



BILLING CODE 3510-22-P

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

[RTID 0648-XA396]

Takes of Marine Mammals Incidental to Specified Activities; Taking Marine Mammals Incidental to Marine Site Characterization Surveys off of Massachusetts, Rhode Island, Connecticut, New York and New Jersey

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 Equinor Wind, LLC (Equinor) to incidentally harass, by Level B harassment only, marine mammals during site characterization surveys off the coast in the Atlantic Ocean in the area of the Commercial Leases of Submerged Lands for Renewable Energy Development on the Outer Continental Shelf (OCS-A 0520 and OCS-A 0512) and along potential submarine cable routes to a landfall location in Massachusetts, Rhode Island, Connecticut, New York or New Jersey.

DATES: This authorization is effective for one year from September 20, 2020 to September 19, 2021.

FOR FURTHER INFORMATION CONTACT: Rob Pauline, Office of Protected Resources, NMFS, (301) 427-8401. Electronic copies of the application and supporting

documents, as well as a list of the references cited in this document, may be obtained online at: <https://www.fisheries.noaa.gov/permit/incidental-take-authorizations-under-marine-mammal-protection-act>. In case of problems accessing these documents, please call the contact listed above.

SUPPLEMENTARY INFORMATION:

Background

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

Authorization for incidental takings shall be granted if NMFS finds that the taking will have a negligible impact on the species or stock(s) and will not have an unmitigable adverse impact on the availability of the species or stock(s) for taking for subsistence uses (where relevant). Further, NMFS must prescribe the permissible methods of taking and other “means of effecting the least practicable adverse impact” on the affected species or stocks and their habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance, and on the availability of the species or stocks for taking for certain subsistence uses (referred to in shorthand as “mitigation”); and

requirements pertaining to the mitigation, monitoring and reporting of the takings are set forth.

Summary of Request

On January 30, 2020, NMFS received a request from Equinor for an IHA to take marine mammals incidental to marine site characterization surveys in the Atlantic Ocean in the area of the Commercial Leases of Submerged Lands for Renewable Energy Development on the Outer Continental Shelf (OCS-A 0520 and OCS-A 0512) and along potential submarine cable routes to a landfall location in Massachusetts, Rhode Island, Connecticut, New York or New Jersey. A revised application was received on March 31, 2020. NMFS deemed that request to be adequate and complete. On May 22, 2020 Equinor notified NMFS of a revision to their planned activities and submitted a revised IHA application reflecting the change. Equinor's request is for the take of 17 marine mammal stocks by Level B harassment only. Neither Equinor 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 Activity

Equinor plans to conduct marine site characterization surveys, including high-resolution geophysical (HRG) and geotechnical surveys, in the area of Commercial Leases of Submerged Lands for Renewable Energy Development on the Outer Continental Shelf OCS-A 0520 and OCS-A 0512 (Lease Areas) and along potential submarine cable routes offshore Massachusetts, Rhode Island, Connecticut, New York and New Jersey.

The purpose of the planned surveys is to support the preliminary site characterization, siting, and engineering design of offshore wind project facilities and submarine cables within the Lease Areas and in export cable route areas (ECRAs). As many as two survey vessels may operate concurrently as part of the planned surveys. Underwater sound resulting from Equinor’s planned surveys has the potential to result in the incidental take of marine mammals in the form of behavioral harassment.

The HRG survey activities planned by Equinor are described in detail in the notice of proposed IHA (85 FR 37848; June 24, 2020). The HRG equipment planned for use is shown in Table 1.

Table 1 – Summary of Vessel-based HRG Survey Equipment Planned for Use by Equinor with the Potential to Result in the Take of Marine Mammals

HRG Equipment Type	Equipment	Operating Frequency	SL rms (dB re 1 µPa m)	SL pk (dB re 1 µPa m)	Pulse Duration (milli-second)	Repetition Rate (Hz)	Beam Width (degrees)
Medium Sub-bottom Profiler ²	Geo-Source 400 Tip Sparker Source (800 J)	0.25 to 3.25	203	213	2	4	Omni-directional

¹ Sound source characteristics from manufacturer specifications.

² SLs as reported for the ELC820 sparker in Crocker and Fratantonio (2016) which represents the most applicable proxy to the Geo-Source 800-J sparker expected for use during Equinor’s planned surveys.

As described above, a detailed description of the planned HRG surveys is provided in the **Federal Register** notice for the proposed IHA (85 FR 37848; June 24, 2020). Since that time, no changes have been made to the planned HRG survey activities. Therefore, a detailed description is not provided here. Please refer to that **Federal Register** notice for the description of the specified activity. Mitigation, monitoring, and reporting measures are described in detail later in this document (please see **Mitigation and Monitoring and Reporting** below).

Comments and Responses

A notice of NMFS's proposal to issue an IHA to Equinor was published in the **Federal Register** on June 24, 2020 (85 FR 37848). That notice described, in detail, Equinor's activity, the marine mammal species that may be affected by the activity, and the anticipated effects on marine mammals. During the 30-day public comment period, NMFS received comment letters from the Marine Mammal Commission (Commission) and a group of environmental non-governmental organizations (ENGOS). The letter was submitted jointly by the Natural Resources Defense Council, National Wildlife Federation, Conservation Law Foundation, Mass Audubon, Wildlife Conservation Society, NY4WHALES, Defenders of Wildlife, Surfrider Foundation, Connecticut Audubon Society, WDC Whale and Dolphin Conservation, International Marine Mammal Project of Earth Island Institute, Inland Ocean Coalition, Gotham Whale, International Fund for Animal Welfare, Marine Mammal Alliance Nantucket, Oceanic Preservation Society, and Sanctuary Education Advisory Specialists. NMFS has posted the comments online at: www.fisheries.noaa.gov/national/marine-mammal-protection/incidental-take-authorizations-other-energy-activities-renewable. A summary of the public comments received from the Commission and ENGOS as well as NMFS' responses to those comments are below. Please see the comment letters, available online, for full details of the comments and rationale.

Comment 1: The Commission recommended that NMFS use consistent source levels for the same equipment that operates under the same parameters amongst the various action proponents. The Commission noted that NMFS used inconsistent source levels for the GeoMarine Dual 400 sparker 800J in the proposed notice and another

recently proposed IHA. In the recently proposed IHA (85 FR 36537; June 17, 2020) the applicant (Dominion Energy) used a source level of 200 dB re 1 μ Pa root-mean-square (rms) and 210 dB re 1 μ Pa peak based on manufacturers data. Equinor and NMFS proposed to use a source level of 203 dB re 1 μ Pa rms and 213 dB re 1 μ Pa peak for this IHA based on source levels for the ELC820 sparker as listed in Crocker and Fratantonio (2016).

Response: NMFS encourages applicants to use data from Crocker and Fratantonio (2016), as we believe it to be the best available data regarding source levels. If information for specific equipment is not available in that document, the applicant should use manufacturer data. In this instance, Equinor felt that the manufacturer's data did not accurately reflect how the device was going to be utilized and, therefore, an appropriate proxy source from Crocker and Fratantonio (2016) was used. Note that the specifications used by Equinor results in a Level B harassment isopleth (141 m) that is more conservative than is found in the proposed IHA for Dominion (100 m). No revisions to Equinor's final IHA are required. While NMFS appreciates the Commission's call for consistency in the application of available data across applicants, it would not be appropriate to assume that all surveys will use a particular source in the same way and, therefore, it may be appropriate (as is the case here) to use different data sources or values to address these differences.

Comment 3: The Commission observed that neither Equinor nor NMFS specified in a separate table in the proposed IHA what input parameters and thresholds were used to estimate the Level A harassment zones, which is inconsistent with other recently proposed authorizations that used NMFS's user spreadsheet. The Commission noted that

Equinor, and in turn NMFS, underestimated the Level A harassment zones. According to the Commission, the Level A harassment zones should have been based on the information provided in Table 2, an average vessel speed of 4 knots (85 FR 37848; June 24, 2020), and the impulsive thresholds and would have resulted in a Level A harassment zone of 1.2 m rather than <1 m for low frequency (LF) cetaceans and 8.4 m rather than <1 m for high frequency (HF) cetaceans for the cumulative sound exposure level thresholds. The Commission recommended that NMFS specify the input parameters and thresholds used to validate Level A harassment zones provided by the action proponent using NMFS's user spreadsheet.

Response: NMFS has provided User Spreadsheet inputs for the GeoMarine Dual 400 sparker 800J as shown in Table 4. Inputs were not provided for the USBL since impacts to such devices are considered to be de minimis based on small zone sizes. This information requested by the commenter is contained in Equinor's application.

Comment 4: The Commission recommended that NMFS use its revised user spreadsheet, in-beam source levels, the actual beamwidth, and the maximum water depth in the Survey Area to estimate the Level B harassment zones for all future proposed authorizations involving HRG sources.

Response: NMFS concurs with the Commission's recommendation. NMFS' interim guidance for determining Level B harassment zones from HRG sources includes all of the parameters listed above. We recommend that applicants employ these tools, as we believe they are generally the best methodologies that are currently available.

Comment 5: The Commission recommended that NMFS consult with its acoustic experts to determine how to estimate Level A harassment zones accurately, what Level A

harassment zones are actually expected, and whether it is necessary to estimate Level A harassment zones for HRG surveys in general.

Response: NMFS concurs with the Commission's recommendation and works with our acoustic experts to evaluate the appropriate methods for determining the potential for Level A harassment from HRG surveys.

Comment 6: To ensure that in-situ data are collected and analyzed appropriately, the Commission recommended that NMFS and (Bureau of Ocean Energy Management (BOEM) expedite efforts to develop and finalize methodological and signal processing standards for HRG sources.

Response: NMFS concurs with the Commission that methodological and signal processing standards for HRG sources is warranted and is working on developing such standards. However, the effort is resource-dependent and NMFS cannot ensure such standards will be developed within the Commission's preferred time frame.

Comment 7: The Commission recommended that Level B harassment takes should be discounted for Equinor, consistent with the approach NMFS has taken for Dominion and considering that the revised Level B harassment zone is the same size or smaller than the shut-down zones. For the same reason, the Commission also recommended that NMFS follow a consistent approach across authorizations regarding the discounting of takes by Level B harassment.

Response: NMFS generally concurs with the Commission's position regarding discounting Level B harassment takes for species in which the shut-down zones are equal to or greater than the Level B harassment zones. We agree that this tenet applies during daylight. However, during night operations it is possible that some unseen number of

marine mammals could enter into the Level B harassment zone. Additionally, since shutdown is waived for certain dolphin genera, take of these species could occur during both day and night operations. Note that in Equinor's case the Level B harassment zone (141 m) was not revised for reasons stated in response to Comment 1 and is larger than the shutdown zone (100 m). Therefore, discount of takes by Level B harassment by Equinor and Dominion are not directly comparable.

Comment 9: The Commission recommended that NMFS evaluate the impacts of sound sources consistently across all applications and provide notice in its guidance to applicants and to the public regarding those sources that it has determined to be *de minimis*.

Response: NMFS concurs with the Commission's recommendation and is currently working together with BOEM to develop a tool to assist applicants and NMFS in more quickly and efficiently identifying activities and mitigation approaches that are unlikely to result in take of marine mammals.

Comment 10: The Commission recommended that NMFS consider whether, in situations involving HRG surveys, incidental harassment authorizations are necessary given the small size of the Level B harassment zones, the various required shutdown requirements, and BOEM's lease-stipulated requirements. The Commission recommended that NMFS should evaluate whether take needs to be authorized for those sources that are not considered *de minimis*, including sparkers, and for which implementation of the various mitigation measures should be sufficient to avoid Level B harassment takes.

Response: NMFS concurs with the Commission's recommendation. However, NMFS has evaluated whether taking needs to be authorized for those sources that are not considered *de minimis*, including sparkers and boomers, factoring into consideration the effectiveness of mitigation and monitoring measures, and we have determined that implementation of mitigation and monitoring measures cannot ensure that all take can be avoided during all HRG survey activities under all circumstances at this time. If and when we are able to reach such a conclusion, we will re-evaluate our determination that incidental take authorization is warranted for these activities.

