Respondent's Obligation: Required to Obtain or Retain Benefits.

Legal Authority: Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. 1801 *et seq.*; 50 CFR 665.819).

This information collection request may be viewed at *reginfo.gov*. Follow the instructions to view Department of Commerce collections currently under review by OMB.

Written comments and recommendations for the proposed information collection should be submitted within 30 days of the publication of this notice on the following website *www.reginfo.gov/public/do/PRAMain*. Find this particular information collection by selecting ''Currently under 30-day Review—Open for Public Comments'' or by using the search function and entering either the title of the collection or the OMB Control Number 0648–0689.

Sheleen Dumas,

Department PRA Clearance Officer, Office of the Chief Information Officer, Commerce Department.

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DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

[RTID 0648–XB866]

Takes of Marine Mammals Incidental to Specified Activities; Taking Marine Mammals Incidental to Geophysical Surveys of the Guerrero Gap in the Eastern Tropical Pacific

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

ACTION: Notice; issuance of an incidental harassment authorization (IHA).

SUMMARY: In accordance with the regulations implementing the Marine Mammal Protection Act (MMPA) as amended, NMFS has issued an IHA to the Lamont-Doherty Earth Observatory (L–DEO) to incidentally harass marine mammals during geophysical surveys of the Guerrero Gap off the coast of Mexico in the Eastern Tropical Pacific.

DATES: This authorization is effective from May 2, 2022 through May 1, 2023.

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

SUPPLEMENTARY INFORMATION:

Background

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

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

The definitions of all applicable MMPA statutory terms cited above are included in the relevant sections below.

Summary of Request

On August 21, 2021, NMFS received a request from L–DEO for an IHA to take marine mammals incidental to geophysical surveys of the Guerrero Gap off the coast of Mexico in the Eastern Tropical Pacific (ETP). The application was deemed adequate and complete on December 14, 2021. L–DEO's request is for take of a small number of 30 species of marine mammals by Level B harassment and, for two of those species, by Level A harassment. NMFS published a notice of proposed IHA for public review and comment on January 12, 2022 (87 FR 1992). Neither L–DEO nor NMFS expects serious injury or mortality to result from this activity and, therefore, an IHA is appropriate.

Description of Planned Activity

Researchers from L–DEO, University of Texas Institute of Geophysics (UTIG), and Northern Arizona University (NAU), with funding from the National Science Foundation (NSF), and in collaboration with researchers from the National Autonomous University of Mexico (Universidad Nacional Autonoma de Mexico or UNAM) and Kyoto University, plan to conduct high-energy seismic surveys from the research vessel (R/V) *Marcus G. Langseth* (*Langseth*) in and around the Guerrero Gap off western Mexico, in the ETP in the mid- to late-spring of 2022. The study uses two-dimensional (2–D) seismic surveying to quantify incoming plate hydration and examine the role of fluids on megathrust slip behavior in and around the Guerrero Gap of the Middle America Trench. L–DEO plans to conduct two different methods of seismic acquisition, multi-channel seismic (MCS) using a hydrophone streamer and refraction surveys using ocean bottom seismometers (OBSs). A total of 3,600 kilometers (km) of transect lines would be surveyed (2,230 km of 2–D MCS reflection data and 1,370 km of OBS refraction data). Approximately 62 percent of the total survey effort would be MCS surveys, with the remaining 38 percent using OBSs. The planned surveys use a 36-airgun towed array with a total discharge volume of ~6600 cubic inches (in^3) as an acoustic source, acquiring return signals using both a towed streamer as well as OBSs. The total survey duration will be approximately 48 days, including approximately 20 days of seismic survey operations, 3 days of transit to and from the survey area, 19 days for equipment deployment/recovery, and 6 days of contingency time for poor weather, etc.

The majority of the 2–D seismic surveys would occur within the Exclusive Economic Zone (EEZ) of Mexico, including territorial seas, and a small portion would occur in International Waters. Approximately 6 percent of the total survey effort would occur in Mexican territorial waters. Note that the MMPA does not apply in Mexican territorial waters. L–DEO is subject only to Mexican law in conducting that portion of the survey. However, NMFS has calculated the expected level of incidental take in the entire activity area (including Mexican territorial waters) as part of the analysis supporting our determination under the MMPA that the activity will have a negligible impact on the affected species or stocks (see Estimated Take and

Negligible Impact Analysis and Determination).

A detailed description of the planned geophysical surveys is provided in the **Federal Register** notice for the proposed IHA (87 FR 1992; January 12, 2022). Since that time, no changes have been made to the planned survey activities. Therefore, a detailed description is not provided here. Please refer to that **Federal Register** notice for the description of the specific activity.

Comments and Responses

A notice of NMFS's proposal to issue an IHA to L–DEO was published in the **Federal Register** on January 12, 2022 (87 FR 1992). 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 comment letters from the Center for Biological Diversity (CBD), Whales of Guerrero, and the Sociedad Mexicana de Mastozoología Marina, A.C. (SOMEMMA). The Sociedad Mexicana de Mastozoología Marina's comment letter was written in support of and reiterated the recommendations in the Whales of Guerrero letter, and we therefore address their comments together.

Comment 1: Whales of Guerrero and SOMEMMA highlighted the status of the endangered Central America Distinct Population Segment (DPS) of humpback whales. Whales of Guerrero noted that in addition to transiting through the survey area along their migratory route, humpback whales from the Central America DPS have been observed calving, nursing, resting, and breeding in the planned survey area between November and May. Citing their own research surveys, Whales of Guerrero recommended that seismic surveys not occur in the region between November 1 and May 1 to ensure minimal impact on the Central America DPS humpback whales.

Response: As required under the MMPA, NMFS preliminarily determined that the mitigation measures in the proposed IHA set forth the means of effecting the least practicable impact on the species and its habitat. ''Minimal impact''—which was not defined by the commenter—is not the standard that must be met through the prescription of mitigation requirements. However, in consideration of the data and maps provided by Whales of Guerrero in their comment letter, showing humpback whale presence concentrated in nearshore waters, and on review of its survey plans, L–DEO agreed that limiting surveys of nearshore tracklines to between May 1 and October 31 would be practicable. NMFS here defines ''nearshore'' tracklines as those tracklines planned to occur in areas where humpback whale sightings (as provided by Whales of Guerrero in their comment letter) have been recorded during the migratory period (*i.e.,* until May 1), or where the associated estimated Level B harassment area would overlap areas where humpback whale sightings have been recorded. This definition includes tracklines within approximately 33.4 km of shore (*i.e.,* the maximum reported distance from shore of humpback sightings in the area). For example, this definition includes the 264-km MCS and OBS trackline running parallel to shore off Guerrero, as well as all connector lines and portions of tracklines landward of that trackline (see Figure 1 of L–DEO's IHA application). NMFS has included this requirement in the final IHA.

Comment 2: Whales of Guerrero and SOMEMMA noted that at least 16 additional species of marine mammals occur in the survey area, including endangered species and species with limited data on abundance and status. Whales of Guerrero included a table of sightings of these species over the course of their research activities between 2014 and 2021. Whales of Guerrero states that they have launched a 3-year, 6-site land-based field survey to identify important and vulnerable nursing and resting sites for humpback whales in Guerrero and are seeking funds to undertake year-round environmental DNA (eDNA) collections to determine cetacean usage of Guerrero's waters, coupled with concurrent boat-based year-round surveys to refine current understanding of marine mammal species present in Guerrero. Until these studies have been completed, Whales of Guerrero states that it would be ''irresponsible'' to approve seismic surveys in the region and that in-depth, year-round research is required to determine species presence and habitat usage before seismic surveys can safely occur in the region.

Response: All species referenced by Whales of Guerrero were included in the table of marine mammals that could occur in the region (Table 1) in the notice of proposed IHA (87 FR 1992; January 12, 2022) and in Table 1 of this notice. The abundance and status of all species in Table 1, as well as the potential effects of L–DEO's activities on these species, have been considered in our determinations. Whales of Guerrero did not provide any additional information on these species that would change our determinations. Additionally, we note that NMFS does not have the authority to approve the seismic surveys, only the take of marine mammals incidental to the seismic surveys. NMFS must grant incidental take authorizations if it can find, based on the best scientific information available, 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). While Whales of Guerrero referenced ongoing studies, these studies have not yet been completed and are not available for NMFS's consideration. The available information for all species referenced by Whales of Guerrero thus supports our required findings for authorizing the taking of marine mammals incidental to L–DEO's planned surveys.

Comment 3: Whales of Guerrero and SOMEMMA stated that Guerrero lacks the infrastructure to support response to potential marine mammal strandings and mortality events. Whales of Guerrero further states that there is no year-round monitoring or stranding response team in place and the remote locations and difficulty in accessing much of the coastline would make it unlikely that live stranding events could be documented and responded to appropriately. Both organizations noted that scientists and stranding experts from SOMEMMA are planning a stranding network capacity-building workshop for Guerrero-based officials, scientists, and local stakeholders in summer of 2022. Whales of Guerrero recommended seismic surveys in the region not be approved until a region-wide stranding and monitoring support network is established.

Response: As stated above, NMFS does not have the authority to approve the seismic surveys, only the take of marine mammals incidental to the surveys. We note that L–DEO has conducted seismic surveys around the world for decades, including in areas without dedicated stranding networks, and no mass strandings have been reported. As discussed in the notice of proposed IHA (87 FR 1992; January 12, 2022), stranding is not expected to result from L–DEO's surveys. In a review of possible stranding associations with seismic surveys, Castellote and Llorens (2016) noted one stranding event, involving two Cuvier's beaked whales, that was contemporaneous with and reasonably associated spatially with a seismic survey conducted by L–DEO. However, the event was not considered a ''true atypical mass stranding'' and the L–DEO

survey was not determined to be a cause of the stranding event. While we agree with the authors of that review in that lack of evidence should not be considered conclusive, it is clear that there is very little evidence that seismic surveys should be considered as posing a significant risk of acute harm to beaked whales or other mid-frequency cetaceans. Using the best available information, which does not suggest that stranding is a likely outcome of the planned surveys, NMFS has made the necessary findings and is authorizing the incidental take requested by L–DEO.

