

FINDING OF NO SIGNIFICANT IMPACT
FOR THE ISSUANCE OF AN INCIDENTAL HARASSMENT AUTHORIZATION TO
LAMONT-DOHERTY EARTH OBSERVATORY AND ADOPTION OF THE NATIONAL
SCIENCE FOUNDATION FINAL ENVIRONMENTAL ASSESSMENT

I. INTRODUCTION

The National Marine Fisheries Service (NMFS) received an application from the Lamont-Doherty Earth Observatory (L-DEO) requesting authorization to take marine mammals incidental to a marine geophysical survey, which was analyzed in the National Science Foundation’s (NSF’s) 2021 Final Environmental Assessment (EA), “*Final Environmental Assessment/Analysis of a Marine Geophysical Survey by R/V Marcus G. Langseth of the Queen Charlotte Fault in the Northeast Pacific Ocean, Summer 2021.*” NMFS is required to review applications and, if appropriate, issue Incidental Take Authorizations¹ (ITAs) pursuant to the Marine Mammal Protection Act of 1972, as amended (MMPA; 16 U.S.C. 1361 et seq.). In addition, the National Environmental Policy Act (NEPA), 40 Code of Federal Regulations (CFR) Parts 1500 -1508², and National Oceanic and Atmospheric Administration (NOAA) policy and procedures³ require all proposals for major federal actions be reviewed with respect to environmental consequences on the human environment. Therefore, the purposes of this document are twofold. First, this document explains NMFS’ determination to adopt NSF’s Final EA for the NEPA review that NMFS is required to conduct for its consideration of whether to issue an Incidental Harassment Authorization (IHA) for the L-DEO Marine Geophysical Survey by the Research Vessel (R/V) *Marcus G. Langseth* of the Queen Charlotte Fault in 2021. Second, this document explains NMFS’ rationale for its finding that issuance of the IHA for this survey will not significantly impact the quality of the human environment.

NMFS proposes to issue an IHA to L-DEO pursuant to Section 101(a)(5)(D) of the MMPA and 50 Code of Federal Regulations (CFR) Part 216. This IHA will be valid for one year from the date of issuance and authorizes takes, by Level A or Level B harassment, of small numbers of marine mammals incidental to L-DEO conducting a geophysical survey, with funding from NSF, of the Queen Charlotte Fault off the coast of Alaska and British Columbia. NMFS’ proposed action is a direct outcome of L-DEO’s request for an IHA for conducting the geophysical survey. The survey involves collecting seismic reflection and refraction data that reveal the structure and stratigraphy of the crust and overlying sediment of the seafloor. The survey will be conducted aboard a vessel towing an array of airguns⁴ that produce low frequency sound pulses that penetrate deep into the subsurface and are then reflected and recorded by receivers to image deep geological features. The use of airgun arrays has the potential to cause marine mammal harassment in the form of behavioral harassment or, for some species, auditory injury and, therefore, requires an authorization from NMFS for incidental taking pursuant to the MMPA. An authorization for incidental takings shall be

¹ Incidental Take Authorizations (ITAs) may be issued as either (1) regulations and the associated Letter of Authorization (LOA) or (2) an Incidental Harassment Authorization (IHA). LOAs may be issued for a maximum period of five years and IHAs may be issued for a maximum period of one year. Detailed information about the MMPA is available at <https://www.fisheries.noaa.gov/topic/laws-policies#marine-mammal-protection-act>.

² This FONSI is being prepared using the 1978 CEQ NEPA Regulations. NEPA reviews initiated prior to the effective date of the 2020 CEQ NEPA regulations may be conducted using the 1978 version of the regulations. The effective date of the 2020 CEQ NEPA Regulations was September 14, 2020. This review began on December 2, 2019 and the agency has decided to proceed under the 1978 regulations.

³ NOAA Administrative Order (NAO) 216-6A “*Compliance with the National Environmental Policy Act, Executive Orders 12114, Environmental Effects Abroad of Major Federal Actions; 11988 and 13690, Floodplain Management; and 11990, Protection of Wetlands*” issued April 22, 2016 and the Companion Manual for NAO 216-6A “*Policy and Procedures for Implementing the National Environmental Policy Act and Related Authorities*” issued January 13, 2017.

⁴ 2D data acquisition involves a single vessel towing a single acoustic array. The receiver(s) is towed behind the vessel on a long cable (streamer) or is placed on the ocean bottom (cables or nodes).

granted if NMFS finds that the taking will have a negligible impact⁵ on the species or stock(s), and, where relevant, will not have an unmitigable adverse impact on the availability of the species or stock(s) for subsistence uses. In addition, the IHA must set forth the permissible methods of taking, other means of effecting the least practicable adverse impact on the species or stock and its habitat, and requirements pertaining to the monitoring and reporting of such takings.

NMFS' issuance of this IHA allowing the taking of marine mammals, consistent with provisions under the MMPA and incidental to an applicant's lawful activities, is considered a major federal action. Therefore, NMFS conducted an environmental review of L-DEO's application and NSF's 2021 Final EA and determined adopting this EA and preparing a separate Finding of No Significant Impact (FONSI) is appropriate for NMFS' consideration to issue an IHA to L-DEO. This FONSI evaluates the context and intensity of the impacts on marine mammals associated with NMFS' consideration to issue this IHA to L-DEO and documents NMFS' determination to adopt NSF's Final EA pursuant to 40 CFR 1506.3.

