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DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

RIN 0648-XF850

Takes of Marine Mammals Incidental to Specified Activities; Taking Marine Mammals Incidental to Site Characterization Surveys off of New York

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

ACTION: Notice; Issuance of an Incidental Harassment Authorization.

SUMMARY: In accordance with the regulations implementing the Marine Mammal Protection Act (MMPA) as amended, notification is hereby given that NMFS has issued an incidental harassment authorization (IHA) to Statoil Wind U.S. LLC (Statoil) to incidentally harass, by Level B harassment only, marine mammals during marine site characterization surveys off the coast of New York as part of the Empire Wind Project in the area of the Commercial Lease of Submerged Lands for Renewable Energy Development on the Outer Continental Shelf (OCS-A 0512) (Lease Area) and coastal waters where one or more cable route corridors will be established.

DATES: This Authorization is valid for one year from the date of issuance.

FOR FURTHER INFORMATION CONTACT: Jordan Carduner, Office of Protected Resources, NMFS, (301) 427-8401. Electronic copies of the applications and supporting documents, as well as a list of the references cited in this document, may be obtained by visiting the Internet at: *www.fisheries.noaa.gov/national/marine-mammal-protection/incidental-take-*

authorizations-other-energy-activities-renewable. In case of problems accessing these documents, please call the contact listed above.

SUPPLEMENTARY INFORMATION:

Background

Sections 101(a)(5)(A) and (D) of the MMPA (16 U.S.C. 1361 *et seq*.) direct the Secretary of Commerce (as delegated to NMFS) to allow, upon request, the incidental, but not intentional, taking of small numbers of marine mammals by U.S. citizens who engage in a specified activity (other than commercial fishing) within a specified geographical region if certain findings are made and either regulations are issued or, if the taking is limited to harassment, a notice of a proposed authorization is provided to the public for review.

An authorization for incidental takings shall be granted if NMFS finds that the taking will have a negligible impact on the species or stock(s), will not have an unmitigable adverse impact on the availability of the species or stock(s) for subsistence uses (where relevant), and if the permissible methods of taking and requirements pertaining to the mitigation, monitoring and reporting of such takings are set forth.

NMFS has defined "negligible impact" in 50 CFR 216.103 as an impact resulting from the specified activity that cannot be reasonably expected to, and is not reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival.

The MMPA states that the term "take" means to harass, hunt, capture, or kill, or attempt to harass, hunt, capture, or kill any marine mammal.

Except with respect to certain activities not pertinent here, the MMPA defines "harassment" as any act of pursuit, torment, or annoyance which (i) has the potential to injure a marine mammal or marine mammal stock in the wild (Level A harassment); or (ii) has the

potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering (Level B harassment).

Summary of Request

On November 9, 2017, NMFS received a request from Statoil for an IHA to take marine mammals incidental to marine site characterization surveys off the coast of New York as part of the Empire Wind Project in the area of the Commercial Lease of Submerged Lands for Renewable Energy Development on the Outer Continental Shelf (OCS-A 0512) and coastal waters where one or more cable route corridors will be established. A revised application was received on January 8, 2018. NMFS deemed that request to be adequate and complete. Statoil's request is for take of 11 marine mammal species by Level B harassment. Neither Statoil nor NMFS expects serious injury or mortality to result from this activity and the activity is expected to last no more than one year, therefore, an IHA is appropriate.

Description of the Specified Activity

Statoil plans to conduct marine site characterization surveys in the marine environment of the approximately 79,350-acre Lease Area located approximately 11.5 nautical miles (nm) from Jones Beach, New York (see Figure 1 in the IHA application). Additionally, one or more cable route corridors will be established between the Lease Area and New York, identified as the Cable Route Area (see Figure 1 in the IHA application). Cable route corridors are anticipated to be 152 meters (m, 500 feet (ft)) wide and may have an overall length of as much as 135 nm. For the purpose of this IHA, the survey area is designated as the Lease Area and cable route corridors. Water depths across the Lease Area range from approximately 22 to 41 m (72 to 135 ft) while the cable route corridors will extend to shallow water areas near landfall locations.

Surveys will last for approximately 20 weeks. This schedule is based on 24-hour operations and includes potential down time due to inclement weather.

The purpose of the surveys are to support the siting, design, and deployment of up to three meteorological data buoy deployment areas and to obtain a baseline assessment of seabed/sub-surface soil conditions in the Lease Area and cable route corridors to support the siting of the proposed offshore wind farm. Underwater sound resulting from Statoil's site characterization surveys has the potential to result in incidental take of marine mammals in the form of behavioral harassment.

A detailed description of the planned survey activities, including types of survey equipment planned for use, is provided in the *Federal Register* notice for the proposed IHA (83 FR 7655; February 22, 2018). Since that time, no changes have been made to the planned activities. Therefore, a detailed description is not repeated here. Please refer to that *Federal Register* notice for the description of the specific activity.

Comments and Responses

NMFS published a notice of proposed IHA in the *Federal Register* on February 22, 2018 (83 FR 7655). During the 30-day public comment period, NMFS received a comment letter from the Marine Mammal Commission (Commission) and a comment letter from a group of non-governmental organizations (NGOs), including Natural Resources Defense Council, the Wildlife Conservation Society, the National Wildlife Federation, the Conservation Law Foundation, Defenders of Wildlife, Surfrider Foundation, International Fund for Animal Welfare, the Nature Conservancy, and Southern Environmental Law Center. NMFS has posted the comments online at: *www.fisheries.noaa.gov/national/marine-mammal-protection/incidental-take-authorizations-*

other-energy-activities-renewable. The following is a summary of the public comments received and NMFS's responses.

Comment 1: The Commission expressed concern that the method used to estimate the numbers of takes, which summed fractions of takes for each species across project days, does not account for and negates the intent of NMFS' 24-hour reset policy and recommended that NMFS share the rounding criteria with the Commission in an expeditious manner.

NMFS Response: NMFS appreciates the Commission's ongoing concern in this matter. Calculating predicted takes is not an exact science and there are arguments for taking different mathematical approaches in different situations, and for making qualitative adjustments in other situations. We believe, however, that the methodology used for take calculation in this IHA remains appropriate and is not at odds with the 24-hour reset policy the Commission references. We look forward to continued discussion with the Commission on this matter and will share the rounding guidance as soon as it is ready for public review.

Comment 2: The Commission recommended that, until behavioral thresholds are updated, NMFS require applicants to use the 120-decibel (dB) re 1 micropascal (μPa), rather than 160- dB re 1μPa, threshold for acoustic, non-impulsive sources (*e.g.*, sub-bottom profilers / chirps, echosounders, and other sonars including side-scan and fish-finding).

NMFS Response: Certain sub-bottom profiling systems are appropriately considered to be impulsive sources (*e.g.*, boomers, sparkers); therefore, the threshold of 160 dB re 1μPa will continue to be used for those sources. Other source types referenced by the Commission (*e.g.*, chirp sub-bottom profilers, echosounders, and other sonars including side-scan and fish-finding) produce signals that are not necessarily strictly impulsive; however, NMFS finds that the 160-dB rms threshold is most appropriate for use in evaluating potential behavioral impacts to marine

mammals because the temporal characteristics (*i.e.*, intermittency) of these sources are better captured by this threshold. The 120-dB threshold is associated with continuous sources and was derived based on studies examining behavioral responses to drilling and dredging. Continuous sounds are those whose sound pressure level remains above that of the ambient sound, with negligibly small fluctuations in level (NIOSH, 1998; ANSI, 2005). Examples of sounds that NMFS would categorize as continuous are those associated with drilling or vibratory pile driving activities. Intermittent sounds are defined as sounds with interrupted levels of low or no sound (NIOSH, 1998). Thus, signals produced by these source types are not continuous but rather intermittent sounds. With regard to behavioral thresholds, we consider the temporal and spectral characteristics of signals produced by these source types to more closely resemble those of an impulse sound rather than a continuous sound. The threshold of 160 dB re 1μPa is typically associated with impulsive sources, which are inherently intermittent. Therefore, the 160 dB threshold (typically associated with impulsive sources) is more appropriate than the 120 dB threshold (typically associated with continuous sources) for estimating takes by behavioral harassment incidental to use of such sources.

Comment 3: The Commission requested clarification regarding certain issues associated with NMFS's notice that one-year renewals could be issued in certain limited circumstances and expressed concern that the process would bypass the public notice and comment requirements. The Commission also suggested that NMFS should discuss the possibility of renewals through a more general route, such as a rulemaking, instead of notice in a specific authorization. The Commission further recommended that if NMFS did not pursue a more general route, that the agency provide the Commission and the public with a legal analysis supporting our conclusion that this process is consistent with the requirements of section 101(a)(5)(D) of the MMPA.

NMFS Response: The process of issuing a renewal IHA does not bypass the public notice and comment requirements of the MMPA. The notice of the proposed IHA expressly notifies the public that under certain, limited conditions an applicant could seek a renewal IHA for an additional year. The notice describes the conditions under which such a renewal request could be considered and expressly seeks public comment in the event such a renewal is sought. Importantly, such renewals would be limited to circumstances where: the activities are identical or nearly identical to those analyzed in the proposed IHA; monitoring does not indicate impacts that were not previously analyzed and authorized; and, the mitigation and monitoring requirements remain the same, all of which allow the public to comment on the appropriateness and effects of a renewal at the same time the public provides comments on the initial IHA. NMFS has, however, modified the language for future proposed IHAs to clarify that all IHAs, including renewal IHAs, are valid for no more than one year and that the agency would consider only one renewal for a project at this time. In addition, notice of issuance or denial of a renewal IHA would be published in the *Federal Register*, as they are for all IHAs. Last, NMFS will publish on our web site a description of the renewal process before any renewal is issued utilizing the new process.

