

these imports are materially injuring, or threaten material injury to, the U.S. industry.

Notification to Importers

This notice also serves as an initial reminder to importers of their responsibility under 19 CFR 351.402(f) to file a certificate regarding the reimbursement of antidumping duties prior to liquidation. Failure to comply with this requirement could result in Commerce's presumption that reimbursement of antidumping duties occurred and the subsequent assessment of doubled antidumping duties.

Notification to Interested Parties

This determination is issued and published in accordance with sections 733(f) and 777(i)(1) of the Act and 19 CFR 351.205(c).

Dated: September 17, 2019.

Jeffrey I. Kessler,

Assistant Secretary for Enforcement and Compliance.

Appendix I

Scope of the Investigation

The merchandise covered by this investigation is all grades of liquid or aqueous acetone. Acetone is also known under the International Union of Pure and Applied Chemistry (IUPAC) name propan-2-one. In addition to the IUPAC name, acetone is also referred to as β -ketopropane (or beta-ketopropane), ketone propane, methyl ketone, dimethyl ketone, DMK, dimethyl carbonyl, propanone, 2-propanone, dimethyl formaldehyde, pyroacetic acid, pyroacetic ether, and pyroacetic spirit. Acetone is an isomer of the chemical formula C_3H_6O , with a specific molecular formula of CH_3COCH_3 or $(CH_3)_2CO$.

The scope covers both pure acetone (with or without impurities) and acetone that is combined or mixed with other products, including, but not limited to, isopropyl alcohol, benzene, diethyl ether, methanol, chloroform, and ethanol. Acetone that has been combined with other products is included within the scope, regardless of whether the combining occurs in third countries.

The scope also includes acetone that is commingled with acetone from sources not subject to this investigation.

For combined and commingled products, only the acetone component is covered by the scope of this investigation. However, when acetone is combined with acetone components from sources not subject to this investigation, those third country acetone components may still be subject to other acetone investigations.

Notwithstanding the foregoing language, an acetone combination or mixture that is transformed through a chemical reaction into another product, such that, for example, the acetone can no longer be separated from the other products through a distillation process (e.g., methyl methacrylate (MMA) or

Bisphenol A (BPA)), is excluded from this investigation.

A combination or mixture is excluded from these investigations if the total acetone component (regardless of the source or sources) comprises less than 5 percent of the combination or mixture, on a dry weight basis.

The Chemical Abstracts Service (CAS) registry number for acetone is 67-64-1.

The merchandise covered by this investigation is currently classifiable under Harmonized Tariff Schedule of the United States (HTSUS) subheadings 2914.11.1000 and 2914.11.5000. Combinations or mixtures of acetone may enter under subheadings in Chapter 38 of the HTSUS, including, but not limited to, those under heading 3814.00.1000, 3814.00.2000, 3814.00.5010, and 3814.00.5090. The list of items found under these HTSUS subheadings is non-exhaustive. Although these HTSUS subheadings and CAS registry number are provided for convenience and customs purposes, the written description of the scope of this investigation is dispositive.

Appendix II

List of Topics Discussed in the Preliminary Decision Memorandum

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DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

RIN 0648-XR023

Takes of Marine Mammals Incidental to Specified Activities; Taking Marine Mammals Incidental to Office of Naval Research Arctic Research Activities

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 the Office of Naval Research (ONR) to incidentally harass, by Level B harassment only, marine mammals during Arctic Research Activities in the Beaufort and Chukchi Seas. ONR's activities are considered military readiness activities pursuant to the MMPA, as amended by the National Defense Authorization Act for Fiscal Year 2004 (NDAA).

DATES: This Authorization is effective from September 10, 2019 through September 9, 2020.

FOR FURTHER INFORMATION CONTACT:

Amy Fowler, Office of Protected Resources, NMFS, (301) 427-8401. Electronic copies of the application and supporting documents, as well as a list of the references cited in this document, may be obtained online at: <https://www.fisheries.noaa.gov/permit/incidental-take-authorizations-under-marine-mammal-protection-act>. In case of problems accessing these documents, please call the contact listed above.

SUPPLEMENTARY INFORMATION:

Background

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

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

The NDAA (Pub. L. 108–136) removed the “small numbers” and “specified geographical region” limitations indicated above and amended the definition of “harassment” as it applies to a “military readiness activity.” The activity for which incidental take of marine mammals has been requested addressed here qualifies as a military readiness activity. The definitions of all applicable MMPA statutory terms cited above are included in the relevant sections below. The action constitutes a military readiness activity because these scientific research activities directly support the adequate and realistic testing of military equipment, vehicles, weapons, and sensors for proper operation and suitability for combat use by providing critical data on the changing natural and physical environment in which such materiel will be assessed and deployed. This scientific research also directly supports fleet training and operations by providing up to date information and data on the natural and physical environment essential to training and operations.

Summary of Request

On April 25, 2019, NMFS received a request from ONR for an IHA to take marine mammals incidental to Arctic Research Activities in the Beaufort and Chukchi Seas. The application was deemed adequate and complete on July 16, 2019. ONR’s request was for take of a small number of beluga whales (*Delphinapterus leucas*), bearded seals (*Erignathus barbatus*), and ringed seals (*Pusa hispida hispida*) by Level B harassment only. Neither ONR nor NMFS expects serious injury or mortality to result from this activity and, therefore, an IHA is appropriate.

This IHA covers the second year of a larger project for which ONR obtained a prior IHA and intends to request take authorization for subsequent facets of the project. The larger three-year project involves several scientific objectives which support the Arctic and Global Prediction Program, as well as the Ocean Acoustics Program and the Naval Research Laboratory, for which ONR is the parent command. ONR complied with all the requirements (*e.g.*, mitigation, monitoring, and reporting) of the previous IHA (83 FR 48799; September 27, 2019).

Description of Activity

Overview

ONR’s Arctic Research Activities include scientific experiments to be

conducted in support of the Stratified Ocean Dynamics of the Arctic (SODA), Arctic Mobile Observing System (AMOS), Ocean Acoustics field work (including the Coordinated Arctic Active Tomography Experiment (CAATEX)), and Naval Research Laboratory experiments in the Beaufort and Chukchi Seas. The study area for the Arctic Research Activities is located in the U.S. Exclusive Economic Zone (EEZ) and the high seas north of Alaska (see Figure 1–1 in the IHA application). The total area of the study area is 835,860 square kilometers (km²) (322,727 square miles (mi²)).

