



NOAA FISHERIES

PROPOSED ACTION: Issuance of Incidental Harassment Authorization for Marine Site Characterization Surveys Associated with Wind Energy Development in the Atlantic Ocean

TYPE OF STATEMENT: Environmental Assessment

LEAD AGENCY: U.S. Department of Commerce
National Oceanic and Atmospheric Administration
National Marine Fisheries Service

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LOCATION: U.S. Atlantic Ocean, waters offshore North Carolina and Virginia

ABSTRACT: This Environmental Assessment analyzes the environmental impacts of the National Marine Fisheries Service, Office of Protected Resources' proposal to issue an Incidental Harassment Authorization, pursuant to section 101(a)(5)(D) of the Marine Mammal Protection Act to Avangrid Renewables LLC incidental to Marine Site Characterization Surveys in the Atlantic Ocean.

DATE: May 2019

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Chapter 1 Introduction and Purpose and Need

1.1. INTRODUCTION AND BACKGROUND

The National Marine Fisheries Service (NMFS) received application from Avangrid Renewables LLC (Avangrid) requesting authorization for the take of marine mammals incidental to marine site characterization surveys associated with offshore wind energy development site characterization in the Outer Continental Shelf (OCS) of the Atlantic Ocean. Avangrid is a developer that is actively planning offshore wind energy projects to serve multiple East Coast locations, including areas offshore of North Carolina and Virginia as part of the Kitty Hawk Offshore Wind Project (Project). NMFS has a statutory responsibility to authorize incidental take of marine mammals pursuant to the Marine Mammal Protection Act of 1972, as amended (MMPA; 16 U.S.C. 1361 et seq.) after receipt and review of an application if certain findings and determinations are made. In general, NMFS issues one-year incidental harassment authorizations (IHAs) for small numbers of marine mammals to an applicant if the proposed take is: incidental to an otherwise lawful activity, limited to harassment, occurs within a specific geographic area, will have a negligible impact on affected marine mammal species, and subject to appropriate mitigation, monitoring and reporting requirements.

In addition, the National Environmental Policy Act (NEPA), 40 Code of Federal Regulations (CFR) Parts 1500 -1508, and National Oceanic and Atmospheric Administration (NOAA) policy and procedures¹ require all proposals for major federal actions be reviewed with respect to environmental consequences on the human environment. NMFS determined that preparing an Environmental Assessment (EA) is appropriate to analyze environmental impacts associated with NMFS's issuance of the IHA.

This Chapter presents a summary of NMFS' authority to authorize take of marine mammals incidental to specified activities other than commercial fishing (Section 1.2) and a summary of the applicants' requests and survey locations (Sections 1.3), and identifies NMFS' proposed action and purpose and need (Section 1.4). This Chapter also explains the environmental review process (1.5) and provides other information relevant to the analysis in this EA, such as compliance with applicable environmental laws (Section 1.6) and the scope of the analysis (Section 1.7). The remainder of this EA is organized as follows:

- Chapter 2 describes the applicant's activities and the alternatives carried forward for analysis as well as alternatives not carried forward for analysis.
- Chapter 3 describes the baseline conditions of the affected environment.
- Chapter 4 describes the direct, indirect, and cumulative impacts to the affected environment, specifically impacts to marine mammals and their habitat associated with NMFS's proposed action and alternatives.

¹ NOAA Administrative Order (NAO) 216-6A "Compliance with the National Environmental Policy Act, Executive Orders 12114, Environmental Effects Abroad of Major Federal Actions; 11988 and 13690, Floodplain Management; and 11990, Protection of Wetlands" issued April 22, 2016 and the Companion Manual for NAO 216-6A "Policy and Procedures for Implementing the National Environmental Policy Act and Related Authorities" issued January 13, 2017.

On October 4, 2018, NMFS received a request from Avangrid for an IHA to take marine mammals incidental to High-Resolution Geophysical (HRG) survey investigations off the coast of North Carolina in the OCS-A 0508 Lease Area and in the coastal waters of Virginia and North Carolina where one or more cable route corridors will be established to support the development of an offshore wind project.

A revised application was received on February 21, 2019, and NMFS deemed that request to be adequate and complete.

Avangrid plans to conduct HRC and geotechnical surveys. This will include the use of multi-beam echosounders, side-scan sonars, shallow penetration sub-bottom profilers, medium penetration sub-bottom profilers, marine magnetometers, benthic drop down video and grab samples.

Avangrid's survey activities off the coast of North Carolina and Virginia will last for approximately 37 days. The anticipated start date for the survey is June 1, 2019.

The general area for Avangrid's planned survey is in Lease Area OCS-A 0508 located 31.3 nautical miles off the coast of Currituck, North Carolina in Federal waters of the United States. In addition, multiple cable route corridors will be surveyed that are 30 to 70 nautical miles in length and extend from the lease area to landfall locations to be determined.

1.4. PURPOSE AND NEED

1.4.1. Description of the Proposed Action

NMFS proposes to issue an IHA to Avangrid pursuant to Section 101(a)(5)(D) of the MMPA and 50 CFR Part 216. The IHA will be valid for one year from the date the IHA is issued, and will authorize takes, by Level B harassment, of marine mammals incidental to the surveys in the Project Area. The impacts of underwater noise associated with the surveys have the potential to cause marine mammals within or near the survey areas to be harassed, thus, the activities warrant authorization, in the form of an IHA, from NMFS. NMFS' proposed action is a direct outcome of Avangrid's request for an IHA to take marine mammals.

1.4.2. Purpose

The purpose of NMFS' action is to authorize take of marine mammals incidental to the marine site characterization surveys proposed by Avangrid, consistent with applicable legal requirements. Acoustic stimuli from use of certain equipment has the potential to cause harassment of marine mammals, and thus the survey activities warrant an IHA from NMFS. The IHA will allow Avangrid to take small numbers of marine mammals within a specific geographic region incidental to the specified activities.

To authorize the incidental take of marine mammals, NMFS evaluates the best available scientific information to determine whether the take would have a negligible impact on marine mammals or stocks and determines whether mitigation will achieve the least practicable impact on species. NMFS also determines whether the activity would have an unmitigable impact on the availability of affected marine mammal species for subsistence use pursuant to the MMPA.

made the IHA applications available for public review and comment and, separately, published the proposed IHA April 25, 2019 (84 FR 17384) in the Federal Register. NMFS alerted the public it intended to use the MMPA public review process for the proposed IHA to solicit relevant environmental information and provide the public an opportunity to submit comments.