Comment 4: The commenters expressed concern regarding the marine mammal density estimates used to calculate take. Specifically, the commenters stated the estimates derived from models presented in Roberts *et al.* (2016) may underrepresent density and seasonal presence of large whales in the New York Bight region, and recommended that NMFS consider additional data sources in density modeling for future analyses of estimated take, including initial data from the newly launched New York Bight whale monitoring program and other State efforts, existing passive acoustic monitoring data, and opportunistic marine mammal sightings data available

from whale watching records. The commenters further asserted that the method used to estimate densities of North Atlantic right whales does not account for the potentially elevated seasonal presence of right whales in the New York Bight during March and April and recommended that NMFS adjust density estimates it derived from Roberts *et al.* (2016) to account for the higher relative presence of right whales in the New York Bight for the months when the surveys are expected to occur.

NMFS Response: NMFS has determined that the data provided by Roberts *et al.* (2016) represents the best available information concerning marine mammal density in the survey area and has used it accordingly. NMFS has considered other available information, including that cited by the commenters, and determined that it does not contradict the information provided by Roberts *et al.* (2016). The information discussed by the commenters does not provide data in a format that is directly usable in an acoustic exposure analysis and the commenters make no useful recommendation regarding how to do so. We will review the data sources recommended by the commenters and will consider their suitability for inclusion in future analyses, as requested by the commenters. Regarding the method used to estimate cetacean densities, NMFS determined the method used is conservative in that the highest seasonal density estimate was used to estimate take over the duration of the entire survey, including during seasons that would be expected to have lower densities. In the case of the North Atlantic right whale, the season with the highest predicted density was Spring, thus right whale density in March and April was in fact used to predict the species' density for the duration of the survey.

Comment 5: Regarding mitigation measures, the NGOs recommended NMFS impose a restriction on site assessment and characterization activities that have the potential to injure or harass the North Atlantic right whale from November 1st to April 30th.

NMFS Response: In evaluating how mitigation may or may not be appropriate to ensure the least practicable adverse impact on species or stocks and their habitat, we carefully consider two primary factors: (1) The manner in which, and the degree to which, the successful implementation of the measure(s) is expected to reduce impacts to marine mammals, marine mammal species or stocks, and their habitat; and (2) the practicability of the measures for applicant implementation, which may consider such things as relative cost and impact on operations.

Statoil determined the planned duration of the survey based on their data acquisition needs, which are largely driven by the Bureau of Ocean Energy Management's (BOEM's) data collection requirements prior to required submission of a construction and operations plan (COP). Any effort on the part of NMFS to restrict the months during which the survey could operate would likely have the effect of forcing the applicant to conduct additional months of surveys the following year, resulting in increased costs incurred by the applicant and additional time on the water with associated additional production of underwater noise which could have further potential impacts to marine mammals. Thus the time and area restrictions recommended by the commenters would not be practicable for the applicant to implement and would to some degree offset the benefit of the recommended measure. In addition, our analysis of the potential impacts of the survey on right whales does not indicate that such closures are warranted, as potential impacts to right whales from the survey activities would be limited to short-term behavioral responses; no marine mammal injury is expected as a result of the survey, nor is injury authorized in the IHA. Thus, in this case, the limited potential benefits of time and area restrictions, when considered in concert with the impracticability and increased cost on the part of the applicant that would result from such restrictions, suggests time and area restrictions are

not warranted in this case. Existing mitigation measures, including exclusion zones, ramp-up of survey equipment, and vessel strike avoidance measures, are sufficiently protective to ensure the least practicable adverse impact on species or stocks and their habitat.

Comment 6: Regarding mitigation measures, the NGOs recommended that NMFS require that geophysical surveys commence, with ramp-up, during daylight hours only to maximize the probability that North Atlantic right whales are detected and confirmed clear of the exclusion zone, and that, if a right whale were detected in the exclusion zone during nighttime hours and the survey is shut down, developers should be required to wait until daylight hours for ramp-up to commence.

NMFS Response: We acknowledge the limitations inherent in detection of marine mammals at night. However, similar to the discussion above regarding time and area closures, restricting the ability of the applicant to ramp-up surveys only during daylight hours would have the potential to result in lengthy shutdowns of the survey equipment, which could result in the applicant failing to collect the data they have determined is necessary, which could result in the need to conduct additional surveys the following year. This would result in significantly increased costs incurred by the applicant. Thus the restriction suggested by the commenters would not be practicable for the applicant to implement. In addition, as described above, potential impacts to marine mammals from the survey activities would be limited to short-term behavioral responses. Restricting surveys in the manner suggested by the commenters may reduce marine mammal exposures by some degree in the short term, but would not result in any significant reduction in either intensity or duration of noise exposure. No injury is expected to result even in the absence of mitigation, given the very small estimated Level A harassment zones. In the event that NMFS imposed the restriction suggested by the commenters, potentially

resulting in a second survey season of surveys required for the applicant, vessels would be on the water introducing noise into the marine environment for a significantly extended period of time. Therefore, in addition to practicability concerns for the applicant, the restrictions recommended by the commenters could result in the surveys spending increased time on the water, which may result in greater overall exposure to sound for marine mammals; thus the commenters have failed to demonstrate that such a requirement would even result in a net benefit for affected marine mammals. Therefore, in consideration of potential effectiveness of the recommended measure and its practicability for the applicant, NMFS does not believe that restricting survey start-ups to daylight hours is warranted in this case.

However, in recognition of the concerns raised by the commenters, we have added a mitigation requirement to the IHA that shutdown of geophysical survey equipment is required upon confirmed passive acoustic monitoring (PAM) detection of a North Atlantic right whale at night, even in the absence of visual confirmation, except in cases where the acoustic detection can be localized and the right whale can be confirmed as being beyond the 500 m exclusion zone (EZ); equipment may be re-started no sooner than 30 minutes after the last confirmed acoustic detection.

Comment 7: The NGOs recommended that NMFS require a 500 m EZ for marine mammals and sea turtles (with the exception of dolphins that voluntarily approach the vessel). Additionally, the NGOs recommended that protected species observers (PSOs) monitor to an extended 1,000 m EZ for North Atlantic right whales.

NMFS Response: Regarding the recommendation for a 1,000 m EZ specifically for North Atlantic right whales, we have determined that the 500 m EZ, as required in the IHA, is sufficiently protective. We note that mitigation measures also require that PSOs monitor to the

extent of the Level B zone (in this case, 1,160 m), or as far as possible if the extent of the level B zone is not visible, thus PSOs would be aware of any right whales within 1,000 m of the vessel and would be able to call for shutdown if a right whale were approaching the 500 m EZ. Regarding the commenters' recommendation to require a 500 m EZ for all marine mammals (except dolphins that approach the vessel) we have determined the EZs as currently required in the IHA (described in Mitigation Measures, below) are sufficient to ensure the least practicable adverse impact on species or stocks and their habitat. The EZs would prevent all potential instances of marine mammal injury (though in this instance, injury would not be an expected outcome even in the absence of mitigation due to very small predicted isopleths corresponding to the Level A harassment threshold (Table 4) and would further prevent some instances of behavioral harassment, as well as limiting the intensity and/or duration of behavioral harassment that does occur. As NMFS has determined the EZs currently required in the IHA to be sufficiently protective, we do not think expanded EZs, beyond what is required in the IHA, are warranted. With respect to EZs for sea turtles, we do not have the statutory authority under the MMPA to require mitigation measures specific to sea turtles.

Comment 8: The NGOs recommended that NMFS should not allow modifications of the radii of the EZs based on sound source validation data, except in the event that sound source validation data support the extension of the EZs.

NMFS Response: Our analyses, including the analysis of the mitigation measures that would ensure the least practicable adverse impact on species or stocks and their habitat, are based on the best available information. At the time of Statoil's submission of the IHA application, we determined the data presented in Crocker and Fratantonio (2016) represented the best available information on sound levels associated with high-resolution geophysical (HRG)

survey equipment planned for use by Statoil. If new information on sound levels associated with HRG survey used by Statoil becomes available, including data from field verification studies, we will determine at that time whether that new information represents the best available information, and if so, whether that information warrants revision of marine mammal EZs. The commenters requested that any modification of the EZs be limited to potential expansion of the EZs, but provide no substantive rationale for why a zone should not be modified to be contracted if sound source verification indicates that such a modification is warranted; therefore there is no basis to think that such a limitation would satisfy the standard that mitigation measures must ensure the least practicable adverse impact on species or stocks and their habitat.

Comment 9: The NGOs recommended that a combination of visual monitoring by PSOs and PAM should be required 24 hours per day, and that a combination of PAM and continual visual monitoring using night vision and infra-red should be required at night. The NGOs further recommended that at least two PSOs should be required to be on shift at any one time during daylight hours.

NMFS Response: Per the terms of BOEM's lease stipulations, the applicant is required to implement marine mammal monitoring, including having four visual PSOs and two PAM operators available, with at least one visual PSO on duty at all times and at least one PAM operator on duty at night. We have reviewed these minimum requirements and find that they are sufficient to meet the MMPA standard that mitigation measures must ensure the least practicable adverse impact on species or stocks and their habitat. We have determined the requirements for visual and acoustic monitoring are sufficient to ensure the EZs and Watch Zone are adequately monitored. While PAM can be beneficial to supplement visual monitoring, especially in low-visibility conditions, its utility is limited in that it is only beneficial when animals are vocalizing.

When potential benefits of a 24 hour PAM requirement are considered in concert with the potential increased costs on the part of the applicant that would result from such a requirement, we determined a requirement for 24 hour PAM operation is not warranted in this case.

Comment 10: The NGOs recommended that NMFS incentivize offshore wind developers to partner with scientists to collect data that would increase the understanding of the effectiveness of night vision and infra-red technologies in the New York Bight and broader region**,** with a view towards greater reliance on these technologies to commence surveys during nighttime hours in the future.