These experiments involve deployment of moored and ice-tethered active acoustic sources, primarily from the U.S. Coast Guard Cutter (CGC) HEALY. CGC HEALY may also be required to perform icebreaking to deploy the acoustic sources in deep water. CGC HEALY will perform a research cruise for up to 60 days in September and October 2019 to deploy acoustic sources. A second, non-icebreaking ship may also perform a cruise of up to 30 days to deploy any remaining sources in the fall of 2019. A total of eight days of icebreaking are anticipated within the effective dates of this IHA to deploy and/or retrieve the northernmost sources. A subsequent research cruise of up to 60 days beginning in August 2020 to deploy and retrieve sources.

A detailed description of the planned Arctic Research Activities is provided in the **Federal Register** notice of the proposed IHA (84 FR 37240; July 31, 2019). Since that time, no changes have been made to the planned activities. Therefore, a detailed description is not provided here. Please refer to that **Federal Register** notice for the description of the specified activity.

Comments and Responses

A notice of NMFS’s proposal to issue an IHA to ONR was published in the **Federal Register** on July 31, 2019 (84 FR 37240). That notice described, in detail, ONR’s activity, the marine mammal species that may be affected by the activity, and the anticipated effects on marine mammals. During the 30-day public comment period, NMFS received a comment from the Marine Mammal Commission (Commission).

Comment 1: The Commission noted that the Navy used cutoff distances instead of relying on Bayesian biphasic dose response functions (BRFs) to inform take estimates. The Commission asserted that the cutoff distances used by the Navy are unsubstantiated and that the Navy arbitrarily set a cutoff distance of 10 kilometers (km) for

pinnipeds, which could effectively eliminate a large portion of the estimated number of takes. The Commission, therefore, recommended that the Navy refrain from using cut-off distances in conjunction with the Bayesian BRFs.

Response: We disagree with the Commission’s recommendation. The derivation of the behavioral response functions and associated cutoff distances is provided in the Navy’s Criteria and Thresholds for U.S. Navy Acoustic and Explosive Effects Analysis (Phase III) technical report (Navy 2017a). The consideration of proximity (distance cutoff) was part of criteria developed in consultation with NMFS and was applied within the Navy’s BRF. Distance cutoffs beyond which the potential of significant behavioral responses were considered to be unlikely were used in conducting analysis for ONR’s Arctic Research Activities. The Navy’s BRF applied within these distances is an appropriate method for providing a realistic (but still conservative where some uncertainties exist) estimate of impact and potential take for these activities.

Comment 2: The Commission informally noted that the potential for marine mammals to become entangled in the weather balloon parachutes was not addressed in the **Federal Register** notice of proposed IHA and should have been discounted appropriately.

Response: The weather balloons being released could introduce the potential for entanglement following their descent; these balloons would consist of shredded debris from bursting balloons, a parachute used to slow the descent of the radiosonde, and all of the ropes and twine used to keep all of the components together (the radiosonde would be suspended 82–115 ft (25–35 m) below the balloon). The components from the weather balloons present the highest risk of entanglement. Balloon fragments would temporarily be deposited on the ice, until the ice melts and the materials would sink to the seafloor.

Although there is a potential for entanglement from an expended material, the amount of materials expended will be low. Additionally, marine mammals are very mobile within the water column and are capable of avoiding debris. Although it is unknown whether animals will avoid this debris, a recent stranding report found that out of the 21 reported seal strandings that occurred from human interaction in the Arctic regions, none were documented to be from entanglement (Savage 2017). Therefore, based on the lack of evidence of previous pinniped entanglements in

this region and the very low amount of project materials capable of resulting in entanglement, the probability of marine mammals becoming entangled in project-related materials is extremely small, and thus take from entanglement in balloon materials is unlikely to occur.

Comment 3: The Commission questioned whether the public notice provisions for IHA renewals fully satisfy the public notice and comment provision in the MMPA and discussed the potential burden on reviewers of reviewing key documents and developing comments quickly. Additionally, the Commission recommended that NMFS use the IHA Renewal process sparingly and selectively for activities expected to have the lowest levels of impacts to marine mammals and that require less complex analysis.

Response: NMFS has responded to this comment in full in our **Federal Register** notice announcing the issuance of an IHA to Avangrid Renewables, and we refer the reader to that response (84 FR 31035; June 28, 2019).

Description of Marine Mammals in the Area of Specified Activities

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

Table 1 lists all species with expected potential for occurrence in the study area and summarizes information related to the population or stock, including regulatory status under the MMPA and ESA and potential biological removal (PBR), where known. For taxonomy, we follow Committee on Taxonomy (2018). PBR is defined by the MMPA as the maximum number of animals, not including natural mortalities, that may be removed from a

marine mammal stock while allowing that stock to reach or maintain its optimum sustainable population (as described in NMFS's SARs). While no mortality is anticipated or authorized here, PBR and annual serious injury and mortality from anthropogenic sources are included here as gross indicators of the status of the species and other threats.

Marine mammal abundance estimates presented in this document represent the total number of individuals that make up a given stock or the total number estimated within a particular study or survey area. NMFS's stock abundance estimates for most species represent the total estimate of individuals within the geographic area, if known, that comprises that stock. For some species, this geographic area may extend beyond U.S. waters. All managed stocks in this region are assessed in NMFS's U.S. 2018 SARs (e.g., Muto *et al.*, 2019; Carretta *et al.*, 2019). All values presented in Table 1 are the most recent available at the time of publication and are available in the 2018 SARs (Muto *et al.*, 2019; Carretta *et al.*, 2019).

TABLE 1—MARINE MAMMAL SPECIES POTENTIALLY PRESENT IN THE PROJECT AREA

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 Eschrichtiidae: <i>Gray whale</i>	<i>Eschrichtius robustus</i>	Eastern North Pacific	-/-; N	26960 (0.05, 25,849, 2016).	801	135
Family Balaenidae: <i>Bowhead whale</i>	<i>Balaena mysticetus</i>	Western Arctic	E/D; Y	16,820 (0.052, 16,100, 2011).	161	46
Superfamily Odontoceti (toothed whales, dolphins, and porpoises)						
Family Delphinidae: <i>Beluga whale</i>	<i>Delphinapterus leucas</i>	Beaufort Sea	-/-; N	39,258 (0.229, N/A, 1992).	⁴ Undet.	139
<i>Beluga whale</i>	<i>Delphinapterus leucas</i>	Eastern Chukchi Sea	-/-; N	20,752 (0.70, 12,194, 2012).	244	67
Order Carnivora—Superfamily Pinnipedia						
Family Phocidae (earless seals): <i>Bearded seal</i> ⁵	<i>Erignathus barbatus</i>	Alaska	T/D; Y	299,174 (-, 273,676, 2013).	8,210	557
<i>Ribbon seal</i>	<i>Histiophoca fasciata</i>	Alaska	-/-; N	184,697 (-, 163,086, 2013).	9,785	3.9
<i>Ringed seal</i> ⁵	<i>Pusa hispida hispida</i>	Alaska	T/D; Y	170,000 (-, 170,000, 2013).	5,100	1,054
<i>Spotted seal</i>	<i>Phoca largha</i>	Alaska	-/-; N	461,625 (-, 423,237, 2013).	12,697	329

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

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

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

⁴ The 2016 guidelines for preparing SARs state that abundance estimates older than 8 years should not be used to calculate PBR due to a decline in the reliability of an aged estimate. Therefore, the PBR for this stock is considered undetermined.