Comment 4: Whales of Guerrero and SOMEMMA noted that Guerrero is an authorized whale watch state in Mexico, with 56 boats and 200 crew members participating in the whale watch industry. Whales of Guerrero stated that the whale watch industry and larger community depend on marine mammal ecotourism, and would be impacted, should the population of humpback whales, which calve, breed, and nurse in the region be harmed. The whale watch guide network requested that seismic surveys do not occur during whale migration season, as threats to whales and dolphins are a threat to their livelihood.

Response: Again, NMFS does not have the authority to authorize seismic surveys and will not require L–DEO to change their planned survey timing to accommodate the whale watch industry. However, since L–DEO is required to limit its surveys of the ''nearshore'' tracklines (see definition above) between May 1 and October 31, when migrating humpbacks are expected to have transited through the area. NMFS has determined that L–DEO's planned surveys would have a negligible impact on all species, including the humpback whales that are of particular interest to the whale watch companies.

Comment 5: Whales of Guerrero and SOMEMMA expressed concern that the surveys would harm the reputation of the region as environmentally protective, which would be financially damaging to the area. Both organizations requested L–DEO discuss the ''potentially harmful'' surveys with regional governmental officials and scientific organizations which are invested in a healthy marine ecology prior to conducting survey work in Guerrero.

Response: This comment is outside the scope of our action. L–DEO conducted all necessary consultations with the Mexican government to obtain approval to operate in the area.

Comment 6: The CBD stated that the proposed IHA does not include the best available science regarding humpback whales. The CBD stated that the proposed IHA says that both the threatened Mexico DPS and endangered Central America DPS may occur in the proposed survey area, while the CBD said that humpback whales that winter along the Pacific coast of southern Mexico off the states of Oaxaca and Guerrero are likely to be part of the Central America DPS, not the Mexico DPS.

Response: The CBD is correct that the notice of proposed IHA (87 FR 1992; January 12, 2022) stated that humpback whales from both the Central America DPS and Mexico DPS may occur in the survey area. The notice further states that due to the expected timing of the surveys (spring), most humpbacks from the Mexico DPS will have begun their migration north toward the feeding grounds off of the U.S. west coast and are likely to be outside of the survey area. Humpbacks from the Central America DPS will likely be migrating northward through the survey area at the time of the proposed survey. The notice stated that we assume that most humpback whales taken by the proposed survey activities will be from the Central America DPS. NMFS has used the best available science in assessing the likelihood of each DPS occurring in the survey area during the planned surveys, and CBD does not offer new or contradictory information.

Comment 7: The CBD stated that NMFS overestimated the abundance of the humpback whale population that may be exposed to the surveys. The CBD referenced Wade (2021) which estimated the abundance of the Central America DPS of humpback whales to be 755 individuals, while Table 1 in the notice of proposed IHA gives an abundance estimate of the Central North Pacific stock of humpback whales as 10,103 individuals. The CBD asserts that the Central North Pacific stock of humpback whales is the wrong stock for the area.

Response: As noted by the CBD in previous comment letters (*e.g.,* 86 FR 29090; May 28, 2021), the designated stocks of humpback whales under the MMPA do not neatly align with the ESA-designated DPSs. Some humpback whales from the Mexico and Central America DPSs may be part of the Central North Pacific stock, and some may be part of the California/Oregon/Washington stock, which has an estimated abundance of 4,973 individuals (Carretta *et al.,* 2021). The abundance of humpback whales used to assess the relative proportion of the population taken, which informs our small numbers determination, is the estimated population of humpbacks in the Pacific waters of Mexico (2,566 individuals; Gerrodette and Palacios, 1996). NMFS has authorized a total of only 8 takes of humpback whales, which is considered small numbers relative to any of the aforementioned abundance estimates for each population.

Comment 8: The CBD asserts that NMFS failed to adequately assess the impacts of the surveys on the Central America DPS of humpback whales. The CBD states that the surveys may disrupt breeding activity, which would have a potential individual effect (*i.e.,* lowering the individual's reproductive fitness), and a population-level impact by decreasing the population's ability to grow and recover, referring to a paper cited by NMFS in the notice of proposed IHA (Cerchio *et al.,* 2014). The CBD recommended NMFS restrict the authorization to the summer months to minimize harm to humpback whales.

Response: The paper referenced by the CBD (Cerchio *et al.,* 2014) describes observations of humpback whales off the coast of Angola reducing their singing activity when exposed to noise from seismic surveys. However, the authors of that paper state that it is impossible to determine from the study whether the decrease in humpback whale singing would translate into detrimental effects on individuals or the population. The CBD does not provide any additional evidence to support its assertion that the effects of L–DEO's proposed activity would have population-level impacts, or to justify its assertion that the recommended temporal restriction is warranted under the MMPA. NMFS does not expect any impacts to the fitness of individual breeding humpback whales or the population as a whole, regardless of the prescribed mitigation. However, as described above, Whales of Guerrero informed NMFS that humpback whales have been observed breeding, calving, and nursing in the region throughout the spring. Based on the information provided by Whales of Guerrero, which showed that humpback whale occurrence in the survey area is generally concentrated in the nearshore waters, and confirmation on the measure's practicability, NMFS is adding a requirement to the IHA to limit L–DEO's survey of the ''nearshore'' tracklines until after May 1, at which point all breeding humpback whales are expected to have left the area, through October 31, before breeding humpback whales are expected to return to the area. Therefore, any potential for impacts to the fitness of individual breeding humpback whales or the

population as a whole is further reduced.

Comment 9: The CBD urged NMFS to use density estimates for waters in the area of the survey specifically, rather than in the greater Eastern Tropical Pacific.

Response: The CBD did not provide any sources for site-specific density estimates of any species. Therefore, NMFS' utilization of the density estimates for the greater Eastern Tropical Pacific to estimate take as the best available science remains valid.

Comment 10: The CBD stated that no one-time, one-year IHA renewal should be issued without an opportunity for public comment published in the **Federal Register** prior to issuance because the timing of the survey could result in much more severe impacts to Central America humpback whales if it interrupts more of their breeding season.

Response: As described in the notice of proposed IHA (87 FR 1992; January 12, 2022), on a case-by-case basis, NMFS may issue a Renewal IHA following notice to the public providing an additional 15 days for public comments when (1) up to another year of identical or nearly identical activities as described in the Description of Proposed Activity section of the notice of proposed IHA is planned or (2) the activities as described in the Description of Proposed Activity section of the notice of proposed IHA would not be completed by the time the IHA expires and a Renewal would allow for completion of the activities beyond that described in the Dates section of this notice, provided specific conditions are met. All proposed Renewal IHAs are posted for public comment in the **Federal Register**. Additionally, all parties that commented on the initial proposed IHA are directly contacted to provide opportunity to submit additional comments. If L–DEO requests an IHA Renewal, NMFS will comply with all procedural requirements, including the 15-day public comment period and notification to the CBD. Any Renewal IHA issued to L–DEO would include the same mitigation requirements as the initial IHA, including the timing restrictions described in the Mitigation section of this notice.

Changes From the Proposed IHA to Final IHA

No changes have been made to the survey equipment, tracklines, or objectives. The only change from the proposed to final IHA is the addition of a requirement to limit surveys of ''nearshore'' tracklines (see definition in the Comments and Responses section and in the Mitigation section of this notice) between May 1 and October 31.

Description of Marine Mammals in the Area of Specified Activities

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

Table 1 lists all species or stocks for which take is expected and authorized for this action, and summarizes information related to the population or stock, including regulatory status under the MMPA and Endangered Species Act (ESA) and potential biological removal (PBR), where known. For taxonomy, we follow Committee on Taxonomy (2021). PBR is defined by the MMPA as the maximum number of animals, not including natural mortalities, that may be removed from a marine mammal stock while allowing that stock to reach or maintain its optimum sustainable population (as described in NMFS's SARs). While no mortality is anticipated or authorized here, PBR and annual serious injury and mortality from anthropogenic sources are included here as gross indicators of the status of the species and other threats.

Marine mammal abundance estimates presented in this document represent the total number of individuals that make up a given stock or the total number estimated within a particular study or survey area. NMFS's stock abundance estimates for most species represent the total estimate of individuals within the geographic area, if known, that comprises that stock. For some species, this geographic area may extend beyond U.S. waters. All managed stocks in this region are assessed in NMFS's U.S. Pacific SARs. All values presented in Table 1 are the most recent available at the time of publication and are available in the 2020 SARs (Carretta *et al.,* 2021) and draft 2021 SARs (available online at: *https://www.fisheries.noaa.gov/national/marine-mammal-protection/draft-marine-mammal-stock-assessment-reports*). Where available, abundance and status information is also presented for marine mammals in the Pacific waters of Mexico and/or the greater ETP region. Table 1 denotes the status of species and stocks under the U.S. MMPA and ESA. We note also that the Guadalupe fur seal is classified as ''En peligro de extinción'' (in danger of extinction) under the Norma Oficial Mexicana NOM–059–SEMARNAT–2010 and all other marine mammal species listed in Table 1, with the exception of Longman's beaked whales and Deraniyagala's beaked whales, are listed as ''Sujetas a protección especial'' (subject to special protection).