Comment 11: The Commission recommended that NMFS require Equinor to report as soon as possible and cease project activities immediately in the event of an unauthorized injury or mortality of a marine mammal, including from a vessel strike, until NMFS's Office of Protected Resources and the New England/Mid-Atlantic Regional Stranding Coordinator determine whether additional measures are necessary to minimize the potential for additional unauthorized takes.

Response: NMFS has imposed a suite of measures in this IHA to reduce the risk of vessel strikes and does not anticipate, and has not authorized, any takes associated with vessel strikes. Further, in the event of a ship strike Equinor is required both to collect and report an extensive suite of information that NMFS has identified in order to evaluate the ship strike, and to notify OPR and the New England/Mid-Atlantic Regional Stranding Coordinator as soon as feasible. At that point, as the Commission suggests, NMFS would work with the applicant to determine whether there are additional mitigation measures or modifications that could further reduce the likelihood of vessel strike for the activities. However, given the existing requirements and the very low likelihood of a vessel strike

occurring, the protective value of ceasing operations while NMFS and Equinor discuss potential additional mitigations in order to avoid a second highly unlikely event during that limited period is unclear.

NMFS does not expect that the proposed activities, including HRG surveys, cable-lay activities and offshore pile driving activities, have the potential to result in injury or mortality to marine mammals and therefore does not agree that a blanket requirement for project activities to cease would be warranted. While injury or mortality to marine mammals is possible due to vessel strike, NMFS does not agree that a requirement for a vessel that is operating on the open water to suddenly stop operating is practicable, and it is unclear what mitigation benefit would result from such a requirement in relation to vessel strike. The Commission does not suggest what measures other than those prescribed in this IHA would potentially prove more effective in reducing the risk of strike. Therefore, we have not included this requirement in the authorization. NMFS retains authority to modify the IHA and cease all activities immediately based on a vessel strike and will exercise that authority if warranted.

Comment 12: The Commission considers the renewal process to be inconsistent with the statutory requirements under section 101(a)(5)(D) of the MMPA and recommend that NMFS refrain from issuing renewals for any authorization.

Response: In prior responses to comments about IHA Renewals (e.g., 84 FR 52464; October 02, 2019), NMFS has explained how the Renewal process, as implemented, is consistent with the statutory requirements contained in section 101(a)(5)(D) of the MMPA and, therefore, we plan to continue to issue qualifying Renewals when the requirements outlined on our website are met. Thus, NMFS agrees

with the Commission's recommendation that we should not issue a Renewal for any authorization unless it is consistent with the procedural requirements specified in section 101(a)(5)(D)(iii) of the MMPA.

Additionally, regarding the recommendation to use abbreviated notices, we agree that they are a useful tool by which to increase efficiency in conjunction with the use of Renewals, but we disagree that their use alone would equally fulfill NMFS' goal to maximize efficiency and provide regulatory certainty for applicants, with no reduction in protections for marine mammals. The Renewal process, with its narrowly described qualifying actions, specific issuance criteria, and additional 15-day comment period, allows for NMFS to broadly commit to a 60-day processing time. This commitment, which would not be possible in the absence of this narrow definition and the 15-day additional comment period, provides both a meaningfully shortened processing time and regulatory certainty for planning purposes. Increasing the comment period for Renewals to 30 days would increase processing time by 25% and is unnecessary, given the legal sufficiency of the process as it stands, as described above, and no additional protections for marine mammals that would result. NMFS uses abbreviated notices when proposed actions do not qualify for Renewals, but still allow for reliance upon previous documentation and analyses. These abbreviated notice projects, which deviate from the narrow qualifications of a Renewal, require some additional time for the analyst to appropriately review the small changes from the initial IHA and further necessitate the 30-day public review required for a new IHA. NMFS has evaluated the use of both the Renewal and abbreviated notice processes, as well as the associated workload for each, and determined that using both of these processes provides maximum efficiency for the

agency and applicants, regulatory certainty, and appropriate protections for marine mammals consistent with the statutory standards. Using the abbreviated notice process, however, is unnecessary and unwarranted for projects that meet the narrow qualifications for a Renewal IHA.

As previously noted, we have found that the Renewal process is consistent with the statutory requirements of the MMPA and, further, promotes NMFS' goals of improving conservation of marine mammals and increasing efficiency in the MMPA compliance process. Therefore, we intend to continue implementing the Renewal process.

Comment 13. The NGOs objected to NMFS' process to consider extending any one-year IHA with a truncated 15-day comment period as contrary to the MMPA.

Response: NMFS' IHA Renewal process meets all statutory requirements. All IHAs issued, whether an initial IHA or a Renewal IHA, are valid for a period of not more than one year. And the public has at least 30 days to comment on all proposed IHAs, with a cumulative total of 45 days for IHA Renewals. As noted above, the *Request for Public Comments* section made clear that the agency was seeking comment on both the initial proposed IHA and the potential issuance of a Renewal for this project. Because any Renewal (as explained in the *Request for Public Comments* section) is limited to another year of identical or nearly identical activities in the same location (as described in the *Description of Proposed Activity* section) or the same activities that were not completed within the one-year period of the initial IHA, reviewers have the information needed to effectively comment on both the immediate proposed IHA and a possible one-year Renewal, should the IHA holder choose to request one in the coming months.

While there will be additional documents submitted with a Renewal request, for a qualifying Renewal these will be limited to documentation that NMFS will make available and use to verify that the activities are identical to those in the initial IHA, are nearly identical such that the changes would have either no effect on impacts to marine mammals or decrease those impacts, or are a subset of activities already analyzed and authorized but not completed under the initial IHA. NMFS will also confirm, among other things, that the activities will occur in the same location; involve the same species and stocks; provide for continuation of the same mitigation, monitoring, and reporting requirements; and that no new information has been received that would alter the prior analysis. The Renewal request will also contain a preliminary monitoring report, but that is to verify that effects from the activities do not indicate impacts of a scale or nature not previously analyzed. The additional 15-day public comment period provides the public an opportunity to review these few documents, provide any additional pertinent information and comment on whether they think the criteria for a Renewal have been met. Between the initial 30-day comment period on these same activities and the additional 15 days, the total comment period for a Renewal is 45 days.

Comment 14: The ENGOs recommended NMFS establish seasonal restrictions on site assessment and characterization activities in the Project Area with the potential to injure or harass the North Atlantic right whale between November 1, 2020 and April 30, 2021. This recommendation is in addition to the existing seasonal restrictions detailed in the Proposed IHA (*i.e.*, Off Race Point Seasonal Management Area (“SMA”) and Cape Cod Bay SMA from January through May and in the Great South Channel SMA from April through July3).

Response: NMFS appreciates the value of seasonal restrictions under certain circumstances. As part of the 2008 NOAA Ship Strike Rule (73 FR 60173; October 10, 2008) NMFS has designated SMAs along the eastern seaboard based on known North Atlantic right whale movement, distribution, and aggregation patterns. Additionally, temporary dynamic management areas (DMAs) are established whenever an aggregation of three or more whales are sighted within 2-3 miles of each other outside of active SMAs. Note that SELC proposes to prohibit all HRG activities across an expansive area. Halting all HRG surveys for six months each year in an area with active offshore wind energy projects under development is simply not practicable. We also determined that seasonal restrictions are not warranted since impacts to North Atlantic right whales from HRG surveys would be limited to behavioral harassment (*i.e.*, Level B harassment) in the form of temporary avoidance of the area. Such responses that are considered to be of low severity and with no lasting biological consequences (*e.g.*, Ellison *et al.*, 2012).

NMFS has required applicants to observe seasonal restrictions when such actions are both warranted and practicable. NMFS issued an IHA to Vineyard Winds (85 FR 26940; May 6, 2020) for marine site characterization surveys off the southern New England coast. NMFS reviewed the best available North Atlantic right whale abundance data for the planned survey area (Roberts *et al.* 2017; Kraus *et al.* 2016) and determined that North Atlantic right whale abundance is significantly higher in the period starting in late winter and extending to late spring in specific sections of the survey area. Based on this information NMFS defined seasonal restriction areas that Vineyard Wind must follow when conducting HRG surveys. Survey activities may only occur in the Cape Cod Bay SMA and off of the Race Point SMA during the months of August and September to

ensure sufficient buffer between the SMA restrictions (January to May 15) and known seasonal occurrence of North Atlantic right whales north and northeast of Cape Cod (fall, winter, and spring).

Vineyard Wind planned to operate up to nine survey vessels concurrently but they must limit to three the number of survey vessels that will operate concurrently from March through June within the lease areas (OCS-A 0501 and 0487) and OECC areas north of the lease areas up to, but not including, coastal and bay waters. An additional seasonal restriction area was defined south of Nantucket and is effect from December to February in the area. The seasonal restrictions described above will help to reduce both the number and intensity of North Atlantic right whale takes. NMFS was concerned that operating more than three vessels concurrently within a relatively small area could negatively impact North Atlantic right whales. Given the elevated concentrations of North Atlantic right whales in the delineated areas, NMFS determined that seasonal restrictions were warranted. NMFS also worked with Vineyard Wind to ensure that the measures were practicable.

Comment 15: The ENGOs recommended that NMFS should require developers to operate sub-bottom profilers at power settings that achieve the lowest practicable source level for the objective.

Response: Equinor has selected the equipment necessary to achieve their objectives. We have evaluated the effects expected as a result of use of this equipment, made the necessary findings, and imposed mitigation requirements sufficient to achieve the least practicable adverse impact on the affected species and stocks of marine

mammals. It is not within NMFS' purview to make judgments regarding what constitutes the "lowest practicable source level" for an operator's survey objectives.

Comment 16: The ENGOs recommended that surveys should not be done at night or during times of poor visibility to maximize the probability that the North Atlantic right whale and other endangered and protected large whale species are detected and confirmed clear of the exclusion zone.

Response: We acknowledge the limitations inherent in detection of marine mammals at night. However, no injury is expected to result even in the absence of mitigation, given the very small estimated Level A harassment zones. Any potential impacts to marine mammals authorized for take 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. Vessels would also potentially be on the water for an extended time introducing noise into the marine environment. The restrictions recommended by the ENGOs could result in the surveys spending increased time on the water, which may result in greater overall exposure to sound for marine mammals and increase the risk of a vessel strike; thus the commenters have not demonstrated that such a requirement would result in a net benefit. Additionally, restricting the applicant to daylight operations 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 and, subsequently, 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 consideration of potential effectiveness of the recommended measure and its practicability for the applicant, NMFS has determined that restricting survey operations to daylight hours when visibility is unimpeded is not warranted or practicable in this case.

Comment 17: The ENGOs recommended that developers should be required to monitor an exclusion zone (EZ) for the North Atlantic right whale of 1,000 m and 500 m for other endangered and protected large whale species

Response: Regarding the recommendation for 500-m EZ for endangered and protected marine mammals and 1,000-m EZ specifically for North Atlantic right whales, NMFS has determined that the 500-m EZ, as required in the IHA, is sufficiently protective. We note that the 500-m EZ for North Atlantic right whales exceeds the modeled distance to the largest Level B harassment isopleth distance (141 m) by a factor of more than three. Thus, we are not requiring shutdown if a North Atlantic right whale is sighted beyond 500-m or other marine mammal is observed beyond 100 m.

Comment 18: The ENGO's recommended that monitoring should consist of a combination of visual monitoring by PSOs and passive acoustic monitoring at all times that survey work is underway.

Response: There are several reasons why we do not agree that use of PAM is warranted for 24-hour HRG surveys. While NMFS agrees that PAM can be an important tool for augmenting detection capabilities in certain circumstances, its utility in further reducing impact for Equinor's proposed HRG survey activities is limited. First, for this activity, the area expected to be ensonified above the Level B harassment threshold is relatively small (a maximum of 141 m as described in the Estimated Take section)—this

reflects the fact that, to start with, the source level is comparatively low and the intensity of any resulting impacts would be lower level and, further, it means that inasmuch as PAM will only detect a portion of any animals exposed within a zone, the overall probability of PAM detecting an animal in the harassment zone is low—together these factors support the limited value of PAM for use in reducing take with smaller zones. PAM is only capable of detecting animals that are actively vocalizing, while many marine mammal species vocalize infrequently or during certain activities, which means that only a subset of the animals within the range of the PAM would be detected (and potentially have reduced impacts). Additionally, localization and range detection can be challenging under certain scenarios. For example, odontocetes are fast moving and often travel in large or dispersed groups which makes localization difficult. In addition, the ability of PAM to detect baleen whale vocalizations is further limited due to being deployed from the stern of a vessel, which puts the PAM hydrophones in proximity to propeller noise and low frequency engine noise which can mask the low frequency sounds emitted by baleen whales, including North Atlantic right whales. We also note that the effects to North Atlantic right whales, and all marine mammals, from the types of surveys authorized in this IHA are expected to be limited to low level behavioral harassment even in the absence of mitigation; no injury is expected or authorized.