⁵ Abundances and associated values for bearded and ringed seals are for the U.S. population in the Bering Sea only.
Note: *Italicized species are not expected to be taken and take is not authorized.*

A detailed description of the species likely to be affected by the Arctic Research Activities, including brief information regarding population trends and threats, and information regarding local occurrence, were provided in the **Federal Register** notice for the proposed IHA (84 FR 37240; July 31, 2019). Since that time, we are not aware of any changes in the status of these species and stocks; therefore, detailed descriptions are not provided here. Please refer to that **Federal Register** notice for those descriptions. Please also refer to NMFS' website (<https://www.fisheries.noaa.gov/find-species>) for generalized species accounts.

Marine Mammal Hearing

Hearing is the most important sensory modality for marine mammals

underwater, and exposure to anthropogenic sound can have deleterious effects. To appropriately assess the potential effects of exposure to sound, it is necessary to understand the frequency ranges marine mammals are able to hear. Current data indicate that not all marine mammal species have equal hearing capabilities (*e.g.*, Richardson *et al.*, 1995; Wartzok and Ketten, 1999; Au and Hastings, 2008). To reflect this, Southall *et al.* (2007) recommended that marine mammals be divided into functional hearing groups based on directly measured or estimated hearing ranges on the basis of available behavioral response data, audiograms derived using auditory evoked potential techniques, anatomical modeling, and other data. Note that no direct

measurements of hearing ability have been successfully completed for mysticetes (*i.e.*, low-frequency cetaceans). Subsequently, NMFS (2018) described generalized hearing ranges for these marine mammal hearing groups. Generalized hearing ranges were chosen based on the approximately 65 dB threshold from the normalized composite audiograms, with the exception for lower limits for low-frequency cetaceans where the lower bound was deemed to be biologically implausible and the lower bound from Southall *et al.* (2007) retained. Marine mammal hearing groups and their associated hearing ranges are provided in Table 2.

TABLE 2—MARINE MAMMAL HEARING GROUPS [NMFS, 2018]

Hearing group	Generalized hearing range *
Low-frequency (LF) cetaceans (baleen whales)	7 Hz to 35 kHz.
Mid-frequency (MF) cetaceans (dolphins, toothed whales, beaked whales, bottlenose whales)	150 Hz to 160 kHz.
High-frequency (HF) cetaceans (true porpoises, <i>Kogia</i> , river dolphins, cephalorhynchid, <i>Lagenorhynchus cruciger</i> & <i>L. australis</i>).	275 Hz to 160 kHz.
Phocid pinnipeds (PW) (underwater) (true seals)	50 Hz to 86 kHz.
Otariid pinnipeds (OW) (underwater) (sea lions and fur seals)	60 Hz to 39 kHz.

* Represents the generalized hearing range for the entire group as a composite (*i.e.*, all species within the group), where individual species' hearing ranges are typically not as broad. Generalized hearing range chosen based on ~65 dB threshold from normalized composite audiogram, with the exception for lower limits for LF cetaceans (Southall *et al.* 2007) and PW pinniped (approximation).

The pinniped functional hearing group was modified from Southall *et al.* (2007) on the basis of data indicating that phocid species have consistently demonstrated an extended frequency range of hearing compared to otariids, especially in the higher frequency range (Hemilä *et al.*, 2006; Kastelein *et al.*, 2009; Reichmuth and Holt, 2013).

For more detail concerning these groups and associated frequency ranges, please see NMFS (2018) for a review of available information. Three marine mammal species (one cetacean and two pinniped (both phocid) species) have the reasonable potential to co-occur with the planned survey activities. Please refer to Table 1. Beluga whales are classified as mid-frequency cetaceans.

Potential Effects of Specified Activities on Marine Mammals and Their Habitat

The effects of underwater noise from the deployed acoustic sources, as well as icebreaking, have the potential to result in behavioral harassment of marine mammals in the vicinity of the

study area. The **Federal Register** notice for the proposed IHA 84 FR 37240; July 31, 2019) included a discussion of the effects of anthropogenic noise on marine mammals and their habitat, therefore that information is not repeated here; please refer to the **Federal Register** notice (84 FR 37240; July 31, 2019) for that information.

Estimated Take

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

Harassment is the only type of take expected to result from these activities. For this military readiness activity, the MMPA defines "harassment" as (i) Any act that injures or has the significant potential to injure a marine mammal or marine mammal stock in the wild (Level A harassment); or (ii) Any act that disturbs or is likely to disturb a marine mammal or marine mammal stock in the wild by causing disruption of natural

behavioral patterns, including, but not limited to, migration, surfacing, nursing, breeding, feeding, or sheltering, to a point where such behavioral patterns are abandoned or significantly altered (Level B harassment).

Authorized takes are by Level B harassment only, in the form of disruption of behavioral patterns and TTS for individual marine mammals resulting from exposure to acoustic transmissions and icebreaking noise. Based on the nature of the activity, Level A harassment is neither anticipated nor authorized.

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 ensounded areas; and, (4) and 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). For this IHA, ONR employed a sophisticated model known as the Navy Acoustic Effects Model (NAEMO) for assessing the impacts of underwater sound. Below, we describe the factors considered here in more detail and present the authorized take.

Acoustic Thresholds

Using the best available science, NMFS has developed 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—In coordination with NMFS, the Navy developed behavioral thresholds to support environmental analyses for the Navy's testing and training military readiness activities utilizing active sonar sources; these behavioral harassment thresholds are used here to evaluate the potential effects of the active sonar components of the planned action. The response of a marine mammal to an anthropogenic sound will depend on the frequency, duration, temporal pattern and amplitude of the sound as well as the animal's prior experience with the sound and the context in which the sound is encountered (i.e., what the animal is doing at the time of the exposure). The distance from the sound source and whether it is perceived as approaching or moving away can also affect the way an animal responds to a sound (Wartzok *et al.* 2003). For marine mammals, a review of responses to anthropogenic sound was first conducted by Richardson *et al.* (1995). Reviews by Nowacek *et al.* (2007) and Southall *et al.* (2007) address studies conducted since 1995 and focus on observations where the received sound level of the exposed marine mammal(s) was known or could be estimated.