TABLE 1—MARINE MAMMALS THAT COULD OCCUR IN THE SURVEY AREA

Common name	Scientific name	Stock	ESA/MMPA status; strategic (Y/N) [1]	Stock abundance (CV, N_{min}, most recent abundance survey) [2]	PBR	Annual M/SI [3]	ETP abundance [4]	Mexico Pacific abundance [5]
Order Cetartiodactyla—Cetacea—Superfamily Mysticeti (baleen whales)								
Family Balaenopteridae (rorquals):								
Humpback Whale	*Megaptera novaeangliae.*	Central N Pacific	-, -, Y	10,103 (0.3, 7,890, 2006).	83	26	2,566	
Minke whale	*Balaenoptera acutorostrata.*	N/A	-, -, N	N/A	N/A	N/A	115	
Bryde's whale	*Balaenoptera edeni*	Eastern Tropical Pacific.	-, -, N	Unknown (Unknown, Unknown, N/A).	Undetermined	Unknown	10,411	649
Sei whale	*Balaenoptera borealis*	Eastern N Pacific	E, D, Y	519 (0.4, 374, 2014)	0.75	≥0.2	0	

TABLE 1—MARINE MAMMALS THAT COULD OCCUR IN THE SURVEY AREA—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]	ETP abundance [4]	Mexico Pacific abundance [5]
Fin whale	*Balaenoptera physalus*.	N/A	E, D, Y	N/A	N/A	N/A	574	145
Blue whale	*Balaenoptera musculus*.	Eastern N Pacific	E, D, Y	1,898 (0.085, 1,767, 2018).	4.1	≥19.4	1,415	773
Superfamily Odontoceti (toothed whales, dolphins, and porpoises)								
Family Physeteridae:								
Sperm whale	*Physeter macrocephalus*.	N/A	E, D, Y	N/A	N/A	N/A	4,145	2,810
Family Kogiidae:								
Dwarf Sperm Whale.	*Kogia sima*	N/A	N/A	N/A	N/A	N/A	[6] 11,200	
Family Ziphiidae (beaked whales):								
Cuvier's Beaked Whale.	*Ziphius cavirostris*	N/A	-, -, N	N/A	N/A	N/A	[7] 20,000	[8] 68,828
Longman's beaked whale.	*Indopacetus pacificus*	N/A	-, -, N	N/A	N/A	N/A	1,007	
Blainville's beaked whale.	*Mesoplodon densirostris*.	N/A	-, -, N	N/A	N/A	N/A	[9] 25,300	[8] 68,828
Ginkgo-toothed beaked whale.	*M. ginkgodens*	N/A	-, -, N	N/A	N/A	N/A	[9] 25,300	[8] 68,828
Deraniyagala's beaked whale.	*M. hotaula*	N/A	-, -, N	N/A	N/A	N/A	[9] 25,300	[8] 68,828
Pygmy beaked whale.	*M. peruvianus*	N/A	-, -, N	N/A	N/A	N/A	[9] 25,300	[8] 68,828
Family Delphinidae:								
Risso's dolphin	*Grampus griseus*	N/A	-, -, N	N/A	N/A	N/A	110,457	24,084
Rough-toothed dolphin.	*Steno bredanensis*	N/A	-, -, N	N/A	N/A	N/A	107,663	37,511
Common bottlenose dolphin.	*Tursiops truncatus*	N/A	-, -, N	N/A	N/A	N/A	335,834	61,536
Pantropical spotted dolphin.	*Stenella attenuata*	N/A [10]	-, D, N	N/A	N/A	N/A	[11] 1,297,091	146,296
Spinner dolphin	*Stenella longirostris*	N/A [10]	-, D, N	N/A	N/A	N/A	[11] 2,075,871	186,906
Striped dolphin	*Stenella coeruleoalba*	N/A	-, -, N	N/A	N/A	N/A	964,362	128,867
Short-beaked common dolphin.	*Delphinus delphis*	N/A	-, -, N	N/A	N/A	N/A	3,127,203	283,196
Fraser's dolphin	*Lagenodelphis hosei*	N/A	-, -, N	N/A	N/A	N/A	[7] 289,300	
Short-finned pilot whale.	*Globicephala macrorhynchus*.	N/A	-, -, N	N/A	N/A	N/A	[12] 589,315	3,348
Killer whale	*Orcinus orca*	N/A	-, -, N	N/A	N/A	N/A	[7] 8,500	852
False killer whale	*Pseudorca crassidens*	N/A	-, -, N	N/A	N/A	N/A	[7] 39,800	
Pygmy killer whale	*Feresa attenuata*	N/A	-, -, N	N/A	N/A	N/A	[7] 38,900	
Melon-headed whale.	*Peponocephala electra*.	N/A	-, -, N	N/A	N/A	N/A	[7] 45,400	
Order Carnivora—Superfamily Pinnipedia								
Family Otariidae (eared seals and sea lions):								
Guadalupe fur seal.	*Arctocephalus townsendi*.	Mexico	T, D, Y	34,187 (N/A, 31,019, 2013).	1,062	≥3.8		
California sea lion	*Zalophus californianus*	U.S	-, -, N	257,606 (N/A,233,515, 2014).	14,011	>320	105,000	

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

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

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

[4] From NMFS (2015b) unless otherwise noted.

[5] Pacific Mexico excluding the Gulf of California (from Gerrodette and Palacios (1996) unless otherwise noted).

[6] Estimate for ETP is mostly for *K. sima* but may also include some *K. breviceps* (Wade and Gerrodette 1993).

[7] Wade and Gerrodette 1993.

[8] Abundance for all ziphiids.

[9] This estimate for the ETP includes all species of the genus *Mesoplodon*.

[10] Several stocks of these species, while not classified as such in the U.S. SARs, are considered depleted due to historical interactions with tuna fisheries in the area. Please see the notice of proposed IHA (87 FR 1992; January 12, 2022) for a discussion of these stocks.

As indicated above, all 30 species (with six managed stocks) in Table 1 temporally and spatially co-occur with the activity to the degree that take is reasonably likely to occur, and we have authorized it. As the planned survey lines are outside of the U.S. EEZ, they do not directly overlap with the defined ranges for most U.S. managed stocks (Carretta *et al.,* 2021). For some species (*e.g.,* Bryde's whale, Guadalupe fur seal; see Table 1), animals encountered during the surveys could be from a defined stock under the MMPA but most marine mammals in the survey area do not belong to any defined stock.

A detailed description of the species likely to be affected by the geophysical surveys, including brief introductions to the species and relevant stocks as well as available information regarding population trends and threats, and information regarding local occurrence, were provided in L–DEO's IHA application and summarized in the **Federal Register** notice for the proposed IHA (87 FR 1992; January 12, 2022). Additional information provided by Whales of Guerrero regarding seasonal presence of humpback whales is summarized in the Comments and Responses section above, and their full comment letter is available at *https://www.fisheries.noaa.gov/national/marine-mammal-protection/incidental-take-authorizations-research-and-other-activities*. Since publication of the notice of proposed IHA, we are not aware of any changes in ESA or MMPA status of these species or stocks; therefore, detailed descriptions are not provided here. Please refer to that **Federal Register** notice and the IHA application for these descriptions. Please also refer to NMFS' website (*www.nmfs.noaa.gov/pr/species/mammals/*) 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. 30 marine mammal species (28 cetacean and two pinniped (both otariid) species) have the reasonable potential to co-occur with the planned survey activities. Please refer to Table 1. Of the cetacean species that may be present, six are classified as low-frequency cetaceans (*i.e.,* all mysticete species), 20 are classified as mid-frequency cetaceans (*i.e.,* all delphinid and ziphiid species and the sperm whale), and two are classified as high-frequency cetaceans (*i.e., Kogia* spp.).

Potential Effects of Specified Activities on Marine Mammals and Their Habitat

The effects of underwater noise from L–DEO's geophysical survey activities have the potential to result in behavioral harassment of marine mammals in the vicinity of the survey area. The notice of proposed IHA (87 FR 1992; January 12, 2022) included a discussion of the effects of anthropogenic noise on marine mammals and the potential effects of underwater noise from L–DEO's geophysical survey activities on marine mammals and their habitat. That information and analysis is incorporated by reference into this final IHA determination and is not repeated here; please refer to the notice of proposed IHA (87 FR 1992; January 12, 2022). The referenced information includes a summary and discussion of the ways that the specified activity may impact marine mammals and their habitat. Consistent with the analysis in our prior **Federal Register** notices for similar L–DEO surveys and after independently evaluating the analysis in L–DEO's application, we determine that the survey is likely to result in the takes described in the Estimated Take section of this document and that other forms of take are not expected to occur.

The Estimated Take section later in this document includes a quantitative analysis of the number of individuals that are expected to be taken by this

activity. The Negligible Impact Analysis and Determination section considers the content of this section, the Estimated Take section, and the Mitigation section, to draw conclusions regarding the likely impacts of these activities on the reproductive success or survivorship of individuals and how those impacts on individuals are likely to impact marine mammal species or stocks.

Estimated Take

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

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

Authorized takes are primarily by Level B harassment, as use of 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) for mysticetes and high frequency cetaceans (*i.e., Kogia* spp.). The required mitigation and monitoring measures are expected to minimize the severity of such taking to the extent practicable. As described previously, no serious injury or mortality is anticipated or authorized for this activity. Below we describe how the take is estimated.

Generally speaking, we estimate take by considering: (1) Acoustic thresholds above which NMFS believes the best available science indicates marine mammals will be behaviorally harassed or incur some degree of permanent hearing impairment; (2) the area or volume of water that will be ensonified above these levels in a day; (3) the density or occurrence of marine mammals within these ensonified areas; and, (4) the number of days of activities. We note that while these basic factors can contribute to a basic calculation to provide an initial prediction of takes, additional information that can qualitatively inform take estimates is also sometimes available (*e.g.,* previous monitoring results or average group size). Below, we describe the factors considered here in more detail and present the take estimate.

Acoustic Thresholds

NMFS recommends the use of acoustic thresholds that identify the received level of underwater sound above which exposed marine mammals would be reasonably expected to be behaviorally harassed (equated to Level B harassment) or to incur permanent threshold shift (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 microPascal (µPa) root mean square (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 activity includes the use of impulsive seismic sources, and therefore the 160 dB re 1 µPa (rms) threshold is applicable.