The Federal Register notice for the proposed IHA included a detailed description of the proposed action resulting from the MMPA incidental take authorization process; consideration of environmental issues and impacts of relevance related to the proposed issuance of the IHA; and potential mitigation and monitoring measures to avoid and minimize potential adverse impacts to marine mammals and their habitat. The Federal Register notice of the proposed IHA and the corresponding public comment period are instrumental in providing the public with information on relevant environmental issues and offering the public a meaningful opportunity to provide comments for our consideration in both the MMPA and NEPA decision-making processes. Avangrid's application is posted on our web site concurrently with the release of the Federal Register notices of the proposed IHA at: www.fisheries.noaa.gov/national/marine-mammal-protection/incidental-take-authorizations-other-energy-activities-renewable.

During the 30-day public comment period following the publishing of the proposed IHA, NMFS received a comment letter from the Marine Mammal Commission (Commission) and a letter from a group of non-governmental organizations (NGOs). The Commission recommended that, until the behavior thresholds are updated, NMFS require applicants to use the 120- rather than 160-dB re 1 μ Pa threshold for intermittent, non-impulsive sources (i.e., parametric SBPs, chirps, echosounders, and other sonars). In response, NMFS stated that certain sub-bottom profiling systems are appropriately considered to be impulsive sources (e.g., boomers, sparkers); therefore, the threshold of 160 dB re 1 μ Pa will continue to be used for those sources. The NGOs recommended that we revise take numbers and mitigation measures, increase the size of exclusion zones, restrict the timing of the survey to avoid North Atlantic right whales, require a speed restriction for all survey vessels, and consider additional sighting and acoustic data to inform take and mitigation measures. All comments received in response to the publication of the proposed IHA were considered and used to inform the analysis in this Final EA and to develop mitigation, monitoring and other conditions for the final IHA. A more detailed summary of the comments, and NMFS' responses to those comments, is included in the *Federal Register* notice for the issued final IHA

1.6. OTHER ENVIRONMENTAL LAWS OR CONSULTATIONS

NMFS must comply with all applicable federal environmental laws and regulations necessary to implement a proposed action. NMFS's evaluation of and compliance with environmental laws and regulations is based on the nature and location of the applicants proposed activities and NMFS's proposed action. Therefore, this section only summarizes environmental laws applicable to NMFS's issuance of the IHA to Avangrid.

1.6.1. Endangered Species Act

The ESA establishes a national program for conserving threatened and endangered species of fish, wildlife, plants, and the habitat they depend on. An endangered species is a species in danger of extinction throughout all or a significant portion of its range, and a threatened species

The three ESA-listed large whales that could potentially be present in the survey area occur at very low densities, and the calculated numbers of potential acoustic exposures above the 160-dB threshold in the absence of mitigation are small (*i.e.*, one right whale exposure, zero sei whale exposures, and eight fin whale exposures). Avangrid proposed a 500 m (1,640 ft) exclusion zone for the right whale and NMFS recommended a 200 m (656 ft) exclusion zone for sei and fin whales. These exclusion zones exceed (in the case of right whales) or equal (in the case of sei and fin whales) the distance to the conservatively calculated Level B harassment isopleth. Given the low likelihood of exposure in context of the proposed mitigation requirements (with relatively high detection probabilities for large whales at these distances during good visibility), we believe that there is not a reasonably anticipated potential for the specified activity to cause the disruption of behavioral patterns for these species. Therefore, we determined that consultation under section 7 of the ESA was not warranted.

1.6.2. Magnuson-Stevens Fishery Conservation and Management Act

Under the Magnuson-Stevens Fishery Conservation and Management Act (MSA; 16 U.S.C. 1801 et seq.), federal agencies are required to consult with the Secretary of Commerce with respect to any action authorized, funded, undertaken or proposed to be authorized by such agency that may adversely affect essential fish habitat (EFH) identified under the MSFCMA.

EFH was identified and is present in the Project Area for several species of shark, flounder, tuna, monkfish, squid, herring, bluefish, bass, skate, scup, and butterfish while no habitat areas of particular concern were identified. Authorizing the take of marine mammals through the issuance of an IHA is unlikely to affect the ability of the water column or substrate to provide necessary spawning, feeding, breeding or growth to maturity functions for managed fish. Likewise, authorizing the take of marine mammals is not likely to reduce (directly or indirectly) the quantity or quality of EFH by affecting the physical, biological or chemical parameters of EFH. Marine mammals were not identified as a prey component of EFH for managed fish species in this area, so authorizing the incidental take of marine mammals will likely not reduce the quantity and/or quality of EFH. Finally, none of the required mitigation or monitoring elements in the IHA have the ability to affect EFH. Therefore, pursuant to NMFS Office of Habitat Conservation 2017 guidance on EFH and ITAs, NMFS determined issuance of an IHA to Avangrid will not result in adverse impacts to EFH and that a separate consultation per Section 305(B)(2) of the MSFCMA as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267) is not required.

1.7. SCOPE OF THE ENVIRONMENTAL ANALYSIS

NMFS prepared this draft EA in accordance with NEPA (42 USC 4321, et seq.), CEQ Regulations (40 CFR 1500-1508), and NOAA policy and procedures set forth in the Companion Manual for NAO 216-6A. The analysis in this EA addresses potential direct, indirect, and cumulative impacts to marine mammals and their habitat, resulting from NMFS's proposed action to authorize incidental take associated with Avangrid's proposed survey activities. However, the scope of this analysis is limited to the decision for which we are responsible (*i.e.*, whether to issue the IHA). Therefore, this EA is intended to provide focused information on the primary impacts of environmental concern specific to authorizing take of marine mammals and the mitigation and monitoring measures to minimize the effects of that take. For these reasons, this EA does not provide a detailed evaluation of the effects to the elements of the human

Chapter 2 Alternatives

2.1. INTRODUCTION

As described in Chapter 1, the NMFS Proposed Action is to issue an IHA to authorize the take of small numbers of marine mammals incidental to Avangrid's marine site characterization survey activities. NMFS' Proposed Action is triggered by Avangrid's request for an IHA per the Marine Mammal Protection Act of 1972, as amended (MMPA; 16 U.S.C. 1361 *et seq.*). In accordance with the National Environmental Policy Act (NEPA) and the Council on Environmental Quality (CEQ) Regulations, NMFS is required to consider a range of alternatives to the Proposed Action as well as the No Action. The evaluation of alternatives under NEPA assists NMFS with ensuring that any unnecessary impacts are avoided through an assessment of alternative ways to achieve the purpose and need for our Proposed Action that may result in less environmental harm. For the purposes of this EA, an alternative will only meet the purpose and need if it satisfies the requirements under section 101(a)(5)(D) the MMPA. Therefore, NMFS applied the screening criteria and considerations outlined in Section 2.1 to the alternatives to identify which alternatives to carry forward for analysis. Accordingly, reasonable alternatives are carried forward for evaluation under NEPA while alternatives considered but determined not to meet purpose and need are not carried forward.