Multi-year research efforts have conducted sonar exposure studies for odontocetes and mysticetes (Miller *et al.* 2012; Sivle *et al.* 2012). Several studies with captive animals have provided data under controlled circumstances for odontocetes and pinnipeds (Houser *et*

al. 2013a; Houser *et al.* 2013b). Moretti *et al.* (2014) published a beaked whale dose-response curve based on passive acoustic monitoring of beaked whales during U.S. Navy training activity at Atlantic Underwater Test and Evaluation Center during actual Anti-Submarine Warfare exercises. This new information necessitated the update of the behavioral response criteria for the U.S. Navy's environmental analyses.

Southall *et al.* (2007) synthesized data from many past behavioral studies and observations to determine the likelihood of behavioral reactions at specific sound levels. While in general, the louder the sound source the more intense the behavioral response, it was clear that the proximity of a sound source and the animal's experience, motivation, and conditioning were also critical factors influencing the response (Southall *et al.* 2007). After examining all of the available data, the authors felt that the derivation of thresholds for behavioral response based solely on exposure level was not supported because context of the animal at the time of sound exposure was an important factor in estimating response. Nonetheless, in some conditions, consistent avoidance reactions were noted at higher sound levels depending on the marine mammal species or group allowing conclusions to be drawn. Phocid seals showed avoidance reactions at or below 190 dB re 1 μ Pa at 1m; thus, seals may actually receive levels adequate to produce TTS before avoiding the source.

Odontocete behavioral criteria for non-impulsive sources were updated based on controlled exposure studies for dolphins and sea mammals, sonar, and safety (3S) studies where odontocete behavioral responses were reported after exposure to sonar (Antunes *et al.*, 2014; Houser *et al.*, 2013b; Miller *et al.*, 2011; Miller *et al.*, 2014; Miller *et al.*, 2012). For the 3S study the sonar outputs included 1–2 kHz up- and down-sweeps and 6–7 kHz up-sweeps; source levels were ramped up from 152–158 dB re 1 μ Pa to a maximum of 198–214 re 1 μ Pa at 1 m. Sonar signals were ramped up over several pings while the vessel approached the mammals. The study did include some control passes of ships with the sonar off to discern the behavioral responses of the mammals to vessel presence alone versus active sonar.

The controlled exposure studies included exposing the Navy's trained bottlenose dolphins to mid-frequency sonar while they were in a pen. Mid-frequency sonar was played at 6 different exposure levels from 125–185 dB re 1 μ Pa (rms). The behavioral response function for odontocetes

resulting from the studies described above has a 50 percent probability of response at 157 dB re 1 μ Pa. Additionally, distance cutoffs (20 km for MF cetaceans) were applied to exclude exposures beyond which the potential of significant behavioral responses is considered to be unlikely.

The pinniped behavioral threshold was updated based on controlled exposure experiments on the following captive animals: Hooded seal, gray seal, and California sea lion (Götz *et al.* 2010; Houser *et al.* 2013a; Kvadsheim *et al.* 2010). Hooded seals were exposed to increasing levels of sonar until an avoidance response was observed, while the grey seals were exposed first to a single received level multiple times, then an increasing received level. Each individual California sea lion was exposed to the same received level ten times. These exposure sessions were combined into a single response value, with an overall response assumed if an animal responded in any single session. The resulting behavioral response function for pinnipeds has a 50 percent probability of response at 166 dB re 1 μ Pa. Additionally, distance cutoffs (10 km for pinnipeds) were applied to exclude exposures beyond which the potential of significant behavioral responses is considered to be unlikely.

NMFS adopted the Navy's approach to estimating incidental take by Level B harassment from the active acoustic sources for this action, which includes use of these dose response functions. The Navy's dose response functions were developed to estimate take from sonar and similar transducers and are not applicable to icebreaking. NMFS predicts that marine mammals are likely to be behaviorally harassed in a manner we consider Level B harassment when exposed to underwater anthropogenic noise above received levels of 120 dB re 1 μ Pa (rms) for continuous (e.g., vibratory pile-driving, drilling, icebreaking) and above 160 dB re 1 μ Pa (rms) for non-explosive impulsive (e.g., seismic airguns) or intermittent (e.g., scientific sonar) sources. Thus, take of marine mammals by Level B harassment due to icebreaking has been calculated using the Navy's NAEMO model with a step-function at 120 dB re 1 μ Pa (rms) received level for behavioral response.

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). ONR's activities involve only non-impulsive sources.

These thresholds are provided in the table 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	Cell 1: $L_{pk,flat}$: 219 dB; $L_{E,LF,24h}$: 183 dB	Cell 2: $L_{E,LF,24h}$: 199 dB.
Mid-Frequency (MF) Cetaceans	Cell 3: $L_{pk,flat}$: 230 dB; $L_{E,MF,24h}$: 185 dB	Cell 4: $L_{E,MF,24h}$: 198 dB.
High-Frequency (HF) Cetaceans	Cell 5: $L_{pk,flat}$: 202 dB; $L_{E,HF,24h}$: 155 dB	Cell 6: $L_{E,HF,24h}$: 173 dB.
Phocid Pinnipeds (PW) (Underwater)	Cell 7: $L_{pk,flat}$: 218 dB; $L_{E,PW,24h}$: 185 dB	Cell 8: $L_{E,PW,24h}$: 201 dB.
Otariid Pinnipeds (OW) (Underwater)	Cell 9: $L_{pk,flat}$: 232 dB; $L_{E,OW,24h}$: 203 dB	Cell 10: $L_{E,OW,24h}$: 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 μ Pa, and cumulative sound exposure level (L_E) has a reference value of 1 μ Pa²s. 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.

Quantitative Modeling

The Navy performed a quantitative analysis to estimate the number of mammals that could be harassed by the underwater acoustic transmissions during the planned action. Inputs to the quantitative analysis included marine mammal density estimates, marine mammal depth occurrence distributions (Navy 2017a), oceanographic and environmental data, marine mammal hearing data, and criteria and thresholds for levels of potential effects. The quantitative analysis consists of computer modeled estimates and a post-model analysis to determine the number of potential animal exposures. The model calculates sound energy propagation from the planned non-impulsive acoustic sources and icebreaking, the sound received by animat (virtual animal) dosimeters representing marine mammals distributed in the area around the modeled activity, and whether the sound received by animats exceeds the thresholds for effects.