Level A harassment for non-explosive sources—NMFS' Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing (Version 2.0) (Technical Guidance, 2018) identifies dual criteria to assess auditory injury (Level A harassment) to five different marine mammal groups (based on hearing sensitivity) as a result of exposure to noise from two different types of sources (impulsive or non-impulsive). L–DEO's planned seismic survey includes the use of impulsive (seismic airguns) sources.

These thresholds are provided in the table below. The references, analysis, and methodology used in the development of the thresholds are described in NMFS 2018 Technical Guidance, which may be accessed at *https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-acoustic-technical-guidance*.

TABLE 3—THRESHOLDS IDENTIFYING THE ONSET OF PERMANENT THRESHOLD SHIFT

Hearing group	PTS onset acoustic thresholds * (received level)	
	Impulsive	Non-impulsive
Low-Frequency (LF) Cetaceans	*Cell 1:* $L_{pk,flat}$: 219 dB; $L_{E,LF,24h}$: 183 dB	*Cell 2:* $L_{E,LF,24h}$: 199 dB.
Mid-Frequency (MF) Cetaceans	*Cell 3:* $L_{pk,flat}$: 230 dB; $L_{E,MF,24h}$: 185 dB	*Cell 4:* $L_{E,MF,24h}$: 198 dB.
High-Frequency (HF) Cetaceans	*Cell 5:* $L_{pk,flat}$: 202 dB; $L_{E,HF,24h}$: 155 dB	*Cell 6:* $L_{E,HF,24h}$: 173 dB.
Phocid Pinnipeds (PW) (Underwater)	*Cell 7:* $L_{pk,flat}$: 218 dB; $L_{E,PW,24h}$: 185 dB	*Cell 8:* $L_{E,PW,24h}$: 201 dB.
Otariid Pinnipeds (OW) (Underwater)	*Cell 9:* $L_{pk,flat}$: 232 dB; $L_{E,OW,24h}$: 203 dB	*Cell 10:* $L_{E,OW,24h}$: 219 dB.

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

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

Ensonified Area

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

The planned 2–D survey would acquire data using 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 in deep water (>1,000 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 (approximately 1600 m), intermediate water depth on the slope (approximately 600–1100 m), and shallow water (approximately 50 m) in the Gulf of Mexico 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 harassment 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 SPL isopleths at their widest point from the sea surface down to the maximum relevant water depth for marine mammals of ~2,000 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 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 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 model curve. However, the observed sound levels are found to fall almost entirely below the model curve. Thus, analysis of the Gulf of Mexico calibration measurements demonstrates that although simple, the L–DEO model is a robust tool for conservatively estimating isopleths.

For deep water (>1,000 m), L–DEO used the deep-water radii obtained from model results down to a maximum water depth of 2000 m. The radii for intermediate water depths (100–1,000 m) were 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 (See Fig. 16 in Appendix H of NSF–USGS, 2011).

L–DEO's modeling methodology is described in greater detail in their IHA application. The estimated distances to the Level B harassment isopleths for the array are shown in Table 4. Please note that no survey effort will occur in waters <100 m deep. The estimated isopleth distance specific to shallow water depths are provided for reference only.

TABLE 4—PREDICTED RADIAL DISTANCES TO ISOPLETHS CORRESPONDING TO LEVEL B HARASSMENT THRESHOLD

Source and volume	Tow depth (m)	Water depth (m)	Level B harassment zone (m)
36 airgun array; 6,600 in^3	12	>1,000	[1] 6,733
		100–1,000	[2] 10,100
		<100 [3]	[4] 25,494

[1] Distance 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] No survey effort will occur in waters <100 m deep.
[4] Distance is based on empirically derived measurements in the Gulf of Mexico 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 source modeling software program and the NMFS User Spreadsheet, described below. The 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 2018). 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 arrays were derived from calculating the modified far-field signature. The far-field signature is often used as a theoretical representation of the source level. To compute the far-field 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 far-field 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 far-field 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 far-field signature. Because the far-field signature does not take into account the large array effect near the source and is calculated as a point source, the modified far-field 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 estimating Level B harassment distances 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.

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). 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 information specific to the planned survey (*i.e.,* the 2.2 m/s source velocity and (worst-case) 50-m shot interval, equivalent to a repetition rate of 23.1 seconds), potential radial distances to auditory injury zones were then calculated for SEL_{cum} thresholds.

Inputs to the User Spreadsheets in the form of estimated source levels are shown in Appendix A of L–DEO's application. User Spreadsheets used by L–DEO to estimate distances to Level A harassment isopleths for the airgun arrays are also provided in Appendix A of the application. Outputs from the User Spreadsheets in the form of estimated distances to Level A harassment isopleths for the survey are shown in Table 5. 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). L–DEO plans to conduct two different methods of seismic acquisition, MCS using a hydrophone streamer (approximately 62 percent of the total survey effort) and refraction surveys using OBSs (approximately 38 percent of the total survey effort). The airguns would fire at a shot interval of 50 m (repetition rate of 23 seconds) during MCS surveys and at a 400-m interval (repetition rate of 155 seconds) during refraction surveys to OBSs. The distances presented in Table 5 were calculated using the MCS survey inputs as using the 50-m shot interval provides more conservative distances than the 400-m shot interval.

TABLE 5—MODELED RADIAL DISTANCES (m) TO ISOPLETHS CORRESPONDING TO LEVEL A HARASSMENT THRESHOLDS

Source (volume)	Threshold	Level A harassment zone (m)			
		LF cetaceans	MF cetaceans	HF cetaceans	Otariids
36-airgun array (6,600 in^3)	SEL_{cum}	320.2	0	1.0	0
	Peak	8.9	13.9	268.3	10.6

Note that because of some of the assumptions included in the methods used (*e.g.,* stationary receiver with no vertical or horizontal movement in response to the acoustic source), isopleths produced may be overestimates to some degree, which will ultimately result in some degree of overestimation 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.

Auditory injury is unlikely to occur for mid-frequency cetaceans and otariid pinnipeds, given very small modeled zones of injury for those species (all estimated zones less than 15 m for mid-frequency cetaceans and otariid pinnipeds), in context of distributed source dynamics. The source level of the array is a theoretical definition assuming a point source and measurement in the far-field of the source (MacGillivray, 2006). As

described by Caldwell and Dragoset (2000), an array is not a point source, but one that spans a small area. In the far-field, individual elements in arrays will effectively work as one source because individual pressure peaks will have coalesced into one relatively broad pulse. The array can then be considered a ''point source.'' For distances within the near-field, *i.e.,* approximately 2–3 times the array dimensions, pressure peaks from individual elements do not arrive simultaneously because the observation point is not equidistant from each element. The effect is destructive interference of the outputs of each element, so that peak pressures in the near-field will be significantly lower than the output of the largest individual element. Here, the relevant peak isopleth distances would in all cases be expected to be within the near-field of the array where the definition of source level breaks down. Therefore, actual locations within this distance of the array center where the sound level exceeds the relevant peak SPL thresholds would not necessarily exist. In general, Caldwell and Dragoset (2000) suggest that the near-field for airgun arrays is considered to extend out to approximately 250 m.

In order to provide quantitative support for this theoretical argument, we calculated expected maximum distances at which the near-field would transition to the far-field (Table 5). For a specific array one can estimate the distance at which the near-field transitions to the far-field by:

$$D = \frac{L^2}{4\lambda}$$

with the condition that $D >> \lambda$, and where D is the distance, L is the longest dimension of the array, and λ is the wavelength of the signal (Lurton, 2002). Given that λ can be defined by:

$$\lambda = \frac{v}{f}$$

where f is the frequency of the sound signal and v is the speed of the sound in the medium of interest, one can rewrite the equation for D as:

$$D = \frac{fL^2}{4v}$$

and calculate D directly given a particular frequency and known speed of sound (here assumed to be 1,500 meters per second in water, although this varies with environmental conditions).

To determine the closest distance to the arrays at which the source level predictions in Table 5 are valid (*i.e.,* maximum extent of the near-field), we calculated D based on an assumed frequency of 1 kHz. A frequency of 1 kHz is commonly used in near-field/far-field calculations for airgun arrays (Zykov and Carr, 2014; MacGillivray, 2006; NSF and USGS, 2011), and based on representative airgun spectrum data and field measurements of an airgun array used on the *Langseth,* nearly all (greater than 95 percent) of the energy from airgun arrays is below 1 kHz (Tolstoy *et al.,* 2009). Thus, using 1 kHz as the upper cut-off for calculating the maximum extent of the near-field should reasonably represent the near-field extent in field conditions.

If the largest distance to the peak sound pressure level threshold was equal to or less than the longest dimension of the array (*i.e.,* under the array), or within the near-field, then received levels that meet or exceed the threshold in most cases are not expected to occur. This is because within the near-field and within the dimensions of the array, the source levels specified in Appendix A of L–DEO's application are overestimated and not applicable. In fact, until one reaches a distance of approximately three or four times the near-field distance the average intensity of sound at any given distance from the array is still less than that based on calculations that assume a directional point source (Lurton, 2002). The 6,600-in^3 airgun array planned for use during the planned survey has an approximate diagonal of 28.8 m, resulting in a near-field distance of 138.7 m at 1 kHz (NSF and USGS, 2011). Field measurements of this array indicate that the source behaves like multiple discrete sources, rather than a directional point source, beginning at approximately 400 m (deep site) to 1 km (shallow site) from the center of the array (Tolstoy *et al.,* 2009), distances that are actually greater than four times the calculated 140-m near-field distance. Within these distances, the recorded received levels were always lower than would be predicted based on calculations that assume a directional point source, and increasingly so as one moves closer towards the array (Tolstoy *et al.,* 2009). Given this, relying on the calculated distance (138.7 m) as the distance at which we expect to be in the near-field is a conservative approach since even beyond this distance the acoustic modeling still overestimates the actual received level. Within the near-field, in order to explicitly evaluate the likelihood of exceeding any particular acoustic threshold, one would need to consider the exact position of the animal, its relationship to individual array elements, and how the individual acoustic sources propagate and their acoustic fields interact. Given that within the near-field and dimensions of the array source levels would be below those assumed here, we believe exceedance of the peak pressure threshold would only be possible under highly unlikely circumstances.