NMFS Response: NMFS agrees with the NGOs that improved data on relative effectiveness of night vision and infra-red technologies would be beneficial and could help to inform future efforts at detection of marine mammals during nighttime activities. We have no authority to incentivize such partnerships under the MMPA. However, we will encourage coordination and communication between offshore wind developers and researchers on effectiveness of night vision and infra-red technologies. In recognition of the commenters' concerns, we have also added a requirement that the final report submitted to NMFS must include an assessment of the effectiveness of night vision equipment used during nighttime surveys, including comparisons of relative effectiveness among the different types of night vision equipment used.

Comment 11: The NGOs recommended that NMFS require a 10 knot speed restriction on all project-related vessels transiting to/from the survey area from March 1st through April 30th and that all project vessels operating within the survey area should be required to maintain a speed of 10 knots or less during the entire survey period.

NMFS Response: NMFS has analyzed the potential for ship strike resulting from Statoil's activity and has determined that the mitigation measures specific to ship strike avoidance are sufficient to avoid the potential for ship strike. These include: a requirement that all vessel operators comply with 10 knot (18.5 kilometer (km)/hr) or less speed restrictions in any Seasonal Management Area (SMA) or Dynamic Management Area (DMA); a requirement that all vessel operators reduce vessel speed to 10 knots (18.5 km/hr) or less when any large whale, any mother/calf pairs, pods, or large assemblages of non-delphinoid cetaceans are observed within 100 m of an underway vessel; a requirement that all survey vessels maintain a separation distance of 500 m or greater from any sighted North Atlantic right whale; a requirement that, if underway, vessels must steer a course away from any sighted North Atlantic right whale at 10 knots or less until the 500 m minimum separation distance has been established; and a requirement that, if a North Atlantic right whale is sighted in a vessel's path, or within 100 m to an underway vessel, the underway vessel must reduce speed and shift the engine to neutral. Additional measures to prevent the potential for ship strike are discussed in more detail below (see the Mitigation section). We have determined that the ship strike avoidance measures are sufficient to ensure the least practicable adverse impact on species or stocks and their habitat. We also note that vessel strike during surveys is extremely unlikely based on the low vessel speed; the survey vessel would maintain a speed of approximately 4 knots (7.4 kilometers per hour) while transiting survey lines.

Comment 12: The NGOs recommended that NMFS account for the potential for indirect ship strike risk resulting from habitat displacement in our analyses.

NMFS Response: NMFS determined that habitat displacement was not an expected outcome of the specified activity, therefore an analysis of potential impacts to marine mammals from habitat displacement is not warranted in this case.

Comment 13: The NGOs recommended that NMFS fund analyses of recently collected marine mammal sighting and acoustic data from 2016 and continue to fund and expand surveys and studies to (i) improve our understanding of distribution and habitat use of marine mammals in the New York Bight and the broader mid-Atlantic region, and (ii) enhance the resolution of population genetic structure for humpback, fin, and blue whales. The NGOs also recommended that NMFS support an expert workshop to consider the data referred to in Comment 8, and any new information necessary to inform seasonal restrictions and mitigation measures in time for the November 2018 North Atlantic right whale migration period.

NMFS Response: We agree with the NGOs that analyses of recently collected sighting and acoustic data, as well as continued marine mammal surveys, are warranted, and we welcome the opportunity to participate in fora where implications of such data for potential mitigation measures would be discussed; however, we have no statutory authority or ability to require funding of such analyses and surveys, nor do we have the ability or authority to fund such a workshop. We note that NMFS is undertaking numerous efforts relative to recovering right whales; these include expert working groups focused on specific aspects of recovery such as ship strike mitigation and entanglement mitigation, including two subgroups under the Atlantic Large Whale Take Reduction Plan which both met within the previous month, with a further full team meeting planned for fall 2018.

Description of Marine Mammals in the Area of Specified Activity

Sections 3 and 4 of Statoil's IHA application summarize available information regarding status and trends, distribution and habitat preferences, and behavior and life history, of the potentially affected species. Additional information regarding population trends and threats may be found in NMFS's Stock Assessment Reports (SAR; *www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessment-reports-region*) and more general information about these species (*e.g.*, physical and behavioral descriptions) may be found on NMFS's website (*www.fisheries.noaa.gov/species-directory*).

Table 1 lists all species with expected potential for occurrence in the survey area and summarizes information related to the population or stock, including regulatory status under the MMPA and ESA and potential biological removal (PBR), where known. For taxonomy, we follow the Committee on Taxonomy (2017). PBR is defined by the MMPA as the maximum number of animals, not including natural mortalities, that may be removed from a marine mammal stock while allowing that stock to reach or maintain its optimum sustainable population (as described in NMFS's SARs). While no mortality is anticipated or authorized here, PBR is included here as gross indicators of the status of the species and other threats.

Marine mammal abundance estimates presented in this document represent the total number of individuals that make up a given stock or the total number estimated within a particular study or survey area. NMFS's stock abundance estimates for most species represent the total estimate of individuals within the geographic area, if known, that comprises that stock. For some species, this geographic area may extend beyond U.S. waters. All managed stocks in this region are assessed in NMFS's U.S. 2017 draft SARs (*e.g.*, Hayes *et al*., 2018). All values presented in Table 1 are the most recent available at the time of publication and are available in the 2017 draft SARs (Hayes *et al.*, 2018).

Table 1. Marine Mammals Known to Occur in the Survey Area.

Common Name	Stock	NMFS MMPA and ESA Status; Strategic (Y/N)[1]	Stock Abundance (CV,N_{min}, most recent abundance survey)[2]	PBR[3]	Occurrence and seasonality in the NW Atlantic OCS
Toothed whales (Odontoceti)					
Atlantic white-sided dolphin (*Lagenorhynchus acutus)*	W. North Atlantic	--; N	48,819 (0.61; 30,403; n/a)	304	rare
Atlantic spotted dolphin (*Stenella frontalis)*	W. North Atlantic	--; N	44,715 (0.43; 31,610; n/a)	316	rare
Bottlenose dolphin (*Tursiops truncatus)*	W. North Atlantic, Offshore	--; N	77,532 (0.40; 56,053; 2011)	561	Common year round
Clymene dolphin (*Stenella clymene)*	W. North Atlantic	--; N	Unknown (unk; unk; n/a)	Undet	rare
Pantropical Spotted dolphin (*Stenella attenuata)*	W. North Atlantic	--; N	3,333 (0.91; 1,733; n/a)	17	rare
Risso's dolphin (*Grampus griseus)*	W. North Atlantic	--; N	18,250 (0.46; 12,619; n/a)	126	rare
Short-beaked common dolphin (*Delphinus delphis)*	W. North Atlantic	--; N	70,184 (0.28; 55,690; 2011)	557	Common year round
Striped dolphin (*Stenella coeruleoalba)*	W. North Atlantic	--; N	54,807 (0.3; 42,804; n/a)	428	rare
Spinner Dolphin (*Stenella longirostris)*	W. North Atlantic	--; N	Unknown (unk; unk; n/a)	Undet	rare
White-beaked dolphin (*Lagenorhynchus albirostris)*	W. North Atlantic	--; N	2,003 (0.94; 1,023; n/a)	10	rare
Harbor porpoise (*Phocoena*	Gulf of Maine/Bay of Fundy	--; N	79,833 (0.32; 61,415; 2011)	706	Common year round

phocoena)					
Killer whale (*Orcinus orca)*	W. North Atlantic	--; N	Unknown (unk; unk; n/a)	Undet	rare
False killer whale (*Pseudorca crassidens)*	W. North Atlantic	--; Y	442 (1.06; 212; n/a)	2.1	rare
Long-finned pilot whale (*Globicephala melas)*	W. North Atlantic	--; Y	5,636 (0.63; 3,464; n/a)	35	rare
Short-finned pilot whale (*Globicephala macrorhynchus)*	W. North Atlantic	--; Y	21,515 (0.37; 15,913; n/a)	159	rare
Sperm whale (*Physeter macrocephalus)*	North Atlantic	E; Y	2,288 (0.28; 1,815; n/a)	3.6	Year round in continental shelf and slope waters, occur seasonally to forage
Pygmy sperm whale [4] (*Kogia breviceps)*	W. North Atlantic	--; N	3,785 (0.47; 2,598; n/a)	26	rare
Dwarf sperm whale [4] (*Kogia sima)*	W. North Atlantic	--; N	3,785 (0.47; 2,598; n/a)	26	rare
Cuvier's beaked whale (*Ziphius cavirostris)*	W. North Atlantic	--; N	6,532 (0.32; 5,021; n/a)	50	rare
Blainville's beaked whale [5] (*Mesoplodon densirostris)*	W. North Atlantic	--; N	7,092 (0.54; 4,632; n/a)	46	rare
Gervais' beaked whale [5] (*Mesoplodon europaeus)*	W. North Atlantic	--; N	7,092 (0.54; 4,632; n/a)	46	rare
True's beaked whale [5] (*Mesoplodon mirus)*	W. North Atlantic	--; N	7,092 (0.54; 4,632; n/a)	46	rare
Sowerby's Beaked Whale [5]	W. North Atlantic	--; N	7,092 (0.54; 4,632; n/a)	46	rare

(*Mesoplodon bidens)*					
Rough-toothed dolphin *(Steno bredanensis)*	W. North Atlantic	--; N	271 (1.0; 134; 2013)	1.3	rare
Melon-headed whale (*Peponocephala electra)*	W. North Atlantic	--; N	Unknown (unk; unk; n/a)	Undet	rare
Northern bottlenose whale (*Hyperoodon ampullatus)*	W. North Atlantic	--; N	Unknown (unk; unk; n/a)	Undet	rare
Pygmy killer whale *(Feresa attenuata)*	W. North Atlantic	--; N	Unknown (unk; unk; n/a)	Undet	rare
Baleen whales (Mysticeti)					
Minke whale (*Balaenoptera acutorostrata)*	Canadian East Coast	--; N	2,591 (0.81; 1,425; n/a)	162	Year round in continental shelf and slope waters, occur seasonally to forage
Blue whale (*Balaenoptera musculus)*	W. North Atlantic	E; Y	Unknown (unk; 440; n/a)	0.9	Year round in continental shelf and slope waters, occur seasonally to forage
Fin whale (*Balaenoptera physalus)*	W. North Atlantic	E; Y	1,618 (0.33; 1,234; n/a)	2.5	Year round in continental shelf and slope waters, occur seasonally to forage
Humpback whale (*Megaptera novaeangliae)*	Gulf of Maine	--; N	823 (0; 823; n/a)	2.7	Common year round
North Atlantic right whale (*Eubalaena glacialis)*	W. North Atlantic	E; Y	458 (0; 455; n/a)	1.4	Year round in continental shelf and slope waters, occur seasonally to forage.
Sei whale	Nova Scotia	E; Y	357 (0.52; 236; n/a)	0.5	Year round in continental

