DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

[Docket No. FWS–R7–ES–2020–0132; FXES111607MRG01–212–FF07CAMM00]

Marine Mammals; Incidental Take During Specified Activities; Proposed Incidental Harassment Authorization for Southeast Alaska Stock of Northern Sea Otters in the Queen Charlotte Fault Region, Alaska

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Notice of receipt of application; proposed incidental harassment authorization; request for comments.

SUMMARY: We, the U.S. Fish and Wildlife Service, in response to a request under the Marine Mammal Protection Act of 1972, as amended, from the National Science Foundation and the Lamont-Doherty Earth Observatory, propose to authorize nonlethal, incidental take by harassment of small numbers of the Southeast Alaska stock of northern sea otters between July 1, 2021, and August 31, 2021. The applicants have requested this authorization for take that may result from high-energy seismic surveys in the Queen Charlotte Fault region of Southeast Alaska. Seismic surveys are being conducted to characterize crustal and uppermost mantle velocity structure, fault zone architecture and rheology, and seismicity in the Queen Charlotte Fault. We estimate that this project may result in the nonlethal incidental take of up to 27 northern sea otters from the Southeast Alaska stock. This proposed authorization, if finalized, will be for up to 49 takes of 27 northern sea otters by Level B harassment only. No injury or mortality is expected or will be authorized.

DATES: Comments on the proposed incidental harassment authorization and draft environmental assessment must be received by July 9, 2021.

ADDRESSES: *Document availability:* You may view this proposed authorization, the application package, supporting information, and the lists of references cited herein at *http://www.regulations.gov* under Docket No. FWS–R7–ES–2020–0132, or these documents may be requested as described under **FOR FURTHER INFORMATION CONTACT**.

Comment submission: You may submit comments on this proposed authorization by one of the following methods:

- *U.S. mail:* Public Comments Processing, Attn: Docket No. FWS–R7–ES–2020–0132, U.S. Fish and Wildlife Service, MS: PRB/3W, 5275 Leesburg Pike, Falls Church, Virginia 22041–3803.
- *Electronic submission:* Federal eRulemaking Portal at: *http://www.regulations.gov.* Follow the instructions for submitting comments to Docket No. FWS–R7–ES–2020–0132. We will post all comments at *http://www.regulations.gov.* You may request that we withhold personal identifying information from public review; however, we cannot guarantee that we will be able to do so. See Request for Public Comments for more information.

FOR FURTHER INFORMATION CONTACT: Marine Mammals Management, U.S. Fish and Wildlife Service, MS–341, 1011 East Tudor Road, Anchorage, Alaska, 99503, by email at *R7mmmregulatory@fws.gov;* or by telephone at 1–800–362–5148. Persons who use a telecommunications device for the deaf (TDD) may call the Federal Relay Service (FRS) at 1–800–877–8339, 24 hours a day, 7 days a week.

SUPPLEMENTARY INFORMATION:

Background

Section 101(a)(5)(D) of the Marine Mammal Protection Act of 1972 (MMPA; 16 U.S.C. 1361, *et seq.*), authorizes the Secretary of the Interior (Secretary) to allow, upon request, the incidental but not intentional taking of small numbers of marine mammals of a species or population stock by U.S. citizens who engage in a specified activity (other than commercial fishing) within a specified region during a period of not more than one year. Incidental take may be authorized only if statutory and regulatory procedures are followed and the U.S. Fish and Wildlife Service (hereafter, ''the Service'' or ''we'') makes the following findings: (i) Take is of a small number of marine mammals of a species or population stock, (ii) take will have a negligible impact on the species or stock, and (iii) take will not have an unmitigable adverse impact on the availability of the species or stock for subsistence uses by coastal-dwelling Alaska Natives.

The term ''take,'' as defined by the MMPA, means to harass, hunt, capture, or kill, or to attempt to harass, hunt, capture, or kill any marine mammal (16 U.S.C. 1362(13)). Harassment, as defined by the MMPA, means any act of pursuit, torment, or annoyance that (i) has the potential to injure a marine mammal or marine mammal stock in the wild (the MMPA defines this as ''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 (the MMPA defines this as ''Level B harassment'').

