instructions to CBP 15 days after the publication of this notice.

**Notifications**

This notice serves as a final reminder to importers of their responsibility under 19 CFR 351.402(f)(2) to file a certificate regarding the reimbursement of antidumping duties prior to liquidation of the relevant entries during this review period. Failure to comply with this requirement could result in Commerce's presumption that reimbursement of the antidumping duties occurred and the subsequent assessment of doubled antidumping duties.

This notice also serves as a final reminder to parties subject to administrative protective order (APO) of their responsibility concerning the return or destruction of proprietary information disclosed under APO in accordance with 19 CFR 351.305, which continues to govern business proprietary information in this segment of the proceeding. Timely written notification of the return/destruction of APO materials or conversion to judicial protective order is hereby requested. Failure to comply with the regulations and terms of an APO is a violation which is subject to sanction.

This notice is issued and published in accordance with sections 751(a)(1) and 777(i)(1) of the Act and 19 CFR 351.213(d)(4).

Dated: June 6, 2019.

**James Maeder,**

*Associate Deputy Assistant Secretary for Antidumping and Countervailing Duty Operations.*

[FR Doc. 2019–12393 Filed 6–11–19; 8:45 am]

**BILLING CODE 3510–DS–P**

## DEPARTMENT OF COMMERCE

### National Oceanic and Atmospheric Administration

**RIN 0648–XG736**

### Takes of Marine Mammals Incidental to Specified Activities; Taking Marine Mammals Incidental to a Marine Geophysical Survey in the Gulf of Alaska

**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 Lamont-Doherty Earth Observatory of Columbia University (L–DEO) to incidentally harass, by Level A and Level B harassment, marine mammals during seismic airgun activities associated with a marine geophysical survey in the Gulf of Alaska.

**DATES:** This Authorization is effective from June 1, 2019 through May 31, 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/national/marine-mammal-protection/incidental-take-authorizations-research-and-other-activities.* 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 definitions of all applicable MMPA statutory terms cited above are included in the relevant sections below.

**Summary of Request**

On November 20, 2018, NMFS received a request from L–DEO for an IHA to take marine mammals incidental to conducting seismic geophysical surveys in the Gulf of Alaska along the Alaska Peninsula subduction zone. On December 19, 2018, NMFS received a revised copy of the application, and that application was deemed adequate and complete on February 11, 2019. L–DEO's request is for take of a small number of 21 marine mammal species by Level B harassment and Level A harassment. Underwater sound associated with airgun use may result in the behavioral harassment or auditory injury of marine mammals in the ensonified areas. Neither L–DEO nor NMFS expects serious injury or mortality to result from this activity and, therefore, an IHA is appropriate.

NMFS previously issued an IHA to L–DEO for similar work (76 FR 38621; July 1, 2011). L–DEO complied with all the requirements (*e.g.,* mitigation, monitoring, and reporting) of the previous IHA and information regarding their monitoring results may be found in the ''Description of Marine Mammals in the Area of Specified Activities.''

**Description of the Specified Activity**

*Overview*

The specified activity consists of a high energy geophysical seismic survey conducted in a portion of the Gulf of Alaska. Researchers from Lamont-Doherty Earth Observatory (L–DEO and other institutions, with funding from NSF, plan to conduct the seismic survey from the Research Vessel (R/V) *Marcus G. Langseth* (*Langseth*) in the Gulf of Alaska during 2019. The NSF-owned *Langseth* is operated by Columbia University's L–DEO under an existing Cooperative Agreement. The planned seismic survey would likely occur in the Gulf of Alaska off the Alaska Peninsula and the eastern Aleutian islands during late spring 2019 and would use a 36-airgun towed array with a total discharge volume of ~6600 $in^3$. The survey would take place within the U.S. Exclusive Economic Zone (EEZ), in water ~15 to ~6184 m deep and would take advantage of a network of ocean bottom seismometers (OBSs) and onshore seismometers currently installed in the area. During the survey, approximately 13 percent of the survey kilometers would take place in shallow water (<100 meter (m)), 27 percent would occur in intermediate water

depths (100–1000 m), and the rest (60 percent) would occur in deep water (≤ 1000 m).

The survey is expected to consist of up to 18 days of seismic operations and ~1 day of transit and survey approximate 4400 km of transect lines. The *Langseth* would leave from and return to port in Kodiak, likely during late spring (end of May/early June) 2019. Tentative sail dates are 1–19 June 2019.

The main goal of L–DEO's planned seismic program is to conduct a 2D survey along the Alaska Peninsula subduction zone using airguns. The addition of active sources (airguns) to the existing seismic monitoring equipment in place would directly contribute to the overall project goals of imaging the architecture for the subduction zone and understanding the structures controlling how and where the planet's largest earthquakes occur.

A detailed description of the planned geophysical survey is provided in the **Federal Register** notice for the proposed IHA (84 FR 14200; April 9, 2019). Since that time, no changes have been made to the planned geophysical survey activities. Therefore, a detailed description is not provided here. Please refer to that **Federal Register** notice for the description of the specific activity.

**Comments and Responses**

A notice of NMFS's proposal to issue an IHA to L–DEO was published in the **Federal Register** on April 9, 2019 (84 FR 14200). That notice described, in detail, L–DEO'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 comments from the Marine Mammal Commission (Commission) and the public.

*Comment:* The Commission recommended that NMFS refrain from issuing this authorization until L–DEO provides information on its efforts to contact Native Alaska communities and entities, and addresses any concerns that these groups raise.

*Response:* NMFS provides a full description of these outreach efforts in this document (in the ''Effects of Specified Activities on Subsistence Uses of Marine Mammals'' section), as they are described by L–DEO in its final EA.

*Comment:* The Commission recommended that NMFS adjust the density estimates used to estimate the numbers of potential takes by incorporating some measure of uncertainty. Since many of the references from which the density data originated include coefficients of variation (CVs), standard errors (SEs), or confidence intervals (CI), which provide information on uncertainty relative to the underlying data, the Commission recommended that NMFS adjust the density estimates using some measure of uncertainty (*i.e.,* CV, SD, SE, upper CI) for the Gulf of Alaska survey area. The Commission believes that the 25 percent contingency increase, routinely included by L–DEO does not account for uncertainty in density, because it has been included prior to the raising of these concerns. The Commission also recommended that NMFS convene a working group of scientists to determine how best to incorporate uncertainty in density data that are extrapolated.

*Response:* The Commission recommended that NMFS adjust density estimates using some measure of uncertainty. While we acknowledge the uncertainty in these (or any) density estimates, the take estimate methodology used here produces the most appropriate estimate of likely takes. Uniformly adjusting the density upward based on uncertainty in every situation will result in over-estimates of take (and an unrealistic associated analysis) and, in fact, marine mammal observations both during the activities conducted under the previous GOA IHA as well as other NSF surveys in no way suggest that the surveys are resulting in unauthorized numbers of take. Further, the 25 percent correction factor does help to conservatively account for uncertainties in the density data that were available for use in the take estimates. NMFS is open to consideration of specific correction factors for use for specific circumstances or species in future IHAs and looks forward to further discussion with the Commission on how best to incorporate uncertainty in density estimates in instances where density data is limited.

Regarding the Commission's recommendation that NMFS convene an internal working group to determine what data sources are considered best available for the various species and in the various areas, NMFS may consider future action to address these issues, but currently intends to address these questions through ongoing interactions with the U.S. Navy, academic institutions, and other research organizations.

*Comment:* The Commission recommended that NMFS increase its proposed Steller sea lion density based on the Department of the Navy's (2018) recently reported higher density estimates for Southeast Alaska and the Pacific Northwest.

*Response:* Through discussions with the Commission, NMFS has increased the expected density of Steller sea lions to 0.0392 individuals/km$^2$ for inshore environments. This value is the higher, uncorrected, value determined by the Department of the Navy for the Gulf of Alaska. Further detail regarding this density change is included later in this document. NMFS believes, that while this density value may be older than those recommended by the Commission, it is the most spatially appropriate estimate available, and conservative.

*Comment:* The Commission recommended that NMFS require L–DEO to re-estimate the proposed Level A and Level B harassment zones and associated takes of marine mammals using (1) both operational (including number/type/spacing of airguns, tow depth, source level/operating pressure, operational volume) and site-specific environmental (including sound speed profiles, bathymetry, and sediment characteristics 41 at a minimum) parameters, (2) a comprehensive source model (*i.e.,* Gundalf Optimizer or AASM) and (3) an appropriate sound propagation model for the proposed incidental harassment authorization. Specifically, the Commission reiterates that L–DEO should be using the ray-tracing sound propagation model BELLHOP—which is a free, standard propagation code that readily incorporates all environmental inputs listed herein, rather than the limited, in-house MATLAB code currently in use.

*Response:* NMFS acknowledges the Commission's concerns about L–DEO's current modeling approach for estimating Level A and Level B harassment zones and takes. L–DEO's application and the **Federal Register** notice of the proposed IHA (84 FR 14200; April 9, 2019) describe the applicant's approach to modeling Level A and Level B harassment zones. The model LDEO currently uses does not allow for the consideration of environmental and site-specific parameters as requested by the Commission.

L–DEO's application describes their approach to modeling Level A and Level B harassment zones. In summary, LDEO acquired field measurements for several array configurations at shallow, intermediate, and deep-water depths during acoustic verification studies conducted in the northern Gulf of Mexico in 2007 and 2008 (Tolstoy *et al.,* 2009). Based on the empirical data from those studies, LDEO developed a sound propagation modeling approach that predicts received sound levels as a function of distance from a particular airgun array configuration in deep water. For this survey, LDEO modeled

Level A and Level B harassment zones based on the empirically-derived measurements from the Gulf of Mexico calibration survey (Appendix H of NSF–USGS 2011). LDEO used the deep-water radii obtained from model results down to a maximum water depth of 2,000 m (Figure 2 and 3 in Appendix H of NSF–USGS 2011).

In 2015, LDEO explored the question of whether the Gulf of Mexico calibration data described above adequately informs the model to predict exclusion isopleths in other areas by conducting a retrospective sound power analysis of one of the lines acquired during L–DEO's seismic survey offshore New Jersey in 2014 (Crone, 2015). NMFS presented a comparison of the predicted radii (*i.e.,* modeled exclusion zones) with radii based on in situ measurements (*i.e.,* the upper bound [95th percentile] of the cross-line prediction) in a previous notice of issued Authorization for LDEO (see 80 FR 27635, May 14, 2015, Table 1). Briefly, the analysis presented in Crone (2015), specific to the survey site offshore New Jersey, confirmed that in-situ, site specific measurements and estimates of 160 decibel (dB) and 180 dB isopleths collected by the hydrophone streamer of the R/V *Marcus Langseth* in shallow water were smaller than the modeled (*i.e.,* predicted) zones for two seismic surveys conducted offshore New Jersey in shallow water in 2014 and 2015. In that particular case, Crone's (2015) results showed that LDEO's modeled 180 dB and 160 dB zones were approximately 28 percent and 33 percent larger, respectively, than the in-situ, site-specific measurements, thus confirming that LDEO's model was conservative in that case.

The following is a summary of two additional analyses of in-situ data that support LDEO's use of the modeled Level A and Level B harassment zones in this particular case. In 2010, LDEO assessed the accuracy of their modeling approach by comparing the sound levels of the field measurements acquired in the Gulf of Mexico study to their model predictions (Diebold *et al.,* 2010). They reported that the observed sound levels from the field measurements fell almost entirely below the predicted mitigation radii curve for deep water (*i.e.,* greater than 1,000 m; 3,280.8 ft) (Diebold *et al.,* 2010). In 2012, LDEO used a similar process to model distances to isopleths corresponding to Level A and Level B harassment thresholds for a shallow-water seismic survey in the northeast Pacific Ocean offshore Washington State. LDEO conducted the shallow-water survey using a 6,600 $in^3$ airgun configuration aboard the *R/V Marcus Langseth* and recorded the received sound levels on both the shelf and slope using the *Langseth's* 8 km hydrophone streamer. Crone *et al.* (2014) analyzed those received sound levels from the 2012 survey and confirmed that in-situ, site specific measurements and estimates of the 160 dB and 180 dB isopleths collected by the *Langseth's* hydrophone streamer in shallow water were two to three times smaller than LDEO's modeling approach had predicted. While the results confirmed the role of bathymetry in sound propagation, Crone *et al.* (2014) were also able to confirm that the empirical measurements from the Gulf of Mexico calibration survey (the same measurements used to inform LDEO's modeling approach for the planned surveys in the northwest Atlantic Ocean) overestimated the size of the exclusion and buffer zones for the shallow-water 2012 survey off Washington State and were thus precautionary, in that particular case.

NMFS continues to work with LDEO to address the issue of incorporating site-specific information for future authorizations for seismic surveys. However, LDEO's current modeling approach (supported by the three data points discussed previously) represents the best available information for NMFS to reach determinations for this IHA. As described earlier, the comparisons of LDEO's model results and the field data collected at multiple locations (*i.e.,* the Gulf of Mexico, offshore Washington State, and offshore New Jersey) illustrate a degree of conservativeness built into LDEO's model for deep water, which NMFS expects to offset some of the limitations of the model to capture the variability resulting from site-specific factors. Based upon the best available information (*i.e.,* the three data points, two of which are peer-reviewed, discussed in this response), NMFS finds that the Level A and Level B harassment zone calculations are appropriate for use in this particular IHA.

The use of models for calculating Level A and Level B harassment zones and for developing take estimates is not a requirement of the MMPA incidental take authorization process. Further, NMFS does not provide specific guidance on model parameters nor prescribe a specific model for applicants as part of the MMPA incidental take authorization process at this time, although we do review methods to ensure they adequately predict take. There is a level of variability not only with parameters in the models, but also the uncertainty associated with data used in models, and therefore, the quality of the model results submitted by applicants. NMFS considers this variability when evaluating applications and the take estimates and mitigation measures that the model informs. NMFS takes into consideration the model used, and its results, in determining the potential impacts to marine mammals; however, it is just one component of the analysis during the MMPA authorization process as NMFS also takes into consideration other factors associated with the activity (*e.g.,* geographic location, duration of activities, context, sound source intensity, etc.).

*Comment:* Given the shortcomings noted for L–DEO's source and sound propagation modeling and the requirements that other action proponents are obliged to fulfill, the Commission recommended that NMFS require L–DEO to archive, analyze, and compare the in-situ data collected by the hydrophone streamer and OBSs to L–DEO's modeling results for the extents of the Level A and B harassment zones based on the various water depths to be surveyed and provide the data and results to NMFS.

*Response:* Based on information presented by the applicant and supported by published analysis such as Diebold et al. 2010, Tolstoy et al. 2009, Crone et al. 2014, Crone et al. 2017, Barton et al. 2006, and Diebold et al. 2006, L–DEO modeling results and predicted distances to harassment zones are likely more conservative than actual distances measured from data collected in situ for depths from shallow to deep. The Commission stated one reason for recommending that NMFS require L–DEO to conduct sound source verification efforts was due to the shortcomings of the L–DEO model. However, as previously noted, the L–DEO model is conservative and is viewed appropriate for R/V *Langseth* operations. Use of the L–DEO model is further supported by ten years of successful operations with no observed harm to marine life. For these reasons, additional sound source verification efforts are not warranted at this time.

*Comment:* The Commission recommended that NMFS use a consistent approach for requiring all geophysical and seismic survey operators to abide by the same general mitigation measures, including prohibiting L–DEO from using power downs and the mitigation airgun during its geophysical surveys.

*Response:* NMFS is in the process of developing protocols that could be applied to geophyscical and seismic surveys. The protocols are being developed on the basis of detailed review of available literature, including

peer-review science, review articles, gray literature, and protocols required by other countries around the world. NMFS will share the protocols with the Commission when they are ready for external comment and review.

Note that powerdowns are only allowed/required in lieu of shutdown when certain species of dolphins, specifically identified in the Mitigation section, enter the shutdown zone. In all other cases, shutdown would be implemented under conditions as described in the IHA.