The Navy developed a set of software tools and compiled data for estimating acoustic effects on marine mammals without consideration of behavioral avoidance or mitigation. These tools and data sets serve as integral components of NAEMO. In NAEMO, animats are distributed non-uniformly based on species-specific density, depth distribution, and group size information and animats record energy received at their location in the water column. A fully three-dimensional environment is

used for calculating sound propagation and animat exposure in NAEMO. Site-specific bathymetry, sound speed profiles, wind speed, and bottom properties are incorporated into the propagation modeling process. NAEMO calculates the likely propagation for various levels of energy (sound or pressure) resulting from each source used during the training event.

NAEMO then records the energy received by each animat within the energy footprint of the event and calculates the number of animats having received levels of energy exposures that fall within defined impact thresholds. Predicted effects on the animats within a scenario are then tallied and the highest order effect (based on severity of criteria; *e.g.*, PTS over TTS) predicted for a given animat is assumed. Each scenario, or each 24-hour period for scenarios lasting greater than 24 hours (which NMFS recommends in order to ensure more consistent quantification of take across actions), is independent of all others, and therefore, the same individual marine animal (as represented by an animat in the model environment) could be impacted during each independent scenario or 24-hour period. In few instances, although the activities themselves all occur within the study area, sound may propagate beyond the boundary of the study area. Any exposures occurring outside the boundary of the study area are counted as if they occurred within the study area boundary. NAEMO provides the initial estimated impacts on marine species with a static horizontal distribution (*i.e.*,

animats in the model environment do not move horizontally).

There are limitations to the data used in the acoustic effects model, and the results must be interpreted within this context. While the best available data and appropriate input assumptions have been used in the modeling, when there is a lack of definitive data to support an aspect of the modeling, conservative modeling assumptions have been chosen (*i.e.*, assumptions that may result in an overestimate of acoustic exposures):

- Animats are modeled as being underwater, stationary, and facing the source and therefore always predicted to receive the maximum potential sound level at a given location (*i.e.*, no porpoising or pinnipeds' heads above water);
- Animats do not move horizontally (but change their position vertically within the water column), which may overestimate physiological effects such as hearing loss, especially for slow moving or stationary sound sources in the model;
- Animats are stationary horizontally and therefore do not avoid the sound source, unlike in the wild where animals would most often avoid exposures at higher sound levels, especially those exposures that may result in PTS;
- Multiple exposures within any 24-hour period are considered one continuous exposure for the purposes of calculating potential threshold shift, because there are not sufficient data to

estimate a hearing recovery function for the time between exposures; and

- Mitigation measures were not considered in the model. In reality, sound-producing activities would be reduced, stopped, or delayed if marine mammals are detected by visual monitoring.

Because of these inherent model limitations and simplifications, model-estimated results should be further analyzed, considering such factors as the range to specific effects, avoidance, and the likelihood of successfully implementing mitigation measures. This analysis uses a number of factors in addition to the acoustic model results to predict acoustic effects on marine mammals.

The underwater radiated noise signature for icebreaking in the central Arctic Ocean by CGC HEALY during different types of ice-cover was characterized in Roth *et al.* (2013). The radiated noise signatures were characterized for various fractions of ice cover. For modeling, the 8/10 ice cover was used. Each modeled day of icebreaking consisted of 6 hours of 8/10 ice cover. Icebreaking was modeled for eight days for each of the 2019 and 2020 cruises. For each cruise, this includes four days of icebreaking for the deployment (or recovery) of the VLF source and four days of icebreaking for the deployment (or recovery) of the northernmost navigation sources. Since ice forecasting cannot be predicted more than a few weeks in advance it is unknown if icebreaking would be needed to deploy or retrieve the sources after one year of transmitting. Therefore, icebreaking was conservatively analyzed within this IHA. Figure 5a and 5b in Roth *et al.* (2013) depicts the source spectrum level versus frequency for 8/

10 ice cover. The sound signature of the ice coverage level was broken into 1-octave bins (Table 4). In the model, each bin was included as a separate source on the modeled vessel. When these independent sources go active concurrently, they simulate the sound signature of CGC HEALY. The modeled source level summed across these bins was 196.2 dB for the 8/10 signature ice signature. These source levels are a good approximation of the icebreaker's observed source level (provided in Figure 4b of Roth *et al.* (2013)). Each frequency and source level was modeled as an independent source, and applied simultaneously to all of the animals within NAEMO. Each second was summed across frequency to estimate sound pressure level (root mean square (SPL_{RMS})). For PTS and TTS determinations, sound exposure levels were summed over the duration of the test and the transit to the deployment area. The method of quantitative modeling for icebreaking is considered to be a conservative approach; therefore, the number of takes estimated for icebreaking are likely an over-estimate and would not be expected.

TABLE 4—MODELED BINS FOR ICEBREAKING IN 8/10 ICE COVERAGE ON CGC HEALY

Frequency (Hz)	Source level (dB)
25	189
50	188
100	189
200	190
400	188
800	183
1600	177
3200	176
6400	172

TABLE 4—MODELED BINS FOR ICEBREAKING IN 8/10 ICE COVERAGE ON CGC HEALY—Continued

Frequency (Hz)	Source level (dB)
12800	167

For the other non-impulsive sources, NAEMO calculates the SPL and SEL for each active emission during an event. This is done by taking the following factors into account over the propagation paths: Bathymetric relief and bottom types, sound speed, and attenuation contributors such as absorption, bottom loss, and surface loss. Platforms such as a ship using one or more sound sources are modeled in accordance with relevant vehicle dynamics and time durations by moving them across an area whose size is representative of the testing event's operational area. Table 5 provides range to effects for non-impulsive sources and icebreaking noise planned for the Arctic research activities to mid-frequency cetacean and pinniped specific criteria. Marine mammals within these ranges would be predicted to receive the associated effect. Range to effects is important information in not only predicting non-impulsive acoustic impacts, but also in verifying the accuracy of model results against real-world situations and determining adequate mitigation ranges to avoid higher level effects, especially physiological effects in marine mammals. Therefore, the ranges in Table 5 provide realistic maximum distances over which the specific effects from the use of non-impulsive sources during the planned action would be possible.

TABLE 5—RANGE TO PTS, TTS, AND BEHAVIORAL EFFECTS IN THE STUDY AREA

Source	Range to behavioral effects (m)		Range to TTS effects (m)		Range to PTS effects (m)	
	MF cetacean	Pinniped	MF cetacean	Pinniped	MF cetacean	Pinniped
Navigation and real-time sensing sources	^a 20,000	^a 10,000	0	6	0	0
Spiral Wave Beacon source	^a 20,000	^a 10,000	0	0	0	0
Icebreaking noise	4,275	4,525	3	12	0	0

^a Cutoff distances applied.