Additionally, since Equinor's PSOs will be on duty only during daylight operations night vision equipment is not required. This is standard practice during HRG surveys and is discussed in greater detail below.

Comment 19: The ENGOs recommended that four PSOs should be required to implement a two-on/two-off shift schedule so no single PSO is responsible for monitoring more than 180°.

Response: NMFS does not agree with the commenters that a minimum of four PSOs should be required, following a two-on/two-off rotation, to meet the MMPA requirement that mitigation must effect the least practicable adverse impact upon the affected species or stocks and their habitat. NMFS typically requires that a single PSO must be stationed at the highest vantage point and engaged in general 360-degree scanning during daylight hours. The monitoring reports submitted to NMFS have demonstrated that PSOs active only during daylight operations are able to detect marine mammals and implement appropriate mitigation measures.

Comment 20: The ENGOs suggested that it should be NMFS' top priority to consider any initial data from state monitoring efforts, passive acoustic monitoring data, opportunistic marine mammal sightings data, satellite telemetry, and other data sources, because the models used by NMFS do not adequately capture increased use of the survey areas by North Atlantic right whales. Further, these commenters state that the density models NMFS uses result in an underestimate of take, and do not fully reflect the abundance, distribution, and density of marine mammals for the U.S. East Coast.

Response: NMFS will review any recommended data sources and will continue to use the best available information. We welcome future input from interested parties on data sources that may be of use in analyzing the potential presence and movement patterns of marine mammals, including North Atlantic right whales, in New England waters. NMFS will review any recommended data sources and will continue to use the

best available information. NMFS used the best scientific information available at the time the analyses for the proposed IHA were conducted—in this case the marine mammal density models developed by the Duke Marine Geospatial Ecology Lab (MGEL) (Roberts *et al.* 2016, 2017, 2018)—to inform our determinations in the proposed IHA. The ENGOs are correct in their statement that North Atlantic right whale distribution has shifted in recent years. In fact, a new North Atlantic right whale density model was recently released by Roberts et al (2020). The model shows approximately double the density of North Atlantic right whales in the activity area as was considered in the proposed IHA. We have adjusted the take estimates accordingly in the final IHA.

Comment 21: The ENGOs advised NMFS to develop a dataset that accurately reflects marine mammal presence for future IHAs.

Response: NMFS has relied on the best available science in issuing this IHA, but we generally agree with the ENGOs and welcome the opportunity to participate in fora where implications of such data and development of a dataset would be discussed.

Comment 22: The ENGOs recommended that NMFS should carefully analyze the cumulative impacts on the North Atlantic right whale and other protected species from the proposed survey activities and other survey activities contemplated in other lease areas.

Response: The MMPA grants exceptions to its broad take prohibition for a “specified activity.” 16 U.S.C. 1371(a)(5)(A)(i). Cumulative impacts (also referred to as cumulative effects) is a term that appears in the context of the National Environmental Policy Act (NEPA) and the Endangered Species Act (ESA), but it is defined differently in those contexts. Neither the MMPA nor NMFS' codified implementing regulations

address consideration of other unrelated activities and their impacts on populations. However, the preamble for NMFS' implementing regulations (54 FR 40338; September 29, 1989) states in response to comments that the impacts from other past and ongoing anthropogenic activities are to be incorporated into the negligible impact analysis via their impacts on the baseline. Accordingly, NMFS here has factored into its negligible impact analysis the impacts of other past and ongoing anthropogenic activities via their impacts on the baseline (*e.g.*, as reflected in the density/distribution and status of the species, population size and growth rate, and other relevant stressors).

Comment 23: The ENGOs recommended that NMFS make available information regarding source levels and the reflection of sound from Surveyor Remotely Operated Vehicle (SROVs) to allow a full evaluation of the effectiveness of SROVs in entirely avoiding harassment of marine mammals.

Response: SROVs contain the same types of HRG equipment that are commonly found on full-size survey vessels. Therefore, the source levels and directionality of specific equipment located on SROVs should be the same as when it is operating from a survey vessel. The operating parameters and specifications associated with HRG equipment is generally available from device manufacturers or can be found in studies that quantified characteristics of sounds radiated by commercial marine geophysical survey systems (*e.g.* Crocker and Fratantonio 2016). As the ENGOs noted, SROV sound sources are generally downward facing and located at a depth of no more than 6 m above the seabed while actively surveying. Given the beam direction and shallow operational depths, it is highly unlikely a marine mammal would swim directly under an SROV and be exposed to sound at levels that could result in injury or behavioral modification.

Comment 24: The ENGOs noted that Equinor committed to a number of mitigation measures in the IHA application (*e.g.*, passive acoustic monitoring, infrared equipment) that are not required by the Proposed IHA. The ENGOs recommended that NMFS incorporate these measures into the Final IHA.

Response: NMFS does not necessarily include mitigation measures in IHAs that are mandated by other regulatory entities or which an applicant plans to voluntarily employ. We generally do not require mitigation measures that we do not believe are effective or practicable. We explained why we believe PAM is not warranted in response to another comment. As far as visual monitoring at night, we have not required night monitoring because it was presumed to be ineffective. However, as night vision technology continues to improve it may be considered effective at some point. If an applicant voluntarily proposes to employ PSOs at night, we include the measure as part of the IHA. Similarly, if pre-clearance and ramp-up operations are to be monitored at night, then PSOs should be provided with night vision equipment.

Comment 25: The ENGOs recommended that NMFS develop, and subsequently require, a robust and effective real-time monitoring and mitigation system for North Atlantic right whales and other endangered and protected species (*e.g.*, fin whales, sei whales, humpback whales).

Response: NMFS is generally supportive of this concept. A network of near real-time baleen whale monitoring devices are active or have been tested in portions of New England and Canadian waters. These systems employ various digital acoustic monitoring instruments which have been placed on autonomous platforms including slocum gliders, wave gliders, profiling floats and moored buoys. Systems that have proven to be

successful will likely see increased use as operational tools for many whale monitoring and mitigation applications.

NOAA Fisheries recently published “Technical Memorandum NMFS-OPR-64: North Atlantic Right Whale Monitoring and Surveillance: Report and Recommendations of the National Marine Fisheries Service’s Expert Working Group” which is available at: <https://www.fisheries.noaa.gov/resource/document/north-atlantic-right-whale-monitoring-and-surveillance-report-and-recommendations>. This report summarizes a workshop NOAA Fisheries convened to address objectives related to monitoring North Atlantic right whales and presents the Expert Working Group’s recommendations for a comprehensive monitoring strategy to guide future analyses and data collection. Among the numerous recommendations found in the report, the Expert Working Group encouraged the widespread deployment of auto-buoys to provide near real-time detections of NARW calls that visual survey teams can then respond to for collection of identification photographs or biological samples. Equinor must consult NMFS’ North Atlantic right whale reporting systems for the presence of North Atlantic right whales throughout survey operations for the establishment of a Dynamic Management Area (DMA) and is immediately report a sighting of a North Atlantic right whale to the NMFS North Atlantic Right Whale Sighting Advisory System.

Comment 26: The ENGOs asserted that the agency's assumptions regarding mitigation effectiveness are unfounded and cannot be used to justify any reduction in the number of takes authorized as was done for North Atlantic right whales. The reasons cited include: (i) the agency's reliance on a 160 dB threshold for behavioral harassment that is not supported by the best available scientific information; (ii) the agency relies on

the assumption that marine mammals will take measures to avoid the sound even though studies have not found avoidance behavior to be generalizable among species and contexts and even though avoidance may itself constitute take under the MMPA; and (iii) the mitigation and monitoring protocols prescribed by the agency are inadequate at protecting marine mammals and do not comply with the MMPA.

Response: The three comments provided by the ENGOs are addressed individually below.

(i) NMFS acknowledges that the 160-dB rms step-function approach is simplistic, and that an approach reflecting a more complex probabilistic function may more effectively represent the known variation in responses at different levels due to differences in the receivers, the context of the exposure, and other factors. The commenters suggested that our use of the 160-dB threshold implies that we do not recognize the science indicating that animals may react in ways constituting behavioral harassment when exposed to lower received levels. However, we do recognize the potential for Level B harassment at exposures to received levels below 160 dB rms, in addition to the potential that animals exposed to received levels above 160 dB rms will not respond in ways constituting behavioral harassment (e.g., Malme et al., 1983, 1984, 1985, 1988; McCauley et al., 1998, 2000a, 2000b; Barkaszi et al., 2012; Stone, 2015a; Gailey et al., 2016; Barkaszi and Kelly, 2018). These comments appear to evidence a misconception regarding the concept of the 160-dB threshold. While it is correct that in practice it works as a step-function, i.e., animals exposed to received levels above the threshold are considered to be “taken” and those exposed to levels below the threshold are not, it is in fact intended as a sort of mid-point of likely behavioral responses (which

are extremely complex depending on many factors including species, noise source, individual experience, and behavioral context). What this means is that, conceptually, the function recognizes that some animals exposed to levels below the threshold will in fact react in ways that are appropriately considered take, while others that are exposed to levels above the threshold will not. Use of the 160-dB threshold allows for a simplistic quantitative estimate of take, while we can qualitatively address the variation in responses across different received levels in our discussion and analysis.

As behavioral responses to sound depend on the context in which an animal receives the sound, including the animal's behavioral mode when it hears sounds, prior experience, additional biological factors, and other contextual factors, defining sound levels that disrupt behavioral patterns is extremely difficult. Even experts have not previously been able to suggest specific new criteria due to these difficulties (e.g., Southall et al. 2007; Gomez et al., 2016).

(ii) The ENGOS disagreed with NMFS' assumption that marine mammals move away from sound sources. The ENGOS claimed that studies have not found avoidance behavior to be generalizable among species and contexts, and even though avoidance may itself constitute take under the MMPA. Importantly, the commenters mistakenly seem to believe that the NMFS' does not consider avoidance as a take, and that the concept of avoidance is used as a mechanism to reduce overall take—this is not the case. Avoidance of loud sounds is a well-documented behavioral response, and NMFS often accordingly accounts for this avoidance by reducing the number of injurious exposures, which would occur in very close proximity to the source and necessitate a longer duration of exposure. However, when Level A harassment takes are reduced in this manner, they

are changed to Level B harassment takes, in recognition of the fact that this avoidance or other behavioral responses occurring as a result of these exposures are still take, NMFS does not reduce the overall amount of take as a result of avoidance.

(iii) The ENGOs questioned the effectiveness of the mitigation and monitoring measures proposed to be authorized. They specifically recommended that seasonal restrictions should be established and consideration should be given to species for which an unusual mortality event (UME) has been declared. Note that NMFS is requiring Equinor to comply with restrictions associated with identified seasonal management areas (SMA) and they must comply with dynamic management area restrictions (DMAs), if any DMAs are established near the Project Area. Furthermore, we have established a 500-m shutdown zone for North Atlantic right whales which is three times as large as the greatest Level B harassment isopleth calculated for the specified activities for this IHA (141 m). Additionally, similar mitigation and monitoring measures have previously been required in numerous HRG survey IHAs and have been successfully implemented.

Comment 27: The ENGOs recommended that HRG surveys should commence, with ramp-up, during daylight hours only, to maximize the probability that North Atlantic right whales detected and confirmed clear of the exclusion zone.