(*Balaenoptera borealis)*					shelf and slope waters, occur seasonally to forage
Earless seals (Phocidae)					
Gray seal [6] (*Halichoerus grypus)*	W. North Atlantic	--; N	27,131 (0.10; 25,908; n/a)	1,554	Unlikely
Harbor seal (*Phoca vitulina)*	W. North Atlantic	--; N	75,834 (0.15; 66,884; 2012)	2,006	Common year round
Hooded seal (*Cystophora cristata)*	W. North Atlantic	--; N	Unknown (unk; unk; n/a)	Undet	rare
Harp seal (*Phoca groenlandica)*	North Atlantic	--; N	Unknown (unk; unk; n/a)	Undet	rare

1 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 (see footnote 3) 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 CV is coefficient of variation; Nmin is the minimum estimate of stock abundance. In some cases, CV is not applicable. For certain stocks, abundance estimates are actual counts of animals and there is no associated CV. The most recent abundance survey that is reflected in the abundance estimate is presented; there may be more recent surveys that have not yet been incorporated into the estimate. All values presented here are from the 2016 Atlantic SARs.

3 Potential biological removal, defined by the MMPA as the maximum number of animals, not including natural mortalities, that may be removed from a marine mammal stock while allowing that stock to reach or maintain its optimum sustainable population size (OSP).

4 Abundance estimate includes both dwarf and pygmy sperm whales.

5 Abundance estimate includes all species of *Mesoplodon* in the Atlantic.

6 Abundance estimate applies to U.S. population only, actual abundance is believed to be much larger.

All species that could potentially occur in the survey area are included in Table 1. However, the temporal and/or spatial occurrence of 26 of the 37 species listed in Table 1 is such that take of these species is not expected to occur, and they are not discussed further beyond the explanation provided here. Take of these species is not anticipated either because they have very

low densities in the project area, are known to occur further offshore than the project area, or are considered very unlikely to occur in the project area during the survey due to the species' seasonal occurrence in the area.

A detailed description of the species likely to be affected by Statoil's survey, including brief introductions to the species and relevant stocks as well as available information regarding population trends and threats, and information regarding local occurrence, were provided in the *Federal Register* notice for the proposed IHA (83 FR 7655; February 22, 2018); since that time, we are not aware of any changes in the status of these species and stocks; therefore, detailed descriptions are not repeated here. Please refer to that *Federal Register* notice for these descriptions. Please also refer to NMFS' web site (*www.fisheries.noaa.gov/species-directory*) for generalized species accounts.

Information concerning marine mammal hearing, including marine mammal functional hearing groups, was provided in the *Federal Register* notice for the proposed IHA (83 FR 7655; February 22, 2018), therefore that information is not repeated here; please refer to that *Federal Register* notice for this information. For further information about marine mammal functional hearing groups and associated frequency ranges, please see NMFS (2016) for a review of available information. Eleven marine mammal species (nine cetacean and two pinniped (both phocid) species) have the reasonable potential to co-occur with the survey activities (Table 7). Of the cetacean species that may be present, four are classified as low-frequency cetaceans (*i.e.*, North Atlantic right whale, humpback whale, fin whale, and minke whale), four are classified as mid-frequency cetaceans (*i.e.*, sperm whale, bottlenose dolphin, common dolphin and Atlantic white-sided dolphin), and one is classified as a high-frequency cetacean (*i.e.*, harbor porpoise).

Potential Effects of Specified Activities on Marine Mammals and their Habitat

The effects of underwater noise from Statoil's survey activities have the potential to result in behavioral harassment of marine mammals in the vicinity of the survey area. The *Federal Register* notice for the proposed IHA (83 FR 7655; February 22, 2018) included a discussion of the effects of anthropogenic noise on marine mammals and their habitat, therefore that information is not repeated here; please refer to that *Federal Register* notice for that information. No instances of hearing threshold shifts, injury, serious injury, or mortality are expected as a result of the planned activities.

Estimated Take

This section provides an estimate of the number of incidental takes authorized through this IHA, which informs both NMFS' consideration of "small numbers" and the negligible impact determination.

Harassment is the only type of take expected to result from these activities. Except with respect to certain activities not pertinent here, the MMPA defines "harassment" as any act of pursuit, torment, or annoyance which (i) has the potential to injure a marine mammal or marine mammal stock in the wild (Level A harassment); or (ii) has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering (Level B harassment).

Authorized takes are by Level B harassment, as use of the survey equipment has the potential to result in disruption of behavioral patterns for individual marine mammals. NMFS has determined take by Level A harassment is not an expected outcome of the activity and thus we do not authorize the take of any marine mammals by Level A harassment. This is discussed in

greater detail below. As described previously, no mortality or serious injury is anticipated or authorized for this activity. Below we describe how the take is estimated for this project.

Described in the most basic way, we estimate take by considering: (1) acoustic thresholds above which NMFS believes the best available science indicates marine mammals will be behaviorally harassed or incur some degree of permanent hearing impairment; (2) the area or volume of water that will be ensonified above these levels in a day; (3) the density or occurrence of marine mammals within these ensonified areas; and, (4) and the number of days of activities. Below, we describe these components in more detail and present the take estimate.

Acoustic Thresholds

NMFS uses acoustic thresholds that identify the received level of underwater sound above which exposed marine mammals would be reasonably expected to be behaviorally harassed (equated to Level B harassment) or to incur PTS of some degree (equated to Level A harassment).

Level B Harassment – Though significantly driven by received level, the onset of behavioral disturbance from anthropogenic noise exposure is also informed to varying degrees by other factors related to the sound source (*e.g.*, frequency, predictability, duty cycle); the environment (*e.g.*, bathymetry); and the receiving animals (hearing, motivation, experience, demography, behavioral context); and therefore can be difficult to predict (Southall *et al.*, 2007, Ellison *et al.* 2011). NMFS uses a generalized acoustic threshold based on received level to estimate the onset of Level B (behavioral) harassment. NMFS predicts that marine mammals may be behaviorally harassed when exposed to underwater anthropogenic noise above received levels 160 dB re 1 μPa (rms) for non-explosive impulsive (*e.g.*, high resolution geophysical (HRG) equipment) or intermittent (*e.g.*, scientific sonar) sources. Statoil's activity includes the

use of impulsive sources. Therefore, the 160 dB re 1 μPa (rms) criteria is applicable for analysis of Level B harassment.

Level A harassment - NMFS' Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing (NMFS 2016) identifies dual criteria to assess auditory injury (Level A harassment) to five different marine mammal groups (based on hearing sensitivity) as a result of exposure to noise from two different types of sources (impulsive or non-impulsive). The Technical Guidance identifies the received levels, or thresholds, above which individual marine mammals are predicted to experience changes in their hearing sensitivity for all underwater anthropogenic sound sources, reflects the best available science, and better predicts the potential for auditory injury than does NMFS' historical criteria.

These thresholds were developed by compiling and synthesizing the best available science and soliciting input multiple times from both the public and peer reviewers to inform the final product, and are provided in Table 2 below. The references, analysis, and methodology used in the development of the thresholds are described in NMFS 2016 Technical Guidance, which may be accessed at: *www.nmfs.noaa.gov/pr/acoustics/guidelines.htm*. As described above, Statoil's activity includes the use of intermittent and impulsive sources.

Table 2. Thresholds Identifying the Onset of Permanent Threshold Shift in Marine Mammals.

Hearing Group	PTS Onset Thresholds	
	Impulsive*	**Non-impulsive**
Low-Frequency (LF) Cetaceans	$L_{pk,flat}$: 219 dB $L_{E,LF,24h}$: 183 dB	$L_{E,LF,24h}$: 199 dB
Mid-Frequency (MF) Cetaceans	$L_{pk,flat}$: 230 dB $L_{E,MF,24h}$: 185 dB	$L_{E,MF,24h}$: 198 dB
High-Frequency (HF) Cetaceans	$L_{pk,flat}$: 202 dB $L_{E,HF,24h}$: 155 dB	$L_{E,HF,24h}$: 173 dB
Phocid Pinnipeds (PW) (Underwater)	$L_{pk,flat}$: 218 dB $L_{E,PW,24h}$: 185 dB	$L_{E,PW,24h}$: 201 dB

Otariid Pinnipeds (OW) (Underwater)	$L_{pk,flat}$: 232 dB $L_{E,OW,24h}$: 203 dB	$L_{E,OW,24h}$: 219 dB

Note: *Dual metric acoustic thresholds for impulsive sounds: Use whichever results in the largest isopleth for calculating PTS onset. If a non-impulsive sound has the potential of exceeding the peak sound pressure level thresholds associated with impulsive sounds, these thresholds should also be considered.

Note: Peak sound pressure (Lpk) has a reference value of 1 µPa, and cumulative sound exposure level (LE) has a reference value of 1µPa2s. In this Table, thresholds are abbreviated to reflect American National Standards Institute standards (ANSI 2013). However, peak sound pressure is defined by ANSI as incorporating frequency weighting, which is not the intent for this Technical Guidance. Hence, the subscript "flat" is being included to indicate peak sound pressure should be flat weighted or unweighted within the generalized hearing range. The subscript associated with cumulative sound exposure level thresholds indicates the designated marine mammal auditory weighting function (LF, MF, and HF cetaceans, and PW and OW pinnipeds) and that the recommended accumulation period is 24 hours. The cumulative sound exposure level thresholds could be exceeded in a multitude of ways (*i.e.*, varying exposure levels and durations, duty cycle). When possible, it is valuable for action proponents to indicate the conditions under which these acoustic thresholds will be exceeded.