A behavioral response study conducted on and around the Navy range in Southern California (SOCAL BRS) observed reactions to sonar and similar sound sources by several marine mammal species, including Risso's dolphins (*Grampus griseus*), a mid-frequency cetacean (DeRuiter *et al.*, 2013; Goldbogen *et al.*, 2013; Southall *et*

al., 2011; Southall *et al.*, 2012; Southall *et al.*, 2013; Southall *et al.*, 2014). In preliminary analysis, none of the Risso's dolphins exposed to simulated or real mid-frequency sonar demonstrated any overt or obvious responses (Southall *et al.*, 2012, Southall *et al.*, 2013). In general, although the responses to the simulated sonar were varied across

individuals and species, none of the animals exposed to real Navy sonar responded; these exposures occurred at distances beyond 10 km, and were up to 100 km away (DeRuiter *et al.*, 2013; B. Southall pers. comm.). These data suggest that most odontocetes (not including beaked whales and harbor porpoises) likely do not exhibit

significant behavioral reactions to sonar and other transducers beyond approximately 10 km. Therefore, the Navy uses a cutoff distance for odontocetes of 10 km for moderate source level, single platform training and testing events, and 20 km for all other events, including the Arctic Research Activities (Navy 2017a).

Southall *et al.* (2007) report that pinnipeds do not exhibit strong reactions to SPLs up to 140 dB re 1 µPa from non-impulsive sources. While there are limited data on pinniped behavioral responses beyond about 3 km in the water, the Navy uses a distance cutoff of 5 km for moderate source level, single platform training and testing events, and 10 km for all other events, including the Arctic Research Activities (Navy 2017a).

NMFS and the Navy conservatively implemented a distance cutoff of 10 km for pinnipeds, and 20 km for mid-frequency cetaceans (Navy 2017a). Regardless of the received level at that distance, take is not estimated to occur beyond 10 and 20 km from the source for pinnipeds and cetaceans, respectively. Sources that show a range

of zero do not rise to the specified level of effects (*i.e.*, there is no chance of PTS for either MF cetaceans or pinnipeds from any of the sources). No instances of PTS were modeled for any species or stock; as such, no take by Level A harassment is anticipated or authorized.

As discussed above, within NAEMO animats do not move horizontally or react in any way to avoid sound. Furthermore, mitigation measures that reduce the likelihood of physiological impacts are not considered in quantitative analysis. Therefore, the model may overestimate acoustic impacts, especially physiological impacts near the sound source. The behavioral criteria used as a part of this analysis acknowledges that a behavioral reaction is likely to occur at levels below those required to cause hearing loss. At close ranges and high sound levels approaching those that could cause PTS, avoidance of the area immediately around the sound source is the assumed behavioral response for most cases.

In previous environmental analyses, the Navy has implemented analytical factors to account for avoidance

behavior and the implementation of mitigation measures. The application of avoidance and mitigation factors has only been applied to model-estimated PTS exposures given the short distance over which PTS is estimated. Given that no PTS exposures were estimated during the modeling process for this planned action, the quantitative consideration of avoidance and mitigation factors were not included in this analysis.

The marine mammal density numbers utilized for quantitative modeling are from the Navy Marine Species Density Database (Navy 2014). Density estimates are based on habitat-based modeling by Kaschner *et al.* (2006) and Kaschner (2004). While density estimates for the two stocks of beluga whales are equal (Kaschner *et al.*, 2006; Kaschner 2004), take has been apportioned to each stock proportional to the abundance of each stock. Table 6 shows the exposures expected for the beluga whale, bearded seal, and ringed seal based on NAEMO modeled results.

TABLE 6—QUANTITATIVE MODELING RESULTS OF POTENTIAL EXPOSURES

Species	Density estimate within study area (animals per square km) ^a	Level B harassment from deployed sources	Level B harassment from icebreaking	Level A harassment	Total authorized take	Percentage of stock taken
Beluga Whale (Beaufort Sea Stock)	0.0087	331	32	0	363	0.92
Beluga Whale (Eastern Chukchi Sea stock)	0.0087	178	18	0	196	0.94
Bearded Seal	0.0332	0	0	0	^b 5	<0.01
Ringed Seal	0.3760	6,773	1,072	0	7,845	2.17

^aKaschner *et al.* (2006); Kaschner (2004).

^bQuantitative modeling yielded zero takes of bearded seals. However, in an abundance of caution, we are proposing to authorize five takes of bearded seals by Level B harassment.

Effects of Specified Activities on Subsistence Uses of Marine Mammals

Subsistence hunting is important for many Alaska Native communities. A study of the North Slope villages of Nuiqsut, Kaktovik, and Barrow identified the primary resources used for subsistence and the locations for harvest (Stephen R. Braund & Associates 2010), including terrestrial mammals (caribou, moose, wolf, and wolverine), birds (geese and eider), fish (Arctic cisco, Arctic char/Dolly Varden trout, and broad whitefish), and marine mammals (bowhead whale, ringed seal, bearded seal, and walrus). Bearded seals, ringed seals, and beluga whales are located within the study area during

the planned action. The permitted sources would be placed outside of the range for subsistence hunting and the study plans have been communicated to communities and tribes in the area, including the Alaska Eskimo Whaling Commission (AEWC) and the Arctic Waterways Safety Committee (AWSC). The closest active acoustic source within the study area (aside from the *de minimis* sources), is approximately 145 mi (233 km) from land. As stated above, the range to effects for non-impulsive acoustic sources in this experiment is much smaller than the distance from shore. In addition, the planned action would not remove individuals from the population. Therefore, there would be no impacts caused by this action to the

availability of bearded seal, ringed seal, or beluga whale for subsistence hunting. Therefore, subsistence uses of marine mammals are not expected to be impacted by the planned action.

Mitigation

In order to issue an IHA under Section 101(a)(5)(D) of the MMPA, NMFS must set forth the permissible methods of taking pursuant to such activity, and other means of effecting the least practicable impact on such species or stock and its habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance, and on the availability of such species or stock for taking for certain subsistence uses. NMFS

regulations require applicants for incidental take authorizations to include information about the availability and feasibility (economic and technological) of equipment, methods, and manner of conducting such activity or other means of effecting the least practicable adverse impact upon the affected species or stocks and their habitat (50 CFR 216.104(a)(11)). The NDAA for FY 2004 amended the MMPA as it relates to military readiness activities and the incidental take authorization process such that "least practicable impact" shall include consideration of personnel safety, practicality of implementation, and impact on the effectiveness of the military readiness activity.

