



DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

RTID 0648-XB007

Takes of Marine Mammals Incidental to Specified Activities; Taking Marine Mammals Incidental to Marine Site

Characterization Surveys off of Delaware

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 Skipjack Offshore Energy, LLC (Skipjack) to incidentally harass, by Level B harassment only, marine mammals during marine site characterization surveys offshore of Delaware in the area of the Commercial Lease of Submerged Lands for Renewable Energy Development on the Outer Continental Shelf (OCS-A 0519) and along potential submarine cable routes to a landfall location in Delaware.

DATES: This Authorization is effective for a period of one year, from April 5, 2021 through April 4, 2022.

FOR FURTHER INFORMATION CONTACT: Robert Pauline, Office of Protected Resources, NMFS, (301) 427-8401.

Electronic copies of the applications and supporting documents, as well as a list of the references cited in this document, may be obtained by visiting the Internet at: www.fisheries.noaa.gov/national/marine-mammal-protection/incidental-take-authorizations-other-energy-activities-renewable. In case of problems accessing these documents, please call the contact listed above.

SUPPLEMENTARY INFORMATION:

Background

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 such 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 such takings are set forth.

Summary of Request

On August 12, 2020, NMFS received a request from Skipjack for an IHA to take marine mammals incidental to marine site characterization surveys offshore of Delaware in the area of the Commercial Lease of Submerged Lands for Renewable Energy Development on the Outer Continental Shelf (OCS-A 0519) and along potential submarine cable routes to a landfall location in Delaware. Revised versions of the application were received on September 21, 2020 and November 5, 2020. The

application was deemed adequate and complete on December 12, 2020. Skipjack's request is for take of a small number of 16 species of marine mammals by Level B harassment only. Neither Skipjack nor NMFS expects serious injury or mortality to result from this activity and, therefore, an IHA is appropriate.

NMFS previously issued an IHA to Skipjack for similar work in the same geographic area on December 3, 2019 (84 FR 66156) with effective dates from November 26, 2019 through November 25, 2020. Skipjack complied with all the requirements (*e.g.*, mitigation, monitoring, and reporting) of the previous IHA and given the similarity in activities and location, relevant information regarding their previous marine mammal monitoring results may be found in the **Estimated Take** section.

Description of the Specified Activity

Skipjack plans to conduct marine site characterization surveys, including high-resolution geophysical (HRG) surveys, in the area of OCS-A 0519 (Lease Area) and along potential submarine cable routes to landfall locations in Delaware over approximately 200 days. The purpose of the marine site characterization surveys are to obtain a baseline assessment of seabed (geophysical, geotechnical, and geohazard), ecological, and archeological conditions within the footprint of offshore wind facility development. Underwater sound resulting from Skipjack's planned activities, specifically certain acoustic sources planned for use during surveys, has the potential to result in incidental take of marine mammals in the form of behavioral harassment (*i.e.*, Level B harassment only). Impulsive sources (*e.g.*, sparker systems) would be utilized for 50 survey days while the non-impulsive sources (*e.g.*, CHIRP sub-bottom profilers (SBPs)) would be used for the remaining 150 days. The survey activities planned by Skipjack are described in detail in the notice of proposed IHA (86 FR 11239; February 24, 2021). The HRG survey equipment that may be used by Skipjack are shown in Table 1.

Table 1—Summary of Representative HRG Survey Equipment

Equipment	Acoustic Source Type	Operating Frequency (kHz)	SL _{rms} (dB re 1 μPa m)	SL _{0-pk} (dB re 1 μPa m)	Pulse Duration (width) (milli-second)	Repetition Rate (Hz)	Beamwidth (degrees)	CF= Crocker and Fratantonio (2016) MAN = Manufacturer
Non-impulsive, Non-parametric, Shallow Sub-bottom Profilers (CHIRP Sonars)								
ET 216 (2000DS or 3200 top unit)	Non-impulsive, mobile, intermittent	2–16 2–8	195	-	20	6	24	MAN
ET 424	Non-impulsive, mobile, intermittent	4–24	176	-	3.4	2	71	CF
ET 512	Non-impulsive, mobile, intermittent	0.7–12	179	-	9	8	80	CF
GeoPulse 5430A	Non-impulsive, mobile, intermittent	2–17	196	-	50	10	55	MAN
Teledyne Benthos Chirp III - TTV 170	Non-impulsive, mobile, intermittent	2–7	197	-	60	15	100	MAN
Impulsive, Medium Sub-bottom Profilers (Sparkers & Boomers)								
AA, Dura-spark UHD (400 tips, 500 J)	Impulsive, mobile	0.3–1.2	203	211	1.1	4	Omni	CF
AA, Dura-spark UHD (400+400)	Impulsive, mobile	0.3–1.2	203	211	1.1	4	Omni	CF (AA Dura-spark UHD Proxy)
GeoMarine, Geo-Source dual 400 tip sparker (800 J)	Impulsive, mobile	0.4–5	203	211	1.1	2	Omni	CF (AA Dura-spark UHD Proxy)
GeoMarine Geo-Source 200 tip sparker (400 J)	Impulsive, mobile	0.3–1.2	203	211	1.1	4	Omni	CF (AA Dura-spark UHD Proxy)
GeoMarine Geo-Source 200-400 tip sparker (400 J)	Impulsive, mobile	0.3–1.2	203	211	1.1	4	Omni	CF (AA Dura-spark UHD Proxy)
AA, triple plate S-Boom (700–1,000 J)	Impulsive, mobile	0.1–5	205	211	0.6	4	80	CF

As described above, a detailed description of Skipjack's planned surveys is provided in the **Federal Register** notice for the proposed IHA (86 FR 11239; February 24, 2021). Since that time, no changes have been made to the planned survey activities. Therefore, a detailed description is not provided here. Please refer to that **Federal Register** notice for the description of the specific 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 Skipjack was published in the **Federal Register** on February 24, 2021 (86 FR 11239). During the 30-day comment period, NMFS received comments from: 1) a group of environmental non-governmental organizations (ENGOS) including the Natural Resources Defense Council, Conservation Law Foundation, National Wildlife Federation, Defenders of Wildlife, Southern Environmental Law Center, Wildlife Conservation Society, Surfrider Foundation, Mass Audubon, Friends of the Earth, International Fund for Animal Welfare, NY4WHALES, WDC Whale and Dolphin Conservation, Marine Mammal Alliance Nantucket, Gotham Whale, All Our Energy, Seatuck Environmental Association, Inland Ocean Coalition, Nassau Hiking & Outdoor Club, and Connecticut Audubon Society; and 2) the Delaware Department of Resources and Environmental Control (DNREC).

NMFS has posted the comments online at: www.fisheries.noaa.gov/national/marine-mammal-protection/incidental-take-authorizations-other-energy-activities-renewable. Please see the letters for full detail and rationale for the comments.

Comment 1: The ENGOS recommended that NMFS incorporate additional data sources into calculations of marine mammal density and take and that NMFS must ensure all available data are used to ensure that any potential shifts in North Atlantic right whale habitat usage are reflected in estimations of marine mammal density and take. The ENGOS asserted in

general that the density models used by NMFS do not fully reflect the abundance, distribution, and density of marine mammals for the U.S. East Coast and therefore result in an underestimate of take.

Response: At the outset of their letter, the ENGOs note that the comments reflect overarching concerns regarding NMFS' IHAs for marine site characterization survey (including HRG survey) activities required for offshore wind energy development, as well as their intention that the comments be considered in relation to all authorizations associated with marine site characterization activities for offshore wind energy off the U.S. East Coast. The comments provided in the letter apparently focus concern on available data regarding the Massachusetts and Rhode Island and Massachusetts Wind Energy Areas, and on North Atlantic right whale habitat usage within those areas. As such, the specific comments pertaining to those data and right whale habitat usage within those areas are not germane to this specific action, *i.e.*, issuance of an IHA associated with HRG survey activity off of Delaware. We address the general comments regarding sufficiency of the available data on marine mammal occurrence below.

Habitat-based density models produced by the Duke University Marine Geospatial Ecology Lab (MGEL) (Roberts *et al.* 2016, 2017, 2018, 2020) represent the best available scientific information concerning marine mammal occurrence within the U.S. Atlantic Ocean. Density models were originally developed for all cetacean taxa in the U.S. Atlantic (Roberts *et al.*, 2016); more information, including the model results and supplementary information for each of those models, is available at seamap.env.duke.edu/models/Duke-EC-GOM-2015/. These models provided key improvements over previously available information, by incorporating additional aerial and shipboard survey data from NMFS and from other organizations collected over the period 1992-2014, incorporating 60 percent more shipboard and 500 percent more aerial survey hours than did previously available models; controlling for the influence of sea state, group size, availability bias, and perception bias on the probability of making a sighting; and modeling density from an expanded set of eight physiographic and 16 dynamic

oceanographic and biological covariates. In subsequent years, certain models have been updated on the basis of additional data as well as methodological improvements. In addition, a new density model for seals was produced as part of the 2017-18 round of model updates.

Of particular note, Roberts *et al.* (2020) further updated density model results for North Atlantic right whales by incorporating additional sighting data and implementing three major changes: increasing spatial resolution, generating monthly estimates on three time periods of survey data, and dividing the study area into five discrete regions. This most recent update—model version 9 for North Atlantic right whales—was undertaken with the following objectives (Roberts *et al.*, 2020):

- To account for recent changes to right whale distributions, the model should be based on survey data that extend through 2018, or later if possible. In addition to updates from existing collaborators, data should be solicited from two survey programs not used in prior model versions:

- Aerial surveys of the Massachusetts and Rhode Island Wind Energy Areas led by New England Aquarium (Kraus *et al.*, 2016), spanning 2011-2015 and 2017-2018.