Ensonified Area

Here, we describe operational and environmental parameters of the activity that will feed into estimating the area ensonified above the acoustic thresholds.

The survey would entail the use of HRG survey equipment. The distance to the isopleth corresponding to the threshold for Level B harassment was calculated for all HRG survey equipment with the potential to result in harassment of marine mammals (*i.e.*, the USBL and the sub-bottom profilers) based on source characteristics as described in Crocker and Fratantonio (2016) using the practical transmission loss (TL) equation: $TL=15\log_{10}r$. Of the survey equipment planned for use that has the potential to result in harassment of marine mammals, acoustic modeling indicated the Sig ELC 820 Sparker (a type of sub-bottom profiler) would be expected to produce sound that would propagate the furthest in the water (Table 3); therefore, for the purposes of the take calculation, it was assumed the Sig ELC 820 Sparker would be active during the entirety of the survey. Thus the distance to the isopleth corresponding to the threshold

for Level B harassment for the Sig ELC 820 Sparker (1,166 m; Table 3) was used as the basis of the Level B take calculation for all marine mammals.

Table 3. Predicted Radial Distances (m) from HRG Sources to Isopleths Corresponding to Level B Harassment Threshold.

HRG System	Survey Equipment	Modeled Distance to Threshold (160 dB re 1 µPa)
Subsea Positioning / USBL	Sonardyne Ranger 2 USBL	74
Shallow penetration sub-bottom profiler	EdgeTech 512i	18
Medium penetration sub-bottom profiler	SIG ELC 820 Sparker	1,166

Predicted distances to Level A harassment isopleths, which vary based on marine mammal functional hearing groups (Table 4), were also calculated by Statoil. The updated acoustic thresholds for impulsive sounds (such as HRG survey equipment) contained in the Technical Guidance (NMFS, 2016) were presented as dual metric acoustic thresholds using both cumulative sound exposure level (SEL_{cum}) and peak sound pressure level metrics. As dual metrics, NMFS considers onset of PTS (Level A harassment) to have occurred when either one of the two metrics is exceeded (*i.e.*, metric resulting in the largest isopleth). The SEL_{cum} metric considers both level and duration of exposure, as well as auditory weighting functions by marine mammal hearing group. In recognition of the fact that calculating Level A harassment ensonified areas could be more technically challenging to predict due to the duration component and the use of weighting functions in the new SEL_{cum} thresholds, NMFS developed an optional User Spreadsheet that includes tools to help predict a simple isopleth that can be used in conjunction with marine mammal density or occurrence to facilitate the estimation of take numbers. Statoil used the NMFS optional User Spreadsheet to calculate distances to Level A harassment isopleths based on SEL_{cum} (shown in Appendix A of the IHA application) and used the practical spreading

loss model (similar to the method used to calculate Level B isopleths as described above) to calculate distances to Level A harassment isopleths based on peak pressure. Modeled distances to isopleths corresponding to Level A harassment thresholds for the Sig ELC 820 Sparker are shown in Table 4.

Table 4. Modeled Radial Distances (m) to Isopleths Corresponding to Level A Harassment Thresholds.

Functional Hearing Group (Level A harassment thresholds)	SEL_{cum}[1]	Peak SPL_{flat}
Low frequency cetaceans ($L_{pk,flat}$: 219 dB; $L_{E,LF,24h}$: 183 dB)	9.8	n/a
Mid frequency cetaceans ($L_{pk,flat}$: 230 dB; $L_{E,MF,24h}$: 185 dB)	0	n/a
High frequency cetaceans ($L_{pk,flat}$: 202 dB; $L_{E,HF,24h}$: 155 dB)	3.6	7.3
Phocid Pinnipeds (Underwater) ($L_{pk,flat}$: 218 dB; $L_{E,HF,24h}$: 185 dB)	2.6	n/a

1 Distances to isopleths based on SEL_{cum} were calculated in the NMFS optional User Spreadsheet based on the following inputs: source level of 206 dB rms, source velocity of 2.06 meters per second, pulse duration of 0.008 seconds, repetition rate of 0.25 seconds, and weighting factor adjustment of 1.4 kHz. Isopleths shown for SEL_{cum} are different than those shown in the IHA application as one of the inputs used by the applicant was incorrect which resulted in outputs that were not accurate: the applicant entered an incorrect repetition rate of 4 seconds rather than the correct repetition rate of 0.25 seconds. NMFS therefore used the NMFS optional User Spreadsheet to calculate isopleths for SEL_{cum} for the Sig ELC 820 Sparker using the correct repetition rate.

In this case, due to the very small estimated distances to Level A harassment thresholds for all marine mammal functional hearing groups, based on both SEL_{cum} and peak SPL (Table 4), and in consideration of the mitigation measures, including marine mammal exclusion zones that greatly exceed the largest modeled isopleths to Level A harassment thresholds (see the Mitigation section for more detail) NMFS determined that the likelihood of Level A take of marine mammals occurring as a result of the survey is so low as to be discountable.

We note that because of some of the assumptions included in the methods used, isopleths produced may be overestimates to some degree. The acoustic sources planned for use in Statoil's survey do not radiate sound equally in all directions but were designed instead to focus acoustic

energy directly toward the sea floor. Therefore, the acoustic energy produced by these sources is not received equally in all directions around the source but is instead concentrated along some narrower plane depending on the beamwidth of the source. However, the calculated distances to isopleths do not account for this directionality of the sound source and are therefore conservative. For mobile sources, such as Statoil's planned survey, the User Spreadsheet predicts the closest distance at which a stationary animal would not incur PTS if the sound source traveled by the animal in a straight line at a constant speed.

Marine Mammal Occurrence

In this section we provide the information about the presence, density, or group dynamics of marine mammals that will inform the take calculations.

The best available scientific information was considered in conducting marine mammal exposure estimates (the basis for estimating take). For cetacean species, densities calculated by Roberts *et al.* (2016) were used. The density data presented by Roberts *et al.* (2016) incorporates aerial and shipboard line-transect survey data from NMFS and from other organizations collected over the period 1992-2014. Roberts *et al*. (2016) modeled density from 8 physiographic and 16 dynamic oceanographic and biological covariates, and controlled for the influence of sea state, group size, availability bias, and perception bias on the probability of making a sighting. In general, NMFS considers the models produced by Roberts *et al*. (2016) to be the best available source of data regarding cetacean density in the Atlantic Ocean. More information, including the model results and supplementary information for each model, is available online at: *seamap.env.duke.edu/models/Duke-EC-GOM-2015/*.

For the purposes of the take calculations, density data from Roberts *et al.* (2016) were mapped within the boundary of the survey area for each survey segment (*i.e.*, the Lease Area

survey segment and the cable route area survey segment; See Figure 1 in the IHA application) using a geographic information system. Monthly density data for all cetacean species potentially taken by the planned survey was available via Roberts *et al.* (2016). Monthly mean density within the survey area, as provided in Roberts *et al.* (2016), were averaged by season (*i.e.*, Winter (December, January, February), Spring (March, April, May), Summer (June, July, August), Fall (September, October, November)) to provide seasonal density estimates. For the Lease Area survey segment, the highest average seasonal density as reported by Roberts *et al.* (2016) was used based on the planned survey dates of March through July. For the cable route area survey segment, the average spring seasonal densities within the maximum survey area were used, given the planned start date and duration of the survey within the cable route area.

Systematic, offshore, at-sea survey data for pinnipeds are more limited than those for cetaceans. The best available information concerning pinniped densities in the planned survey area is the U.S. Navy's Navy Operating Area (OPAREA) Density Estimates (NODEs) (DoN, 2007). These density models utilized vessel-based and aerial survey data collected by NMFS from 1998-2005 during broad-scale abundance studies. Modeling methodology is detailed in DoN (2007). The NODEs density estimates do not include density data for gray seals. For the purposes of this IHA, gray seal density in the project area was assumed to be the same as harbor seal density. Mid-Atlantic OPAREA Density Estimates (DoN, 2007) as reported for the spring and summer season were used to estimate pinniped densities for the purposes of the take calculations.

Take Calculation and Estimation

Here we describe how the information provided above is brought together to produce a quantitative take estimate.

In order to estimate the number of marine mammals predicted to be exposed to sound levels that would result in harassment, radial distances to predicted isopleths corresponding to harassment thresholds are calculated, as described above. Those distances are then used to calculate the area(s) around the HRG survey equipment predicted to be ensonified to sound levels that exceed harassment thresholds. The area estimated to be ensonified to relevant thresholds in a single day of the survey is then calculated, based on areas predicted to be ensonified around the HRG survey equipment and estimated trackline distance traveled per day by the survey vessel. The estimated daily vessel track line distance was determined using the estimated average speed of the vessel (4 knot) multiplied by 24 (to account for the 24 hour operational period of the survey). Using the maximum distance to the Level B harassment threshold of 1,166 m (Table 3) and estimated daily track line distance of approximately 177.8 km (110.5 mi), it was estimated that an area of 418.9 km^2 (161.7 mi^2) per day would be ensonified to the Level B harassment threshold.

The number of marine mammals expected to be incidentally taken per day is then calculated by estimating the number of each species predicted to occur within the daily ensonified area, using estimated marine mammal densities as described above. In this case, estimated marine mammal density values varied between the Lease Area and cable route corridor survey areas, therefore the estimated number of each species taken per survey day was calculated separately for the Lease Area survey area and cable route corridor survey area. Estimated numbers of each species taken per day are then multiplied by the number of survey days to generate an estimate of the total number of each species expected to be taken over the duration of the survey. In this case, as the estimated number of each species taken per day varied depending on survey area (Lease Area and cable route corridor), the number of each species taken per day

in each respective survey area was multiplied by the number of survey days anticipated in each survey area (*i.e.,* 123 survey days in the Lease Area portion of the survey and 19 survey days in the cable route corridor portion of the survey) to get a total number of takes per species in each respective survey area. Total take numbers for each respective survey area (Lease Area and cable route corridor) were then rounded. These numbers were then summed to get a total number of each species expected to be taken over the duration of all surveys (Table 7).