Response: We acknowledge the limitations inherent in detection of marine mammals at night. However, no injury is expected to result even in the absence of mitigation, given the very small estimated Level A harassment zones. Any potential impacts to marine mammals authorized for take 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. Vessels would also potentially be on the water for an extended time introducing noise into the marine environment. 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 and increase the risk of a vessel strike; thus the commenters have not demonstrated that such a requirement would result in a net benefit. Furthermore, restricting the applicant to ramp-up 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 and, subsequently, 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 consideration of potential effectiveness of the recommended measure and its practicability for the applicant, NMFS has determined that restricting survey start-ups to daylight hours when visibility is unimpeded is not warranted or practicable in this case.

Comment 28: The ENGOs recommended that all project vessels operating within or transiting to/from the Project Area, regardless of size, observe a mandatory 10 knot speed restriction during the entire survey period.

Response: NMFS does not concur with these measures. NMFS has analyzed the potential for ship strike resulting from Equinor'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 km/hour) or less speed restrictions in any established DMA or SMA; a requirement

that all vessel operators reduce vessel speed to 10 knots (18.5 km/hour) 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 500 m of an underway vessel, the underway vessel must reduce speed and shift the engine to neutral. 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. Furthermore, no documented vessel strikes have occurred for any HRG surveys which were issued IHAs from NMFS.

Changes from the Proposed IHA to Final IHA

NMFS has included User Spreadsheet inputs in Table 4 that were used to determine Level A harassment isopleths. Table 5 was revised to illustrate Level A harassment isopleths based on inputs from Table 4. NMFS has added language to the **Mitigation** section exempting harbor and gray seals from shutdown if they approach the survey vessel or towed survey equipment. This language is identical to that found in another recent HRG IHA issued in July, 2020 to Mayflower Wind Energy, LLC. (85 FR 45578; July 29, 2020). The **Federal Register** notice announcing our issuance of the IHA to Mayflower Wind Energy, LLC outlines the basis for these exceptions. NMFS increased the authorized number of takes of North Atlantic right whale by Level B

harassment based on a new density model that was released after the publication of the proposed IHA in the **Federal Register**.

Description of Marine Mammals in the Area of Specified Activities

Sections 3 and 4 of the 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 (SARs; <https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessments>) and more general information about these species (e.g., physical and behavioral descriptions) may be found on NMFS's website. (<https://www.fisheries.noaa.gov/find-species>).

Table 2 lists all species or stocks for which take is expected and authorized for this action, 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 Committee on Taxonomy (2020). 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 and annual serious injury and mortality from anthropogenic sources are 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. Atlantic SARs. All values presented in Table 2 are the most recent available at the time of publication and are available in the 2019 Atlantic and Gulf of Mexico Marine Mammal Stock Assessments (Hayes *et al.*, 2020), available online at : www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessment-reports-region.

Table 2 – Marine Mammals Known to Occur in the Survey Area That May be Affected by Equinor’s Planned Activity

Common Name (Scientific Name)	Stock	MMPA and ESA Status; Strategic (Y/N) ¹	Stock Abundance (CV, N _{min} , most recent abundance survey) ²	Predicted abundance (CV) ³	PBR ⁴	Annual M/SI ⁴	Occurrence in project area
Toothed whales (Odontoceti)							
Sperm whale <i>(Physeter macrocephalus)</i>	North Atlantic	E; Y	4,349 (0.28; 3,451; n/a)	5,353 (0.12)	6.9	0.0	Rare
Atlantic white- sided dolphin <i>(Lagenorhynchus acutus)</i>	W. North Atlantic	--; N	93,233(0.71; 54,443; n/a)	37,180 (0.07)	544	26	Common
Atlantic spotted dolphin <i>(Stenella frontalis)</i>	W. North Atlantic	--; N	39,921 (0.27; 32,032; 2012)	55,436 (0.32)	320	0	Common
Common dolphin <i>(Delphinus delphis)</i>	W. North Atlantic	--; N	172,825 (0.21; 145,216; 2011)	86,098 (0.12)	1,452	419	Common
Bottlenose dolphin <i>(Tursiops truncatus)</i>	W. North Atlantic, Offshore	--; N	62,851 (0.23; 51,914; 2011)	97,476 (0.06) ⁵	519	28	Common offshore
	W. North Atlantic, Northern	--; N	6,639 (0.41; 4,759; 2015)		48	6.1-13.2	Common nearshore

	Coastal Migratory						
Long-finned pilot whale (<i>Globicephala melas</i>)	W. North Atlantic	--; N	39,215 (0.3; 30,627; n/a)	18,977 (0.11) ⁵	306	21	Rare
Risso's dolphin (<i>Grampus griseus</i>)	W. North Atlantic	--; N	35,493 (0.19; 30,289; 2011)	7,732 (0.09)	303	54.3	Rare
Harbor porpoise (<i>Phocoena phocoena</i>)	Gulf of Maine/Bay of Fundy	--; N	95,543 (0.31; 74,034; 2011)	45,089 (0.12)*	851	217	Common
Baleen whales (Mysticeti)							
Fin whale (<i>Balaenoptera physalus</i>)	W. North Atlantic	E; Y	7,418 (0.25; 6,025; n/a)	4,633 (0.08)	12	2.35	Year round in continental shelf and slope waters
Sei whale (<i>Balaenoptera borealis</i>)	Nova Scotia	E; Y	6,292 (1.015; 3,098; n/a)	717 (0.30)*	6.2	1.0	Year round in continental shelf and slope waters
Minke whale (<i>Balaenoptera acutorostrata</i>)	Canadian East Coast	--; N	24,202 (0.3; 18,902; n/a)	2,112 (0.05)*	8.0	7.0	Year round in continental shelf and slope waters
Humpback whale (<i>Megaptera novaeangliae</i>)	Gulf of Maine	--; N	1,396 (0; 1,380; n/a)	1,637 (0.07)*	22	12.15	Common year round
North Atlantic right whale (<i>Eubalaena glacialis</i>)	W. North Atlantic	E; Y	428 (0; 418; n/a)	535 (0.45)*	0.8	6.85	Occur seasonally
Earless seals (Phocidae)							
Gray seal ⁶ (<i>Halichoerus grypus</i>)	W. North Atlantic	--; N	27,131 (0.19; 23,158; n/a)	n/a	1,389	5,410	Common
Harbor seal (<i>Phoca vitulina</i>)	W. North Atlantic	--; N	75,834 (0.15; 66,884; 2012)	n/a	2,006	350	Common
Harp seal ⁷ (<i>Pagophilus groenlandicus</i>)	W. North Atlantic	--; N	Unknown (n/a; n/a; n/a)	n/a	unk.	232,422	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 Stock abundance as reported in NMFS marine mammal stock assessment reports (SAR) except where otherwise noted. SARs available online at: www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessments. CV is coefficient of variation; N_{\min} 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 2019 Atlantic SARs (Hayes *et al.*, 2019).

³ This information represents species- or guild-specific abundance predicted by recent habitat-based cetacean density models (Roberts *et al.*, 2016, 2017, 2018). These models provide the best available scientific information regarding predicted density patterns of cetaceans in the U.S. Atlantic Ocean, and we provide the corresponding abundance predictions as a point of reference. Total abundance estimates were produced by computing the mean density of all pixels in the modeled area and multiplying by its area. For those species marked with an asterisk, the available information supported development of either two or four seasonal models; each model has an associated abundance prediction. Here, we report the maximum predicted abundance.

⁴ 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). Annual M/SI, found in NMFS' SARs, represent annual levels of human-caused mortality plus serious injury from all sources combined (*e.g.*, commercial fisheries, subsistence hunting, ship strike). Annual M/SI values often cannot be determined precisely and is in some cases presented as a minimum value. All M/SI values are as presented in the 2019 SARs (Hayes *et al.*, 2020)

⁵ Abundance estimates are in some cases reported for a guild or group of species when those species are difficult to differentiate at sea. Similarly, the habitat-based cetacean density models produced by Roberts *et al.* (2016, 2017, 2018) are based in part on available observational data which, in some cases, is limited to genus or guild in terms of taxonomic definition. Roberts *et al.* (2016, 2017, 2018) produced density models to genus level for *Globicephala* spp. and produced a density model for bottlenose dolphins that does not differentiate between offshore and coastal stocks.

⁶ NMFS stock abundance estimate applies to U.S. population only, actual stock abundance is approximately 505,000.

⁷ Stock abundance estimate is not available in NMFS SARs and predicted abundance estimate is not provided in Roberts *et al.* (2016, 2017, 2018).

A detailed description of the species for which take has been authorized, including brief introductions to the 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 (85 FR 37848; June 24, 2020); since that time, we are not aware of any changes in the status of these species and stocks; therefore, detailed descriptions are not provided here. Please refer to that **Federal Register** notice for these descriptions. Please also refer to NMFS' website (<https://www.fisheries.noaa.gov/find-species>) for generalized species accounts.

Potential Effects of Specified Activities on Marine Mammals and their Habitat

The effects of underwater noise from Equinor's survey activities have the potential to result in take of marine mammals by harassment in the vicinity of the survey area. The **Federal Register** notice for the proposed IHA (85 FR 37848; June 24, 2020) included a discussion of the effects of anthropogenic noise on marine mammals and their habitat. That information and analysis is incorporated by reference into this final IHA determination and is not repeated here; please refer to the notice of proposed IHA (85 FR 37848; June 24, 2020).

Estimated Take

This section provides an estimate of the number of incidental takes authorized through this IHA, which will inform 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, section 3(18) of 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 would be by Level B harassment only in the form of disruption of behavioral patterns for individual marine mammals resulting from exposure to HRG sources. Based on the nature of the activity and the anticipated effectiveness of the mitigation measures (*i.e.*, exclusion zones and shutdown measures), discussed in detail

below in the **Mitigation** section, Level A harassment is neither anticipated nor authorized.

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

Generally speaking, 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) the number of days of activities. We note that while these basic factors can contribute to a basic calculation to provide an initial prediction of takes, additional information that can qualitatively inform take estimates is also sometimes available (*e.g.*, previous monitoring results or average group size). Below, we describe the factors considered here in more detail and present the authorized take estimate.

Acoustic Thresholds

NMFS recommends the use of 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 for non-explosive sources – 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 source (*e.g.*, frequency, predictability, duty cycle), the environment (*e.g.*, bathymetry), and the receiving animals

(hearing, motivation, experience, demography, behavioral context) and can be difficult to predict (Southall *et al.*, 2007, Ellison *et al.*, 2012). Based on what the available science indicates and the practical need to use a threshold based on a factor that is both predictable and measurable for most activities, NMFS uses a generalized acoustic threshold based on received level to estimate the onset of behavioral harassment. NMFS predicts that marine mammals are likely to be behaviorally harassed in a manner we consider Level B harassment when exposed to underwater anthropogenic noise above received levels of 120 dB re 1 μ Pa (rms) for continuous (*e.g.*, vibratory pile-driving, drilling) and above 160 dB re 1 μ Pa (rms) for non-explosive impulsive (*e.g.*, seismic airguns) or intermittent (*e.g.*, scientific sonar) sources. Equinor's planned activity includes the use of intermittent sources (geophysical survey equipment) and therefore use of the 160 dB re 1 μ Pa (rms) threshold is applicable

Level A harassment for non-explosive sources - NMFS' Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing (Version 2.0) (Technical Guidance, 2018) 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 components of Equinor's planned activity that may result in the take of marine mammals include the use of impulsive and non-impulsive intermittent sources.

These thresholds are provided in Table 3 below. The references, analysis, and methodology used in the development of the thresholds are described in NMFS 2018 Technical Guidance, which may be accessed at

<https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-acoustic-technical-guidance>.