- Recent surveys of New York waters, either traditional aerial surveys initiated by the New York State Department of Environmental Conservation in 2017, or digital aerial surveys initiated by the New York State Energy Research and Development Authority in 2016, or both.

- To reflect a view in the right whale research community that spatiotemporal patterns in right whale density changed around the time the species entered a decline in approximately 2010, consider basing the new model only on recent years, including contrasting “before” and “after” models that might illustrate shifts in density, as well as a model spanning both periods, and specifically consider which model would best represent right whale density in the near future.

- To facilitate better application of the model to near-shore management questions, extend the spatial extent of the model farther in-shore, particularly north of New York.
- Increase the resolution of the model beyond 10 kilometers (km), if possible.

All of these objectives were met in developing the most recent update to the North Atlantic right whale density model. The commenters do not cite this most recent report, and the comments suggest that the aforementioned data collected by the New England Aquarium is not reflected in the model. Therefore, it is unclear whether the commenters are aware of the most recently available data, which is used herein.

As noted above, NMFS has determined that the Roberts *et al.* suite of density models represent the best available scientific information, and we specifically note that the most recent version of the North Atlantic right whale model may address some of the specific concerns provided by the commenters. However, NMFS acknowledges that there will always be additional data that is not reflected in the models and that may inform our analyses, whether because the data were not made available to the model authors or because the data is more recent than the latest model version for a specific taxon. NMFS will review any recommended data sources to evaluate their applicability in a quantitative sense (*e.g.*, to an estimate of take numbers) and, separately, to ensure that relevant information is considered qualitatively when assessing the impacts of the specified activity on the affected species or stocks and their habitat. NMFS will continue to use the best available scientific information, and 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 U.S. Atlantic waters.

The ENGOs cited several additional sources of information that are not reflected in currently available density models, including sightings databases and passive acoustic monitoring (PAM) efforts. However, no specific recommendations were made with regard to use of this information in informing the take estimates. Rather, the commenters reference a disparate array

of data sources (some which are indeed reflected in the most recent models) and suggest that NMFS should “collate and integrate these and more recent data sets to more accurately reflect marine mammal presence for future IHAs and other work.” NMFS would welcome in the future constructive suggestions as to how these objectives might be more effectively accomplished. NMFS used the best scientific information available at the time the analyses for the proposed IHA were conducted, and has considered all available data, including sources referenced by the commenters, in reaching its determinations in support of issuance of the IHA requested by Skipjack.

Comment 2: The ENGOs noted that the Roberts *et al.* model does not differentiate between species of pilot whale or seal or between stocks of bottlenose dolphin. The ENGOs express concern that, as a result, NMFS may not conduct the appropriate species-or stock-specific negligible impact analysis. The ENGOs also imply that use of these models may produce inaccurate take numbers by stating that “[m]iscalculation of take levels based on incomplete data could have serious implications for the future conservation of these species and stocks.”

Response: The MMPA requires that species- or stock-specific negligible impact determinations be made, and NMFS has done so. In this case, NMFS has authorized take numbers specific to each affected species or stock. As a general matter, NMFS is unaware of any available density data which differentiates between species of pilot whales or seals, or stocks of bottlenose dolphins. However, lack of such data does not preclude the requisite species- or stock-specific findings. In the event that an amount of take is authorized at the guild or species level only, *e.g.*, for pilot whales or bottlenose dolphins, respectively, NMFS may adequately evaluate the effects of the activity by conservatively assuming (for example) that all takes authorized for the guild or species would accrue to each potentially affected species or stock. In this case, NMFS has apportioned the overall take number for bottlenose dolphins according to stock, as described in the Estimated Take section and, for pilot whales, has assigned take on the basis of an assumed group size of 10 for each potentially affected species. NMFS does not

agree that use of these models is likely to result in miscalculation of take levels, and the commenters do not provide support for this statement.

Comment 3: The ENGOs assert that NMFS has not acknowledged the use of areas south of Nantucket and Martha's Vineyard as important habitat for foraging and social behavior for North Atlantic right whales, but rather that NMFS believes the areas are important solely as a migratory pathway. The commenters also asserted that NMFS is overly reliant on the description of biologically important areas (BIA) provided in LaBrecque *et al.* (2015), stating that "NMFS should not rely on the North Atlantic right whale migratory corridor BIA as the sole indicator of habitat importance for the species."

Response: The specified activity associated with the IHA addressed herein is located off of Delaware. Therefore, this comment is not relevant to issuance of this IHA. However, as a general matter, NMFS disagrees with the commenters' assertion. Although NMFS has in other notices discussed at length the use of the referenced area as a migratory pathway (and recognition of such use through the area's description as a BIA for right whales), we have also acknowledged the more recent data and its implications for the use of the referenced area (see, *e.g.*, 85 FR 63508; December 7, 2018; 86 FR 11930; March 1, 2021). Similarly, NMFS does not agree with the assertion that our understanding of important habitat for marine mammals stems solely from existing, described BIAs. NMFS concurs with the statement that BIAs are not comprehensive and are intended to be periodically reviewed and updated and we routinely review newly available information to inform our understanding of important marine mammal habitat. In this case, the specified geographical region does not include important habitat other than that described as being the migratory pathway for right whales.

Comment 4: The ENGOs commented that the waters off Cape Hatteras, North Carolina, have high marine mammal biodiversity and that marine mammals occur at unusually high densities off Cape Hatteras compared to other areas along the East Coast. The ENGOs asserted that this area demands special attention from NMFS.

Response: NMFS concurs with the commenters regarding the importance of deepwater areas off of Cape Hatteras. However, the specific activity associated with the IHA addressed herein does not occur off of Cape Hatteras and, in general, the site characterization surveys conducted in support of wind energy development that are the subject of the ENGO comment letter occur in shallow water (not the area of high biodiversity and density referenced by commenters). When appropriate, NMFS has accorded special attention to the development of additional mitigation for activities conducted in that location (*e.g.*, 83 FR 63268; December 7, 2018). NMFS uses the best available scientific information when analyzing potential impacts to marine mammals and in developing prescribed mitigation sufficient to meet the MMPA's "least practicable adverse impact" standard, and has done so in this case.

Comment 5: The ENGOs asserted that NMFS must analyze cumulative impacts to North Atlantic right whales and other marine mammal species and stocks and ensure appropriate mitigation of these cumulative impacts. The commenters express particular concern about the cumulative impacts of survey activities off Rhode Island and Massachusetts on North Atlantic right whales. They further recommended that NMFS develop programmatic incidental take regulations applicable to site characterization activities.

Response: Neither the MMPA nor NMFS' codified implementing regulations call for consideration of other unrelated activities and their impacts on populations. 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. Consistent with that direction, NMFS 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. The 1989 implementing regulations also addressed public comments regarding cumulative effects from

future, unrelated activities. There NMFS stated that such effects are not considered in making findings under section 101(a)(5) concerning negligible impact. In this case, both this IHA, as well as other IHAs currently in effect or proposed within the specified geographic region, are appropriately considered an unrelated activity relative to the others. The IHAs are unrelated in the sense that they are discrete actions under section 101(a)(5)(D), issued to discrete applicants.

Section 101(a)(5)(D) of the MMPA requires NMFS to make a determination that the take incidental to a “specified activity” will have a negligible impact on the affected species or stocks of marine mammals. NMFS’ implementing regulations require applicants to include in their request a detailed description of the specified activity or class of activities that can be expected to result in incidental taking of marine mammals. 50 CFR 216.104(a)(1). Thus, the “specified activity” for which incidental take coverage is being sought under section 101(a)(5)(D) is generally defined and described by the applicant. Here, Skipjack was the applicant for the IHA, and we are responding to the specified activity as described in that application (and making the necessary findings on that basis).

Through the response to public comments in the 1989 implementing regulations, we also indicated (1) that NMFS would consider cumulative effects that are reasonably foreseeable when preparing a NEPA analysis, and (2) that reasonably foreseeable cumulative effects would also be considered under section 7 of the ESA for ESA-listed species. In this case, cumulative impacts have been adequately addressed under NEPA in prior environmental analyses that form the basis for NMFS’ determination that this action is appropriately categorically excluded from further NEPA analysis. Regarding activities in the Mid- and South Atlantic region, in 2018 NMFS signed a Record of Decision that (1) adopted the Bureau of Ocean Energy Management’s 2014 Final Programmatic Environmental Impact Statement that evaluated the direct, indirect, and cumulative impacts of geological and geophysical survey activities on the Mid- and South Atlantic Outer Continental Shelf to support NMFS’ analysis associated with issuance of incidental take authorizations pursuant to sections 101(a)(5)(A) or (D) of

the MMPA and the regulations governing the taking and importing of marine mammals (50 CFR Part 216), and (2) in accordance with 40 CFR 1505.2, announced and explained the basis for our decision to review and potentially issue incidental take authorizations under the MMPA on a case-by-case basis, if appropriate. Separately, NMFS has previously written Environmental Assessments (EA) that addressed cumulative impacts related to substantially similar activities, in similar locations, *e.g.*, 2019 Orsted EA for survey activities offshore southern New England; 2019 Avangrid EA for survey activities offshore North Carolina and Virginia; 2018 Deepwater Wind EA for survey activities offshore Delaware, Massachusetts, and Rhode Island.

Separately, cumulative effects were analyzed as required through NMFS' required intra-agency consultation under section 7 of the ESA, which determined that NMFS' action of issuing the IHA is not likely to adversely affect listed marine mammals or their critical habitat.

Finally, the ENGOs suggested that NMFS should promulgate programmatic incidental take regulations for site characterization activities. Although NMFS is open to this approach, we have not received a request for such regulations. The ENGOs do not explain their apparent position that NMFS may advance regulations absent a requester.