*Comment:* The Commission noted that monitoring and reporting requirements adopted need to be sufficient to provide a reasonably accurate assessment of the manner of taking and the numbers of animals taken incidental to the specified activity. Those assessments should account for all animals in the various survey areas, including those animals directly on the trackline that are not detected and how well animals are detected based on the distance from the observer which is achieved by incorporating g(0) and f(0) values. The Commission recommended that NMFS require L–DEO to use the Commission's method as described in the Commission's Addendum to better estimate the numbers of marine mammals taken by Level A and B harassment for the incidental harassment authorization. The Commission stated that all other NSF-affiliated entities and all seismic operators should use this method as well.

*Response:* NMFS agrees that reporting of the manner of taking and the numbers of animals incidentally taken should account for all animals taken, including those animals that are not detected and how well animals are detected based on the distance from the observer, to the extent practicable. NMFS appreciates the Commission's recommendations and further requires that L–DEO provide an estimate of take, including marine mammals that were not detected in their reporting for this survey, as it has in previous actions. NMFS welcomes L–DEO's input on a method to generate this quantitative method, but in the absence of a new procedure, recommends that use of the Commission's method for marine geophysical surveys, which was attached to the Commission's comment letter. We look forward to engaging further with L–DEO, the Commission and other applicants to refine methods to incorporate consideration of g(0) and f(0) values into post-survey take estimates.

*Comment:* The Commission recommend that NMFS refrain from using the proposed renewal process for L–DEO's authorization based on the complexity of analysis and potential for impacts on marine mammals. Additionally, the Commission recommends that if NMFS plans to use the renewal process frequently or for projects involving complex review, such as geophysical surveys, the comment period should be 30-days.

*Response:* We believe our proposed method for issuing renewals meets statutory requirements and maximizes efficiency. Importantly, such renewals would be limited to circumstances where: The activities are identical or nearly identical to those analyzed in the proposed IHA; monitoring does not indicate impacts were incurred that were not previously analyzed and authorized; and, the mitigation and monitoring requirements remain the same, all of which allow the public to comment on the appropriateness and effects of a renewal at the same time the public provides comments on the initial IHA. As stated, if new monitoring information were to be available at the time a renewal was being considered, and NMFS determined that this information may indicate impacts not previously analyzed, the action would not meet the circumstances set forth for a renewal. Regarding the potential application of the Renewal process to this action, the case-by-case determination of whether or not a Renewal is appropriate would be made at the time L–DEO submits a request. If L–DEO submits a Renewal request, the Commission's recommendations will be considered at that time.

*Comment:* One private citizen requested that we deny issuance of the IHA because marine mammals would be killed as a result of the survey.

*Response:* This activity is not expected to result in the death of any marine mammal species, and no such take is authorized. Extensive analysis of the planned 2D seismic survey was conducted in accordance with the MMPA, Endangered Species Act (ESA), and National Environmental Policy Act (NEPA). We analyzed the impacts to marine mammals (including those listed as threatened or endangered under the ESA), to their habitat (including critical habitat designated under the ESA), and to the availability of marine mammals for taking for subsistence uses. The MMPA analyses revealed that the activities would have a negligible impact on affected marine mammal species or stocks and would not have an unmitigable adverse impact on the availability of marine mammals for taking for subsistence uses. The ESA analysis concluded that the activities are not likely to jeopardize the continued existence of ESA-listed species or destroy or adversely modify designated critical habitat. The NEPA analysis, conducted by NSF and adopted by NMFS, concluded that there would not be a significant impact on the human environment.

**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 (SAR; *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 Gulf of Alaska 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 (2017). PBR is defined by the MMPA as the maximum number of animals, not including natural mortalities, that may be removed from a marine mammal stock while allowing that stock to reach or maintain its optimum sustainable population (as described in NMFS's SARs). While no mortality is anticipated or authorized here, PBR and annual serious injury and mortality from anthropogenic sources are included here as gross indicators of the status of the species and other threats.

Sixteen species of cetaceans and five species of pinnipeds could occur in the planned Gulf of Alaska survey area. Cetacean species include seven species of mysticetes (baleen whales) and nine species of odontocetes (dolphins and small and large toothed whales).

Ferguson *et al.* (2015) described Biological Important Areas (BIAs) for cetaceans in the Gulf of Alaska. BIAs were delineated for four baleen whale species and one toothed whale species including fin, gray, North Pacific right, and humpback whales, and belugas in U.S. waters of the Gulf of Alaska. BIAs are described in the following sections for each marine mammal species, except for beluga whale BIAs, as these do not co-occur within L–DEO's planned

survey area and the species is not expected to be present there. BIAs are delineated for feeding, migratory corridors, and small and resident populations. Supporting evidence for these BIAs came from aerial-, land-, and vessel-based surveys; satellite tagging data; passive acoustic monitoring; traditional ecological knowledge; photo- and genetic-identification data; whaling data, including catch and sighting locations and stomach contents; prey studies; and observations from fishermen.

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, stock abundance estimates are not available, and survey abundance estimates are used. This survey area may or may not align completely with a stock's geographic range as defined in the SARs. 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. Alaska and U.S. Pacific SARs (*e.g.,* Muto *et al.* 2018, Carretta *et al.* 2018). All values presented in Table 1 are the most recent available at the time of publication and are available in the 2017 SARs (Muto *et al.* 2018, Carretta *et al.* 2018) and draft 2018 SARs (available online at: *https://www.fisheries.noaa.gov/national/marine-mammal-protection/draft-marine-mammal-stock-assessment-reports*).

TABLE 1—MARINE MAMMALS THAT COULD OCCUR IN THE PROJECT AREA DURING THE SPECIFIED 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 Eschrichtiidae: | | | | | | |
| Gray whale | Eschrichtius robustus | Eastern North Pacific | -, -, N | 26,960 (0.05, 25,849, 2016) | 801 | 138 |
| | | Western North Pacific | E, D, Y | 175 (0.05, 167, 2016) | 0.07 | UNK |
| Family Balaenidae: | | | | | | |
| North Pacific right whale | Eubalaena japonica | Eastern North Pacific | E, D, Y | 31 (0.226, 26, 2015) | 0.05 b | 0 |
| Family Balaenopteridae (rorquals): | | | | | | |
| Blue whale | Balaenoptera musculus | Eastern North Pacific | E, D, Y | 1,647 (0.07, 1,551, 2011) | 2.3 | 0.2 |
| | | Central North Pacific | E, D, Y | 133 (1.09, 63, 2010) | 0.1 | 0 |
| Fin whale *[4] | Balaenoptera physalus | Northeast Pacific | E, D, Y | [4] 3,168 | 5.1 | 0.6 |
| Sei whale | Balaenoptera borealis | Eastern North Pacific | E, D, Y | 519 (0.4, 374, 2014) | 0.75 | 0 |
| Minke whale *[5] | Balaenoptera acutorostrata | Alaska | -, -, N | [5] 1,233 | UND | 0 |
| Humpback whale | *Megaptera novaeangliae* | Central North Pacific | -, -, Y | 10,103 (0.3, 7,890, 2006) | 83 | 25 |
| | | Western North Pacific | E, D, Y | 1,107 (0.3, 865, 2006) | 3 | 3.2 |
| **Superfamily Odontoceti (toothed whales, dolphins, and porpoises)** | | | | | | |
| Family Physeteridae: | | | | | | |
| Sperm whale * | Physeter macrocephalus | North Pacific | E, D, Y | N/A (see SAR, N/A, 2015) | see SAR | 4.4 |
| Family Ziphiidae (beaked whales): | | | | | | |
| Cuvier's beaked whale | *Ziphius cavirostris* | Alaska | -, -, N | N/A (see SAR, N/A, see SAR) | UND | 0 |
| Baird's beaked whale | *Berardius bairdii* | Alaska | -, -, N | N/A (see SAR, N/A, see SAR) | UND | 0 |
| Stejneger's beaked whale | *Mesoplodon stejnegeri* | Alaska | -, -, N | N/A (see SAR, N/A, see SAR) | UND | 0 |
| Family Delphinidae: | | | | | | |
| | | Eastern North Pacific Alaska Resident. | -, -, N | 2,347 c (N/A, 2347, 2012) | 24 | 1 |
| Killer whale | *Orcinus orca* | Gulf of Alaska, Aleutian Islands, and Bering Sea Transient. | -, -, N | 587 c (N/A, 587, 2012) | 5.87 | 1 |
| | | AT1 Transient | -, D, Y | 7 c (N/A, 7, 2017) | 0.01 | 0 |
| | | Offshore | -, -, N | 240 (0.49, 162, 2014) | 1.6 | 0 |
| Risso's dolphin | Grampus griseus | CA/WA/OR | -, -, N | 6,336 (0.32, 4,817, 2014) | 46 | ≥3.7 |
| Pacific white-sided dolphin. | Lagenorhynchus obliquidens | North Pacific | -, -, N | 26,880 (N/A, N/A, 1990) | UND | 0 |
| Family Phocoenidae (porpoises): | | | | | | |
| Harbor porpoise | Phocoena phocoena | GOA | -, -, Y | 31,046 (0.214, N/A, 1998) | UND | 72 |
| | | Southeast Alaska | -, -, Y | see SAR (see SAR, see SAR, 2012). | 8.9 | 34 |
| Dall's porpoise | *Phocoenoides dalli* | Alaska | -, -, N | 83,400 (0.097, N/A, 1991) | UND | 38 |
| **Order Carnivora—Superfamily Pinnipedia** | | | | | | |
| Family Otariidae (eared seals and sea lions): | | | | | | |
| Steller sea lion | *Eumetopias jubatus* | Eastern U.S. | T, D, Y | 41,638 a (see SAR, 41,638, 2015). | 2498 | 108 |
| | | Western U.S. | E, D, Y | 54,267 a (see SAR, 54,267, 2017). | 326 | 252 |
| California sea lion | Zalophus californianus | U.S. | -, -, N | 296,750 (N/A, 153,337, 2011) | 9200 | 389 |
| Northern fur seal | Callorhinus ursinus | Eastern Pacific | -, D, Y | 620,660 (0.2, 525,333, 2016) | 11295 | 457 |
| Family Phocidae (earless seals): | | | | | | |
| Northern elephant seal | Mirounga angustirostris | California Breeding | -, -, N | 179,000 (N/A, 81,368, 2010) | 4882 | 8.8 |

TABLE 1—MARINE MAMMALS THAT COULD OCCUR IN THE PROJECT AREA DURING THE SPECIFIED ACTIVITY—Continued

| 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] |
|---|---|---|---|---|---|---|
| Harbor seal | Phoca vitulina | South Kodiak | -, -, N | 19,199 (see SAR, 17,479, 2011). | 314 | 128 |
| | | Cook Inlet/Shelikof Strait | -, -, N | 27,386 (see SAR, 25,651, 2011). | 770 | 234 |
| | | Prince William Sound? | -, -, N | 29,889 (see SAR, 27,936, 2011). | 838 | 279 |

* Stocks marked with an asterisk are addressed in further detail in text below.

[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-assessments.* CV is coefficient of variation; $N_{min}$ is the minimum estimate of stock abundance. In some cases, CV is not applicable (N/A).

[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).

[4] Uncorrected estimate from Rone *et al.* (2017) based on a series of line-transect surveys off of Kodiak Island. The maximum estimate from the three surveys was selected. Based on the limited footprint of the surveys that lead to this estimate, the true abundance of the stock is expected to be much higher.

[5] Uncorrected estimate from Zerbini *et al.,* (2006) based on a partial line-transect survey of the Gulf of Alaska.

NOTE—Italicized species or stocks are not expected to be taken and no take is authorized.

All species that could potentially occur in the planned survey areas are included in Table 1. With the exception of AT1 transient killer whales, these species or stocks temporally and spatially co-occur with the activity to the degree that take is reasonably likely to occur. However, the spatial occurrence of the AT1 transient is such that take is not expected to occur, and they are not discussed further beyond the explanation provided here.

A detailed description of the of the species likely to be affected by the Gulf of Alaska geophysical survey, including brief introductions to the species and relevant stocks as well as available information regarding population trends and threats, and information regarding local occurrence, were provided in the **Federal Register** notice for the proposed IHA (84 FR 14200; April 9, 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 these 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 decibel (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, *Kogia,* river dolphins, cephalorhynchid, *Lagenorhynchus cruciger* & *L. australis*). | 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. Twenty-one marine mammal species (16 cetacean and 5 pinniped (3 otariid and 2 phocid) species) have the reasonable potential to co-occur with the planned survey activities. Please refer to Table 1. Of the 16 cetacean species that may be present, 7 are classified as low-frequency cetaceans (*i.e.,* all mysticete species), 7 are classified as mid-frequency cetaceans (*i.e.,* all delphinid and ziphiid species and the sperm whale), and 2 are classified as high-frequency cetaceans (*i.e.,* harbor porpoise and Kogia spp.).

**Potential Effects of Specified Activities on Marine Mammals and Their Habitat**

The effects of underwater noise from seismic airgun and other associated activities for the Gulf of Alaska geophysical survey have the potential to result in behavioral harassment and a small degree of PTS in marine mammals in the vicinity of the action area. The **Federal Register** notice for the proposed IHA (84 FR 14200; April 9, 2019) included a discussion of the effects of anthropogenic noise on marine mammals, therefore that information is not repeated here; please refer to the **Federal Register** notice (84 FR 14200; April 9, 2019) for that information.

The main impact associated with the Gulf of Alaska geophysical survey would be temporarily elevated sound levels and the associated direct effects on marine mammals. The project would not result in permanent impacts to habitats used directly by marine mammals, such as haulout sites, but may have potential short-term impacts to food sources such as forage fish or zooplankton during the Gulf of Alaska geophysical survey. These potential effects are discussed in detail in the **Federal Register** notice for the proposed IHA (84 FR 14200; April 9, 2019), therefore that information is not repeated here; please refer to that **Federal Register** notice 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.

Since the proposed IHA, NMFS was made aware of errors in the calculations used to estimate ensonified area and determined there was reason to use an increased Steller sea lion density estimate. These changes resulted in an increase in the estimated take by Level A harassment for some species, and an increase in take by both Level A and Level B harassment for Steller sea lions. Additionally, to account for group behavior of marine mammals, the authorized number of takes by Level A harassment for some species has been increased to that of an average group size if the calculated value was smaller. These changes are discussed in greater detail below in the appropriate sections.

Harassment is the only type of take expected to result from these activities and the only type of take that is authorized. Except with respect to certain activities not pertinent here, section 3(18) of the MMPA defines ''harassment'' as: Any act of pursuit, torment, or annoyance which (i) has the potential to injure a marine mammal or marine mammal stock in the wild (Level A harassment); or (ii) has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering (Level B harassment).

Authorized takes would primarily be by Level B harassment, as use of the acoustic source (*i.e.,* seismic airguns) has the potential to result in disruption of behavioral patterns for individual marine mammals. There is also some potential for auditory injury (Level A harassment) to result, primarily for high frequency species because predicted auditory injury zones are larger than for low-frequency species, mid-frequency species, phocids, and otariids. As a precaution, small numbers of takes by Level A harassment are authorized for many species listed in Table 1. Please see Table 9 below for additional further information on what species have authorized takes by Level A harassment. This auditory injury is expected to be, at most, low level PTS and the mitigation and monitoring measures are expected to further minimize the severity of such taking to the extent practicable.

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) 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). Below, we describe the factors considered here in more detail and present the take estimates.

*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—Though significantly driven by received level, the onset of behavioral disturbance from anthropogenic noise exposure is also informed to varying degrees by other factors related to the source (*e.g.,* frequency, predictability, duty cycle), the environment (*e.g.,* bathymetry), and the receiving animals (hearing, motivation, experience, demography, behavioral context) and can be difficult to predict (Southall *et al.,* 2007, Ellison *et al.,* 2012). Based on what the available science indicates and the practical need to use a threshold based on a factor that is both predictable and measurable for most activities, NMFS uses a generalized acoustic threshold based on received level to estimate the onset of behavioral harassment. NMFS predicts that marine mammals are likely to be behaviorally harassed in a manner we consider Level B harassment when exposed to underwater anthropogenic noise above received levels of 120 dB re 1 µPa (rms) for continuous (*e.g.,* vibratory pile-driving, drilling) and above 160 dB re 1 µPa (rms) for non-explosive impulsive (*e.g.,* seismic airguns) or intermittent (*e.g.,* scientific sonar) sources. L–DEO's specified activity includes the use of impulsive seismic sources. Therefore, the 160 dB re 1 µPa (rms) criteria is applicable for analysis of level B harassment.

