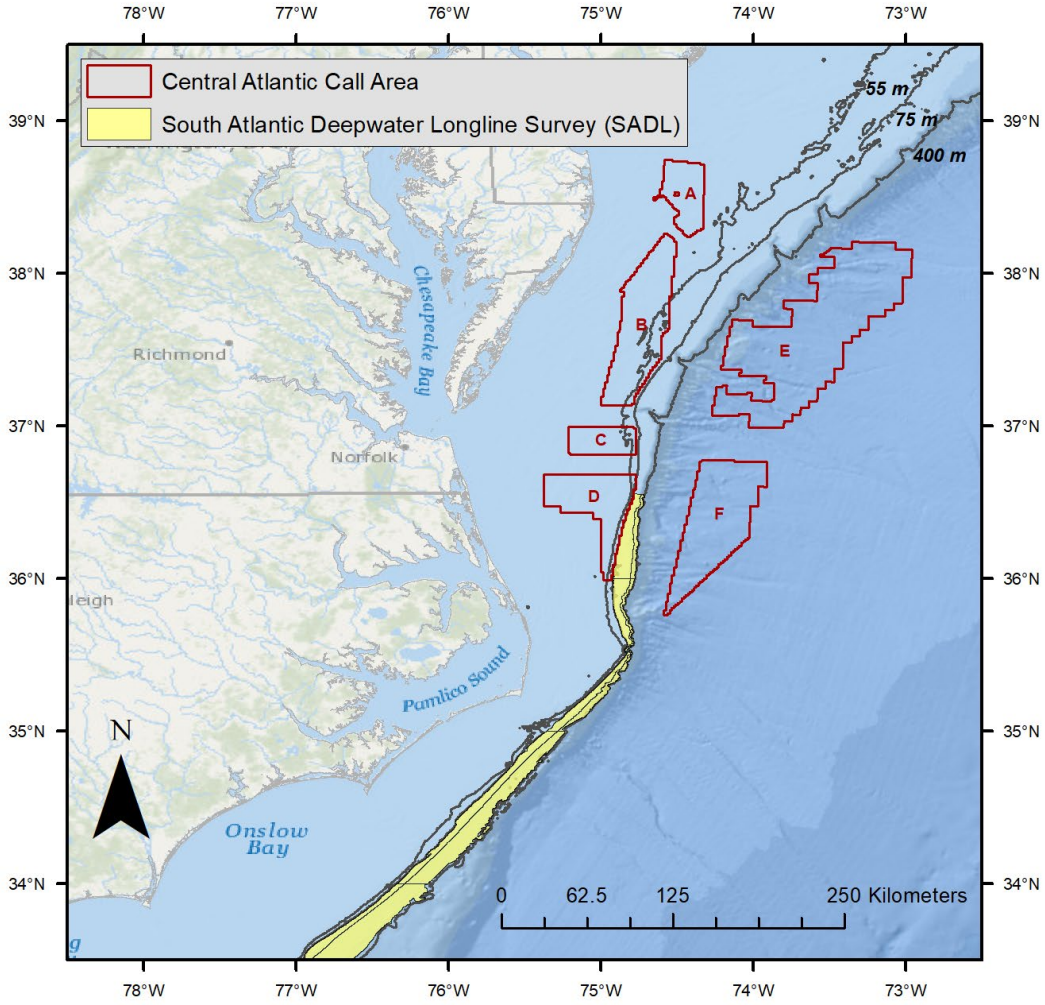
Ocean Quahog Survey Central Atlantic Overlap		
Central Atlantic Call Area	Strata	% of Overlap
A	2Q	7%
B	1Q	16%
	2Q	6%
C	1Q	3%
D	1Q	2%
Cumulative Overlap by Strata		
All other Wind Development Areas (Range)		1-22%
Total % Survey Overlap		
Central Atlantic Call Area		4%
All Other Areas		8%
Total		**12%**



Surfclam Survey Central Atlantic Overlap		
Central Atlantic Call Area	Strata	% of Overlap
A	3S	6%
B	1S	10%
	3S	5%
	4S	15%
C	1S	6%
	4S	4%
D	1S	9%
	4S	3%
Cumulative Overlap by Strata		
All other Wind Development Areas (Range)		1-22%
Total % Survey Overlap		
Central Atlantic Call Area		9%
All Other Areas		8%
Total		**17%**



Large Coastal Shark Bottom Longline Survey Overlap	
Central Atlantic Call Area	% of Overlap
A-D	5%
All other Wind Development Areas	4%
Total % Survey Overlap	9%


Central Atlantic Call Area
South Atlantic Deepwater Longline Survey (SADL)
55 m
75 m
400 m
A
B
C
D
E
F
Richmond
Norfolk
Chesapeake Bay
Pamlico Sound
Onslow Bay
N
0
62.5
125
250 Kilometers
78°W
77°W
76°W
75°W
74°W
73°W
39°N
38°N
37°N
36°N
35°N
34°N

Appendix B
Fisheries and Socioeconomic Information for Proposed Central Atlantic Call Areas
(see attached files)

New England Fishery Management Council

MID-ATLANTIC FISHERY MANAGEMENT COUNCIL

December 16, 2022

Bridgette Duplantis
Bureau of Ocean Energy Management (BOEM)
Office of Leasing and Plans
1201 Elmwood Park Boulevard
New Orleans, LA 70123

Re: Central Atlantic Draft Wind Energy Areas

Dear Ms. Duplantis,

On behalf of the Mid-Atlantic and New England Fishery Management Councils, please accept these comments on the draft wind energy areas (WEAs) for the Central Atlantic region. We urge BOEM to consider these comments when developing final WEAs which may be further refined into wind energy lease areas.

The Mid-Atlantic Council manages more than 65 marine species in federal waters and is composed of members from the coastal states of New York to North Carolina (including Pennsylvania). The New England Council has primary management jurisdiction over 28 marine fishery species in federal waters and is composed of members from the coastal states of Maine to Connecticut. In addition to managing these fisheries, both Councils have enacted measures to identify and conserve essential fish habitats, 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 Central Atlantic Call Areas 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.

As described in more detail below, our key recommendations for the draft WEAs include:

- Remove the entirety of all Frank R. Lautenberg Deep Sea Coral Protection Areas, including the discrete zones and the entire broad zone, from further consideration for wind energy development.
- Further clarify the specific data sets for coral presence and coral habitat suitability which were incorporated into the modeling exercise and how those data were weighted against other datasets.
- Consider additional data sources for commercial and recreational fisheries, including vessel trip report data.
- Remove areas identified in the "Prime Fishing Grounds of New Jersey" dataset from further consideration.

Overlap with deep sea coral protection areas

The Draft WEAs in Call Area E are within the Frank R. Lautenberg Deep Sea Coral Protection Area broad zone. As we stated in comment letters in December 2021 and June 2022,[1] as well as through verbal comments provided during the February 2022 Task Force meeting, all Frank R. Lautenberg Deep Sea Coral Protection Areas, including the discrete and broad zones, must be excluded from all stages of offshore wind energy planning and development. These areas include known and likely coral presence (Figure 1). Deep sea corals form important and sensitive habitats. Most deep sea corals are slow-growing and fragile; therefore, damage caused by the installation, maintenance, operations, and decommissioning of offshore wind energy projects must be completely avoided.

The Frank R. Lautenberg Deep Sea Coral Protection Areas and the associated fishing gear prohibitions became effective in January 2017. These areas were defined based on a combination of records of coral presence[2] and habitat suitability modeling.[3] This information is summarized in Figure 1. The Mid-Atlantic Council focused on structure-forming corals when defining these areas; however, the fishing gear prohibitions also benefit other corals and other habitat types within these areas.[4] Use of all types of bottom-tending commercial fishing gears (including, but not limited to bottom-tending otter trawls, bottom-tending beam trawls, hydraulic dredges, non-hydraulic dredges, bottom-tending seines, bottom longlines, pots/traps, and sink or anchored gillnets) are prohibited within these areas, with narrow exemptions for transit, lobster trap gear, and red crab trap gear (81 Federal Register 90246, 12/14/2016; 50 CFR § 648.372). The prohibitions are not fishery-specific and the same restrictions apply to all discrete zones and in the broad zone.[5]

Placing wind energy structures, including foundations and cables, in these areas, would negate protections established by the Mid-Atlantic Council after a multi-year, thorough, transparent, and stakeholder driven process. The New England Council adopted a similar deep sea coral protection area south of Georges Bank, which was implemented in 2021. Combined, these areas

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[1] Both letters are available at https://www.mafmc.org/correspondence.

[2] NOAA National Database for Deep Sea Corals and Sponges (Database version: 20211110-0). https://deepseacoraldata.noaa.gov/. NOAA Deep Sea Coral Research & Technology Program.

[3] Kinlan, B.; Poti, M.; Dorfman, D.; Caldow, C.; Drohan, A.; Packer, D.; Nizinski, M. (2016). Model output for deep-sea coral habitat suitability in the U.S. North and Mid-Atlantic from 2013 (NCEI Accession 0145923). Threshold Logistic Outputs for Alcyonacea. NOAA National Centers for Environmental Information (NCEI). https://www.ncei.noaa.gov/archive/accession/0145923.

A description of how this model was used to define the Frank R. Lautenberg Deep Sea Coral Protection Areas can be found in section 6.3.2.4 of the Environmental Assessment for the Deep Sea Corals Amendment, available at https://www.mafmc.org/actions/msb-am16.

[4] For more information, see https://www.mafmc.org/actions/msb-am16.

[5] Although these restrictions were implemented through Amendment 16 to the Mackerel, Squid, and Butterfish Fishery Management Plan, they apply to all bottom tending gear, not just for the mackerel, squid, and butterfish fisheries (with specific exclusions for American lobster, red crab, and transiting).

clearly indicate the high value the Councils place on conserving deep sea habitats over an extensive geographic area.

In addition, placing wind energy structures in these protected sensitive habitat areas would run counter to the federal administration's goal to conserve 30 percent of America's lands and waters by 2030 through the America the Beautiful initiative.

Coral data

The draft report on development of the draft WEAs[6] does not provide sufficient detail for us to fully understand how data on coral presence and coral habitat suitability were utilized. By request, BOEM staff provided us with additional details and an additional report on coral and hardbottom habitat considerations.[7] However, we have not had time to review this information prior to the deadline for this comment period. We were not previously aware of this additional report and we did not see a reference to it in the draft report on the draft WEAs.

We recommend that BOEM provide more details in future WEA documentation on which data were considered and how they were used, including which data were used as constraints (i.e., resulting in exclusion from consideration for draft WEAs) and how other data not used as constraints were weighted against other data sets in the model. For example, more detail should be provided on which coral taxonomic groups were considered (Alcyonacean, Alcyonacean non-gorgonian, Alcyonacean gorgonian, Pennatulaceans) and which levels of habitat suitability were used (e.g., all levels or only higher suitability levels). For coral data, we recommend that BOEM work with NOAA's Deep-Sea Coral Research and Technology Program to ensure that all available data have been integrated into the analysis. It is important to note that the draft WEAs have not been adequately surveyed for the presence of deep sea corals. Therefore, a lack of coral records and/or poor habitat suitability based on a predictive model should not necessarily be interpreted as a lack of coral presence.

While identified as constraints, it appears that all data points of known coral presence were not excluded from the draft WEAs. This is evident from the WEA option characterization as described in the draft report associated with this comment period (Table 3.20, Figure 3.58), but it is not clear in the methods section. We recommend explaining in the section on the habitat suitability model methods that constraints did not always preclude an area from being included in a draft WEA. For example, based on the information shown in the map attached to this letter, as well as in Figure 3.1 in the draft report on the draft WEAs, locations of known coral presence in

[6] Randall, A. L., J. A Jossart, B. M. Jensen, B. H. Duplantis, J. A. Morris. 2022. Development of the Central Atlantic Wind Energy Areas (Draft). Accessed in December 2022 from https://www.boem.gov/renewable-energy/state-activities/central-atlantic.

[7] Poti, M, H. F. Goyert, E. J. Salgado, R. Bassett, M. Coyne, A. J. Winship, P. J. Etnoyer, T. F. Hourigan, H. M. Coleman, J. Christensen. 2022. Data synthesis and predictive modeling of deep-sea coral and hardbottom habitats offshore of the southeastern US: Guiding efficient discovery and protection of sensitive benthic areas. OCS Study BOEM 2022-038. Available at https://espis.boem.gov/final%20reports/BOEM_2022-038.pdf.

Call Area E were identified as constraints, but three areas with coral records remain within the draft WEAs (e.g., Figure 3.19 compared to Figures 3.20 and 3.58 in the draft report).[8]

Although development of the Frank R. Lautenberg Zones focused on structure-forming corals, we recommend that BOEM also consider data on the presence of and habitat suitability for sponges. Non-encrusting sponges are structure forming epifauna, fragile, and vulnerable to anthropogenic impacts. They are also a good proxy for hard bottom; therefore, protecting areas with known or likely sponge presence can also protect other sensitive habitats. Sponge data are available from the NOAA Deep-Sea Coral Data Portal.[9] We are unclear as to whether these data have already been incorporated into the siting analysis.

It is important to emphasize that concerns regarding coral habitat data would be completely addressed by fully removing the Frank R. Lautenberg Deep Sea Coral Protection Areas, including the discrete and broad zones, from further consideration. In establishing these protected areas, the Mid-Atlantic Council took a precautionary approach to protecting sensitive coral habitats and BOEM must do the same.

Commercial and recreational fisheries information

We appreciate that NMFS fisheries-independent surveys were considered during model development. This supports mitigation of offshore wind energy impacts on fishery surveys, consistent with NOAA Fisheries and BOEM's recently released Federal Survey Mitigation Strategy.[10]

The draft report on development of the draft WEAs notes that only two fisheries data sets were used in the modeling exercise to define the draft WEAs: vessel monitoring system (VMS) data for 2016-2021 and Southeast Region Headboat Survey data for 2014-2020. As noted in the draft report, these data sets do not encompass all commercial and recreational fisheries in the region. VMS is not required in all fisheries. The draft report notes that the fisheries represented in the VMS dataset include commercial fisheries for scallops, highly migratory species (i.e., certain tunas and billfish, including the pelagic longline fishery), monkfish, Atlantic mackerel, *Illex* and longfin squid, butterfish, surfclam, Atlantic herring, and "Declare Out of Fishery" (vessels who hold a permit requiring a VMS). The Southeast Region Headboat Survey collects data from recreational for-hire vessels from North Carolina through Texas.

As such, it appears that the modeling exercise that informed development of the draft WEAs did not include any data on private recreational angling, on for-hire vessels permitted through the NOAA Greater Atlantic Regional Fisheries Office (GARFO) but not through the Southeast Regional Office (SERO), or on any commercial fisheries not requiring VMS. Many important

[8] It appears that Figure 3.56 in the draft report should have included a closer view of these details for draft WEA E-1; however, that figure appears to have been mistakenly replaced with a map for the Gulf of Mexico.

[9] https://deepseacoraldata.noaa.gov/

[10] Hare JA, Blyth BJ, Ford KH, Hooker BR, Jensen BM, Lipsky A, Nachman C, Pfeiffer L, Rasser M, Renshaw K. 2022. NOAA Fisheries and BOEM Federal Survey Mitigation Implementation Strategy - Northeast U.S. Region. NOAA Technical Memorandum 292. Woods Hole, MA. 33 pp.

commercial and recreational fisheries managed by our Councils appear to be missing from the analysis. The analysis is inadequate and should be revised if this is the case.

We urge BOEM to work with partners at NOAA Fisheries to consider how to best incorporate other commercial and recreational fisheries data sets. We understand that given the nature of the modeling framework, it is not straightforward to combine multiple fisheries datasets and doing so can lead to unintended consequences such as double counting certain fisheries. However, we believe further work to consider how to most appropriately combine multiple fisheries datasets would be beneficial. For example, we encourage consideration of vessel trip report (VTR) data as VTRs are required of all commercial and for-hire vessels which are permitted through GARFO. Any analytical approaches developed may be transferable to spatial analysis for other regions, for example on the west coast or in the Gulf of Maine.

We also recommend further consideration of the dataset referred to as the Prime Fishing Grounds of New Jersey, which includes commercial and recreational fishing areas.[11] It is not clear if this dataset was already considered. Three fishing areas from this dataset overlap with the draft WEAs, including the areas referred to as the Doc Lummis Slough and the Parking Lot in the draft WEAs in Call Area A as well as the area referred to as the T Cup in the draft WEAs in Call Area B. These are areas where environmental conditions have created natural sloughs or natural shell hash bottoms, which are important habitats for many species. As such, they should be removed from further consideration for wind energy development due to both fisheries and habitat importance.

Spatial buffers between wind energy structures and sensitive ecological features and important habitats are an appropriate way to reduce the impacts of wind energy projects. The draft report on the WEAs indicates that a 1,000-meter buffer was used for areas of known coral presence and a 500-foot setback for areas identified as fish havens. The report does not indicate what, if any, buffer distance was used for other hard bottom areas or artificial reefs (e.g., shipwrecks that are important fishing sites). The Councils do not have a recommendation for a specific buffer distance that would be appropriate in all circumstances. We recommend that BOEM provide details on the rationale for all buffers.

It will be important to coordinate with multiple offices within NOAA to ensure that all relevant fisheries data are considered, including GARFO for data on species managed by the Mid-Atlantic and New England Councils, SERO for data on species managed by the South Atlantic Council, and the Sustainable Fisheries Headquarters Office for data on highly migratory species fisheries.

After updating the model to consider a more complete representation of commercial and recreational fisheries in this region, BOEM should provide a detailed report on exactly which data were used and why, as well as how those data were weighted in the model.

[11] Available at https://gisdata-njdep.opendata.arcgis.com/datasets/njdep::prime-fishing-grounds-of-new-jersey/about.

Approach to lease area development

We appreciate that BOEM made these draft WEAs available for public comment. We understand this step has not been taken for previous WEAs. This increases transparency in the process and provides an additional opportunity for public input. We also support the use of a spatial analysis tool, coupled with input from subject matter experts and public comments, to consider how to best balance multiple factors when determining the most suitable areas for wind energy development.

We urge BOEM to take the time to thoroughly consider public input and improve the modeling analysis before finalizing the WEAs. As we have previously commented to BOEM, we see no need to rush into leasing additional areas. From Maine through North Carolina, there are already 13 projects in the planning stages, two projects currently under construction, and two small projects in operation. In addition, technological and offtake capacity limitations preclude near-term development of many of these areas.