In consideration of the received sound levels in the near-field as described above, we expect the potential for Level A harassment of mid-frequency cetaceans, otariid pinnipeds, and phocid pinnipeds to be de minimis, even before the likely moderating effects of aversion and/or other compensatory behaviors (*e.g.,* Nachtigall *et al.,* 2018) are considered. We do not believe that Level A harassment is a likely outcome for any mid-frequency cetacean, otariid pinniped, or phocid pinniped and have not authorized any Level A harassment for these species.

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.

L–DEO used habitat-based stratified marine mammal densities for summer for the ETP when available (Barlow *et al.,* 2009), and densities for the ETP from NMFS (2015b) for all other species (Table 6). Barlow *et al.* (2009) used data from 16 NMFS Southwest Fisheries Science Center (SWFSC) ship-based cetacean and ecosystem assessment surveys between 1986 and 2006 to develop habitat models to predict density for 15 cetacean species in the ETP. Model predictions were then used in standard line-transect formulae to estimate density for each transect segment for each survey year. Predicted densities for each year were smoothed with geospatial methods to obtain a continuous grid of density estimates for the surveyed area in the ETP. These annual grids were then averaged to obtain a composite grid that represents our best estimates of cetacean density over the past 20 years in the ETP. The models developed by Barlow *et al.* (2009) have been incorporated into a web-based GIS software system developed by Duke University's Strategic Environmental Research and Development Program. The habitat-based density models consist of 100 km x 100 km grid cells. Densities in the grid cells that overlapped the survey area were averaged for each of the three water depth categories (shallow, intermediate, deep).

The NMFS SWFSC also developed density estimates for species in the ETP that may be affected by their own

fisheries research activities (NMFS 2015b). These estimates were derived from abundance estimates using ship-based surveys of marine mammals in the ETP, as reported by Gerrodette *et al.* (2008). While the SWFSC developed volumetric density estimates (animals/km^3) to account for typical dive depth of each species (0–200 m and >200 m), L–DEO used the area density (animals/km^2) to represent expected density across all water depth strata.

For the sei whale, for which NMFS (2015b) reported a density of zero, L–DEO used the spring density for Baja from U.S. Navy (2017b). No regional density estimates are available for Guadalupe fur seals in the ETP; therefore, NMFS (2015b) used the density of Guadalupe fur seals in the California Current Ecosystem (CCE) as a proxy. However, as the survey area is south of the typical range of Guadalupe fur seals (Ortiz *et al.,* 2019), the density from the CCE is likely an overestimate. In the survey area, Guadalupe fur seals are extremely unlikely to occur in waters over the continental shelf under 2,000 m (T. Norris, pers. comm.). NMFS has therefore assumed that the density of Guadalupe fur seals in water depths under 2,000 m is zero animals per square km, and have retained the CCE density estimate for waters over 2,000 m deep (Table 6).

TABLE 6—ESTIMATED DENSITIES OF MARINE MAMMALS IN THE SURVEY AREA

Species	Density (#/km^2) in survey area		
	Shallow water (<100 m)	Intermediate water (100–1,000 m)	Deep water (>1,000 m)
Humpback whale	[1] 0.00013	[1] 0.00013	[1] 0.00013
Minke whale	[1] 0.00001	[1] 0.00001	[1] 0.00001
Bryde's whale	[2] 0.000486	[2] 0.000489	[2] 0.000451
Fin whale	[1] 0.00003	[1] 0.00003	[1] 0.00003
Sei whale	[3] 0.00005	[3] 0.00005	[3] 0.00005
Blue whale	[2] 0.00010	[2] 0.00009	[2] 0.00008
Sperm whale	[1] 0.00019	[1] 0.00019	[1] 0.00019
Cuvier's beaked whale	[2] 0.00105	[2] 0.00106	[2] 0.00107
Longman's beaked whale	[1] 0.00004	[1] 0.00004	[1] 0.00004
Mesoplodon spp.[4]	[2] 0.00032	[2] 0.00033	[2] 0.00036
Risso's dolphin	[1] 0.00517	[1] 0.00517	[1] 0.00517
Rough-toothed dolphin	[2] 0.00880	[2] 0.00891	[2] 0.00945
Common bottlenose dolphin	[2] 0.04809	[2] 0.04502	[2] 0.03557
Pantropical spotted dolphin	[1] 0.12263	[1] 0.12263	[1] 0.12263
Spinner dolphin (whitebelly)	[2] 0.00148	[2] 0.00155	[2] 0.00193
Spinner dolphin (eastern)	[2] 0.13182	[2] 0.12989	[2] 0.12791
Striped dolphin	[2] 0.02800	[2] 0.02890	[2] 0.03516
Short-beaked common dolphin	[2] 0.04934	[2] 0.04881	[2] 0.04435
Fraser's dolphin	[1] 0.01355	[1] 0.01355	[1] 0.01355
Short-finned pilot whale[5]	[2] 0.00346	[2] 0.00344	[2] 0.00382
Killer whale	[1] 0.0004	[1] 0.0004	[1] 0.0004
False killer whale	[1] 0.00186	[1] 0.00186	[1] 0.00186
Pygmy killer whale	[1] 0.00183	[1] 0.00183	[1] 0.00183
Melon-headed whale	[1] 0.00213	[1] 0.00213	[1] 0.00213
Kogia spp.	[1] 0.00053	[1] 0.00053	[1] 0.00053
Guadalupe fur seal	0	[1][6] 0.00741	[1] 0.00741
California sea lion	[1] 0.16262	[1] 0.16262	[7] 0

[1] Density in greater ETP (NMFS 2015b).
[2] Density in planned survey area (Barlow *et al.,* 2009).
[3] Density for Baja (U.S. Navy 2017b).
[4] Density for Mesoplodon species guild (Blainville's beaked whale, Gingko-toothed beaked whale, Deraniyagala's beaked whale, and pygmy beaked whale).
[5] Density for *Globicephala* species guild.
[6] Density is assumed to be zero in waters <2,000 m.
[7] Density is assumed to be zero in deep water (>1,000 m).

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 or Level B harassment, radial distances 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 and Level B harassment thresholds. L–DEO identified specific seismic survey trackline(s) that could be surveyed on one day of research; in this case, a representative 182-km MCS line and a 222-km long OBS line were chosen. The distances to the 160-dB Level B harassment threshold and PTS (Level A harassment) thresholds (based on L–DEO model results) were used to draw a buffer around every transect line in GIS to determine the daily ensonified area in each depth category. The ensonified areas were then multiplied by the number of survey days (7 days for OBS survey effort; 13 days for MCS survey effort) increased by 25 percent. As noted previously, L–DEO has added 25 percent in the form of operational days, which is equivalent to adding 25 percent to the planned line kilometers to be surveyed. This accounts for the possibility that additional operational days are required, but likely results in an overestimate of actual exposures. For additional details regarding calculations of ensonified area, please see Appendix D of L–DEO's application. L–DEO's estimated incidents of exposure above Level A and Level B harassment criteria are presented in Table 7.

As previously noted, NMFS does not have authority under the MMPA within the territorial seas of foreign nations (from 0–12 nmi (22.2 km) from shore), as the MMPA does not apply in those waters, and therefore does not authorize incidental take that may occur as a result of activities occurring within territorial waters. However, NMFS has still calculated the estimated level of incidental take in the entire activity area (including Mexican territorial waters) as part of the analysis supporting our determination under the MMPA that the activity will have a negligible impact on the affected species. The total estimated take in U.S. and Mexican waters is presented in Table 8 (see Negligible Impact Analysis and Determination).

L–DEO generally assumed that their estimates of marine mammal exposures above harassment thresholds to equate to take and requested authorization of those takes. Those estimates in turn form the basis for our take authorization numbers. For the species for which NMFS does not expect there to be a reasonable potential for take by Level A harassment to occur, *i.e.,* mid-frequency cetaceans and all pinnipeds, we have added L–DEO's estimated exposures above Level A harassment thresholds (and requests for take by Level A harassment) to their estimated exposures above the Level B harassment threshold to produce a total number of incidents of take by Level B harassment that is authorized. Estimated exposures and authorized take numbers are shown in Table 7.