Comment 6: The ENGOs state that NMFS should not adjust estimated take numbers for large whales on the basis of assumed efficacy of mitigation requirements, and assert that NMFS' assumptions regarding effectiveness of mitigation requirements are unfounded.

Response: In this case, NMFS did not propose to adjust downward any estimated take number based on proposed mitigation measures, and has not done so in the issued IHA. Therefore, the comment is not relevant to this specific action. Generally, NMFS does not agree with the apparent contention that it is never appropriate to reduce estimated take numbers

based on anticipated implementation and effectiveness of mitigation measures, and will continue to evaluate the appropriateness of doing so on a case-specific basis.

While we acknowledge the commenters' concerns regarding unfounded assumptions concerning the effectiveness of mitigation requirements in reducing actual take, it is important to also acknowledge the circumstances of a particular action. In most cases, the maximum estimated Level B harassment zone associated with commonly-used acoustic sources is approximately 150 meters (m), whereas the typically-required shutdown zone for North Atlantic right whales is 500 m. For North Atlantic right whales, NMFS expects that this requirement will indeed be effective in reducing actual take below the estimated amount, which typically does not account for the beneficial effects of mitigation.

Comment 7: The ENGOs state that NMFS must require mitigation measures that meet the least practicable adverse impact standard, imply that the requirements prescribed by NMFS have not met that standard, and recommend various measures that the commenters state NMFS should require.

The ENGOs first state that NMFS should prohibit site assessment and characterization activities involving equipment with noise levels that the commenters assert could cause injury or harassment to North Atlantic right whales during periods of highest risk, which the commenters define as times of highest relative density of animals during their migration, and times when mother-calf pairs, pregnant females, surface active groups, or aggregations of three or more whales are, or are expected to be, present. The commenters additionally state that NMFS should require that work commence only during daylight hours and good visibility conditions to maximize the probability that marine mammals are detected and confirmed clear of the exclusion zone before activities begin. If the activity is halted or delayed because of documented or suspected North Atlantic right whale presence in the area, the commenters state that NMFS should require operators to wait until daylight hours and good visibility conditions to recommence.

Response: NMFS acknowledges 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 characteristics of the sources planned for use (supported by the very small estimated Level A harassment zones). The ENGOs do not provide any support for the apparent contention that injury is a potential outcome of these activities. Regarding Level B harassment, any potential impacts would be limited to short-term behavioral responses, as described in greater detail herein. The commenters establish that the status of North Atlantic right whales in particular is precarious. NMFS agrees in general with the discussion of this status provided by the commenters. NMFS also agrees with the commenters that certain recommended mitigation requirements, *e.g.*, avoiding impacts in places and times of greatest importance to marine mammals, limiting operations to times of greatest visibility, would be effective in reducing impacts. However, the commenters fail entirely to establish that Skipjack's specified site assessment and characterization survey activities—or site assessment and characterization survey activities in general—would have impacts on North Atlantic right whales (or any other species) such that operational limitations would be warranted. In fact, NMFS considers this category of survey operations to be near de minimis, with the potential for Level A harassment for any species to be discountable and the severity of Level B harassment (and, therefore, the impacts of the take event on the affected individual), if any, to be low. In that context, there is no need for more restrictive mitigation requirements, and the commenters offer no justification to the contrary.

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; thus the commenters have not demonstrated that such a requirement would

result in a net benefit. Furthermore, restricting the applicant to begin operations 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 the likely effects of the activity on marine mammals absent mitigation, potential unintended consequences of the measures as proposed by the commenters, and practicability of the recommended measures for the applicant, NMFS has determined that restricting operations as recommended is not warranted or practicable in this case.

Comment 8: The ENGOs recommended that NMFS establish an exclusion zone (EZ) of 1,000-m around each vessel conducting activities with noise levels that they assert could result in injury or harassment to North Atlantic right whales, and a minimum EZ of 500 m for all other large whale species and strategic stocks of small cetaceans.

Response: NMFS disagrees with this recommendation, and has determined that the EZs included here are 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. The commenters do not provide any justification for the contention that the existing EZs are insufficient, and do not provide any rationale for their recommended alternatives (other than that they are larger).

Comment 9: The ENGOs stated that NMFS' requirements related to visual monitoring are inadequate. The commenters specifically noted their belief that a requirement for one Protected Species Observer (PSO) to be on duty during daylight hours is insufficient, and recommended that NMFS require the use of infrared equipment to support visual monitoring by PSOs

during periods of darkness. DNREC also recommended that infrared equipment be used to support visual monitoring by PSOs during periods of darkness.

Response: 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 only. Although NMFS acknowledges that the single PSO cannot reasonably maintain observation of the entire 360-degree area around the vessel, it is reasonable to assume that the single PSO engaged in continual scanning of such a small area (*i.e.*, 500-m EZ, which is greater than the maximum 141-m harassment zone) will be successful in detecting marine mammals that are available for detection at the surface. 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. As far as visual monitoring at night, we have not historically required visual monitoring at night because available information demonstrated that such monitoring should not be considered effective. However, as night vision technology has continued to improve, NMFS has adapted its practice, and two PSOs are required to be on duty at night. Moreover, NMFS has included a requirement in the final IHA that night-vision equipment (*i.e.*, night-vision goggles and/or infrared technology) must be available for use.

Regarding specific technology cited by the ENGOs, NMFS appreciates the suggestion and agrees that relatively new detection platforms have shown promising results. Following review of the ENGO's letter, we considered these and other supplemental platforms as suggested. However, to our knowledge, there is no clear guidance available for operators regarding characteristics of effective systems, and the detection systems cited by the commenters are typically extremely expensive, and are therefore considered impracticable for use in most surveys. The commenters do not provide specific suggestions with regard to recommended systems or characteristics of systems. NMFS does not generally consider requirements to use systems such as those cited by the commenters to currently be practicable.

Comment 10: The ENGOs recommended that NMFS should require PAM at all times, both day and night, to maximize the probability of detection for North Atlantic right whales, and other species and stocks. DNREC echoed this recommendation.

Response: The foremost concern expressed by the ENGOs in making the recommendation to require use of PAM is with regard to North Atlantic right whales. However, the commenters do not explain why they expect that PAM would be effective in detecting vocalizing *mysticetes*. It is generally well-accepted fact that, even in the absence of additional acoustic sources, using a towed passive acoustic sensor to detect baleen whales (including right whales) is not typically effective because the noise from the vessel, the flow noise, and the cable noise are in the same frequency band and will mask the vast majority of baleen whale calls. Vessels produce low-frequency noise, primarily through propeller cavitation, with main energy in the 5-300 Hertz (Hz) frequency range. Source levels range from about 140 to 195 dB re 1 μ Pa (micropascal) at 1 m (NRC, 2003; Hildebrand, 2009), depending on factors such as ship type, load, and speed, and ship hull and propeller design. Studies of vessel noise show that it appears to increase background noise levels in the 71-224 Hz range by 10-13 dB (Hatch *et al.*, 2012; McKenna *et al.*, 2012; Rolland *et al.*, 2012). PAM systems employ hydrophones towed in streamer cables approximately 500 m behind a vessel. Noise from water flow around the cables and from strumming of the cables themselves is also low-frequency and typically masks signals in the same range. Experienced PAM operators participating in a recent workshop (Thode *et al.*, 2017) emphasized that a PAM operation could easily report no acoustic encounters, depending on species present, simply because background noise levels rendered any acoustic detection impossible. The same workshop report stated that a typical eight-element array towed 500 m behind a vessel could be expected to detect delphinids, sperm whales, and beaked whales at the required range, but not baleen whales, due to expected background noise levels (including seismic noise, vessel noise, and flow noise).

There are several additional 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 during HRG survey activities is limited. First, for this activity, the area expected to be ensounded above the Level B harassment threshold is relatively small (a maximum of 141 m)—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.

Given that the effects to 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, the limited additional benefit anticipated by adding this detection method (especially for right whales and other low frequency cetaceans, species for which PAM has limited efficacy), and the cost and impracticability of implementing a full-time PAM program, we have determined the current requirements for visual monitoring are sufficient to ensure the least practicable adverse impact on the affected species or stocks and their habitat.

Comment 11: The ENGOs recommended that NMFS require applicants to use the lowest practicable source level.

Response: Wind energy developers selected the equipment necessary during HRG surveys to achieve their objectives. As part of the analysis for all HRG IHAs, NMFS 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 12: The ENGOs recommended that NMFS require all offshore wind energy related project vessels operating within or transiting to/from survey areas, regardless of size, to observe a 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 various HRG activities 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 dynamic management area (DMA) or seasonal management area (SMA); a requirement that all vessel operators reduce vessel speed to 10 knots (18.5 km/hour) or less when any large whale, mother/calf pairs, pods, or large assemblages of non-delphinid 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; a requirement that all vessels must maintain a minimum separation distance of 100 m from sperm whales and all other baleen whales; and a requirement that all vessels must, to the maximum extent practicable, attempt to maintain a minimum separation distance of 50 m from all other marine mammals, with an understanding that at times this may not be possible (e.g., for animals that approach the vessel). 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 marine site characterization survey activities which were issued IHAs from NMFS.

Comment 13: The ENGOs recommend that NMFS work with relevant experts and stakeholders towards developing a robust and effective near real-time monitoring and mitigation system for North Atlantic right whales and other endangered and protected species (*e.g.*, fin, sei, minke, and humpback whales) during offshore wind energy development.

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. The ENGOs cited the NMFS publication “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 NMFS 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 North Atlantic right whale calls that visual survey teams can then respond to for collection of identification photographs or biological samples.