We look forward to further engaging with you on this issue. 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, M. Bachman

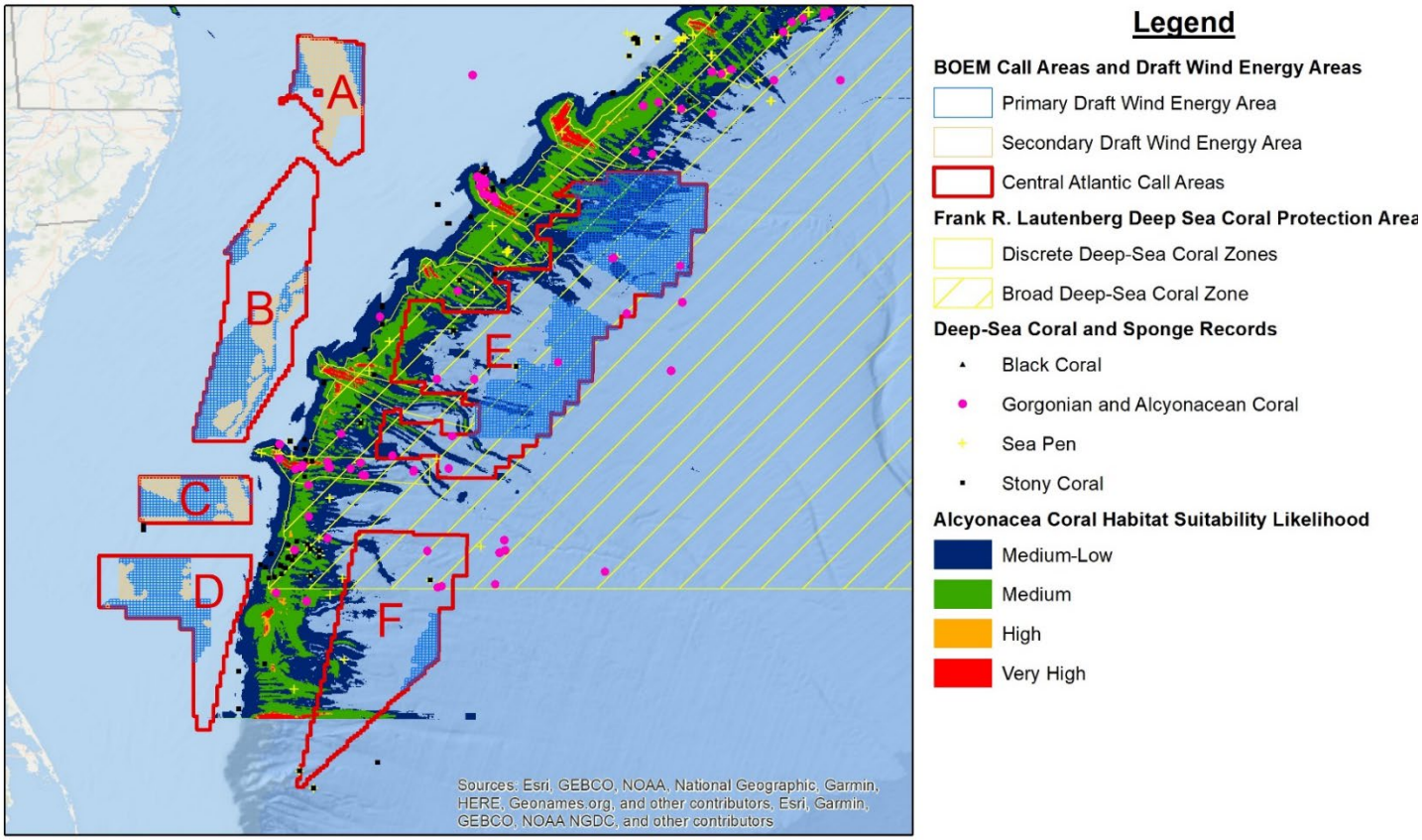

Figure 1: BOEM Central Atlantic Call Areas, Draft Wind Energy Areas, Frank R. Lautenberg Deep Sea Coral Protection Areas, modeled coral habitat suitability for Alcyonacean corals (gorgonian and non-gorgonian outputs combined; expected to be the best predictor of habitat suitability for structure-forming corals),[12] and historical records of known coral presence with structure forming corals highlighted.[13] "Gorgonian and Alcyonacean Coral" includes soft coral, gorgonian coral, and stoloniferan coral.

[12] Kinlan, B.; Poti, M.; Dorfman, D.; Caldow, C.; Drohan, A.; Packer, D.; Nizinski, M. (2016). Model output for deep-sea coral habitat suitability in the U.S. North and Mid-Atlantic from 2013 (NCEI Accession 0145923). Threshold Logistic Outputs for Alcyonacea. NOAA National Centers for Environmental Information (NCEI). https://www.ncei.noaa.gov/archive/accession/0145923.

[13] NOAA National Database for Deep Sea Corals and Sponges (Database version: 20211110-0). https://deepseacoraldata.noaa.gov/. NOAA Deep Sea Coral Research & Technology Program.

New England Fishery Management Council
50 WATER STREET | NEWBURYPORT, MASSACHUSETTS 01950 | PHONE 978 465 0492 | FAX 978 465 3116
Eric Reid, *Chair* | Thomas A. Nies, *Executive Director*

December 14, 2022

Mr. Michael Pentony
Regional Administrator
National Marine Fisheries Service
Greater Atlantic Regional Fisheries Office
55 Great Republic Drive
Gloucester, MA 01930

Dear Mike:

During the September and December meetings the Council discussed the Stellwagen and Georges Bank Dedicated Habitat Research Areas (DHRAs) implemented in April 2018 via Omnibus Habitat Amendment 2. The Council reviewed a report compiled by your staff, which reflected public comments received in response to a July 20 Federal Register notice. Thank you for conducting the review and preparing the report.

As noted in the report, there is ongoing research in the Stellwagen DHRA that directly addresses the Council's objectives. In September, the Council recommended retaining the Stellwagen DHRA for an additional three years. In December, the Council agreed with the recommendation of its Habitat Committee that the Georges Bank DHRA should be retained for three years with the current restrictions on bottom trawls and dredges.

Please consider the Council's recommendations as you make decisions about these DHRAs, using the discretionary authority granted by the Council in Omnibus Habitat Amendment 2. Our understanding is that after three years, your office, working with the Council, will complete another review of both DHRAs, according to the flowchart in Amendment 2 and considering the Council's research objectives.

Feel free to contact me if you have any questions.

Sincerely,

Thomas A. Nies

Thomas A. Nies
Executive Director

Estimated Total Annual Cost to Public: 0.

Respondent's Obligation: Voluntary.

Legal Authority: Sections 744.15, and 744.16 of the EAR.

IV. Request for Comments

We are soliciting public comments to permit the Department/Bureau to: (a) Evaluate whether the proposed information collection is necessary for the proper functions of the Department, including whether the information will have practical utility; (b) Evaluate the accuracy of our estimate of the time and cost burden for this proposed collection, including the validity of the methodology and assumptions used; (c) Evaluate ways to enhance the quality, utility, and clarity of the information to be collected; and (d) Minimize the reporting burden on those who are to respond, including the use of automated collection techniques or other forms of information technology.

Comments that you submit in response to this notice are a matter of public record. We will include or summarize each comment in our request to OMB to approve this ICR. Before including your address, phone number, email address, or other personal identifying information in your comment, you should be aware that your entire comment—including your personal identifying information—may be made publicly available at any time. While you may ask us in your comment to withhold your personal identifying information from public review, we cannot guarantee that we will be able to do so.

Sheleen Dumas,

Department PRA Clearance Officer, Office of the Chief Information Officer, Commerce Department.

[FR Doc. 2022–25700 Filed 11–23–22; 8:45 am]

BILLING CODE 3510–33–P

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

[Docket No. 221020–0223]

RIN 0648–BL36

Taking and Importing Marine Mammals; Taking Marine Mammals Incidental to the Ocean Wind 1 Offshore Wind Energy Project Offshore of New Jersey; Extension of Public Comment Period

AGENCY: National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

ACTION: Notice; extension of public comment period.

SUMMARY: On October 26, 2022, NMFS published a proposed rule, with a 30-day public comment period ending November 25, 2022, in response to a request by Ocean Wind, LLC (Ocean Wind) for regulations and associated Letter of Authorization (LOA), pursuant to the Marine Mammal Protection Act (MMPA), that would authorize the take of marine mammals, by Level A harassment and Level B harassment, incidental to the Ocean Wind Offshore Wind Energy Project (Ocean Wind 1), offshore of New Jersey. In response to a request, NMFS is announcing an extension of the public comment period by an additional 15 days ending on December 10, 2022.

DATES: The deadline for receipt of comments on the proposed rule published on October 26, 2022 (87 FR 64868), is extended from November 25, 2022, to December 10, 2022.

ADDRESSES: Submit all electronic public comments via the Federal e-Rulemaking Portal. Go to *www.regulations.gov* and enter NOAA–NMFS–2022–0109 in the Search box. Click on the ''Comment'' icon, complete the required fields, and enter or attach your comments.

Instructions: Comments sent by any other method, to any other address or individual, or received after the end of the comment period, may not be considered by NMFS. All comments received are a part of the public record and will generally be posted for public viewing on *www.regulations.gov* without change. All personal identifying information (*e.g.,* name, address), confidential business information, or otherwise sensitive information submitted voluntarily by the sender will be publicly accessible. NMFS will accept anonymous comments (enter ''N/A'' in the required fields if you wish to remain anonymous). Attachments to electronic comments will be accepted in Microsoft Word, Excel, or Adobe PDF file formats only.

FOR FURTHER INFORMATION CONTACT: Kelsey Potlock, Office of Protected Resources, NMFS, (301) 427–8401.

SUPPLEMENTARY INFORMATION:

Background

On October 26, 2022, NMFS published a proposed rulemaking in response to a request from Ocean Wind that NMFS authorize the taking, by Level A harassment and Level B harassment, of marine mammals incidental to the construction of Ocean Wind 1, located off of New Jersey in and around lease area OCS–A–0498. When published, the proposed rule (87 FR 64868; October 26, 2022) allowed for a 30-day public comment period, ending on November 25, 2022. On November 10, 2022, we received a request from the Natural Resource Defense Council (NRDC) for a 15-day extension of the public comment period. NMFS considered the request and the targeted timelines for this project and, in this case, is extending the comment period on the proposed rule for an additional 15 days to provide further opportunity for public comment. This extension provides a total of 45 days for public input on the proposed rule.

All comments and information submitted previously regarding the proposed rule for Ocean Wind 1 will be fully considered during the development of the final rule and LOA, if determined to be promulgated and issued, and do not need to be resubmitted.

Information Solicited

Interested persons may submit information, suggestions, and comments concerning the proposed rulemaking for the Ocean Wind 1 project (see **ADDRESSES**). NMFS will consider all information, suggestions, and comments from both the initial and extended public comment periods related to the request during the development of final regulations governing the incidental taking of marine mammals by Ocean Wind, if appropriate.

Dated: November 18, 2022.

Kimberly Damon-Randall,

Director, Office of Protected Resources, National Marine Fisheries Service.

[FR Doc. 2022–25771 Filed 11–23–22; 8:45 am]

BILLING CODE 3510–22–P

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

Notice of Availability of a Final Programmatic Environmental Impact Statement for Surveying and Mapping Projects in U.S. Waters for Coastal and Marine Data Acquisition

AGENCY: National Ocean Service (NOS), National Oceanic and Atmospheric Administration (NOAA), Department of Commerce.

ACTION: Notice of availability of a final programmatic environmental impact statement.

SUMMARY: The National Oceanic and Atmospheric Administration, National Ocean Service has prepared a final programmatic environmental impact

statement (PEIS) in accordance with the National Environmental Policy Act of 1969, as amended (NEPA), to analyze the potential environmental impacts associated with NOS' recurring data collection projects to characterize submerged features (*e.g.,* habitat, bathymetry, marine debris). The ''action area'' for these projects encompasses the United States (U.S.) territorial sea, the contiguous zone, the U.S. Exclusive Economic Zone (U.S. EEZ), U.S. rivers, States' offshore waters, and coastal and riparian lands. As part of the Proposed Action, NOS may use active acoustic equipment such as sub-bottom profilers, single beam and multibeam echo sounders, side-scan sonars, and Acoustic Doppler Current Profilers. The Final PEIS analyzes NOS data collection projects for a time period of five years. In preparing the Final PEIS, NOS has considered public comments received on the Draft PEIS, which was published in June 2021.

DATES: NOS will publish a Record of Decision no sooner than 30 days after publication of the U.S. Environmental Protection Agency's Notice of Availability for this Final PEIS in the **Federal Register**.

ADDRESSES: The Final PEIS can be viewed or downloaded from the NOS website at *https://oceanservice.noaa.gov/about/environmental-compliance/surveying-mapping.html.*

FOR FURTHER INFORMATION CONTACT: Jay Nunenkamp, Environmental Compliance Coordinator, National Ocean Service, SSMC4, 1305 East West Highway, Silver Spring, MD 20910, *nosaa.ec@noaa.gov,* (302) 715–2405.

SUPPLEMENTARY INFORMATION: The Proposed Action analyzed in the Final PEIS is to continue NOS' surveying and mapping projects throughout the action area. The Final PEIS assesses the direct, indirect, and cumulative environmental impacts of a suite of surveying and mapping data collection activities.

The Final PEIS responds to, and incorporates where appropriate, agency and public comments received on the Draft PEIS, which was available for public review from June 25, 2021 to November 22, 2021. During the public comment period for the Draft PEIS, NOS received 31 comment submissions from 30 commenters via *Regulations.gov* and email. NOS responses to agency and public comments are provided in Appendix C of the Final PEIS.

NOS updated the Draft PEIS to include additional mitigation measures designed to minimize the impacts of surveying and mapping activities on the human environment. Additional mitigation measures incorporated into the Final PEIS are expected to result in a reduction of adverse environmental impacts analyzed in the Draft PEIS.

Due to the timing of the consultations and publication of the Final PEIS, the temporal scope of the Proposed Action has been reduced from six years (2022–2027) to five years (2023–2027). The annual numbers for project activities and project miles are expected to remain consistent with those estimated in the Draft PEIS; however, since the Final PEIS covers one less year than the Draft PEIS, the total estimated survey effort has decreased.

NOS has incorporated additional data sources into the calculations of marine mammal density, and made technical corrections to the acoustic exposure estimates. These data have been updated for the Final PEIS.

The Final PEIS evaluates three alternatives:

- *Alternative A—No Action:* Under Alternative A, NOS would continue to operate a variety of equipment and technologies to gather accurate and timely data on the nature and condition of the marine and coastal environment. This alternative reflects the technology, equipment, scope, and methods currently in use by NOS, at the level of effort reflecting NOS fiscal year 2019 funding levels. (NOS is using 2019 as the baseline year for funding, as that was the last year of normal NOS operations prior to COVID–19 disruptions.)
- *Alternative B:* This alternative consists of Alternative A plus the more widespread adoption of new techniques and technologies (such as remotely operated vehicles (ROVs), microwave water level (MWWL) sensors, etc.) to more efficiently perform surveying, mapping, charting and related data gathering. Specific examples of adaptive methods and equipment that NOS programs are likely to adopt under Alternative B in the next five years include:
  - Greater use of ROVs with echo sounder technologies;
  - Greater use of autonomous underwater vehicles (AUVs) and uncrewed surface vehicles (USVs) with echo sounder technologies;
  - Conversion of one or more existing 10-m (33 feet) crewed survey boats into USVs;
  - Greater use of more efficient, wide-beam sonar systems (phase-differencing bathymetric systems) for nearshore hydrographic surveys;
  - Increased field operations in the National Marine Sanctuary system with associated requirements for hydroacoustic charting, surveying, mapping and associated activities; and
  - Installation, operation, and maintenance of additional water level stations including transitioning to mostly MWWL sensors and upgraded storm strengthening to make stations more climate resilient.

Under Alternative B, all of the activities and equipment operation described in Alternative A would continue, many at a higher level of effort. The nature of these actions would not change, but the overall level of activity would be increased.

- *Alternative C:* Like Alternative B, Alternative C adopts new techniques and technologies to encourage greater program efficiencies regarding surveying, mapping, charting, and related data gathering activities. In addition, Alternative C would consist of NOS program implementation with an overall funding increase of 20 percent relative to Alternative B. Under Alternative C, all of the activities and equipment operation described in Alternative B would continue, many at a higher level of effort. The nature of these actions would not change, but the overall level of activity would be augmented.

NOS has identified Alternative B as the preferred alternative, which fully addresses the purpose and need of the Proposed Action.

NOS initiated consultations under the Magnuson-Stevens Fishery Conservation and Management Act for Essential Fish Habitat, Endangered Species Act, and National Marine Sanctuaries Act following publication of the Draft PEIS. NOS has also completed Federal consistency determinations to comply with Section 307 of the Coastal Zone Management Act (CZMA) and has received concurrence responses from several States. Under the Marine Mammal Protection Act, NOS has submitted an application for a Letter of Authorization to the National Marine Fisheries Service, and an Incidental Take Regulation request to the U.S. Fish and Wildlife Service. NOS will initiate consultation under the National Historic Preservation Act prior to conducting individual projects that may affect cultural and historic properties.

Public Review

We are not requesting public comments on the FEIS, but any written comments we receive will become part of the public record associated with this action. The entirety of the comment, including the name of the commenter, email address, attachments, and other supporting materials, will be publicly accessible. Sensitive personal information, such as account numbers or Social Security numbers, should not

be included with the comment. Comments that are not responsive or that contain profanity, vulgarity, threats, or other inappropriate language will not be considered.

Authority: The preparation of the Final PEIS was conducted in accordance with the requirements of NEPA, the Council on Environmental Quality's Regulations (40 CFR 1500 *et seq.* (1978)), other applicable regulations, and NOAA's policies and procedures for compliance with those regulations. While the CEQ regulations implementing NEPA were revised as of September 14, 2020 (85 FR 43304, July 16, 2020), and further revised as of May 20, 2022 (87 FR 23453, April 20, 2022), NOS prepared this Final PEIS using the 1978 CEQ regulations because this environmental review began on December 19, 2016, when NOS published a Notice of Intent to prepare a NEPA document for its mapping program.

Nicole R. LeBoeuf,

Assistant Administrator for Ocean Services and Coastal Zone Management, National Ocean Service, National Oceanic and Atmospheric Administration.

[FR Doc. 2022–25309 Filed 11–23–22; 8:45 am]

BILLING CODE 3510–JE–P

BUREAU OF CONSUMER FINANCIAL PROTECTION

Supervisory Highlights, Issue 28, Fall 2022

AGENCY: Bureau of Consumer Financial Protection.

ACTION: Supervisory Highlights.

SUMMARY: The Consumer Financial Protection Bureau (CFPB or Bureau) is issuing its twenty-eighth edition of Supervisory Highlights.

DATES: The Bureau released this edition of the Supervisory Highlights on its website on November 16, 2022. The findings in this report cover examinations in the areas of auto servicing, consumer reporting, credit card account management, debt collection, deposits, mortgage origination, mortgage servicing and payday lending completed between January 1, 2022, and June 31, 2022.

FOR FURTHER INFORMATION CONTACT: Jaclyn Sellers, Senior Counsel, at (202) 435–7449. If you require this document in an alternative electronic format, please contact *CFPB_Accessibility@cfpb.gov.*

SUPPLEMENTARY INFORMATION:

1. Introduction

The CFPB's supervision program is focused on ensuring that financial institutions subject to its authority comply with Federal consumer financial laws. Where violations of law or compliance weaknesses are found, CFPB encourages compliance and deters misconduct and recidivism.[1] *Supervisory Highlights* promotes transparency of the Bureau's supervisory work and provides the public with insight into supervisory findings.

In this issue of *Supervisory Highlights* several trends are evident. The first is that examiners continue to identify the same violations of law across multiple institutions of a certain type, even though past editions of *Supervisory Highlights* have publicized such violations at other institutions of that type. Another is findings related to entities that engaged in unfair, deceptive or abusive acts or practices (UDAAP) in violation of the Consumer Financial Protection Act (CFPA).[2] In addition, there are findings on CARES Act-related or COVID–19-related issues. Finally, this issue contains certain types of novel supervisory findings that have not previously been reported in *Supervisory Highlights* involving unique factual or legal analysis.