The terms ''negligible impact,'' ''small numbers,'' and ''unmitigable adverse impact'' are defined in the Code of Federal Regulations at 50 CFR 18.27, the Service's regulations governing take of small numbers of marine mammals incidental to specified activities. ''Negligible impact'' is defined 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. ''Small numbers'' is defined as a portion of a marine mammal species or stock whose taking would have a negligible impact on that species or stock. However, we do not rely on that definition, as it conflates the terms ''small numbers'' and ''negligible impact,'' which we recognize as two separate and distinct requirements (see *Natural Res. Def. Council, Inc.* v. *Evans,* 232 F. Supp. 2d 1003, 1025 (N.D. Cal. 2003)). Instead, in our small numbers determination, we evaluate whether the number of marine mammals likely to be taken is small relative to the size of the overall population. ''Unmitigable adverse impact'' is defined as an impact resulting from the specified activity (1) that is likely to reduce the availability of the species to a level insufficient for a harvest to meet subsistence needs by (i) causing the marine mammals to abandon or avoid hunting areas, (ii) directly displacing subsistence users, or (iii) placing physical barriers between the marine mammals and the subsistence hunters; and (2) that cannot be sufficiently mitigated by other measures to increase the availability of marine mammals to allow subsistence needs to be met.

If the requisite findings are made, we will issue an Incidental Harassment Authorization (IHA), which sets forth the following: (i) Permissible methods of taking; (ii) other means of effecting the least practicable impact on marine mammals and their habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance, and on the availability of marine mammals for taking for subsistence uses by coastal-dwelling Alaska Natives; and (iii) requirements for monitoring and reporting take.

Summary of Request

On December 2, 2019, the National Science Foundation and Lamont-Doherty Earth Observatory (hereafter

''NSF/L–DEO'' or ''the applicant'') submitted a request to the Service's Marine Mammals Management Office (MMM) for authorization to take by Level B harassment a small number of northern sea otters (*Enhydra lutris kenyoni,* hereafter ''sea otters'' or ''otters'' unless another species is specified) from the Southeast Alaska stock. NSF/L–DEO expects that take by unintentional harassment may occur during their planned high-energy marine seismic surveys at the Queen Charlotte Fault (QCF) in the Northeast Pacific Ocean within the U.S. Exclusive Economic Zone (EEZ).

Description of Specified Activities and Geographic Region

The specified activity (the ''project'') consists of Lamont-Doherty Earth Observatory's (L–DEO) 2021 Marine Geophysical Surveys by the Research Vessel (R/V) *Marcus G. Langseth* (Langseth) of the QCF in the Northeast Pacific Ocean from July 1, 2021, to August 31, 2021. High-energy two-dimensional (2–D) seismic surveys will be used to characterize crustal and uppermost mantle velocity structure, fault zone architecture and rheology, and seismicity of the QCF. The 2–D seismic surveys will be conducted along transect lines within the area of 52–57° N and 131–137° W (Figure 1). Some deviation in actual transects, including order of survey operations, could be necessary due to poor data quality, inclement weather, or mechanical issues with the research vessel or equipment. The surveys are proposed to occur within the EEZs of the United States and Canada, including U.S. Federal Waters, State of Alaska Waters, and Canadian Territorial Waters ranging from 50 to 2,800 meters (m; 164 to 9,186 feet (ft)) in depth. The Service cannot and is not authorizing the incidental take of marine mammals in waters not under the jurisdiction of the United States. Therefore, the Service's calculation of estimated incidental take is limited to the specified activity occurring in United States jurisdictional waters within the stock's range. The proposed surveys are anticipated to last for 36 days, including approximately 27 days of seismic operations, approximately 2 days of transit to and from the survey area, 3 days for equipment deployment/recovery, and 4 days of contingency. The R/V *Langseth* will likely leave out of and return to the port of Ketchikan, AK, during summer 2021.

The R/V *Langseth* will tow 4 strings containing an array of 36 airguns at a depth of 12 m (39 ft), creating a discharge volume of approximately 0.11 cubic meter (m^3; 6,600 cubic inches (in^3)). The peak sound pressure 1 m (3.2 ft) from the center of the airgun array is 258.6 decibels (Tolstoy *et al.* 2009). Noise levels herein are given in decibels (dB) referenced to 1 μPa (dB re: 1 μPa) for underwater sound. All dB levels are dB_{RMS} (root-mean-squared dB level) unless otherwise noted; dB_{RMS} refers to the square root of the average of the squared sound pressure level typically measured over 1 second. Other important metrics include the sound exposure level (SEL; represented as dB re: 1 μPa^2-s), which represents the total energy contained within a pulse and considers both intensity and duration of exposure, and the peak sound pressure (also referred to as the zero-to-peak sound pressure or 0–p). Peak sound pressure is the maximum instantaneous sound pressure measurable in the water at a specified distance from the source and is represented in the same units as the dB_{RMS} sound pressure. See Richardson *et al.* (1995), Götz *et al.* (2009), Hopp *et al.* (2012), Navy (2014), for descriptions of acoustical terms and measurement units in the context of ecological impact assessment.