2.2. CRITERIA AND CONSIDERATIONS FOR SELECTING ALTERNATIVES

Under Section 101(a)(5)(D) of the MMPA, NMFS must set forth the permissible methods of taking pursuant to such activity, and other means of effecting the least practicable adverse impact on such species or stock and its habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance, and on the availability of such species or stock for taking for certain subsistence uses ("least practicable adverse impact"). Consideration of the availability of marine mammal species or stocks for taking for subsistence uses pertains only to Alaska, and is therefore not relevant here. NMFS does not have a regulatory definition for "least practicable adverse impact." However, NMFS's implementing regulations require applicants for incidental take authorizations to include information about the availability and feasibility (economic and technological) of equipment, methods, and manner of conducting such activity or other means of effecting the least practicable adverse impact upon the affected species or stocks and their habitat (50 CFR 216.104(a)(11)). In evaluating how mitigation may or may not be appropriate to ensure the least practicable adverse impact on species or stocks and their habitat, NMFS carefully considers two primary factors:

- (1) The manner in which, and the degree to which, implementation of the measure(s) is expected to reduce impacts to marine mammal species or stocks, their habitat, and their availability for subsistence uses (when relevant). This analysis will consider such things as the nature of the potential adverse impact (such as likelihood, scope, and range), the likelihood that the measure will be effective if implemented, and the likelihood of successful implementation.
- (2) The practicability of the measure for applicant implementation includes consideration of cost and the impact on operations and personnel safety.

Mitigating these types of effects is intended to reduce the likelihood that the activity will result in energetic or other types of impacts that are more likely to result in reduced reproductive success or survivorship. It is also important to consider the degree of impacts expected in the absence of mitigation in order to assess the benefit of any potential measures. Finally, because the least practicable adverse impact standard authorizes NMFS to weigh a variety of factors when evaluating appropriate mitigation measures, it does not compel mitigation for every kind of individual take, even when practicable for implementation by the applicant.

2.3. DESCRIPTION OF APPLICANT’S PROPOSED ACTIVITIES

Avangrid proposes to conduct marine site characterization survey investigations in the areas of the Commercial Lease of Submerged Lands for Renewable Energy Development on the Outer Continental Shelf (OCS) lease areas OCS-A-0508 and coastal waters where cable route corridors will be established. Our notice of the proposed IHA and Avangrid’s IHA application provide detailed descriptions of Avangrid’s proposed activities for the Project. That information is incorporated herein by reference and summarized below.

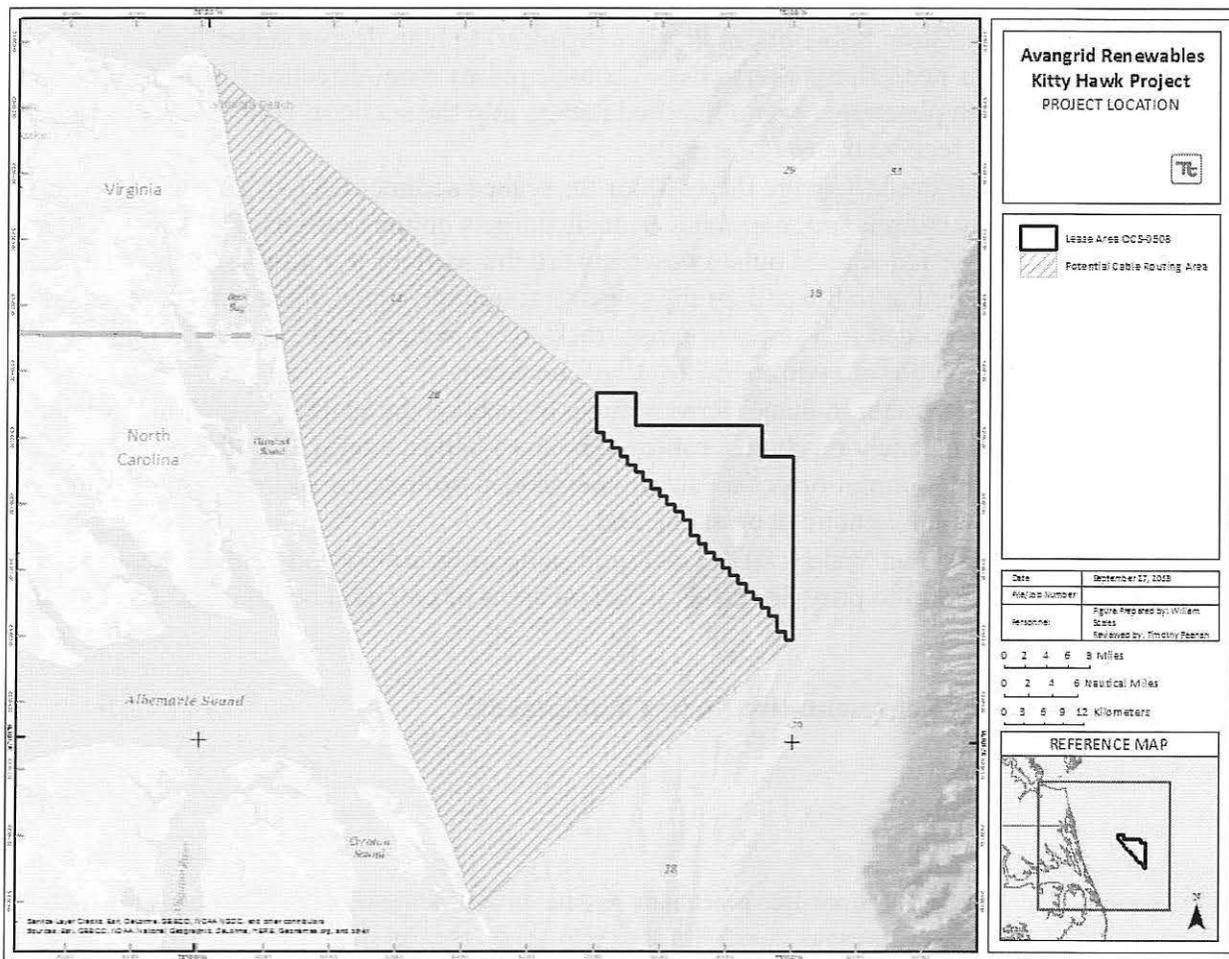


Figure 1. Project Location in OCS-A-0508 off the coast of North Carolina and Virginia