TABLE 7—ESTIMATED AND AUTHORIZED TAKE BY LEVEL A AND LEVEL B HARASSMENT, AND PERCENTAGE OF POPULATION

Species	Estimated takes by Level B harassment	Estimated takes by Level A harassment	Authorized takes by Level B harassment	Authorized takes by Level A harassment	Total authorized take	Regional population size	Percent of population
Humpback whale	8	0	8	0	8	[a] 2,566	0.31
Minke whale	1	0	[b] 2	0	[b] 2	115	1.74
Bryde's whale	27	1	27	1	28	[a] 649	4.31
Fin whale	2	0	2	0	2	[a] 145	1.38
Sei whale	3	0	3	0	3	[c] 29,600	0.01
Blue whale	5	0	5	0	5	773	0.65
Sperm whale	12	0	12	0	12	2,810	0.43
Cuvier's beaked whale	69	0	69	0	69	[c] 20,000	0.35
Longman's beaked whale	3	0	3	0	3	[c] 1,007	0.30
Mesoplodon spp.	23	0	23	0	23	[c] 25,300	0.09
Risso's dolphin	327	1	328	0	328	[a] 24,084	1.36
Rough-toothed dolphin	596	1	597	0	597	[a] 37,511	1.59
Common bottlenose dolphin	2,268	6	2,274	0	2,274	[a] 61,536	3.70
Pantropical spotted dolphin	7,973	15	7,988	0	7,988	[a] 146,296	5.46
Spinner dolphin (whitebelly)	121	0	121	0	121	[a] 186,906	0.06
Spinner dolphin (eastern)	8,173	16	8,189	0	8,189	[a] 186,906	4.38
Striped dolphin	2,209	3	2,212	0	2,212	[a] 128,867	1.72
Short-beaked common dolphin	2,812	6	2,818	0	2,818	[a] 283,196	1.00
Fraser's dolphin	856	2	858	0	858	[c] 289,300	0.30
Short-finned pilot whale	244	0	244	0	244	[a] 3,348	7.29
Killer whale	25	0	25	0	25	[a] 852	2.93
False killer whale	118	0	118	0	118	[c] 39,600	0.30
Pygmy killer whale	116	0	116	0	116	[c] 38,900	0.30
Melon-headed whale	135	0	135	0	135	[c] 45,400	0.30
Kogia spp	33	1	33	1	34	[c d] 11,200	0.30
Guadalupe fur seal	415	1	416	0	416	[c] 34,187	1.22
California sea lion	349	16	365	0	365	[c] 105,000	0.35

[a] Estimated population in Pacific waters of Mexico (Gerrodette and Palacios (1996)).
[b] Authorized take increased to maximum group size.
[c] Population in ETP or wider Pacific (NMFS 2015b).
[d] Population of *Kogia* species guild.

Mitigation

In order to issue an IHA under section 101(a)(5)(D) of the MMPA, NMFS must set forth the permissible methods of taking pursuant to the activity, and other means of effecting the least practicable impact on the species or stock and its habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance, and on the availability of the species or stock for taking for certain subsistence uses (latter not applicable for this action). NMFS regulations require applicants for incidental take authorizations to include information about the availability and feasibility (economic and technological) of equipment, methods, and manner of conducting the activity or other means of effecting the least practicable adverse impact upon the affected species or stocks and their habitat (50 CFR 216.104(a)(11)).

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

(1) The manner in which, and the degree to which, the successful implementation of the measure(s) is expected to reduce impacts to marine mammals, marine mammal species or stocks, and their habitat. This considers the nature of the potential adverse impact being mitigated (likelihood,

scope, range). It further considers the likelihood that the measure will be effective if implemented (probability of accomplishing the mitigating result if implemented as planned), 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.

In order to satisfy the MMPA's least practicable adverse impact standard, NMFS has evaluated a suite of basic mitigation protocols for seismic surveys that are required regardless of the status of a stock. Additional or enhanced protections may be required for species whose stocks are in particularly poor health and/or are subject to some significant additional stressor that lessens that stock's ability to weather the effects of the specified activities without worsening its status. We reviewed seismic mitigation protocols required or recommended elsewhere (*e.g.,* HESS, 1999; DOC, 2013; IBAMA, 2018; Kyhn *et al.,* 2011; JNCC, 2017; DEWHA, 2008; BOEM, 2016; DFO, 2008; GHFS, 2015; MMOA, 2016; Nowacek *et al.,* 2013; Nowacek and Southall, 2016), recommendations received during public comment periods for previous actions, and the available scientific literature. We also considered recommendations given in a number of review articles (*e.g.,* Weir and Dolman, 2007; Compton *et al.,* 2008; Parsons *et al.,* 2009; Wright and Cosentino, 2015; Stone, 2015b). This exhaustive review and consideration of public comments regarding previous, similar activities has led to development of the protocols included here.

Vessel-Based Visual Mitigation Monitoring

Visual monitoring requires the use of trained observers (herein referred to as visual protected species observers (PSOs)) to scan the ocean surface for the presence of marine mammals. The area to be scanned visually includes primarily the exclusion zone (EZ), within which observation of certain marine mammals requires shutdown of the acoustic source, but also a buffer zone and, to the extent possible depending on conditions, the surrounding waters. The buffer zone means an area beyond the EZ to be monitored for the presence of marine mammals that may enter the EZ. During pre-start clearance monitoring (*i.e.,* before ramp-up begins), the buffer zone also acts as an extension of the EZ 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 EZ, out to a radius of 1,000 m from the edges of the airgun array (500–1,000 m). This 1,000-m zone (EZ plus buffer) represents the pre-start clearance zone. Visual monitoring of the EZ 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 closer to the vessel. Visual monitoring of the buffer zone is intended to (1) provide additional protection to marine mammals that may be in the vicinity of the vessel during pre-start clearance, and (2) during airgun use, aid in establishing and maintaining the EZ by alerting the visual observer and crew of marine mammals that are outside of, but may approach and enter, the EZ.

L–DEO must use dedicated, trained, NMFS-approved 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 (discussed below) aboard the vessel must have a minimum of 90 days at-sea experience working in those roles, respectively, with no more than 18 months elapsed since the conclusion of the at-sea experience. One visual PSO with such experience must be designated as the lead for the entire protected species observation team. The lead PSO must 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 must 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). Visual monitoring of the pre-start clearance zone must begin no less than 30 minutes prior to ramp-up, and monitoring must continue until one hour after use of the acoustic source ceases or until 30 minutes past sunset. Visual PSOs must 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 must establish and monitor the exclusion and buffer zones. These zones must 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 acoustic source (*i.e.,* anytime airguns are active, including ramp-up), detections of marine mammals within the buffer zone (but outside the EZ) must be communicated to the operator to prepare for the potential shutdown of the acoustic source. Visual PSOs must 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 must be relayed to the PSO team. During good conditions (*e.g.,* daylight hours; Beaufort sea state (BSS) 3 or less), visual PSOs must conduct observations when the acoustic source is not operating for comparison of sighting rates and behavior with and without use of the acoustic source and between acquisition periods, to the maximum extent practicable.

Visual PSOs may be on watch for a maximum of 4 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 EZ 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.

PAM must 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. Acoustic 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 vocalize, but it can be effective either by day or by night, and does not depend on good visibility. It must be monitored in real time so that the visual observers can be advised when cetaceans are detected.

The R/V *Langseth* must 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 4 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 5 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 EZ in the previous 2 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 5 hours in any 24-hour period.

Establishment of Exclusion and Pre-Start Clearance Zones

An 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 must establish a minimum EZ with a 500-m radius. The 500-m EZ must be based on radial distance from the edge 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 must be shut down.

The pre-start clearance zone is defined as the area that must be clear of marine mammals prior to beginning ramp-up of the acoustic source, and includes the EZ plus the buffer zone. Detections of marine mammals within the pre-start clearance zone must prevent airgun operations from beginning (*i.e.,* ramp-up).

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 SEL_{cum} 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. The pre-start clearance zone simply represents the addition of a buffer to the EZ, doubling the EZ size during pre-clearance.

An extended EZ of 1,500 m must be enforced for all beaked whales and *Kogia* species. No buffer of this extended EZ is required.

Pre-Start 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 must not be less than approximately 20 minutes. The intent of pre-start clearance observation (30 minutes) is to ensure no protected species are observed within the pre-clearance zone (or extended EZ, for beaked whales and *Kogia* spp.) prior to the beginning of ramp-up. During pre-start clearance period is the only time observations of marine mammals in the buffer zone would prevent operations (*i.e.,* the beginning of ramp-up). The intent of ramp-up is to warn marine mammals of pending seismic survey 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-start 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 must not be less than 60 minutes prior to the planned ramp-up in order to allow the PSOs time to monitor the pre-start clearance zone (and extended EZ) for 30 minutes prior to the initiation of ramp-up (pre-start clearance);
- Ramp-ups must 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-start 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 pre-start clearance zone (or extended EZ, for beaked whales and *Kogia* species) during the 30 minute pre-start 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 mysticetes and all other odontocetes, including sperm whales, beaked whales, and large delphinids, such as killer whales);
- Ramp-up must 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 must not be less than 20 minutes. The operator must

provide information to the PSO documenting that appropriate procedures were followed;

- PSOs must monitor the pre-start clearance zone (and extended EZ) during ramp-up, and ramp-up must cease and the source must be shut down upon detection of a marine mammal within the applicable zone. Once ramp-up has begun, detections of marine mammals within the buffer zone do not require shutdown, but such observation must be communicated to the operator to prepare for the potential shutdown;
- 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 (*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 EZ. For any longer shutdown, pre-start 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-start clearance watch of 30 minutes 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-start clearance of 30 min.

Shutdown

The shutdown of an airgun array requires the immediate de-activation of all individual airgun elements of the array. Any PSO on duty will have the authority to delay the start of survey operations or to call for shutdown of the acoustic source if a marine mammal is detected within the applicable EZ. The 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 commands are conveyed swiftly while allowing PSOs to maintain watch. When both visual and acoustic PSOs are on duty, all detections must 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 (1) a marine mammal appears within or enters the applicable EZ and/or (2) a marine mammal (other than delphinids, see below) is detected acoustically and localized within the applicable EZ, the acoustic source must be shut down. When shutdown is called for by a PSO, the acoustic source must be immediately deactivated and any dispute resolved only following deactivation. Additionally, shutdown must 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 must be notified but shutdown is not required.

Following a shutdown, airgun activity must not resume until the marine mammal has cleared the EZ. The animal is considered to have cleared the EZ if it is visually observed to have departed the EZ (*i.e.,* animal is not required to fully exit the buffer zone where applicable), or it has not been seen within the EZ for 15 minutes for small odontocetes and pinnipeds, or 30 minutes for all mysticetes and all other odontocetes, including sperm whales, beaked whales, *Kogia* species, and large delphinids, such as killer whales.

The shutdown requirement is waived for small dolphins if an individual is detected within the EZ. As defined here, the small dolphin 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 applies solely to specific genera of small dolphins (*Delphinus, Lagenodelphis, Lissodelphis, Stenella, Steno, and Tursiops*).