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). L–DEO's planned seismic

survey includes the use of impulsive (seismic airguns) sources.

These thresholds are provided in the 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 IN MARINE MAMMALS

| Hearing group | PTS onset thresholds | |
|---|---|---|
| | Impulsive* | Non-impulsive |
| Low-Frequency (LF) Cetaceans | $L_{pk,flat}$: 219 dB; $L_{E,LF,24h}$: 183 dB | $L_{E,LF,24h}$: 199 dB |
| Mid-Frequency (MF) Cetaceans | $L_{pk,flat}$: 230 dB; $L_{E,MF,24h}$: 185 dB | $L_{E,MF,24h}$: 198 dB |
| High-Frequency (HF) Cetaceans | $L_{pk,flat}$: 202 dB; $L_{E,HF,24h}$: 155 dB | $L_{E,HF,24h}$: 173 dB |
| Phocid Pinnipeds (PW) (Underwater) | $L_{pk,flat}$: 218 dB; $L_{E,PW,24h}$: 185 dB | $L_{E,PW,24h}$: 201 dB |
| Otariid Pinnipeds (OW) (Underwater) | $L_{pk,flat}$: 232 dB; $L_{E,OW,24h}$: 203 dB | $L_{E,OW,24h}$: 219 dB |

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

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

*Ensonified Area*

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

The planned surveys would acquire data with the 36-airgun array with a total discharge of 6,600 $in^3$ at a maximum tow depth of 12 m. L–DEO model results are used to determine the 160-dBrms radius for the 36-airgun array and 40-$in^3$ airgun at a 12-m tow depth in deep water (≤1000 m) down to a maximum water depth of 2,000 m. Received sound levels were predicted by L–DEO's model (Diebold *et al.,* 2010) which uses ray tracing for the direct wave traveling from the array to the receiver and its associated source ghost (reflection at the air-water interface in the vicinity of the array), in a constant-velocity half-space (infinite homogeneous ocean layer, unbounded by a seafloor). In addition, propagation measurements of pulses from the 36-airgun array at a tow depth of 6 m have been reported in deep water (~1600 m), intermediate water depth on the slope (~600–1100 m), and shallow water (~50 m) in the Gulf of Mexico (GoM) in 2007–2008 (Tolstoy *et al.* 2009; Diebold *et al.* 2010).

For deep and intermediate-water cases, the field measurements cannot be used readily to derive Level A and Level B isopleths, as at those sites the calibration hydrophone was located at a roughly constant depth of 350–500 m, which may not intersect all the sound pressure level (SPL) isopleths at their widest point from the sea surface down to the maximum relevant water depth for marine mammals of ~2000 m. At short ranges, where the direct arrivals dominate and the effects of seafloor interactions are minimal, the data recorded at the deep and slope sites are suitable for comparison with modeled levels at the depth of the calibration hydrophone. At longer ranges, the comparison with the mitigation model—constructed from the maximum SPL through the entire water column at varying distances from the airgun array—is the most relevant.

In deep and intermediate-water depths, comparisons at short ranges between sound levels for direct arrivals recorded by the calibration hydrophone and model results for the same array tow depth are in good agreement (Fig. 12 and 14 in Appendix H of the NSF–USGS, 2011). Consequently, isopleths falling within this domain can be predicted reliably by the L–DEO model, although they may be imperfectly sampled by measurements recorded at a single depth. At greater distances, the calibration data show that seafloor-reflected and sub-seafloor-refracted arrivals dominate, whereas the direct arrivals become weak and/or incoherent. Aside from local topography effects, the region around the critical distance is where the observed levels rise closest to the mitigation model curve. However, the observed sound levels are found to fall almost entirely below the mitigation model. Thus, analysis of the GoM calibration measurements demonstrates that although simple, the L–DEO model is a robust tool for conservatively estimating isopleths.

In shallow water (<100 m), the depth of the calibration hydrophone (18 m) used during the GoM calibration survey was appropriate to sample the maximum sound level in the water column, and the field measurements reported in Table 1 of Tolstoy *et al.* (2009) for the 36-airgun array at a tow depth of 6 m can be used to derive isopleths.

For deep water (<1000 m), we use the deep-water radii obtained from L–DEO model results down to a maximum water depth of 2000 m. The radii for intermediate water depths (100–1000 m) are derived from the deep-water ones by applying a correction factor (multiplication) of 1.5, such that observed levels at very near offsets fall below the corrected mitigation curve (Fig. 16 in Appendix H of the NSF–USGS, 2011).

The shallow-water radii are obtained by scaling the empirically derived measurements from the GoM calibration survey to account for the differences in tow depth between the calibration survey (6 m) and the planned survey (12 m); whereas the shallow water in the GoM may not exactly replicate the shallow water environment at the specified survey site, it has been shown to serve as a good and very conservative proxy (Crone *et al.* 2014). A simple scaling factor is calculated from the ratios of the isopleths determined by the deep-water L–DEO model, which are essentially a measure of the energy radiated by the source array.

Measurements have not been reported for the single 40-$in^3$ airgun. L–DEO

model results are used to determine the 160 $dB_{rms}$ radius for the 40-in$^3$ airgun at a 12-m tow depth in deep water (Fig. A–3 in the IHA application). For intermediate-water depths, a correction factor of 1.5 was applied to the deep-water model results. For shallow water, a scaling of the field measurements obtained for the 36-airgun array was used.

L–DEO's modeling methodology is described in greater detail in the IHA application. The estimated distances to the Level B harassment isopleth for the *Langseth's* 36-airgun array and single 40-in$^3$ airgun are shown in Table 4.

TABLE 4—PREDICTED RADIUS FROM R/V LANGSETH SEISMIC SOURCE TO ISOPLETHS CORRESPONDING TO LEVEL B HARASSMENT THRESHOLD

| Source and volume | Tow depth (m) | Water depth (m) | Predicted distances (in m) to the 160-dB Received Sound Level |
|---|---|---|---|
| Single Bolt airgun, 40 in$^3$ | 12 | >1000 m | [1] 431 |
| | | 100–1000 m | [2] 647 |
| | | <100 m | [3] 1,041 |
| 4 strings, 36 airguns, 6600 in$^3$ | 12 | >1000 m | [1] 6,733 |
| | | 100–1000 m | [2] 10,100 |
| | | <100 m | [3] 25,494 |

[1] Distance is based on L–DEO model results.
[2] Distance is based on L–DEO model results with a 1.5 × correction factor between deep and intermediate water depths.
[3] Distance is based on empirically derived measurements in the GoM with scaling applied to account for differences in tow depth.

Predicted distances to Level A harassment isopleths, which vary based on marine mammal hearing groups, were calculated based on modeling performed by L–DEO using the NUCLEUS software program and the NMFS User Spreadsheet, described below. The updated acoustic thresholds for impulsive sounds (*e.g.,* airguns) contained in the Technical Guidance were presented as dual metric acoustic thresholds using both $SEL_{cum}$ and peak sound pressure metrics (NMFS 2016a). As dual metrics, NMFS considers onset of PTS (Level A harassment) to have occurred when either one of the two metrics is exceeded (*i.e.,* metric resulting in the largest isopleth). The $SEL_{cum}$ metric considers both level and duration of exposure, as well as auditory weighting functions by marine mammal hearing group. In recognition of the fact that the requirement to calculate Level A harassment ensonified areas could be more technically challenging to predict due to the duration component and the use of weighting functions in the new $SEL_{cum}$ thresholds, NMFS developed an optional User Spreadsheet that includes tools to help predict a simple isopleth that can be used in conjunction with marine mammal density or occurrence to facilitate the estimation of take numbers.

The values for $SEL_{cum}$ and peak SPL for the *Langseth* airgun array were derived from calculating the modified farfield signature (Table 5). The farfield signature is often used as a theoretical representation of the source level. To compute the farfield signature, the source level is estimated at a large distance below the array (*e.g.,* 9 km), and this level is back projected mathematically to a notional distance of 1 m from the array's geometrical center. However, when the source is an array of multiple airguns separated in space, the source level from the theoretical farfield signature is not necessarily the best measurement of the source level that is physically achieved at the source (Tolstoy *et al.* 2009). Near the source (at short ranges, distances <1 km), the pulses of sound pressure from each individual airgun in the source array do not stack constructively, as they do for the theoretical farfield signature. The pulses from the different airguns spread out in time such that the source levels observed or modeled are the result of the summation of pulses from a few airguns, not the full array (Tolstoy *et al.* 2009). At larger distances, away from the source array center, sound pressure of all the airguns in the array stack coherently, but not within one time sample, resulting in smaller source levels (a few dB) than the source level derived from the farfield signature. Because the farfield signature does not take into account the large array effect near the source and is calculated as a point source, the modified farfield signature is a more appropriate measure of the sound source level for distributed sound sources, such as airgun arrays. L–DEO used the acoustic modeling methodology as used for Level B harassment with a small grid step of 1 m in both the inline and depth directions. The propagation modeling takes into account all airgun interactions at short distances from the source, including interactions between subarrays which are modeled using the NUCLEUS software to estimate the notional signature and MATLAB software to calculate the pressure signal at each mesh point of a grid. For a more complete explanation of this modeling approach, please see ''Appendix A: Determination of Mitigation Zones'' in the IHA application.

In order to more realistically incorporate the Technical Guidance's weighting functions over the seismic array's full acoustic band, unweighted spectrum data for the *Langseth's* airgun array (modeled in 1 Hz bands) was used to make adjustments (dB) to the unweighted spectrum levels, by frequency, according to the weighting functions for each relevant marine mammal hearing group. These adjusted/weighted spectrum levels were then converted to pressures (μPa) in order to integrate them over the entire broadband spectrum, resulting in broadband weighted source levels by hearing group that could be directly incorporated within the User Spreadsheet (*i.e.,* to override the Spreadsheet's more simple weighting factor adjustment). These hearing group specific weighted source levels are presented in Table 5 below.

TABLE 5—MODELED SOURCE LEVELS BASED ON MODIFIED FARFIELD SIGNATURE FOR THE R/V LANGSETH 6,600 IN$^3$ AIRGUN ARRAY, AND SINGLE 40 IN$^3$ AIRGUN

| | Low frequency cetaceans ($L_{pk,flat}$: 219 dB; $L_{E,LF,24h}$: 183 dB) | Mid frequency cetaceans ($L_{pk,flat}$: 230 dB; $L_{E,MF,24h}$: 185 dB | High frequency cetaceans ($L_{pk,flat}$: 202 dB; $L_{E,HF,24h}$: 155 dB) | Phocid Pinnipeds (Underwater) ($L_{pk,flat}$: 218 dB; $L_{E,HF,24h}$: 185 dB) | Otariid Pinnipeds (Underwater) ($L_{pk,flat}$: 232 dB; $L_{E,HF,24h}$: 203 dB) |
|---|---|---|---|---|---|
| 6,600 in$^3$ airgun array (Peak $SPL_{flat}$) .... | 252.06 | 252.65 | 253.24 | 252.25 | 252.52 |
| 6,600 in$^3$ airgun array ($SEL_{cum}$) ..... | 232.98 | 232.84 | 233.10 | 232.84 | 232.08 |
| 40 in$^3$ airgun (Peak $SPL_{flat}$) ..... | 223.93 | N.A. | 223.92 | 223.95 | N.A. |
| 40 in$^3$ airgun ($SEL_{cum}$) ..... | 202.99 | 202.89 | 204.37 | 202.89 | 202.35 |

Using the User Spreadsheet's ''safe distance'' methodology for mobile sources (described by Sivle *et al.,* 2014) with the hearing group-specific weighted source levels, and inputs assuming spherical spreading propagation and source velocities and shot intervals provided in the IHA application, potential radial distances to auditory injury zones were then calculated for $SEL_{cum}$ thresholds (Table 6).

Inputs to the User Spreadsheets in the form of estimated SLs are shown in Table 5. User Spreadsheets used by L–DEO to estimate distances to Level A harassment isopleths for the 36-airgun array and single 40 in$^3$ airgun for the surveys are shown is Tables A–2, A–3, A–5, and A–8 in Appendix A of the IHA application. Outputs from the User Spreadsheets in the form of estimated distances to Level A harassment isopleths for the surveys are shown in Table 6. As described above, NMFS considers onset of PTS (Level A harassment) to have occurred when either one of the dual metrics ($SEL_{cum}$ and Peak $SPL_{flat}$) is exceeded (*i.e.,* metric resulting in the largest isopleth).

TABLE 6—MODELED RADIUS (m) TO ISOPLETHS CORRESPONDING TO LEVEL A HARASSMENT THRESHOLDS

| | Low frequency cetaceans ($L_{pk,flat}$: 219 dB; $L_{E,LF,24h}$: 183 dB) | Mid frequency cetaceans ($L_{pk,flat}$: 230 dB; $L_{E,MF,24h}$: 185 dB | High frequency cetaceans ($L_{pk,flat}$: 202 dB; $L_{E,HF,24h}$: 155 dB) | Phocid Pinnipeds (Underwater) ($L_{pk,flat}$: 218 dB; $L_{E,HF,24h}$: 185 dB) | Otariid Pinnipeds (Underwater) ($L_{pk,flat}$: 232 dB; $L_{E,HF,24h}$: 203 dB) |
|---|---|---|---|---|---|
| 6,600 in$^3$ airgun array (Peak $SPL_{flat}$) .... | 38.9 | 13.6 | 268.3 | 43.7 | 10.6 |
| 6,600 in$^3$ airgun array ($SEL_{cum}$) ..... | 40.1 | N.A. | 0.1 | 1.3 | N.A. |
| 40 in$^3$ airgun (Peak $SPL_{flat}$) ..... | 1.76 | N.A. | 12.5 | 1.98 | N.A. |
| 40 in$^3$ airgun ($SEL_{cum}$) ..... | 2.38 | N.A. | N.A. | N.A. | N.A. |

Note that because of some of the assumptions included in the methods used, isopleths produced may be overestimates to some degree, which will ultimately result in some degree of overestimate of Level A harassment. However, these tools offer the best way to predict appropriate isopleths when more sophisticated 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 the planned seismic survey, the User Spreadsheet predicts the closest distance at which a stationary animal would not incur PTS if the sound source traveled by the animal in a straight line at a constant speed.

*Marine Mammal Occurrence*

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

Since the proposed IHA, NMFS identified a more appropriate inshore density estimate for Steller sea lions, as reported in Table 7, changing it from 0.0098 individuals/km$^2$ to 0.0392 individuals/km$^2$. This change was made after discussion with the Commission and determining that the density value used by the Navy, which was corrected to account for the proportion of Steller sea lions expected to be at sea, may not be the best proxy for L–DEO's survey area. Because the Navy's action area was located in a more offshore portion of the Gulf of Alaska and only a portion (25 percent) of Steller sea lions were expected to be feeding at-sea, the Navy applied a 0.25 correction factor to the calculated density of Steller sea lions for the Gulf of Alaska Large Marine Ecosystem. L–DEO's survey does include areas closer to shore, so the use of this corrected density estimate may have resulted in underestimating Steller sea lion take. In this final IHA, we account for the difference in action areas by removing the Navy's correction factor and the updating the inshore density used to generate final take estimates to 0.0392 individuals/km$^2$ (0.0098 * 4). The density for deeper strata remains at 0.0098 individuals/km$^2$ for L–DEO's planned survey. The resulting increases in take by Level A and Level B harassment are displayed in Table 9.