Comment 14: The ENGOs state that NMFS must not issue Renewal IHAs, and assert that the process is contrary to statutory requirements.

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 Comments and Responses 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 Comments and Responses section) is limited to another year of identical or nearly identical activities in the same location (as described in the Description of Specified 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, in order 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 15: The ENGOs expressed concern about past instances where NMFS has modified issued IHAs in response to preliminary monitoring data indicating that certain species of marine mammal were being encountered more frequently than anticipated.

Response: No modifications are included as part of this action and, therefore, this comment is not relevant to this IHA.

Changes from the Proposed IHA to Final IHA

NMFS has revised the final IHA to include a section requiring that night-vision equipment (*i.e.*, night-vision goggles and/or infrared technology) must be available for use during nighttime monitoring. NMFS has also included language in the IHA stating that all 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 including SMAs and DMAs when in effect and that all vessels greater than or equal to 19.8 m in overall length operating from November 1 through April 30 will operate at speeds of 10 knots or less while transiting to and from Project Area.

The language above was included in the text of the notice of proposed IHA but inadvertently omitted from the draft IHA. There were no other changes from the proposed IHA to the final IHA.

Description of Marine Mammals in the Area of the Specified Activity

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, NMFS follows 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 Project 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 SARs (Hayes *et al.*, 2020), available online at: www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessment-reports-region and draft 2020 Atlantic and Gulf of Mexico Marine Mammal SARs available online at: <https://www.fisheries.noaa.gov/national/marine-mammal-protection/draft-marine-mammal-stock-assessment-reports>.

Table 2—Marine Mammal Species Likely To Occur Near the Project Area That May be Affected by Skipjack’s Activity

Common name	Scientific name	Stock	ESA/MMPA status; Strategic (Y/N) ¹	Stock abundance (CV, N _{min} , most recent abundance survey) ²	PBR	Annual M/SI ³
Order Cetartiodactyla – Cetacea – Superfamily Mysticeti (baleen whales)						
Family Balaenidae						
North Atlantic right whale	<i>Eubalaena glacialis</i>	Western North Atlantic	E/D; Y	412 (0; 408; 2018)	0.8	18.6
Family Balaenopteridae (rorquals)						
Humpback whale	<i>Megaptera novaeangliae</i>	Gulf of Maine	-/ -; Y	1,393 (0; 1,375; 2016)	22	58
Fin whale	<i>Balaenoptera physalus</i>	Western North Atlantic	E/D; Y	6,802 (0.24; 5,573; 2016)	11	2.35
Sei whale	<i>Balaenoptera borealis</i>	Nova Scotia	E/D; Y	6,292 (1.015; 3,098; see SAR)	6.2	1.2
Minke whale	<i>Balaenoptera acutorostrata</i>	Canadian East Coast	-/ -; N	21,968 (0.31; 17,002; 2016)	170	10.6
Superfamily Odontoceti (toothed whales, dolphins, and porpoises)						
Family Physeteridae						
Sperm whale	<i>Physeter macrocephalus</i>	NA	E; Y	4,349 (0.28; 3,451; See SAR)	3.9	0
Family Delphinidae						
Long-finned pilot whale	<i>Globicephala melas</i>	Western North Atlantic	-/ -; N	39,215 (0.30; 30,627; See SAR)	306	21

Short finned pilot whale	<i>Globicephala macrorhynchus</i>	Western North Atlantic	-/-;Y	28,924 (0.24; 23,637; See SAR)	236	160
Bottlenose dolphin	<i>Tursiops truncatus</i>	Western North Atlantic Offshore	-/-; N	62,851 (0.23; 51,914; See SAR)	519	28
		W.N.A. Northern Migratory Coastal	-/-;Y	6,639 (0.41,4 ,759, 2016)	48	12.2-21.5
Common dolphin	<i>Delphinus delphis</i>	Western North Atlantic	-/-; N	172,897 (0.21; 145,216; 2016)	1,452	399
Atlantic white-sided dolphin	<i>Lagenorhynchus acutus</i>	Western North Atlantic	-/-; N	93,233 (0.71; 54,443; See SAR)	544	26
Atlantic spotted dolphin	<i>Stenella frontalis</i>	Western North Atlantic	-/-; N	39,921 (0.27; 32,032; 2012)	320	0
Risso's dolphin	<i>Grampus griseus</i>	Western North Atlantic	-/-; N	35,493 (0.19; 30,289; See SAR)	303	54.3
Family Phocoenidae (porpoises)						
Harbor porpoise	<i>Phocoena phocoena</i>	Gulf of Maine/Bay of Fundy	-/-; N	95,543 (0.31; 74,034; See SAR)	851	217
Order Carnivora – Superfamily Pinnipedia						
Family Phocidae (earless seals)						
Gray seal ⁴	<i>Halichoerus grypus</i>	Western North Atlantic	-/-; N	27,131 (0.19; 23,158, 2016)	1,389	5,410

Harbor seal	<i>Phoca vitulina</i>	Western North Atlantic	-/-; N	75,834 (0.15; 66,884, 2018)	2,006	350
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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 or which is determined to be declining and likely to be listed under the ESA within the foreseeable future. Any species or stock listed under the ESA is automatically designated under the MMPA as depleted and as a strategic stock.

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

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

⁴ The NMFS stock abundance estimate applies to U.S. population only, however the actual stock abundance is approximately 451,431.

As indicated above, all 16 species (with 17 managed stocks) in Table 2 temporally and spatially co-occur with the activity to the degree that take is reasonably likely to occur and has been authorized by NMFS.

A detailed description of the of the species likely to be affected by Skipjack's surveys, including brief introductions to the species and relevant stocks as well as available information regarding population trends and threats, and information regarding local occurrence, were provided in the notice of proposed IHA (86 FR 11239; February 24, 2021); 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 notice for these descriptions. Please also refer to NMFS' web site (www.fisheries.noaa.gov/find-species) for generalized species accounts.

Potential Effects of Specified Activities on Marine Mammals and their Habitat

The underwater noise from Skipjack's survey activities has the potential to result in behavioral harassment of marine mammals in the vicinity of the survey area. The notice of proposed IHA (86 FR 11239; February 24, 2021) included a discussion of the effects of anthropogenic noise on marine mammals and the potential effects of underwater noise from Skipjack's survey activities 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 (86 FR 11239; February 24, 2021).

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.

Level B 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 are by Level B harassment only. Based on the nature of the activity, even in the absence of mitigation, Level A harassment is neither anticipated nor authorized. The anticipated effectiveness of the required mitigation measures (*i.e.*, exclusion zones and shutdown measures), discussed in detail below in **Mitigation** section, serves to strengthen the position that Level A harassment is not expected.

As described previously, no 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 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 NMFS considers 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. Skipjack's planned activity includes the use of intermittent sources (HRG equipment) and therefore the 160 dB re 1 μ Pa (rms) 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). Skipjack’s planned activity includes the use of impulsive (*e.g.*, sparkers and boomers) and non-impulsive (*e.g.*, CHIRP) 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
Mid-Frequency (MF) Cetaceans	<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
High-Frequency (HF) 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
Phocid Pinnipeds (PW) (Underwater)	<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
Otariid Pinnipeds (OW) (Underwater)	<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.

Note: Peak sound pressure (L_{pk}) has a reference value of 1 μPa , and cumulative sound exposure level (L_{E}) has a reference value of 1 $\mu\text{Pa}^2\text{s}$. In this Table, thresholds are abbreviated to reflect American National Standards Institute standards (ANSI 2013). However, peak sound pressure is defined by ANSI as incorporating frequency weighting, which is not the intent for this Technical Guidance. Hence, the subscript “flat” is being included to indicate peak sound pressure should be flat weighted or unweighted within the generalized hearing range. The subscript associated with cumulative sound exposure level thresholds indicates the designated marine mammal auditory weighting function (LF, MF, and HF cetaceans, and PW and OW pinnipeds) and that the recommended accumulation period is 24 hours. The cumulative sound exposure level thresholds could be exceeded in a multitude of ways (*i.e.*, varying exposure levels and durations, duty cycle). When possible, it is valuable for action proponents to indicate the conditions under which these acoustic thresholds will be exceeded.

Ensonified Area

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

NMFS has developed a user-friendly methodology for determining the rms sound pressure level (SPL_{rms}) at the 160-dB isopleth for the purposes of estimating the extent of Level B harassment isopleths associated with HRG survey equipment (NMFS, 2020). This methodology incorporates frequency and some directionality to refine estimated ensonified zones. For sources that operate with different beam widths, the maximum beam width was used (see Table 1). The lowest frequency of the source was used when calculating the absorption coefficient (Table 1).

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 A and Level B harassment thresholds. 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 surveys 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 Skipjack that has the potential to result in Level B harassment of marine mammals, sound produced by the Applied Acoustics Dura-Spark UHD sparkers and GeoMarine Geo-Source sparker would propagate furthest to the Level B harassment threshold (141 m; Table 6). As described above, only a portion of Skipjack's survey activity days will employ sparkers or boomers; therefore, for the purposes of the exposure analysis, it was assumed that sparkers would be the dominant acoustic source for 50 of the total 200 survey activity days. For the remaining 150 survey days, the TB Chirp III (48 m) was assumed to be the dominant source. Thus, the distances to the isopleths corresponding to the threshold for Level B harassment for sparkers (141 m) and the TB Chirp III (48m) were used as the basis of the take calculation for all marine mammals 25 percent and 75 percent of survey activity days, respectively. This is a conservative approach, as the actual sources used on individual survey days may produce smaller harassment distances.