We include this small dolphin exception because shutdown requirements for small dolphins under all circumstances represent practicability concerns without likely commensurate benefits for the animals in question. Small dolphins 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 dolphins commonly approach vessels and/or towed arrays during active sound production for purposes of bow riding, with no apparent effect observed in those delphinoids (*e.g.,* Barkaszi *et al.,* 2012, Barkaszi and Kelly, 2018). The potential for increased shutdowns resulting from such a measure would require the *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 dolphins, they are much less likely to approach vessels. Therefore, retaining a 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 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 *Langseth.*

Visual PSOs must 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 EZ).

L–DEO must implement shutdown if a marine mammal species for which take was not authorized, or a species for which authorization was granted but the takes have been met, approaches the Level A or Level B harassment zones. L–DEO must also implement shutdown if any large whale (defined as a sperm whale or any mysticete species) with a calf (defined as an animal less than two-thirds the body size of an adult observed to be in close association with an adult) and/or an aggregation of six or more large whales are observed at any distance.

Vessel Strike Avoidance

Vessel operators and crews must maintain a vigilant watch for all protected species and slow down, stop their vessel, or alter course, as

appropriate and regardless of vessel size, to avoid striking any marine mammal. A visual observer aboard the vessel must monitor a vessel strike avoidance zone around the vessel (distances stated below). Visual observers monitoring the vessel strike avoidance zone may be third-party observers (*i.e.,* PSOs) or crew members, but crew members responsible for these duties must be provided sufficient training to (1) distinguish marine mammals from other phenomena and (2) broadly to identify a marine mammal as a whale or other marine mammal.

Vessel speeds must be reduced to 10 knots or less when mother/calf pairs, pods, or large assemblages of cetaceans are observed near a vessel.

All vessels must maintain a minimum separation distance of 100 m from sperm whales and all other baleen whales.

All vessels must, to the maximum extent practicable, attempt to maintain a minimum separation distance of 50 m from all other marine mammals, with an understanding that at times this may not be possible (*e.g.,* for animals that approach the vessel).

When marine mammals are sighted while a vessel is underway, the vessel must take action as necessary to avoid violating the relevant separation distance (*e.g.,* attempt to remain parallel to the animal's course, avoid excessive speed or abrupt changes in direction until the animal has left the area). If marine mammals are sighted within the relevant separation distance, the vessel must reduce speed and shift the engine to neutral, not engaging the engines until animals are clear of the area. This does not apply to any vessel towing gear or any vessel that is navigationally constrained.

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

Operational Restrictions

L–DEO has agreed to limit surveys of all ''nearshore'' tracklines (*i.e.,* tracklines occurring in, or which are anticipated to result in ensonification above the Level B harassment threshold of, areas where humpback whale sightings have been recorded during the migratory period, *e.g.,* the 264-km MCS and OBS trackline nearest and parallel to the shoreline, and all lines landward of that trackline) to between May 1 and October 31. Offshore tracklines may be surveyed outside that date range. This is included as a requirement of the IHA.

We have carefully evaluated the suite of mitigation measures described here and considered a range of other measures in the context of ensuring that we prescribe the means of effecting the least practicable adverse impact on the affected marine mammal species and stocks and their habitat. Based on our evaluation of the required measures, as well as other measures considered by NMFS described above, NMFS has determined that the mitigation measures provide the means of effecting the least practicable impact on the affected species or stocks and their habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance.

Mitigation Measures in Mexican Waters

As stated previously, NMFS cannot authorize the incidental take of marine mammals in the territorial seas of foreign nations, as the MMPA does not apply in those waters. L–DEO is required to adhere to the mitigation measures described above while operating within the Mexican EEZ and International Waters. The requirements do not apply within Mexican territorial waters. Mexico may prescribe mitigation measures that would apply to survey operations within the Mexican EEZ and territorial waters but NMFS is currently unaware of any specific potential requirements. While operating within the Mexican EEZ but outside Mexican territorial waters, if mitigation requirements prescribed by NMFS differ from the requirements established under Mexican law, L–DEO must adhere to the most protective measure. For operations in Mexican territorial waters, L–DEO would implement measures required under Mexican law (if any). No new information is available on mitigation measures required under Mexican law.

Monitoring and Reporting

In order to issue an IHA for an activity, section 101(a)(5)(D) of the MMPA states that NMFS must set forth requirements pertaining to the monitoring and reporting of such taking. The MMPA implementing regulations at 50 CFR 216.104 (a)(13) indicate that requests for authorizations must include the suggested means of accomplishing the necessary monitoring and reporting that will result in increased knowledge of the species and of the level of taking or impacts on populations of marine mammals that are expected to be present in the survey area. Effective reporting is critical both to compliance as well as ensuring that the most value is obtained from the required monitoring.

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

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

Vessel-Based Visual Monitoring

As described above, PSO observations must take place during daytime airgun operations. During seismic survey operations, at least five visual PSOs must be based aboard the *Langseth.* Two visual PSOs must be on duty at all time during daytime hours. Monitoring must be conducted in accordance with the following requirements:

- The operator must 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 must 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; and
- The operator must 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 must be independent, dedicated, trained visual and acoustic PSOs and must be employed by a third-party observer provider;
- PSOs must 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 must 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;
- 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 1 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 must demonstrate good standing and consistently good performance of PSO duties.

For data collection purposes, PSOs must use standardized data collection forms, whether hard copy or electronic. PSOs must 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 must 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-start clearance, ramp-up, shutdown, testing, shooting, ramp-up completion, end of operations, streamers, etc.).

The following information must 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 must 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.

Reporting

A report must be submitted to NMFS within 90 days after the end of the cruise. The report must summarize the dates and locations of seismic survey operations, and all marine mammal sightings (dates, times, locations, activities, associated seismic survey activities), and provide full documentation of methods, results, and interpretation pertaining to all monitoring.

The draft report must also include geo-referenced time-stamped vessel tracklines for all time periods during which airguns were operating. Tracklines must 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 must be provided in ESRI shapefile format and include the UTC date and time, latitude in decimal degrees, and longitude in decimal degrees. All coordinates must be referenced to the WGS84 geographic coordinate system. In addition to the report, all raw observational data must be made available to NMFS. The report must summarize the data collected as described above and in the IHA. A final report must be submitted within 30 days following resolution of any comments on the draft report.

Reporting Injured or Dead Marine Mammals

Discovery of injured or dead marine mammals—In the event that personnel involved in survey activities covered by the authorization discover an injured or dead marine mammal, the L–DEO must report the incident to the Office of Protected Resources (OPR), NMFS and to the NMFS West Coast Regional Stranding Coordinator as soon as feasible. The report must include the following information:

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

Vessel strike—In the event of a ship strike of a marine mammal by any vessel involved in the activities covered by the authorization, L–DEO must report the incident to OPR, NMFS and to the NMFS West Coast Regional Stranding Coordinator as soon as feasible. The report must include the following information:

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

Actions To Minimize Additional Harm to Live-Stranded (or Milling) Marine Mammals

In the event of a live stranding (or near-shore atypical milling) event within 50 km of the survey operations, where the NMFS stranding network is engaged in herding or other interventions to return animals to the water, the Director of OPR, NMFS (or designee) will advise L–DEO of the need to implement shutdown for all active acoustic sources operating within 50 km of the stranding. Procedures related to shutdowns for live stranding or milling marine mammals include the following:

- If at any time, the marine mammal(s) die or are euthanized, or if herding/intervention efforts are stopped, the Director of OPR, NMFS (or designee) will advise L–DEO that the shutdown around the animals' location is no longer needed.
- Otherwise, shutdown procedures will remain in effect until the Director of OPR, NMFS (or designee) determines and advises L–DEO that all live animals involved have left the area (either of their own volition or following an intervention).
- If further observations of the marine mammals indicate the potential for re-stranding, additional coordination with L–DEO will be required to determine what measures are necessary to minimize that likelihood (*e.g.,* extending the shutdown or moving operations farther away) and to implement those measures as appropriate.

Additional Information Requests—If NMFS determines that the circumstances of any marine mammal stranding found in the vicinity of the activity suggest investigation of the association with survey activities is warranted, and an investigation into the stranding is being pursued, NMFS will submit a written request to L–DEO indicating that the following initial available information must be provided as soon as possible, but no later than 7 business days after the request for information:

- Status of all sound source use in the 48 hours preceding the estimated time of stranding and within 50 km of the discovery/notification of the stranding by NMFS; and
- If available, description of the behavior of any marine mammal(s) observed preceding (*i.e.,* within 48 hours and 50 km) and immediately after the discovery of the stranding.

In the event that the investigation is still inconclusive, the investigation of the association of the survey activities is still warranted, and the investigation is still being pursued, NMFS may provide additional information requests, in writing, regarding the nature and location of survey operations prior to the time period above.

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 geophysical 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.

As described above, we have authorized only the takes estimated to occur outside of Mexican territorial waters (Table 7); however, for the purposes of our negligible impact analysis and determination, we consider the total number of takes that are anticipated to occur as a result of the entire survey (including the portion of the survey that would occur within the Mexican territorial waters (approximately 6 percent of the survey) (Table 8).