HRG System	Representative HRG Survey Equipment	Operating Frequencies	Peak Source Level	RMS Source Level	Pulse Duration (ms)	Beam Width (degree)	Signal Type
Subsea Positioning / USBL ¹	Sonardyne Ranger 2 USBL	35-50 kHz	200 dB _{peak}	188 dB _{RMS}	16	180	FM Chirp
Sidescan Sonar	Klein 3900 Sidescan Sonar	445 kHz/ 900 kHz	226 dB _{peak}	220 dB _{RMS}	0.016 to 0.100	1 to 2	Impulse
Shallow penetration sub-bottom profiler	EdgeTech 512i	0.4 to 12 kHz	186 dB _{peak}	179 dB _{RMS}	1.8 to 65.8	51 to 80	FM Chirp
Parametric Shallow penetration sub-bottom profiler	Innomar parametric SES-2000 Standard	85 to 115 kHz	243 dB _{peak}	236 dB _{RMS}	0.07 to 2	1	FM Chirp
Medium penetration sub-bottom profiler	SIG ELC 820 Sparker	0.9 to 1.4 kHz	215 dB _{peak}	206 dB _{RMS}	0.8	30 ²	Impulse
Multibeam Echo Sounder	Reson T20-P	200/300/400 kHz	227 dB _{peak}	221 dB _{RMS}	2 to 6	1.8 ±0.2°	Impulse

1: Equipment information not provided in Crocker and Fratantonio, 2016. Information provided is based on manufacturer specifications.

2: A beamwidth of 30 degrees from horizontal is considered typical for electrode sparker technologies. Specific beamwidth information is not readily available from the equipment manufacturer.

The geophysical and shallow geotechnical survey activities are anticipated to be supported by a vessel, or vessels, capable of maintaining course and a survey speed of approximately 4 nautical miles per hour (knots, 7 kilometers per hour [km/hr]) while transiting survey lines. Surveys will be conducted along tracklines spaced 150 m (98 ft) apart, with tie-lines spaced every 500 m (1640 ft). Survey activities will be executed in compliance with the July 2015 *BOEM Guidelines for Providing Geophysical, Geotechnical, and Geohazard Information Pursuant to 30 CFR Part 585*.

2.3.1. Specified Time and Specified Area

The IHA will be effective for one year from the IHA issuance date, however the actual duration of site characterization surveys is expected to be approximately 37 days in the lease area and 8 days in the cable route corridor off the coast of North Carolina and Virginia.

Avangrid's survey activities will occur within the following areas:

- Lease Area OCS-0508, which is approximately 122,317 acres and is located 31.3 nautical miles east of Currituck, North Carolina, with water depths that range from 20 to 50 m (66 to 164 feet (ft)); and

- a 200 m EZ for other ESA-listed whales including fin whales and sei whales; and
 - 100 m (328 ft) exclusion zone for other large cetaceans (i.e. humpback whale, minke whale, pilot whale, Risso's dolphin).
4. Ramp-up for geophysical activities: A ramp-up procedure will be used at the beginning of geophysical survey activities when technically feasible in order to provide additional protection to marine mammals by allowing them to vacate the area prior to the commencement of survey equipment use. Ramp-up would begin with the power of the smallest geophysical equipment at its lowest practical power output appropriate for the survey. The power would then be gradually turned up and other acoustic sources added gradually.

Avangrid is required to submit draft monitoring reports to the NMFS Office of Protected Resources within 90 days after the conclusion of the activities. Final reports shall be prepared and submitted within 30 days following resolution of any comments on the draft reports from NMFS. A description of the activities conducted by Avangrid and the monitoring protocols would be included in the reports.

In our *Federal Register* notice for the proposed IHA, which we incorporate by reference, NMFS preliminarily determined that the measures included in the proposed IHA were sufficient to reduce the effects of Avangrid's activities on marine mammals to the level of least practicable adverse impact. In addition, we described our analyses of impacts and preliminarily determined that the taking of small numbers of marine mammals, incidental to Avangrid's projects, would have a negligible impact on the relevant species or stocks and would not have an unmitigable adverse impact on affected species or stocks for taking for subsistence uses. Our final IHA contains the same requirements and the *Federal Register* notice for the final IHA affirms the preliminary findings. Accordingly, this Preferred Alternative would satisfy the purpose and need of our proposed action under the MMPA— issuance of an IHA, along with required mitigation and monitoring measures, that meets the standards set forth in section 101(a)(5)(D) of the MMPA and the implementing regulations.

2.4.2. Alternative 2 – No Action Alternative

In accordance with NOAA's implementing procedures, the Companion Manual (CM) for NAO 216-6A, Section 6.B.i, NMFS is defining the No Action alternative as not authorizing the requested incidental take of marine mammals under Section 101(a)(5)(D) of the MMPA. This is consistent with our statutory obligation under the MMPA to either: (1) deny the requested authorization or (2) grant the requested authorization and prescribe mitigation, monitoring, and reporting requirements. Under the No Action Alternative, NMFS would not issue an IHA to Avangrid, in which case we assume the company would not proceed with their proposed survey activities as described in the application. The requested take would not occur and mitigation, monitoring and reporting for marine mammals would not be implemented. Although the No Action Alternative would not meet the purpose and need to allow incidental takes of marine mammals under certain conditions (i.e., when the statutory requirements are satisfied), the CEQ Regulations require consideration and analysis of a No Action Alternative for the purposes of

Chapter 3 Affected Environment

NMFS reviewed all relevant environmental, cultural, historical, social, and economic resources based on the specific geographic region associated with NMFS's proposed action, alternatives, and the applicants request for an IHA. Based on this review, this section describes the affected environment and existing (baseline) conditions for select resource categories (e.g., marine environment). As explained in Chapter 1, certain resource categories were not carried forward for further consideration or evaluation in this EA (see Table 1 in Section 1.5) and where appropriate, the analyses in the proposed IHA related to select resource categories carried forward are incorporated by reference. Chapter 4 provides an analysis and description of environmental impacts associated with the affected environment.

3.1. BIOLOGICAL ENVIRONMENT

The primary component of the biological environment that would be impacted by the proposed action and alternatives would be marine mammals, which would be directly impacted by the incidental take. We briefly summarize this component of the biological environment here.

3.1.1. Marine Mammal Habitat

We presented information on marine mammal habitat and the potential impacts to marine mammal habitat in the *Federal Register* notice of the proposed IHA. In summary, no critical habitat is listed in the Project Area. However, the area is considered part of a biologically significant migratory area for North Atlantic right whales (Waring et al., 2016).

We also presented information on marine mammal habitat, including prey species, and the potential impacts to marine mammal habitat in the *Federal Register* notices of the proposed IHA. These are further described in the IHA application. Forage fish and other marine mammal prey are generally anticipated to be present in the project area but not in high densities. Effects on Essential Fish Habitat (EFH) by the project and issuance of the IHA assessed here would be temporary and minor. The main effect would be short-term disturbance that might lead to temporary and localized relocation of the fish species or their food. The actual physical and chemical properties of the EFH will not be impacted.