When the NMFS Technical Guidance was first published in 2016, in recognition of the fact that ensonified area/volume could be more technically challenging to predict because of the duration component in the new thresholds, NMFS developed a User Spreadsheet that includes tools to help predict a simple isopleth that can be used in conjunction with marine mammal density or occurrence to help predict takes. NMFS notes that because of some of the assumptions included in the methods used for these tools, it is anticipated that isopleths produced are typically going to be overestimates of some degree, which may result in some degree of overestimate of Level A harassment take. However, these tools offer the best way to predict appropriate isopleths when more sophisticated 3D modeling methods are not available, and NMFS continues to develop ways

to quantitatively refine these tools, and will qualitatively address the output where appropriate. For mobile sources such as HRG equipment, the User Spreadsheet predicts the closest distance at which a stationary animal would not incur PTS if the sound source traveled by the animal in a straight line at a constant speed. Inputs used in the User Spreadsheet are shown in Table 4 and Table 5 and the resulting isopleths are reported in Table 6.

Table 4—User Spreadsheet Inputs for Non-impulsive, Non-parametric, Shallow Sub-bottom Profilers (CHIRP Sonars)

Device	EdgeTech 216	Edgetech 424	Edgetech 512	GeoPulse 5430	Teledyne Chirp III
Spreadsheet Tab Used	D1) Mobile Source; Non-impulsive, Intermittent	D1) Mobile Source; Non-impulsive, Intermittent	D1) Mobile Source; Non-impulsive, Intermittent	D1) Mobile Source; Non-impulsive, Intermittent	D1) Mobile Source; Non-impulsive, Intermittent
Frequency used for Weighting Factor Adjustment (kHz) ^{1,2}	2; 16; 16; 6.2	4; 24; 24; 6.2	1.7; 12; 12; 6.2	2; 17; 17 ; 6.2	2; 7; 7; 6.2
Source Level (RMS SPL)	195	176	179	196	197
Source Velocity (m/sec)	2.057	2.057	2.057	2.057	2.057
Pulse Duration (sec)	0.02	0.0034	0.009	0.05	0.06
1/Repetition rate (sec)	0.17	0.5	0.125	0.1	0.07

¹Values for WFA represented =(LFC; MFC; HFC; PPW)

²WFAs were selected in the User Spreadsheet for each marine mammal hearing group based on estimated hearing sensitivities of each group and the operational frequency of the source.

Table 5—User Spreadsheet Inputs for Impulsive, Medium Sub-bottom Profilers (Sparkers & Boomers)

Device	AA, Dura-spark UHD (400 tips, 500 J) ¹	AA, Dura-spark UHD (400+400) ¹	GeoMarine, Geo-Source dual 400 tip sparker (800 J) ¹	GeoMarine Geo-Source 200 tip sparker (400 J) ¹	GeoMarine Geo-Source 200-400 tip sparker (400 J) ¹	AA, triple plate S Boom (700–1,000 J) ²
Spreadsheet Tab Used	F1) Mobile Source: Impulsive, Intermittent	F1) Mobile Source: Impulsive, Intermittent	F1) Mobile Source: Impulsive, Intermittent	F1) Mobile Source: Impulsive, Intermittent	F1) Mobile Source: Impulsive, Intermittent	F1) Mobile Source: Impulsive, Intermittent
Frequency used for Weighting Factor Adjustment (kHz)*	1	1	1.5	1	1	3.4

Source Level (RMS SPL; PK SPL)	203; 211	203; 211	203; 211	203; 211	203; 211	205; 211
Source Velocity (m/sec)	2.057	2.057	2.057	2.057	2.057	2.057
Pulse Duration (sec)	0.0011	0.0011	0.0011	0.0011	0.0011	0.0006
1/Repetition rate (sec)	0.25	0.25	0.25	0.25	0.25	0.25

¹The Dura-spark measurements and specifications provided in Crocker and Fratantonio (2016) were used for all sparker systems planned for the survey. The data provided in Crocker and Fratantonio (2016) represent the most applicable data for similar sparker systems with comparable operating methods and settings when manufacturer or other reliable measurements are not available.

²Crocker and Fratantonio (2016) provide S-Boom measurements using two different power sources (CSP-D700 and CSP-N). The CSP-D700 power source was used in the 700 J measurements but not in the 1,000 J measurements. The CSP-N source was measured for both 700 J and 1,000 J operations but resulted in a lower SL; therefore, the single maximum SL value was used for both operational levels of the S Boom.

Table 6—Modeled Radial Distances From HRG Survey Equipment to Isoleths Corresponding to Level B Harassment Thresholds

Source	Distance to Level B Harassment Threshold (m)
	(SPL _{rms} threshold)
Non-impulsive, Non-parametric, Shallow SBPs	
ET 216 CHIRP	9
ET 424 CHIRP	4
ET 512i CHIRP	6
GeoPulse 5430	21
TB CHIRP III	48
Impulsive, Medium SBPs	
AA Triple plate S-Boom (700/1,000 J)	34
AA, Dura-spark UHD (500 J /400 tip)	141
AA, Dura-spark UHD 400+400	141
GeoMarine, Geo-Source dual 400 tip sparker	141
GeoMarine, Geo-Source 200 tip sparker	141
GeoMarine, Geo-Source 200-400 tip sparker	141

Isoleth distances to Level A harassment thresholds for all types of HRG equipment and all marine mammal functional hearing groups were modeled using the NMFS User Spreadsheet and NMFS Technical Guidance (2018). The dual criteria (peak SPL and SEL_{cum}) were applied to all HRG sources using the modeling methodology as described above, and the isopleth distances for each functional hearing group were then carried forward in the exposure analysis. Modeled distances to isopleths corresponding to the Level A harassment thresholds are very small for all marine mammals and stocks (<5 m) with the exception of HF cetaceans (36.5 m from GeoPulse 5430). Note that the modeled distances to isopleths corresponding to the Level A harassment threshold are also assumed to be conservative. Level A harassment would also be more likely to occur at close approach to the sound source or as a result of longer duration exposure to the sound source. In regards to the one HF cetacean that is likely to occur in Skipjack’s Project Area, the harbor porpoise, it is a notoriously shy species which is known to avoid

vessels. Harbor porpoise would also be expected to avoid a sound source prior to that source reaching a level that would result in injury (Level A harassment).

Given the factors above, Level A harassment of marine mammals is neither anticipated nor authorized, even in the absence of mitigation measures. However, the required mitigation measures – including shutdown measures and a 100 m exclusion zone for all marine mammals including the harbor porpoise – are expected to even further minimize the potential for close approach or longer duration exposure to active HRG acoustic sources. Those mitigation measures in addition to the very small size of Level A harassment zones, strengthens NMFS' determination that the potential for any marine mammals to be taken by Level A harassment is considered so low as to be discountable. Skipjack did not request and NMFS has not authorized 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 (Roberts *et al.*, 2016, 2017, 2018, 2020) represent the best available information regarding marine mammal densities in the planned survey area. The density data presented by Roberts *et al.* (2016, 2017, 2018, 2020) 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 based on additional data as well as certain methodological improvements. More information is available online

at seamap.env.duke.edu/models/Duke-EC-GOM-2015/. Marine mammal density estimates in the survey area (animals/kilometers squared (km²)) were obtained using the most recent model results for all taxa (Roberts *et al.*, 2016, 2017, 2018, 2020). The updated models incorporate additional sighting data, including sightings from the NOAA Atlantic Marine Assessment Program for Protected Species (AMAPPS) surveys (e.g., NEFSC & SEFSC, 2011, 2012, 2014a, 2014b, 2015, 2016). For the exposure analysis, density data from Roberts *et al.* (2016, 2017, 2018, 2020) were mapped using a geographic information system (GIS). Density grid cells that included any portion of the planned survey area were selected for all survey months.

Densities from each of the selected density blocks were averaged for each month available to provide monthly density estimates for each species (when available based on the temporal resolution of the model products), along with the average annual density (Table 7).

Table 7—Estimated Monthly and Average Annual Density (Animals/km²) of Potentially Affected Marine Mammals within the Project Area Based on Monthly Habitat Density Models (Roberts *et al.* 2016; Roberts, 2018, 2020)

Species	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Average Annual Density (km ⁻²)
Low-Frequency Cetaceans													
Fin whale	0.0010	0.0008	0.0015	0.0020	0.0017	0.0012	0.0005	0.0004	0.0011	0.0014	0.0010	0.0009	0.0011
Sei whale	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Minke whale	0.0002	0.0002	0.0002	0.0009	0.0010	0.0005	0.0001	0.0000	0.0001	0.0003	0.0001	0.0001	0.0003
Humpback whale	0.0013	0.0006	0.0006	0.0005	0.0005	0.0004	0.0001	0.0001	0.0002	0.0004	0.0004	0.0014	0.0005
North Atlantic right whale	0.0037	0.0042	0.0043	0.0028	0.0002	0.0000	0.0000	0.0000	0.0000	0.0000	0.0003	0.0020	0.0015
Mid-Frequency Cetaceans													
Sperm whale	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0001	0.0001	0.0000	0.0001	0.0000	0.0000	0.0000
Atlantic white-sided dolphin	0.0017	0.0009	0.0012	0.0028	0.0035	0.0022	0.0006	0.0003	0.0008	0.0026	0.0036	0.0034	0.0020
Atlantic spotted dolphin	0.0017	0.0017	0.0017	0.0017	0.0017	0.0017	0.0017	0.0017	0.0017	0.0017	0.0017	0.0017	0.0017
Common bottlenose dolphin (Offshore) ¹	0.0134	0.0088	0.0125	0.0193	0.1224	0.1138	0.1361	0.1663	0.0800	0.0713	0.0524	0.0201	0.0680
Common bottlenose dolphin (Migratory) ¹	0.0317	0.0271	0.0444	0.0910	0.5921	0.4623	0.5903	0.6439	0.2388	0.2015	0.1335	0.0459	0.2585
Short-finned pilot whale ²	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003
Long-finned pilot whale ²	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003
Risso's dolphin	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Common dolphin	0.0071	0.0035	0.0040	0.0092	0.0167	0.0110	0.0125	0.0143	0.0109	0.0109	0.0200	0.0152	0.0113
High-Frequency Cetaceans													
Harbor porpoise	0.0261	0.0247	0.0225	0.0095	0.0031	0.0000	0.0000	0.0000	0.0000	0.0005	0.0153	0.0535	0.0129
Pinnipeds ³													
Gray seal	0.0003	0.0003	0.0003	0.0003	0.0003	0.0007	0.0007	0.0007	0.0003	0.0003	0.0003	0.0003	0.0004
Harbor seal	0.0003	0.0003	0.0003	0.0003	0.0003	0.0007	0.0007	0.0007	0.0003	0.0003	0.0003	0.0003	0.0004

¹Bottlenose dolphin stocks were delineated based on the 20-m isobath as identified in NMFS 2017 SAR; all density blocks falling inland of the 20-m depth contour were assumed to belong to the migratory coastal stock, and those beyond this depth were assumed to belong to the offshore stock.