II. BACKGROUND

NSF is the federal agency that supports all fields of science and engineering (except medical sciences), and therefore, funds a variety of research projects across a wide-range of scientific disciplines, including oceanography. NSF does this through grants and cooperative agreements issued to colleges, universities, businesses, scientific research organizations, and other federal agencies throughout the United States. NSF does not own and operate research facilities or laboratories but does support National Research Centers, user facilities, certain oceanographic vessels, and Antarctic research stations. To support and fund scientific research, NSF established several programs focused on basic and applied science and engineering research, for example, Geosciences. Each of their research programs forms the basis for specific research areas and projects, like the Division of Ocean Sciences-Marine Geology and Geophysics program in which NSF may fund geophysical surveys in support of this program's priorities and objectives. Details about NSF and their research programs is available on the Internet at <https://www.nsf.gov/about/> and https://www.nsf.gov/about/research_areas.jsp.

NSF has funded marine-related research for over 50 years and identified the need to continue funding marine-related geophysical surveys to enable scientists to collect data essential to understanding the complex Earth processes beneath the ocean floor. NSF funds research based on proposals reviewed under its merit review process and identified as program priorities. Information about NSF processes, procedures and outcomes, including the merit review process and results of NSF-funded research is available on the Internet at <https://www.nsf.gov/od/transparency/transparency.jsp>. Examples of NSF-funded marine-related research include:

- Studying source mechanisms, fault locations, and hazard potentials for large earthquakes and tsunamis along faults and segments of tectonic plate boundaries, allowing prioritization of tsunami and earthquake warning systems;
- Imaging to indicate how erosion and sedimentation have impacted and changed the size and shapes of the continental shelves over time;
- Examining the formation and evolution of volcanic islands, mid-ocean ridges, and igneous provinces;

⁵ NMFS defines "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)

- Studying the evolution and movement of tectonic plates; and
- Mapping the seafloor and its topographic relief and understanding the causes of submarine geologic structures.

NSF is also responsible for environmental reviews of the research they propose to fund, associated with investigating the geology and geophysics of the seafloor. Therefore, NSF prepares analyses under NEPA for these research activities. Historically, NSF prepared EAs for each research cruise on a project-specific basis. However, over time NSF concluded that this approach was not conducive to a comprehensive assessment that considered funding multiple geophysical survey activities over larger geographical areas. NSF determined a programmatic⁶ approach was appropriate for a number of reasons. Data obtained from geophysical surveys can occur over large geographical areas, in any given ocean area, and there is inherent uncertainty regarding the timing, locations of site-specific surveys, survey specifics (e.g., equipment and vessels), as well as which research organization will conduct the survey⁷. In addition, NSF and the U.S. Geological Service (USGS) determined a programmatic document would minimize duplication of effort when preparing environmental documentation because USGS conducts the same or similar research activities and, as a federal agency, is also required to complete environmental reviews under NEPA.

Therefore, in June 2011, NSF completed a Programmatic Environmental Impact Statement/ Overseas Environmental Impact Statement for marine-related research funded by NSF or conducted by the U.S. Geological Survey (USGS) (herein “NSF/USGS 2011 Final PEIS”) and issued a Record of Decision in June 2012. The analysis in the NSF/USGS 2011 Final PEIS supports NSF planning-level decisions associated with their continuing need to fund marine-related research conducted by USGS and other research organizations and establishes the framework and parameters for subsequent analyses based on the programmatic review. While the level of activity proposed may vary from one year to the next, the action alternatives analyzed in the NSF/USGS 2011 Final PEIS represent the average range and level of marine-related research NSF anticipates funding and for which ITAs and other permits or authorizations may be required. NSF collaborated with USGS and NMFS (see explanations below) to prepare the evaluation of potential impacts of geophysical surveys on the human environment, including impacts to marine mammals. Information about NSF’s programmatic approach is in Chapter 1, Section 1.4 of the NSF/USGS 2011 Final PEIS and the potential effects to marine mammals and the estimates of marine mammal acoustic exposures are in Chapter 3, Sections 3.1- 3.9. A copy of the NSF/USGS 2011 Final PEIS is available at https://www.nsf.gov/geo/oce/envcomp/usgs-nsf-marine-seismic-research/nsf-usgs-final-eis-oeis_3june2011.pdf.

Cooperating Agencies

USGS participated in the development of the NSF/USGS 2011 Final PEIS and served as a cooperating agency because the scope of the proposed action and alternatives involved research activities that USGS conducts. USGS is the federal agency that maps public lands, examines geological structures, and evaluates mineral resources. USGS also provides information about the

⁶ The concept of “programmatic” NEPA analysis is included in the 1978 CEQ Regulations, which addresses analyses of “broad actions” and the “tiering” process. Programmatic NEPA reviews add value and efficiency to the decision-making process when they inform the scope of decisions and subsequent tiered NEPA reviews. Programmatic NEPA analyses can facilitate decisions on agency actions that precede project-specific decisions and action. They also provide information and analysis that can be incorporated by reference in future, tiered NEPA reviews.