The findings in this report cover examinations in the areas of auto servicing, consumer reporting, credit card account management, debt collection, deposits, mortgage origination, mortgage servicing and payday lending completed between January 1, 2022, and June 31, 2022. To maintain the anonymity of the supervised institutions discussed in *Supervisory Highlights,* references to institutions generally are in the plural and the related findings may pertain to one or more institutions.

Supervision is increasing its focus on repeat offenders, particularly those who violate agency or court orders. As part of that focus, Supervision has created a Repeat Offender Unit.

The Repeat Offender Unit is focused on:

- Reviewing and monitoring the activities of repeat offenders;
- Identifying the root cause of recurring violations;
- Pursuing and recommending solutions and remedies that hold entities accountable for failing to consistently comply with Federal consumer financial law; and,
- Designing a model for order review and monitoring that reduces the occurrences of repeat offenders.

The Repeat Offender Unit will focus on ways to enhance the detection of repeat offenses, develop a process for rapid review and response designed to address the root cause of violations, and recommend corrective actions designed to stop recidivist behavior. This will include closer scrutiny of corporate compliance with orders to ensure that requirements are being met and any issues are addressed in a timely manner.

We invite readers with questions or comments about *Supervisory Highlights* to contact us at *CFPB_Supervision@cfpb.gov.*

2. Supervisory Observations

2.1 Auto Servicing

The Bureau continues to evaluate auto loan servicing activities, primarily to assess whether entities have engaged in any UDAAPs prohibited by the CFPA.[3] Examiners identified unfair and deceptive acts or practices across many aspects of auto servicing, including violations related to add-on product charges, loan modifications, double billing, use of devices that interfered with driving, collection tactics, and payment allocation.

2.1.1 Overcharging for Add-On Products at Early Payoff

When consumers purchase an automobile, auto dealers and finance companies offer optional, add-on products that consumers can purchase. Some of the add-on products provide specific types of potential benefits, such as guaranteed asset protection (GAP) products that offer to help pay off an auto loan if the car is totaled or stolen and the consumer owes more than the car's depreciated value, accident and health protection, or credit life protection. The add-on products' potential benefits apply only for specific time periods, such as four years after purchase or for the term of the loan, and only under certain circumstances.

Auto dealers and finance companies often charge consumers all payments for any add-on products as a lump sum at origination of the auto loan or purchase of the vehicle. Dealers and finance companies generally include the lump sum cost of the add-on product as part of the total vehicle financing agreement, and consumers typically make payments on these products throughout the loan term, even if the product expires years earlier.

[1] If a supervisory matter is referred to the Office of Enforcement, Enforcement may cite additional violations based on these facts or uncover additional information that could impact the conclusion as to what violations may exist.

[2] 12 U.S.C. 5531, 5536.

[3] 12 U.S.C. 5531, 5536.

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

November 21, 2022

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

RE: Public Notice Number: NAE-2020-00707, Orsted/Revolution Wind, LLC.

Dear Mr. Maniccia:

Reference is made to Public Notice NAE-2020-00707 published on September 2, 2022, which describes an application by Orsted/Revolution Wind, LLC, to construct, operate, maintain, and eventually decommission an offshore wind farm in the Atlantic Ocean on the Outer Continental Shelf (OCS) within BOEM Renewable Energy Lease Area OCS-A 00486, located offshore of the coastlines of Rhode Island and Massachusetts. According to the public notice, the wind farm is proposed to include up to 100 wind turbine generators (WTGs), inter-array cables, up to two offshore substations connected by one offshore substation link cable, and one onshore logistics or O&M facility. Additionally, an export cable corridor is proposed that includes the installation of up to two alternating current electric cables, one onshore substation, and one interconnection facility. The nearshore export cable corridor component would occur offshore and within the nearshore waters of Narragansett Bay- West Passage, terminating near Quonset Point in North Kingstown, RI.

The Bureau of Ocean Energy Management (BOEM) is the lead federal agency for offshore wind development activities and, as such, is responsible for consulting with us under the Magnuson Stevens Fishery Conservation and Management Act (MSA), the Fish and Wildlife Coordination Act (FWCA), and the Endangered Species Act (ESA). The consultation with us under section 7 of the ESA and the essential fish habitat (EFH) consultation under the MSA have not yet been initiated, and therefore, it is premature for us to offer comments specific to the consultations or any project specific EFH conservation recommendations at this time. However, we recognize that both NOAA Fisheries (NMFS)and the US Army Corps of Engineers (USACE) are cooperating agencies with BOEM on the development of the National Environmental Policy Act (NEPA) documents in accordance with the Title 41 of the Fixing America's Surface Transportation (FAST) Act, known as FAST-41, and that a number of activities including your public interest evaluation, the development of the NEPA documents, and the MSA, FWCA, and ESA consultations must all occur concurrently.

We have been working directly with BOEM, the lead federal agency, related to information needs for our EFH consultation. On June 24, 2022, we provided BOEM with an additional information request in response to a draft EFH Assessment received on April 25, 2022. Currently, we are working with BOEM to help ensure that the EFH assessment reflects the complexity of habitats that occur within the lease area and that effects of the project are appropriately evaluated and analyzed, including impacts and effects to cod spawning activity. Provided we receive the information requested in time, we expect our consultation with BOEM to be initiated on December 1, 2022, with the submission of a complete EFH assessment and will provide our recommendations to BOEM by March 1, 2023. We understand USACE plans to use the EFH consultation to satisfy your responsibilities under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act. We recommend that any appropriate EFH and FWCA recommendations we make to BOEM as part of the MSA and FWCA consultations be incorporated as special conditions to any Department of the Army permit issued for the proposed activity. As a partner cooperating agency, and in response to your Public Notice, we offer the following technical assistance related to our mandates under MSA and FWCA as you undertake your evaluation and public interest review of the activities proposed within your regulatory authority.

General Comments

The public notice states that up to 100 WTGs are proposed to be installed within the lease area. However, Orsted has communicated to us and to BOEM that the results of surveys carried out in summer 2022 confirm that 21 of the 100 identified positions for installing WTG foundations are not feasible for development. It is our understanding that installation of foundations at those 21 infeasible locations would require either foundation types or clearance/installation methods that are outside the scope of their current Construction and Operations Plan and their Project Design Envelope. As a result, it appears that the maximum number of WTGs that would be constructed include 79 foundations. We recommend that you confirm with BOEM the number of reasonably foreseeable foundations to be installed within the lease area to ensure that the information used in your evaluation and public interest review is accurate. It would also be helpful to us to understand how you will consider this new information regarding feasibility of installing WTG foundations, whether you intend to modify your proposed action, or if you will be requesting additional information from the applicant to support moving forward with a permit for up to 100 foundations.

Given the size of the proposed project, substantial impacts to NOAA trust resources may occur as a result of project construction, operation, and decommissioning. Of particular concern are potential impacts to spawning and early life stage habitats of managed species and to sensitive habitats such as complex natural rocky habitats, as well as submerged aquatic vegetation (SAV) that may be found in the nearshore project areas. To avoid and minimize adverse impacts to these habitats we typically recommend: 1) the project be sited outside of areas of sensitive and complex habitats: and 2) in-water work time of year restrictions during spawning and early life history development periods. For this project, there is the potential for impacts to spawning and early life stage habitats of multiple managed species and NOAA trust resources including, Atlantic cod (*Gadus morhua*), winter flounder (*Pseudopleuronectes americanus*), summer flounder (*Paralichthys dentatu*s), anadromous fish, shellfish, and horseshoe crab (*Limulus*

polyphemus). We also have concerns about the potential effects of the project on commercial and recreational fishing activities within the project area. This is especially concerning along the alignment of the export cable where boulder removal and relocation has the potential to significantly impact fishing activities particularly those associated with the groundfish and herring/mackerel/squid fishing sectors. Given the complexity of this area, we anticipate substantial boulder relocation and modification of hard bottom habitats due to pre-lay grapnel run for cable installation.

As discussed below, alternatives that avoid and minimize impacts to aquatic habitats, fisheries, and fishing activities should be identified, evaluated fully, and implemented unless it can be demonstrated that they are not practicable. This includes cable alignments and installation methods. As is standard practice with many coastal development activities that you authorize under your authorities, compensatory mitigation should be required to offset unavoidable losses of aquatic habitats and ecological functions. We have recently released a comprehensive mitigation policy for NOAA trust resources that complements the existing 2008 USACE and EPA Compensatory Mitigation Rule (33 CFR Parts 325 and 332 & 40 CFR Part 230). Both of these documents should be used to inform the development of a compensatory mitigation plan for unavoidable aquatic resource impacts.

Alternatives

The Clean Water Act Section 404(b)(1) Guidelines indicate that a Department of the Army permit should reflect the least environmentally damaging practicable alternative (LEDPA) (40 CFR 23.10(a)). To identify the LEDPA, a full range of practicable alternatives, defined by the purpose and need for the project should be evaluated and the range of alternatives should include adjustments to the project location/alignment in addition to design modifications that avoid or further minimize impacts. Based on the information available for review and other information provided in the Construction and Operations Plan (COP) and DEIS, it does not appear that the proposed project represents the LEDPA. In particular, alternate export cable routes and landing locations should be considered that avoid and minimize impacts to aquatic resources.

Further, as described in the NOAA Mitigation Policy for Trust Resources (NAO 216-123, Section 3.06) and consistent with the Section 404(b)(1) Guidelines impact avoidance and minimization must be considered and fully and fairly evaluated through the alternative development process before minimization measures and compensatory mitigation are considered; this is known as the mitigation sequence. This step-wise approach first focuses on the avoidance of adverse impacts, followed by the incorporation of minimization measures, limiting the degree and magnitude of adverse impacts. This approach is especially important where a number of ecologically valuable habitats including sensitive spawning locations, rocky habitats, and HAPCs are currently within the proposed wind farm area and export cable corridor.

During the scoping process for this project, we recommended to BOEM that an alternative to minimize impacts to EFH be considered as an alternative carried forward for evaluation in the NEPA process. While BOEM is considering a Habitat Impact Minimization Alternative for the lease area, they did not also include this alternative for the export cable, despite our recommendation. We continue to recommend that export cables avoid estuaries and embayments

and sensitive habitats, including rocky habitats and HAPCs. Avoidance and minimization measures that should be considered include an evaluation of an upland cable corridor to fully avoid traversing the West Branch of the Narragansett Bay estuary, as well as a modified or expanded cable corridor. A modified or expanded cable corridor would provide additional micrositing opportunities to avoid and minimize impacts to sensitive habitats and resources. Further, alternate methods of construction, including methods and routing that would allow full cable burial to minimize permanent habitat impacts and avoid potential interactions with fishing gear should be considered.

Aquatic Resources

As mentioned above, the project area provides habitat for a wide variety of commercially and recreationally important fish species and ecologically important habitats. The ones listed below are just a small sample we are highlighting for your awareness during your review of the application for this project. Because the project plans contained in the public notice do not include the delineation of aquatic resources in the area such as SAV, rocky habitats, and shellfish beds, we are providing our comments related to aquatic resources based upon information provided to us by the developer and BOEM. Of particular concern for this project are impacts to Atlantic cod and rocky habitats. As currently proposed, the project may result in population level impacts to Atlantic cod and permanent impacts to the highly complex rocky habitats of Cox Ledge.

The complex and unique features of Cox Ledge, and the importance of this area for marine resources and fisheries, is well documented. To protect areas of documented complex habitats from benthic disturbance (i.e. fishing gear) the New England Fishery Management Council recently proposed and approved a Habitat Area of Particular Concern (HAPC) that overlaps with a portion of the proposed project area. Cox Ledge is also a known, documented spawning ground for Atlantic cod and serves as the center of a distinct spawning stock for this species. This stock has cultural, ecological and economic significance to this region and the importance of this stock to the area's commercial and recreational fisheries cannot be understated. This stock is heavily regulated due to the declining abundance and vulnerability resulting from reduced recruitment in recent years.

<u>Atlantic cod</u>
Atlantic cod form discrete aggregations during their spawning season, which varies based on location. BOEM is currently funding a study examining the distribution and habitat use of soniferous fish, focusing on cod spawning aggregations on Cox Ledge that includes the project area. The current results of this study, as well as historical data and developer funded surveys, indicate that spawning activities of Atlantic cod occur within and adjacent to the lease area on Cox Ledge between November and April. Atlantic cod exhibit high site-fidelity to spawning areas and complex behavior during spawning; forming leks and haystacks during active spawning that can extend for weeks to months. Post-spawn, studies conducted on Georges Bank found cod settlement begins approximately 3-4 months. Early life stages of Atlantic cod require complex habitats, particularly pebble, cobble and boulder habitats. Minimizing seafloor disturbances (e.g. seafloor preparation) within areas known to support cod spawning aggregations and limiting construction related noise, particularly pile driving activities, between November and April would minimize

potential impacts to cod spawning. Further, due to uncertainties regarding the impact of altering the characteristics of current spawning locations through construction, and concerns over operational noise (both turbine generated noise and vessel/maintenance) the location of turbines within identified spawning areas should be avoided. Additionally, avoiding and minimizing impacts to the highly complex habitats on Cox Ledge would minimize adverse impacts to sensitive early life history stages of Atlantic cod on Cox Ledge that depend on such habitats.

Rocky Habitats

Intertidal and subtidal gravel (i.e. mixed sand, pebble, cobble, and/or boulder) habitats with added habitat complexity from invertebrate communities and macroalgal cover serve as important shelter and forage habitat for a variety of species including Atlantic cod, black sea bass (*Centropristis striata*), red hake (*Urophycis chuss*), striped bass (*Morone saxatilis*), cunner (*Tautogolabrus adspersus*), tautog (*Tautoga onitis*), and scup (*Stenotomus chrysops*). The structural complexity of rocky habitats is important for fish as they provide shelter and refuge from predators. Rocky habitats provide a substrate for macroalgal and epibenthic growth that serves as additional refuge for juvenile fish. The complexity of rocky habitats with, and without, macroalgal and epifaunal cover have been well demonstrated as important habitats for juvenile and adult life history stages of Atlantic cod, Atlantic pollock (*Pollachius virens*), red hake, American lobster (*Homarus americanus*), cunner, and tautog.

Due to their important role for multiple marine organisms, impacts to rocky habitats should be avoided wherever feasible. This is particularly true for rocky habitats supporting macroalgae and/or epifauna. To avoid and minimize impacts to complex habitats, we typically recommend measures such as the micrositing of structures (e.g. WTGs, inter-array cables, export cables, etc.), and/or structure relocation or removal when micrositing would not avoid or minimize permanent impacts to complex, rocky habitats. Other measures that may avoid and/or minimize impacts to these habitats include: 1) restricting anchoring in these habitats; and 2) minimizing scour and cable protection and/or choosing materials that match the existing habitat characteristics in areas where full avoidance is not feasible.

Submerged Aquatic Vegetation (SAV)

Submerged aquatic vegetation is designated as a Habitat Area of Particular Concern (HAPC) for Atlantic cod and summer flounder. HAPCs are subsets of EFH that have been designated because of their important ecological function, sensitivity to human induced degradation, development related stressors, and/or the rarity of habitat type. While the Public Notice indicates that the project has avoided all Corps special aquatic sites, site-specific survey results identified an SAV bed adjacent to the project landing location at Quonset. The potential impacts to this ecologically important habitat, as well as alternatives that avoid and minimize these impacts should be included in your evaluation of the proposed project. As you are aware, increases in suspended sediments and the subsequent reductions in water transparency caused by construction activities associated with cable installation limit light attenuation and may result in losses of this important resource. We typically recommend the avoidance of dredging, staging equipment, and mooring within and adjacent to SAV beds. For this region, we also typically recommend a minimum of a 100-foot setback of any sediment disturbing activity.

Anadromous Fish

Nearshore portions of the project area are important habitat for anadromous species such as alewife (*Alosa pseudoharengus*) and blueback herring (*Alosa aestivalis*). These species use estuarine systems, including the West Branch of Narragansett bay, to reach freshwater streams and rivers for migrating, spawning, and nursery functions. Alewife and blueback herring, collectively known as river herring, have complex lifecycles where individuals spend most of their lives at sea then migrate great distances to return to freshwater rivers to spawn during the late winter and spring. Alewife and blueback herring are also believed to be repeat spawners, generally returning to their natal rivers to spawn. Because landing statistics and the number of fish observed on annual spawning runs indicate a drastic decline in alewife and blueback herring populations throughout much of their range since the mid-1960s, river herring have been designated as Species of Concern by NOAA.

Increases in turbidity due to the resuspension of sediments into the water column during construction activities can degrade water quality, lower dissolved oxygen levels, and potentially release chemical contaminants bound to the fine-grained estuarine/marine sediments. Suspended sediment can also mask pheromones used by migratory fishes such as these to reach their spawning grounds and impede their migration. Noise from the construction activities may also result in adverse effects including non-life threatening damage to body tissues, physiological effects including changes in stress hormones or hearing capabilities, or changes in behavior. In order to minimize the adverse effects of suspended sediment and noise on migrating anadromous fish. Depending on the extent of construction activities within anadromous migratory corridors a time of year restriction may be appropriate. We typically recommend a time-of-year restriction on in-water work from March 15 to June 30 any year during the upstream migration of these species to their spawning grounds. The implementation of this time-of-year restriction should be closely coordinated with us based on location and proposed activity, as it may only be necessary in limited circumstances.

Winter Flounder

Winter flounder is one of the federally managed species we often comment on in our coordination with you on coastal development projects within Rhode Island waters. Our concern for this species is based upon a number of factors, but their somewhat unique life history is the main concern, particularly that of the eggs and larvae in the estuaries. 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. Young-of-the-year flounder tend to burrow in the sand rather than swim away from threats, so they can be entrained in dredge plants. Increased turbidity and the subsequent deposition of the suspended sediments can also smother the winter flounder eggs and can adversely affect their EFH. Avoiding in-water construction activities such as seafloor disturbances and silt-producing activities when early life stages are present, generally from February 1 to June 30 is often the preferred method of avoiding and minimizing adverse effects to EFH for these life stages.

Horseshoe Crabs and Shellfish

Seafloor disturbances, including trenching, dredging, and sediment placement may result in the loss of horseshoe crabs, their eggs and larvae, and their habitat, resulting in a reduction in prey species for several federally managed species and adverse effect to their EFH. Horseshoe crabs

play a valuable ecological role in the food web and their eggs are avital food source for the red knot (*Calidris canutus*), a federally threatened species under the Endangered Species Act. Horseshoe crab eggs and larvae are a food source for a number of other species including striped bass, white perch (*Morone americana*), weakfish (*Cynoscion regalis*), American eel (*Anguilla rostrata*), silver perch (*Bairdiella chrysoura*), summer flounder and winter flounder. Horseshoe crabs are also an important resource for commercial fishermen and the biomedical industry. Therefore, it will be important to determine if the site of the specific project is regionally/locally important to horseshoe crabs, as either staging, nursery, resting, foraging or other aggregating-type habitat

Shellfish such as blue mussel (*Mytilus edulis*), northern quahog (*Mercenaria mercenaria*), soft-shelled clam (*Mya arenaria*), bay scallop (*Argopecten irradians*), and Eastern oyster (*Crassostrea virginica*) provide an important ecological role through water column filtration, sediment stabilization as well as supplying habitat for multiple fish species. Shellfish are also an important food source for federally managed species such as skates, bluefish (*Pomatomus saltatrix*), summer flounder, and windowpane flounder, winter flounder, and scup. Infaunal species such as shellfish filter significant volumes of water, effectively retaining organic nutrients from the water column. Similar to horseshoe crabs, shellfish are vulnerable to seafloor disturbances, particularly those that result in elevated levels of suspended sediments, which can interfere with spawning success, feeding, and growth for shellfish. Further, sessile species and life history stages are highly vulnerable to smothering and activities that may result in dislodgement of recently settled individuals. Avoiding seafloor disturbances in Narragansett Bay between April 1 and October 14 minimizes potential impacts to horseshoe crab spawning (April to June) and shellfish resources (May through October 14).