Table 3. Thresholds Identifying the Onset of Permanent Threshold Shift

Hearing Group	PTS Onset Acoustic Thresholds* (Received Level)	
	Impulsive	Non-impulsive
Low-Frequency (LF) Cetaceans	<i>Cell 1</i> $L_{pk,flat}$: 219 dB $L_{E,LF,24h}$: 183 dB	<i>Cell 2</i> $L_{E,LF,24h}$: 199 dB
	<i>Cell 3</i> $L_{pk,flat}$: 230 dB $L_{E,MF,24h}$: 185 dB	<i>Cell 4</i> $L_{E,MF,24h}$: 198 dB
Mid-Frequency (MF) Cetaceans	<i>Cell 5</i> $L_{pk,flat}$: 202 dB $L_{E,HF,24h}$: 155 dB	<i>Cell 6</i> $L_{E,HF,24h}$: 173 dB
	<i>Cell 7</i> $L_{pk,flat}$: 218 dB $L_{E,PW,24h}$: 185 dB	<i>Cell 8</i> $L_{E,PW,24h}$: 201 dB
High-Frequency (HF) Cetaceans	<i>Cell 9</i> $L_{pk,flat}$: 232 dB $L_{E,OW,24h}$: 203 dB	<i>Cell 10</i> $L_{E,OW,24h}$: 219 dB
	* 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.	
<p><u>Note:</u> Peak sound pressure (L_{pk}) has a reference value of 1 μPa, and cumulative sound exposure level (L_E) 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>i.e.</i>, 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.</p>		

Ensonified Area

Here, we describe operational and environmental parameters of the activity that will feed into identifying the area ensonified above the acoustic thresholds, which include source levels and transmission loss coefficient.

The planned survey would entail the use of HRG equipment. The distance to the isopleth corresponding to the threshold for Level B harassment was calculated for all HRG equipment with the potential to result in harassment of marine mammals. NMFS has developed an interim methodology for determining the rms sound pressure level (SPL_{rms}) at the 160-dB isopleth for the purposes of estimating take by Level B harassment resulting from exposure to HRG survey equipment (NMFS, 2019). This methodology incorporates frequency and some directionality to refine estimated ensonified zones and is described below:

If only peak source sound pressure level (SPL_{pk}) is given, the SPL_{rms} can be roughly approximated by:

$$(1) \quad SPL_{rms} = SPL_{pk} + 10 \log_{10} \tau$$

where τ is the pulse duration in second. If the pulse duration varies, the longest duration should be used, unless there is certainty regarding the portion of time a shorter duration will be used, in which case the result can be calculated/parsed appropriately.

In order to account for the greater absorption of higher frequency sources, we recommend applying $20 \log(r)$ with an absorption term $\alpha \cdot r/1000$ to calculate transmission loss (TL), as described in Eq.s (2) and (3) below:

$$(2) \quad TL = 20 \log_{10} (r) + \alpha \cdot r/1000 \text{ (dB)}$$

where r is the distance in meters, and α is absorption coefficient in dB/km.

While the calculation of absorption coefficient varies with frequency, temperature, salinity, and pH, the largest factor driving the absorption coefficient is frequency. A simple formula to approximate the absorption coefficient (neglecting temperature, salinity, and pH) is provided by Richardson *et al.* (1995):

$$(3) \quad \alpha \approx 0.036f^{1.5} \text{ (dB/km)}$$

where f is frequency in kHz. When a range of frequencies, is being used, the lower bound of the range should be used for this calculation, unless there is certainty regarding the portion of time a higher frequency will be used, in which case the result can be calculated/parsed appropriately.

Further, if the beamwidth is less than 180° and the angle of beam axis in respect to sea surface is known, the horizontal impact distance R should be calculated using

$$(4) \quad R = r \cos \left(\phi - \frac{\theta}{2} \right) \text{ (m)}$$

where SL is the SPL_{rms} at the source (1 m), θ is the beamwidth (in radian), and ϕ is the angle of beam axis in respect to sea surface (in radian).

Finally, if the beam is pointed at a normal downward direction, Eq. (4) can be simplified as:

$$(5) \quad R = r \cos \left(\frac{\pi}{2} - \frac{\theta}{2} \right) = r \sin \frac{\theta}{2} \text{ (m)}$$

The interim methodology described above was used to estimate isopleth distances to the Level B harassment threshold for the planned HRG survey. NMFS considers the data provided by Crocker and Fratantonio (2016) to represent the best available information on source levels associated with HRG equipment and therefore recommends that source levels provided by Crocker and Fratantonio (2016) be incorporated in the method described above to estimate isopleth distances to the Level B harassment threshold. In cases when the source level for a specific type of HRG equipment is not provided in Crocker and Fratantonio (2016), NMFS recommends that either the source levels provided by the manufacturer be used, or, in instances where source levels provided by the manufacturer are unavailable or unreliable, a proxy from Crocker and

Fratantonio (2016) be used instead. Table 1 shows the HRG equipment types that may be used during the planned vessel-based surveys that may result in take of marine mammals, and the sound levels associated with those HRG equipment types.

Results of modeling using the methodology described above indicated that, of the HRG survey equipment planned for use by Equinor that has the potential to result in harassment of marine mammals, sound produced by the GeoSource 800 J sparker would propagate furthest to the Level B harassment threshold (Table 4); therefore, for the purposes of the exposure analysis, it was assumed the GeoSource 800 J 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 GeoSource 800 J (estimated at 141 m; Table 5) was used as the basis of the take calculation for all marine mammals. We note that this is a conservative assumption as there may be times during the planned surveys when the GeoSource 800 J is not operated (Table 5).

Predicted distances to Level A harassment isopleths, which vary based on marine mammal functional hearing groups (Table 5), were also calculated, though it is important to note that NMFS does not believe that occurrence of Level A harassment is a realistic outcome of use of these sources. The updated acoustic thresholds for impulsive sounds (such as are produced by sparkers) contained in the Technical Guidance (NMFS, 2018) 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.*, the 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. Inputs to the User Spreadsheet are shown in Table 4.

Table 4 —User Spreadsheet Inputs

HRG System	Medium Sub-bottom Profiler
HRG Equipment	Geo-Source 400 Tip Sparker Source (800 J)
User Spreadsheet Tab	F. Mobile Source: impulsive, Intermittent
Source Level	203 RMS/213 PK
Weighting Factor Adjustment (kHz)	3.25
Source Velocity (m/sec)	2.06
Pulse Duration (seconds)	0.002
1/repetition rate^ (seconds)	0.25
Propagation (xLogR)	20

Table 5 – Modeled Radial Distances from HRG Survey Equipment to Isoleths Corresponding to Level A Harassment and Level B Harassment Thresholds

Sound Source	Radial Distance to Level A Harassment Threshold (m)				Radial Distance to Level B Harassment Threshold (m)
	Low frequency cetaceans (peak SPL / SELcum)	Mid frequency cetaceans (peak SPL / SELcum)	High frequency cetaceans (peak SPL / SELcum)	Phocid pinnipeds (underwater) (peak SPL / SELcum)	All marine mammals
Geo-Source 400 Tip Sparker (800 J)	-/1.2	-/0	-/8.4	-/<1	141

Modeled distances to isopleths corresponding to the Level A harassment thresholds are very small (< 8.4 m) for all marine mammal species and stocks that may be impacted by the planned activities (Table 5). Based on the very small Level A harassment

zones for all marine mammal species and stocks that may be impacted by the planned activities, the potential for any marine mammals to be taken by Level A harassment is considered so low as to be discountable. As NMFS has determined that the likelihood of take in the form of Level A harassment of any marine mammals as a result of the planned surveys is so low as to be discountable, we therefore do not propose to authorize the take by Level A harassment of any marine mammals.

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 habitat-based density models produced by the Duke University Marine Geospatial Ecology Laboratory (MGEL) (Roberts *et al.*, 2016, 2017, 2018) represent the best available information regarding marine mammal densities in the planned survey area. The density data presented by the Duke University MGEL incorporates aerial and shipboard line-transect survey data from NMFS and other organizations and incorporates data from 8 physiographic and 16 dynamic oceanographic and biological covariates, and controls for the influence of sea state, group size, availability bias, and perception bias on the probability of making a sighting. These density models were originally developed for all cetacean taxa in the U.S. Atlantic (Roberts *et al.*, 2016). In subsequent years, certain models have been updated on the basis of additional data as well as certain methodological improvements. The updated models incorporate additional sighting data, including sightings from the NOAA Atlantic Marine Assessment Program for Protected Species (AMAPPS) surveys from 2010–2014 (NEFSC & SEFSC, 2011, 2012, 2014a, 2014b, 2015, 2016), and include updated density data for North Atlantic right whales,

including in Cape Cod Bay (Roberts *et al.*, 2018). Our evaluation of the changes leads to a conclusion that these represent the best scientific evidence available. More information is available online at seamap.env.duke.edu/models/Duke-EC-GOM-2015/. Marine mammal density estimates in the project area (animals/km²) were obtained using these model results (Roberts *et al.*, 2016, 2017, 2018).

For the exposure analysis, density data from the Duke University MGEL (Roberts *et al.* (2016, 2017, 2018)) were mapped using a geographic information system (GIS). The density coverages that included any portion of the planned project area were selected for all potential survey months. For each of the survey areas (*i.e.*, ECRA-1, ECRA-2, ECRA-3 and ECRA-4), the densities of each species as reported by the Duke University MGEL (Roberts *et al.* (2016, 2017, 2018)) were averaged by season; thus, a density was calculated for each species for spring, summer, fall and winter. To be conservative, the greatest seasonal density calculated for each species be carried forward in the exposure analysis. Estimated seasonal densities (animals per km²) of all marine mammal species that may be taken by the surveys, for all seasons and all survey areas, are shown in Tables 6-2, 6-3, 6-4, 6-5 and 6-6 of the IHA application. The maximum seasonal density values used to estimate marine mammal exposure numbers are shown in Table 6 below. Note that Duke University MGEL density models do not differentiate by bottlenose dolphin stocks and instead provide estimates at the species level (Roberts *et al.* (2016, 2017, 2018)); the Western North Atlantic northern migratory coastal stock and the Western North Atlantic offshore stock of bottlenose dolphins may occur in the planned survey areas (Hayes *et al.* 2018). Similarly, the Duke University MGEL produced density

models for all seals and did not differentiate by seal species (Roberts *et al.* (2018)); harbor, gray and harp seals may occur in the planned survey areas (Hayes *et al.* 2018).

Table 6 – Seasonal Marine Mammal Densities (Number of Animals per 100 km²) in All Survey Areas Used in Exposure Estimates

Species	ECRA-1	ECRA-2	ECRA-3	ECRA-4
North Atlantic right whale ¹	0.006803	0.008907	0.0000913	0.007247667
Humpback whale	0.0054269	0.00147951	0.0003133	0.0007076
Fin whale	0.0048318	0.00392609	0.000154	0.0029756
Sei whale	0.0003972	0.00028884	0.00002179	0.000146
Minke whale	0.0044061	0.0020292	0.00006959	0.0015375
Sperm Whale	0.0001033	0.00029419	0.00004323	0.0003508
Pilot whales	0.0014728	0.00011263	0.00002895	0.0058357
Bottlenose dolphins	0.0847306	0.02955662	0.0684936	0.0527685
Common dolphin	0.0224355	0.2121851	0.0043119	0.1539656
Atlantic white-sided dolphin	0.057509	0.05269613	0.0015548	0.0305044
Atlantic spotted dolphin	0.00005057	0.00212995	0.00008059	0.0020008
Risso’s dolphin	0.00007374	0.00294218	0.00000215	0.000818
Harbor porpoise	0.05438	0.07252193	0.1348293	0.0671625
Seals (all species)	0.3330293	0.0717368	0.0506316	0.0539549

Note: All density values, with the exception North Atlantic right whales, were derived from Roberts *et al.* (2016, 2017, 2018). Densities shown represent the maximum seasonal density values calculated, except pilot whales for which seasonal densities were not available.

¹Densities for North Atlantic right whales derived from Roberts *et al.* 2020, which was published after the Notice of Proposed IHA had published in the **Federal Register**.

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 is then calculated, based

on areas predicted to be ensonified around the HRG survey equipment and the estimated trackline distance traveled per day by the survey vessel.

Equinor estimates that planned surveys will achieve a maximum daily track line distance of 177.6 km (110.3 mi) per day during planned HRG surveys. We note that this is a conservative estimate as it accounts for the vessel traveling at approximately 4 knots and accounts for non-active survey periods (*i.e.*, it assumes HRG equipment would be active 24 hours per day during all survey days when in fact there are likely to be periods when the equipment is not active). Based on the maximum estimated distance to the Level B harassment threshold of 141 m (Table 5) and the maximum estimated daily track line distance of 177.6 km (110.3 mi), an area of 50.08 km² would be ensonified to the Level B harassment threshold per day during Equinor's planned surveys. As stated above, this is a conservative assumption as there may be times during the planned surveys when the GeoSource 800 J is not operated; if this were the case, the ensonified area would be much smaller, based on the modeled Level B harassment threshold associated with the USBL.