In evaluating how mitigation may or may not be appropriate to ensure the least practicable adverse impact on species or stocks and their habitat, as well as subsistence uses where applicable, we carefully consider two primary factors:

(1) The manner in which, and the degree to which, the successful implementation of the measure(s) is expected to reduce impacts to marine mammals, marine mammal species or stocks, and their habitat, as well as subsistence uses. 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, and, in the case of a military readiness activity, personnel safety, practicality of implementation, and impact on the effectiveness of the military readiness activity.

Mitigation for Marine Mammals and their Habitat

Ships operated by or for the Navy have personnel assigned to stand watch at all times, day and night, when moving through the water. While in transit, ships must use extreme caution and proceed at a safe speed such that the ship can take proper and effective action to avoid a collision with any marine mammal and can be stopped within a distance appropriate to the prevailing circumstances and conditions.

During navigational source deployments, visual observation must start 30 minutes prior to and continue

throughout the deployment within an exclusion zone of 55 m (180 ft, roughly one ship length) around the deployed mooring. Deployment must stop if a marine mammal is visually detected within the exclusion zone. Deployment will re-commence if any one of the following conditions are met: (1) The animal is observed exiting the exclusion zone, (2) the animal is thought to have exited the exclusion zone based on its course and speed, or (3) the exclusion zone has been clear from any additional sightings for a period of 15 minutes for pinnipeds and 30 minutes for cetaceans. Visual monitoring must continue through 30 minutes following the deployment of sources.

Once deployed, the spiral wave beacon would transmit for five days. The ship will maintain position near the moored source and must monitor the surrounding area for marine mammals. Transmission must cease if a marine mammal enters a 55-m (180 ft) exclusion zone. Transmission will re-commence if any one of the following conditions are met: (1) The animal is observed exiting the exclusion zone, (2) the animal is thought to have exited the exclusion zone based on its course and speed and relative motion between the animal and the source, or (3) the exclusion zone has been clear from any additional sightings for a period of 15 minutes for pinnipeds and 30 minutes for cetaceans. The spiral wave beacon source will only transmit during daylight hours.

Ships must avoid approaching marine mammals head on and would maneuver to maintain an exclusion zone of 1,500 ft (457 m) around observed mysticete whales, and 600 ft (183 m) around all other marine mammals, provided it is safe to do so in ice free waters.

With the exception of the spiral wave beacon, moored/drifted sources are left in place and cannot be turned off until the following year during ice free months. Once they are programmed they will operate at the specified pulse lengths and duty cycles until they are either turned off the following year or there is failure of the battery and are not able to operate. Due to the ice covered nature of the Arctic it is not possible to recover the sources or interfere with their transmit operations in the middle of the deployment.

These requirements do not apply if a vessel's safety is at risk, such as when a change of course would create an imminent and serious threat to safety, person, vessel, or aircraft, and to the extent vessels are restricted in their ability to maneuver. No further action is necessary if a marine mammal other than a whale continues to approach the

vessel after there has already been one maneuver and/or speed change to avoid the animal. Avoidance measures should continue for any observed whale in order to maintain an exclusion zone of 1,500 ft (457 m).

All ships are required to coordinate with the AEWC using established check-in and communication procedures when vessels approach subsistence hunting areas.

All personnel conducting on-ice experiments, as well as all aircraft operating in the study area, are required to maintain a separation distance of 1,000 ft (305 m) from any sighted marine mammal.

NMFS has determined that the mitigation measures provide the means effecting the least practicable impact on the affected species or stocks and their habitat, paying particular attention to rookeries, mating grounds, areas of similar significance, and on the availability of such species or stock for subsistence uses.

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 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.

While underway, the ships (including non-Navy ships operating on behalf of the Navy) utilizing active acoustics must have at least one watch person during activities. Watch personnel undertake extensive training in accordance with the U.S. Navy Lookout Training Handbook or civilian equivalent, including on the job instruction and a formal Personal Qualification Standard program (or equivalent program for supporting contractors or civilians), to certify that they have demonstrated all necessary skills (such as detection and reporting of floating or partially submerged objects). Additionally, watch personnel have taken the Navy's Marine Species Awareness Training. Their duties may be performed in conjunction with other job responsibilities, such as navigating the ship or supervising other personnel. While on watch, personnel employ visual search techniques, including the use of binoculars, using a scanning method in accordance with the U.S. Navy Lookout Training Handbook or civilian equivalent. A primary duty of watch personnel is to detect and report all objects and disturbances sighted in the water that may be indicative of a threat to the ship and its crew, such as debris, or surface disturbance. Per safety requirements, watch personnel also report any marine mammals sighted that have the potential to be in the direct path of the ship as a standard collision avoidance procedure.

The U.S. Navy has coordinated with NMFS to develop an overarching program plan in which specific monitoring would occur. This plan is called the Integrated Comprehensive Monitoring Program (ICMP) (Navy 2011). The ICMP has been developed in direct response to Navy permitting requirements established through various environmental compliance efforts. As a framework document, the ICMP applies by regulation to those activities on ranges and operating areas for which the Navy is seeking or has

sought incidental take authorizations. The ICMP is intended to coordinate monitoring efforts across all regions and to allocate the most appropriate level and type of effort based on a set of standardized research goals, and in acknowledgement of regional scientific value and resource availability.

The ICMP is focused on Navy training and testing ranges where the majority of Navy activities occur regularly as those areas have the greatest potential for being impacted. ONR's Arctic Research Activities in comparison is a less intensive test with little human activity present in the Arctic. Human presence is limited to a minimal amount of days for source operations and source deployments, in contrast to the large majority (>95%) of time that the sources will be left behind and operate autonomously. Therefore, a dedicated monitoring project is not warranted. However, ONR is required to record all observations of marine mammals, including the marine mammal's location (latitude and longitude), behavior, and distance from project activities, including icebreaking.

The Navy is committed to documenting and reporting relevant aspects of research and testing activities to verify implementation of mitigation, comply with permits, and improve future environmental assessments. If any injury or death of a marine mammal is observed during the 2019–20 Arctic Research Activities, the Navy must immediately halt the activity and report the incident to the Office of Protected Resources, NMFS, and the Alaska Regional Stranding Coordinator, NMFS. The following information must be provided:

- Time, date, and location of the discovery;
- 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(s) was discovered (e.g., during use of towed acoustic sources, deployment of moored or drifting sources, during on-ice experiments, or by transiting vessel).