Additionally, the estimates of take by Level A harassment in the proposed IHA did not accurately account for the 18 day duration of the survey. To correct this, Table 8 explaining the derivation of ensonified areas has been adjusted and the resulting take by Level A harassment for all species has been increased as needed (Table 9). As in the proposed IHA, the estimated number of takes by Level B harassment has been reduced by the numbers of take by Level A harassment to avoid double counting of an individual animal exposed to both levels of harassment.

Additionally, all proposed takes by Level A harassment for mid-frequency cetaceans were removed, and there is no take by Level A harassment authorized for species in this hearing group. This removal was based on consideration of the small calculated Level A harassment zone and the properties of sound fields produced by arrays in the near field versus far field which logically lead to the conclusion that Level A harassment is so unlikely for this hearing group as to be discountable. Estimated takes by Level A harassment which were presented in the proposed IHA have been added as takes by Level B harassment to ensure all marine mammals estimated to be in the ensonified area are accounted for.

Finally, for some species, including blue whale, sei whale, and minke whale, the number of proposed takes by Level A harassment was increased to the average group size to conservatively account for how these species may be encountered during the survey. These changes are explained in Table 9.

In the planned survey area in the Gulf of Alaska, L–DEO determined the best marine mammal density data to be habitat-based stratified marine mammal densities developed by the U.S. Navy for assessing potential impacts of training activities in the GOA (DoN 2014). Alternative density estimates available for species in this region are not stratified by water depth and therefore do not reflect the known variability in species distribution relative to habitat features. Consistent with Rone *et al.* (2014), four strata were defined: Inshore: All waters <1000 m deep; Slope: From 1000 m water depth to the Aleutian trench/subduction zone; Offshore: Waters offshore of the Aleutian trench/subduction zone; Seamount: Waters within defined seamount areas. Densities corresponding to these strata were based on data from several different sources, including Navy funded line-transect surveys in the GOA as described below and in Appendix B.

To develop densities specific to the GOA, the Navy conducted two comprehensive marine mammal surveys in the Temporary Marine Activities Area (TMAA) in the GOA prior to 2014. The first survey was conducted from 10 to 20 April 2009 and the second was from 23 June to 18 July 2013. Both surveys used systematic line-transect survey protocols including visual and acoustic detection methods (Rone *et al.* 2010; Rone *et al.* 2014). The data were collected in four strata that were designed to encompass the four distinct habitats within the TMAA and greater GOA. Rone *et al.* (2014) provided stratified line-transect density estimates used in this analysis for fin, humpback, blue, sperm, and killer whales, as well as northern fur seals (Table 7). Data from a subsequent survey in 2015 were used to calculate alternative density estimates for several species (Rone *et al.* 2017) and the density estimates for Dall's porpoise used here were taken from that source.

DoN (2014) derived gray whale densities in two zones, nearshore (0–2.25 n.mi from shore) and offshore (from 2.25–20 nmi from shore). In our calculations, the nearshore density was used to represent the inshore zone and the offshore density was used to represent the slope zone.

Harbor porpoise densities in DoN (2014) were derived from Hobbs and Waite (2010) which included additional shallow water depth strata. The density estimate from the 100 m to 200 m depth strata was conservatively used to represent the entire inshore zone (<1000 m) in this analysis.

Harbor seals typically remain close to shore so minimal estimates were used for the three deep water zones. To account for increased inshore density, a one thousand fold increase of the minimal density was assumed to represent the entire inshore zone (DoN 2014).

Densities for Minke whale, Pacific white-sided dolphin, and Cuvier's and Baird's beaked whales were based on Waite (2003 *in* DoN 2009). Although sei whale sightings and Stejneger's beaked whale acoustic detections were recorded during the Navy funded GOA surveys, data were insufficient to calculate densities for these species, so predictions from a global model of marine mammals densities were used (DoN 2014).

Steller sea lion and northern elephant seal densities were calculated using shore-based population estimates divided by the area of the GOA Large Marine Ecosystem (DoN 2014). As mentioned above, in the proposed IHA, the values for Steller sea lion were corrected to account for the proportion of the population that would be encountered at sea. For the final IHA, Steller sea lion inshore density was increased to 0.0392 individuals/km$^2$, by eliminating the Navy's correction factor, to account for L–DEO's more inshore activity when compared to the Navy's.

The North Pacific right whale, Risso's dolphin, and California sea lion are only rarely observed in or near the survey area, so minimal densities were used to represent their potential presence. However, in the North Pacific right whale critical habitat off of Kodiak Island, it is reasonable to expect a higher density. In this critical habitat area, the Alaska Fisheries Science Center (LOA application available here: *https://www.fisheries.noaa.gov/national/marine-mammal-protection/incidental-take-authorizations-research-and-other-activities*) used a conservative density estimate based on acoustic detections (Rone *et al.* 2014) and photo identifications throughout the entirety of the Gulf of Alaska. For the portion of L–DEO's activities that occur in North Pacific right whale critical habitat, NMFS will use this more conservative density estimate (Table 7).

All densities were corrected for perception bias [$f(0)$] but only harbor porpoise densities were corrected for availability bias [$g(0)$], as described by the respective authors. There is some uncertainty related to the estimated density data and the assumptions used in their calculations, as with all density data estimates. However, the approach used here is based on the best available data and are stratified by the water depth (habitat) zones present within the survey area. These depth stratified densities allow L–DEO to better capture known variability in species distribution in the Gulf of Alaska, and accurately assess impacts. Alternative density estimates were available for species in this region, such as those used by the Alaska Fisheries Science Center (AFSC) (AFSC LOA application available here: *https://www.fisheries.noaa.gov/national/marine-mammal-protection/incidental-take-authorizations-research-and-other-activities*). AFSC density values were not stratified by water depth and represented marine mammal density throughout the entire Gulf of Alaska. While some density estimates provided in the AFSC application are more conservative, the relative proximity of surveys that generated DoN estimates and L–DEO's consideration and inclusion of publically available newer values from Rone *et al.* (2017) mean the calculated exposures that are based on these densities are best estimates for L–DEO's planned survey.

TABLE 7—MARINE MAMMAL DENSITY VALUES IN THE PLANNED SURVEY AREA AND SOURCE

| Species [1] | Estimated density (#/km$^2$) | | | | Source |
|---|---|---|---|---|---|
| | Inshore (<1000 m) | Slope (1000 m to Aleutian Trench) | Offshore (offshore of Aleutian Trench) | Seamount (in defined seamount areas) | |
| LF Cetaceans: | | | | | |
| North Pacific Right Whale .... | [2] 0.00001 | [2] 0.00001 | [2] 0.00001 | [2] 0.00001 | DoN (2014). |

TABLE 7—MARINE MAMMAL DENSITY VALUES IN THE PLANNED SURVEY AREA AND SOURCE—Continued

| Species [1] | Estimated density (#/km²) | | | | Source |
|---|---|---|---|---|---|
| | Inshore (<1000 m) | Slope (1000 m to Aleutian Trench) | Offshore (offshore of Aleutian Trench) | Seamount (in defined seamount areas) | |
| Humpback Whale | 0.129 | 0.0002 | 0.001 | 0.001 | Rone *et al.* (2014) (Table 16). |
| Blue whale | 0.0005 | 0.0005 | 0.0005 | 0.002 | Rone *et al.* (2014) (Table 16). |
| Fin Whale | 0.071 | 0.014 | 0.021 | 0.005 | Rone *et al.* (2014) (Table 16). |
| Sei Whale | 0.0001 | 0.0001 | 0.0001 | 0.0001 | DoN (2014), adapted from Figure 5–24. |
| Minke Whale | 0.0006 | 0.0006 | 0.0006 | 0.0006 | DoN (2014). |
| Gray Whale | [3] 0.04857 | [3] 0.00243 | [3] 0 | [3] 0 | DoN (2014). |
| MF Cetaceans: | | | | | |
| Sperm Whale | 0 | 0.0033 | 0.0013 | 0.00036 | DoN (2014). |
| Killer Whale | 0.005 | 0.02 | 0.002 | 0.002 | Rone *et al.* (2014) (Table 14). |
| Pacific White-Sided Dolphin | 0.0208 | 0.0208 | 0.0208 | 0.0208 | DoN (2014). |
| Cuvier's Beaked Whale | 0.0022 | 0.0022 | 0.0022 | 0.0022 | Waite (2003) in DoN (2014). |
| Baird's Beaked Whale | 0.0005 | 0.0005 | 0.0005 | 0.0005 | DoN (2014). |
| Stejneger's Beaked Whale | [4] 0.00001 | 0.00142 | 0.00142 | 0.00142 | DoN (2014), adapted from Figure 9–12. |
| Risso's Dolphin | 0.00001 | 0.00001 | 0.00001 | 0.00001 | DoN (2014). |
| HF Cetaceans: | | | | | |
| Harbor Porpoise | 0.0473 | 0 | 0 | 0 | Hobbes and Waite (2010) in DoN (2014). |
| Dall's Porpoise | 0.218 | 0.196 | 0.037 | 0.024 | Rone *et al.* (2017). |
| Otarrid Seals: | | | | | |
| Steller Sea Lion | 0.0392 | 0.0098 | 0.0098 | 0.0098 | DoN (2014). |
| California Sea Lion | 0.00001 | 0.00001 | 0.00001 | 0.00001 | DoN (2014). |
| Northern Fur Seal | 0.015 | 0.004 | 0.017 | 0.006 | Rone *et al.* (2014) (Table 14). |
| Phocid Seals: | | | | | |
| Northern Elephant Seal | 0.0022 | 0.0022 | 0.0022 | 0.022 | DoN (2014). |
| Harbor Seal | 0.01 | 0.00001 | 0.00001 | 0.00001 | DoN (2014). |

[1] No stock specific densities are available so densities are assumed equal for all stocks present.
[2] For North Pacific right whales, estimated density within the Kodiak Island critical habitat is 0.0053 animals/km², based on detections from the GOALSII survey (Rone *et al.* 2014), the assumed use of the critical habitat by all right whales in the Gulf of Alaska (Wade *et al.* 2011a), and a conservative correction factor.
[3] Gray whale density was defined in two zones, nearshore (0–2.25 n.mi from shore) and offshore (from 2.25–20 nmi from shore). In our calculations, the nearshore density was used to represent the inshore zone and the offshore density was used to represent the slope zone. In areas further offshore than the slope, density was assumed to be 0.
[4] Stejneger's whale are generally found in slope waters, therefore, assuming minimal inshore density.

*Take Calculation and Estimation*

Here we describe how the information provided above is brought together to produce a quantitative take estimate. In order to estimate the number of marine mammals predicted to be exposed to sound levels that would result in Level A harassment or Level B harassment, the radius from the airgun array to predicted isopleths corresponding to the Level A harassment and Level B harassment thresholds are calculated, as described above. Those radial distances are then used to calculate the area(s) around the airgun array predicted to be ensonified to sound levels that exceed the Level A harassment and Level B harassment thresholds. The area estimated to be ensonified in a single day of the survey is then calculated (Table 8), based on the areas predicted to be ensonified around the array and the estimated trackline distance traveled per day. This number is then multiplied by the number of survey days. Active seismic operations are planned for 18 days during this Gulf of Alaska survey.

TABLE 8—AREAS (km²) ESTIMATED TO BE ENSONIFIED TO LEVEL A AND LEVEL B HARASSMENT THRESHOLDS, PER DAY FOR GULF OF ALASKA SURVEY

| | Criteria | Daily ensonified area (km²) | 25 Percent increase | Increased daily ensonified area (km²) | Total survey days | Total ensonified area (km²) | Relevant isopleth (m) |
|---|---|---|---|---|---|---|---|
| Level B: | | | | | | | |
| Inshore [1] | 160 dB | 1963.1 | 1.25 | 2453.9 | 18 | 44,170.2 | 10,100, [1] 25,493 |
| Slope | 160 dB | 684.1 | 1.25 | 855.2 | 18 | 15,393.6 | 6,733 |
| Offshore | 160 dB | 1159.5 | 1.25 | 1449.3 | 18 | 26,087.4 | 6,733 |
| Seamount | 160 dB | 119.8 | 1.25 | 149.7 | 18 | 2,694.6 | 6,733 |
| Level A: | | | | | | | |
| LF Cetacean | ..... | 19.6 | 1.25 | 24.5 | 18 | 441.0 | 40.1 |
| MF Cetacean | ..... | 6.6 | 1.25 | 8.3 | 18 | 149.4 | 13.6 |
| HF Cetacean | ..... | 131.1 | 1.25 | 163.5 | 18 | 2950.2 | 268.3 |
| Otarid | ..... | 5.2 | 1.25 | 6.5 | 18 | 117.0 | 10.6 |
| Phocid | ..... | 21.4 | 1.25 | 26.7 | 18 | 480.6 | 43.7 |

[1] Includes area ensonified above 160 dB in waters <100 m deep using an isopleth distance of 25,493 m. See application for further explanation.

The product is then multiplied by 1.25 to account for the additional 25 percent contingency. This results in an estimate of the total areas ($km^2$) expected to be ensonified to the Level A harassment and Level B harassment thresholds. The marine mammals predicted to occur within these respective areas, based on estimated densities, are assumed to be incidentally taken. Estimated exposures for the Gulf of Alaska seismic survey are shown in Table 9.

TABLE 9—ESTIMATED LEVEL A AND LEVEL B EXPOSURES, AND PERCENTAGE OF STOCK OR POPULATION EXPOSED DURING GULF OF ALASKA SURVEY

| | Stock | Level B [1] | Level A [1] | Stock size | Percentage of stock |
|---|---|---|---|---|---|
| LF Cetaceans: | | | | | |
| North Pacific Right Whale | Eastern North Pacific | [2] 11 | 0 | 31 | [3] <33 |
| Humpback Whale | Central North Pacific (Hawaii DPS) [3] | [4] 5,079 | 21 | 11,398 | [3] <33 |
| | Central North Pacific (Mexico DPS) [3] | [4] 599 | 3 | 3,264 | 18.44 |
| | Western North Pacific [3] | [4] 28 | 1 | 1,107 | 2.62 |
| Blue whale | Eastern North Pacific | 47 | [5 6] 2 | 1,647 | 2.98 |
| | Central North Pacific. | | | 133 | [3] <33 |
| Fin Whale | Northeast Pacific | 3,897 | 16 | [7] 3,168 | [3] <33 |
| Sei Whale | Eastern North Pacific | 7 | [6] 2 | 519 | 1.73 |
| Minke Whale | Alaska | 52 | [6] 2 | [8] 1,233 | 4.38 |
| Gray Whale | Eastern North Pacific | 2,174 | [5] 9 | 26,960 | 8.10 |
| | Western North Pacific. | | | 175 | [3] <33 |
| MF Cetaceans: | | | | | |
| Sperm Whale | North Pacific | 86 | [9] 0 | [10] 345 | 24.93 |
| Killer Whale | Alaska Resident | 587 | [9] 0 | 2,347 | 25.01 |
| | Gulf of Alaska, Aleutian Islands, and Bering Sea Transient. | | | 587 | [3] <33 |
| | Offshore. | | | 240 | [3] <33 |
| Pacific White-Sided Dolphin | North Pacific | 1,838 | [9] 0 | 26,880 | 6.84 |
| Cuvier's Beaked Whale | Alaska | 195 | [9] 0 | [11] NA | NA |
| Baird's Beaked Whale | Alaska | 45 | [9] 0 | [11] NA | NA |
| Stejneger's Beaked Whale | Alaska | 64 | [9] 0 | [11] NA | NA |
| Risso's Dolphin | CA/OR/WA | [12] 16 | [9] 0 | 6,336 | 0.25 |
| HF Cetaceans: | | | | | |
| Harbor Porpoise | Gulf of Alaska | [13] 1,830 | [13] 51 | 31,046 | [13] 6.06 |
| | Southeast Alaska | [13] 203 | [13] 6 | 975 | [13] 21.74 |
| Dall's Porpoise | Alaska | 13,196 | 481 | 83,400 | 16.44 |
| Otariid Seals: | | | | | |
| Steller Sea Lion | Eastern U.S | 2,165 | [5] 3 | 41,638 | 5.21 |
| | Western U.S. | | | 54,267 | 4.00 |
| California Sea Lion | U.S | [14] 1 | 1 | 296,750 | 0.00067 |
| Northern Fur Seal | Eastern Pacific | 1,182 | 2 | 620,660 | 0.19 |
| Phocid Seals: | | | | | |
| Northern Elephant Seal | California Breeding | 193 | 2 | 179,000 | 0.11 |
| Harbor Seal | South Kodiak | 441 | [5] 2 | 19,199 | 2.31 |
| | Cook Inlet/Shelikof Strait. | | | 27,386 | 1.62 |
| | Prince William Sound. | | | 29,889 | 1.48 |

[1] Unless otherwise noted, all calculated takes by Level B harassment have been reduced by the number of authorized takes by Level A harassment. This prevents double counting of takes across the two levels of harassment.