⁷ Approximately four to seven NSF-funded marine-related research cruises involving geophysical surveys are conducted annually, across the world’s oceans including the Northeast Pacific, Eastern Tropical Pacific, and Southwest Pacific, Gulf of Mexico, Caribbean Sea, Mid-Atlantic Ridge, North Atlantic, Norwegian Sea, Arctic Ocean, Bering Sea, and Gulf of Alaska, by research organizations and government agencies. However, details and specifics are unknown until proposals are submitted, reviewed, and approved under NSF’s merit process. For example, the final determination of specific cruise tracks depends on research objectives of proposals recommended for award during merit reviews, NSF’s research budget for a given fiscal year, and other factors such as vessel availability and environmental considerations.

science of natural hazards and conducts scientific research on other natural resources such as water resources, and studies the health of ecosystems and the environmental health, including the impacts of climate and land use change.

NMFS, on behalf of NOAA, served as a cooperating agency due to NMFS' legal jurisdiction and special expertise for conservation and management of marine mammals. Through its role as a cooperating agency, NMFS did not propose or authorize any action. Instead, NMFS provided NSF with technical assistance and input regarding the analysis of impacts for protected resources. This included information regarding critical habitat and threatened and endangered species pursuant to the Endangered Species Act (ESA), marine mammals pursuant to the MMPA, and Essential Fish Habitat (EFH) and fishery resources pursuant to the Magnuson-Stevens Fishery Conservation and Management Act (MSA).

Regarding the current IHA application submitted by L-DEO, NSF completed an EA in July 2021 that tiers to the NSF/USGS 2011 Final PEIS and provides the geophysical survey and site-specific level of analysis addressing potential impacts associated with NSF's proposal to fund L-DEO to conduct geophysical surveys of the Queen Charlotte Fault in Alaska and British Columbia. Impacts of the proposed geophysical survey activities to 21 species of marine mammals, including 7 listed as threatened or endangered, estimates of take based on NMFS-recommended criteria, and identification of mitigation and monitoring measures were the primary foci of the 2021 Final EA. The analysis in this document also supports the ESA Section 7 consultation and the IHA application processes.

While NSF is the federal agency funding marine-related research projects, the USGS and others like L-DEO conduct the marine-related research projects NSF funds. Therefore, as the owner of the R/V *Marcus G. Langseth*⁸, L-DEO, on behalf of itself and NSF, submitted the application for incidental take to NMFS for take of small numbers of marine mammals incidental to conducting the geophysical survey.

III. PROPOSED ACTION AND ALTERNATIVES SUMMARY

A. NSF's Proposed Action

NSF is proposing to fund L-DEO to conduct a geophysical survey of the Queen Charlotte Fault off the coast of Alaska and British Columbia. The survey will occur within the Exclusive Economic Zones (EEZ) of the U.S. and Canada, including in Alaska state waters and Canadian territorial waters. The survey would occur in water depths ranging from 50 to 2,800 m, and take place over 36 days, including 27 days of seismic data acquisition. The remainder of the survey duration would be involved in equipment deployment and retrieval and vessel transit. The survey will use a 36-airgun towed array with a total discharge volume of ~6,600 in³. Survey protocols generally involve a predetermined set of survey track lines. The vessel travels down a linear track for some distance until a line of data is acquired, then turns and acquires data on a different track. Representative survey tracklines are shown in Figure 1 of the NSF's 2021 EA for this project, but there may be deviation from these tracklines due to scientific drivers, poor data quality, inclement weather, or mechanical issues with the research vessel and/or equipment.

B. NMFS' Proposed Action

⁸ Vessel to be used for the geophysical survey.

Sections 101(a)(5)(A) and (D) of the MMPA give NMFS the authority to authorize the incidental, but not intentional, take of small numbers of marine mammals by harassment, provided certain determinations are made and statutory and regulatory procedures are met⁹. To authorize the incidental take of marine mammals, NMFS evaluates the best available scientific information to determine whether the take would have a negligible impact on marine mammal species or stocks, will be limited to small numbers of the relevant species or stocks' abundance, and whether the activity would have an unmitigable adverse impact on the availability of affected marine mammal species for subsistence use. NMFS cannot issue ITAs if it would result in more than a negligible impact on marine mammal species or stocks or would result in an unmitigable adverse impact on subsistence uses. NMFS must also prescribe the permissible methods of taking and other means of effecting the least practicable impact on the species or stocks of marine mammals and their habitat, paying particular attention to rookeries, mating grounds, and other areas of similar significance. Where applicable, NMFS must prescribe means of effecting the least practicable impact on the availability of the species or stocks of marine mammals for subsistence uses. ITAs will include additional requirements or conditions pertaining to monitoring and reporting.

Since NMFS' proposed action of issuing an IHA to L-DEO would authorize take of marine mammals incidental to a subset of the activities analyzed in the NSF Final EA, these components of NSF's proposed action to fund L-DEO are the subject of NMFS' proposed action. Therefore, NMFS' issuance of an IHA to L-DEO is a direct outcome of L-DEO's request for an IHA and would authorize take of marine mammals incidental to a subset of the activities analyzed in the NSF's 2021 Final EA and specified in the application submitted by L-DEO.

C. Alternatives Considered by NSF

NSF analyzed two alternatives in their Final EA, the proposed action and the No Action alternative. These alternatives include NMFS' consideration to grant or deny permit applications pursuant to the MMPA (i.e., conducting the geophysical survey with issuance of an associated IHA or not conducting the geophysical survey and the IHA is not issued).