²Roberts (2018) only provides density estimates for “generic” pilot whales. It is assumed that each species has density levels that are equivalent to the generic pilot whale Density levels.

³Seal densities are not given by individual months or species, instead, seasons are divided as summer (June, July, August) and Winter (September – May) and applied to “generic” seals; as a result, reported seasonal densities for spring and fall are the same and are not provided for each species (Roberts 2018). Densities were evenly split between both species.

Take Calculation and Estimation

Here NMFS describes 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 Level B 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. The daily area is multiplied by the mean annual density of a given marine mammal species. This value is then multiplied by the number of planned vessel days.

The estimated potential daily active survey distance of 70 km was used as the estimated areal coverage over a 24-hour period. This distance accounts for the vessel traveling at roughly 4 knots and only for periods during which equipment <180 kHz is in operation. A vessel traveling 4 knots can cover approximately 110 km per day; however, based on data from 2017, 2018, and 2019 surveys, survey coverage over a 24-hour period is closer to 70 km per day. For daylight only vessels, the distance is reduced to 35 km per day. To maintain the potential for 24-hour surveys, the Level B harassment ZOIs provided in Table 8 were calculated for each source based on the Level B harassment threshold distances in Table 6 with a 24-hour (70 km) operational period.

Table 8—Calculated Zone of Influence (ZOI) encompassing Level B thresholds for each sound source or comparable sound source category.

Source	Level B ZOI (km ²)
Hearing Group	All
ET 216 CHIRP	1.3
ET 424 CHIRP	0.6
ET 512i CHIRP	0.8

GeoPulse 5430	2.9
TB CHIRP III	6.7
AA Triple plate S-Boom (700-1,000 J)	4.8
AA, Dura-spark UHD	19.8
AA, Dura-spark UHD 400+400	19.8
GeoMarine, Geo-Source dual 400 tip Sparker	19.8

AA = Applied Acoustics; CHIRP = Compressed High-Intensity Radiated Pulse; ET = EdgeTech; HF = high-frequency; J = joules; LF = low-frequency; MF = mid-frequency; PW = phocid pinnipeds in water; SBP = sub-bottom profiler; TB = Teledyne Benthos; UHD = ultra-high definition.

Level B exposures were estimated by multiplying the average annual density of each species (Table 7) (Roberts *et al.*, 2016; Roberts, 2018) by the daily ZOI that was estimated to be ensonified to an SPL_{rms} exceeding 160 dB re 1 μPa (Table 8), times the number of operating days expected for the survey in each area assessed. As described previously, it was assumed that that sparker systems with 141-m Level B harassment isopleths would operate for 50 survey days and the non-sparker TB CHIRP III with 48-m Level B harassment isopleth would operate for the remaining 150 survey days. The results of these calculations are shown in Table 9.

Table 9—Summary of Take Numbers Authorized by NMFS

Species	Abundance	Level B Takes ¹	Max Percent Population	
Low-Frequency Cetaceans				
Fin whale	7,418	2	0.03%	
Sei whale	6,292	0 (1)	0.02%	
Minke whale	24,202	0 (2)	0.01%	
Humpback whale	1,396	2	0.14%	
North Atlantic right whale	428	3	0.70%	
Mid-Frequency Cetaceans				
Sperm whale ³	4,349	0 (3)	0.07%	
Atlantic white-sided dolphin	93,233	4	0.00%	
Atlantic spotted dolphin	39,921	4 (2,000)	5.00%	
Common bottlenose dolphin ²	Offshore Stock	62,851	135	0.21%
	Migratory Stock	6,639	516	7.77%
Pilot Whales ³	Short-finned pilot whale	28,924	0 (10)	0.03%
	Long-finned pilot whale	39,215	0 (10)	0.03%
Risso's dolphin	35,493	0 (30)	0.08%	
Common dolphin	178,825	24 (70)	0.04%	
High-Frequency Cetaceans				
Harbor porpoise	95,543	22	0.03%	
Pinnipeds				
Seals ⁴	Gray seal	27,131	0 (10)	0.04%
	Harbor seal	75,834	0 (10)	0.01%

¹Parenthesis denote changes from calculated take estimates.

²Roberts *et al.* (2016) does not provide density estimates for individual stocks of common bottlenose dolphins; therefore, stock densities were delineated using the 20-m isobath.

³Roberts (2018) only provides density estimates for “generic” pilot whales and seals; therefore, an equal potential for takes has been assumed either for species or stocks within the larger group.

⁴Roberts (2018) only provides density estimates for “generic” seals; therefore, densities were split evenly between the two species.

No takes were calculated for the sei whale, minke whale, sperm whale, short- and long-finned pilot whale, or Risso’s dolphin. However, based on anticipated species distributions and data from previous surveys conducted in the DE WEA, it is possible that these species could be encountered. Therefore, Skipjack based its take requests on estimated group sizes for these species (1 for sei whales, 2 for minke whales, 3 for sperm whales, 10 for short- and long-finned pilot whales, and 30 for Risso’s dolphins). For species with no modeled exposures, requested takes for HRG surveys are based on mean group sizes derived from the following references:

- Sei whale: Kenney and Vigness-Raposa, 2010;
- Minke whale: Kenney and Vigness-Raposa, 2020;
- Sperm whale: Barkaszi and Kelly, 2018;
- Short- and long-finned pilot whales: Kenney and Vigness-Raposa, 2010;
- and
- Risso’s dolphin: Barkaszi and Kelly, 2018.

NMFS concurred with this approach and based its authorized takes of these species on Skipjack’s requests. Additionally, the number of takes authorized in Table 9 for Atlantic white-sided dolphin, bottlenose dolphin, and harbor porpoise are equivalent to the numbers requested by Skipjack.

Roberts *et al.* (2018) produced density models for all seals and did not differentiate by seal species. The take calculation methodology as described above resulted in close to zero takes. The marine mammal monitoring report associated with the previous IHA issued to Skipjack in this survey area (84 FR 66156; December 3, 2019) did not record any takes of seals. However, the planned survey area includes a portion of

Delaware Bay which is not covered by Roberts *et al.* (2018) and was not included as part of the previous IHA. Therefore, Skipjack did not request take of any harbor or gray seals. However, since seals are known to occur in the Bay, mostly during winter months, NMFS is conservatively authorizing 10 takes of each species by Level B harassment of both harbor and gray seals.

Skipjack had requested 4 takes of spotted dolphin and 24 takes of common dolphin by Level B harassment. However, recent HRG surveys in the Mid-Atlantic area off the coast of Virginia have recorded unexpectedly large numbers of both Atlantic spotted dolphin and common dolphin. These events have led NMFS to modify another offshore wind energy company's existing IHA (85 FR 81879; December 17, 2020) in order to accommodate larger take numbers. The spotted dolphins had been recorded at a rate of up 15 per day while common dolphins were recorded at a rate of 62 animals in a single week. Note that there were many days in which there were no sightings of spotted dolphins and that all of the 62 common dolphin sightings occurred during a single week. The previous Skipjack marine mammal monitoring report from this area recorded up to 8 common dolphins over 23 days of active surveying (0.35 animals/day). Given this data, NMFS will assume that 0.35 common dolphins could be exposed within the Level B harassment zone per day over 200 days resulting in the 70 authorized takes of common dolphin by Level B harassment. NMFS will also assume that there could be up to 10 exposures of spotted dolphin per day resulting in the 2000 authorized takes by Level B harassment.

Note that Skipjack submitted a marine mammal monitoring report under the previous IHA covering the period of June 4, 2020 through June 26, 2020. Over the 23-day monitoring period there were 110 sightings consisting of 112 individual animals. Only three bottlenose dolphins were recorded as occurring within estimated Level B harassment zones which is well below the 1,465 takes that were authorized. However,

due to a range of factors only 23 actual survey days occurred out of 200 that were planned.

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 (latter not applicable for this action). NMFS regulations require applicants for incidental take authorizations to include information about the availability and feasibility (economic and technological) of equipment, methods, and manner of conducting 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, NMFS carefully considers two primary factors:

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

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

Mitigation for Marine Mammals and their Habitat

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

Marine Mammal Exclusion Zones and Harassment Zones

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

- 500 m EZ for North Atlantic right whales during use of all acoustic sources;
- 100 m EZ for all marine mammals, with certain exceptions specified below, during operation of impulsive acoustic sources (boomer and/or sparker).