[2] NMFS feels that take by Level A harassment of North Pacific right whale can be effectively avoided based on mitigation and monitoring measures, and therefore has not authorized take by Level A harassment for the species.

[3] The percentage of these stocks expected to experience take is discussed further in the *Small Numbers* section later in the document.

[4] Takes are allocated amongst the three DPSs in the area based on Wade *et al.* 2016 (0.5% WNP, 89.0% Hawaii DPS, 10.5% Mexico DPS). Because of rounding, the total take is higher than calculated. Population sizes for the Hawaii and Mexican DPSs are provided in 81 FR 62259 (effective October 11, 2016).

[5] Where multiple stocks are being affected and there is no clear method to allocate takes between stocks, for the purposes of calculating the percentage of the stock impacted, takes by Level A harassment are being analyzed as if it occurred within each stock.

[6] Authorized take by Level A harassment was raised to the approximate group size for these species. Group estimates were based on Rone *et al.* (2017) (Blue whale), NOAA Fisheries Species page (*https://www.fisheries.noaa.gov/species/sei-whale*) (Sei whale), and Zerbini *et al.* (2006) (Minke whale).

[7] Fin whale abundance estimate is the highest of Rone *et al.* (2017) estimates. Based on the limited footprint of the surveys that lead to this estimate, the true abundance of the stock is expected to be much higher.

[8] Minke whale abundance estimates is from Zerbini *et al.* (2006).

[9] In the proposed **Federal Register** notice, NMFS proposed to authorize 1 take by Level A harassment for each species in the MF Cetacean hearing group. Based on the small Level A harassment zone, NMFS believes these takes by Level A harassment are not necessary for this action.

[10] Sperm whale abundance estimates is the maximum value from Rone *et al.* (2017).

[11] For beaked whales, there is no accepted estimates of abundance for the Alaska stocks.

[12] The requested number of takes by Level B harassment for Risso's dolphin has been increased to 16, the average group size.

[13] Based on the range of the Southeast Alaska stock of harbor porpoises, they are expected to be very rare in the area (See ''Description of Marine Mammals in the Area of Specified Activities''). We therefore conservatively assume that at most, 10 percent of takes will occur from the Southeast Alaska population. The numbers for both Gulf of Alaska and Southeast Alaska stocks reflect this assumption. Because of rounding, the total take between the two stocks is higher than the original calculation.

[14] Only 1 take by Level B harassment was requested for California sea lion, but a take by Level A harassment was also requested. Therefore, the amount of take by Level B harassment has not be reduced by the number of takes by Level A harassment.

It should be noted that the take numbers shown in Table 9 are expected to be conservative for several reasons. First, in the calculations of estimated take, 25 percent has been added in the form of operational survey days to account for the possibility of additional seismic operations associated with airgun testing and repeat coverage of any areas where initial data quality is sub-standard, and in recognition of the uncertainties in the density estimates

used to estimate take as described above. Additionally, marine mammals would be expected to move away from a loud sound source that represents an aversive stimulus, such as an airgun array, potentially reducing the number of takes by Level A harassment. However, the extent to which marine mammals would move away from the sound source is difficult to quantify and is, therefore, not accounted for in the take estimates.

For North Pacific right whale, there is evidence of a much higher density in the critical habitat south of Kodiak Island (Table 7). This density value of 0.0053 animals/km² is based on detections from the GOALSII survey (4 individuals) (Rone *et al.,* 2014), the assumed use of the critical habitat by all right whales in the Gulf of Alaska (Wade et al., 2011a), and a conservative correction factor (4), all divided by the area of the critical habitat (3,042.2 km²). To account for this habitat, NMFS used the Alaska Protected Resources Division Species Distribution Mapper (*https://www.fisheries.noaa.gov/resource/data/alaska-endangered-species-and-critical-habitat-mapper-web-application*) to determine a conservative approximation of L–DEO's survey path through the critical habitat based on the representative tracks in Figure 1 of the IHA Application. This measured distance was 35 km. Because the majority of this habitat is inside of the 100 m isopleth, the predicted distance to the 160-dB received sound level would be ~25.5 km. This resulted in a portion of the critical habitat 35 km long by 51 km wide (25.5 km on each side of the survey track), or 1,785 km² being ensonified. Applying the higher density of 0.0053 animals/km² to this area, results in an estimate of 9.46 North Pacific right whales exposed to Level B harassment in the critical habitat. No further correction, such as the 25 percent operation day increase, is needed for the estimate in the critical habitat, because the density of 0.0053 animals/km² has already been corrected to be highly conservative (AFSC Application, Table 6–10d). To account for the rest of the survey occurring outside of the critical habitat, the minimal density presented in DoN (2014), 0.00001 individuals/km², was used for the remainder of the survey. The expected take in the rest of the survey is 1.10 individuals. Summing these two estimates for take, in both the critical habitat and remainder of survey, results in an expected take of 10.56 individuals (rounded to 11 individuals). No takes by Level A harassment are authorized for North Pacific right whale given the low density of the species and NMFS evaluation of the effectiveness of mitigation and monitoring measures.

**Effects of Specified Activities on Subsistence Uses of Marine Mammals**

The availability of the affected marine mammal stocks or species for subsistence uses may be impacted by this activity. The subsistence uses that may be affected and the potential impacts of the activity on those uses are described below. Measures included in this IHA to reduce the impacts of the activity on subsistence uses are described in the *Mitigation* section. Last, the information from this section and the *Mitigation* section is analyzed to determine whether the necessary findings may be made in the *Unmitigable Adverse Impact Analysis and Determination* section.

In the GOA, the marine mammals that are hunted are Steller sea lions and harbor seals. In 2011–2012, 37 harbor seals were taken from the North Kodiak Stock and 126 harbor seals were taken from the South Kodiak Stock by communities on Kodiak Island (Muto *et al.* 2016). The number taken from the Cook Inlet/Shelikof Strait Stock for 2011–2012 is unknown, but an average of 233 were taken from this stock annually during 2004–2008 (Muto *et al.* 2016). The seasonal distribution of harbor seal takes by Alaska Natives typically shows two distinct hunting peaks—one during spring and one during fall and early winter; however, seals are taken in all months (Wolfe *et al.* 2012). In general, the months of highest harvest are September through December, with a smaller peak in February/March (Wolfe *et al.* 2012). Harvests are traditionally low from May through August, when harbor seals are raising pups and molting.

In 2008, 19 Steller sea lions were taken in the Kodiak Island region and 9 were taken along the South Alaska Peninsula (Wolfe *et al.* 2009). As of 2009, data on community subsistence harvests are no longer being collected consistently so few data are available. Wolfe *et al.* (2012) reported an estimated 20 sea lions taken by hunters on Kodiak Island in 2011. The most recent 5-year period with data available (2004–2008) shows an annual average catch of 172 steller sea lions for all areas in Alaska combined except the Pribilof Islands in the Bering Sea (Muto *et al.* 2018). Sea lions are taken from Kodiak Island in low numbers year round (Wolfe *et al.* 2012).

During the process of planning their survey, L–DEO and its representatives contacted organizations associated with subsistence harvest of marine mammals the Gulf of Alaska and requested their comment on the Draft EA, which included information on marine mammal impacts. The groups contacted included the Alaska Native Harbor Seal Commission, the Alaska Sea Otter and Steller Sea Lion Commission, and the Aleut Marine Mammal Commission. L–DEO and its representatives received no comment from these groups.

The planned project could potentially impact the availability of marine mammals for harvest in a small area immediately around the *Langseth,* and for a very short time period during seismic operations. Considering the limited time that the planned seismic surveys would take place close to shore, where most subsistence harvest of marine mammals occurs in the Gulf of Alaska, the planned project is not expected to have any significant impacts to the availability of Steller sea lions or harbor seals for subsistence harvest. Additionally, to mitigate any possible conflict, community outreach is planned and described further in *Mitigation* below.

**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)).

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.

L–DEO has reviewed mitigation measures employed during seismic research surveys authorized by NMFS under previous incidental harassment authorizations, as well as recommended best practices in Richardson *et al.* (1995), Pierson *et al.* (1998), Weir and Dolman (2007), Nowacek *et al.* (2013), Wright (2014), and Wright and Cosentino (2015), and has incorporated a suite of mitigation measures into their project description based on the above sources. Since the proposed IHA, NMFS has clarified that the seismic array must be immediately shutdown if a marine mammal species not authorized for take, or a species which has reached its authorized number of takes, is observed entering or approaching the Level B harassment zone. This measure will prevent the unauthorized harassment of any marine mammal species.

To reduce the potential for disturbance from acoustic stimuli associated with the activities, L–DEO will implement mitigation measures for marine mammals. Mitigation measures that would be adopted during the planned survey include (1) Vessel-based visual mitigation monitoring; (2) Vessel-based passive acoustic monitoring; (3) Establishment of an exclusion zone; (4) Power down procedures; (5) Shutdown procedures; (6) Ramp-up procedures; (7) Vessel strike avoidance measures; and (8) Sensitive Habitat Measures.

*Vessel-Based Visual Mitigation Monitoring*

Visual monitoring requires the use of trained observers (herein referred to as visual PSOs) to scan the ocean surface visually for the presence of marine mammals. The area to be scanned visually includes primarily the exclusion zone, but also the buffer zone. The buffer zone means an area beyond the exclusion zone to be monitored for the presence of marine mammals that may enter the exclusion zone. During pre-clearance monitoring (*i.e.,* before ramp-up begins), the buffer zone also acts as an extension of the exclusion zone in that observations of marine mammals within the buffer zone would also prevent airgun operations from beginning (*i.e.,* ramp-up). The buffer zone encompasses the area at and below the sea surface from the edge of the 0–500 m exclusion zone, out to a radius of 1,000 m from the edges of the airgun array (500–1,000 m). Visual monitoring of the exclusion zones and adjacent waters is intended to establish and, when visual conditions allow, maintain zones around the sound source that are clear of marine mammals, thereby reducing or eliminating the potential for injury and minimizing the potential for more severe behavioral reactions for animals occurring close to the vessel. Visual monitoring of the buffer zone is intended to (1) provide additional protection to naïve marine mammals that may be in the area during pre-clearance, and (2) during airgun use, aid in establishing and maintaining the exclusion zone by alerting the visual observer and crew of marine mammals that are outside of, but may approach and enter, the exclusion zone.

L–DEO must use at least six dedicated, trained, NMFS-approved Protected Species Observers (PSOs). The PSOs must have no tasks other than to conduct observational effort, record observational data, and communicate with and instruct relevant vessel crew with regard to the presence of marine mammals and mitigation requirements. PSO resumes shall be provided to NMFS for approval.

At least one of the visual and two of the acoustic PSOs aboard the vessel must have a minimum of 90 days at-sea experience working in those roles, respectively, during a deep penetration (*i.e.,* ''high energy'') seismic survey, with no more than 18 months elapsed since the conclusion of the at-sea experience. One visual PSO with such experience shall be designated as the lead for the entire protected species observation team. The lead PSO shall serve as primary point of contact for the vessel operator and ensure all PSO requirements per the IHA are met. To the maximum extent practicable, the experienced PSOs should be scheduled to be on duty with those PSOs with appropriate training but who have not yet gained relevant experience.

During survey operations (*e.g.,* any day on which use of the acoustic source is planned to occur, and whenever the acoustic source is in the water, whether activated or not), a minimum of two visual PSOs must be on duty and conducting visual observations at all times during daylight hours (*i.e.,* from 30 minutes prior to sunrise through 30 minutes following sunset) and 30 minutes prior to and during nighttime ramp-ups of the airgun array. Visual monitoring of the exclusion and buffer zones must begin no less than 30 minutes prior to ramp-up and must continue until one hour after use of the acoustic source ceases or until 30 minutes past sunset. Visual PSOs shall coordinate to ensure 360° visual coverage around the vessel from the most appropriate observation posts, and shall conduct visual observations using binoculars and the naked eye while free from distractions and in a consistent, systematic, and diligent manner.

PSOs shall establish and monitor the exclusion and buffer zones. These zones shall be based upon the radial distance from the edges of the acoustic source (rather than being based on the center of the array or around the vessel itself).

During use of the airgun (*i.e.,* anytime the acoustic source is active, including ramp-up), occurrences of marine mammals within the buffer zone (but outside the exclusion zone) shall be communicated to the operator to prepare for the potential shutdown or powerdown of the acoustic source. Visual PSOs will immediately communicate all observations to the on duty acoustic PSO(s), including any determination by the PSO regarding species identification, distance, and bearing and the degree of confidence in the determination. Any observations of marine mammals by crew members shall be relayed to the PSO team. During good conditions (*e.g.,* daylight hours; Beaufort sea state (BSS) 3 or less), visual PSOs shall conduct observations when the acoustic source is not operating for comparison of sighting rates and behavior with and without use of the acoustic source and between acquisition periods, to the maximum extent practicable. Visual PSOs may be on watch for a maximum of four consecutive hours followed by a break of at least one hour between watches and may conduct a maximum of 12 hours of observation per 24-hour period. Combined observational duties (visual and acoustic but not at same time) may not exceed 12 hours per 24-hour period for any individual PSO.

*Passive Acoustic Monitoring*

Acoustic monitoring means the use of trained personnel (sometimes referred to as passive acoustic monitoring (PAM) operators, herein referred to as acoustic PSOs) to operate PAM equipment to acoustically detect the presence of marine mammals. Acoustic monitoring involves acoustically detecting marine mammals regardless of distance from the source, as localization of animals may not always be possible. Acoustic monitoring is intended to further

support visual monitoring (during daylight hours) in maintaining an exclusion zone around the sound source that is clear of marine mammals. In cases where visual monitoring is not effective (*e.g.,* due to weather, nighttime), acoustic monitoring may be used to allow certain activities to occur, as further detailed below.

Passive acoustic monitoring (PAM) would take place in addition to the visual monitoring program. Visual monitoring typically is not effective during periods of poor visibility or at night, and even with good visibility, is unable to detect marine mammals when they are below the surface or beyond visual range. Acoustical monitoring can be used in addition to visual observations to improve detection, identification, and localization of cetaceans. The acoustic monitoring would serve to alert visual PSOs (if on duty) when vocalizing cetaceans are detected. It is only useful when marine mammals call, but it can be effective either by day or by night, and does not depend on good visibility. It would be monitored in real time so that the visual observers can be advised when cetaceans are detected.

The *R/V Langseth* will use a towed PAM system, which must be monitored by at a minimum one on duty acoustic PSO beginning at least 30 minutes prior to ramp-up and at all times during use of the acoustic source. Acoustic PSOs may be on watch for a maximum of four consecutive hours followed by a break of at least one hour between watches and may conduct a maximum of 12 hours of observation per 24-hour period. Combined observational duties (acoustic and visual but not at same time) may not exceed 12 hours per 24-hour period for any individual PSO.

Survey activity may continue for 30 minutes when the PAM system malfunctions or is damaged, while the PAM operator diagnoses the issue. If the diagnosis indicates that the PAM system must be repaired to solve the problem, operations may continue for an additional two hours without acoustic monitoring during daylight hours only under the following conditions:

- Sea state is less than or equal to BSS 4;
- No marine mammals (excluding delphinids) detected solely by PAM in the applicable exclusion zone in the previous two hours;
- NMFS is notified via email as soon as practicable with the time and location in which operations began occurring without an active PAM system; and
- Operations with an active acoustic source, but without an operating PAM system, do not exceed a cumulative total of four hours in any 24-hour period.