Under the Proposed Action, NSF would fund L-DEO to conduct the geophysical survey using the *Langseth* off of Alaska and British Columbia. The purpose of conducting this geophysical survey is to collect data on an approximately 900 km-long offshore component of the Queen Charlotte Fault system (an approximately 1,200 km-long onshore-offshore transform system connecting the Cascadia and Alaska-Aleutian subduction zones). Detailed explanations concerning the survey objectives, protocols, equipment and locations along with how geophysical surveys are conducted is in Section 2.1 of the 2021 Final EA.

Under the "No Action" alternative, NSF would not fund L-DEO to conduct the marine geophysical survey in Alaska and British Columbia and L-DEO would not conduct this geophysical survey. The consideration and analysis of this alternative is included for presenting a comparative analysis to the action alternative, in accordance with 40 CFR 1502.14. Additional explanation concerning the No Action Alternative is in Section 2.2 of the Final EA.

D. Alternatives Considered by NMFS

⁹ The MMPA does not apply in foreign territorial waters. NMFS' proposed action addresses the portion of the survey occurring in the U.S. EEZ and in the Canada EEZ, but outside of Canadian territorial waters.

In accordance with NEPA and 1978 CEQ Regulations, NMFS is also required to consider a reasonable range of alternatives to a Proposed Action. Since NMFS is adopting NSF's Final EA, it reviewed this document to determine whether it met this requirement. NMFS determined NSF's analysis of alternatives in their Final EA is adequate for purposes of NEPA and the CEQ regulations and, therefore, chose not to supplement this EA by developing and evaluating additional alternatives. However, based on the statutory framework explained in Section III, paragraph B above, NMFS considers two alternatives, a No Action alternative in which NMFS denies the L-DEO application and an action alternative in which it grants the application and issues an IHA to the L-DEO. Thus, the alternatives analysis in Section 2 in NSF's Final EA supports NMFS' alternatives described below.

No Action Alternative: For NMFS, denial of an MMPA authorization constitutes the NMFS No Action alternative, which is consistent with our statutory obligation under the MMPA to grant or deny ITA requests and to prescribe mitigation, monitoring, and reporting with any authorizations. Under NMFS' No Action alternative, NMFS would not issue the IHA to L-DEO, and NMFS assumes L-DEO would not conduct the geophysical surveys as described in their application and NSF's 2021 Final EA. The No Action Alternative served as a baseline in the EA against which the impacts of the Preferred Alternative were compared and contrasted.

Action Alternative: NMFS issues the IHA to L-DEO authorizing take of marine mammals incidental to the subset of activities described under NSF's preferred alternative (Section 2.1 in the Final EA), with the mitigation and monitoring in Section 2.1.3 of the 2021 Final EA and in NMFS' Federal Register notice of proposed IHA under "Summary of Request" and "Description of Proposed Activity" and the "Proposed Mitigation" and "Proposed Monitoring and Reporting" sections.

IV. ENVIRONMENTAL REVIEW

NMFS independently reviewed NSF's 2021 Final EA and concluded that impacts evaluated by NSF are substantially the same as the impacts of NMFS' issuance of an IHA for the take of marine mammals incidental to the geophysical survey funded by NSF but conducted by L-DEO. In particular, the Final EA contains an adequate evaluation of the direct, indirect and cumulative impacts on marine mammals, including species listed under the ESA and the marine environment. The Final EA also addresses NOAA's required components for adoption because it meets the requirements for an adequate EA under the 1978 CEQ regulations and NOAA policy and procedures and reflects comments and expert input provided by NMFS as a cooperating agency. For example, the Final EA includes:

- a discussion of NSF's proposed action and purpose and need for the action and a discussion of the MMPA authorization process necessary to support implementation of the action;
- evaluation of a reasonable range of alternatives to the proposed action, including a no action alternative, and alternatives to mitigate adverse effects to marine mammals;
- a description of the affected environment including the status of all marine mammals species likely to be affected;
- a description of the environmental impacts of the proposed action and alternatives, including direct, indirect and cumulative impacts on marine mammals and projected estimate of incidental take;
- identification and evaluation of reasonable mitigation measures to avoid or minimize adverse impacts to marine mammals; and

- a listing of agencies consulted.

As a result of this review, the Office of Protected Resources has determined that it is not necessary to prepare a separate EA or environmental impact statement to issue an IHA to L-DEO and that adoption of NSF's EA is appropriate.

NMFS also determined NSF/USGS 2011 Final PEIS to be comprehensive in analyzing the broad scope of marine-related research, including geophysical surveys, and that this initial evaluation of direct, indirect and cumulative impacts on the marine environment was adequate to support NMFS' consideration for issuance of ITAs to potential, future applicants (e.g., L-DEO) through tiering and incorporation by reference. NMFS also determined that any subsequent issuance of ITAs for geological surveys is within the scope of the analysis in the NSF/USGS 2011 Final PEIS. For example, the evaluation of the alternatives addressed impacts over a larger geographical area than what is analyzed by NMFS for any given ITA, and the analysis encompasses many of the same factors NMFS historically considered when reviewing applications for ITAs for NSF-funded research involving geophysical surveys (e.g., marine mammal exposures, intensity of acoustic exposure, monitoring and mitigation measures).