The seismic array produces broadband energy that ranges from a few hertz (Hz) to kilohertz (kHz). However, all but a small fraction of the energy is focused in the 10–300 Hz range (Tolstoy *et al.* 2009). The survey will also include the use of a single 655-cubic-centimeter (cm^3; 40-in^3) airgun that will be used when the full array is powered down.

The receiving system will consist of a 15-kilometer (km; 9.3-mile (mi)) hydrophone streamer and approximately 60 short-period and 28 broadband Ocean Bottom Seismometer (OBS) devices, which will be primarily deployed from a second vessel, the Canadian Coast Guard R/V *John P. Tully* (however, R/V *Langseth* may also deploy OBSs). The OBSs will be deployed at approximately 10-km (6.2-mi) intervals with 5-km (3.1 mi) spacing over the central 40 km (25 mi) of the fault zone. The OBSs have a height and diameter of 1 m (3.2 ft) and an 80-kilogram (176-pound) anchor.

Additional project details may be reviewed in the application materials available as described under **ADDRESSES** or may also be requested as described under **FOR FURTHER INFORMATION CONTACT**.

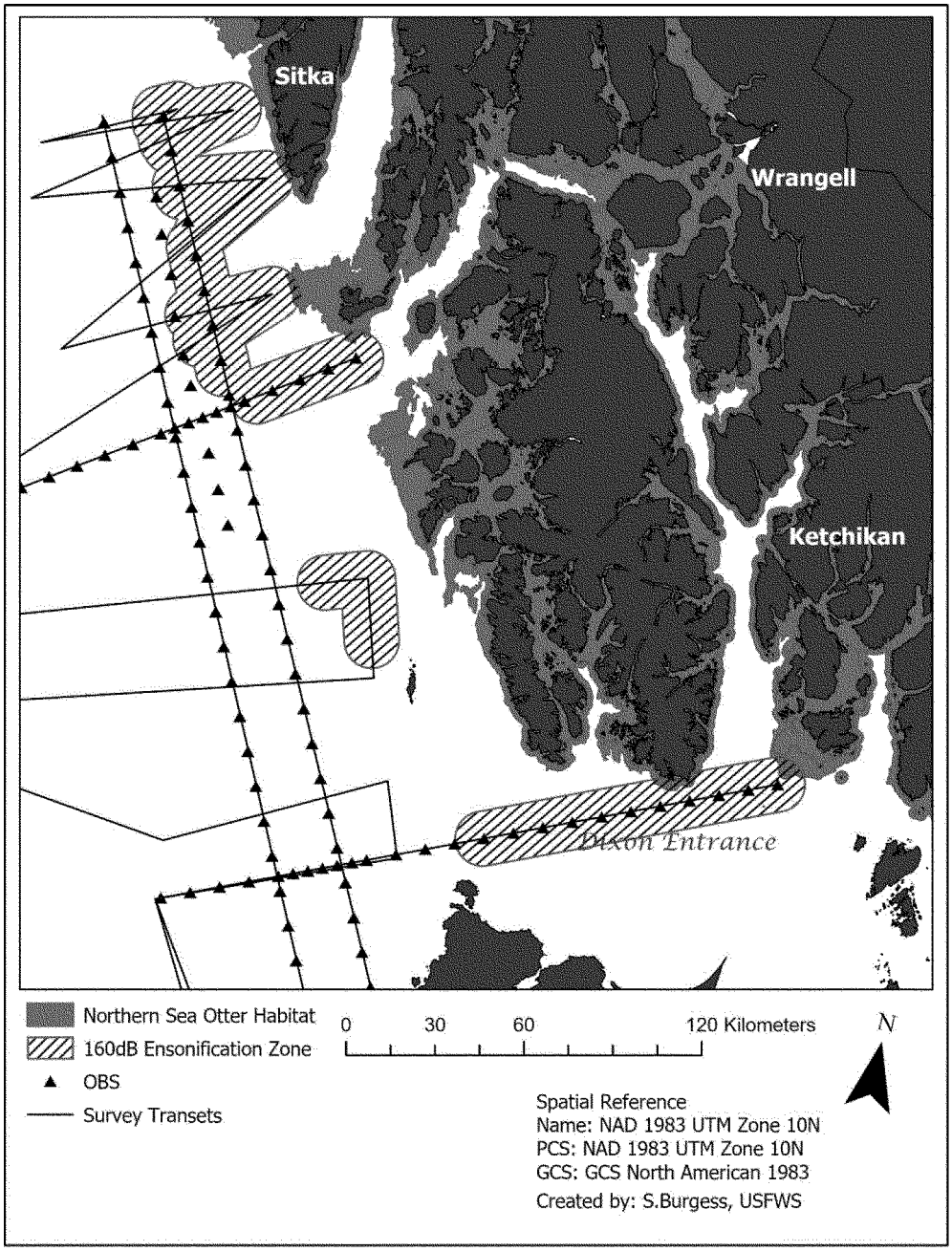

Figure 1. Specified geographic area for the National Science Foundation and Lamont-Doherty Earth Observatory seismic survey planned for summer 2021.

Description of Marine Mammals in the Specified Activity Area

The northern sea otter is the only marine mammal under the Service's jurisdiction that normally occupies the Northeast Pacific Ocean. Sea otters in Alaska are represented by three stocks. Those in the Northeast Pacific Ocean belong to the Southeast Alaska stock. Two other stocks occur in Southcentral and Southwest Alaska. Detailed information about the biology of the Southeast Alaska stock can be found in the most recent stock assessment report (USFWS 2014), which can be found at: *https://www.fws.gov/r7/fisheries/mmm/stock/Revised_April_2014_Southeast_Alaska_Sea_Otter_SAR.pdf.*

Sea otters may be distributed anywhere within the specified project area other than upland areas; however, they generally occur in shallow water near the shoreline. They are most commonly observed within the 40-m (131-ft) depth contour (USFWS 2014), although they can be found in areas with deeper water. Ocean depth is