*Establishment of an Exclusion Zone and Buffer Zone*

An exclusion zone (EZ) is a defined area within which occurrence of a marine mammal triggers mitigation action intended to reduce the potential for certain outcomes, *e.g.,* auditory injury, disruption of critical behaviors. The PSOs would establish a minimum EZ with a 500 m radius for the 36 airgun array. The 500 m EZ would be based on radial distance from any element of the airgun array (rather than being based on the center of the array or around the vessel itself). With certain exceptions (described below), if a marine mammal appears within or enters this zone, the acoustic source would be shut down.

The 500 m EZ is intended to be precautionary in the sense that it would be expected to contain sound exceeding the injury criteria for all cetacean hearing groups, (based on the dual criteria of SELcum and peak SPL), while also providing a consistent, reasonably observable zone within which PSOs would typically be able to conduct effective observational effort. Additionally, a 500 m EZ is expected to minimize the likelihood that marine mammals will be exposed to levels likely to result in more severe behavioral responses. Although significantly greater distances may be observed from an elevated platform under good conditions, we believe that 500 m is likely regularly attainable for PSOs using the naked eye during typical conditions.

Because the North Pacific right whale is a stock of high concern, L–DEO will implement a shutdown if the species is observed at any distance. In addition, when transiting through North Pacific right whale critical habitat, L–DEO must conduct any survey operations during daylight hours, to facilitate the ability of PSOs to observe any right whales that may be present. If transit through the North Pacific right whale critical habitat is required during darkness, or conditions of similar limited visibility, L–DEO must reduce vessel speed to at most 5 kn (knots) while in this critical habitat. Additionally, for high risk circumstances, such as observation of a calf or aggregation of large whales (defined as 6 or more mysticetes or sperm whales), L–DEO will shutdown if these circumstances are observed at any distance.

Finally, to minimize impact on fin whales in their feeding BIA near Kodiak Island, L–DEO must observe a larger EZ for this species while in the BIA. If a fin whale or group of fin whales is observed with 1,500 m of the acoustic source within the fin whale BIA, L–DEO must implement a shutdown.

*Pre-Clearance and Ramp-Up*

Ramp-up (sometimes referred to as ''soft start'') means the gradual and systematic increase of emitted sound levels from an airgun array. Ramp-up begins by first activating a single airgun of the smallest volume, followed by doubling the number of active elements in stages until the full complement of an array's airguns are active. Each stage should be approximately the same duration, and the total duration should not be less than approximately 20 minutes. The intent of pre-clearance observation (30 minutes) is to ensure no protected species are observed within the buffer zone prior to the beginning of ramp-up. During pre-clearance is the only time observations of protected species in the buffer zone would prevent operations (*i.e.,* the beginning of ramp-up). The intent of ramp-up is to warn protected species of pending seismic operations and to allow sufficient time for those animals to leave the immediate vicinity. A ramp-up procedure, involving a step-wise increase in the number of airguns firing and total array volume until all operational airguns are activated and the full volume is achieved, is required at all times as part of the activation of the acoustic source. All operators must adhere to the following pre-clearance and ramp-up requirements:

- The operator must notify a designated PSO of the planned start of ramp-up as agreed upon with the lead PSO; the notification time should not be less than 60 minutes prior to the planned ramp-up in order to allow the PSOs time to monitor the exclusion and buffer zones for 30 minutes prior to the initiation of ramp-up (pre-clearance);
- Ramp-ups shall be scheduled so as to minimize the time spent with the source activated prior to reaching the designated run-in;
- One of the PSOs conducting pre-clearance observations must be notified again immediately prior to initiating ramp-up procedures and the operator must receive confirmation from the PSO to proceed;
- Ramp-up may not be initiated if any marine mammal is within the applicable exclusion or buffer zone. If a marine mammal is observed within the applicable exclusion zone or the buffer zone during the 30 minute pre-clearance period, ramp-up may not begin until the animal(s) has been observed exiting the zones or until an additional time period has elapsed with no further sightings (15 minutes for small odontocetes and

pinnipeds and 30 minutes for all other species);

- Ramp-up shall begin by activating a single airgun of the smallest volume in the array and shall continue in stages by doubling the number of active elements at the commencement of each stage, with each stage of approximately the same duration. Duration shall not be less than 20 minutes. The operator must provide information to the PSO documenting that appropriate procedures were followed;
- PSOs must monitor the exclusion and buffer zones during ramp-up, and ramp-up must cease and the source must be shut down upon observation of a marine mammal within the applicable exclusion zone. Once ramp-up has begun, observations of marine mammals within the buffer zone do not require shutdown or powerdown, but such observation shall be communicated to the operator to prepare for the potential shutdown or powerdown;
- Ramp-up may occur at times of poor visibility, including nighttime, if appropriate acoustic monitoring has occurred with no detections in the 30 minutes prior to beginning ramp-up. Acoustic source activation may only occur at times of poor visibility where operational planning cannot reasonably avoid such circumstances;
- If the acoustic source is shut down for brief periods (*i.e.,* less than 30 minutes) for reasons other than that described for shutdown and powerdown (*e.g.,* mechanical difficulty), it may be activated again without ramp-up if PSOs have maintained constant visual and/or acoustic observation and no visual or acoustic detections of marine mammals have occurred within the applicable exclusion zone. For any longer shutdown, pre-clearance observation and ramp-up are required. For any shutdown at night or in periods of poor visibility (*e.g.,* BSS 4 or greater), ramp-up is required, but if the shutdown period was brief and constant observation was maintained, pre-clearance watch of 30 min is not required; and
- Testing of the acoustic source involving all elements requires ramp-up. Testing limited to individual source elements or strings does not require ramp-up but does require pre-clearance of 30 min.

*Shutdown and Powerdown*

The shutdown of an airgun array requires the immediate de-activation of all individual airgun elements of the array while a powerdown requires immediate de-activation of all individual airgun elements of the array except the single 40-in$^3$ airgun. Any PSO on duty will have the authority to delay the start of survey operations or to call for shutdown or powerdown of the acoustic source if a marine mammal is detected within the applicable exclusion zone. The operator must also establish and maintain clear lines of communication directly between PSOs on duty and crew controlling the acoustic source to ensure that shutdown and powerdown commands are conveyed swiftly while allowing PSOs to maintain watch. When both visual and acoustic PSOs are on duty, all detections will be immediately communicated to the remainder of the on-duty PSO team for potential verification of visual observations by the acoustic PSO or of acoustic detections by visual PSOs. When the airgun array is active (*i.e.,* anytime one or more airguns is active, including during ramp-up and powerdown) and (1) a marine mammal appears within or enters the applicable exclusion zone and/or (2) a marine mammal (other than delphinids, see below) is detected acoustically and localized within the applicable exclusion zone, the acoustic source will be shut down. The array must also be immediately shutdown whenever a marine mammal species not authorized for take, or a species which has reached its authorized number of takes, is observed entering or approaching the Level B harassment zone. When shutdown is called for by a PSO, the acoustic source will be immediately deactivated and any dispute resolved only following deactivation. Additionally, shutdown will occur whenever PAM alone (without visual sighting), confirms presence of marine mammal(s) in the EZ. If the acoustic PSO cannot confirm presence within the EZ, visual PSOs will be notified but shutdown is not required.

Following a shutdown, airgun activity would not resume until the marine mammal has cleared the 500 m EZ. The animal would be considered to have cleared the 500 m EZ if it is visually observed to have departed the 500 m EZ, or it has not been seen within the 500 m EZ for 15 min in the case of small odontocetes and pinnipeds, or 30 min in the case of mysticetes and large odontocetes, including sperm Cuvier's beaked, Baird's beaked, Stejneger's beaked, and killer whales.

The shutdown requirement can be waived for small dolphins in which case the acoustic source shall be powered down to the single 40-in$^3$ airgun if an individual is visually detected within the exclusion zone. As defined here, the small delphinoid group is intended to encompass those members of the Family Delphinidae most likely to voluntarily approach the source vessel for purposes of interacting with the vessel and/or airgun array (*e.g.,* bow riding). This exception to the shutdown requirement would apply solely to specific genera of small dolphins —*Lagenorhynchus and Grampus*—The acoustic source shall be powered down to 40-in$^3$ airgun if an individual belonging to these genera is visually detected within the 500 m exclusion zone.

Powerdown conditions shall be maintained until delphinids for which shutdown is waived are no longer observed within the 500 m exclusion zone, following which full-power operations may be resumed without ramp-up. Visual PSOs may elect to waive the powerdown requirement if delphinids for which shutdown is waived to be voluntarily approaching the vessel for the purpose of interacting with the vessel or towed gear, and may use best professional judgment in making this decision.

We include this small delphinid exception because power-down/shutdown requirements for small delphinids under all circumstances represent practicability concerns without likely commensurate benefits for the animals in question. Small delphinids are generally the most commonly observed marine mammals in the specific geographic region and would typically be the only marine mammals likely to intentionally approach the vessel. As described above, auditory injury is extremely unlikely to occur for mid-frequency cetaceans (*e.g.,* delphinids), as this group is relatively insensitive to sound produced at the predominant frequencies in an airgun pulse while also having a relatively high threshold for the onset of auditory injury (*i.e.,* permanent threshold shift).

A large body of anecdotal evidence indicates that small delphinids commonly approach vessels and/or towed arrays during active sound production for purposes of bow riding, with no apparent effect observed in those delphinids (*e.g.,* Barkaszi *et al.,* 2012). The potential for increased shutdowns resulting from such a measure would require the *R/V Langseth* to revisit the missed track line to reacquire data, resulting in an overall increase in the total sound energy input to the marine environment and an increase in the total duration over which the survey is active in a given area. Although other mid-frequency hearing specialists (*e.g.,* large delphinids) are no more likely to incur auditory injury than are small delphinids, they are much less likely to

approach vessels. Therefore, retaining a power-down/shutdown requirement for large delphinids would not have similar impacts in terms of either practicability for the applicant or corollary increase in sound energy output and time on the water. We do anticipate some benefit for a power-down/shutdown requirement for large delphinids in that it simplifies somewhat the total range of decision-making for PSOs and may preclude any potential for physiological effects other than to the auditory system as well as some more severe behavioral reactions for any such animals in close proximity to the source vessel.

Powerdown conditions shall be maintained until the marine mammal(s) of the above listed genera are no longer observed within the exclusion zone, following which full-power operations may be resumed without ramp-up. Additionally, visual PSOs may elect to waive the powerdown requirement if the small dolphin(s) appear to be voluntarily approaching the vessel for the purpose of interacting with the vessel or towed gear, and may use best professional judgment in making this decision. Visual PSOs shall use best professional judgment in making the decision to call for a shutdown if there is uncertainty regarding identification (*i.e.,* whether the observed marine mammal(s) belongs to one of the delphinid genera for which shutdown is waived or one of the species with a larger exclusion zone). If PSOs observe any behaviors in a small delphinid for which shutdown is waived that indicate an adverse reaction, then powerdown will be initiated immediately.

Upon implementation of shutdown, the source may be reactivated after the marine mammal(s) has been observed exiting the applicable exclusion zone (*i.e.,* animal is not required to fully exit the buffer zone where applicable) or following 15 minutes for small odontocetes and pinnipeds and 30 minutes for all other species with no further observation of the marine mammal(s).

*Vessel Strike Avoidance*

These measures apply to all vessels associated with the planned survey activity; however, we note that 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. These measures include the following:

1. Vessel operators and crews must maintain a vigilant watch for all marine mammals and slow down, stop their vessel, or alter course, as appropriate and regardless of vessel size, to avoid striking any marine mammal. A single marine mammal at the surface may indicate the presence of submerged animals in the vicinity of the vessel; therefore, precautionary measures should be exercised when an animal is observed. A visual observer aboard the vessel must monitor a vessel strike avoidance zone around the vessel (specific distances detailed below), to ensure the potential for strike is minimized. Visual observers monitoring the vessel strike avoidance zone can be either third-party observers or crew members, but crew members responsible for these duties must be provided sufficient training to distinguish marine mammals from other phenomena and broadly to identify a marine mammal to broad taxonomic group (*i.e.,* as a large whale or other marine mammal);

2. Vessel speeds must be reduced to 10 kn or less when mother/calf pairs, pods, or large assemblages of any marine mammal are observed near a vessel;

3. All vessels must maintain a minimum separation distance of 100 m from large whales (*i.e.,* sperm whales and all baleen whales;

4. All vessels must attempt to maintain a minimum separation distance of 50 m from all other marine mammals, with an exception made for those animals that approach the vessel; and

5. When marine mammals are sighted while a vessel is underway, the vessel should 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 should reduce speed and shift the engine to neutral, not engaging the engines until animals are clear of the area. This recommendation does not apply to any vessel towing gear.

*Sensitive Habitat Measures*

Because the propose survey overlaps with BIAs and critical habitat for some species (see MM Occurance), L–DEO will implement additional measures related to these areas including area avoidance and the implementation of special shutdown zones. For Steller sea lion rookeries and major haulouts, classified as critical habitat (58 FR 45269, August 27, 1993). Steller sea lions maintain rookeries and major haulouts in the area of L–DEO's survey (Figure 1 in the IHA Application). Additionally the timing of the survey overlaps with the breeding season of Steller sea lions. As such, L–DEO must observe a three nautical mile exclusion zone around these critical habitats. This means that L–DEO avoid transiting through and operating seismic airguns in these areas.

A portion of L–DEO's planned survey will also occur in the fin whale BIA (Ferguson *et al.* 2015). Because of the temporal and spatial overlap in the planned survey and peak use of the fin whale BIA, L–DEO will implement a shutdown if a fin whale or group of fin whales is observed at within a 1,500 m radius from the acoustic source, within their BIA. L–DEO will refer to Ferguson *et al.* (2015) for the location of the BIA, but waters around the Semidi Islands, Kodiak Island, and Chirikof Island generally define the portion of the BIA L–DEO is expected to transit through.

The expected elevated density of North Pacific right whales in their critical habitat means that additional measures are prudent for this area. When transiting through North Pacific right whale critical habitat, any survey operations conducted by L–DEO must be done during daylight hours, to facilitate the ability of PSOs to observe any right whales that may be present. Additionally, if transit through the North Pacific right whale critical habitat is required during darkness or conditions of similar limited visibility, L–DEO must reduce vessel speed to at most 5 kn (knots) while in the critical habitat. These measures are in addition to the requirement that L–DEO must implement a shutdown if a North Pacific right whale is observed at any distance.

*Mitigation for Subsistence Uses of Marine Mammals—Community Outreach*

Although impacts on subsistence uses are not expected due to the strong separation in time and space between marine mammal subsistence harvest and L–DEO's specified activities, project principle investigators will conduct outreach with communities near the planned project area to identify and avoid areas of potential conflict, including for marine subsistence activities. This measure will mitigate any potential negative impact on subsistence hunting activities, despite there being no expected significant impact.

NMFS has determined that these mitigation measures provide the means of effecting the least practicable impact on the affected species or stocks and their habitat, paying particular attention to rookeries, mating grounds, and areas

of similar significance, 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 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.

*Vessel-Based Visual Monitoring*

As described above, PSO observations would take place during daytime airgun operations and nighttime start ups (if applicable) of the airguns. During seismic operations, at least six visual PSOs would be based aboard the *Langseth.* Monitoring shall be conducted in accordance with the following requirements:

- The operator shall provide PSOs with bigeye binoculars (*e.g.,* 25 x 150; 2.7 view angle; individual ocular focus; height control) of appropriate quality (*i.e.,* Fujinon or equivalent) solely for PSO use. These shall be pedestal-mounted on the deck at the most appropriate vantage point that provides for optimal sea surface observation, PSO safety, and safe operation of the vessel;
- The operator will work with the selected third-party observer provider to ensure PSOs have all equipment (including backup equipment) needed to adequately perform necessary tasks, including accurate determination of distance and bearing to observed marine mammals.