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 (animals / km²), incorporating the estimated marine mammal densities as described above. Estimated numbers of each species taken per day are then multiplied by the total number of survey days. The product is then rounded, to generate an estimate of the total number of instances of harassment expected for each species over the duration of the survey. A summary of this method is illustrated in the following formula:

$$\text{Estimated Take} = D \times \text{ZOI} \times \# \text{ of days}$$

Where: D = average species density (per km^2) and ZOI = maximum daily ensonified area to relevant thresholds.

In this case, the methodology described above was used to estimate marine mammal exposures separately in the four ECRA's. Thus, exposures were calculated separately for each of the four individual ECRA's based on estimated survey duration in each ECRA and using the maximum seasonal density estimates for each respective ECRA (Table 7).

Note that after the Notice of Proposed IHA was published (June 24, 2020; 85 FR 36537) a new North Atlantic right whale density model became available to the public (Roberts *et al.* 2020) which NMFS considers to be the best available information. The model integrated data from a number of aerial and vessel-based surveys between 2003 and 2018. Equinor revised the North Atlantic right whale take calculations contained in the application and published in the Notice of Proposed IHA in response to the new Roberts *et al.* 2020 model data. Equinor revised the estimated duration of survey days in each export cable route area (ECRA) resulting in a total of 113 survey days reduced from 218 days. Since Equinor is working under an existing LoC allowing daylight only operations, they have been able to reduce the remaining number of anticipated survey days. Additionally, Equinor used an overly conservative assumption of the daily survey trackline distance in their application, which NMFS then used in the proposed IHA, and which now appropriately has been reduced from 177.6 km/day to 110 km/day. Although likely still conservative it is more aligned with trackline distances presented in other recent HRG survey IHAs. Takes by Level B harassment of North Atlantic right whales were calculated based on the modeling approach described above and are shown in Table

7. In the Notice of Proposed IHA, Equinor determined that take of the species could be avoided due to mitigation and therefore did not request take authorization for the North Atlantic right whale. However, given the size of modeled Level B harassment zone, the duration of the planned surveys, and the fact that surveys will occur 24 hours per day, NMFS is not confident that all takes of North Atlantic right whales could be avoided due to mitigation, and we therefore proposed to authorize 50 percent of the total number of exposures above the Level B harassment threshold that were modeled. We expect the required mitigation measures, including a 500-m exclusion zone for North Atlantic right whales (which exceeds the Level B harassment zone by over 350-m), will be effective in reducing the potential for takes by Level B harassment, but there is still a risk that North Atlantic right whales may not be detected within the Level B harassment zone during periods of diminished visibility, particularly at night. For the reasons listed above, we are confident that the mitigation will avoid at least 50% of the take. Therefore, we have authorized 14 North Atlantic right whale takes by Level B harassment based on a total of 28 calculated takes. No take by Level A harassment was proposed or has been authorized.

Table 7 — Revised North Atlantic Right Whale Take Estimate based on Roberts et al. 2020

ECRA	Total Days [d]	km/day	ZOI (km ²)	Maximum Seasonal Density (indiv/km ²) [D]	Estimated Exposure or Take = D x ZOI x (d)
1	5	110	31.12	0.006803	1
2	65	110	31.12	0.008907333	18
3	3	110	31.12	0.0000913	0
4	40	110	31.12	0.007247667	9
Total					28

Exposure estimates for the four survey areas as shown in Table 6 and Table 7 were combined for a total estimated number of exposures (Table 8).

Table 8 – Numbers of Potential Incidental Take of Marine Mammals Authorized and Authorized Takes as a Percentage of Population

Species	Estimated Takes by Level B Harassment ECRA-1	Estimated Takes by Level B Harassment ECRA-2	Estimated Takes by Level B Harassment ECRA-3	Estimated Takes by Level B Harassment ECRA-4	Total Takes by Level B Harassment Authorized	Total Authorized Instances of Take as a Percentage of Population ¹
North Atlantic right whale	1	18	0	9	14 ²	3.1
Humpback whale	3	5	1	4	13	0.8
Fin whale	3	14	0	19	36	0.8
Sei whale	1	1	0	1	3	0.4
Minke whale	3	7	0	10	20	0.9
Sperm Whale	0	1	0	2	3	0.1
Long-finned Pilot Whale	1	1	0	37	39	0.2
Bottlenose dolphin ³	48	104	39	331	522	7.9
Common dolphin	13	747	2	966	1,728	2.0
Atlantic white-sided dolphin	33	185	1	191	410	1.1
Atlantic spotted dolphin	0	8	0	13	21	0.0
Risso's dolphin	0	10	0	5	15	0.2
Harbor porpoise	31	255	76	421	783	1.7
Seals ⁴	188	253	29	338	808	1.1

¹ Calculations of percentage of stock taken are based on the best available abundance estimate as shown in Table 2. In most cases the best available abundance estimate is provided by Roberts *et al.* (2016, 2017, 2018), when available, to maintain consistency with density estimates derived from Roberts *et al.* (2016, 2017, 2018). For North Atlantic right whales the best available abundance estimate is derived from the North Atlantic Right Whale Consortium 2019 Annual Report Card (Pettis *et al.*, 2019). For bottlenose

dolphins and seals, Roberts *et al.* (2016, 2017, 2018) provides only a single abundance estimate and does not provide abundance estimates at the stock or species level (respectively), so abundance estimates used to estimate percentage of stock taken for bottlenose dolphins, gray, harbor and harp seals are derived from NMFS SARs (Hayes *et al.*, 2019).

²New Roberts et al (2020) density estimates shows 28 North Atlantic right whale Level B harassment exposures in the activity area as was considered in the proposed IHA. We have confidence in the effectiveness of mitigation and its ability to minimize right whale exposure and, therefore, in the Proposed IHA, we project that the mitigation will avoid at least 50% of the take. Therefore we are authorizing 14 North Atlantic Right Whale Takes by Level B harassment.

³ Either the Western North Atlantic coastal migratory stock or the Western North Atlantic offshore stock may be taken. Total authorized instances of take as a percentage of population shown for Western North Atlantic coastal migratory stock (based on all 522 authorized takes accruing to that stock). The total authorized instances of take as a percentage of population for the Western North Atlantic offshore stock is 0.8 (based on all 522 authorized takes accruing to that stock).

⁴ Harbor, gray or harp seals may be taken. Total authorized instances of take as a percentage of population shown for harbor seals (based on all 808 authorized takes accruing to that species). The total authorized instances of take as a percentage of population for gray seals and harp seals is 0.2 and 0.0, respectively (based on all 808 authorized takes accruing to each species).

As described above, the Duke University MGEL produced density models that did not differentiate by seal species. The underlying data in the Duke University MGEL seal models came almost entirely from AMAPPS aerial surveys which were unable to differentiate by seal species, with the majority of seal sightings reported as “unidentified seal” (Roberts *et al.*, 2018). Given the fact that the in-water habitats of harbor seals and gray seals are not well described but likely overlap, and based on the few species identifications that were available, the Duke University MGEL did not attempt to classify the ambiguous “unidentified seal” sightings by species (Roberts *et al.*, 2018) and instead produced models for seals as a guild. The take calculation methodology described above resulted in an estimate of 808 total seal takes. Based on this estimate, Equinor requested 808 takes each of harbor, gray and harp seals, based on an assumption that the modeled takes could accrue to any of the respective species. We instead propose to authorize 808 total takes of seals by Level B harassment. Based on the occurrence of harbor, gray and harp seals in the survey areas, we expect the authorized takes would accrue roughly equally to gray and harbor seals, with only a handful of takes of harp seals at most.

The density models produced by the Duke University MGEL also did not differentiate by bottlenose dolphin stocks (Roberts *et al.* (2016, 2017, 2018). The Western North Atlantic northern migratory coastal stock and the Western North Atlantic offshore stock occur in the planned survey areas. The northern migratory coastal stock occurs in coastal waters from the shoreline to approximately the 20-m isobath while the offshore stock occurs at depths of 20-m and greater (Hayes *et al.* 2019). The take calculation methodology described above resulted in an estimate of 522 total bottlenose dolphin takes. Depths across the planned survey areas range from very shallow waters near landfall locations to approximately 75-m in offshore survey locations. As planned surveys would occur in areas where either the northern migratory coastal stock or the offshore stock may occur, we expect the authorized takes would accrue roughly equally to both stocks.

Equinor requested 39 total takes of pilot whales (either long-finned or short-finned). However, the range of short-finned pilot whales does not extend north of Delaware (Hayes *et al.*, 2019) and therefore short-finned pilot whales are not expected to occur in the planned survey areas. As such, we propose to authorize takes of long-finned pilot whales only.

As described above, NMFS has determined that the likelihood of take of any marine mammals in the form of Level A harassment occurring as a result of the planned surveys is so low as to be discountable; therefore, we do not propose to authorize take of any marine mammals by Level A harassment.

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 the activity, and other means of effecting the least practicable impact on the species or stock and its habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance, and on the availability of the species or stock for taking for certain subsistence uses. 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 the 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 proposed), the likelihood of effective implementation (probability implemented as proposed), and;

(2) The practicability of the measures for applicant implementation, which may consider such things as cost, impact on operations, and, in the case of a military readiness

activity, personnel safety, practicality of implementation, and impact on the effectiveness of the military readiness activity.

Mitigation Measures

NMFS proposes the following mitigation measures be implemented during Equinor's planned marine site characterization surveys.

Marine Mammal Exclusion Zones, Buffer Zone and Monitoring Zone

Marine mammal EZs would be established around the HRG survey equipment and monitored by PSOs during HRG surveys as follows:

- A 500-m EZ is required for North Atlantic right whales; and
- A 100-m EZ is required for all other marine mammal species.

If a marine mammal is detected approaching or entering the EZs during the planned survey, the vessel operator must adhere to the shutdown procedures described below. In addition to the EZs described above, PSOs must visually monitor a 200 m Buffer Zone. During use of acoustic sources with the potential to result in marine mammal harassment (*i.e.*, anytime the acoustic source is active, including ramp-up), occurrences of marine mammals within the Buffer Zone (but outside the EZs) must be communicated to the vessel operator to prepare for potential shutdown of the acoustic source. The Buffer Zone is not applicable when the EZ is greater than 100 meters. PSOs must also be required to observe a 500-m Monitoring Zone and record the presence of all marine mammals within this zone. The zones described above must be based upon the radial distance from the active equipment (rather than being based on distance from the vessel itself).

Visual Monitoring

A minimum of one NMFS-approved PSO must be on duty and conducting visual observations at all times during daylight hours (*i.e.*, from 30 minutes prior to sunrise through 30 minutes following sunset). Visual monitoring must begin no less than 30 minutes prior to ramp-up of HRG equipment and must continue until 30 minutes after use of the acoustic source ceases or until 30 minutes past sunset. PSOs must establish and monitor the applicable EZs, Buffer Zone and Monitoring Zone as described above. Visual PSOs must coordinate to ensure 360° visual coverage around the vessel from the most appropriate observation posts, and must conduct visual observations using binoculars and the naked eye while free from distractions and in a consistent, systematic, and diligent manner. PSOs must estimate distances to observed marine mammals. It is the responsibility of the Lead PSO on duty to communicate the presence of marine mammals as well as to communicate action(s) that are necessary to ensure mitigation and monitoring requirements are implemented as appropriate. Position data must be recorded using hand-held or vessel global positioning system (GPS) units for each confirmed marine mammal sighting.