Habitat Areas of Particular Concern

The project area overlaps with two designated and one proposed HAPC. As discussed above, HAPCs are a subset of EFH that are especially important ecologically, particularly susceptible to human-induced degradation, vulnerable to developmental stressors, and/or rare. Currently, both summer flounder and juvenile Atlantic cod HAPCs have been designated in the project area. The juvenile Atlantic cod HAPC includes rocky habitats, SAV, and adjacent sand habitats from mean high water to 20 meters in depth. The summer flounder HAPC includes all native species of macroalgae, SAV, and freshwater and tidal macrophytes in any size bed, as well as loose aggregations, within adult and juvenile summer flounder EFH. If native species of SAV are eliminated then exotic species should be protected because of functional value. Both of these HAPCs occur within the project area within Narragansett Bay. Shellfish beds and SAV are also considered special aquatic sites under the Clean Water Act. Alternatives that include an overland route to avoid impacts to these habitats should be considered and evaluated. The full description of these HAPCs can be linked to from our EFH Mapper.

On June 30, 2022, the New England Fishery Management Council also recently approved a new HAPC for cod spawning and complex habitats that includes the entirety of the RI/MA WEA and extends 10 km beyond the WEA. The HAPC is focused on known and potential cod spawning areas, and complex habitats (as defined in our Fish Habitat Mapping Recommendations). The rationale and background for the HAPC is detailed in the Council's Southern New England HAPC Preliminary Submission document. NOAA Fisheries has received the submission and we

expect rulemaking to be completed by early 2023. Wherever feasible, impacts to HAPCs should be fully avoided, and where full avoidance is not feasible, measures to minimize and mitigate impacts should be fully evaluated and considered.

Endangered Species Act

As noted above, BOEM is the lead action agency for the ESA section 7 consultation. BOEM has submitted a Biological Assessment and request for consultation to us on behalf of the other action agencies, including the USACE. They have determined in their BA for the Revolution Wind Project that the proposed action may affect, and is likely to adversely affect, a number of ESA listed species under our jurisdiction. Our consultation will consider the effects of all proposed federal actions on ESA listed species and critical habitat in the action area, including consideration of the permit proposed for issuance by the USACE. Please note that consultation has not been initiated yet due to a lack of sufficient information regarding the proposed action and the effects of the action on ESA listed species. As described in our letter to BOEM dated November 17, 2022 (enclosed for your reference), BOEM is requesting consultation on an action that would include installation of up to 100 WTG foundations; however, the BA does not contain information or analysis for the activities that we understand would be necessary to install WTG foundations and associated inter-array cables at the 21 locations that the applicant has determined are infeasible for installation. As such, the consultation timeline is currently uncertain. It would be helpful to understand how USACE is considering the new information regarding feasibility of installing WTG foundations at the 21 identified locations and whether USACE intends to modify your proposed action to reflect permitting up to 79 foundations rather than up to 100 foundations and/or if you will be requesting additional information from the applicant to support moving forward with a permit for up to 100 foundations.

At some point, we anticipate issuing a biological opinion that will determine whether the proposed actions are likely to jeopardize the continued existence of any listed species or destroy or adversely modify any designated critical habitat. This Opinion may include an Incidental Take Statement that may include Reasonable and Prudent Measures (RPMs) and implementing Terms and Conditions. It is our expectation that any of these RPMs or terms and conditions that apply to the USACE will be incorporated as conditions of any permit you issue for this project. We may also include Conservation Measures that should be considered by you as appropriate to further minimize effects of the proposed action.

Marine Mammal Protection Act (MMPA)

The MMPA prohibits the take 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 the taking will be of small numbers, have a negligible impact on the affected species or stock, and will not have an unmitigable adverse impacts on the availability of the species or stock(s) for taking for subsistence uses (where relevant). NMFS Office of Protected Resources has received a request from Revolution Wind, LLC, a subsidiary of Orsted Wind Power North America, LLC, for

authorization to take small numbers of marine mammals incidental to construction activities associated with the Revolution Wind offshore wind energy facility. NMFS announced the receipt of Revolution Wind's request for the development and implementation of regulations governing the incidental taking of marine mammals in a March 21, 2022 *Federal Register* notice (87 FR 12666). NMFS is scheduled to publish the proposed Incidental Take Authorization (ITA) in the Federal Register in December 2022 and make a final decision regarding the ITA in October 2023. Please note that the proposed ITA will reflect recent submissions from the applicant regarding a reduced project scope (i.e., installation of up to 79 WTG foundations and reduced HRG surveys).

Conclusion

Thank you for the opportunity to comment on the Public Notice for this project. We look forward to continued coordination as a partner cooperating agency on this project as it moves forward in the NEPA process. We will update you on the status of the MSA, FWCA, and ESA consultations as information becomes available and if any additional information or issues of concern arise. If you have any questions or need additional information, please contact Sue Tuxbury at (978)-281-9176 or by e-mail (susan.tuxbury@noaa.gov). Should you have any questions about the ongoing Section 7 consultation process for the Revolution Wind project, please contact Julie Crocker at (978) 282-8480 or by email (julie.crocker@noaa.gov).

Sincerely,

Karen M. Greene
Mid-Atlantic Field Offices Supervisor
Habitat Conservation and Ecosystem Services

cc:

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DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS
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November 18, 2022

Environmental Resources Branch

Karen Greene
Chief, Mid-Atlantic Branch
Habitat and Ecosystems Services Division
National Marine Fisheries Service
Greater Atlantic Region Fisheries Office
55 Great Republic Drive
Gloucester, MA 01930

Dear Ms. Greene:

On September 16, 2022, the U.S. Army Corps of Engineers (USACE), Philadelphia District released a draft Environmental Assessment (EA), pursuant to the National Environmental Policy Act (NEPA), for the *Maurice River Federal Navigation Channel and Beneficial Use of Dredged Material, Cumberland County, New Jersey*. The Magnuson Stevens Fishery and Conservation Management Act (MSA) and the Fish and Wildlife Coordination Act (FWCA) require that we consult with you on projects that may affect essential fish habitat (EFH). An EFH Assessment was integrated into the draft EA for your review. The proposed project entails maintenance dredging of the lower reach of the federally authorized Maurice River navigation channel with beneficial use placement of the dredged material into selected areas within the northwest reach of the Heislerville Wildlife Management Area.

You provided a comment letter on October 25, 2022, which noted several deficiencies within the EFH Assessment and concluded that the information was insufficient for you to initiate consultation under the MSA. Specifically, you noted that the EFH Assessment was not clearly identified in the draft EA or that a separate, stand-along EFH Assessment was not provided, as is required by EFH regulations. Additionally, you have concluded that the NOAA Fisheries Greater Atlantic Regional Fisheries Office EFH Worksheet would not be appropriate for this project. In order to facilitate continued coordination for this project, a stand-alone EFH Assessment has been prepared and is enclosed with this letter. Accordingly, the EA will be revised to remove the EFH Assessment sections and the stand-alone EFH Assessment will be included as an Appendix to the final EA. The stand-alone EFH Assessment addresses the required components as described in 50 CFR 600.920(e)(2).

Based on our EFH Assessment and EA evaluation of potential adverse impacts, we have concluded that the proposed maintenance dredging of the Maurice River lower navigation channel and beneficial use placement of dredged sediments in a degraded marsh system within the Heislerville Wildlife Management Area poses minor and temporary impacts to EFH in the short-term and expected improved habitat in the long-term. The beneficial placement of sediments obtained from channel maintenance serves

to retain the valuable sediments within the local estuarine system where they are needed. A monitoring program will evaluate the efficacy of the beneficial use placement operation. Lessons learned from the monitoring plan will inform adaptive management strategies for future placements.

Consultation, pursuant to the MSA and FWCA is requested for beneficial placement of sediments dredged from the lower Maurice River channel for 10-year period of future maintenance dredging cycles within the identified proposed placement areas. The monitoring program will evaluate the efficacy of the beneficial use placement operation and how the dredged material establishes higher elevations within the degraded marsh placement areas.

Please review the enclosed EFH Assessment and pursuant to the EFH regulation at 50 CFR 600.905, provide your conservation recommendations for the proposed maintenance dredging and beneficial use action for a ten-year consultation period within 60 days. The USACE Philadelphia District is committed to continuing to work closely with Federal and State resource agencies, prior to and during project construction. If you have any further questions regarding this project, please contact Ms. Barbara Conlin of the Environmental Resources Branch at (215) 656-6557, email Barbara.E.Conlin@usace.army.mil or Ms. Monica Chasten at (215) 656-6683, email Monica.A.Chasten@usace.army.mil.

Sincerely,

FOR Peter R. Blum, P.E.
Chief, Planning Division

Enclosure

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ESSENTIAL FISH HABITAT ASSESSMENT

Maurice River Channel Maintenance Dredging
and
Beneficial Use of Dredged Material
Cumberland County, New Jersey

November 2022

Essential Fish Habitat Assessment
Maurice River Channel Maintenance Dredging
and
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1.0 INTRODUCTION

The U.S. Army Corps of Engineers, Philadelphia District, (USACE) has prepared an Environmental Assessment (EA) in compliance with the National Environmental Policy Act (NEPA) of 1969, as amended, for the Maurice River Maintenance Dredging and Beneficial Use of Dredged Material Project in Cumberland County, New Jersey. The EA with an integrated Essential Fish Habitat (EFH) Assessment was previously provided to your office. Due to confusion regarding the presence of the EFH assessment components within the EA, a separate EFH analysis has been prepared pursuant to Section 305(b)(2) of the Magnuson-Stevens Fishery Conservation & Management Act (MSA). The MSA requires the USACE to evaluate the proposed actions that occur within coastal waters of the United States. EFH textual descriptions are contained in fishery management plans developed by the regional fishery management councils. EFH for federally-managed species can include habitats such as wetlands, reefs, seagrass, rivers, and coastal estuaries that fish can spawn, breed, feed, and grow to maturity. This stand-alone EFH Assessment will be included in Appendix E of the final EA.

Authorized Federal Channel. The Maurice River Federal Navigation Channel, adopted as HD 59-644 in 1910 and modified as HD 73-275 in 1935, provides for a channel 7 feet deep and 150 feet wide in Delaware Bay across Maurice Cove to the mouth; thence a channel 7 feet deep, 100 feet wide to the fixed bridge at Millville, 21.5 miles above the mouth, and then 60 feet wide to the mill dam, a further distance of one-half mile, including a turning basin 7 feet deep at Millville. The total length of the Federal navigation project is about 24 miles. The Maurice River supports local fishing, the oyster industry and ship repair industries. The Federal channel requires periodic maintenance dredging to authorized depth. A portion of the channel was last dredged in 1996.

2.0 PROJECT LOCATION

The project area is located in Maurice River Township, Cumberland County, New Jersey (39.2279, -75.0211). The project area includes the lower portion of Maurice River navigation channel at the confluence with the Delaware Bay south of Bivalve, New Jersey and the northwest reach of the Heislerville Wildlife Management Area (Figure 1).

Figure 1: Channel dredging reach and Heislerville Wildlife Management Area

3.0 EXISTING ENVIRONMENT

The tides affecting the project area are semi-diurnal with two nearly equal high tides and two nearly equal low tides per day (or approximately 12 hours and 25 minutes per tidal period. Table 1 summarizes the 1983 – 2001 tidal epoch datums relative to Mean Lower Low Water (MLLW) and NAVD88 from NOAA's Tide and Currents (2022).

Datum	Description	Elevation (ft. MLLW)	Elevation (ft. NAVD88)
MHHW	Mean Higher-High Water	6.27	2.86
MHW	Mean High Water	5.84	2.43
MTL	Mean Tide Level	3.02	-0.39
MLW	Mean Low Water	0.19	-3.22
MLLW	Mean Lower-Low Water	0.00	-3.41

Table 1: Tidal datum values for Maurice River tide gauge at Bivalve, New Jersey

Water levels in the Maurice River cove area are predominately driven by astronomical tides; however, other factors such as sustained wind (*i.e.,* fetch), freshwater inflow from the river, rainwater runoff, and strong tides driven by storms can also affect water levels in the project area. Waters in this region of the Maurice River are turbid due to high concentrations of suspended sediments produced by strong tidal and wind-generated currents. The predominant wind direction varies by season, swinging to the south during summer. As wave energy in the bay approaches the Maurice River cove shoreline, it is limited by the shallow water depths. Normal wave heights are therefore generally low (less than 2 feet). The proposed project area is located in the lower reach of the authorized channel (11,500 linear feet) from station 1+500 to station 13+000 and adjacent flooded marsh system and has a predominately fine-grained sediment substrate. Grain size analyses of the channel sediments conducted in 2017 and 2022 are provided in Table 2. Sediment samples taken within the channel are predominantly fines (43.65 % to 95.1%) with fine, medium sand and coarse sands (9.8% to 38.8%).

2017

	MR-1	MR-2	MR-3	MR-4
SOIL CLASSIFICATION	%	%	%	%
Coarse Sand	0	0.2	0.6	6.5
Fine Sand	3.9	7.2	7.6	5.7
Fines	95.1	87.1	86	43.6
Gravel	0	0	0.4	37
Medium Sand	1	5.5	5.4	7.2
Sand	4.9	12.9	13.6	19.4

2022

SOIL CLASSIFICATION	MR 5	MR 6	MR 7	MR 8	MR 9	MR 10	MR 11	MR 12
Coarse Sand	%	%	%	%	%	%	%	%
Fine Sand	2.4	0.1	0.6	0.1	0.2	1	1	1.5
Fines	29	5.7	8.2	2.6	35.5	3.4	3.1	4.3
Gravel	61	91.6	83.7	96.1	36.2	93.3	92.8	91.3
Medium Sand	0	0	0	0	0	0	0	0
Sand	7.6	2.6	7.5	1.2	28.1	2.3	3.1	2.9
	39	8.4	16.3	3.9	63.8	6.7	7.2	8.7

Table 2: Soil classification of four Maurice River entrance channel samples (Tetra Tech, 2017, 2022).

Over the years, storms of note along the Delaware Estuary have caused many miles of shoreline along the Delaware Bay to retreat up to 75 feet. The combined effects of wind, waves, and elevated tidal water levels led to significant erosion along the Delaware bay shore. The study area continues to be subjected to progressive erosion of the shoreline and marshes due to long-term shore processes relating to storm events and SLR (Figure 2). Over the past several decades,

the mouth of the Maurice River has been undergoing a rapid transition into a muddy delta. Siltation, channel erosion, and flooding have inundated the once pristine wetlands and meadows. Eroded material from wetlands has long been recognized as a source of shoal material within navigation channels within the area.

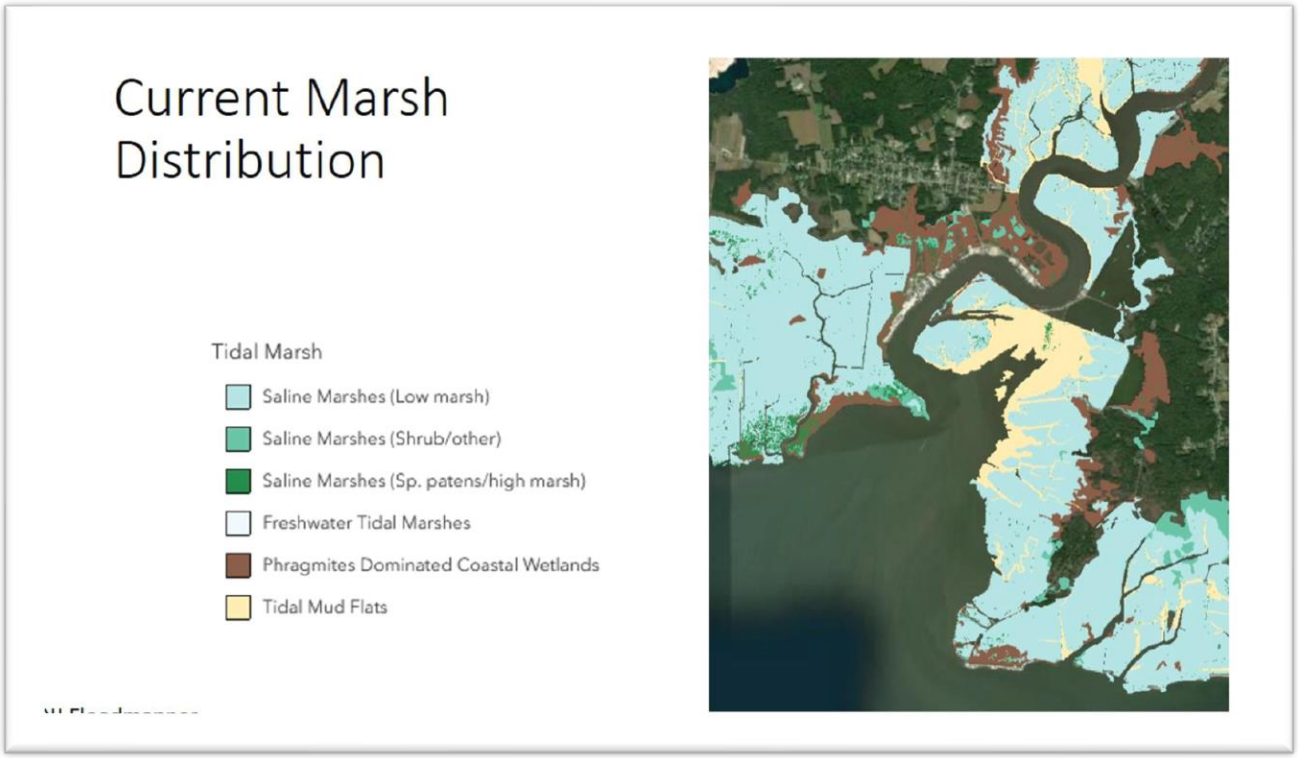

Figure 2: Current landcover data for the area (courtesy of L. Tedesco, The Wetlands Institute).

4.0 PROPOSED ACTION

For maintenance dredging operations, USACE utilizes Regional Sediment Management (RSM) and Engineering with Nature (EWN) principles and practices in a natural infrastructure approach. Maintenance dredging is necessary for navigation safety within authorized channels and will occur periodically, as needed. For the initial dredging operation scheduled to begin in winter 2023, the Philadelphia District proposes to dredge approximately 75,000-100,000 cubic yards (cy) of a portion of the lower Maurice River federally-authorized navigation channel between stations 1+500 to 11+500 and beneficially use the material by placing it in eroded marsh area in Heislerville Wildlife Management Area (WMA) (Figure 3). In a subsequent maintenance cycle, an additional 25,000-50,000 cy is anticipated to be dredged between stations 1+500 to 13+000, where needed, to the authorized depth of 7 ft MLLW with 2 ft allowable over-depth. Additional future maintenance dredging cycles will occur as needed, pending surveying. The proposed dredging operation will employ a hydraulic pipeline dredge and will require approximately 8 weeks of in-water work. Dredging will remove critical shoaling in priority areas

within this lower reach in order to maintain a safe and reliable navigation channel for commercial and recreational vessels. The additional 25,000-50,000 cy proposed to be dredged from this reach will occur after a consolidation period of 1-2 years after the initial placement.