PSOs must have the following requirements and qualifications:

- PSOs shall be independent, dedicated, trained visual and acoustic PSOs and must be employed by a third-party observer provider;
- PSOs shall have no tasks other than to conduct observational effort (visual or acoustic), collect data, and communicate with and instruct relevant vessel crew with regard to the presence of protected species and mitigation requirements (including brief alerts regarding maritime hazards);
- PSOs shall have successfully completed an approved PSO training course appropriate for their designated task (visual or acoustic). Acoustic PSOs are required to complete specialized training for operating PAM systems and are encouraged to have familiarity with the vessel with which they will be working;
- PSOs can act as acoustic or visual observers (but not at the same time) as long as they demonstrate that their training and experience are sufficient to perform the task at hand;
- NMFS must review and approve PSO resumes accompanied by a relevant training course information packet that includes the name and qualifications (*i.e.,* experience, training completed, or educational background) of the instructor(s), the course outline or syllabus, and course reference material as well as a document stating successful completion of the course;
- NMFS shall have one week to approve PSOs from the time that the necessary information is submitted, after which PSOs meeting the minimum requirements shall automatically be considered approved;
- PSOs must successfully complete relevant training, including completion of all required coursework and passing (80 percent or greater) a written and/or oral examination developed for the training program;
- PSOs must have successfully attained a bachelor's degree from an accredited college or university with a major in one of the natural sciences, a minimum of 30 semester hours or equivalent in the biological sciences, and at least one undergraduate course in math or statistics; and
- The educational requirements may be waived if the PSO has acquired the relevant skills through alternate experience. Requests for such a waiver shall be submitted to NMFS and must include written justification. Requests shall be granted or denied (with justification) by NMFS within one week of receipt of submitted information. Alternate experience that may be considered includes, but is not limited to (1) secondary education and/or experience comparable to PSO duties; (2) previous work experience conducting academic, commercial, or government-sponsored protected species surveys; or (3) previous work experience as a PSO; the PSO should demonstrate good standing and consistently good performance of PSO duties.

For data collection purposes, PSOs shall use standardized data collection forms, whether hard copy or electronic. PSOs shall record detailed information about any implementation of mitigation requirements, including the distance of animals to the acoustic source and description of specific actions that ensued, the behavior of the animal(s), any observed changes in behavior before and after implementation of mitigation, and if shutdown was implemented, the length of time before any subsequent ramp-up of the acoustic source. If required mitigation was not implemented, PSOs should record a description of the circumstances. At a minimum, the following information must be recorded:

- Vessel names (source vessel and other vessels associated with survey) and call signs;
- PSO names and affiliations;
- Dates of departures and returns to port with port name;
- Date and participants of PSO briefings;
- Dates and times (Greenwich Mean Time) of survey effort and times corresponding with PSO effort;
- Vessel location (latitude/longitude) when survey effort began and ended and 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 changed significantly), including BSS and any other relevant weather conditions including cloud cover, fog, sun glare, and overall visibility to the horizon;
- Factors that may have contributed to impaired observations during each PSO shift change or as needed as environmental conditions changed (*e.g.,* vessel traffic, equipment malfunctions); and
- Survey activity information, such as acoustic source power output while in operation, number and volume of airguns operating in the array, tow depth of the array, and any other notes of significance (*i.e.,* pre-clearance, ramp-up, shutdown, testing, shooting, ramp-up completion, end of operations, streamers, etc.).

The following information should be recorded upon visual observation of any protected species:

- 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) and 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/breaths, 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 (CPA) and/or closest distance from any element of the acoustic source;
- Platform activity at time of sighting (*e.g.,* deploying, recovering, testing, shooting, data acquisition, other); and
- Description of any actions implemented in response to the sighting (*e.g.,* delays, shutdown, ramp-up) and time and location of the action.

If a marine mammal is detected while using the PAM system, the following information should be recorded:

- An acoustic encounter identification number, and whether the detection was linked with a visual sighting;
- Date and time when first and last heard;
- Types and nature of sounds heard (*e.g.,* clicks, whistles, creaks, burst pulses, continuous, sporadic, strength of signal); and
- Any additional information recorded such as water depth of the hydrophone array, bearing of the animal to the vessel (if determinable), species or taxonomic group (if determinable), spectrogram screenshot, and any other notable information.

A report would be submitted to NMFS within 90 days after the end of the cruise. The report would describe the operations that were conducted and sightings of marine mammals near the operations. The report would provide full documentation of methods, results, and interpretation pertaining to all monitoring. The 90-day report would summarize the dates and locations of seismic operations, and all marine mammal sightings (dates, times, locations, activities, associated seismic survey activities). The report would also include estimates of the number and nature of exposures that occurred above the harassment threshold based on PSO observations and including an estimate of those that were not detected, in consideration of both the characteristics and behaviors of the species of marine mammals that affect detectability, as well as the environmental factors that affect detectability.

*Reporting*

L–DEO will be required to shall submit a draft comprehensive report to NMFS on all activities and monitoring results within 90 days of the completion of the survey or expiration of the IHA, whichever comes sooner. The report must describe all activities conducted and sightings of protected species near the activities, must provide full documentation of methods, results, and interpretation pertaining to all monitoring, and must summarize the dates and locations of survey operations and all protected species sightings (dates, times, locations, activities, associated survey activities). The report will also include estimates of the number and nature of exposures that occurred above the harassment threshold based on PSO observations, including an estimate of those on the trackline but not detected. The draft report shall also include geo-referenced time-stamped vessel tracklines for all time periods during which airguns were operating. Tracklines should include points recording any change in airgun status (*e.g.,* when the airguns began operating, when they were turned off, or when they changed from full array to single gun or vice versa). GIS files shall be provided in ESRI shapefile format and include the UTC date and time, latitude in decimal degrees, and longitude in decimal degrees. All coordinates shall be referenced to the WGS84 geographic coordinate system. In addition to the report, all raw observational data shall be made available to NMFS. The report must summarize the information submitted in interim monthly reports as well as additional data collected as described above and the IHA. The draft report must be accompanied by a certification from the lead PSO as to the accuracy of the report, and the lead PSO may submit directly NMFS a statement concerning implementation and effectiveness of the required mitigation and monitoring. A final report must be submitted within 30 days following resolution of any comments on the draft report.

**Negligible Impact Analysis and Determination**

NMFS has defined negligible impact as an impact resulting from the specified activity that cannot be reasonably expected to, and is not reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival (50 CFR 216.103). A negligible impact finding is based on the lack of likely adverse effects on annual rates of recruitment or survival (*i.e.,* population-level effects). An estimate of the number of takes alone is not enough information on which to base an impact determination. In addition to considering estimates of the number of marine mammals that might be ''taken'' through harassment, NMFS considers other factors, such as the likely nature of any responses (*e.g.,* intensity, duration), the context of any responses (*e.g.,* critical reproductive time or location, migration), as well as effects on habitat, and the likely effectiveness of the mitigation. We also assess the number, intensity, and context of estimated takes by evaluating this information relative to population status. Consistent with the 1989

preamble for NMFS's implementing regulations (54 FR 40338; September 29, 1989), the impacts from other past and ongoing anthropogenic activities are incorporated into this analysis via their impacts on the environmental baseline (*e.g.,* as reflected in the regulatory status of the species, population size and growth rate where known, ongoing sources of human-caused mortality, or ambient noise levels).

To avoid repetition, our analysis applies to all species listed in Table 1, given that NMFS expects the anticipated effects of the planned seismic survey to be similar in nature. Where there are meaningful differences between species or stocks, or groups of species, in anticipated individual responses to activities, impact of expected take on the population due to differences in population status, or impacts on habitat, NMFS has identified species-specific factors to inform the analysis.

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

The final IHA authorizes a limited number of instances of Level B harassment of 21 species of marine mammal, and a limited number of instances of take by Level A harassment for 13 of those marine mammal species. However, we believe that any PTS incurred in marine mammals as a result of the planned activity would be in the form of only a small degree of PTS, not total deafness, and would be unlikely to affect the fitness of any individuals, because of the constant movement of both the *Langseth* and of the marine mammals in the project areas, as well as the fact that the vessel is not expected to remain in any one area in which individual marine mammals would be expected to concentrate for an extended period of time (*i.e.,* since the duration of exposure to loud sounds will be relatively short). Also, as described above, we expect that marine mammals would be likely to move away from a sound source that represents an aversive stimulus, especially at levels that would be expected to result in PTS, given sufficient notice of the *Langseth's* approach due to the vessel's relatively low speed when conducting seismic surveys. We expect that the majority of takes would be in the form of short-term Level B behavioral harassment in the form of temporary avoidance of the area or decreased foraging (if such activity were occurring), reactions which, because of their comparatively short duration, are considered to be of lower severity and with no lasting biological consequences (*e.g.,* Southall *et al.,* 2007).

Potential impacts to marine mammal habitat were discussed briefly in this document and more extensively in the proposed IHA (84 FR 14200, April 9, 2019) (see *Potential Effects of the Specified Activity on Marine Mammals and their Habitat*). Marine mammal habitat may be impacted by elevated sound levels, but these impacts would be temporary. Prey species are mobile and are broadly distributed throughout the project areas; 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 relatively short duration (~18 days) and temporary nature of the disturbance, 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.

The tracklines of this survey either traverse or are proximal to the BIAs for four baleen whale species including fin, gray, North Pacific right, and humpback whales in U.S. waters of the Gulf of Alaska (Ferguson *et al.* 2015). Additionally, there is a BIA for beluga whales in nearby Cook Inlet, but the location of the BIA means the habitat will not co-occur with the effects of L–DEO's survey (Ferguson *et al.* 2015). The North Pacific Right whale feeding BIA east of the Kodiak Archipelago is primarily used between June and September. The fin whale feeding BIA that stretches from Kenai Peninsula through the Alaska Peninsula is primarily used between June and August. The gray whale feeding BIA east of the Kodiak Archipelago is primarily used between June and August. For the North Pacific Right whale, gray whale, and fin whale feeding BIAs, L–DEO's survey planned for June 1 through June 19, 2019 could overlap with a period where BIAs represent an important habitat. However, only of a portion of seismic survey days would actually occur in or near these BIAs, and all survey efforts should be completed by mid-June, still in the early window of primary use for all these BIAs. Additionally, there are mitigation measures in place that should further reduce take number and severity for fin whales and North Pacific right whales. These include the requirement to shutdown the acoustic source if a fin whale, within the fin whale BIA, is observed within 1,500 meters of the source and the requirement to shutdown if a North Pacific right whale is observed at any distance from the source. The gray whale migratory corridor BIA and humpback whale feeding BIAs overlap spatially with L–DEO's survey, but the timing of primary use of these BIAs does not overlap temporally with the survey. Gray whales are most commonly seen migratory northward between March and May and southward between November and January. As planned, there is no possibility that L–DEO's survey impacts the southern migration, and presence of northern migrating individuals should be below peak during survey operations beginning in June 2019. Additionally, humpback whale feeding BIAs in the region are primarily used between July and August or September. L–DEO's survey efforts should be completed before peak use of these feeding habitats. For all habitats, no physical impacts to BIA habitat are anticipated from seismic activities. While SPLs of sufficient strength have been known to cause injury to fish and fish and invertebrate mortality, in feeding habitats, the most likely impact to prey species from survey activities would be temporary avoidance of the affected area and any injury or mortality of prey species would be localized around the survey and not of a degree that would adversely impact marine mammal foraging. The duration of fish avoidance of a given area after survey effort stops is unknown, but a rapid return to normal recruitment, distribution and behavior is expected. Given the short operational seismic time near or traversing BIAs, as well as the ability of cetaceans and prey species to move away from acoustic sources, NMFS expects that there would be, at worst, minimal impacts to animals and habitat within the designated BIAs.

Critical habitat has been designated for the ESA listed North Pacific right whale and western DPS of Steller sea lions. Only a portion of L–DEO's planned seismic survey will occur in these critical habitats. Steller sea lion critical habitat also includes a ''no approach'' zone within 3 nmi of rookeries for vessels. Steller sea lions both occupy rookeries and pup from late-May through early-July (NMFS 2008), which coincides with L–DEO's planned survey. Thus, we are requiring that the planned survey avoid transiting or surveying within 3 nmi of any rookeries. For North Pacific right whale critical habitat, L–DEO would only need

to traverse approximately 35 km of the designated critical habitat. At a speed of approximately 9.3 km per hour (5 kn), L–DEO would only be in the critical habitat for less than 4 hours. L–DEO would only conduct survey activities in this critical habitat during daylight hours to facilitate the ability of PSOs to observe any right whales that may be present, so as to reduce the potential for their exposure to airgun noise. If they were in the critical habitat outside of daylight, vessel speed would be restricted to at most 5 kn. Additionally, L–DEO would be required to shutdown seismic airguns if a North Pacific right whale is observed at any distance, further minimizing the impacts on North Pacific right whales in their critical habitat and elsewhere. The characteristics that make this habitat an important feeding area for North Pacific right whales are abundant planktonic food sources. While there are possible impacts of seismic activity on plankton (McCauley *et al.,* 2017), the currents that flow through the Gulf of Alaska will readily refresh plankton resources in the area. As such, this seismic activity is not expected to have a lasting physical impact on habitat or prey within it. Any impact would be a temporary increase in sound levels when the survey is occurring in or near the critical habitat and resulting temporary avoidance of prey or marine mammals themselves due to these elevated sound levels.

After accounting for qualitative factors, the activity is expected to impact a small percentage of all marine mammal stocks that would be affected by L–DEO's planned survey (see ''Small Numbers'' below). Additionally, the acoustic ''footprint'' of the planned survey would be small relative to the ranges of the marine mammals that would potentially be affected. At any given time, sound levels would increase in the marine environment in a relatively small area surrounding the vessel compared to the range of the marine mammals within the planned survey area. The seismic array would be active 24 hours per day throughout the duration of the planned survey. However, the very brief overall duration of the planned survey (18 days) would further limit potential impacts that may occur as a result of the specified activity.

The mitigation measures are expected to reduce the number and/or severity of takes by allowing for detection of marine mammals in the vicinity of the vessel by visual and acoustic observers, and by minimizing the severity of any potential exposures via power downs and/or shutdowns of the airgun array. Based on previous monitoring reports for substantially similar activities that have been previously authorized by NMFS, we expect that the planned mitigation will be effective in preventing, at least to some extent, potential PTS in marine mammals that may otherwise occur in the absence of mitigation (although all authorized PTS has been accounted for in this analysis).

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

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

- No mortality is anticipated or authorized;
- The specified activity is temporary and of relatively short duration (~18 days);
- The anticipated impacts of the specified activity on marine mammals would primarily be temporary behavioral changes due to avoidance of the area around the survey vessel;
- The number of instances of potential PTS that may occur are expected to be minimal. Instances of potential PTS that are incurred in marine mammals would be of a low level, due to constant movement of the vessel and of the marine mammals in the area, and the nature of the survey design (not concentrated in areas of high marine mammal concentration);
- 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;
- The potential adverse effects on fish or invertebrate species that serve as prey species for marine mammals from the planned survey would be temporary and spatially limited; and
- The mitigation measures, including visual and acoustic monitoring, power-downs, shutdowns, and enhanced measures for areas of biological importance are expected to minimize potential impacts to marine mammals (both amount and severity) in these important areas and times.

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

**Small Numbers**

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

There are seven stocks for which the estimated instances of take appear high when compared to the stock abundance (Table 9), including the Northeast Pacific fin whale stock, the North Pacific right whale stock, the Western North Pacific gray whale stock, the Central North Pacific blue whale stock, the Central North Pacific humpback whale stock (Hawaii DPS), the Offshore killer whale stock, and the Gulf of Alaska, Aleutian Islands, and Bering Sea transient killer whale stock. However, when other qualitative factors are used to inform an assessment of the likely number of individual marine mammals taken, the resulting numbers are appropriately considered small. We discuss these in further detail below.