If a marine mammal is detected approaching or entering the EZs during the HRG survey, the vessel operator would adhere to the shutdown procedures described below to minimize noise impacts on the animals. These stated requirements will be included in the site-specific training to be provided to the survey team.

Pre-Clearance of the Exclusion Zones

Skipjack would implement a 30-minute pre-clearance period of the EZ prior to the initiation of ramp-up of HRG equipment. During this period, the exclusion zone will be monitored by the PSOs, using the appropriate visual technology. Ramp-up may not be initiated if any marine mammal(s) is within its respective EZ. If a marine mammal is observed within an EZ during the pre-clearance period, ramp-up may not begin until the animal(s) has been observed exiting its respective EZ or until an additional time period has elapsed with no further sighting (*i.e.*, 15 minutes for small odontocetes and seals, and 30 minutes for all other species).

Ramp-Up of Survey Equipment

When technically feasible, a ramp-up procedure would be used for HRG survey equipment capable of adjusting energy levels at the start or restart of survey activities. The ramp-up procedure would be used at the beginning of HRG survey activities in order to provide additional protection to marine mammals near the survey area by allowing

them to vacate the area prior to the commencement of survey equipment operation at full power.

A ramp-up would begin with the powering up of the smallest acoustic HRG equipment at its lowest practical power output appropriate for the survey. When technically feasible, the power would then be gradually turned up and other acoustic sources would be added.

Ramp-up activities will be delayed if a marine mammal(s) enters its respective EZ. Ramp-up will continue if the animal has been observed exiting its respective EZ or until an additional time period has elapsed with no further sighting (*i.e.*, 15 minutes for small odontocetes and seals and 30 minutes for all other species).

Activation of survey equipment through ramp-up procedures may not occur when visual observation of the pre-clearance zone is not expected to be effective (*i.e.*, during inclement conditions such as heavy rain or fog).

Shutdown Procedures

An immediate shutdown of the impulsive HRG survey equipment would be required if a marine mammal is sighted entering or within its respective EZ. The vessel operator must comply immediately with any call for shutdown by the Lead PSO. Any disagreement between the Lead PSO and vessel operator should be discussed only after shutdown has occurred. Subsequent restart of the survey equipment can be initiated if the animal has been observed exiting its respective EZ or until an additional time period has elapsed (*i.e.*, 30 minutes for all other species).

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 Level B harassment zone (48 m, non-impulsive; 141 m impulsive), shutdown would occur.

If the acoustic source is shut down for reasons other than mitigation (*e.g.*, mechanical difficulty) for less than 30 minutes, it may be activated again without ramp-up if PSOs have maintained constant observation and no detections of any marine mammal have occurred within the respective EZs. If the acoustic source is shut down for a period longer than 30 minutes and PSOs have maintained constant observation, then pre-clearance and ramp-up procedures will be initiated as described in the previous section.

The shutdown requirement would be waived for small delphinids of the following genera: *Delphinus*, *Lagenorhynchus*, *Stenella*, and *Tursiops* and seals. Specifically, if a delphinid from the specified genera or a pinniped is visually detected approaching the vessel (*i.e.*, to bow ride) or towed equipment, shutdown is not required. Furthermore, 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 judgement in making the decision to call for a shutdown. Additionally, shutdown is required if a delphinid or pinniped detected in the exclusion zone and belongs to a genus other than those specified.

Vessel Strike Avoidance

Skipjack will ensure that vessel operators and crew maintain a vigilant watch for cetaceans and pinnipeds and slow down or stop their vessels to avoid striking these species. Survey vessel crew members responsible for navigation duties will receive site-specific training on marine mammals sighting/reporting and vessel strike avoidance measures. Vessel strike avoidance measures would include the following, except under circumstances when complying with these requirements would put the safety of the vessel or crew at risk:

- 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 based on the appropriate separation distance 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 right whale, other whale (defined in this context as sperm whales or baleen whales other than right whales), or other marine mammal.

- All vessels (*e.g.*, source vessels, chase vessels, supply 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 including SMAs and DMAs when in effect;
- All vessels greater than or equal to 19.8 m in overall length operating from November 1 through April 30 will operate at speeds of 10 knots or less while transiting to and from Project Area;
- All vessels must reduce their speed 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 right whales. If a whale is observed but cannot be confirmed as a species other than a right whale, the vessel operator must assume that it is a 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 marine mammals, with an

understanding that at times this may not be possible (*e.g.*, for animals that approach the vessel).

- When marine mammals are sighted while a vessel is underway, the vessel shall 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 marine mammals 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

Members of the monitoring team will consult NMFS North Atlantic right whale reporting system and Whale Alert, as able, for the presence of North Atlantic right whales throughout survey operations, and for the establishment of a DMA. If NMFS should establish a DMA in the Lease Areas during the survey, the vessels will abide by speed restrictions in the DMA.

Project-specific training will be conducted for all vessel crew prior to the start of a survey and during any changes in crew such that all survey personnel are fully aware and understand the mitigation, monitoring, and reporting requirements. Prior to implementation with vessel crews, the training program will be provided to NMFS for review and approval. Confirmation of the training and understanding of the requirements will be documented on a training course log sheet. Signing the log sheet will certify that the crew member understands and will comply with the necessary requirements throughout the survey activities.

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 of effecting the least practicable impact on marine mammal 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); and
- Mitigation and monitoring effectiveness.

Monitoring Measures

Visual monitoring will be performed by qualified, NMFS-approved PSOs, the resumes of whom will be provided to NMFS for review and approval prior to the start of survey activities. Skipjack would employ independent, dedicated, trained PSOs, meaning that the PSOs must 1) be employed by a third-party observer provider, 2) 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 3) have successfully completed an approved PSO training course appropriate for their designated task. On a case-by-case basis, non-independent observers may be approved by NMFS for limited, specific duties in support of approved, independent PSOs on smaller vessels with limited crew capacity operating in nearshore waters.

The PSOs will be responsible for monitoring the waters surrounding each survey vessel to the farthest extent permitted by sighting conditions, including exclusion zones, during all HRG survey operations. PSOs will visually monitor and identify marine mammals, including those approaching or entering the established exclusion zones during survey activities. It will be the responsibility of the Lead PSO on duty to communicate the presence of marine mammals as well as to communicate the action(s) that are

necessary to ensure mitigation and monitoring requirements are implemented as appropriate.

During all HRG 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 during daylight operations on each survey vessel, 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). Two PSOs will be on watch during nighttime operations. The PSO(s) would ensure 360° visual coverage around the vessel from the most appropriate observation posts and would conduct visual observations using binoculars and/or night vision goggles 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 would be communicated to PSOs on all nearby survey vessels.

PSOs must be equipped with binoculars and have the ability to estimate distance and bearing to detect marine mammals, particularly in proximity to exclusion zones. Reticulated binoculars must also be available to PSOs for use as appropriate based on conditions and visibility to support the sighting and monitoring of marine mammals. During nighttime operations, night-vision goggles with thermal clip-ons and infrared technology would be used. Position data would be recorded using hand-held or vessel GPS units for each sighting.

During good conditions (*e.g.*, daylight hours; Beaufort sea state (BSS) 3 or less), to the maximum extent practicable, PSOs would also conduct observations when the acoustic source is not operating for comparison of sighting rates and behavior with and

without use of the active acoustic sources. Any observations of marine mammals by crew members aboard any vessel associated with the survey would be relayed to the PSO team.

Data on all PSO observations would be recorded based on standard PSO collection requirements. This would 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 behavior that occurs (*e.g.*, noted behavioral disturbances).

Reporting Measures

Within 90 days after completion of survey activities or expiration of this IHA, whichever comes sooner, 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 observed during survey activities (by species, when known), 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. All draft and final marine mammal and acoustic monitoring reports must be submitted to *PR.ITP.MonitoringReports@noaa.gov* and *ITP.Pauline@noaa.gov*. The report must contain at minimum, the following:

- PSO names and affiliations
- Dates of departures and returns to port with port name
- Dates and times (Greenwich Mean Time) of survey effort and times corresponding with PSO effort
- Vessel location (latitude/longitude) when survey effort begins and ends;

vessel location at beginning and end of visual PSO duty shifts

- Vessel heading and speed at beginning and end of visual PSO duty shifts and upon any line change
- Environmental conditions while on visual survey (at beginning and end of PSO shift and whenever conditions change significantly), including wind speed and direction, Beaufort sea state, Beaufort wind force, swell height, weather conditions, cloud cover, sun glare, and overall visibility to the horizon
- Factors that may be contributing to impaired observations during each PSO shift change or as needed as environmental conditions change (*e.g.*, vessel traffic, equipment malfunctions)
- Survey activity information, such as type of survey equipment in operation, acoustic source power output while in operation, and any other notes of significance (*i.e.*, pre-clearance survey, ramp-up, shutdown, end of operations, etc.)

If a marine mammal is sighted, the following information should be recorded:

- Watch status (sighting made by PSO on/off effort, opportunistic, crew, alternate vessel/platform);
- PSO who sighted the animal;
- Time of sighting;
- Vessel location at time of sighting;
- Water depth;
- Direction of vessel's travel (compass direction);
- Direction of animal's travel relative to the vessel;
- Pace of the animal;
- Estimated distance to the animal and its heading relative to vessel at initial sighting;
- Identification of the animal (*e.g.*, genus/species, lowest possible taxonomic level, or unidentified); also note the composition of the group if there is a mix

of species;

- Estimated number of animals (high/low/best) ;
- Estimated number of animals by cohort (adults, yearlings, juveniles, calves, group composition, etc.);
- Description (as many distinguishing features as possible of each individual seen, including length, shape, color, pattern, scars or markings, shape and size of dorsal fin, shape of head, and blow characteristics);
- Detailed behavior observations (*e.g.*, number of blows, number of surfaces, breaching, spyhopping, diving, feeding, traveling; as explicit and detailed as possible; note any observed changes in behavior);
- Animal's closest point of approach and/or closest distance from the center point of the acoustic source;
- Platform activity at time of sighting (*e.g.*, deploying, recovering, testing, data acquisition, other);
- Description of any actions implemented in response to the sighting (*e.g.*, delays, shutdown, ramp-up, speed or course alteration, etc.) and time and location of the action.