Figure 3: Proposed location of channel dredging and beneficial use placement areas.

Beneficial Use Placement Objective. The beneficial placement of the dredged material within the Heislerville Wildlife Management Area (WMA) will help to rebuild and bolster substrate elevations in an inter-tidal wetland/mudflat/shallow water marsh complex that has been subjected to excessive inundation and erosion for several decades. Several alternatives for dredging and placement locations within the general vicinity of the Maurice River Navigation Channel were evaluated. The alternative plans considered were 1) No Action (no channel maintenance dredging); 2) channel maintenance dredging and placement of dredged material in the upland Cape May CDF; 3) channel maintenance dredging and placement at East Point; and 4) channel maintenance and placement at the Heislerville WMA. The alternatives are described in detail in Section 3 of the EA and the reasons for why alternatives 1,2, and 3 were eliminated from further consideration. These reasons included: working with fine-grained sediments at these alternative locations was determined to be infeasible, other locations were not cost-effective, and other locations would not result in an environmental benefit and could pose increased potential adverse impacts to the environment. Two preferred placement areas were identified in collaboration with coastal engineers, scientists, landscape architects, and resource managers from the Philadelphia District USACE, the New Jersey Department of Environmental Protection (NJDEP), the U.S. Army's Research and Development Center (ERDC), the University of Pennsylvania (UP), and local officials (see Figure 3).

These proposed placement areas within the northwest Heislerville WMA for the beneficial use placement of channel maintenance material were selected in order to best achieve success in retaining the material within the localized estuarine system and provide a sediment benefit to a flooded marsh system to build and bolster the natural infrastructure that protects the Heislerville Dike, which in turn protects the critical impoundments and habitat located in the Heislerville WMA. These areas are managed by the NJDEP's Division of Fish & Wildlife. Both placement areas are each approximately 9 acres in size (Figure 4). The proposed placement objective is to enrich substrates incrementally within the existing but degrading subtidal, intertidal, and low marsh areas to increase their resiliency. This is a systems approach to enhancing existing habitats through sediment addition. The intent is to avoid conversion of low marsh habitat to other habitat types, such as high marsh or upland. This will be accomplished by avoiding the deposition of material in the low marsh portions of the placement site or placing lesser amounts to maintain elevations below mean high water. The project will include sediment nourishment to mudflats and adjacent subtidal areas to extend the footprint of the inter-tidal fringe.

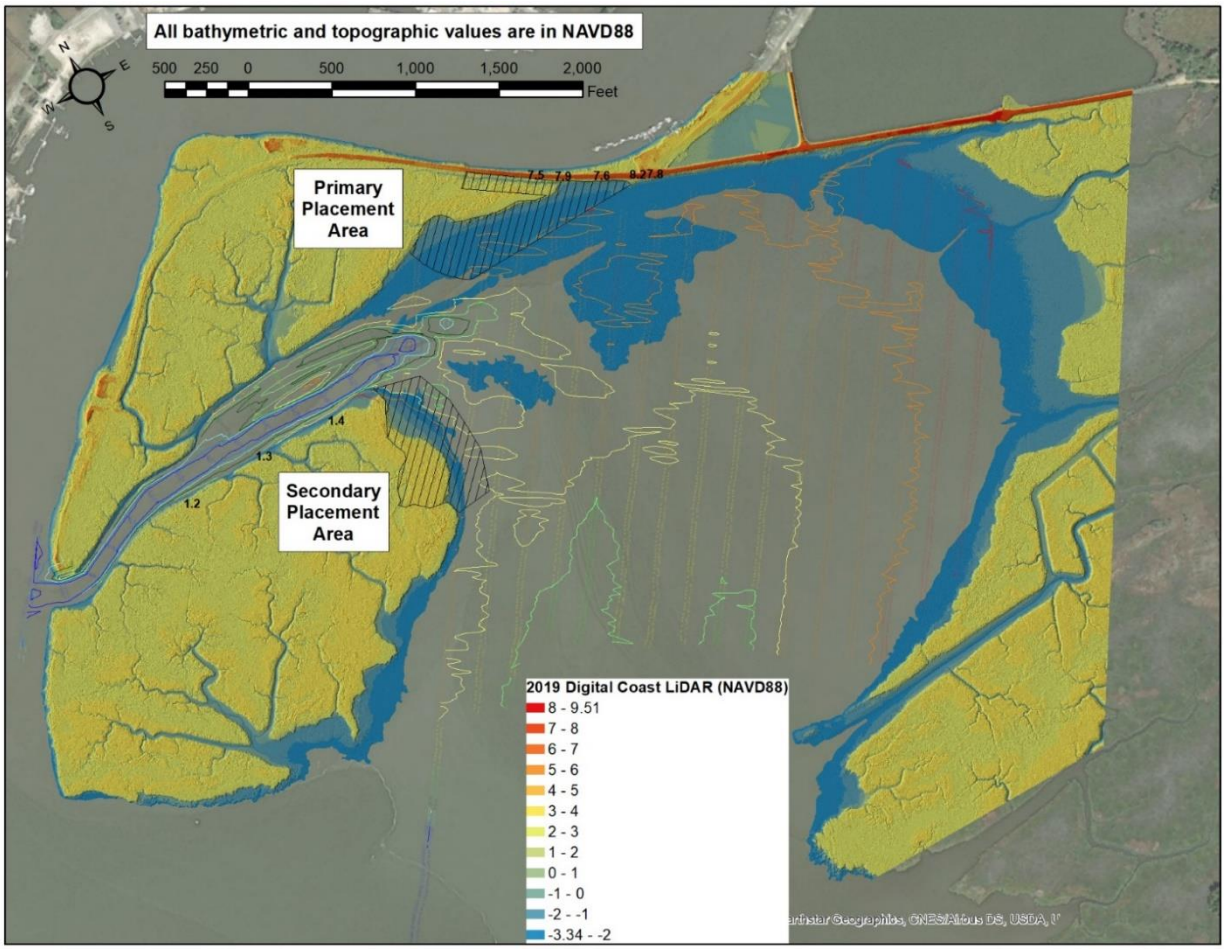

Figure 4: Proposed dredged material placement areas, primary and secondary locations.

The first-year placement will occur within the primary placement area, the majority of which is within an old railroad bed located bayward of the Heislerville dike. Containment will be incorporated into the design utilizing the stable foundation of the old railroad bed to build elevation adjacent to the dike. Containment efforts may include the use of turbidity curtains, coir logs, and/or hay bales, and earthen berms. The turbidity curtain planned will be similar to that used during the Mordecai Island restoration (USACE, 2022) since it adapted with phases of the tide and successfully stabilized the fine-grained sediment portion over time. There are no known areas of submerged aquatic vegetation (SAV) in the proposed dredging or placement areas. The primary placement area is comprised of approximately 60 percent mudflat and 30 percent subtidal and 10 percent low marsh and abuts with the Heislerville dike, which consists of broken concrete and stone and will serve to help contain the sediments. The secondary placement area is comprised of approximately 16 percent mudflat, 48 percent subtidal, and 36 percent low marsh. Elevations are shown in Figure 4. Deposition of dredged sediments will vary in the placement area but will not exceed 3.5 feet NAVD88. In the primary placement area, sediments that settle in subtidal habitat may convert a portion of habitat to intertidal mud flat habitat. Sediments that settle on existing intertidal mud flat may convert naturally to low marsh if

sufficient elevations allow saltmarsh vegetation to establish. Any thin-layer placements within the low marsh will enrich the low marsh habitat resiliency. The sediment characteristics are not conducive to building above a low marsh elevation. In the secondary placement area, dredged sediments may serve to raise elevations to those that existed as low marsh prior to 1991 but are currently intertidal and subtidal.

The initial dredging and placement operation is currently scheduled to occur between January and March 2023. Monitoring of placement elevations and sediment consolidation via traditional and remote sensing techniques will be conducted and will occur prior to, during, and post-placement operations. Lessons learned from the first placement in Winter 2023 will inform the design and construction of the follow-on dredging and placement operation in subsequent years, based on resultant elevation and consolidation data from the first placement. The secondary placement area has been identified for sediment enrichment in the event that the initial primary placement area requires additional consolidation time between maintenance dredging cycles. Either placement area will receive sediment enrichment in future maintenance dredging cycles.

At the primary placement site, the marsh fronting the Heislerville dike structure protects the impoundments from the large fetch conditions that exist due to the flooded marsh having a direct connection to the Delaware Bay. The dike has been repaired multiple times by NJDEP as it protects the critical habitat located behind the dike in the Heislerville WMA. The WMA is managed by NJDEP's Division of Fish and Wildlife and is integral to the local community and also prevents the Maurice River and the Delaware Bay from being directly connected hydraulically. Compromise to this structure could result in significant changes to the geomorphology of the area which would have a negative impact on the surrounding saltmarshes, the commercial/private facilities north of it, and in turn, the entire local economy. The tidal marsh complex of habitats from a systems perspective provides numerous fish species vital resources for refuge, foraging, spawning, and nursery grounds.

Saltmarshes and their adjacent intertidal mudflats and shallow water are critical habitats for fish and wildlife. New Jersey's salt marshes are rapidly disappearing due to sea level rise (SLR), which is estimated to be between 5 and 6 mm/year. Parts of New Jersey's baycoast are sinking (subsidence) due to geological factors, which compounds wetland losses due to SLR. Saltmarshes must accrete sediments to keep pace with the rate of SLR. Excessive flooding of salt marshes prevents the vegetation from thriving, which in turn, renders them unable to trap sediments. Frequent inundation due to large storms and high erosion rates due to SLR over the past 50 years have resulted in extensive losses of tidal marshes. Wetlands in the Heislerville Wildlife Management Area have been severely impacted, resulting in exacerbated flooding, erosion, and subsidence. New Jersey has lost large coastal habitat areas, and it is estimated that another 28% of tidal marshes will be lost by 2050 (State of New Jersey, 2021). The loss of salt marshes in New Jersey is best exemplified at the Heislerville Wildlife Management Area (WMA). Since 1985, an estimated 40% of the salt marshes protecting Matts Landing Road Dike that preserves the WMA's migratory bird impoundments have been lost due to the constant stressors placed on this fragile ecosystem.

Channel maintenance dredging is necessary for navigational safety. By placing the dredged sediments in adjacent flooded degraded marshes as opposed to placement in an upland CDF, the dredged material can be used to sustain the marshes by raising the substrate elevation incrementally in the face of continued erosion and sea level rise. Multiple lifts will be needed over time for the fine-grained material to aid the marsh in keeping pace with SLR. The proposed beneficial use takes a systems approach to enhancing the wetland complex. Each successive placement operation will incrementally add sediment over time to the existing landscape to build elevation to bolster wetland habitats. The beneficial placement of sediments obtained from maintenance dredging of authorized navigation channels serves to retain the valuable sediments within the local estuarine system where they are needed. The strategic placement method will allow the sediments to flow and position naturally within the proposed placement areas to bolster the wetland habitats against excessive flooding. Dredge material placement within the primary site, abutting the toe of the Heislerville dike, will also provide natural and nature-based storm protection to the dike and infrastructure behind it. The placement areas will be monitored before, during, and after operations to document how fluidized sediments behave and augment subtidal, intertidal, and low marsh elevations. Lessons learned from the monitoring plan will inform adaptive management strategies for future placements.

The abundance of dredged materials from channel maintenance throughout the state of New Jersey provides a valuable and needed resource as well as opportunities to combine dredging needs with coastal marsh rehabilitation. Beneficial use of dredged material removed from navigation channels is preferrable to disposal of the sediments in upland contained disposal facilities (CDFs). The National Marine Fisheries Service (NMFS) has stated that it supports implementing positive and sustainable measures to meet the needs of the living resources and communities of the Maurice River because of the area's increased rates of erosion, sea level rise, loss of living resources (*e.g.* fish, shellfish, invertebrates, vegetation) and habitat. Placement of the dredged material on former but now excessively flooded marsh area (*i.e*. the proposed placement areas) is expected to raise the substrate elevations within the existing habitats such that they may better perform their valuable ecological services. Commercially and recreationally important living resources are dependent upon tidal marshes for foraging, spawning, and nursery areas. Wetlands represent a defining characteristic of a healthy estuarine ecosystem and help to maintain water quality through the interception of and filtering of upland runoff and tidal flushing.

<u>Monitoring and Adaptive Management Plan</u>. The following proposed monitoring plan was developed by the USACE, Philadelphia District (NAP) in coordination with USACE's ERDC, the NJDEP Division of Fish & Wildlife, the University of Pennsylvania's Weitzman School of Design (UP) and other project stakeholders to develop the comprehensive data collection and monitoring plan for the Heislerville Wildlife Management Area (WMA) beneficial use placement operation. Ongoing monitoring, research efforts and lessons learned being developed in the Seven Mile Island Innovation Laboratory (SMIIL) within the Cape May Wetlands Wildlife Management Area are also being leveraged for this work.

Proposed monitoring and data collection plans will occur for a minimum of 5 years post-placement and include:

Pre-Placement Monitoring

- Elevation data of the placement areas adjacent to the Heislerville Dike and in the Northwest Reach as well as the federal channel (including LiDAR (UAS), DEM from photogrammetry (UAS), INSAR from satellite (tentative), traditional boat and topo surveys)
- Multispectral imagery pre and post dredging using UAS
- Sediment sampling in channel and placement areas (2017 and 2022)
- Data collection and laboratory analysis of consolidation including additional cores within the channel and placement sites
- Drone photography at high and low tides (pre-placement and throughout construction)
- Leverage Seven Mile Island Innovation Lab monitoring, R&D efforts and lessons learned

During Placement

- Monitoring of dredged sediments and settling
- Installation of time-lapse cameras around the site to monitor surface change, flow velocity (dredging, within tidal creeks (with containment structures) pre-, during and post-dredging
- High resolution photography and video footage
- Documentation of innovative dredging technologies and techniques such as turbidity curtain concept, diffused discharge, use of natural landscape to move sediment to support intertidal or subtidal mudflats.
- Turbidity Monitoring including roving turbidity meter for project area and potential fixed meter as needed

Post-Placement

- Surface elevation post placement using LiDAR (UAS), DEM from photogrammetry (UAS), INSAR from satellite (tentative)
- Topographic and bathymetric data collection for minimum of 3 years
- Multispectral imagery pre- and post-dredging using UAS
- Aerial monitoring of elevation and topography and design of landscape features
- Subsurface imagery with time to monitor evolution of dredged fill (consolidation, sediment mixing, bioturbation) post-dredging
- Follow-up sampling on consolidation work including modeling
- Quantification of NNBF benefits for Heislerville Dike
- Leverage SMIIL monitoring, R&D efforts and lessons learned

5.0 ESSENTIAL FISH HABITAT

The lower Maurice River and confluence with the Delaware Bay have the potential to provide habitat for federally-managed fish species. The MSA and Fish and Wildlife Coordination Act (FWCA) require federal agencies to consult with NMFS on projects that may adversely affect EFH. NMFS will in turn, provide conservation recommendations for EFH and other NOAA trust resources. The Guide to Essential Fish Habitat Designations in the Northeastern United States Volume IV (NOAA 1999) and NOAA's EFH Mapper were used to identify federally-managed fish species and life stages within the vicinity of the proposed project area.

5.1 Federally-managed Species

Finfish represent a major resource group in the Maurice River cove project area and the Delaware Bay. Water depths range from 1-7 feet MLLW. Fish species of various life history stages occur in both the proposed dredging as well as the placement areas. NOAA Fisheries has designated EFH for 12 federally managed species in the project area based on life stages likely to be present (FishMapper accessed 7 March 2022). The species are listed in Table 3 for the open water (flooded marsh) area of Maurice River and Cove (Degrees, Minutes, Seconds: 39º13'48"N, Longitude= 76º58'59"W). Additionally, in a letter dated 25 October 2022, NMFS identified designated EFH for several Atlantic highly migratory species (*i.e.,* tuna, swordfish, billfish, and several species of sharks: the sandbar shark (*Carcharhinus plumbeus*), smoothhound shark complex (*Mustelus mustelus*) Atlantic stock, and sand tiger shark (*Carcharias taurus*) (Collette, B.B. and C.E. Nauen, 1983; Compagno, 1984). The managed species and life stages are listed below for the open water of the proposed channel dredging area and proposed saltmarsh and shallow water placement area (flooded marsh) and confluence with the Delaware Bay. EFH textual descriptions are contained in fishery management plans developed by the regional fishery management councils. EFH can include habitats such as wetlands, reefs, seagrass, rivers, and coastal estuaries that fish can spawn, breed, feed, and grow to maturity.

Table 3: Federally-managed fish species and life stages that may occur at the Maurice River project area.

Species	Lifestage(s) Found at Location
Little Skate *Leucoraja erinacea*	Juvenile Adult
Atlantic Herring *Clupea harengus*	Juvenile Adult
Red Hake *Urophycis chuss*	Adult
Windowpane Flounder *Pseudopleuronectes americanus*	Adult Juvenile

Winter Skate *Leucoraja ocellata*	Adult Juvenile
Clearnose Skate *Raja eglanteria*	Adult Juvenile
Longfin Inshore Squid *Doryteuthis pealeii*	Eggs
Bluefish *Pomatomus saltatrix*	Adult Juvenile
Atlantic Butterfish *Peprilus triacanthus*	Larvae Adult Juvenile
Scup *Stenotomus chrysops*	Juvenile Adult
Summer Flounder *Paralichthys dentatus*	Juvenile Adult
Black Sea Bass *Centropristis striata*	Juvenile Adult
Sandbar Shark *Carcharhinus plumbeus* (HAPC)	Neonate Adult
Sand Tiger Shark *Carcharias taurus*	Neonate Adult
Smoothhound Shark Complex *Mustelus* spp.	Adult

Habitat Area of Particular Concern (HAPC) has been designated in the project area for the sandbar shark. HAPCs either play important roles in the life history (*e.g.*, spawning or pupping areas) of federally managed fish species or are especially vulnerable to degradation from fishing or other human activities.

5.2 Species Life History Evaluations

Atlantic herring (*Clupea harengus*) are pelagic, schooling, plankton-feeding species that inhabits both sides of the North Atlantic Ocean. In the western North Atlantic this species ranges from Labrador to Cape Hatteras and supports major commercial fisheries. Adults migrate south into southern New England and mid-Atlantic shelf waters in the winter after spawning in the Gulf of Maine, on Georges Bank, and on Nantucket Shoals. Eggs occur predominantly in offshore, well-mixed waters of 32 – 33 ppt salinity, with tidal currents between 1.5 and 3.0 knots, water temperatures below 15° C, and in depths of 20 – 80 meters. Juvenile and adult herring are abundant in coastal and mid-shelf waters from southern New England to Cape Hatteras in the winter and spring. In the spring, adults return north, but juveniles do not undertake coastal migrations. Larval herring are limited almost exclusively to Georges Bank and the Gulf of Maine

waters. Larvae typically metamorphose the following spring into young-of-year (YOY) juveniles. Atlantic sea herring prefer higher salinities (26 – 32 ppt) and juveniles and adults (including spawning adults) are typically found at depths of 15 – 130 meters (Stevenson and Scott 2005). Atlantic herring juvenile and adult forms may occur within the project area. These life stages will likely occur in low numbers and no significant adverse effects of the dredging and placement actions are anticipated.