As described above, due to the very small estimated distances to Level A harassment thresholds (based on both SEL_{cum} and peak SPL; Table 4), and in consideration of the mitigation measures, the likelihood of the survey resulting in take in the form of Level A harassment is considered so low as to be discountable, therefore we do not authorize take of any marine mammals by Level A harassment. Authorized take numbers are shown in Tables 5, 6, and 7. Take numbers authorized (Tables 5, 6, and 7) are slightly different than those requested in the IHA application (Table 7 in the IHA application) due to slight differences in take calculation methods.

Table 5. Numbers of Potential Incidental Take of Marine Mammals Authorized in Cable Route Corridor Portion of Survey.

Species	Density (# / 1,000 km^2)	Level A Takes	Level B Takes	Total takes
North Atlantic right whale	0.04	0	3	3
Humpback whale	0.02	0	2	2
Fin whale	0.1	0	8	8
Sperm whale	0.01	0	1	1
Minke whale	0.03	0	2	2
Bottlenose dolphin	9.65	0	768	768

Short-beaked common dolphin	1.42	0	113	113
Atlantic white-sided dolphin	0.32	0	25	25
Harbor porpoise	1.91	0	152	152
Harbor seal	4.87	0	388	388
Gray seal	4.87	0	388	388

Table 6. Numbers of Potential Incidental Take of Marine Mammals Authorized in Lease Area Portion of Survey.

Species	Density (# / 1,000 km^2)	Level A Takes	Level B Takes	Total takes
North Atlantic right whale	0.03	0	15	15
Humpback whale	0.04	0	21	21
Fin whale	0.17	0	88	88
Sperm whale	0.01	0	5	5
Minke whale	0.07	0	36	36
Bottlenose dolphin	1.53	0	788	788
Short-beaked common dolphin	3.06	0	1577	1577
Atlantic white-sided dolphin	0.78	0	402	402
Harbor porpoise	4.09	0	2107	2107
Harbor seal	4.87	0	2509	2509
Gray seal	4.87	0	2509	2509

Table 7. Total Numbers of Potential Incidental Take of Marine Mammals Authorized and Takes as a Percentage of Population.

Species	Level A Takes	Level B Takes	Total Takes	Total Takes as a Percentage of Population
North Atlantic right whale	0	18	18	4.1
Humpback whale	0	23	23	2.8
Fin whale	0	96	96	5.9
Sperm whale	0	6	6	0.3
Minke whale	0	38	38	1.5
Bottlenose dolphin	0	1556	1556	2.0
Short-beaked common dolphin	0	1690	1690	2.4
Atlantic white-sided dolphin	0	427	427	0.9
Harbor porpoise	0	2259	2259	2.8
Harbor seal	0	2897	2897	3.8
Gray seal	0	2897	2897	0.6

Mitigation

In order to issue an IHA 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 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 (latter not applicable for this action).

NMFS 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, as well as subsistence uses where applicable, we carefully consider two primary factors:

1) The manner in which, and the degree to which, the successful implementation of the measure(s) is expected to reduce impacts to marine mammals, marine mammal species or stocks, and their habitat. This considers the nature of the potential adverse impact being mitigated (likelihood, scope, range). It further considers the likelihood that the measure will be effective if implemented (probability of accomplishing the mitigating result if implemented as planned) and the likelihood of effective implementation (probability implemented as planned), and;

2) The practicability of the measures for applicant implementation, which may consider such things as relative cost and impact on operations.

Mitigation Measures

With NMFS' input during the application process, and as per the BOEM Lease, Statoil proposed the following mitigation measures during their site characterization surveys.

Marine Mammal Exclusion and Watch Zones

As required in the BOEM lease, marine mammal exclusion zones (EZ) will be established around the HRG survey equipment and monitored by protected species observers (PSO) during HRG surveys as follows:

- 50 m EZ for pinnipeds and delphinids (except harbor porpoises);

- 100 m EZ for large whales including sperm whales and mysticetes (except North Atlantic right whales) and harbor porpoises;
- 500 m EZ for North Atlantic right whales.

In addition, PSOs will visually monitor for all marine mammals to the extent of a 500 m "Watch Zone" or as far as possible if the extent of the Watch Zone is not fully visible.

Statoil intends to submit a sound source verification report showing sound levels associated with HRG survey equipment. If results of the sound source verification report indicate that actual distances to isopleths corresponding to harassment thresholds are larger than the EZs and/or Level B monitoring zones, NMFS may modify the zone(s) accordingly. If results of source verification indicate that actual distances to isopleths corresponding to harassment thresholds are less than the EZs and/or Level B monitoring zones, Statoil has indicated an intention to request modification of the zone(s), as appropriate. NMFS would review any such request and may modify the zone(s) depending on review of the report on source verification. Any such modification may be superseded by EZs required by BOEM.

Visual Monitoring

As per the BOEM lease, visual and acoustic monitoring of the established exclusion and monitoring zones will be performed by qualified and NMFS-approved PSOs. It will be the responsibility of the Lead PSO on duty to communicate the presence of marine mammals as well as to communicate and enforce the action(s) that are necessary to ensure mitigation and monitoring requirements are implemented as appropriate. PSOs will be equipped with binoculars and have the ability to estimate distances to marine mammals located in proximity to the vessel and/or exclusion zone using range finders. Reticulated binoculars will also be available to PSOs for use as appropriate based on conditions and visibility to support the siting and monitoring of

marine species. Digital single-lens reflex camera equipment will be used to record sightings and verify species identification. During surveys conducted at night, night-vision equipment and infrared technology will be available for PSO use, and PAM (described below) will be used.

Pre-Clearance of the Exclusion Zone

For all HRG survey activities, Statoil will implement a 30-minute pre-clearance period of the relevant EZs prior to the initiation of HRG survey equipment (as required by BOEM). During this period the EZs will be monitored by PSOs, using the appropriate visual technology for a 30-minute period. HRG survey equipment will not be initiated if marine mammals are observed within or approaching the relevant EZs during this pre-clearance period. If a marine mammal is observed within or approaching the relevant EZ during the pre-clearance period, ramp-up will not begin until the animal(s) has been observed exiting the EZ or until an additional time period has elapsed with no further sighting of the animal (15 minutes for small delphinoid cetaceans and pinnipeds and 30 minutes for all other species). This pre-clearance requirement will include small delphinoids that approach the vessel (*e.g.*, bow ride). PSOs will also continue to monitor the zone for 30 minutes after survey equipment is shut down or survey activity has concluded.

Passive Acoustic Monitoring

As required in the BOEM lease, PAM will be required during HRG surveys conducted at night. In addition, PAM systems would be employed during daylight hours as needed to support system calibration and PSO and PAM team coordination, as well as in support of efforts to evaluate the effectiveness of the various mitigation techniques (*i.e.*, visual observations during day and night, compared to the PAM detections/operations). PAM operators will also be on call as necessary during daytime operations should visual observations become impaired. BOEM's lease stipulations require the use of PAM during nighttime operations. However, these

requirements do not require that any mitigation action be taken upon acoustic detection of marine mammals. Given the range of species that could occur in the survey area, the PAM system will consist of an array of hydrophones with both broadband (sampling mid-range frequencies of 2 kHz to 200 kHz) and at least one low-frequency hydrophone (sampling range frequencies of 75 Hz to 30 kHz). The PAM operator would monitor the hydrophone signals in real time both aurally (using headphones) and visually (via the monitor screen displays). The PAM operator would communicate detections to the Lead PSO on duty who will ensure the implementation of the appropriate mitigation procedures. A mitigation and monitoring communications flow diagram has been included as Appendix C of the IHA application.

Ramp-Up of Survey Equipment

As required in the BOEM lease, where technically feasible, a ramp-up procedure will be used for HRG survey equipment capable of adjusting energy levels at the start or re-start of HRG survey activities. The ramp-up procedure will be used at the beginning of HRG survey activities in order to provide additional protection to marine mammals near the survey area by allowing them to vacate the area prior to the commencement of survey equipment use at full energy. A ramp-up will begin with the power of the smallest acoustic equipment at its lowest practical power output appropriate for the survey. When technically feasible the power will then be gradually turned up and other acoustic sources added in a way such that the source level would increase gradually.

Shutdown Procedures

As required in the BOEM lease, if a marine mammal is observed within or approaching the relevant EZ (as described above) an immediate shutdown of the survey equipment is required. Subsequent restart of the survey equipment may only occur after the animal(s) has

either been observed exiting the relevant EZ or until an additional time period has elapsed with no further sighting of the animal (*e.g.*,15 minutes for delphinoid cetaceans and pinnipeds and 30 minutes for all other species). HRG survey equipment may continue operating if small delphinids voluntarily approach the vessel (*e.g.*, to bow ride) when HRG survey equipment is operating.

As required in the BOEM lease, if the HRG equipment shuts down for reasons other than mitigation (*i.e.*, mechanical or electronic failure) resulting in the cessation of the survey equipment for a period greater than 20 minutes, a 30 minute pre-clearance period (as described above) will precede the restart of the HRG survey equipment. If the pause is less than 20 minutes, the equipment may be restarted as soon as practicable at its full operational level only if visual surveys were continued diligently throughout the silent period and the EZs remained clear of marine mammals during that entire period. If visual surveys were not continued diligently during the pause of 20 minutes or less, a 30-minute pre-clearance period (as described above) will precede the re-start of the HRG survey equipment. Following a shutdown, HRG survey equipment may be restarted following pre-clearance of the zones as described above.