V. PUBLIC INVOLVEMENT

During the development of the NSF/USGS 2011 Final PEIS, the public had opportunities to comment during the scoping period in 2005 and during the public comment period on October 8, 2010 – November 22, 2010. The details concerning public involvement and public comments associated with the NSF/USGS 2011 Final PEIS is in Chapter 1, Section 1.9 of the 2011 Final PEIS. NSF also posted their 2021 Draft EA for the geophysical survey on their website and notified relevant groups of its availability.

In addition to the public involvement process described above for NSF, NMFS relied substantially on the public involvement process pursuant to the MMPA to develop and evaluate information relevant to an analysis under NEPA. NMFS made the IHA application and a draft of the proposed IHA available for public review and comment and, separately, published notice of the proposed IHA in the Federal Register (FR) on June 4, 2021 (86 FR 30006). There, NMFS alerted the public it intended to use the MMPA public review process for the proposed IHA to solicit relevant environmental information and provide the public an opportunity to submit comments. In addition, NMFS indicated that it believed it was appropriate to adopt NSF's 2021 EA and provided a link to both the NSF draft EA, as well as the proposed IHA.

NMFS did not receive any comments in response to the publication of the proposed IHA. Therefore, NMFS did not make any changes to its analysis in response to public comments. NMFS' Final IHA notice of issuance is available for review on NMFS' website:

<https://www.fisheries.noaa.gov/national/marine-mammal-protection/incidental-take-authorizations-research-and-other-activities>.

VI. ANALYSIS SUMMARY

The environmental consequences to the marine environment and protected resources are important to the evaluation leading to the decision to issue any given ITA. In particular, because NMFS' action is specific to authorizing incidental take of marine mammals, the key factors relevant to, and considered in a decision to issue any given ITA, are related to NMFS' statutory mission under the MMPA. The information in the following subsections discusses key factors considered in the

analysis in the EA along with the evaluation and reasons why the impacts of our issuance of an IHA to L-DEO will not significantly impact the quality of the human environment.

A. Environmental Consequences

In the Final EA, NSF presented the baseline environmental conditions and impacts for affected resources in the survey area. The affected environment and environmental consequences are in Sections 3.1-3.9 and 4.1. Since the anticipated impacts of NMFS' issuance of an IHA to L-DEO are to marine mammals, which, if affected, would be through the introduction of sound into the marine environment during geophysical surveys, the analysis in the NSF Final EA specifically describes and addresses potential acoustic impacts to marine mammals, such as masking, stress, and behavioral response (Section 4.1.1 of the Final EA). NSF assessed impacts to marine mammals through both acoustic exposure estimates and a qualitative assessment based on a review of literature primarily on acoustic impacts to marine mammals (Section 4.1.1 of the Final EA).

B. Significance Evaluation

The 1978 CEQ Regulations state that the significance of an action be analyzed in terms of both "context" and "intensity" and lists ten criteria for intensity. The Companion Manual for NAO 216-6A requires consideration of CEQ's context and intensity criteria (40 CFR 1508.27(a) and 40 CFR 1508.27(b)) along with six additional factors for determining whether the impacts of a proposed action are significant. Each criterion is discussed below with respect to NMFS' issuance of an IHA to L-DEO and is considered individually as well as in combination with the others. In addition, NMFS relied on the analysis in NSF's 2021 Final EA, incorporating certain material by reference per 40 CFR 1502.21 in the evaluation discussed below. NSF's Final EA and other information and documentation are available on NMFS' website: <https://www.fisheries.noaa.gov/national/marine-mammal-protection/incidental-take-authorizations-research-and-other-activities>.

1. Can the proposed action reasonably be expected to cause both beneficial and adverse impacts that overall may result in a significant effect, even if the effect will be beneficial?

Response: NMFS' issuance of an IHA to L-DEO is not expected to cause either beneficial or adverse impacts resulting in any significant effects. NMFS is proposing to authorize take incidental to a geophysical survey for marine mammal species expected to occur in survey areas off of southeast Alaska and British Columbia. Airguns emit low-frequency noise into the water column, which has the potential to behaviorally disturb marine mammals and, for some species, cause auditory injury. In addition, noise can mask the detection or interpretation of important sounds. Given their reliance on sound for basic biological functioning (e.g., foraging, mating), marine mammals are the species most vulnerable to increased noise in the marine environment, although marine mammal prey (e.g., fish and squid) may be impacted in some of the same ways. However, NMFS only expects intermittent, localized impacts on marine mammals and their habitat because survey duration will be limited to 27 days and only cover a portion of the region's coastline and surrounding waters. In addition, the prescribed mitigation and monitoring required for L-DEO will protect and lessen the potential for adverse effects to marine mammal species and their habitat. While NMFS predicts potential for direct adverse effects to individuals, it does not anticipate population-level effects that would rise to the level of significance. Effects to marine mammal populations are expected to be negligible to minor. Moderate impacts to a very limited number of animals could occur and would likely include a small degree of auditory injury in the form of permanent threshold shift (PTS). Short-term, temporary impacts would occur to the majority of

animals affected in the form of behavioral disturbance, including temporary avoidance of the affected area or decreased foraging (if such activity were occurring).

2. Can the proposed action reasonably be expected to significantly affect public health or safety?

Response: The issuance of this IHA to L-DEO to authorize take of marine mammals is not likely to have the potential for this kind of effect because the proposed geophysical survey will take place across a broad area of a relatively remote coastal area and is unlikely to overlap with activities conducted by the public. NMFS only authorizes the take of marine mammal species associated with this survey, which does not involve the public or expose the public directly (e.g., chemicals, diseases) or indirectly (e.g., food sources) to hazardous or toxic materials in a way that would be linked to the quality of the environment and well-being of humans.