3.1.2. Ambient Sound

We presented information on ambient sound and the potential impacts to marine mammal habitat in the *Federal Register* notice of the proposed IHA.

The need to understand the marine acoustic environment is critical when assessing the effects of anthropogenic noise on marine wildlife. Sounds generated by site characterization surveys such as geophysical activities within the marine environment can affect its inhabitants' behavior (e.g., deflection from loud sounds) or ability to effectively live in the marine environment (e.g., masking of sounds that could otherwise be heard).

Ambient sound levels are the result of numerous natural and anthropogenic sounds that can propagate over large distances and vary greatly on a seasonal and spatial scale. These ambient sounds occupy all frequencies and contributions in ocean soundscape from a few hundred Hz to

Minke whale	<i>Balaenoptera acutorostrata</i>	Canadian East Coast	-/-; N	2,591 (0.81; 1,425)	14	7.5
Superfamily Odontoceti (toothed whales, dolphins, and porpoises)						
Family Delphinidae						
Short-finned pilot whale	<i>Globicephala macrorhynchus</i>	WNA	-/-; Y	21,515 (0.37; 15,913:2011)	159	192
Long-finned pilot whale	<i>Globicephala melas</i>	WNA	-/-; Y	5,636 (0.63; 3,464)	35	38
Bottlenose dolphin	<i>Tursiops spp.</i>	WNA Offshore	-/-; N	77,532 (0.40; 56053; 2016)	561	39.4
		WNA Southern Migratory Coastal	-/-; Y	3,751 (0.060; 2,353; 2017)	23	0-12.3
Short beaked common dolphin	<i>Delphinus delphis</i>	WNA	-/-; N	70,184 (0.28; 55,690;2011)	557	406
Atlantic white-sided dolphin	<i>Lagenorhynchus acutus</i>	WNA	-/-; N	48,819 (0.61; 30,403; 2011)	304	30
Atlantic spotted dolphin	<i>Stenella frontalis</i>	WNA	-/-; N	44,715 (0.43; 31,610; 2013)	316	0
Risso's dolphin	<i>Grampus griseus</i>	WNA	-/-; N	18,250 (0.5; 12,619; 2011)	126	49.7
Family Phocoenidae (porpoises)						
Harbor porpoise	<i>Phocoena phocoena</i>	Gulf of Maine/Bay of Fundy	-/-; N	79,833 (0.32; 61,415; 2011)	706	255

1 - Endangered Species Act (ESA) status: Endangered (E), Threatened (T)/MMPA status: Depleted (D). A dash (-) indicates that the species is not listed under the ESA or designated as depleted under the MMPA. Under the MMPA, a strategic stock is one for which the level of direct human-caused mortality exceeds PBR or which is determined to be declining and likely to be listed under the ESA within the foreseeable future. Any species or stock listed under the ESA is automatically designated under the MMPA as depleted and as a strategic stock.

2- NMFS marine mammal stock assessment reports online at: <https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessment-reports-region/>. CV is coefficient of variation; Nmin is the minimum estimate of stock abundance. In some cases, CV is not applicable

3 - These values, found in NMFS's SARs, represent annual levels of human-caused mortality plus serious injury from all sources combined (e.g., commercial fisheries, ship strike). Annual M/SI often cannot be determined precisely and is in some cases presented as a minimum value or range.

Below is a description of the species that may occur in the Project Area.

North Atlantic Right Whale

The North Atlantic right whale was listed as a Federal endangered species in 1970. The right whale is a strongly migratory species, with some portion of the population moving annually between high-latitude feeding grounds and low latitude calving and breeding grounds. The present range of the western North Atlantic right whale population extends from the southeastern United States, which is utilized for wintering and calving by some individuals, to summer feeding and nursery grounds between New England and the Bay of Fundy and the Gulf of St. Lawrence (Kenney 2002; Waring *et al.* 2011). The winter distribution of much of the population that does not take part in seasonal migration is largely unknown, although offshore surveys have

species-level listing, and in its place listed four DPSs as endangered and one DPS as threatened (81 FR 62259; September 8, 2016). The remaining nine DPSs were not listed. The West Indies DPS, which is not listed under the ESA, is the only DPS of humpback whale that is expected to occur in the survey area. The best estimate of population abundance for the West Indies DPS is 12,312 individuals, as described in the NMFS Status Review of the Humpback Whale under the Endangered Species Act (Bettridge *et al.*, 2015). This abundance estimate, for the West Indies breeding population, is more appropriate for use in reference to whales that may occur in the survey area than is the estimate given in Table 2, which is specific to the Gulf of Maine feeding population.

Since January 2016, elevated humpback whale mortalities have occurred along the Atlantic coast from Maine through Florida. The event has been declared a UME. Partial or full necropsy examinations have been conducted on approximately half of the 88 known cases. A portion of the whales have shown evidence of pre-mortem vessel strike; however, this finding is not consistent across all of the whales examined so more research is needed. NOAA is consulting with researchers that are conducting studies on the humpback whale populations, and these efforts may provide information on changes in whale distribution and habitat use that could provide additional insight into how these vessel interactions occurred. More detailed information is available at: <https://www.fisheries.noaa.gov/national/marine-life-distress/2016-2018-humpback-whale-unusual-mortality-event-along-atlantic-coast#causes-of-the-humpback-whale-ume> (accessed February 25, 2019). Three previous UMEs involving humpback whales have occurred since 2000, in 2003, 2005, and 2006.

During winter, the majority of humpback whales from North Atlantic feeding areas mate and calve in the West Indies, where spatial and genetic mixing among feeding groups occurs, though significant numbers of animals are found in mid- and high-latitude regions at this time and some individuals have been sighted repeatedly within the same winter season, indicating that not all humpback whales migrate south every winter (Waring *et al.*, 2017). While migrating, humpback whales utilize the Mid-Atlantic as a migration pathway between calving/mating grounds to the south and feeding grounds in the north (Waring *et al.* 2013). Humpbacks typically occur within the Mid-Atlantic region during fall, winter, and spring months (Waring *et al.* 2012).