Vessel Strike Avoidance

Statoil will ensure that vessel operators and crew maintain a vigilant watch for cetaceans and pinnipeds by slowing down or stopping the vessel to avoid striking marine mammals. Survey vessel crew members responsible for navigation duties will receive site-specific training on marine mammal sighting/reporting and vessel strike avoidance measures. Vessel strike avoidance measures will include, but are not limited to, the following, as required in the BOEM lease, except under circumstances when complying with these requirements would put the safety of the vessel or crew at risk:

- All vessel operators and crew will maintain vigilant watch for cetaceans and pinnipeds, and slow down or stop their vessel to avoid striking these protected species;
- All vessel operators will comply with 10 knot (18.5 km/hr) or less speed restrictions in any SMA per NOAA guidance. This applies to all vessels operating at any time of year;
- All vessel operators will reduce vessel speed to 10 knots (18.5 km/hr) or less when any large whale, any mother/calf pairs, pods, or large assemblages of non-delphinoid cetaceans are observed near (within 100 m (330 ft)) an underway vessel;
- All survey vessels will maintain a separation distance of 500 m (1640 ft) or greater from any sighted North Atlantic right whale;
- If underway, vessels must steer a course away from any sighted North Atlantic right whale at 10 knots (18.5 km/hr) or less until the 500 m (1640 ft) minimum separation distance has been established. If a North Atlantic right whale is sighted in a vessel's path, or within 100 m (330 ft) to an underway vessel, the underway vessel must reduce speed and shift the engine to neutral. Engines will not be engaged until the North Atlantic right whale has moved outside of the vessel's path and beyond 100 m. If stationary, the vessel must not engage engines until the North Atlantic right whale has moved beyond 100 m;
- All vessels will maintain a separation distance of 100 m (330 ft) or greater from any sighted non-delphinoid cetacean. If sighted, the vessel underway must reduce speed and shift the engine to neutral, and must not engage the engines until the non-delphinoid cetacean has moved outside of the vessel's path and beyond 100 m. If a survey vessel is stationary, the vessel will not engage engines until the non-delphinoid cetacean has moved out of the vessel's path and beyond 100 m;

- All vessels will maintain a separation distance of 50 m (164 ft) or greater from any sighted delphinoid cetacean. Any vessel underway will remain parallel to a sighted delphinoid cetacean's course whenever possible, and avoid excessive speed or abrupt changes in direction. Any vessel underway will reduce vessel speed to 10 knots (18.5 km/hr) or less when pods (including mother/calf pairs) or large assemblages of delphinoid cetaceans are observed. Vessels may not adjust course and speed until the delphinoid cetaceans have moved beyond 50 m and/or the abeam of the underway vessel;
- All vessels underway will not divert or alter course in order to approach any whale, delphinoid cetacean, or pinniped. Any vessel underway will avoid excessive speed or abrupt changes in direction to avoid injury to the sighted cetacean or pinniped; and
- All vessels will maintain a separation distance of 50 m (164 ft) or greater from any sighted pinniped.

Confirmation of the training and understanding of the requirements will be documented on a training course log sheet. Signing the log sheet will certify that the crew members understand and will comply with the necessary requirements throughout the survey event.

Seasonal Operating Requirements

Between watch shifts, members of the monitoring team will consult NMFS' North Atlantic right whale reporting systems for the presence of North Atlantic right whales throughout survey operations. However, the survey activities will occur outside of the SMA located off the coasts of New Jersey and New York. Members of the monitoring team will monitor the NMFS North Atlantic right whale reporting systems for the establishment of a Dynamic Management Area (DMA). If NMFS should establish a DMA in the survey area, within 24 hours of the

establishment of the DMA Statoil will work with NMFS to shut down and/or alter the survey activities to avoid the DMA.

The mitigation measures are designed to avoid the already low potential for injury in addition to some Level B harassment, and to minimize the potential for vessel strikes. There are no known marine mammal feeding areas, rookeries, or mating grounds in the survey area that would otherwise potentially warrant increased mitigation measures for marine mammals or their habitat (or both). The survey will occur in an area that has been identified as a biologically important area for migration for North Atlantic right whales. However, given the small spatial extent of the survey area relative to the substantially larger spatial extent of the right whale migratory area, the survey is not expected to appreciably reduce migratory habitat nor to negatively impact the migration of North Atlantic right whales, thus mitigation to address the survey's occurrence in North Atlantic right whale migratory habitat is not warranted. Further, we believe the mitigation measures are practicable for the applicant to implement.

Based on our evaluation of the applicant's proposed measures, NMFS has determined that the mitigation measures provide the means of effecting the least practicable impact on the affected species or stocks and their habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance.

Monitoring and Reporting

In order to issue an IHA for an activity, Section 101(a)(5)(D) of the MMPA states that NMFS must set forth, requirements pertaining to the monitoring and reporting of such taking. The MMPA implementing regulations at 50 CFR 216.104 (a)(13) indicate that requests for authorizations must include the suggested means of accomplishing the necessary monitoring and reporting that will result in increased knowledge of the species and of the level of taking or

impacts on populations of marine mammals that are expected to be present in the survey area. Effective reporting is critical both to compliance as well as ensuring that the most value is obtained from the required monitoring.

Monitoring and reporting requirements prescribed by NMFS should contribute to improved understanding of one or more of the following:

- Occurrence of marine mammal species or stocks in the area in which take is anticipated (*e.g.*, presence, abundance, distribution, density);
- Nature, scope, or context of likely marine mammal exposure to potential stressors/impacts (individual or cumulative, acute or chronic), through better understanding of: (1) action or environment (*e.g.*, source characterization, propagation, ambient noise); (2) affected species (*e.g.*, life history, dive patterns); (3) co-occurrence of marine mammal species with the action; or (4) biological or behavioral context of exposure (*e.g.*, age, calving or feeding areas);
- Individual marine mammal responses (behavioral or physiological) to acoustic stressors (acute, chronic, or cumulative), other stressors, or cumulative impacts from multiple stressors;
- How anticipated responses to stressors impact either: (1) long-term fitness and survival of individual marine mammals; or (2) populations, species, or stocks;
- Effects on marine mammal habitat (*e.g.*, marine mammal prey species, acoustic habitat, or other important physical components of marine mammal habitat); and
- Mitigation and monitoring effectiveness.

Monitoring Measures

As described above, visual monitoring of the EZs and monitoring zone will be performed by qualified and NMFS-approved PSOs. Observer qualifications will include direct field experience on a marine mammal observation vessel and/or aerial surveys and completion of a PSO and/or PAM training program, as appropriate. As proposed by the applicant and required by BOEM, an observer team comprising a minimum of four NMFS-approved PSOs and a minimum of two certified PAM operator(s), operating in shifts, will be employed by Statoil during the surveys. PSOs and PAM operators will work in shifts such that no one monitor will work more than 4 consecutive hours without a 2 hour break or longer than 12 hours during any 24-hour period. During daylight hours the PSOs will rotate in shifts of one on and three off, while during nighttime operations PSOs will work in pairs. The PAM operators will also be on call as necessary during daytime operations should visual observations become impaired. Each PSO will monitor 360 degrees of the field of vision.

Also as described above, PSOs will be equipped with binoculars and have the ability to estimate distances to marine mammals located in proximity to the vessel and/or exclusion zone using range finders. Reticulated binoculars will also be available to PSOs for use as appropriate based on conditions and visibility to support the siting and monitoring of marine species. Digital single-lens reflex camera equipment will be used to record sightings and verify species identification. During night operations, PAM, night-vision equipment, and infrared technology will be used to increase the ability to detect marine mammals. Position data will be recorded using hand-held or vessel global positioning system (GPS) units for each sighting. Observations will take place from the highest available vantage point on the survey vessel. General 360-degree scanning will occur during the monitoring periods, and target scanning by the PSO will occur when alerted of a marine mammal presence.

Data on all PAM/PSO observations will be recorded based on standard PSO collection requirements. This will include dates and locations of survey operations; time of observation, location and weather; details of the sightings (*e.g.*, species, age classification [if known], numbers, behavior); and details of any observed "taking" (behavioral disturbances). The data sheet will be provided to NMFS for review and approval prior to the start of survey activities. In addition, prior to initiation of survey work, all crew members will undergo environmental training, a component of which will focus on the procedures for sighting and protection of marine mammals. A briefing will also be conducted between the survey supervisors and crews, the PSOs, and Statoil. The purpose of the briefing will be to establish responsibilities of each party, define the chains of command, discuss communication procedures, provide an overview of monitoring purposes, and review operational procedures.

Acoustic Field Verification – As described above, field verification of sound levels associated with survey equipment will be conducted. Results of the field verification may be used to request modification of the EZs and monitoring zones. The details of the applicant's plan for field verification of sound levels are provided as Appendix B to the IHA application.

Reporting Measures

Statoil will provide the following reports as necessary during survey activities:

- The Applicant will contact NMFS within 24 hours of the commencement of survey activities and again within 24 hours of the completion of the activity.
- *Notification of Injured or Dead Marine Mammals* - In the unanticipated event that the specified HRG and geotechnical activities lead to an injury of a marine mammal (Level A harassment) or mortality (*e.g.*, ship-strike, gear interaction, and/or entanglement), Statoil would immediately cease the specified activities and report the incident to the Chief of the Permits and

Conservation Division, Office of Protected Resources and the NMFS Greater Atlantic Stranding Coordinator. The report would include the following information:

- Time, date, and location (latitude/longitude) of the incident;
- Name and type of vessel involved;
- Vessel's speed during and leading up to the incident;
- Description of the incident;
- Status of all sound source use in the 24 hours preceding the incident;
- Water depth;
- Environmental conditions (*e.g.*, wind speed and direction, Beaufort sea state, cloud cover, and visibility);
- Description of all marine mammal observations in the 24 hours preceding the incident;
- Species identification or description of the animal(s) involved;
- Fate of the animal(s); and
- Photographs or video footage of the animal(s) (if equipment is available).