ONR is required to provide NMFS with a draft exercise monitoring report within 90 days of the conclusion of the planned activity. The draft exercise monitoring report must include data regarding acoustic source use, the number of shutdowns during monitoring, any marine mammal

sightings (including the marine mammal's location (latitude and longitude)), and the number of individuals of each species observed during source deployment and operation, their behavior and distance from project activities (including icebreaking), and estimates of the total number of marine mammals taken, by species (including takes that occurred beyond the observable area). If no comments are received from NMFS within 30 days of submission of the draft final report, the draft final report will constitute the final report. If comments are received, a final report must be submitted within 30 days after receipt of comments.

Negligible Impact Analysis and Determination

NMFS has defined negligible impact as an impact resulting from the specified activity that cannot be reasonably expected to, and is not reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival (50 CFR 216.103). A negligible impact finding is based on the lack of likely adverse effects on annual rates of recruitment or survival (*i.e.*, population-level effects). An estimate of the number of takes alone is not enough information on which to base an impact determination. In addition to considering estimates of the number of marine mammals that might be "taken" through harassment, NMFS considers other factors, such as the likely nature of any responses (e.g., intensity, duration), the context of any responses (e.g., critical reproductive time or location, migration), as well as effects on habitat, and the likely effectiveness of the mitigation. We also assess the number, intensity, and context of estimated takes by evaluating this information relative to population status. Consistent with the 1989 preamble for NMFS's implementing regulations (54 FR 40338; September 29, 1989), the impacts from other past and ongoing anthropogenic activities are incorporated into this analysis via their impacts on the environmental baseline (e.g., as reflected in the regulatory status of the species, population size and growth rate where known, ongoing sources of human-caused mortality, or ambient noise levels).

Underwater acoustic transmissions associated with the Arctic Research Activities, as outlined previously, have the potential to result in Level B harassment of beluga whales, ringed seals, and bearded seals in the form of TTS and behavioral disturbance. No serious injury, mortality, or Level A

harassment are anticipated to result from this activity.

Minimal takes of marine mammals by Level B harassment would be due to TTS since the range to TTS effects is small at only 12 m or less while the behavioral effects range is significantly larger extending up to 20 km (Table 5). TTS is a temporary impairment of hearing and can last from minutes or hours to days (in cases of strong TTS). In many cases, however, hearing sensitivity recovers rapidly after exposure to the sound ends, which is expected here, given the anticipated magnitude and duration of any potential exposures. No takes from TTS were modeled, but if TTS did occur, the overall fitness of the individual is unlikely to be affected and negative impacts to the relevant stock are not anticipated.

Effects on individuals that are taken by Level B harassment could include alteration of dive behavior, alteration of foraging behavior, effects to breathing rates, interference with or alteration of vocalization, avoidance, and flight. More severe behavioral responses are not anticipated due to the localized, intermittent use of active acoustic sources. Most likely, individuals will simply be temporarily displaced by moving away from the sound source. As described previously in the behavioral effects section, seals exposed to non-impulsive sources with a received sound pressure level within the range of calculated exposures (142–193 dB re 1 μ Pa), have been shown to change their behavior by modifying diving activity and avoidance of the sound source (Götz *et al.*, 2010; Kvasdheim *et al.*, 2010). Although a minor change to a behavior may occur as a result of exposure to the sound sources associated with the planned action, these changes would be within the normal range of behaviors for the animal (*e.g.*, the use of a breathing hole further from the source, rather than one closer to the source, would be within the normal range of behavior). Thus, even repeated Level B harassment of some small subset of the overall stock is unlikely to result in any significant realized decrease in fitness for the affected individuals, and would not result in any adverse impact to the stock as a whole.

The project is not expected to have significant adverse effects on marine mammal habitat. While the activities may cause some fish to leave the area of disturbance, temporarily impacting marine mammals' foraging opportunities, this would encompass a relatively small area of habitat leaving large areas of existing fish and marine mammal foraging habitat unaffected.

The planned project and associated impacts do not occur in any known Biologically Important Areas (BIAs). Icebreaking may temporarily affect the availability of pack ice for seals to haul out but the proportion of ice disturbed is small relative to the overall amount of available ice habitat. Icebreaking will not occur during the time of year when ringed seals are expected to be within subnivean lairs or pupping (Chapksii 1940; McLaren 1958; Smith and Stirling 1975). As such, the impacts to marine mammal habitat are not expected to cause significant or long-term negative consequences.

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 is anticipated or authorized;
- Impacts will be limited to Level B harassment;
- Takes by Level B harassment will primarily be in the form of low level behavioral disturbance over a short duration;
- The project and associated impacts are not occurring in any known BIAs; and
- There will be no permanent or significant loss or modification of marine mammal prey or habitat.

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.

Unmitigable Adverse Impact Analysis and Determination

Impacts to subsistence uses of marine mammals resulting from the planned action are not anticipated. The closest active acoustic source within the study area is approximately 145 mi (233 km) from land, outside of known subsistence use areas. Based on this information, NMFS has determined that there will be no unmitigable adverse impact on subsistence uses from ONR's planned activities.

National Environmental Policy Act

In compliance with the National Environmental Policy Act (NEPA) of 1969 (42 U.S.C. 4321 *et seq.*), as implemented by the regulations published by the Council on

Environmental Quality (CEQ; 40 CFR parts 1500–1508), ONR prepared an Overseas Environmental Assessment (OEA) to consider the direct, indirect, and cumulative effects to the human environment resulting from the Arctic Research Activities. NMFS made ONR's OEA available to the public for review and comment, concurrently with the publication of the proposed IHA, on the NMFS website (at <https://www.fisheries.noaa.gov/permit/incidental-take-authorizations-under-marine-mammal-protection-act>), in relation to its suitability for adoption by NMFS in order to assess the impacts to the human environment of issuance of an IHA to ONR. Also in compliance with NEPA and the CEQ regulations, as well as NOAA Administrative Order 216–6, NMFS has reviewed ONR's OEA, determined it to be sufficient, and adopted that EA and signed a Finding of No Significant Impact (FONSI) on September 9, 2019.

Endangered Species Act (ESA)

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 Alaska Regional Office (AKR), whenever we propose to authorize take for endangered or threatened species.

The AKR issued a Biological Opinion on August 27, 2019, which concluded that ONR's Arctic Research Activities and NMFS's issuance of an IHA for those activities are not likely to jeopardize the continued existence of the Beringia DPS bearded seal or Arctic ringed seal or adversely modify any designated critical habitat.

Authorization

As a result of these determinations, NMFS has issued an IHA to the U.S. Navy's ONR for conducting Arctic Research Activities in the Beaufort and Chukchi Seas, provided the previously mentioned mitigation, monitoring, and reporting requirements are incorporated.

Dated: September 18, 2019.

Donna S. Wieting,

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National Marine Fisheries Service.*

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