If a North Atlantic right whale is observed at any time by PSOs or personnel on any project vessels, during surveys or during vessel transit, Skipjack must immediately report sighting information to the NMFS North Atlantic Right Whale Sighting Advisory System: (866) 755-6622. North Atlantic right whale sightings in any location may also be reported to the U.S. Coast Guard via channel 16.

In the event that Skipjack personnel discover an injured or dead marine mammal, Skipjack would report the incident to the NMFS Office of Protected Resources (OPR) and the NMFS New England/Mid-Atlantic Stranding Coordinator as soon as feasible.

The report would 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 unanticipated event of a ship strike of a marine mammal by any vessel involved in the activities covered by the IHA, Skipjack would report the incident to the NMFS OPR and the NMFS New England/Mid-Atlantic Stranding Coordinator as soon as feasible. The report would 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. NMFS also assesses 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 9, given that NMFS expects the anticipated effects of the planned survey to be similar in nature. Where there are meaningful differences between species or stocks - as is the case of the North Atlantic right whale - they are included as separate subsections below. NMFS does not anticipate that serious injury or mortality would occur as a result from HRG surveys,

even in the absence of mitigation, and no serious injury or mortality is authorized. 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. NMFS expects that all potential takes would be in the form of short-term Level B behavioral harassment in the form of temporary avoidance of the area or decreased foraging (if such activity was occurring), reactions that are considered to be of low severity and with no lasting biological consequences (*e.g.*, Southall *et al.*, 2007). 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. As described previously due to the nature of the operations, Level A harassment is not expected even in the absence of mitigation. The small size of the Level A harassment zones and the required shutdown zones for certain activities further bolster this conclusion.

In addition to being temporary, the maximum expected harassment zone around a survey vessel is 141 m; 75 percent of survey days would include activity with a reduced acoustic harassment zone of 48 m per vessel, producing expected effects of particularly low severity. Therefore, the ensounded area surrounding each vessel is relatively small compared to the overall distribution of the animals in the area and their use of the habitat. Feeding behavior is not likely to be significantly impacted as prey species are mobile and are broadly distributed throughout the survey 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 and there are no feeding areas known to be biologically important to marine mammals within the planned survey area. There is no designated critical habitat for any ESA-listed marine mammals in the planned survey area.

North Atlantic right whales

The status of the North Atlantic right whale population is of heightened concern and, therefore, merits additional analysis. As noted previously, elevated North Atlantic right whale mortalities began in June 2017 and there is an active unusual mortality event (UME). Overall, findings support human interactions, specifically vessel strikes and entanglements, as the cause of death for the majority of right whales. The planned survey area overlaps a migratory corridor Biologically Important Area (BIA) for North Atlantic right whales (effective March-April and November-December) that extends from Massachusetts to Florida (LeBrecque *et al.*, 2015). Off the coast of Delaware, this migratory BIA extends from the coast to beyond the shelf break. Due to the fact that the planned survey activities are 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 BIA, right whale migration is not expected to be impacted by the survey. Given the relatively small size of the ensonified area, it is unlikely that prey availability would be adversely affected by HRG survey operations. Required vessel strike avoidance measures will also decrease risk of ship strike during migration; no ship strike is expected to occur during Skipjack's planned activities. Additionally, only very limited take by Level B harassment of North Atlantic right whales has been requested or is authorized by NMFS as HRG survey operations are required to maintain a 500-m EZ and shutdown if a North Atlantic right whale is sighted at or within the EZ. The 500-m shutdown zone for right whales is conservative, considering the Level B harassment isopleth for the most

impactful acoustic source (*i.e.*, GeoMarine Geo-Source 400 tip sparker) is estimated to be 141 m, and thereby minimizes the potential for behavioral harassment of this species. As noted previously, Level A harassment is not expected due to the small PTS zones associated with HRG equipment types planned for use. NMFS does not anticipate North Atlantic right whales takes that would result from Skipjack's planned activities would impact annual rates of recruitment or survival. Thus, any takes that occur would not result in population level impacts.

Other marine mammal species with active UMEs

As noted previously, there are several active UMEs occurring in the vicinity of Skipjack's planned survey area. Elevated humpback whale mortalities have occurred along the Atlantic coast from Maine through Florida since January 2016. Of the cases examined, approximately half had evidence of human interaction (ship strike or entanglement). 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 distinct population segment remains stable at approximately 12,000 individuals.

Beginning in January 2017, elevated minke whale strandings have occurred along the Atlantic coast from Maine through South Carolina, with highest numbers in Massachusetts, Maine, and New York. This event does not provide cause for concern regarding population level impacts, as the likely population abundance is greater than 20,000 whales.

Elevated numbers of harbor seal and gray seal mortalities were first observed in July 2018 and have occurred across Maine, New Hampshire, and Massachusetts. Based on tests conducted so far, the main pathogen found in the seals is phocine distemper virus, although additional testing to identify other factors that may be involved in this UME are underway. 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 (350) is well below PBR (2,006) (Hayes *et al.*, 2020). The population abundance for gray seals in the United States is over 27,000, with an estimated abundance, including seals in Canada, of approximately 505,000. In addition, the abundance of gray seals is likely increasing in the U.S. Atlantic Economic Exclusion Zone as well as in Canada (Hayes *et al.*, 2020).

The required mitigation measures are expected to reduce the number and/or severity of authorized takes for all species listed in Table 9, including those with active UME's to the level of least practicable adverse impact. In particular they would provide animals the opportunity to move away from the sound source throughout the survey area before HRG survey equipment reaches full energy, thus preventing them from being exposed to sound levels that have the potential to cause injury (Level A harassment) or more severe Level B harassment. No Level A harassment is anticipated, even in the absence of mitigation measures, or authorized.

NMFS expects that takes would be in the form of short-term Level B behavioral harassment by way of brief startling reactions and/or temporary vacating of the area, or decreased foraging (if such activity was occurring)—reactions that (at the scale and intensity anticipated here) are considered to be of low severity, with no lasting biological consequences. Since both the sources and marine mammals are mobile, animals would only be exposed briefly to a small ensonified area that might result in take. Additionally, required mitigation measures would further reduce exposure to sound that could result in more severe behavioral harassment.

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 or serious injury is anticipated or authorized;

- No Level A harassment (PTS) is anticipated, even in the absence of mitigation measures, or authorized;
- Foraging success is not likely to be significantly impacted as effects on species that serve as prey species for marine mammals from the survey are expected to be minimal;
- The availability of alternate areas of similar habitat value for marine mammals to temporarily vacate the survey area during the planned survey to avoid exposure to sounds from the activity;
- Take is anticipated to be primarily Level B behavioral harassment consisting of brief startling reactions and/or temporary avoidance of the survey area;
- While the survey area is within areas noted as a migratory BIA for North Atlantic right whales, the activities would occur in such a comparatively small area such that any avoidance of the survey area due to activities would not affect migration. In addition, mitigation measures to shutdown at 500 m to minimize potential for Level B behavioral harassment would limit any take of the species.
- The required mitigation measures, including visual monitoring and shutdowns, are expected to minimize potential impacts to marine mammals.

Based on the analysis contained herein of the likely effects of the specified activity on marine mammals and their habitat, and taking into consideration the implementation of the 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.

NMFS has authorized incidental take of 16 marine mammal species (with 17 managed stocks.) The total amount of takes authorized is less than eight percent for one stock (bottlenose dolphin northern coastal migratory stock) and less than one percent of all other species and stocks, which NMFS finds are small numbers of marine mammals relative to the estimated overall population abundances for those stocks. See Table 9. Based on the analysis contained herein of the planned activity (including the required mitigation and monitoring measures) and the anticipated take of marine mammals, NMFS finds that small numbers of marine mammals will be taken relative to the population size of the affected species or stocks.

Unmitigable Adverse Impact Analysis and Determination

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

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 evaluate our proposed action (*i.e.*, the promulgation of regulations and subsequent issuance of incidental take authorization) and alternatives with respect to potential impacts on the human environment.

This action is consistent with categories of activities identified in Categorical Exclusion B4 of the Companion Manual for NAO 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 planned action qualifies to be categorically excluded from further NEPA review.

Endangered Species Act

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

The NMFS Office of Protected Resources is authorizing the incidental take of four species of marine mammals which are listed under the ESA: fin, sei, sperm, and North Atlantic right whales. We requested initiation of consultation under section 7 of the ESA with NMFS GARFO on March 5, 2021, for the issuance of this IHA. On April 2, 2021, NMFS GARFO concurred with our determination that our issuance of the IHA to Skipjack is 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 the take of any marine mammals in violation of the ESA.

Authorization

NMFS has issued an IHA to Skipjack for the potential harassment of small numbers of 16 marine mammal species incidental to the conducting marine site characterization surveys offshore of Delaware in the area of the Commercial Lease of

Submerged Lands for Renewable Energy Development on the Outer Continental Shelf (OCS-A 0519) and along potential submarine cable routes to a landfall location in Delaware provided the previously mentioned mitigation, monitoring and reporting requirements are followed.

Dated: April 6, 2021.

Catherine Marzin,

Acting Director, Office of Protected Resources,

National Marine Fisheries Service.

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