generally correlated with distance to shore, and sea otters typically remain within 1 to 2 km (0.62 to 1.24 mi) of shore (Riedman and Estes 1990). They tend to be found closer to shore during storms, but they venture farther out during good weather and calm seas (Lensink 1962; Kenyon 1969). In the 14 aerial surveys conducted from 1995 to 2012 in Southeast Alaska, 95 percent of otters were found in areas shallower than 40 m (131 ft) (Tinker *et al.* 2019). Areas important to mating for the Southeast Alaska stock include marine coastal regions containing adequate food resources within the 40-m (131-ft) depth contour.

The most recent estimate of the number of sea otters in the Southeast Alaska stock is 25,584 otters (standard error = 3,679; Tinker *et al.* 2019). The estimate was developed using a Bayesian hierarchical modeling framework based on survey and harvest count data. The survey data comprised results from 14 aerial surveys conducted in Southeast Alaska from 1995 to 2012, totaling more than 20,000 km (12,427 mi) of aerial transects. The Service conducted large-scale surveys in cooperation with the U.S. Geological Survey in 2003 and 2010 in southern Southeast Alaska (from Kake to Duke Island and Cape Chacon) and in 2002 and 2011 in northern Southeast Alaska (from Icy Point to Cape Ommaney). In these aerial surveys, transects were flown over high-density otter habitat (<40-m (131-ft) ocean depth) with a spacing of 2 km (1.2 mi) between transects and low-density otter habitat (40- to 100-m (131- to 328-ft) ocean depth) with a spacing of 8 km (5 mi) between transects.

Otter densities within the Southeast Alaska stock have been calculated for 24 subdivisions (Tinker *et al.* 2019). The density of otters in the affected subdivisions ranged from 0.175 to 1.333 otters per km^2. Distribution of the population during the proposed project is likely to be similar to that detected during sea otter surveys, as work will occur during the same time of the year that these surveys were conducted.