Atlantic Butterfish (*Peprilus triacanthus*) are relatively small, fast-growing, short-lived, pelagic fish that form loose schools, often near the surface. Butterfish eggs and larvae are pelagic and occur from the outer continental shelf to the lower, high salinity parts of estuaries in the Mid-Atlantic Bight (MAB). Juveniles and adults are common in inshore areas, including the surf zone, as well as in sheltered bays and estuaries in the MAB during the summer and fall. Inshore EFH is the "mixing" and/or "seawater" portions of all estuaries on the Atlantic coast where butterfish eggs are common, abundant, which may include the waters of the project area. Butterfish eggs are buoyant, and the larvae are nektonic. Juveniles and adults are eurythermal and euryhaline, and are frequently found over sand, mud, and mixed substrates. Smaller juveniles often aggregate under floating objects and often live in the shelter of large jellyfish. Juvenile and adult butterfish in the MAB are typically found at depths ranging from 3 – 23 meters with water temperatures ranging from 8 – 26° C, salinities ranging from 19 – 32 ppt, and DO ranging from 3 – 10 mg/l. All life stages may occur in the project area, most likely in summer and fall (Cross *et al*., 1999). While some impacts to larvae may occur in the project area, since adult butterfish are pelagic and even juveniles are highly mobile, only minimal impacts to butterfish and EFH are expected to occur as a result of the proposed dredging and placement operations.

Black Sea Bass (*Centropristis striata*) are a warm temperate serranid that ranges from southern Nova Scotia and the Bay of Fundy to southern Florida and into the Gulf of Mexico. Black sea bass are typically found on the continental shelf in complex habitats such as reefs and shipwrecks, but young-of-year (YOY) fish also occur in large numbers in structurally complex estuarine habitats. Their distribution changes seasonally as fish migrate from coastal areas to the outer continental shelf while water temperatures decline in the fall and from the outer shelf to inshore areas as water temperatures rise in the spring. Adult sea bass are very structure oriented, especially during their summer coastal residency. Adults only enter larger estuaries and are most abundant along the outer Atlantic coast. Spawning occurs on the continental shelf, beginning in the spring off Cape Hatteras and progressing into the fall in the MAB and off southern New England. Eggs are pelagic with high average egg densities generally located on the continental shelf in the vicinity of large estuaries (Drohan *et al*., 2007).

Black sea bass migrate offshore to avoid cold inshore winter temperatures. After overwintering they return to inshore estuaries in late spring and early summer. They are uncommon in open unvegetated sandy intertidal flats or beaches. The diet of larval black sea bass is poorly known, but probably consists of zooplankton. Juvenile black sea bass are diurnal, visual predators and often prey on small benthic crustaceans (isopods, amphipods, small crabs,

sand shrimp, copepods) and other epibenthic estuarine and coastal organisms. During the summer, adult black sea bass feed on a variety of infaunal and epibenthic invertebrates, especially crustaceans. Project operations are unlikely to impact black sea bass as the species gravitates towards structure which does not occur in the project area. Any juveniles or adults that may occur in the inshore area of the project will avoid the project site temporarily.

Bluefish (*Pomatomus saltatrix*) are a pelagic species that travel in schools of like-sized individuals and undertake seasonal migrations, moving into the MAB during spring and south or farther offshore during fall. Within the MAB they occur in large bays and estuaries as well as across the entire continental shelf. Bluefish spawn offshore in open ocean waters. Juvenile bluefish are found in estuaries, bays, and coastal ocean waters in the MAB and South Atlantic Bight in many habitats. Typically, they are found near shorelines, including the surf zone, during the day and in open waters at night. Like adults, they are active swimmers and feed on small forage fishes, which are commonly found in nearshore habitats. They remain inshore in water temperatures up to 30° C and return to the continental shelf in the fall when water temperatures reach approximately 15° C. Juvenile bluefish are associated mostly with sand but are also found over silt and clay bottom substrates. They usually occur at salinities of 23 – 33 ppt but can tolerate salinities as low as 3 ppt (Shepherd & Packer, 2005). Adults are generally pelagic. Juvenile and adult bluefish may occur in the project area between spring, summer, and fall. Juveniles and adults are motile and will likely temporarily avoid the project area during construction. The project is not expected to impact the available habitat utilized by bluefish in the area.

Red Hake (*Urophycis chuss*) occur in continental waters from the Gulf of St. Lawrence to the Mid-Atlantic states. During warmer months, they are most common in depths less than 100 m; during colder months, they are most common in depths greater than 100 m. In the MAB, red hake occur most frequently in coastal waters in the spring and fall; then move offshore to avoid the warm summer temperatures. Juveniles (< 24 cm) usually avoid shallow waters that are warmer than about 22° C, but they do inhabit deeper bays. Red hake spawn offshore in the MAB in the summer. Adults may be found in the project area although the species prefers deeper, cooler waters than those that occur in the project area (Steimle, 1999a). The proposed project is unlikely to impact red hake adults or EFH.

Scup (*Stenotomus chrysops*) are considered a demersal species. They spawn along the inner continental shelf from Delaware Bay to southern New England between May and August, mainly in bays and sounds. Young-of-Year (YOY) juveniles are commonly found from the intertidal zone to depths of about 30 m in portions of bays and estuaries where salinities are above 15 ppt. Juvenile scup appear to use a variety of coastal intertidal and subtidal sedimentary habitats during their seasonal inshore residency, including sand, mud, mussel beds, and seagrass beds. Adult scup are common residents in the MAB from spring to fall and are generally found in schools on a variety of habitats, from open sandy bottom to structured habitats such as mussel beds, reefs, or rough bottom. Larger adults are found in deeper waters while smaller sized adults are typically found in bays and estuaries. Adults move inshore during early May and June

between Long Island and Delaware Bay. As inshore water temperatures decline to <8 to 9° C adult and juvenile scup leave inshore waters and move to warmer waters on the outer continental shelf south of the Hudson Canyon off New Jersey and along the coast from south of Long Island to North Carolina in depths ranging from 75 – 185 m. Juveniles and adults feed on variety of epifaunal and water column prey. Juvenile and adult Scup are likely to be found in the project area during warmer seasons. The species will migrate offshore into deeper waters once water temperatures fall (Steimle, 1999b). The project activities will likely cause juveniles and adults to avoid the construction area temporarily to subtidal waters and unlikely to be directly impacted by the operation.

Summer Flounder (*Paralichthys dentatus*) have a broad geographical range which encompasses shallow estuarine waters and outer continental shelf from Nova Scotia to Florida. Spawning occurs over the open ocean areas of the continental shelf during fall and winter. Summer flounder exhibit strong inshore–offshore movements with adults and juveniles normally inhabiting shallow coastal and estuarine waters during the warmer months of the year and moving offshore during the fall and winter for growth and spawning. Summer flounder eggs are offshore, planktonic and buoyant. Summer flounder eggs are present in the highest numbers from fall to early winter. Planktonic larvae and post-larvae derived from enter coastal and estuarine nursery areas to complete transformation. Juveniles are distributed inshore and occupy many estuaries during spring, summer, and fall.

Juvenile summer flounder utilize several different estuarine habitats such as marsh creeks, seagrass beds, mud flats, and open bay areas. As long as other conditions are favorable, substrate preferences and prey availability appear to be the most important factors affecting distribution. Summer flounder utilize sandy or mixed substrates as well as mud and vegetated habitats. Adults appear to prefer sandy habitats but can be found in a variety of habitats with both mud and sand substrates (Packer *et al*., 2003c). Given their association with sandy substrates, the summer flounder is not expected to occur in large numbers in the project area. Juveniles and adults may occupy the project area during the late spring, summer, or fall but are very wary of disturbance and will move out of the area to avoid the construction area temporarily. The proposed project is not anticipated to adversely affect summer flounder.

Windowpane Flounder (*Pseudopleuronectes americanus*) are a shallow water mid- and inner-shelf species found primarily between Georges Bank and Cape Hatteras on bottom habitats with a substrate of mud or fine-grained sand. Spawning occurs on inner shelf waters, including many coastal bays and sounds, and on Georges Bank. Windowpane flounder eggs and larvae are often observed in the MAB from February to November with peaks in May and October. Windowpane eggs are buoyant and are found in surface waters. Larvae are initially planktonic then settle to the bottom. Juveniles and adults are similarly distributed. They are found in most bays and estuaries south of Cape Cod throughout the year at depths less than 100 meters, bottom temperatures (3 – 12° C in the spring and 9 – 12° C in the fall), and salinities (5.5 – 36 ppt). Juveniles that settle in shallow inshore waters move to deeper offshore waters as they grow. Adults occur primarily on sand substrates in the MAB. YOY and older juveniles are

common within 100 feet of shore of the coastal and offshore waters (out to the offshore boundary of the EEZ). These waters include seawater (salinity > 25.0 ppt) and brackish salinity zones (0.5 < salinity < 25.0 ppt). Adults and juvenile stages would be expected to occur in the project area during most of the year. These life stages would be expected to temporarily leave the action area during construction with minimal impact to shallow water habitat (Chang *et al*., 1999). The proposed placement of dredged material within eroded wetlands is expected to improve habitat quality for juvenile and adult summer flounder by enhancing habitat for prey species.

Little Skate (*Leucoraja erinacea*) is considered a shallow water species and occurs from the top of the subtidal zone to depths of 90 m. It has a relatively narrow distribution, found only in the northwest Atlantic from Grand Banks, Canada to Cape Hatteras, North Carolina. It is one of the dominant members of the demersal fish community of the northwest Atlantic. Its center of abundance is in the northern section of the MAB and on Georges Bank, where it is found all year over almost the entire range of temperatures. Little skate do not make extensive migrations, although where it occurs inshore the species moves onshore and offshore with seasonal temperature changes. Little skate are generally found on sandy or gravelly bottom, but can also occur on mud. Skates are known to remain buried in depressions during the day, but they may feed at any time during a 24-hour period. Little skate deposit eggs in water not deeper than 27 m on sandy bottoms (Packer *et al*., 2003a). Essential fish habitat source document: little skate, *Leucoraja erinacea*, life history and habitat characteristics. NOAA Technical Memorandum NMFSNE- 175. U.S. Department of Commerce, National Oceanic and Atmospheric administration Northeast Fisheries Science Center Woods Hole, MA. 76 pp. Juvenile and adult stages may occur in the project rea. Eggs are unlikely to be found in the project area. The species is highly mobile and will likely avoid the area of temporary disturbance. No direct impact to Little skate is anticipated to result from dredging and placement operations although indirectly EFH and food prey resources will be temporarily impacted by the proposed federal action.

Sand Tiger Shark (C*archarias taurus*) is commonly found in coastal embayments and nearshore waters, from the surf zone to the outer continental shelves from the surface to a minimum of 183 m. This species exhibits a preference for near-bottom habitats but often occurs in midwater or surface zones. Sand tiger sharks typically feed on bony fishes, small sharks, rays, squids, crabs, and lobsters. EFH for neonates (≤125 cm) is shallow coastal waters to 25 meters deep from Barnegat Inlet, NJ south to Cape Canaveral, FL. Neonate sand tiger sharks may be occur in the near-bottom habitats as well as other parts of the water column in the project although depths may be too shallow in the placement area (Pollard & Smith, 2009). Neonate sand tiger sharks and adults are mobile and likely to temporarily leave the area during construction. No impact to sand tiger shark or EFH is anticipated. No direct impact to sand tiger shark is anticipated to result from dredging and placement operations although indirectly EFH and food prey resources will be temporarily impacted by the proposed federal action.

Sandbar shark (*Carcharinus plumbeus*) is an abundant, coastal–pelagic shark of temperate and tropical waters that occurs inshore and offshore. It is found on continental and insular shelves and is common at bay mouths, in harbors, inside shallow muddy or sandy bays, and at

river mouths, but tends to avoid sandy beaches and the surf zone. Sandbar sharks migrate north and south along the Atlantic coast, reaching as far north as Massachusetts in the summer. Sandbar sharks bear live young in shallow Atlantic coastal waters between Great Bay, New Jersey, and Cape Canaveral, Florida, including Delaware Bay. Neonates and juveniles inhabit shallow coastal nursery grounds during the summer and move offshore into deeper, warmer water in winter. Late juveniles and adults occupy coastal waters as far north as southern New England and Long Island. The area is included as HAPC for the species. Neonates and adult life stages are likely to occur in the proposed dredging area although the species is less likely to be found in the shallow water depths within the proposed placement areas. Sandbar sharks are a mobile species and expected to temporarily leave the area of construction. No direct impact to sandbar shark is anticipated to result from dredging and placement operations although indirectly EFH and food prey resources will be temporarily impacted by the proposed federal action.

Winter Skate (*Leucoraja ocellata*) occur from the south coast of Newfoundland and the southern Gulf of St. Lawrence to Cape Hatteras. Its center of abundance is on Georges Bank and in the northern section of the MAB. Habitat in the MAB includes estuarine and nearshore coastal shelf waters. The winter skate is a benthic species. Habitat ranges from shoreline to 317 m, but it is most abundant at depths <150 m. Eggs of winter skate are deposited throughout the year off southern New England and from summer to autumn off Nova Scotia. Winter skate migrate to deeper colder waters during summer months. The species appears to concentrate in deeper, warmer waters in the winter and move into shallower waters during spring and summer. Juveniles prefer sand and gravel bottoms. The winter skate remains buried in depressions during the day and is more active at night. It may feed at any time during a 24-hour period (Packer *et al.,* 2003b; Sulikowski *et al*., 2009.). Adults and juveniles may occur in the project area. The species is motile and likely to temporarily leave the action area during construction. Minimal direct impacts are expected to result from the project however, there may be indirect impacts to EFH and potential prey food resources in the dredging and placement areas.

Longfin Inshore Squid (*Doryteuthis pealeii*) is a schooling species of the molluscan family Loliginidae. It is distributed in continental shelf and slope waters from Newfoundland to the Gulf of Venezuela and occurs in commercial abundance from southern Georges Bank to Cape Hatteras. The squid is commonly encountered in late spring in nearshore waters but appears to be more dispersed in summer. In fall, small squid are abundant and tend to increase in numbers with depth, highest over mud bottom. Eggs generally inhabit shallow waters, <50 m deep and near shore. Larvae and juveniles are found in coastal and inshore waters, with eggs and larvae at the surface and juveniles in the upper 10 m of the water column. Adults may be found in shallow inshore waters up to 180 m deep from March to October. Adults are typically found over mud or sandy mud bottoms, and have been found at surface temperatures ranging from 9 – 21° C and bottom temperatures ranging from 8 – 16° C (Jacobson, 2005). The project area contains EFH for longfin squid eggs. Since the eggs float, minimum impact may result from dredging and placement activities.

5.3 Prey Species

Invertebrates. Marine benthic invertebrates are bottom-dwelling species that can be grouped into two categories: infaunal (benthic invertebrates living within the substrate) and epifaunal (benthic invertebrates living onthe surface of the substrate). Benthic invertebrates are found in and on the substrate of the intertidal and subtidal habitats. Polychaetes (segmented worms with bristles) are an important component of the benthic infaunal community; epifaunal biota include amphipods, crabs, Atlantic horseshoe crabs (*Limulus polyphemus*) eggs, and various univalve and bivalve mollusks such as soft-shell clam (*Mya arenaria*). Invertebrates provide an important food source for bottom feeding fish and include species that are commercially and recreationally important. The Atlantic horseshoe crab is a marine chelicerate arthropod found along the US Atlantic and Gulf of Mexico coasts. Although not considered a prey species for fish, it merits specific attention as a significant, at-risk component of the intertidal and subtidal zones in the project area. It provides food for endangered sea turtles and migrating shorebirds. Horseshoe crab eggs provide a key food resource for federally listed shorebird species, particularly the red knot. Horseshoe crab burrowing activities affect the habitat available for other species through bioturbation. Nearshore, shallow water, intertidal flats are considered important habitat for development of juvenile horseshoe crabs. The species is now in decline across most of its geographic range. Project construction would not likely temporarily disrupt intertidal habitat if the operation occurs during the cooler months when horseshoe crabs are not likely to be present in the project area.

Finfish. More than 60 species of marine and anadromous fish, sometimes known as shore fishes, use the shallow and intertidal waters of the project area for feeding and refugia. These fish include boreal, temperate, and semitropical seasonally migratory species. In the spring and summer the fish generally move inshore while in the fall and winter the movement is offshore, with some species undertaking long coastal migrations to semi-tropical waters. Some examples of commercially and recreationally important species in the nearshore zone are Atlantic menhaden (*Brevoortia tyrannus*), weakfish (*Cynoscion regalis*), striped bass (*Morone saxatilis*), summer flounder (*Paralichthys dentatus*), bluefish (*Pomatomus saltatrix), black sea bass (Centropristis striata*), Atlantic croaker (*Micropogonias undulatus*), northern kingfish (*Menticirrhus saxatilis*), spot (*Leiostomas xanthurus*), and silverside (*Menidia menidia.* The most abundant fish species in the bay are silversides (*Menidia spp*.), killifish *(Fundulus spp*.), and Atlantic menhaden. Project construction may temporarily cause fish to leave the immediate dredging and placement areas to nearby undisturbed areas, returning after operations cease.

6.0 IMPACTS ASSESSMENT

6.1 Direct Impacts

The project will result in direct impacts to some intertidal and subtidal habitat EFH within the navigation channel and the placement areas. The temporary increase in total suspended solids (TSS) and turbidity in the water column at the dredging and placement sites has the potential to directly impact EFH as well as managed species and their prey. In the channel, dredging activities

may cause fish and/or prey species to move away from the disturbance. Benthic epifaunal and infaunal prey species would likely be most affected by the turbidity plume within the channel or placement areas. Egg or larval stages would most likely be affected by increased turbidity. To minimize adverse effects, dredging and placement will not occur during the spring reproductive season (March 1 to June 30). Outside of the immediate action areas, total suspended solids in the water column would not significantly impact EFH, managed species or their prey. Since the total area that would incur these direct impacts represents a small portion of these habitats in the immediate region, the impact on the affected species is expected to be minimal; the primary species-specific impact would occur to species with non-motile life stages (*i.e.* invertebrate prey species) that use habitats that will be removed or buried during construction. Operational controls and best management practices will aid in reducing impacts to EFH, associated managed species, and their prey. Project construction could temporarily impede foraging by fish in the immediate vicinity until sediment settles. The exact movement of the sediment is difficult to predict, however, the placement areas are somewhat sheltered inside the flooded marsh area where water depths are shallow. This should encourage sediment nourishment on the surrounding mudflats. The project would permanently impact habitat directly by raising the elevation of portions of the area where the sediments flow and settle. Overall, adverse impacts resulting from increased turbidity and TSS concentrations
would be minor and temporary in duration.

For non-motile individuals, particularly benthic invertebrate infauna, the primary type of impact would be permanent, resulting in a temporary reduction in abundance of benthic organisms (prey species) through removal (dredging) or burial (dredged material placement). Some invertebrate species, such as bivalves, are capable of moving upward through the new sediments and survive. Additionally, the reproductive mechanisms of most invertebrates allows for rapid recolonization through recruitment from adjacent, undisturbed areas.

Fish occupation of waters within the project impact area is highly variable spatially and temporally. Fish early life stages (*e.g.* eggs, larvae) are more susceptible to direct impacts to due dredging and placement operations due to their limited mobility. Older life stages are motile and would likely leave the project area during construction to avoid these impacts. All demersal species could be adversely impacted temporarily through water quality impacts (elevated turbidity and lower dissolved oxygen) during in-water placement. Highly pelagic Atlantic species, such as tuna, swordfish, billfish, including their early life stages, are unlikely to be in the shallow waters of the project area. These species occur over the continental shelf feeding and known spawning areas include the Gulf of Mexico and the Mediterranean (Pew Memorial Trust, 2018).