3. Can the proposed action reasonably be expected to result in significant impacts to unique characteristics of the geographic area, such as proximity to historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas?

Response: Authorizing the harassment of marine mammals through this IHA has no foreseeable impact to unique areas, such as historic or cultural resources, parkland, prime farmlands, wetlands, wild and scenic rivers or ecologically critical areas. To the extent that the harassment authorized under the IHA impacts ecologically critical areas, this impact is not substantial. NMFS only anticipates marine mammals might be displaced temporarily and will not permanently vacate any areas, due to the harassment authorized in this IHA. NMFS expects natural processes and the environment to recover from any such displacement. Critical habitat for the Mexico Distinct Population Segment of humpback whale and for Steller sea lions, and several Biologically Important Areas (BIAs) for other cetacean species, are found in the Gulf of Alaska. The survey could temporarily affect a summer feeding BIA recognized for humpback whales. BIAs were identified for populations of cetaceans based on sighting data, photo-identification, genetics, satellite tagging, historic whaling data, prey studies, and expert opinion. Additional information about Essential fish habitat (EFH) and Habitat Areas of Particular Concern (HAPC) in the survey area is in Section 3.7 of the Final EA. Significant impacts in these areas are not expected; underwater noise associated with airgun usage has no impact on physical habitat features and it will be temporary and localized. Individual ecologically critical areas would be subject to noise only as the survey ship traverses across or near these locations.

4. Are the proposed action's effects on the quality of the human environment likely to be highly controversial?

Response: The effects of issuing an IHA to L-DEO on the quality of the human environment are not likely to be highly controversial. Although there is some lack of agreement within the scientific and stakeholder communities about the potential effects of noise on marine mammals, there is not a substantial dispute about the size, nature, or effect of our proposed action. For several years, NMFS has assessed and authorized incidental take for multiple geophysical surveys conducted within the same area and has developed relatively standard mitigation and monitoring measures, all of which have been vetted during past public comment periods. The scope of this action is not substantially different from past geophysical surveys, is not unusually large or substantial, and would include the same or similar mitigation and monitoring measures required in past surveys. Previous projects of this type required marine mammal monitoring reports, which NMFS has reviewed to ensure that the authorized activities have a negligible impact on marine mammals.

To allow other agencies and the public the opportunity to review and comment on the action, NMFS published a notice of the Proposed IHA in the Federal Register on June 4, 2021 (86 FR 30006). NMFS did not receive any comments in response to the publication of the proposed IHA. The lack of any comments indicated that the proposed activities or the effects of the activities on the quality of the human environment were not likely to be highly controversial. NMFS has determined, based on the best available scientific literature, the limited duration of the project, and the low-level effects to marine mammals, that the issuance of an IHA would have a negligible impact on the affected species or stocks of marine mammals.

5. Are the proposed action's effects on the human environment likely to be highly uncertain or involve unique or unknown risks?

Response: The potential risks associated with marine geophysical surveys are neither unique nor unknown, nor is there significant uncertainty about impacts. NMFS has issued authorizations for similar activities or activities with similar types of marine mammal harassment in the Atlantic, Pacific and Southern Oceans and the Mediterranean Sea, and conducted NEPA analyses on those projects. The scope of this action is not substantially different from past geophysical surveys and is not unusually large or substantial, and would include the same or similar mitigation and monitoring measures required in past surveys. Therefore, NMFS expects any potential effects from the issuance of our IHA to be similar to prior activities, which are not likely to be highly uncertain or involve unique or unknown risks.

6. Can the proposed action reasonably be expected to establish a precedent for future actions with significant effects or represent a decision in principle about a future consideration?

Response: The issuance of this IHA to L-DEO is not expected to set a precedent for future actions with significant effects nor represent a decision in principle regarding future considerations. The issuance of an IHA to take marine mammals incidental to the proposed activities is a routine process under the MMPA. To ensure compliance with statutory and regulatory standards, NMFS' actions under section 101(a)(5)(D) of the MMPA must be considered individually and be based on the best available information, which is continuously evolving. Issuance of an IHA to a specific individual or organization for a given activity does not guarantee or imply that NMFS will authorize others to conduct similar activities. Subsequent requests for incidental take authorizations would be evaluated upon their own merits relative to the criteria established in the MMPA and 50 CFR Part 216 on a case-by-case basis. The survey has no unique aspects that would suggest it would be a precedent for any future actions.

7. Is the proposed action related to other actions that when considered together will have individually insignificant but cumulatively significant impacts?

Response: The EA and the documents it references, analyzed the impacts of the issuance of an IHA for the take of marine mammals incidental to the conduct of a marine geophysical survey in light of other human activities within the study area. These activities are described in Section 4.1.5 of the Final EA. The limited duration of the proposed seismic survey (maximum of 27 days of seismic operations) would be expected to result in only a negligible or minor increase in overall disturbance effects on marine animals and would result in no increase in serious injuries or mortality to marine mammals.