TABLE 8—TOTAL ESTIMATED TAKE INCLUDING MEXICAN TERRITORIAL WATERS

Species	Level B harassment (excluding Mexican territorial waters)	Level A harassment (excluding Mexican territorial waters)	Level B harassment (Mexican territorial waters)	Level A harassment (Mexican territorial waters)	Total Level B harassment	Total Level A harassment
Humpback whale	8	0	1	0	9	0
Minke whale	2	0	0	0	2	0
Bryde's whale	27	1	2	0	29	1
Fin whale	2	0	0	0	2	0
Sei whale	3	0	0	0	3	0
Blue whale	5	0	0	0	5	0
Sperm whale	12	0	1	0	13	0
Cuvier's beaked whale	69	0	69	0	138	0
Longman's beaked whale	3	0	0	0	3	0
Mesoplodon spp	23	0	1	0	24	0
Risso's dolphin	328	0	22	0	350	0
Rough-toothed dolphin	597	0	38	0	635	0
Common bottlenose dolphin	2,274	0	196	0	2,470	0
Pantropical spotted dolphin	7,988	0	519	0	8,507	0
Spinner dolphin (whitebelly)	121	0	7	0	128	0
Spinner dolphin (eastern)	8,189	0	557	0	8,746	0
Striped dolphin	2,212	0	122	0	2,334	0
Short-beaked common dolphin	2,818	0	209	0	3,027	0
Fraser's dolphin	858	0	58	0	916	0
Short-finned pilot whale	244	0	15	0	259	0
Killer whale	25	0	2	0	27	0
False killer whale	118	0	8	0	126	0
Pygmy killer whale	116	0	8	0	124	0
Melon-headed whale	135	0	9	0	144	0
Kogia spp	33	1	2	0	35	1
Guadalupe fur seal	416	0	1	0	417	0
California sea lion	365	0	693	0	1,058	0

NMFS does not anticipate that takes by serious injury or mortality would occur as a result of L–DEO's planned survey, even in the absence of mitigation, and no such takes are authorized. Non-auditory physical effects, stranding, and vessel strike are also not expected to occur.

We have authorized a limited number of instances of Level A harassment of two species (Bryde's whale and dwarf sperm whales, which are members of the low- and high-frequency cetacean hearing groups, respectively) in the form of PTS, and Level B harassment only of the remaining marine mammal species. 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, because of the constant movement of both the R/V *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. Additionally, L–DEO must shut down the airgun array if marine mammals approach within 500 m (with the exception of specific genera of dolphins, see Mitigation), further reducing the expected duration and intensity of sound, and therefore the likelihood of marine mammals incurring PTS. Since the duration of exposure to loud sounds will be relatively short, it would be unlikely to affect the fitness of any individuals. Also, as described above, we expect that marine mammals would likely 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 R/V *Langseth's* approach due to the vessel's relatively low speed when conducting seismic surveys. Accordingly, 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 that are considered to be of low severity and with no lasting biological consequences (*e.g.,* Southall *et al.,* 2007, Ellison *et al.,* 2012). L–DEO will only survey ''nearshore'' tracklines between May 1 and October 31, at which point no breeding humpback whales are expected to be in survey area. We therefore expect no impacts on the fitness of individual humpback whales or on recruitment of survival for the population as a whole.

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 (up to 25 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.

Yazvenko *et al.* (2007) reported no apparent changes in the frequency of feeding activity in Western gray whales exposed to airgun sounds in their feeding grounds near Sakhalin Island. Goldbogen *et al.* (2013) found blue whales feeding on highly concentrated prey in shallow depths were less likely to respond and cease foraging than whales feeding on deep, dispersed prey when exposed to simulated sonar sources, suggesting that the benefits of feeding for humpbacks foraging on high-density prey may outweigh perceived harm from the acoustic stimulus, such as the seismic survey (Southall *et al.,* 2016). Additionally, L–DEO must shut down the airgun array upon observation of an aggregation of six or more large whales, which would reduce impacts to cooperatively foraging animals. For all habitats, no physical impacts to 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 specific habitat areas, 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 these areas. The planned survey tracklines do not overlap with any designated critical habitat for ESA-listed species or areas of known importance for any species.

Negligible Impact Conclusions

The planned survey is of short duration (up to 25 days of seismic operations), and the acoustic ''footprint'' of the survey is small relative to the ranges of the marine mammals that would potentially be affected. 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 survey area. Short-term exposures to survey operations are not likely to significantly disrupt marine mammal behavior, and the potential for longer-term avoidance of important areas is limited.

The required mitigation measures are expected to reduce the number of takes by Level A harassment (in the form of PTS) by allowing for detection of marine mammals in the vicinity of the vessel by visual and acoustic observers. The required mitigation measures are also expected to minimize the severity of any potential behavioral disturbance (Level B harassment) via shutdowns of the airgun array. Based on previous monitoring reports for substantially similar activities that have been previously authorized by NMFS (available at *https://www.fisheries.noaa.gov/national/marine-mammal-protection/incidental-take-authorizations-research-and-other-activities*), we expect that the mitigation will be effective in preventing, at least to some extent, potential PTS in marine mammals that may otherwise occur in the absence of the required 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 seismic survey activities would result in only short-term (temporary and short in duration) effects to individuals exposed, over relatively small areas of the affected animals' ranges. 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. Due to the timing of the survey, no impacts to breeding humpback whales are anticipated and NMFS does not anticipate the authorized take to impact annual rates of recruitment or survival for humpback whales or any other species.

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 serious injury or mortality is anticipated or authorized, even absent mitigation;
- The planned activity is temporary and of relatively short duration (up to 25 days);
- The anticipated impacts of the 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 very small in number. Instances of potential PTS that are incurred in marine mammals are expected to 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 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 survey would be temporary and spatially limited, and impacts to marine mammal foraging would be minimal; and
- The required mitigation measures, including visual and acoustic monitoring and shutdowns are expected to minimize potential impacts to marine mammals (both amount and severity).

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

Small Numbers

As noted above, only small numbers of incidental take may be authorized under sections 101(a)(5)(A) and (D) of the MMPA for specified activities other

than military readiness activities. The MMPA does not define small numbers and so, in practice, where estimated numbers are available, NMFS compares the number of individuals taken to the most appropriate estimation of abundance of the relevant species or stock in our determination of whether an authorization is limited to small numbers of marine mammals. When the predicted number of individuals to be taken is fewer than one third of the species or stock abundance, the take is considered to be of small numbers. Additionally, other qualitative factors may be considered in the analysis, such as the temporal or spatial scale of the activities.

The amount of authorized take is below one third of the estimated population abundance of all species (Gerrodette and Palacios 1996; NMFS 2015b). In fact, take of individuals is less than 8 percent of the abundance of any affected population.

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

Unmitigable Adverse Impact Analysis and Determination

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

National Environmental Policy Act

In compliance with Executive Order (E.O.) 12114, the NSF prepared an Environmental Analysis to consider the direct, indirect and cumulative effects to the human environment resulting from this marine geophysical survey in the Eastern Tropical Pacific. The NSF's Environmental Analysis tiers to the 2011 Final Programmatic Environmental Impact Statement/Overseas Environmental Impact Statement for marine-related research funded by the NSF, which was prepared under E.O. 12114 and the National Environmental Policy Act (NEPA).

NMFS determined that the form and substance of the Environmental Analysis satisfies all the requirements of an Environmental Assessment under NEPA, as implemented by the regulations published by the Council on Environmental Quality (CEQ; 40 CFR parts 1500–1508) and includes adequate information analyzing the effects on the human environment of issuing the IHA. The NSF's draft Environmental Analysis was made available to the public for review and comment. In compliance with NEPA and CEQ regulations, as well as NOAA Administrative Order 216–6A, NMFS has reviewed the NSF's Environmental Analysis, determined it to be sufficient, and adopted that Environmental Analysis. The NSF's Environmental Analysis and NMFS' Determination are available at *https://www.fisheries.noaa.gov/national/marine-mammal-protection/incidental-take-authorizations-research-and-other-activities.*

Endangered Species Act

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

The NMFS OPR ESA Interagency Cooperation Division issued a Biological Opinion 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 OPR Permits and Conservation Division and the NSF's funding of L–DEO's survey. The Biological Opinion concluded that the action is not likely to jeopardize the continued existence of ESA-listed blue whales, fin whales, sei whales, sperm whales, Mexico DPS humpback whales, Central America DPS humpback whales, and Guadalupe fur seals.

Authorization

As a result of these determinations, NMFS has issued an IHA to L–DEO for conducting geophysical surveys of the Guerrero Gap in the Eastern Tropical Pacific in spring 2022, provided the previously mentioned mitigation, monitoring, and reporting requirements are incorporated.

Dated: May 2, 2022.

Kimberly Damon-Randall,

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

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BILLING CODE 3510–22–P

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

Agency Information Collection Activities; Submission to the Office of Management and Budget (OMB) for Review and Approval; Comment Request; Southeast Region Vessel Monitoring System (VMS) and Related Requirements

The Department of Commerce will submit the following information collection request to the Office of Management and Budget (OMB) for review and clearance in accordance with the Paperwork Reduction Act of 1995, on or after the date of publication of this notice. We invite the general public and other Federal agencies to comment on proposed, and continuing information collections, which helps us assess the impact of our information collection requirements and minimize the public's reporting burden. Public comments were previously requested via the **Federal Register** on January 12, 2022, during a 60-day comment period. This notice allows for an additional 30 days for public comments.

Agency: National Oceanic & Atmospheric Administration (NOAA), Commerce.

Title: Southeast Region Vessel Monitoring System and Related Requirements.

OMB Control Number: 0648–0544.

Form Number(s): None.

Type of Request: Regular submission (extension of a current information collection).

Number of Respondents: 901.

Average Hours per Response: Annual VMS maintenance, 2 hours; Installation/Activation of VMS unit, 5 hours; Installation and activation checklist, 20 minutes; power-down exemption request, 5 minutes; and trip declaration, 1 minute.

Total Annual Burden Hours: 2,628.

Needs and Uses: The NMFS, Office of Law Enforcement, Southeast Enforcement Division is submitting this request for an extension of a currently approved information collection.

The Magnuson-Stevens Fishery Conservation and Management Act authorizes the Gulf of Mexico Fishery Management Council (Gulf Council) and South Atlantic Fishery Management Council (South Atlantic Council) to prepare and amend fishery management plans for any fishery in Federal waters under their respective jurisdictions. NMFS and the Gulf Council manage the reef fish fishery in the Gulf of Mexico (Gulf) under the Fishery Management