Fish species that are more oriented to bottom or demersal waters may be directly impacted by elevated water turbidity levels due to the dredging and placement action. Dredging-related direct impacts to fish species can be minimized by scheduling the operation during the cooler months of the year outside of the spawning season for most Federally-managed species in the project area. No dredging or placement operations will occur between March 1 and June 30 to minimize impacts to anadromous species. Seasonal abundances are highly variable, as many species are highly migratory. This variability introduces uncertainty to

evaluating impacts to EFH, but also distributes the risk temporally and spatially. All impacts would be expected to be minimal and subside within minutes after each placement and upon project completion. Salinity and dissolved oxygen levels in the water column are not expected to be impacted by the dredging and placement operation. There are not contaminants in the sediments that would impact water quality.

Underwater soundscapes are important to many species of estuarine and coastal fishes. Underwater sounds generated from hydraulic cutterhead suction dredges are typically low in intensity and frequency. Hydraulic cutterhead suction dredging generally produces sound below 1,000 Hz in frequency at one meter below the surface. The majority of the sound produced by cutterhead suction dredges occur in the 70 to 1,000 Hz ranges (Clarke *et al*., 2002). Underwater noise generated by dredging may impact EFH soundscapes and managed fish species in the Action Area. Despite these concerns, only a few studies have examined the sound levels of dredging equipment and the potential impacts these sound levels have on aquatic organisms. Research suggests that dredging noise, especially in soft, non-gravelly sediments, is not likely to produce physiologically damaging results to fish, though it may mask natural sounds used by larvae to locate suitable habitats, and some fishes may demonstrate a change in swimming as a result of noise inputs into their habitat.

During the operation, stabilization measures will be implemented to minimize adverse effects such as turbidity curtains, earthen berms, and/or coir logs to reduce sediments from flowing outside of the defined placement areas. The turbidity curtain planned will be similar to that used during the Mordecai Island restoration (USACE, 2022) since it adapted with phases of the tide and successfully stabilized the fine-grained sediment portion over time. The proposed placement objective is to enrich substrates incrementally within the existing but degrading subtidal, intertidal, and low marsh areas to increase their resiliency. This is a systems approach to enhancing existing habitats through sediment addition. The fluidized sediments pumped onto the placement area will naturally flow to lower areas and settle, providing for a range of final elevations that mimic the natural topography of the area. This will also result in a range of placement thicknesses that benefit the marsh habitats. Lower intertidal mud flat will naturally receive the finer grained material and will build elevation slowly. The intent is to avoid conversion of low marsh habitat to other habitat types, such as high marsh or upland. Healthy saltmarshes provide important habitat for a variety of fish species. Sediment deposition on the expansive subtidal and intertidal mudflats bordering low marsh will reduce the stressors to marsh platform resilience. Beneficial use of dredged material provides the additional sediments to augment the existing natural topography and mosaic of subtidal/intertidal/low marsh habitats that mimics the current marsh configuration but at higher overall elevations. The intent is to provide additional substrate elevation to marsh fringe areas to provide added stabilization and protection to reduce marsh habitat loss. This object in turn, improves valuable habitat for fish.

6.2 Indirect Impacts

For all motile individuals, construction-related impacts during the operation would be temporary. Motile life stages will avoid direct impacts and likely move away from the area of

temporary disturbance. Indirectly, there will be no long-lasting adverse impacts to water quality in or adjacent to the project area. In contrast, enriching the substrate within an excessively flooded marsh system will provide a positive impact for Federally-managed fish species through the eventual re-establishment of intertidal marsh habitat acreage that had been lost. The extent to which intertidal marsh edge develops will be ascertained through post-construction monitoring. Minimal and temporary impacts to the water quality in or adjacent to the project area are expected. Fall *et al.* (2022) documented a turbidity study following an unconfined strategic sediment placement operation on a marsh on Gull Island within the SMIIL system. Roving turbidity surveys found that the resulting turbidity plume was localized, only extending about 20 meters offshore and 100 meters along shore, and that when conditions were calm (wind speeds <5m/s), the plume direction and intensity were driven by tidal circulation. Monitoring showed that near-bed turbidities during active placement operations were greater than typical background conditions but were often less than those conditions observed during high wind or storm events. Post-placement turbidity monitoring was observed to be similar to levels documented in the region prior to any placement activities.

Elevated turbidity poses a temporary impact to marine organisms. Turbidity is not expected to have a negative impact to bivalve prey species because these species are adapted to the fine sediments native to the area and the periodic increases in suspended sediments and other stresses following coastal storms and other perturbations, such as eroding marsh edges. Several studies have demonstrated that shellfish are capable of withstanding elevated turbidity levels for short time periods (*i.e.,* days) with no significant metabolic consequences or mortality (Wilbur and Clarke, 2001; Norkko *et al*., 2006).

Infauna and smaller, less motile epifauna that are food resources for fish that are buried during placement operations will pose an indirect impact on Federally-managed species (both benthic and pelagic). Fish will expand their foraging areas to seek out prey until the disturbed habitat had sufficient time for infauna and epifauna species to recolonize the area. Greene (2002) cited literature on recolonization studies for a wide latitudinal range along the east coast and reported recovery between 2 and 7 months. Intertidal habitat recovery is particularly rapid (perhaps one to two growing seasons), as many invertebrate prey species have high reproductive and growth rates. Re-colonization of infaunal species will be stimulated by adult populations that inhabit similar environments adjacent to the project area. Construction duration at most sites is short (a few months at most) and recolonization can begin as soon as the project is completed. The immediate project area represents a very small percentage of the extensive foraging grounds in this region. Thus, the overall indirect impacts to EFH species and EFH is expected to be minimal. The temporary loss of benthic prey resources caused by removal or burial would not have significant adverse effects on EFH for any species that feeds primarily on more motile epifaunal organisms (*e.g.,* crabs, mysids, sand shrimp) or fish, since these motile organisms would likely move from the area temporarily as well to avoid the disturbance.

Benefits of sediment placement. Low estuarine marshes are an important habitat for many invertebrates that comprise the bottom of the heterotrophic food web. Coastal wetlands throughout the U.S. have been detrimentally altered by diking. These areas have low elevation

associated with long-term lack of tidal inundation that prevents sediment accretion. The surrounding area of the lower Maurice River was historically used for salt hay farming (*Spartina*). In the 1930s, wetlands were diked and the hydraulic connection to the river was blocked. Without the diurnal tidal flushing, the area no longer received sedimentation and could not keep pace with sea level rise and quickly converted to mudflats and open shallow water as farming plots were abandoned. The adverse impact of salt hay farming continues as these farmlands did not naturally restore and became mudflats and open water.

Some areas that have partially revegetated sit at lower elevations due to the long-term restricted tidal flow and are now excessively flooded. This left most previously farmed areas submerged for much longer periods, thereby reducing their capacity for intertidal vegetative growth. Given current rates of sea level rise, these marshes cannot recover elevation deficits naturally to keep pace with sea level. The loss of wetlands from decades of subsidence and inundation has reduced intertidal low marsh habitat for fish and invertebrates. Former salt hay farming practices have left Matt's Landing Road, the Heislerville WMA dike, and the surrounding infrastructure directly exposed to storms. The beneficial use of sediments dredged from the navigation channel and placed in these degraded saltmarshes to bolster their elevations will benefit the ecological food web and energy system.

Wetlands are among the most productive ecosystems in the world, often compared to rain forests and coral reefs. An immense diversity of species of microbes, plants, insects, amphibians, reptiles, birds, fish and mammals exist within a marsh ecosystem. Adding sediment to a flooded, degraded marsh system contributes to the resiliency of these habitats in providing food for species life-cycles. Currently, open water and mudflats comprise the majority of the habitat type in the project area. Without sufficient protection to adjacent vegetated wetlands, there is insufficient dead plant matter available to break down in the water to form detritus. This enriched organic material provides food for many small aquatic insects, shellfish and small fish that are food for larger predatory fish, reptiles, amphibians, birds and mammals. A healthy proportionate combination of habitats (*i.e.* shallow water, intertidal mudflats, and vegetated marsh) provides nutrients and primary productivity necessary for the development of organisms that form the base of the food web that ultimately feeds many of the managed fish species. The beneficial use placement of dredged material is expected to provide increase resiliency by elevating the existing substrates within the flooded marsh system of the Heislerville WMA.

6.3 Climate Change

Climatic changes such as sea level rise and increasing global temperatures are predicted to continue for the foreseeable future. Predicted climate change impacts such as increased ocean temperatures, ocean acidification, sea level rise, and changes in currents, upwelling and weather patterns, have the potential to cause changes in the nature and character of the estuarine ecosystem. Climate change is impacting marine fish and invertebrate species worldwide. Climate vulnerability is the extent to which abundance or productivity of a species is impacted by climate change. New Jersey is at the epicenter of climate change challenges, as sea level rise (SLR) combined with land subsidence has magnified the issue. Protection of the Heislerville WMA from

the increasing threat of storm surge and coastal flooding due to climate change is vital. By enriching substrate elevations in the proposed placement areas, low marsh vegetation may eventually re-establish naturally in areas eroded and flooded.

The proposed project strives to counter the negative effects of SLR on coastal estuarine systems. SLR is reducing the amount of available intertidal saltmarsh habitat that is critical as nursery and foraging areas for many fish species. Hare *et al*. (2016) conducted a climate vulnerability assessment on 82 fish and invertebrate species in the Northeast U.S. shelf, including exploited, forage, and protected species. They found that climate vulnerability is high to very high for approximately half the species assessed. Diadromous and benthic invertebrate species exhibited the greatest vulnerability; having a high potential for distribution changes, illustrating how important support for beneficial use projects are within channel maintenance programs. Wetlands' microbes, plants and wildlife are part of global cycles for water, nitrogen and sulfur. Atmospheric maintenance is also a function of wetlands function**.** Wetlands store carbon within their plant communities and sediments instead of releasing it to the atmosphere as carbon dioxide. Thus, wetlands help to moderate global climate conditions.

Beneficial Use placements of channel maintenance material by the USACE as well as efforts by the NJDEP and the U.S. Fish & Wildlife Service, The Nature Conservancy, and The Wetlands Institute are working to improve wetland habitats within New Jersey coastal marshes in response to SLR. Under present and future sea level rise scenarios, rates are approaching or exceeding typical marsh accretion rates resulting in enhanced concerns about the resilience of coastal marshes. There is currently wide scale loss of high and low marsh areas as they become excessively flooded. With ongoing SLR, projections of marsh conversion to open water and the continued loss of vegetated marsh areas, sediment enrichment through BU placement becomes increasingly more important.

6.4 Cumulative Impacts

Cumulative impacts are those resulting from the incremental impact of the proposed project when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

As noted previously, the cumulative impacts over several decades that have come about as a result of prior land uses (*i.e.* salt hay farming) and sea level rise have caused a significant adverse effect on the marsh/intertidal flats/shallow water complex in the lower Maurice River region. The NJDEP's Division of Fish and Wildlife manages the Heislerville Wildlife Management Area where the proposed placement areas are located. Their mission is to protect and manage the state's fish and wildlife to maximize their long-term biological, recreational, and economic values. In order to protect and enhance the wetland complex of habitats in the lower Maurice River region, sediment enrichment is needed to bolster the flooded former marsh areas. Beneficial placement of channel maintenance dredged material in the Heislerville WMA is crucial.

Present actions in the project area are consistent with its residential, coastal setting and restoration objectives of valuable saltmarsh habitat. These projects have been undertaken to improve the health and sustainability of the region against further degradation due to subsidence, flooding, sea level rise and other ongoing threats. Future activities in this area are anticipated to remain similar to present actions. In 1996, NJDEP's Division of Engineering and Construction reconstructed approximately 4,000 feet of the Heislerville Dike within the Heislerville WMA. In 1998, NJDEP placed sunken barges to serve as breakwaters along the point of Basket Flats to reduce the wave energy entering the area of the flooded marsh behind it. In 2007, a bulkhead was erected at the Port Norris marine police station to combat the continued shoreline deterioration and structural damage. In 2012 the Heislerville dike that was breached during Hurricane Sandy was temporarily repaired but breached again in 2012 and during successive high tides. Additional repairs were completed in 2013 to halt the continuous breaching.

In 2013, NJDEP's Division of Fish & Wildlife partnered with Ducks Unlimited to refurbish the Heislerville WMA's impoundments. These impoundments, located immediately east of Maurice River along Matts Landing, were transformed from stagnant lakes into palustrine wetland, thereby improving habitat conditions and foraging areas for migratory and local birds. A cooperative effort between NJDEP's Office of Natural Resource Restoration and Office of Engineering and Construction, the Maurice River Township, USFWS, and NOAA worked to address degradation of Thompsons Beach. The area over time has incurred both development and erosion. Thompsons Beach lies to the immediate east of the mouth of the Maurice River at the southeast end of the Heislerville WMA, where it fronts the same greater marsh complex adjoining the mouth of the Maurice River. The effort restored the beach habitat there through removal of rubble, timber, and debris in order to improve the coastal habitat.

In 2018, NJDEP's Office of Coastal Engineering repaired and reinforced the Heislerville dike again following a series of winter storms, and in 2019 placed sediment at East Point (along the southeast mouth of the Maurice River) to stabilize the shoreline. Lastly, Rutgers University developed the Delaware Estuary Living Shoreline Initiative (DELSI) in 2008. The objective of this initiative is to stabilize eroding shorelines using a combination of plants, natural structures, and intertidal shellfish to trap sediment, absorb wave energy and provide water filtration. DELSI has developed ten different living shoreline projects within the Maurice River area and to date, has created approximately 1,630 feet of living shorelines that have led to an increase of 7,775 square feet of wetlands. DELSI's recent initiatives in the Maurice River area consists of 200 feet of oyster castles and oyster shell bags along an eroded wetland bank along the lower east Maurice River bank and 1,322 square feet of oyster shell bags and coir logs at Matts Landing. Section 1 of the EA provides a detailed discussion on relevant Federal and nonfederal prior actions that have taken place in the vicinity.

The adverse effects of these past and similar anticipated future actions have been temporary (*i.e.* water turbidity, benthic disturbance) and not adversely cumulative. The majority of impacts are short-term in nature and should not significantly contribute to a decline in the ecological services of the project area but in fact, strive to accomplish the opposite and provide

a positive benefit. The direct effects of the current proposed project are not anticipated to magnify the impacts from other actions in the area. Therefore, no significant cumulative impacts to EFH are projected as a result of the proposed project. This EFH assessment has identified minimal potential adverse impacts to EFH and Federally-managed species. Compensatory mitigation is not proposed because the project is designed to benefit the environment.

The Philadelphia District USACE is embracing the goal of beneficially using 100% of clean New Jersey coastal channel sediments and developing cost effective ways to do so. USACE is a provider when it comes to sediment, a much-needed currency in the natural coastal system in the Maurice River region. In 2019, USACE, the state of New Jersey, and the Wetlands Institute launched the Seven Mile Island Innovation Lab (SMIIL). The SMIIL encompasses about 24 square miles of tidal marshes, coastal lagoons, tidal channels and bays between the Cape May County mainland and the barrier island communities of Stone Harbor and Avalon, NJ. The initiative is designed to advance and improve dredging and marsh restoration through innovative research, collaboration, knowledge-sharing, and practical application.

Under the SMIIL, USACE and partners have completed several dredging and habitat improvement projects (*e.g.* Great Flats and Ring Island near Stone Harbor and Sturgeon Island within the Cape May Wetlands WMA). The work proposed at Maurice River will provide another example of using dredged sediments to enhance and fortify inundated marsh elevation and reduce marsh edge erosion. Monitoring the site will document the efforts to bolster substrate elevations and potentially restore unvegetated marsh fringing mudflats to low marsh habitat and enhance tidal flats and shallows for fish habitat. With ongoing partnerships, coordination at all levels, improvements to design and project implementation, and strong science to support innovation, USACE proposes to conduct similar efforts within the lower Maurice River region and will continue to work to advance best practices through strategies and solutions that address the long-term issues and sustainability of the coastal region.

7.0 CONCLUSIONS

The preferred Beneficial Use placement alternative for material dredged from the Maurice River Federal Navigation Channel is expected to modify between 9 and 18 acres of flooded and degraded marsh through sediment placement. The activity will pump the fluidized sediments (*i.e.* wetland nourishment) into the adjacent flooded and degraded marsh to increase substrate elevations within a designated area within the primary and secondary placement areas. Coastal wetlands are particularly vulnerable to sea level rise (Mitchell *et al*., 2017). Coastal wetlands are a critical natural or nature-based feature (NNBF) that provide a suite of ecosystem benefits and can provide flood risk reduction capability (Narayan *et al*., 2016). The advantages of beneficially using dredged sediment to nourish wetlands have been documented in several studies (Ray 2007; Colten *et al*., 2022) and some saltmarsh plants have the capacity for rapid recovery after dredged sediments are placed in a flooded marsh habitat (Berkowitz *et al*. 2019) to encourage intertidal wetland vegetation to re-establish and reduce erosion effects. The area will require multiple placement operations in order to achieve elevations resilient to storm impacts and marsh enhancement. The consultation period for this effort is 10 years.

Consultation would be re-initiated in the event that any significant changes are initiated for future placement operations based on lessons learned and adaptive management.

The surface waters, water column, intertidal, and benthic habitats of the project area have the potential to experience localized, temporary impacts as a result of implementing the proposed project. The benthic habitats and biological community found directly in the project footprint will be subject to removal or burial by sediments from dredging and placement operations. The project will also cause short-term increases in turbidity in the vicinity of the dredging and placement areas. The material to be dredged is primarily silt with some sand and a study completed by Fall *et al*. (2022) shows that with current placement methodologies, the material does not flow far from the placement location and consolidates under the influence of gravity; thus, only a localized area in the vicinity of the dredge and placement sites is likely to be impacted by elevated concentrations of suspended sediments.

The project is not expected to significantly adversely affect spawning habitat, nursery habitat, foraging or living habitat for Federally-managed fish species or HAPC. This determination is based on the project's small footprint, the sediment characteristics of the dredged material, and the localized nature and temporary duration of the project. Project activities are expected to occur during off-season months to avoid the period of time that EFH-designated species are migrating and spawning. Impacts to transiting and migrating fish due to turbidity are expected to be minimal as the species that occur in this naturally turbid area are adapted to such conditions. Project activities will take place in Maurice River cove where there is an expansive area for fish to transit and avoid any project-related activity and localized increases in turbidity within the water column. Although studies have shown that turbidity impacts organism behavior, coastal and estuarine organisms are exposed to suspended sediments from tidal flows, currents, and storms; therefore, they have adaptive behavioral and physiological mechanisms for dealing with this feature of the habitat.

Best management practices will be implemented during dredging to minimize disturbances to the environment. No dredging or placement activities will occur between March 1 to June 30. To minimize air emissions associated with the dredging vessel, the dredge will not run idle and shut off to the extent practical when not in use. All onboard personnel are responsible for observing water-related activities for the presence of federally-listed species and will abide by procedures required for the protection of threatened and endangered marine species. During the operation, stabilization measures will be implemented to minimize adverse effects such as turbidity curtains, earthen berms, and/or coir logs to reduce sediments from flowing outside of the defined placement areas.