8. *Can the proposed action reasonably be expected to adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural, or historical resources?*

Response: The issuance of this IHA is not expected to adversely affect districts, sites, highways, structures or objects listed in or eligible for listing in the National Register of Historic Places nor cause loss or destruction of significant scientific, cultural and historical resources because NMFS' action is limited to the issuance of an IHA to incidentally harass marine mammals. In addition, NSF determined the conduct of this geophysical survey would not impact cultural resources including traditional fisheries or any shipwrecks.

There is some subsistence harvest by indigenous groups in the proposed survey area in southeast Alaska. However, given the temporary nature of the proposed activities and the fact that the survey does not impact any specific traditional hunting area, the proposed activity would not be expected to have any impact on the availability of the species or stocks for subsistence users. L-DEO conducted outreach to the relevant subsistence users to notify subsistence hunters of the planned survey, to identify the measures that would be taken to minimize any effects on the availability of marine mammals for subsistence uses, and to provide an opportunity for comment on these measures. L-DEO received no concerns regarding the potential effects of the planned survey on the potential availability of marine mammals for subsistence uses.

9. *Can the proposed action reasonably be expected to have a significant impact on endangered or threatened species, or their critical habitat as defined under the Endangered Species Act of 1973?*

Response: The proposed geophysical survey may have the potential to adversely affect the following marine mammal species listed as threatened or endangered under the Endangered Species Act (ESA; 16 U.S.C. 1531 *et seq.*): the sei whale, fin whale, blue whale, sperm whale, the Mexico Distinct Population Segment (DPS) of humpback whale, Western North Pacific DPS of gray whale, North Pacific right whale, and Western DPS of Steller sea lions. A Biological Opinion prepared pursuant to section 7 of the ESA concluded that L-DEO's project was not likely to jeopardize the continued existence of any ESA-listed species and would not destroy or adversely modify critical habitat.

To reduce the potential for disturbance from the activities, L-DEO and the other research partners would implement several monitoring and mitigation measures for marine mammals, which are enforceable through the final IHA and the Biological Opinion's Incidental Take Statement. Taking these measures into consideration, NMFS expects that the responses of marine mammals from the Preferred Alternative would primarily be in the form of temporary displacement from the area and/or short-term behavioral changes, as well as a limited amount of PTS in a small number of marine mammals, falling within the MMPA definition of "Level B harassment" and "Level A harassment." NMFS does not anticipate that take by serious injury or mortality would occur, nor has NMFS authorized take by serious injury or mortality. NMFS's predicted estimates for Level A harassment take for some species are likely overestimates of the injury that will occur, as NMFS expects that successful implementation of the required visual and acoustic mitigation measures would avoid Level A harassment take in some instances. In addition, NMFS expects that some individuals would avoid the source at levels expected to result in injury. NMFS anticipates that any PTS incurred would be in the form of only a small degree of PTS, and not total deafness. Thus, NMFS expects that impacts would be at the lowest level practicable due to the incorporation of the proposed mitigation measures.

10. Can the proposed action reasonably be expected to threaten a violation of Federal, state, or local law or requirements imposed for environmental protection?

Response: The issuance of this IHA to L-DEO would not violate any federal, state, or local laws for environmental protection. NMFS' compliance with environmental laws and regulations is based on NMFS's action and the nature of the applicant's activities. NMFS complied with the MMPA's requirements in issuing this IHA. NMFS also consulted under Section 7 of the ESA to determine if the issuance of this IHA would likely jeopardize the continued existence of listed species or result in destruction or an adverse modification of critical habitat. The consultation concluded that issuance of an IHA would not jeopardize any listed species or destroy or adversely modify critical habitat. NSF and L-DEO fulfilled their responsibilities under the MMPA for this action and will be required to obtain any additional federal, state and local permits necessary to carry out the proposed geophysical survey activities.

11. Can the proposed action reasonably be expected to adversely affect stocks of marine mammals as defined in the Marine Mammal Protection Act?

Response: To assess potential impacts of the proposed action on marine mammal species or stocks, 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. L-DEO calculated the estimated number of animals expected to be exposed to sound levels greater than 160 dB rms, which is the threshold for Level B harassment. The numbers of marine mammals that NMFS proposes for authorized take would be considered small relative to the relevant populations.

Additionally, other qualitative factors may be considered in the analysis, such as the temporal or spatial scale of the activities. The proposed activity is temporary and of relatively short duration. Potential adverse effects on prey species would also be temporary and spatially limited. No serious injury or mortality is anticipated or authorized. Furthermore, alternate areas of similar habitat value for affected marine mammals would be available allowing animals to temporarily vacate the survey areas to avoid exposure to sound.

For these reasons, impacts resulting from this activity are not expected to adversely affect the marine mammal species or stocks as defined in the MMPA.

12. Can the proposed action reasonably be expected to adversely affect managed fish species?

Response: NSF described EFH and HAPC locations within the action areas in Section 3.7 of the Final EA as well as impacts to fish species and fisheries in Section 4.1. NSF concluded that there could be changes in behavior and other non-lethal, short-term, temporary impacts, and injurious or mortal impacts on a small number of individuals within a few meters of a high-energy acoustic source, but that there would be no significant impacts on fish populations. NSF also concluded that seismic surveys could cause temporary, localized reduced fish catch to some species, but that effects on commercial and recreational fisheries would not be significant. Furthermore, in decades of geophysical surveys carried out by the *Langseth* and its predecessor, the R/V *Ewing*, there have never been observations of seismic sound-related fish injuries or mortality.