The documented home range sizes and movement patterns of sea otters illustrate the types of movements that could be seen among otters responding to the proposed activities. Sea otters are non-migratory and generally do not disperse over long distances (Garshelis and Garshelis 1984). They usually remain within a few kilometers of their established feeding grounds (Kenyon 1981). Breeding males stay for all or part of the year in a breeding territory covering up to 1 km (0.62 mi) of coastline while adult females have home ranges of approximately 8 to 16 km (5 to 10 mi), which may include one or more male territories. Juveniles move greater distances between resting and foraging areas (Lensink 1962; Kenyon 1969; Riedman and Estes 1990; Estes and Tinker 1996). Although sea otters generally remain local to an area, they are capable of long-distance travel. Otters in Alaska have shown daily movement distances greater than 3 km (1.9 mi) at speeds up to 5.5 km per hour (km/hr; 3.4 mi per hour (mi/h)) (Garshelis and Garshelis 1984).

Potential Effects of the Specified Activities

Exposure of Sea Otters to Noise

We do not expect the operations outlined in the Description of Specified Activities and Geographic Region and described in the applicant's petition to lead to take from vessel presence or anthropogenic presence. The tracklines for the vessels will not physically enter low-density or high-density sea otter habitat. Thus, we do not anticipate human–otter interactions that would lead to Level B harassment or other forms of take.

The operations have the potential to result in take of sea otters by harassment from noise. Here, we characterize ''noise'' as sound released into the environment from human activities that exceeds ambient levels or interferes with normal sound production or reception by sea otters. The terms ''acoustic disturbance'' or ''acoustic harassment'' are disturbances or harassment events resulting from noise exposure. Potential effects of noise exposure are likely to depend on the distance of the otter from the sound source and the level of sound the otter receives. Temporary disturbance or localized displacement reactions are the most likely to occur. No lethal take is anticipated, nor can the Service authorize lethal take through an Incidental Take Authorization. Therefore, none will be authorized.

Whether a specific noise source will affect a sea otter depends on several factors, including the distance between the animal and the sound source, the sound intensity, background noise levels, the noise frequency, the noise duration, and whether the noise is pulsed or continuous. The actual noise level perceived by individual sea otters will depend on distance to the source, whether the animal is above or below water, atmospheric and environmental conditions as well as aspects of the noise emitted.

From the discussion below, we expect the actual number of otters experiencing Level B take due to harassment by noise to be 27 or fewer. While individual otters may be taken more than once, the total number of incidental takes of sea otters is expected to be less than 49.

Sea Otter Hearing

The NSF/L–DEO's 36-airgun array will produce sound frequencies that fall within the hearing range of sea otters and will be audible to animals. Controlled sound exposure trials on southern sea otters (*E. l. nereis*) indicate that otters can hear frequencies between 125 Hz and 38 kHz with best sensitivity between 1.2 and 27 kHz (Ghoul and Reichmuth 2014). Aerial and underwater audiograms for a captive adult male southern sea otter in the presence of ambient noise suggest the sea otter's hearing was less sensitive to high-frequency (greater than 22 kHz) and low-frequency (less than 2 kHz) sound than terrestrial mustelids but was similar to that of a California sea lion (*Zalophus californianus*). However, the subject otter was still able to hear low-frequency sounds, and the detection thresholds for sounds between 0.125–1 kHz were between 116–101 dB, respectively. Dominant frequencies of southern sea otter vocalizations are between 3 and 8 kHz, with some energy extending above 60 kHz (McShane *et al.* 1995; Ghoul and Reichmuth 2012).

Exposure to high levels of sound may cause changes in behavior, masking of communications, temporary or permanent changes in hearing sensitivity, discomfort, and injury to marine mammals. Unlike other marine mammals, sea otters do not rely on sound to orient themselves, locate prey, or communicate underwater; therefore, masking of communications by anthropogenic sound is less of a concern than for other marine mammals. However, sea otters do use sound for communication in air (especially mothers and pups; McShane *et al.* 1995) and may avoid predators by monitoring underwater sound (Davis *et al.* 1987).

Thresholds have been developed for some marine mammals above which exposure is likely to cause behavioral disturbance and injuries (Southall *et al.* 2007; Finneran and Jenkins 2012; NMFS 2016). However, species-specific criteria for sea otters has not been identified. Because sea otter hearing abilities and sensitivities have not been fully evaluated, we relied on the most similar proxy to evaluate the potential effects of noise exposure.

California sea lions (otariid pinnipeds) have a frequency range of hearing most similar to that of southern sea otters (Ghoul and Reichmuth 2014) and provide the closest related proxy for

which data are available. Sea otters and pinnipeds share a common mammalian aural physiology (Echteler *et al.* 1994; Solntseva 2007). Both are adapted to amphibious hearing, and both use sound in the same way (primarily for in-air communication rather than feeding).