Pre-Clearance of the Exclusion Zones

Prior to initiating HRG survey activities, Equinor must implement a 30-minute pre-clearance period. During pre-clearance monitoring (*i.e.*, before ramp-up of HRG equipment begins), the Buffer Zone must also act as an extension of the 100-m EZ in that observations of marine mammals within the 200-m Buffer Zone must also preclude HRG operations from beginning. During this period, PSOs must ensure that no marine mammals are observed within 200-m of the survey equipment (500-m in the case of North Atlantic right whales). HRG equipment must not start up until this 200-m zone (or,

500-m zone in the case of North Atlantic right whales) is clear of marine mammals for at least 30 minutes. The vessel operator must notify a designated PSO of the planned start of HRG survey equipment as agreed upon with the lead PSO; the notification time should not be less than 30 minutes prior to the planned initiation of HRG equipment order to allow the PSOs time to monitor the EZs and Buffer Zone for the 30 minutes of pre-clearance. A PSO conducting pre-clearance observations must be notified again immediately prior to initiating active HRG sources.

If a marine mammal were observed within the relevant EZs or Buffer Zone during the pre-clearance period, initiation of HRG survey equipment must not begin until the animal(s) has been observed exiting the respective EZ or Buffer Zone, or, until an additional time period has elapsed with no further sighting (*i.e.*, minimum 15 minutes for small odontocetes and seals, and 30 minutes for all other species). The pre-clearance requirement must include small delphinoids that approach the vessel (*e.g.*, bow ride). PSOs must also continue to monitor the zone for 30 minutes after survey equipment is shut down or survey activity has concluded. These requirements must be in effect only when the GeoSource 800 J sparker is being operated.

Ramp-Up of Survey Equipment

When technically feasible, a ramp-up procedure must be used for geophysical survey equipment capable of adjusting energy levels at the start or re-start of survey activities. The ramp-up procedure must 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 detect the presence of the survey and vacate the area prior to the commencement of survey equipment operation at full power. Ramp-up of the survey

equipment must not begin until the relevant EZs and Buffer Zone has been cleared by the PSOs, as described above. HRG equipment must be initiated at their lowest power output and must be incrementally increased to full power. If any marine mammals are detected within the EZs or Buffer Zone prior to or during ramp-up, the HRG equipment must be shut down (as described below).

Shutdown Procedures

The shutdown procedures described below are only in effect when the GeoSource 800 J sparker is being operated. If an HRG source is active and a marine mammal is observed within or entering a relevant EZ (as described above) an immediate shutdown of the HRG survey equipment is required. When shutdown is called for by a PSO, the acoustic source must be immediately deactivated and any dispute resolved only following deactivation. Any PSO on duty must have the authority to delay the start of survey operations or to call for shutdown of the acoustic source if a marine mammal is detected within the applicable EZ. The vessel operator must establish and maintain clear lines of communication directly between PSOs on duty and crew controlling the HRG source(s) to ensure that shutdown commands are conveyed swiftly while allowing PSOs to maintain watch. Subsequent restart of the HRG equipment must only occur after the marine mammal has either been observed exiting the relevant EZ, or, until an additional time period has elapsed with no further sighting of the animal within the relevant EZ (*i.e.*, 15 minutes for small odontocetes, pilot whales and seals, and 30 minutes for large whales).

Upon implementation of shutdown, the HRG source may be reactivated after the marine mammal that triggered the shutdown has been observed exiting the applicable EZ

(*i.e.*, the animal is not required to fully exit the Buffer Zone where applicable), or, following a clearance period of 15 minutes for small odontocetes and seals and 30 minutes for all other species with no further observation of the marine mammal(s) within the relevant EZ. If the HRG equipment shuts down for brief periods (*i.e.*, less than 30 minutes) for reasons other than mitigation (*e.g.*, mechanical or electronic failure) the equipment may be re-activated as soon as is practicable at full operational level, without 30 minutes of pre-clearance, only if PSOs have maintained constant visual observation during the shutdown and no visual detections of marine mammals occurred within the applicable EZs and Buffer Zone during that time. For a shutdown of 30 minutes or longer, or if visual observation was not continued diligently during the pause, pre-clearance observation is required, as described above.

The shutdown requirement is waived for certain genera of small delphinids (*i.e.*, *Delphinus*, *Lagenorhynchus*, *Stenella*, and *Tursiops*) and pinnipeds (gray and harbor seals) under certain circumstances. If a delphinid(s) from these genera or seal(s) is visually detected approaching the vessel (*i.e.*, to bow ride) or towed survey equipment, shutdown is not required. If there is uncertainty regarding identification of a marine mammal species (*i.e.*, whether the observed marine mammal(s) belongs to one of the delphinid genera for which shutdown is waived), PSOs must use best professional judgment in making the decision to call for a shutdown.

If a species for which authorization has not been granted, or, a species for which authorization has been granted but the authorized number of takes have been met, approaches or is observed within the area encompassing the Level B harassment isopleth while the sparker is operating (141 m), shutdown must occur.

Seasonal Restrictions

To minimize the potential for impacts to North Atlantic right whales, vessel-based HRG survey activities would be prohibited in the Off Race Point SMA and Cape Cod Bay SMA from January through May and in the Great South Channel SMA from April through July.

Vessel Strike Avoidance

- Vessel strike avoidance measures would include, but would not be limited to, the following: Vessel operators and crews must maintain a vigilant watch for all protected species and slow down, stop their vessel, or alter course, as appropriate and regardless of vessel size, to avoid striking any protected species. A visual observer aboard the vessel must monitor a vessel strike avoidance zone around the vessel (distances stated below). Visual observers monitoring the vessel strike avoidance zone may be third-party observers (*i.e.*, PSOs) or crew members, but crew members responsible for these duties must be provided sufficient training to 1) distinguish protected species from other phenomena and 2) broadly to identify a marine mammal as a North Atlantic right whale, other whale (defined in this context as sperm whales or baleen whales other than North Atlantic right whales), or other marine mammal.
- All survey vessels, regardless of size, must observe a 10-knot speed restriction in specific areas designated by NMFS for the protection of North Atlantic right whales from vessel strikes: any Dynamic Management Areas (DMAs) when in effect, and the Off Race Point SMA (in effect from January 1 through May 15), Cape Cod Bay SMA (in effect from March 1 through April 30), Great South

Channel SMA (in effect from April 1 through July 31), Block Island Sound SMA (in effect from November 1 through April 30); and New York / New Jersey SMA (in effect from November 1 through April 30). See

www.fisheries.noaa.gov/national/endangered-species-conservation/reducing-ship-strikes-north-atlantic-right-whales for specific detail regarding these areas.

- Vessel speeds must also be reduced to 10 knots or less when mother/calf pairs, pods, or large assemblages of cetaceans are observed near a vessel.
- All vessels must maintain a minimum separation distance of 500 m from North Atlantic right whales. If a whale is observed but cannot be confirmed as a species other than a North Atlantic right whale, the vessel operator must assume that it is a North Atlantic right whale and take appropriate action.
- All vessels must maintain a minimum separation distance of 100 m from sperm whales and all other baleen whales.
- All vessels must, to the maximum extent practicable, attempt to maintain a minimum separation distance of 50 m from all other protected species, with an understanding that at times this may not be possible (*e.g.*, for animals that approach the vessel).
- When protected species are sighted while a vessel is underway, the vessel must take action as necessary to avoid violating the relevant separation distance (*e.g.*, attempt to remain parallel to the animal's course, avoid excessive speed or abrupt changes in direction until the animal has left the area). If protected species are sighted within the relevant separation distance, the vessel must reduce speed and shift the engine to neutral, not engaging the engines until animals are clear of the

area. This does not apply to any vessel towing gear or any vessel that is navigationally constrained.

These requirements do not apply in any case where compliance would create an imminent and serious threat to a person or vessel or to the extent that a vessel is restricted in its ability to maneuver and, because of the restriction, cannot comply.

Seasonal Operating Requirements

As described above, the planned survey area partially overlaps with a portion of five North Atlantic right whale SMAs: Off Race Point SMA (in effect from January 1 through May 15); Cape Cod Bay SMA (in effect from March 1 through April 30); Great South Channel SMA (in effect from April 1 through July 31); Block Island Sound SMA (in effect from November 1 through April 30); and New York / New Jersey SMA (in effect from November 1 through April 30). All Equinor survey vessels, regardless of length, are required to adhere to vessel speed restrictions (<10 knots) when operating within the SMAs during times when the SMAs are in effect. In addition, between watch shifts, members of the monitoring team must consult NMFS's North Atlantic right whale reporting systems for the presence of North Atlantic right whales throughout survey operations. Members of the monitoring team must also monitor the NMFS North Atlantic right whale reporting systems for the establishment of DMA. If NMFS should establish a DMA in the survey area while surveys are underway, Equinor is required to contact NMFS within 24 hours of the establishment of the DMA to determine whether alteration or restriction of survey activities was warranted within the DMA to minimize impacts to North Atlantic right whales.

Also as described above, portions of the planned survey areas overlap spatially with designated critical habitat for North Atlantic right whales, which was established due to the area's significance for North Atlantic right whale foraging (81 FR 4837, January 27, 2016). To minimize potential impacts to North Atlantic right whales during the seasons when they occur in high numbers in the Gulf of Maine/Georges Bank critical habitat, vessel-based HRG survey activities are prohibited in the Off Race Point SMA and Cape Cod Bay SMA from January through May and in the Great South Channel SMA from April through July.

The required mitigation measures are designed to avoid the already low potential for injury in addition to some instances of Level B harassment, and to minimize the potential for vessel strikes. Further, we believe the required mitigation measures are practicable for the applicant to implement.

There are no known marine mammal rookeries or mating or calving grounds in the survey area that would otherwise potentially warrant increased mitigation measures for marine mammals or their habitat (or both). The planned survey areas will overlap spatially with an area that has been identified as a biologically important area for migration for North Atlantic right whales. However, while the potential survey areas across the ECRAAs are relatively large, the actual areas that will ultimately be surveyed are relatively small compared to the substantially larger spatial extent of the North Atlantic right whale migratory area. We have required mitigation measures, including seasonal restrictions and vessel speed restrictions as described above, to minimize potential impacts to North Atlantic right whale migration. Thus, the survey is not expected to appreciably reduce migratory habitat nor to negatively impact the migration

of North Atlantic right whales. As described above, some portions of the planned survey areas will overlap spatially with areas that are recognized as important for North Atlantic right whale foraging, including portions of areas that have been designated as critical habitat due to the significance of the area for North Atlantic right whale foraging. We have required mitigation measures, including seasonal restrictions and vessel speed restrictions as described above, to minimize potential impacts to North Atlantic right whale foraging. Thus, the survey is not expected to appreciably reduce foraging habitat nor to negatively impact North Atlantic right whales foraging.

Based on our evaluation of the applicant's proposed measures, as well as other measures considered by NMFS, NMFS has determined that the required mitigation measures provide the means 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 planned action 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).
- Mitigation and monitoring effectiveness.

Monitoring Measures

As described above, visual monitoring must be performed by qualified and NMFS-approved PSOs. Equinor must use independent, dedicated, trained PSOs, meaning that the PSOs must be employed by a third-party observer provider (with limited exceptions made only for inshore vessels), must have no tasks other than to conduct

observational effort, collect data, and communicate with and instruct relevant vessel crew with regard to the presence of marine mammals and mitigation requirements (including brief alerts regarding maritime hazards), and must have successfully completed an approved PSO training course appropriate for their designated task. Equinor must provide resumes of all proposed PSOs (including alternates) to NMFS for review and approval prior to the start of survey operations.

During survey operations (*e.g.*, any day on which use of an HRG source is planned to occur), a minimum of one PSO must be on duty and conducting visual observations at all times on all active survey vessels during daylight hours (*i.e.*, from 30 minutes prior to sunrise through 30 minutes following sunset). Visual monitoring must begin no less than 30 minutes prior to initiation of HRG survey equipment and must continue until one hour after use of the acoustic source ceases or until 30 minutes past sunset. PSOs must coordinate to ensure 360 degree visual coverage around the vessel from the most appropriate observation posts, and must conduct visual observations using binoculars and the naked eye while free from distractions and in a consistent, systematic, and diligent manner. PSOs may be on watch for a maximum of four consecutive hours followed by a break of at least two hours between watches and may conduct a maximum of 12 hours of observation per 24-hour period. In cases where multiple vessels are surveying concurrently, any observations of marine mammals must be communicated to PSOs on all survey vessels.