For an additional three stocks (Alaska stocks of the three beaked whale species), there are no abundance estimates upon which to base a comparison. However, we note that the anticipated number of incidents of take by Level B and Level A harassment are low (46 to 196 for these three stocks) and represent a small number of animals within these stocks, which have extensive ranges across large parts of the North Pacific Ocean compared to L–DEO's planned survey area (Muto *et al.,* 2018). Based on the broad spatial distributions of these species relative to the planned survey area, NMFS concludes that the authorized take of these species represent small numbers relative to the affected species' overall

population sizes, though we are unable to quantify the authorized take numbers as a percentage of population.

For all other stocks (aside from the seven referenced above and described below and the three beaked whales), the authorized take is less than 25 percent as compared to the stock abundance (recognizing that some of those takes may be repeats of the same individual, thus rendering the percentage even lower).

The expected take of the Northeast Pacific stock of fin whales appears high when presented as a percentage of the available population estimate (123.5 percent), but this percentage is based on an occurrence estimate which surveyed only a small portion of the range (Rone *et al.* 2017), and no representative estimate of the full stock abundance is available (Muto *et al.* 2018). The range of the Northeast Pacific fin whale stock extends through much of the north Pacific (Muto *et al.* 2018). Based on the small portion of the stock's range that Rone *et al.* (2017) observed, the full stock abundance would be much higher than 3,168 individuals, significantly reducing the percentage of the population that would be impacted by take from L–DEO's activities. Additionally, L–DEO's actions are located in a small portion of the total range and will occur within a short period of less than a month. L–DEO's previous marine mammal monitoring in the Gulf of Alaska reported 79 fin whales (RPS 2011) and Zerbini *et al.* (2006) observed 530 fin whales across 3 years of summer surveys in the Northern Gulf of Alaska. Given these previous observations, it is not realistic that L–DEO will encounter 3,914 individual fin whales. Instead, given the range of the species, the known underestimate of stock abundance, and the comparatively small action area, combined with the short duration of the survey, it is more likely that there will be multiple instances of take to a smaller number of individuals that are in the action area during the planned survey and entirely unlikely that more than a third of the stock would be exposed to the seismic survey.

The estimated instances of take for North Pacific right whales appears high compared to stock abundance (35.5 percent), but realistically 11 right whales are not likely to experience harassment. Given the higher assumed density of whales in the critical habitat area off of Kodiak Island, the vast majority of estimated takes would occur in that area (see ''*Take Calculation and Estimation*''). Overall, right whales are very rarely detected in the Gulf of Alaska, and most evidence of the region's importance for the species is based on historic whaling records (Muto *et al.,* 2018). Either visual or acoustic detections of a single right whale are rare in the Gulf of Alaska. North Pacific right whales are much more commonly detected in their Bering Sea critical habitat (73 FR 19000, April 8, 2008; Muto *et al.,* 2018). Given this evidence, only a small portion of the population is expected to be present in the Gulf of Alaska and the Kodiak Island critical habitat. As such, it is more realistic to believe there will be multiple takes of the few individuals present, comprising less than a third of the stock. Additionally, L–DEO planned survey will only impact the North Pacific right whale critical habitat for a very short portion of their survey and there are additional mitigation measures in place to further minimize any acoustic impacts on North Pacific right whales.

The number of instances of take expected for the Western North Pacific stock (WNP) of gray whales appears high when compared to the stock abundance (1,247.43 percent). In reality, 2,183 individuals will be not experience take from this stock. There are two stocks of gray whales in this area, the WNP and the Eastern North Pacific stock (ENP). It is more realistic to apportion expected takes between these stocks. NMFS has no commonly used method to estimate the relative occurrence of these stocks, but here we apportion the takes between the two stocks using their relative abundances and a correction factor to ensure this number is conservative. The total abundance of the two stocks is 27,135 gray whales. Based on estimates of stock size (Table 1), 0.65 percent of encountered gray whales would be expected to come from the WNP stock, and 99.35 percent would be expected to come from the ENP stock, which results in an apportioned take estimate for each stock of 14 (WNP) and 2,169 (ENP). To represent uncertainty in this method and produce a conservative estimate, we then double the apportioned take for the smaller stocks, resulting in an estimated 28 takes for the WNP stock. This estimated level of take could impact an estimated 16 percent of the WNP stock if each take occurred to a different individual. Further supporting this conclusion, the summer feeding grounds of WNP gray whales are believed to be off the Sakhalin Islands and other parts of coastal eastern Russia. In total, 27 to 30 whales have been observed in both the WNP and ENP, meaning that while some whales identified on these summer grounds have been observed overwintering in the eastern Pacific around North America, some also migrate to Japanese and Chinese waters (Caretta *et al.,* 2014; Caretta *et al.,* 2019 DRAFT). Based on relative abundance of gray whale stocks and knowledge of behavior, the WNP stock is expected to make up a small portion of the gray whales that will experience take from L–DEO's activity. Therefore, it is entirely unlikely that more than a third of the stock would be exposed to the seismic survey.

The expected instances of take of the Central North Pacific (CNP) stock of blue whales appears high when compared to the abundance (37 percent), however, in reality 50 CNP blue whales are not likely to be harassed. Blue whales belonging to the CNP stock appear to feed in summer in waters southwest of Kamchatka, south of the Aleutians, and in the Gulf of Alaska (Stafford 2003; Watkins *et al.* 2000). Because of this large summer range of CNP blue whales compared to the size of L–DEO's action area, it is more likely that there will be multiple takes of a smaller number of individuals that would occur within the action area, and the percentage of the stock taken will be less than a third of the individuals.

For humpback whales, takes are apportioned between the different stocks or DPSs present based on Wade *et al.* (2016). With this apportionment, the expected instances of take of the Central North Pacific stock's Hawaii DPS appears high (44.8 percent of the estimated DPS abundance). In reality, 5,101 Hawaii DPS humpback whales are not likely to be harassed, as it is more likely that a smaller number of individuals will experience multiple takes. The Gulf of Alaska is an important center of humpback whale abundance, and L–DEO's survey affects a portion of the Gulf of Alaska. The highest densities of humpback whales in the Gulf of Alaska are observed between July and August (Ferguson *et al.,* 2015), while L–DEO's survey is planned for June, so the survey should not overlap with peak abundance. Additionally, there are other areas of high humpback whale density in the Aleutian Islands and Bering Sea (Muto *et al.* 2018). This evidence, plus the CNP stock's large range relative to L–DEO's action area, along with the short duration of the survey, mean that it is more likely that there will be multiple takes of a smaller portion of the individuals that occur in L–DEO's action area, and fewer than a third of the individuals in the stock will be taken.

The expected instances of take from both the Offshore and Gulf of Alaska, Aleutian Islands, and Bering Sea

transient stocks of killer whales appears high when compared against the stock abundance (245 percent and 100.2 percent respectively). In reality, 588 individuals will not experience take from each of these stocks. There are three stocks of killer whales in this area, including the Eastern North Pacific Alaska Resident stock, and it is more realistic to apportion expected takes between these stocks. NMFS has no commonly used method to estimate the relative occurrence of these stocks, but here we apportion the takes between the three stocks using their relative abundances and a correction factor to ensure this number is conservative. The total abundance of the three stocks in the area is 3,174 killer whales. Based on estimates of stock size, 73.9 percent of encountered killer whales would be expected to come from the Alaska resident stock, 18.5 percent would be expected to come from the Gulf of Alaska, Aleutian Islands, and Bering Sea stock, and 7.6 percent would be expected to come from the offshore stock, which come to a take estimate for each stock of 434.8, 108.7 and 44.5 respectively. To represent uncertainty in this method and produce a conservative estimate, we then double the apportioned take for each of the smaller stocks, resulting in an estimated 218 takes for the Gulf of Alaska, Aleutian Islands, and Bering Sea stock and 90 takes for the Offshore stock. Comparing these estimates to their associated stock abundance estimates results in 37.1 percent of the Gulf of Alaska, Aleutian Islands, and Bering Sea stock experiencing take and 37.5 of the Offshore stock experiencing take. While these numbers still appear high, the extensive ranges of both stocks compared to L–DEO's action area, as well as the short duration of the survey, mean that realistically there will be multiple takes of a smaller portion of both killer whale stocks, resulting in no more than a third of the individuals of any of these stocks being taken. Individuals from the offshore stock are known to undertake large movements across their entire range, from the Aleutian Islands to the California coast and use numerous portions of this habitat in the spring and summer (Dahlheim *et al.* 2008). The Gulf of Alaska, Aleutian Islands, and Bering Sea transient stock occupies a range that includes all of the U.S. EEZ in Alaska (Muto *et al.* 2018), with L–DEO only impacting a portion of this range for a limited time period.

Based on the analysis contained herein of the specified activity (including the mitigation and monitoring measures) and the anticipated take of marine mammals, NMFS finds that small numbers of marine mammals will be taken relative to the population size of the affected species or stocks.

**Unmitigable Adverse Impact Analysis and Determination**

In order to issue an IHA, NMFS must find that the specified activity will not have an ''unmitigable adverse impact'' on the subsistence uses of the affected marine mammal species or stocks by Alaskan Natives. NMFS has defined ''unmitigable adverse impact'' in 50 CFR 216.103 as an impact resulting from the specified activity: (1) That is likely to reduce the availability of the species to a level insufficient for a harvest to meet subsistence needs by: (i) Causing the marine mammals to abandon or avoid hunting areas; (ii) Directly displacing subsistence users; or (iii) Placing physical barriers between the marine mammals and the subsistence hunters; and (2) That cannot be sufficiently mitigated by other measures to increase the availability of marine mammals to allow subsistence needs to be met.

In the GOA, the marine mammals that are hunted are Steller sea lions and harbor seals. For seals, these harvests are traditionally low from May through August, when harbor seals are raising pups and molting. Sea lions are taken from Kodiak Island and other locations in the action area in low numbers year round, but harvests are minimal during late spring and summer (Wolfe *et al.* 2012).

L–DEO's planned seismic survey would occur during a period of low harbor seal and Stellar sea lion harvest, so any impact on subsistence activities will be minimal. Additionally, the survey will occur for approximately 18 days, and the portion of the survey that would occur in nearshore waters, where pinniped harvest is most likely, would be even shorter. L–DEO has also conducted outreach related to subsistence users in the area, in order to determine if potential use conflicts existed and avoid these conflicts if possible. As described in the ''Effects of Specified Activities on Subsistence Uses of Marine Mammals'' section above, L–DEO received no comment from the relevant organizations contacted, meaning no concerns were raised about the project. This outreach, in combination with mitigation measures to avoid Steller sea lion rookeries and haulouts, marine mammal monitoring, and establishing exclusion zones, will effectively minimize impacts on these marine mammals, as well as impacts on subsistence users.

Based on the description of the specified activity, the measures described to minimize adverse effects on the availability of marine mammals for subsistence purposes, and the mitigation and monitoring measures, NMFS has determined that there will not be an unmitigable adverse impact on subsistence uses from L–DEO's specified activities.

**National Environmental Policy Act**

In compliance with the National Environmental Policy Act of 1969 (42 U.S.C. 4321 *et seq.*), as implemented by the regulations published by the Council on Environmental Quality (40 CFR parts 1500–1508), NSF prepared an Environmental Assessment (EA) to consider the direct, indirect and cumulative effects to the human environment resulting from this marine geophysical survey in the Gulf of Alaska. NSF made its EA available to the public for review and comment 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 L–DEO. The comment ran concurrently with the publication of the proposed IHA, and was available on NSF's website (at *https://www.nsf.gov/geo/oce/envcomp/*) and was linked to within the proposed **Federal Register** Notice. Also in compliance with NEPA and the CEQ regulations, as well as NOAA Administrative Order 216–6, NMFS has reviewed the NSF's EA, determined it to be sufficient, and adopted that EA and signed a Finding of No Significant Impact (FONSI) on May 31, 2019.

**Endangered Species Act (ESA)**

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

The NMFS Office Protected Resources Interagency Cooperation Division issued a Biological Opinion on May 31, 2019 under section 7 of the ESA, on the issuance of an IHA to L–DEO under section 101(a)(5)(D) of the MMPA by the NMFS Permits and Conservation Division. The Biological Opinion concluded that the proposed action is

not likely to jeopardize the continued existence of blue whale, fin whale, gray whale (WNP DPS), humpback whale (Mexico DPS and Western North Pacific DPS), North Pacific right whale, sei whale, sperm whale, and Steller sea lion (Western DPS), and is not likely to destroy or adversely modify North Pacific right whale or western DPS Steller sea lion critical habitat or the critical habitat of other listed species because no critical habitat exists for these species in the action area.

### Authorization

NMFS has issued an IHA to L–DEO for the potential harassment of small numbers of 21 marine mammal species incidental to a marine geophysical survey in the Gulf of Alaska, provided the previously mentioned mitigation, monitoring and reporting are incorporated.

Dated: June 4, 2019.

**Donna S. Wieting,**

*Director, Office of Protected Resources, National Marine Fisheries Service.*

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## DEPARTMENT OF COMMERCE

### National Oceanic and Atmospheric Administration

**RIN 0648–XG874**

### Taking of Marine Mammals Incidental to Specific Activities; Taking of Marine Mammals Incidental to Pile Driving and Removal Activities During Construction of a Cruise Ship Berth, Hoonah, Alaska

**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 Duck Point Development II, LLC. (DPD) to incidentally harass, by Level A and B harassment, marine mammals during construction of a second cruise ship berth and new lightering float at Cannery Point (Icy Strait) on Chichagof Island near Hoonah, Alaska.

**DATES:** This Authorization is effective from June 3, 2019 through June 2, 2020.

**FOR FURTHER INFORMATION CONTACT:** Stephanie Egger, 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.

### Summary of Request

On December 28, 2018, NMFS received a request DPD for an IHA to take marine mammals incidental to pile driving and removal activities during construction of a second cruise ship berth and new lightering float at Cannery Point (Icy Strait) on Chichagof Island near Hoonah, Alaska. The application was deemed adequate and complete on April 3, 2019. DPD requested take of nine species of marine mammals by Level B harassment and three species by Level A harassment. Neither DPD nor NMFS expects serious injury or mortality to result from this activity and, therefore, an IHA is appropriate. NMFS previously issued an IHA to the Huna Totem Corporation for the first cruise ship berth in Hoonah, AK in 2015 (80 FR 31352; June 2, 2015).

### Description of Specified Activity

DPD proposed to construct a second cruise ship berth and new lightering float at Cannery Point (Icy Strait) on Chichagof Island near Hoonah, Alaska, in order to accommodate the increase in cruise ship and visitor traffic since completion of the first permanent cruise ship berth completion in 2016 (80 FR 31352; June 2, 2015). The in-water sound from the pile driving and removal activities, may incidentally take marine mammals by Level A and B harassment. A detailed description of the planned Hoonah Berth II project is provided in the **Federal Register** notice for the proposed IHA (84 FR 18495; May 1, 2019).

Pile driving and removal is expected to occur over 75 working days (not necessarily consecutive) beginning June 3, 2019 and extending into November 2019 as needed. Approximately 39 days of vibratory and 8 days of impact hammering will occur. An additional 14 days of socketing and 14 days of anchoring will occur to stabilize the piles. As a contingency, the IHA is effective for a period of one year, from June 3, 2019 through June 2, 2020.

To construct a new cruise ship berth (Berth II), lightering float, associated support structures, and pedestrian walkway connections to shore, the project would require the following (see also Table 1):

- Installation of 62 temporary 30-inch (in) diameter steel piles as templates to guide proper installation of permanent piles (these piles would be removed prior to project completion);
- Installation of 8 permanent 42-in diameter steel piles, 16 permanent 36-in diameter steel piles, and 18 permanent 24-in diameter steel piles to support a new 500 feet (ft) x 50 ft floating pontoon dock, its attached 400 ft x 12 ft small craft float, mooring structures, and shore-access fixed-pier walkway (Figure 6 of the application)
- Installation of three permanent 30-in diameter steel piles to support a 120 ft x 20 ft lightering float, and four permanent 16-in diameter steel piles above the high tide line to construct a 12 ft x 40 ft fixed pier for lightering float shore access (Figure 7 of the application);
- Installation of bull rail, floating fenders, mooring cleats, and mast lights. (Note: these components would be installed out of the water.)