13. Can the proposed action reasonably be expected to adversely affect essential fish habitat as defined under the Magnuson-Stevens Fishery Conservation and Management Act?

Response: NSF described EFH that exists in the action area in Section 3.7 of the Final EA. NMFS does not expect the issuance of an IHA for the take of marine mammals incidental to the conduct of geophysical survey activities would cause substantial damage to the ocean and coastal habitats and/or essential fish habitat because the IHA is limited to the take of marine mammals incidental to geophysical survey activities. Similarly, the mitigation and monitoring measures required by the IHA for L-DEO's proposed activities are limited to actions that minimize take of marine mammals and improve monitoring of marine mammals, and do not alter any aspect of the activity itself.

14. Can the proposed action reasonably be expected to adversely affect vulnerable marine or coastal ecosystems, including but not limited to, deep coral ecosystems?

Response: NMFS does not expect the issuance of an IHA for the take of marine mammals incidental to marine geophysical survey activities would cause damage to marine habitats, coastal habitats, or deep coral ecosystems. The IHA is limited to the take of marine mammals incidental to survey activities and does not authorize the activity itself. The authorized takes are limited to Level B harassment and some Level A harassment in the form of PTS and are not expected to have any ecosystem-level effects. Mitigation and monitoring measures required by the IHA are limited to actions that minimize take of marine mammals and improve monitoring of marine mammals. These mitigation and monitoring measures do not alter any aspect of L-DEO's proposed activity in a way that could adversely affect vulnerable marine or coastal ecosystems or deep coral ecosystems.

15. Can the proposed action reasonably be expected to adversely affect biodiversity or ecosystem functioning (e.g., benthic productivity, predator-prey relationships, etc.)?

Response: NMFS does not expect issuing an IHA to L-DEO for a geophysical survey to have a substantial impact on biodiversity or ecosystem function within the affected environment. Any harassment authorized by the IHA would be limited to temporary behavioral responses (such as brief masking of natural sounds) in marine mammals and temporary changes in animal distribution. These effects would be short-term and localized and will not have a substantial impact on biodiversity or ecosystem function. Current research indicates that some fish species and other marine mammal prey (e.g., squid, zooplankton) can be affected by ocean noise, though the degree of impact depends on many environmental and biological conditions. Any potential impacts to fish is expected to be temporary and localized, and result in short-term displacement, at most.

The current research noted above did indicate that impacts to marine mammal habitat, in the form of effects to marine mammal prey species, is possible. For example, one recent study investigated zooplankton abundance, diversity, and mortality before and after exposure to airgun noise, finding that the exposure resulted in significant depletion for more than half the taxa present and that there were two to three times more dead zooplankton after airgun exposure compared with controls for all taxa. However, in order to have significant impacts on species such as plankton, the spatial or temporal scale of impact must be large in comparison with the ecosystem concerned. Therefore, while the effect observed in this study is of concern, it would likely warrant greater concern particularly where repeated noise exposure in an area is expected (which it is not here) and, given questions about these findings, further study is warranted. Additional studies have shown that some fish and invertebrate species may experience displacement or behavioral changes from acoustic exposure from airgun surveys, such as temporary displacement or cessation in vocalization. However, impacts associated with sound in the water are expected to be sporadic, temporary and localized given a mobile sound source over a broad area. Thus, short-term minor adverse effects are likely to occur but are not expected to rise to the level of significance. There are no known impacts from airgun surveys on deep coral ecosystems. As noted, NMFS does not anticipate any physical

interactions from survey gear/equipment on the environment, and does not expect that noise production from the survey would impact coastal ecosystems at all, given the required mitigation measures.

16. Can the proposed action reasonably be expected to result in the introduction or spread of a nonindigenous species?

Response: The issuance of an IHA to L-DEO does not have the potential to introduce or spread non-indigenous species because it does not encourage or require the R/V *Langseth* to conduct long-range vessel transit that would lead to the introduction or spread of non-indigenous species. The *Langseth* complies with all international and U.S. national ballast water requirements to prevent the spread of a non-indigenous species.

VII. CONDITIONS – MITIGATION, MONITORING AND REPORTING

NMFS does not authorize the geophysical survey proposed by NSF and L-DEO. However, NMFS does authorize the incidental take of marine mammals under its jurisdiction in connection with these activities and prescribes, where applicable, the methods of taking and other means of effecting the least practicable impact on the species and stocks and their habitats. NMFS' issuance of this IHA is thus conditioned upon reporting requirements and the implementation of mitigation and monitoring designed to reduce impacts to marine mammals to the level of least practicable impact. These conditions are summarized below and described in detail in the IHA, and include:

- Visual mitigation monitoring;
- Passive acoustic monitoring;
- Establishment of an exclusion zone and buffer zone;
- Shutdown procedures;
- Ramp-up procedures;
- Vessel strike avoidance measures;
- Documentation of the number and species of marine mammals exposed and behavior and responses of marine mammals; and
- Submission of a monitoring report to NMFS.

VIII. DETERMINATION

Based on the information presented herein along with analysis in the 2021 Final EA prepared by NSF and the application submitted by L-DEO, it is hereby determined the issuance of the IHA to L-DEO will not significantly impact the quality of the human environment. In addition, we have addressed all beneficial and adverse impacts of the action to reach the conclusion of no significant impacts. Accordingly, the preparation of an Environmental Impact Statement for this action is not necessary.

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