Fin Whale

Fin whales are common in waters of the U. S. Atlantic Exclusive Economic Zone (EEZ), principally from Cape Hatteras northward (Waring *et al.*, 2017). Fin whales are present north of 35-degree latitude in every season and are broadly distributed throughout the western North Atlantic for most of the year, though densities vary seasonally (Waring *et al.*, 2017). They are found in small groups of up to five individuals (Brueggeman *et al.*, 1987)

Present threats to fin whales are similar to other whale species, namely fishery entanglements and vessel strikes. Fin whales seem less likely to become entangled than other whale species. Glass *et al.* (2008) reported that between 2002 and 2006, fin whales belonging to the Gulf of Maine population were involved in only eight confirmed entanglements with fishery equipment. Furthermore, Nelson *et al.* (2007) reported that fin whales exhibited a low proportion of entanglements (eight reported events) during their 2001 to 2005 study along the western Atlantic. On the other hand, vessel strikes may be a more serious threat to fin whales. Eight and 10 confirmed vessel strikes with fin whales were reported by Glass *et al.* (2008) and Nelson *et al.*

Both the long-finned and short-finned pilot whale could occur in the survey area. However, the long-finned pilot whale is more generally found farther north in deeper waters along the edge of the continental shelf (a depth of 330 to 3,300 feet (100 to 1,000 meters). While long-finned pilot whales have occasionally been observed stranded as far south as South Carolina, long-finned and short-finned pilot whales tend to overlap spatially along the mid-Atlantic shelf break between New Jersey and the southern flank of Georges Bank (Payne and Heinemann 1993; Rone and Pace 2012). The latitudinal ranges of the two species remain uncertain, although south of Cape Hatteras, most pilot whale sightings are expected to be short-finned pilot whales, while north of ~42°N most pilot whale sightings are expected to be long-finned pilot whales (Hayes et al. 2018).

Bottlenose Dolphin

The bottlenose dolphin occurs in oceans and peripheral seas at both tropical and temperate latitudes. In North America, bottlenose dolphins are found in surface waters with temperatures ranging from 10 to 32°C (50 to 90°F).

There are two distinct bottlenose dolphin morphotypes: coastal and offshore. The coastal morphotype resides in waters typically less than 65.6 ft (20 m) deep, along the inner continental shelf (within 7.5 km (4.6 miles) of shore), around islands, and is continuously distributed south of Long Island, New York into the Gulf of Mexico. These coastal populations are subdivided into seven stocks based largely upon spatial distribution (Waring *et al.* 2016). Of these 7 coastal stocks, the Western North Atlantic Southern Migratory Coastal stock is common in the coastal continental shelf waters off the coast of Virginia and North Carolina (Waring *et al.* 2018). These animals often move into or reside in bays, estuaries, the lower reaches of rivers, and coastal waters. The Southern Migratory Coastal Stock is one of only two (the other being the Northern Migratory Coastal Stock) thought to make broad-scale, seasonal migrations in coastal waters of the western North Atlantic. The spatial distribution and migratory movements of the Southern Migratory Coastal Stock are poorly understood and have been defined based on movement data from satellite-tag telemetry and photo-ID studies, and stable isotope studies. The distribution of this stock is best described by satellite tag-telemetry data which provided evidence for a stock of dolphins migrating seasonally along the coast between North Carolina and northern Florida (Garrison *et al.* 2017b). Tag-telemetry data collected from two dolphins tagged in November 2004 just south of Cape Fear, North Carolina, suggested that, during October–December, this stock occupies waters of southern North Carolina (south of Cape Lookout) where it may overlap spatially with the Southern North Carolina Estuarine System (SNCES) Stock in coastal waters ≤3 km from shore. Based on the satellite telemetry data, during January–March, the Southern Migratory Coastal Stock appears to move as far south as northern Florida. During April–June, the stock moves back north to North Carolina past the tagging site to Cape Hatteras, North Carolina (Garrison *et al.* 2017b). During the warm water months of July–August, the stock is presumed to occupy coastal waters north of Cape Lookout, North Carolina, to Assateague, Virginia, including Chesapeake Bay.

The Southern Migratory Coastal stock may also overlap to some degree with the western North Atlantic Offshore stock of common bottlenose dolphins. A combined genetic and logistic regression analysis that incorporated depth, latitude, and distance from shore was used to model the probability that a particular common bottlenose dolphin group seen in coastal waters was of the coastal versus offshore morphotype (Garrison *et al.* 2017a). North of Cape Hatteras during

There are two species of spotted dolphin in the Atlantic Ocean, the Atlantic spotted dolphin (*Stenella frontalis*) and the pantropical spotted dolphin (*S. attenuata*) (Perrin *et al.* 1987).

The Atlantic spotted dolphin ranges from southern New England, south through the Gulf of Mexico and the Caribbean to Venezuela (Leatherwood *et al.* 1976; Perrin *et al.* 1994). The Atlantic spotted dolphin prefers tropical to warm temperate waters along the continental shelf 10 to 200 meters (33 to 650 feet) deep to slope waters greater than 500 meters (1640 feet) deep. They regularly occur in continental shelf waters south of Cape Hatteras and in continental shelf edge and continental slope waters north of this region (Payne *et al.* 1984; Mullin and Fulling 2003). Pantropical spotted dolphin sightings during surveys in the Atlantic have been concentrated in the slope waters north of Cape Hatteras while in waters south of Cape Hatteras sightings are recorded over the Blake Plateau and in deeper offshore waters of the mid-Atlantic. (NMFS 2014). Given that pantropical spotted dolphins are found in deeper slope waters, it is likely that only Atlantic spotted dolphins, preferring shallower waters, would be found in the survey area.

Risso's Dolphins

Risso's dolphins are distributed worldwide in tropical and temperate seas and in the Northwest Atlantic occur from Florida to eastern Newfoundland. Off the northeastern U.S. coast, Risso's dolphins are distributed along the continental shelf edge from Cape Hatteras northward to Georges Bank during spring, summer, and autumn. In winter, the range is in the mid-Atlantic Bight and extends outward into oceanic waters. In general, the population occupies the mid-Atlantic continental shelf edge year round (Hayes *et al.* 2018).

Harbor Porpoise

The harbor porpoise inhabits shallow, coastal waters, often found in bays, estuaries, and harbors. In the western Atlantic, they are found from Cape Hatteras north to Greenland. During summer (July to September), harbor porpoises are concentrated in the northern Gulf of Maine and southern Bay of Fundy region, generally in waters less than 150 m deep with a few sightings in the upper Bay of Fundy and on Georges Bank. 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. They are seen from the coastline to deep waters (>1800 m) although the majority of the population is found over the continental shelf. 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. There does not appear to be a temporally coordinated migration or a specific migratory route to and from the Bay of Fundy region. However, during the fall, several satellite-tagged harbor porpoises did favor the waters around the 92-m isobaths (Hayes *et al.* 2018)

3.2. SOCIAL ENVIRONMENT

3.2.1. Subsistence

No significant subsistence activity currently occurs within the action area.

Because of the relatively short duration of the activities and the relatively small area of the marine mammal habitat that may be affected, the impacts to marine mammals and the food sources that they utilize are not expected to cause significant or long-term consequences for individual marine mammals or marine mammal populations.