Activities would not resume until NMFS is able to review the circumstances of the event. NMFS would work with Statoil to minimize reoccurrence of such an event in the future. Statoil would not resume activities until notified by NMFS.

In the event that Statoil discovers an injured or dead marine mammal and determines that the cause of the injury or death is unknown and the death is relatively recent (*i.e.*, in less than a moderate state of decomposition), Statoil would immediately report the incident to the Chief of the Permits and Conservation Division, Office of Protected Resources and the NMFS Greater Atlantic Stranding Coordinator. The report would include the same information identified in the

paragraph above. Activities would be able to continue while NMFS reviews the circumstances of the incident. NMFS would work with Statoil to determine if modifications in the activities are appropriate.

In the event that Statoil discovers an injured or dead marine mammal and determines that the injury or death is not associated with or related to the activities authorized in the IHA (*e.g.*, previously wounded animal, carcass with moderate to advanced decomposition, or scavenger damage), Statoil would report the incident to the Chief of the Permits and Conservation Division, Office of Protected Resources, and the NMFS Greater Atlantic Regional Stranding Coordinator, within 24 hours of the discovery. Statoil would provide photographs or video footage (if available) or other documentation of the stranded animal sighting to NMFS. Statoil may continue its operations under such a case.

- Within 90 days after completion of survey activities, a final technical report will be provided to NMFS that fully documents the methods and monitoring protocols, summarizes the data recorded during monitoring, estimates the number of marine mammals estimated to have been taken during survey activities, and provides an interpretation of the results and effectiveness of all mitigation and monitoring. Any recommendations made by NMFS must be addressed in the final report prior to acceptance by NMFS.

Negligible Impact Analysis and Determination

NMFS has defined negligible impact as an impact resulting from the specified activity that cannot be reasonably expected to, and is not reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival. A negligible impact finding is based on the lack of likely adverse effects on annual rates of recruitment or survival (*i.e.*, population-level effects). An estimate of the number of takes alone is not enough

information on which to base an impact determination. In addition to considering estimates of the number of marine mammals that might be "taken" through harassment, NMFS considers other factors, such as the likely nature of any responses (*e.g.*, intensity, duration), the context of any responses (*e.g.*, critical reproductive time or location, migration), as well as effects on habitat, and the likely effectiveness of the mitigation. We also assess the number, intensity, and context of estimated takes by evaluating this information relative to population status. Consistent with the 1989 preamble for NMFS's implementing regulations (54 FR 40338; September 29, 1989), the impacts from other past and ongoing anthropogenic activities are incorporated into this analysis via their impacts on the environmental baseline (*e.g.*, as reflected in the regulatory status of the species, population size and growth rate where known, ongoing sources of human-caused mortality, or ambient noise levels).

To avoid repetition, our analysis applies to all the species listed in Table 7, given that NMFS expects the anticipated effects of the planned survey to be similar in nature.

NMFS does not anticipate that serious injury or mortality would occur as a result of Statoil's survey, even in the absence of mitigation. Thus the authorization does not authorize any serious injury or mortality. As discussed in the *Potential Effects* section, non-auditory physical effects and vessel strike are not expected to occur.

We expect that all potential takes would be in the form of short-term Level B behavioral harassment in the form of temporary avoidance of the area or decreased foraging (if such activity were occurring), reactions that are considered to be of low severity and with no lasting biological consequences (*e.g.*, Southall *et al*., 2007).

Potential impacts to marine mammal habitat were discussed previously in the *Federal Register* notice for the proposed IHA (83 FR 7655; February 22, 2018). Marine mammal habitat

may be impacted by elevated sound levels, but these impacts would be temporary. In addition to being temporary and short in overall duration, the acoustic footprint of the planned survey is small relative to the overall distribution of the animals in the area and their use of the area. Feeding behavior is not likely to be significantly impacted, as no areas of biological significance for marine mammal feeding are known to exist in the survey area. Prey species are mobile and are broadly distributed throughout the project area; therefore, marine mammals that may be temporarily displaced during survey activities are expected to be able to resume foraging once they have moved away from areas with disturbing levels of underwater noise. Because of the temporary nature of the disturbance, the availability of similar habitat and resources in the surrounding area, and the lack of important or unique marine mammal feeding habitat, 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 their populations. In addition, there are no rookeries or mating or calving areas known to be biologically important to marine mammals within the survey area. The survey area is within a biologically important migratory area for North Atlantic right whales (effective March-April and November-December) that extends from Massachusetts to Florida (LaBrecque, *et al*., 2015). Off the coast of New York, this biologically important migratory area extends from the coast to the shelf break. Due to the fact that that the planned survey is temporary and short in overall duration, and the fact that the spatial acoustic footprint of the planned survey is very small relative to the spatial extent of the available migratory habitat in the area, right whale migration is not expected to be impacted by the planned survey.

The mitigation measures are expected to reduce the number and/or severity of takes by (1) giving animals the opportunity to move away from the sound source before HRG survey

equipment reaches full energy; (2) preventing animals from being exposed to sound levels that may otherwise result in injury. Additional vessel strike avoidance requirements will further mitigate potential impacts to marine mammals during vessel transit to and within the survey area.

NMFS concludes that exposures to marine mammal species and stocks due to Statoil's survey will result in only short-term (temporary and short in duration) effects to individuals exposed. Marine mammals may temporarily avoid the immediate area, but are not expected to permanently abandon the area. Major shifts in habitat use, distribution, or foraging success are not expected. NMFS does not anticipate the take estimates to impact annual rates of recruitment or survival.

In summary and as described above, the following factors primarily support our determination that the impacts resulting from this activity are not expected to adversely affect the species or stock through effects on annual rates of recruitment or survival:

- No mortality, serious injury, or Level A harassment is anticipated or authorized;
- The anticipated impacts of the activity on marine mammals would be temporary behavioral changes due to avoidance of the area around the survey vessel;
- The availability of alternate areas of similar habitat value for marine mammals to temporarily vacate the survey area during the survey to avoid exposure to sounds from the activity;
- The project area does not contain areas of significance for feeding, mating or calving;
- Effects on species that serve as prey species for marine mammals from the survey are not expected;
- The mitigation measures, including visual and acoustic monitoring and shutdowns, are expected to minimize potential impacts to marine mammals.

Based on the analysis contained herein of the likely effects of the specified activity on marine mammals and their habitat, and taking into consideration the implementation of the monitoring and mitigation measures, NMFS finds that the total marine mammal take from the planned activity will have a negligible impact on all affected marine mammal species or stocks.

Small Numbers

As noted above, only small numbers of incidental take may be authorized under Section 101(a)(5)(D) of the MMPA for specified activities other than military readiness activities. The MMPA does not define small numbers and so, in practice, where estimated numbers are available, NMFS compares the number of individuals taken to the most appropriate estimation of abundance of the relevant species or stock in our determination of whether an authorization is limited to small numbers of marine mammals. Additionally, other qualitative factors may be considered in the analysis, such as the temporal or spatial scale of the activities.

The numbers of marine mammals authorized to be taken, for all species and stocks, would be considered small relative to the relevant stocks or populations (less than 6 percent of each species and stock). See Table 7. Based on the analysis contained herein of the activity (including the mitigation and monitoring measures) and the anticipated take of marine mammals, NMFS finds that small numbers of marine mammals will be taken relative to the population size of the affected species or stocks.

Unmitigable Adverse Impact Analysis and Determination

There are no relevant subsistence uses of the affected marine mammal stocks or species implicated by this action. Therefore, NMFS has determined that the total taking of affected species or stocks would not have an unmitigable adverse impact on the availability of such species or stocks for taking for subsistence purposes.

Endangered Species Act

Section 7(a)(2) of the Endangered Species Act of 1973 (16 U.S.C. 1531 *et seq*.) requires that each Federal agency insure that any action it authorizes, funds, or carries out is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of designated critical habitat. To ensure ESA compliance for the issuance of IHAs, NMFS consults internally, in this case with the NMFS Greater Atlantic Regional Fisheries Office (GARFO), whenever we authorize take for endangered or threatened species.

The NMFS Office of Protected Resources is authorizing the incidental take of three species of marine mammals which are listed under the ESA: the North Atlantic right, fin, and sperm whale. BOEM consulted with NMFS GARFO under section 7 of the ESA on commercial wind lease issuance and site assessment activities on the Atlantic Outer Continental Shelf in Massachusetts, Rhode Island, New York and New Jersey Wind Energy Areas. NMFS GARFO issued a Biological Opinion concluding that these activities may adversely affect but are not likely to jeopardize the continued existence of the North Atlantic right, fin, and sperm whale. The Biological Opinion can be found online at: *www.fisheries.noaa.gov/national/marine-mammal-protection/incidental-take-authorizations-other-energy-activities-renewable*. Upon request from the NMFS Office of Protected Resources, NMFS GARFO has issued an amended incidental take statement associated with this Biological Opinion to include the takes of the ESA-listed marine mammal species authorized through this IHA.

National Environmental Policy Act

To comply with the National Environmental Policy Act of 1969 (NEPA; 42 U.S.C. 4321 *et seq*.) and NOAA Administrative Order (NAO) 216-6A, NMFS must review our proposed

action (*i.e.,* the issuance of an incidental harassment authorization) with respect to potential impacts on the human environment.

Accordingly, NMFS prepared an Environmental Assessment (EA) and analyzed the potential impacts to marine mammals that would result from the project. A Finding of No Significant Impact (FONSI) was signed on April 25, 2018. A copy of the EA and FONSI is available on the Internet at: *www.fisheries.noaa.gov/national/marine-mammal-protection/incidental-take-authorizations-other-energy-activities-renewable.*

Authorization

NMFS has issued an IHA to Statoil for conducting marine site characterization surveys offshore of New York and along potential submarine cable routes for a period of one year, provided the previously mentioned mitigation, monitoring, and reporting requirements are incorporated.

Dated: April 30, 2018.

Donna S. Wieting,

Director,

Office of Protected Resources,

National Marine Fisheries Service.

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