PSOs must be equipped with binoculars and have the ability to estimate distances to observed marine mammals. Reticulated binoculars will be available to PSOs for use as appropriate based on conditions and visibility to support the monitoring of marine

mammals. Position data must be recorded using hand-held or vessel GPS units for each sighting. Observations must take place from the highest available vantage point on the survey vessel. General 360-degree scanning must occur during the monitoring periods, and target scanning by the PSO must occur when alerted of a marine mammal presence.

During good conditions (*e.g.*, daylight hours; Beaufort sea state (BSS) 3 or less), to the maximum extent practicable, PSOs must conduct observations when the acoustic source is not operating for comparison of sighting rates and behavior with and without use of the acoustic source and between acquisition periods. Any observations of marine mammals by crew members aboard any vessel associated with the survey must be relayed to the PSO team.

Data on all PSO observations must be recorded based on standard PSO collection requirements. This include dates, times, and locations of survey operations; dates and times of observations, location and weather; details of marine mammal sightings (*e.g.*, species, numbers, behavior); and details of any observed marine mammal take that occurs (*e.g.*, noted behavioral disturbances).

Reporting Measures

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, summarizes the number of marine mammals estimated to have been taken during survey activities (by species, when known), (*i.e.*, observations of marine mammals within the Level B harassment zone must be reported as potential takes by Level B harassment) summarizes the mitigation actions taken during surveys (including what type of mitigation and the species and number of

animals that prompted the mitigation action, when known), 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.

In addition to the final technical report, Equinor will provide the reports described below as necessary during survey activities. In the event that personnel involved in the survey activities covered by the authorization discover an injured or dead marine mammal, Equinor must report the incident to the NOAA Fisheries OPR (301-427-8401), and to the NOAA Fisheries New England/Mid-Atlantic Regional Stranding Coordinator (978-282-8478) as soon as feasible. The report must include the following information:

- Time, date, and location (latitude/longitude) of the first discovery (and updated location information if known and applicable);
- Species identification (if known) or description of the animal(s) involved;
- Condition of the animal(s) (including carcass condition if the animal is dead);
- Observed behaviors of the animal(s), if alive;
- If available, photographs or video footage of the animal(s); and
- General circumstances under which the animal was discovered.

In the event of a vessel strike of a marine mammal by any vessel involved in the activities covered by the authorization, the Equinor must report the incident to NOAA Fisheries OPR (301-427-8401) and to the NOAA Fisheries New England/Mid-Atlantic Regional Stranding Coordinator (978-282-8478) as soon as feasible. The report must include the following information:

- Time, date, and location (latitude/longitude) of the incident;
- Species identification (if known) or description of the animal(s) involved;

- Vessel's speed during and leading up to the incident;
- Vessel's course/heading and what operations were being conducted (if applicable);
- Status of all sound sources in use;
- Description of avoidance measures/requirements that were in place at the time of the strike and what additional measures were taken, if any, to avoid strike;
- Environmental conditions (*e.g.*, wind speed and direction, Beaufort sea state, cloud cover, visibility) immediately preceding the strike;
- Estimated size and length of animal that was struck;
- Description of the behavior of the marine mammal immediately preceding and following the strike;
- If available, description of the presence and behavior of any other marine mammals immediately preceding the strike;
- Estimated fate of the animal (*e.g.*, dead, injured but alive, injured and moving, blood or tissue observed in the water, status unknown, disappeared); and
- To the extent practicable, photographs or video footage of the animal(s).

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 (50 CFR 216.103). 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. To be conservative, our analyses assume that a total of 808 exposures above the Level B harassment threshold could accrue to all of the potentially impacted seal species (*i.e.*, harbor, gray and harp seals), and that a total of 522 exposures above the Level B harassment threshold could accrue to both bottlenose dolphin stocks that may be present (*i.e.*, the Western North Atlantic offshore stock and the Western North Atlantic northern coastal migratory stock).

NMFS does not anticipate that serious injury or mortality would occur as a result of Equinor’s planned survey, even in the absence of mitigation, thus the authorization does not authorize any serious injury or mortality. As discussed in the **Potential Effects of Specified Activities on Marine Mammals and their Habitat** section, non-auditory

physical effects and vessel strike are not expected to occur. Additionally and as discussed previously, given the nature of activity and sound sources used and especially in consideration of the required mitigation, Level A harassment is neither anticipated nor authorized. 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, reactions that are considered to be of low severity and with no lasting biological consequences (*e.g.*, Southall *et al.*, 2007).

Effects on individuals that are taken by Level B harassment, on the basis of reports in the literature as well as monitoring from other similar activities, will likely be limited to reactions such as increased swimming speeds, increased surfacing time, or decreased foraging (if such activity were occurring). Most likely, individuals will simply move away from the sound source and temporarily avoid the area where the survey is occurring. We expect that any avoidance of the survey area by marine mammals would be temporary in nature and that any marine mammals that avoid the survey area during the survey activities would not be permanently displaced. Even repeated Level B harassment of some small subset of an overall stock is unlikely to result in any significant realized decrease in viability for the affected individuals, and thus would not result in any adverse impact to the stock as a whole. Instances of more severe behavioral harassment are expected to be minimized by required mitigation and monitoring measures.

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. 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 and the availability of similar habitat and resources in the surrounding area, 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.

There are no rookeries, mating or calving grounds known to be biologically important to marine mammals within the planned survey area. As described above, the planned survey areas overlap spatially with 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 coasts of Massachusetts, Rhode Island, Connecticut, New York and New Jersey, this biologically important migratory area extends from the coast to beyond the shelf break. Due to the fact that that the planned survey is temporary and the spatial extent of sound produced by the survey would be very small relative to the spatial extent of the available migratory habitat in the area, and due to required mitigation measures including seasonal restrictions, North Atlantic right whale migration is not expected to be impacted by the planned survey. As described above, some portions of the planned survey areas overlap spatially with areas that are recognized as important for North Atlantic right whale foraging, including portions of areas that have been designated as ESA critical habitat due to the significance of the area for North Atlantic right whale feeding. Due to the fact that that the planned survey is temporary and the spatial extent of sound produced by the survey would very small relative to the spatial extent of the available foraging habitat in

the area, as well as required mitigation measures including seasonal restrictions in areas and seasons when North Atlantic right whale foraging is predicted to occur, North Atlantic right whale foraging is not expected to be impacted by the planned surveys.

As described above, North Atlantic right, humpback, and minke whales, and gray, harbor and harp seals are experiencing ongoing UMEs. For North Atlantic right whales, as described above, no injury as a result of the planned project is expected or authorization, and Level B harassment takes of North Atlantic right whales are expected to be in the form of avoidance of the immediate area of the planned survey. In addition, the number of takes authorized above the Level B harassment threshold are relatively low (*i.e.* 8), and the take numbers authorized do not account for the required mitigation measures, which would require shutdown of all survey equipment upon observation of a North Atlantic right whale prior to their entering the zone that would be ensounded above the Level B harassment threshold. As no injury or mortality is expected or authorized, and Level B harassment of North Atlantic right whales will be reduced to the level of least practicable adverse impact through use of required mitigation measures, the authorized takes of North Atlantic right whales would not exacerbate or compound the ongoing UME in any way.

Similarly, no injury or mortality is expected or authorized for any of the other species with UMEs, Level B harassment will be reduced to the level of least practicable adverse impact through use of required mitigation measures, and the authorized takes would not exacerbate or compound the ongoing UMEs. For minke whales, although the ongoing UME is under investigation (as occurs for all UMEs), this event does not provide cause for concern regarding population level impacts, as the likely population

abundance is greater than 20,000 whales and annual M/SI does not exceed the calculated PBR value for minke whales. With regard to humpback whales, the UME does not yet provide cause for concern regarding population-level impacts. Despite the UME, the relevant population of humpback whales (the West Indies breeding population, or DPS) remains healthy. The West Indies DPS, which consists of the whales whose breeding range includes the Atlantic margin of the Antilles from Cuba to northern Venezuela, and whose feeding range primarily includes the Gulf of Maine, eastern Canada, and western Greenland is not listed under the ESA. The status review identified harmful algal blooms, vessel collisions, and fishing gear entanglements as relevant threats for this DPS, but noted that all other threats are considered likely to have no or minor impact on population size or the growth rate of this DPS (Bettridge *et al.*, 2015). As described in Bettridge *et al.* (2015), the West Indies DPS has a substantial population size (*i.e.*, approximately 10,000; Stevick *et al.*, 2003; Smith *et al.*, 1999; Bettridge *et al.*, 2015), and appears to be experiencing consistent growth. With regard to gray, harbor and harp seals, although the ongoing UME is under investigation, the UME does not yet provide cause for concern regarding population-level impacts to any of these stocks. For harbor seals, the population abundance is over 75,000 and annual M/SI (345) is well below PBR (2,006) (Hayes *et al.*, 2019). For gray seals, the population abundance in the United States is over 27,000, with an estimated abundance including seals in Canada of approximately 505,000, and abundance is likely increasing in the U.S. Atlantic EEZ as well as in Canada (Hayes *et al.*, 2019). For harp seals, while PBR is unknown, the minimum population estimate is 6.9 million and the population appears to be stable (Hayes *et al.*, 2019).

The required 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 or more severe behavioral responses. 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 Equinor's planned survey would 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 authorized 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 planned activity on marine mammals would primarily be in the form of temporary behavioral changes due to avoidance of the area around the survey vessel;

- The availability of alternate areas of similar habitat value (for foraging and migration) for marine mammals that may temporarily vacate the survey areas during the planned surveys to avoid exposure to sounds from the activity;
- The planned project area does not contain known areas of significance for mating or calving;
- Effects on species that serve as prey species for marine mammals from the planned survey would be minor and temporary and would not be expected to reduce the availability of prey or to affect marine mammal feeding;
- The required mitigation measures, including visual monitoring, exclusion zones, and shutdown measures, 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 required 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 sections 101(a)(5)(A) and (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. When the predicted number of individuals to be taken is fewer than one third of the species or stock abundance, the take is considered to be of small numbers.

Additionally, other qualitative factors may be considered in the analysis, such as the temporal or spatial scale of the activities.

We propose to authorize incidental take of 17 marine mammal stocks. The total amount of taking authorized is less than one third for all stocks (Table 7), which we find are small numbers of marine mammals relative to the estimated overall population abundances for those stocks. To be conservative, our small numbers analysis assumes a total of 808 exposures above the Level B harassment threshold could accrue to any of the potentially impacted seal species (*i.e.*, harbor, gray or harp seals) and a total of 522 exposures above the Level B harassment threshold could accrue to both bottlenose dolphin stocks that may be present (*i.e.*, the Western North Atlantic offshore stock and the Western North Atlantic northern coastal migratory stock). Based on the analysis contained herein of the planned activity (including the proposed 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 all 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 (ESA: 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 whenever we propose to authorize take for endangered or threatened species, in this case with the Greater Atlantic Regional Field Office (GARFO).

We requested initiation of consultation under section 7 of the ESA with NMFS GARFO for the issuance of this IHA. On July 30, 2020, NMFS GARFO determined our issuance of the IHA to Equinor was not likely to adversely affect the North Atlantic right, fin, sei, and sperm whale or the critical habitat of any ESA-listed species or result in take under the ESA.

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

This action is consistent with categories of activities identified in Categorical Exclusion B4 (incidental harassment authorizations with no anticipated serious injury or mortality) of the Companion Manual for NOAA Administrative Order 216-6A, which do not individually or cumulatively have the potential for significant impacts on the quality of the human environment and for which we have not identified any extraordinary circumstances that would preclude this categorical exclusion. Accordingly, NMFS has

determined that the issuance of the IHA qualifies to be categorically excluded from further NEPA review.

Authorization

NMFS has issued an IHA to Equinor for the potential harassment of small numbers of 17 marine mammal stocks incidental to the conducting marine site characterization surveys off the coast of Massachusetts, Rhode Island, Connecticut, New York or New Jersey in the area of the Commercial Leases of Submerged Lands for Renewable Energy Development on the Outer Continental Shelf (OCS-A 0520 and OCS-A 0512) and along potential submarine cable routes to a landfall locations

Dated: September 21, 2020.

Donna S. Wieting,

Director, Office of Protected Resources,

National Marine Fisheries Service.

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