4.1.2. Impacts to Marine Mammals

We expect that behavioral disturbance or temporary displacement associated with Avangrid's survey activities have the potential to impact marine mammals and comprises the only likely source of effects to marine mammals. The level of impact on marine mammals from marine site characterization survey activities would vary depending on the species of marine mammal, the distance between the marine mammal and the project activity, the intensity and duration of the activity, and environmental conditions. Our notice of proposed IHA and Avangrid's application provide detailed descriptions of these potential effects of proposed project activities on marine mammals and can be found online at: www.fisheries.noaa.gov/national/marine-mammal-protection/incidental-take-authorizations-other-energy-activities-renewable. That information is summarized below.

The majority of impacts to marine mammals are likely to occur from geophysical survey activities. Geophysical activities associated with the site characterization surveys could cause behavioral modification and temporary displacement of marine mammals within the vicinity of the action area through noise generated from geophysical survey equipment. Elevated sound levels could cause behavioral harassment in the form of temporary avoidance of the area. We expect these impacts to be minor because we do not anticipate measurable changes to the population or impacts to rookeries, mating grounds, and other areas of similar significance and short-term because they would occur only for a finite period. These activities are not anticipated to result in injury, serious injury or mortality of any marine mammal species. We expect no long-term or substantial adverse effects on marine mammals, their habitats, or their role in the environment.

Estimated Take of Marine Mammals by Level B Incidental Harassment

Geophysical survey activities generate sounds that could potentially harass marine mammals during Avangrid's proposed site characterization surveys. Currently, NMFS uses 160 dB re 1 μ Pa as the received level for the onset of Level B harassment from impulsive sound sources (e.g. geophysical survey equipment) underwater. Table 4 summarizes the current NMFS marine mammal take criteria.

NMFS' Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing (Version 2.0) (NMFS, 2018) identifies new thresholds for predicting auditory injury, which equates to Level A harassment under the MMPA. The Guidance provides updated received levels, or acoustic thresholds, above which individual marine mammals under NMFS' jurisdiction are predicted to experience changes in their hearing sensitivity (either temporary or permanent) for all underwater anthropogenic sound sources. The Guidance established thresholds for marine mammal injury (based on the onset of Permanent Threshold Shift (PTS)) which is considered Level A take; thresholds for Level B take were not revised. NMFS has determined that due to the small size of calculated Level A harassment zones (< 5 meters), take by Level A harassment is not anticipated or authorized.

Table 6. Marine Mammal Density and Proposed Take by Level B Harassment.

Species	Lease Area		Cable Route	Corridor	Totals	
	Maximum Average Seasonal Density ¹ (No./100 km ²)	Calculated Take (No.)	Maximum Average Seasonal Density ¹ (No./100 km ²)	Calculated Take (No.)	Total Take Authorization (No.)	Percent of Population
North Atlantic right whale	0.051	1.063	0.051	0.288	0 ³	--
Humpback whale	0.466	9.631	0.102	0.581	10	1.11
Fin whale	0.328	6.773	0.128	0.729	0 ³	--
Sei whale	0.020	0.406	0.003	0.018	0	--
Minke whale	0.757	15.643	0.171	0.9722	17	0.65
Pilot whale	0.100	2.073	0.034	0.195	10 ^{4,5}	<0.01
Harbor porpoise	1.252	25.874	0.690	3.931	30	<0.01
Bottlenose dolphin (WNA southern migratory coastal) ²	0.000	0.000	49.102	104.944	105	2.8
Bottlenose dolphin (offshore) ²	6.409	132.413	49.102	174.906	307	<0.01
Short beaked common dolphin	5.241	108.275	2.144	12.221	120	0.17
Atlantic white-sided dolphin	2.482	51.288	0.320	1.826	53	0.11
Atlantic spotted dolphin	8.895	183.772	3.493	19.910	204	0.46
Risso's dolphin	0.074	1.525	0.074	0.421	40 ⁴	0.21

¹Density values from Duke University (Roberts *et al.* 2016b; 2017; 2018)

²Estimates split based on bottlenose dolphin stock preferred water depths (Reeves *et al.* 2002; Waring *et al.* 2016).

³No take proposed for authorization, as discussed below.

⁴Adjusted for group size.

have determined it will not result in significant cumulative effects to marine mammals and their habitat.

Therefore, NMFS does not anticipate these activities resulting in significant impacts on the environment, either individually, or incrementally when considered in addition to other activities.

This section provides a brief summary of the human-related activities affecting the marine mammal species in the action area.

4.3.1. Climate Change

Climate change is a reasonably foreseeable condition that may result in cumulative effects to marine mammal species in the Project Area vicinity (NMFS 2011). The 2007 Intergovernmental Panel on Climate Change concluded that there is strong evidence for global warming and associated weather changes, and humans have “very likely” contributed to the problem through burning fossil fuels and adding other “greenhouse gases” to the atmosphere (IPCC 2007). This study involved numerous models to predict changes in temperature, sea level, ice pack dynamics, and other parameters under a variety of future conditions, including different scenarios for how human populations respond to the implications of the study.

Global climate change could significantly affect the marine resources of the Northwest Atlantic Outer Continental Shelf. Possible impacts include temperature and rainfall changes, potentially rising sea levels, and changes to ocean conditions. These changes may affect the coastal marine ecosystem in the proposed project area by increasing the vertical stratification of the water column and changing the intensity and rhythms of coastal winds and upwelling. Such modifications could cause ecosystem regime shifts as the productivity of the regional ecosystem undergoes various changes related to nutrients input and coastal ocean process (USFWS 2011).

It is not clear how governments and individuals would respond to the effects of climate change, or how much future efforts would reduce greenhouse gas emissions. Although the intensity of climate change would depend on how quickly and deeply humanity responds, the models predict that the climate changes observed in the past 30 years would continue at the same or increasing rates for at least 20 years. Although we recognize that climate change is a concern for the sustainability of the entire ecosystem, it is unclear at this time the full extent to which climate change would affect marine mammals. However, given that Avangrid’s project activities would include site characterization surveys, and these impacts are temporary in nature, the immediate project is not likely to result in an increase in vessel traffic or add an incremental disturbance that would cumulatively result in significant adverse impacts to marine mammals due to climate change.

4.3.2. Marine Pollution

Marine mammals are exposed to contaminants via prey consumption, surrounding water quality, and air quality. Point and non-point source pollutants from coastal runoff, offshore mineral and gravel mining, at-sea disposal of dredged materials and sewage effluent, marine debris, and organic compounds from aquaculture are all threats to marine mammals in the project area. The long-term impacts of these pollutants, however, are difficult to measure. Persistent organic pollutants tend to bioaccumulate through the food chain; therefore, the chronic exposure of

associated with project vessel traffic would measurably affect marine mammals in the project area. The cumulative adverse effects of the proposed action on the affected populations, when added to the effects of vessel traffic, are not expected to be significant.