Shallow subtidal habitat in combination with low marsh habitat and intertidal mudflat habitat provides the same functional value with as much or more complexity, particularly for younger fish life stages. The dredge utilized will be a small, shallow draft hydraulic pipeline dredge with a controlled outfall to reduce flow. The cutterhead will be activated only once it is embedded into the bottom sediments and not when it is suspended in the water column. Direct placement of material will not occur on submerge aquatic vegetation. The abundance and/or

distribution of benthic and phytoplankton prey species will be temporarily impacted during and immediately following project activities. However, the short-term and transient nature of water column disturbances will not cause substantial or long-term effects to planktonic prey species. Impacts to the benthic prey community of EFH-designated species will also be temporary. Full benthic recovery is expected within months to a year after dredging and placement activities. Further, these areas are subjected to high energy, unstable environments due to the current open fetch and storms, and as a result do not promote stable long-term benthic communities regardless of project activities. For all of the aforementioned reasons, the proposed project will not significantly adversely affect essential fish habitat. The majority of impacts are short-term in nature and should not significantly contribute to a decline in the ecological services of the project area but in fact, the project is expected provide a positive benefit to EFH, federally-managed species and their prey by improving their habitats.

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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

November 14, 2022

Mr. Andrew Beaudet, Regulatory Chief
Norfolk District
U.S. Army Corps of Engineers
803 Front Street
Norfolk, Virginia 23510

RE: NAO-2013-00418, Coastal Virginia Offshore Wind Commercial (CVOW-C) Project

Dear Mr. Beaudet:

We have reviewed public notice (PN) NAO-2013-00418, dated September 15, 2022, which describes an application by Virginia Electric and Power Company, also known as Dominion Energy Virginia (Dominion Energy) to construct and maintain an offshore wind energy facility and the required supporting infrastructure known as Coastal Virginia Offshore Wind Commercial (CVOW-C) Project. The 2,587-megawatt (MW) commercial offshore wind project is located in the Atlantic Ocean, approximately 27 miles off the coast of Virginia Beach, Virginia on the Outer Continental Shelf (OCS) within BOEM Renewable Energy Lease Area OCS-A 0483; the project includes associated infrastructure within the State's jurisdiction in the Cities of Virginia Beach and Chesapeake, Virginia.

According to the PN, the offshore portion of the project includes construction of one hundred seventy six (176), 14.7 MW wind turbine generators (WTGs) within an 112,799-acre lease area. Stone scour protection a maximum of 180-ft. in diameter will be placed around the base of each WTG. The project also includes the construction of three (3) offshore substations with approximately 0.95 acres of stone scour protection and between approximately 225-300 miles of 660-kilovolt (kV) inter-array cables. Nine (9), buried 230 kV offshore export cables - totaling up to 416.9 miles in length - will extend from the lease area to an onshore cable landing area. The Offshore Export Cables will cross Cells 2 and 5 of the Dam Neck Ocean Disposal Site (DNODS) and three (3) existing fiber optic, in-service telecom cables where twenty-seven (27) 235-foot-long by 36-foot-wide by 5.5-foot-tall protective rock berms will be installed to protect the proposed Offshore Export Cables at these locations. Nine (9) temporary cofferdams will be installed where the offshore export cables exit the seabed. An alternative to using cofferdams includes the placement of nine (9), 82 ft. by 6.6 ft. concrete mattresses to protect the cable in the transition zone. In addition, up to 108 temporary steel pipe piles may be installed along the HDD pipe alignments to act as "goal-posts" to punch-out locations during construction.

The offshore cables will land at the State Military Reservation in Virginia Beach where they will transition to nine (9) underground 230 kV onshore export cables extending approximately 4.4

miles to the Harpers Switching Station located on Naval Air Station (NAS) Oceana. From NAS Oceana, the cables transition to overhead power lines for approximately 14.2 miles along new, existing and expanded utility rights-of-way to the existing Fentress Substation in Chesapeake, Virginia. Both permanent and temporary impacts to palustrine forested and palustrine emergent wetlands will occur along the aerial route.

The project, as currently proposed and described in the PN, would result in thousands of acres of impacts in the offshore and nearshore aquatic habitats. The project would also permanently impact 2.2 acres of palustrine emergent (PEM) wetlands, 0.68 acres of palustrine scrub-shrub (PSS) wetland, and 4.94 acres of palustrine forested (PFO) wetland. Additionally, the project would also temporarily impact 23.57 acres of PEM, and would permanently convert 33.25 acres of PFO to PSS. To compensate for unavoidable impacts, the applicant proposes to purchase 29.75 wetland credits, 1.91 non-tidal wetland credits within the Eastern Lower Delmarva watershed (HUC 02040304) and 27.84 non-tidal wetland credits within Albemarle (HUC 03010205) watershed.

The Bureau of Ocean Energy Management (BOEM) is the lead federal agency for offshore wind development activities and, as such, is responsible for consulting with us under the Magnuson Stevens Fishery Conservation and Management Act (MSA), the Fish and Wildlife Coordination Act (FWCA), and the Endangered Species Act (ESA). NOAA's National Marine Fisheries Service (NMFS), is also an action agency for this project to the extent that NMFS provides Incidental Take Authorizations (ITAs) under the Marine Mammal Protection Act (MMPA). We have been working directly with BOEM related to information needs for the required MSA/ essential fish habitat (EFH) and ESA consultations. However, we also recognize the U.S. Army Corps of Engineers' (USACE) jurisdiction and responsibilities under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act. As a result, we recommend that any appropriate EFH and FWCA recommendations we make to BOEM as part of the MSA and FWCA consultations be incorporated as special conditions to any Department of the Army permit issued for the proposed activity. As a partner cooperating agency, in response to your Public Notice, we offer the following technical assistance related to our mandates under MSA and FWCA as you undertake your evaluation and public interest review of the activities proposed within your regulatory authority.

General Comments

For your awareness, on November 16, 2022, we will provide BOEM with an additional information request in response to a draft EFH Assessment received on September 16, 2022. We expect our EFH consultation with BOEM to be initiated in 2023 with the submission of a complete EFH assessment and will provide our recommendations to BOEM within 60 days of receiving the complete assessment. Currently, we are working with BOEM to ensure the project area is appropriately characterized to reflect the complexity of habitats that occur within the lease area and export cable corridors, impacts to NOAA trust resources, commercial and recreational fishing communities, and our scientific surveys are evaluated fully; and that appropriate mitigation measures are incorporated into the project design and approvals. We have also undertaken a cooperating agency review of the Draft Environmental Impact Statement (DEIS)

and have shared our comments with BOEM on October 17, 2022; we will provide you a copy of our comments upon your request.

Given the size of the proposed project, substantial impacts to NOAA-trust resources may occur as a result of project construction, operation, and decommissioning. It is worth noting that the totality of impacts remains unclear, especially in the offshore environment, as the PN specifically describes the project as having 176 WTGs, which is different from BOEM's DEIS that describes a range of WTGs between 176 and 205. With regards to NOAA-trust resources, of particular concern are potential impacts to spawning and early life stage habitats and sensitive habitats such as complex bottom, sand ridge and trough habitat (ridge and trough complexes), wetlands, and subtidal and intertidal flats (e.g., mudflats). We also have concerns about the potential effects of the project on commercial and recreational fishing activities within the project area. As discussed below, alternatives that avoid and minimize impacts to aquatic habitats, fisheries, and fishing activities should be identified, evaluated fully, and implemented unless it can be demonstrated that they are not practicable. This includes cable alignments and installation methods. As is standard practice with many coastal development activities that you authorize under your authorities, compensatory mitigation should be required to offset unavoidable losses of aquatic habitats and ecological functions. We have recently released a comprehensive mitigation policy for NOAA trust resources that complements the existing 2008 USACE and EPA Compensatory Mitigation Rule (33 CFR Parts 325 and 332 & 40 CFR Part 230). Both of these documents should be used to inform the development of a compensatory mitigation plan for unavoidable aquatic resource impacts.

Alternatives

As you are aware, the Section 404(b)(1) Guidelines of the Clean Water Act includes two rebuttable presumptions for projects with discharges into waters of the U.S., which involve special aquatic sites that do not require access to or siting within the special aquatic site(s) to achieve their basic project purpose. The first presumption states that alternatives that do not affect special aquatic sites are presumed to be available. The second presumption states that practicable alternatives located in non-special aquatic sites (e.g., other waters, uplands, etc.) have less adverse impact on the aquatic ecosystem and that it is the applicant's responsibility to clearly demonstrate that both of these presumptions have been rebutted and to adequately address the alternatives portion of the guidelines. We believe a clear and common sense understanding of "water dependency" should be applied to the current proposed project. Similar to other transmission line projects along the US East Coast, many of which originate in the Atlantic Ocean and make landfall on barrier islands, once the proposed export cables reach the shore, it should no longer be considered water dependent and it should be assumed that viable upland alternatives exist.

Additionally, the 404(b)(1) Guidelines indicate that a Department of the Army permit should reflect the least environmentally damaging practicable alternative (LEDPA) (40 CFR 23.10(a)). To identify the LEDPA, a full range of practicable alternatives, defined by the purpose and need for the project should be evaluated and the range of alternatives should include adjustments to the project location/alignment in addition to design modifications that avoid or further minimize

impacts. Based on the information available for review and other information provided in the Construction and Operations Plan (COP) and DEIS, it does not appear that the proposed project represents the LEDPA.

As described in the NOAA Mitigation Policy for Trust Resources (NAO 216-123, Section 3.06) and consistent with the Section 404(b)(1) Guidelines impact avoidance and minimization must be considered and fully and fairly evaluated through the alternative development process before minimization measures and compensatory mitigation are considered; this is known as the mitigation sequence. This step-wise approach first focuses on the avoidance of adverse impacts, followed by the incorporation of minimization measures, limiting the degree and magnitude of adverse impacts. This approach is especially important where a number of ecologically valuable habitats including wetlands, mudflats, and creeks and streams are currently within the proposed cable alignments.

Aquatic Resources

The marine and estuarine waters of the project area including the Atlantic Ocean offshore of Virginia provide important habitat for many aquatic species including both state and federally managed species and their forage, including the state managed species striped bass (*Morone saxatilis*), tautog (*Tautoga onitis*), blue crab (*Callinectes sapidus*), channeled whelk (*Busycotypus canaliculatus*), knobbed whelk (*Busycon carica*), spot (*Leiostomus xanthurus*), cobia (*Rachycentron canadum*), and Eastern oyster (*Crassostrea virginica*). The marine and estuarine waters of the project area are also designated essential fish habitat (EFH) for nearly every life-stage of every species managed by the New England, Mid-Atlantic Fishery Management Councils and NMFS; portions of the project area are also designated EFH for species managed by the South Atlantic Fishery Management Council. Federally managed species for which EFH has been designated in the project area include, but are not limited to, summer flounder (*Paralichthys dentatus*), longfin inshore squid (*Doryteuthis pealeii*), black sea bass (*Centropristis striata)*, bluefish (*Pomatomus saltatrix*), Atlantic sea scallop (*Placopecten magellanicus*), Atlantic surfclam (*Spisula solidissima*), several species of skates, and a number of highly migratory species. The waters within and surrounding the project area also support important commercial and recreational fisheries for numerous species, including Atlantic menhaden (*Brevoortia tyrannus*), Atlantic surfclam, Atlantic sea scallop, longfin squid, black sea bass, bluefish, summer flounder, monkfish (*Lophius americanus*), striped bass, blue crab, weakfish (*Cynoscion regalis*), channeled whelk, spot, and cobia.

Commercial and recreational fisheries occur within the project area in low levels overall, with most fishing activity occurring both inshore and offshore of the project area. The commercial fisheries most impacted by the proposed project and export cable corridor include the Atlantic menhaden, black sea bass, and conch/whelk fisheries, while the most affected recreational fishery is the black sea bass fishery. There are also many fishing tournaments for Atlantic highly migratory species in and around these waters each year, including tournaments for marlin, sailfish, spearfish, and tuna species

Below you will find descriptions of select habitats or species as well as time-of-year restrictions we recommend to avoid impacts to those habitats and species. As you will note, these are species and habitats we often discuss in our comments and recommendations for activities within Virginia waters. These time-of-year restrictions include:

- Anadromous fish: February 15 to June 30, West Neck Creek and North Landing River, if applicable (depending on crossing/installation methods).

Anadromous Fish

Onshore portions of the project area (cable routes) include important habitat for anadromous species such as alewife (*Alosa pseudoharengus*), blueback herring (*Alosa aestivalis*), striped bass, and yellow perch (*Perca flavescens*). These species use streams and rivers including, West Neck Creek and North Landing River, for migrating, spawning, and for nursery functions. Alewife and blueback herring, collectively known as river herring, have complex lifecycles where individuals spend most of their lives at sea then migrate great distances to return to freshwater rivers to spawn during the late winter and spring. Alewife and blueback herring are also believed to be repeat spawners, generally returning to their natal rivers to spawn. In the Mid-Atlantic, landings of alewife and blueback herring, collectively known as river herring, have declined dramatically since the mid-1960s and have remained very low in recent years. Because landing statistics and the number of fish observed on annual spawning runs indicate a drastic decline in populations throughout much of their range since the mid-1960s, NOAA has designated river herring as Species of Concern. Species of Concern are those about which we have concerns regarding their status and threats, but for which insufficient information is available to indicate a need to list the species under the Endangered Species Act (ESA). We wish to draw proactive attention to these species. If appropriate (based on activity), we typically recommend a time-of-year restriction on in-water work from February 15 to June 30 to avoid impacts to migrating and spawning alewife, blueback herring, striped bass, and yellow perch. The implementation of this time-of-year restriction should be closely coordinated with us based on location and proposed activity, as it may only be necessary in limited circumstances, based primarily on construction methods.

Wetlands

From the project plans included with the PN, it appears that the onshore/inland cable alignments will impact various types of wetlands, as described above. As we have commented to you on numerous other coastal development projects, wetlands provide many ecological functions including fish and wildlife habitat, primary productivity via plant/microalgae/fungal growth, nutrient transformation, sediment retention, and carbon sequestration. The extent to which the productivity of these vegetative communities contributes to overall productivity is mediated in large part by their connectivity to surrounding habitats, including undeveloped uplands and streams and creeks. The primary production of wetlands forms the base of most food webs that support invertebrates and forage fish that are then prey for larger fish such as federally managed bluefish, black sea bass, and others.

The process of avoidance and minimization followed by compensatory mitigation should be followed for impacts to wetlands. Wetlands in and around the project area should be fully delineated and alternative alignments to access Fentress Substation that avoid or minimize crossing wetlands, waterbodies/streams, and installation methods that minimize impacts, such as HDD, should be evaluated and employed when possible. As we typically recommend, staging of material should not occur in wetlands and any necessary wetlands crossing should be done using timber/crane mats. Any areas of wetlands temporarily disturbed should be restored to pre-construction conditions and monitoring should take place for a minimum of five years to ensure restoration success. Compensatory mitigation should be required for unavoidable permanent impacts, as well "temporary impacts" that last for more than 12 months. Central to the development of any restoration or compensatory mitigation plan is an evaluation of the existing conditions of the wetlands to be impacted. Restoration and compensatory mitigation plans should be developed in accordance with NOAA's Mitigation Policy for NOAA trust resources and the 2008 USACE and EPA Compensatory Mitigation Rule.

As part of potential wetland impacts, the applicant describes expanding/upgrading of the existing Fentress Substation will be needed to accommodate electricity from the project. The applicant further describes an additional 4.5 acres of land would be required to build stormwater management facilities related to these upgrades/expansions. At present, detailed plans regarding the proposed stormwater facilities or the potential impacts to associated aquatic resources have not been provided for review. To ensure all aspects of the project considered, we recommend that any impacts related to the Fentress Substation expansion plans be analyzed as part of the proposed project. We also recommend that any expansion of the substation not occur in wetlands, streams, creeks, or other waterbodies. If impacts to wetlands or other water bodies are proposed to accomplish the project's purpose, including for stormwater management facilities at this substation (or elsewhere), we recommend updating the alternatives analysis to further avoid and minimize impacts to aquatic resources by exploring upland alternatives for stormwater management facilities and/or other stormwater management options.

Endangered Species Act

Consistent with the current FAST-41 schedule, we expect to initiate consultation pursuant to section 7 of the Endangered Species Act for the Coastal Virginia Offshore Wind Commercial project on March 20, 2023. BOEM is acting as the lead federal agency for consultation and prepared and submitted a Biological Assessment (BA) to us on September 21, 2022. We anticipate submitting a request for additional information to support the initiation request on November 22, 2022. BOEM has determined in their draft BA for the CVOW-C project that the proposed project may affect, and is likely to adversely affect, a number of listed species under our jurisdiction. Our consultation will consider the effects of all proposed federal actions on ESA listed species and critical habitat in the action area, including consideration of the permit proposed for issuance by the USACE. The FAST-41 Milestone date for completion of the consultation is currently August 17, 2023. We anticipate issuing a biological opinion that will determine whether the proposed actions are likely to jeopardize the continued existence of any listed species or destroy or adversely modify any designated critical habitat. This Opinion may include an Incidental Take Statement that may include Reasonable and Prudent Measures (RPMs) and implementing Terms and Conditions. It is our expectation that any of these RPMs or

terms and conditions that apply to the USACE will be incorporated as conditions of any permit you issue for this project. We may also include Conservation Recommendations (CRs) that should be considered by you as appropriate to further minimize effects of the proposed action on managed fisheries, their habitat and prey. We encourage USACE to coordinate with BOEM to ensure that your proposed action is accurately reflected in the BA and request for consultation.

Marine Mammal Protection Act (MMPA)

The MMPA prohibits the take 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 the taking will be of small numbers, have a negligible impact on the affected species or stock, and will not have an unmitigable adverse impacts on the availability of the species or stock(s) for taking for subsistence uses (where relevant). NMFS Office of Protected Resources has received a request on February 16, 2022 from the Dominion Energy, for authorization to take small numbers of marine mammals incidental to construction activities associated with the CVOW-C wind energy facility. NMFS announced the receipt of Dominion Energy's request for the development and implementation of regulations governing the incidental taking of marine mammals on September 15, 2022 through a *Federal Register* notice (87 FR 566344). Dominion's application is available online at:

https://www.federalregister.gov/documents/2022/09/15/2022-19964/taking-and-importing-marine-mammals-taking-marine-mammals-incidental-to-the-cvow-c-wind-energy.

NMFS is scheduled to publish the proposed Incidental Take Authorization (ITA) in the Federal Register in April 2023 and make a final decision regarding the ITA in March 2024, per the FAST-41 Permitting Dashboard:

https://www.permits.performance.gov/permitting-project/coastal-virginia-offshore-wind-commercial-project.

We encourage USACE to ensure the project description and related analysis in Dominion's MMPA application aligns with that provided in their USACE application.

Conclusion

Thank you for the opportunity to comment on the Public Notice for this project. We look forward to continued coordination as a partner cooperating agency on this project as it moves forward in the NEPA process. We will update you on the status of the MSA, FWCA, and ESA consultations as information becomes available and if any additional information or issues of concern arise. If you have any questions or need additional information, please contact Keith

Hanson at keith.hanson@noaa.gov regarding any MSA or FWCA issues. Should you have any questions about the ongoing Section 7 consultation process please contact Julie Crocker at Julie.Crocker@noaa.gov.

Sincerely,

Karen M. Greene
Mid-Atlantic Branch Chief
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cc: USACE NAO - M. Nash
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