4.3.5. Marine Mammal Watching

Although marine mammal watching is considered by many to be a non-consumptive use of marine mammals with economic, recreational, educational and scientific benefits, it is not without potential negative impacts. One concern is that animals may become more vulnerable to vessel strikes once they habituate to vessel traffic (Swingle *et al.*, 1993; Laist *et al.*, 2001; Jensen and Silber, 2004). Another concern is that preferred habitats may be abandoned if disturbance levels are too high. Several recent research efforts have monitored and evaluated the impacts of people closely approaching, swimming, touching and feeding marine mammals and has suggested that marine mammals are at risk of being disturbed (“harassed”), displaced or injured by such close interactions. Researchers investigating the adverse impacts of marine mammal viewing activities have reported boat strikes, disturbance of vital behaviors and social groups, separation of mothers and young, abandonment of resting areas, and habituation to humans (Nowacek *et al.*, 2001, Bejder et al 2006, Higham et al 2009).

While marine mammal watching operations based out of Virginia Beach, Virginia do occur in the vicinity of the proposed project area, these only occur in the months of December through March. Avangrid’s proposed survey activities are likely to occur during the summer and fall. The cumulative adverse effects of the proposed action on the affected populations when added to the effects of marine mammal watching are not expected to be significant.

4.3.6. Geophysical and Geotechnical Surveys

Marine site characterization surveys associated with offshore wind development in the mid-Atlantic Ocean, and in the nearshore waters off North Carolina and Virginia, are a reasonably foreseeable activity that is expected to result in increased amounts of sound in the marine environment. We expect future activities to utilize geophysical and geotechnical survey equipment similar in nature to the equipment proposed for use by Avangrid as described in Chapter 2.

Additionally, deep-penetration seismic surveys associated with oil and gas exploration are a reasonably foreseeable activity in the mid-Atlantic Ocean, though not in the nearshore waters, that is expected to result in increased amounts of sound in the marine environment. These surveys use airgun arrays as an acoustic source. Airguns emit low-frequency noise into the water column, which has the potential to behaviorally disturb marine mammals and, for some species, cause auditory injury.

Seismic surveys for hydrocarbon exploration were conducted in the U.S. Mid- and South Atlantic Ocean between 1976 and 1983. Fifty-one wells were drilled in the Atlantic OCS between 1975 and 1984, including one well in the Mid-Atlantic OCS Planning Area and seven in the South Atlantic OCS Planning Area. One drillable prospect was identified in the early 1980s roughly 72 km northeast of Cape Hatteras, North Carolina in waters roughly 820 m deep (USDOI, MMS, 1998).

once the acoustic source moves a certain distance from the area, or the surveys cease. When exposure to sound ends, behavioral and/or physiological responses are expected to end relatively quickly (*e.g.*, within hours to days) (McCauley et al., 2000b). Past, current, and future geophysical surveys in aggregation cover an extremely broad area in the Atlantic Ocean. Temporal overlap of geophysical surveys within the same localized area is highly unlikely given that limited number of surveys that have taken place were spread across several decades. Presently, there are no known survey activities occurring simultaneously within a shared spatial area. Although the possibility exists that concurrent surveys could also overlap spatially in the future, this would likely be uncommon given the extent of the area under consideration and the limited availability of specialized vessels equipped to handle such work. Additionally, surveys are not continuous, lasting from a few days to several months. Given these considerations, we do not expect the duration of a sound source to be greater than moderate and intermittent in any given area.

The required mitigation and monitoring measures implemented as part of these surveys will reduce or eliminate the potential for impacts to marine mammals. The surveys are not expected to result in injury or in any long-term avoidance of survey areas. NMFS finds that when these measures are considered in combination with the large ocean expanses over which surveys occur and the comparatively short survey durations (several months), the potential impacts to marine mammals are both temporary and relatively minor. Therefore, NMFS does not expect aggregate impacts from geophysical and geotechnical surveys to affect rates of recruitment or survival, either alone or in combination with other past, present, or ongoing activities. Furthermore, cumulative adverse effects of the proposed action on the affected populations are not expected to be significant.

4.3.7. Military Activity

Various military activities are reasonably foreseeable in the mid-Atlantic Ocean, both in nearshore and offshore waters, that is expected to result in increased amounts of sound in the marine environment—Typical military activities include air-to-air, air-to-surface, and surface-to-surface naval fleet training, submarine and antisubmarine training, and Air Force exercises. Naval vessels and aircraft that conduct operations not compatible with commercial or recreational activity are confined to designated range complexes with associated Operating Areas (OPAREAs) and Special Use Airspace. Comprehensive summaries of the Navy's activities can be found in recent Navy Environmental Impact Statements (*e.g.*, Atlantic Fleet Training and Testing (AFTT) Study Area final EIS/OEIS, published in September 2018: www.aftteis.com) and other documents related to previous phases of the Navy's activities in the AFTT Study Area on NMFS's website: www.fisheries.noaa.gov/national/marine-mammalprotection/incidental-take-authorizations-military-readiness-activities. Three military-related Range Complexes occur near the Project Area. These include the Virginia Capes (VACAPES) Range Complex, which extends along the coastline of Delaware to North Carolina; the Navy Cherry Point Range Complex off the coast of North Carolina and South Carolina; the Jacksonville Range Complex along the coast from North Carolina to Florida.

Though fisheries may adversely impact some marine mammal species in the Project Area, none of the proposed activities would be directed at commercial or recreational fishing or would likely have any impact on commercial fishing in the action area. No significant direct impacts are expected from the action of issuing an IHA for the incidental take of small numbers of marine mammals to Avangrid. No significant indirect impacts are expected from Avangrid conducting site characterization survey activities in the Project Area. The cumulative adverse effects of the proposed action on the affected populations, when added to the effects of fisheries, are not expected to be significant.

4.4. CONCLUSION

Based on the description and analysis of NMFS's activity provided in this EA and in the notice of proposed IHA, the analysis herein supports our conclusion that, with the incorporation of the proposed monitoring and mitigation measures, the issuance of an IHA to Avangrid for take of marine mammals incidental to conducting marine site characterization survey activities would not result in any significant direct, indirect, or cumulative impacts to the human environment as we anticipate no adverse effects at the population level. We do not expect the applicants' activities to affect annual rates of recruitment or survival of marine mammal species or stocks. We expect impacts to marine mammals to be temporary and localized around the survey vessels, remain within the bounds of the established take authorizations (Table 6), and that the required mitigation and monitoring provide substantial protection to marine mammals and their habitat.

Chapter 6

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