Exposure Thresholds

The National Marine Fisheries Service (NMFS) established noise exposure criteria for identifying underwater noise levels capable of causing Level A harassment (injury) of otariid pinnipeds (NMFS 2018). Sea otter-specific criteria have not been determined. However, because of their biological similarities, we assume that NMFS' noise exposure criteria for otariid pinniped injury is a suitable surrogate for sea otter impacts. Those criteria are based on estimated levels of sound exposure capable of causing a permanent shift in sensitivity of hearing (*e.g.,* a permanent threshold shift (PTS) (NMFS 2018)). A PTS occurs when noise exposure causes hairs within the inner ear system to die.

The NMFS (2018) criteria for sound exposure incorporate two metrics of exposure: The peak level of instantaneous exposure likely to cause PTS, and the cumulative sound exposure level during a 24-hour period (SELcum). They also include weighting adjustments for the sensitivity of different species to varying frequencies. The PTS-based injury criteria were developed from theoretical extrapolation of observations of temporary threshold shifts (TTS) detected in lab settings during sound exposure trials. Studies were summarized by Finneran (2015). For otariid pinnipeds, PTS is predicted to occur at 232 dB peak or 203 dB SEL_{cum} for impulsive sound, or 219 dB SEL_{cum} for non-impulsive (continuous) sound.

The NMFS criteria for take by Level A harassment represents the best available information for predicting injury from exposure to underwater sound among pinnipeds, and in the absence of data specific to otters, we assume these criteria also represent appropriate exposure limits for Level A take of sea otters.

The NMFS (2018) criteria do not identify thresholds for avoidance of Level B take. For pinnipeds, the NMFS has adopted a 160-dB threshold for Level B take from exposure to impulse noise and a 120-dB threshold for continuous noise (NMFS 1998; HESS 1999; NMFS undated). These thresholds were developed from observations of mysticete (baleen) whales responding to airgun operations (*e.g.,* Malme *et al.* 1983a, b; Richardson *et al.* 1986, 1995) and from equating Level B take with noise levels capable of causing TTS in lab settings.

We have evaluated these thresholds and determined that the Level B threshold of 120-dB for non-impulsive noise is not applicable to sea otters. The 120-dB threshold is based on studies conducted by Malme *et al.* in the 1980s, during which gray whales (*Eschrichtius robustus*) were exposed to experimental playbacks of industrial noise. Gray whales are in the group of marine mammals believed to be most sensitive to low-frequency sounds, with an estimated audible frequency range of approximately 10 Hz to 30 kHz (Finneran 2015). During the study, conducted at St. Lawrence Island, Alaska, Malme *et al.* (1988) observed the behavioral responses of gray whales to the playback of drillship noise and concluded that ''exposure to levels of 120 dB or more would probably cause avoidance of the area by more than one-half of the gray whales.'' Sea otters do not usually occur at St. Lawrence Island, Alaska, but similar playback studies conducted off the coast of California (Malme 1983a, 1984) included a southern sea otter monitoring component (Riedman 1983, 1984). While the 1983 and 1984 studies detected probabilities of avoidance in gray whales comparable to those reported in Malme *et al.* (1988), there was no evidence of disturbance reactions or avoidance in southern sea otters. Thus, given the different range of frequencies to which sea otters and gray whales are sensitive, the NMFS 120-dB threshold based on gray whale behavior is not appropriate for predicting sea otter behavioral responses, particularly for low-frequency sound.

Although no specific thresholds have been developed for sea otters, several alternative behavioral response thresholds have been developed for pinnipeds. Southall *et al.* (2007, 2019) assessed behavioral response studies and found considerable variability among pinnipeds. The authors determined that exposures between approximately 90 to 140 dB generally do not appear to induce strong behavioral responses in pinnipeds in water. However, they found behavioral effects, including avoidance, become more likely in the range between 120 to 160 dB, and most marine mammals showed some, albeit variable, responses to sound between 140 to 180 dB. Wood *et al.* (2012) later adapted the approach identified in Southall *et al.* (2007) to develop a probabilistic scale for marine mammal taxa at which 10 percent, 50 percent, and 90 percent of individuals exposed are assumed to produce a behavioral response. For many marine mammals, including pinnipeds, these response rates were set at sound pressure levels of 140, 160, and 180 dB, respectively.

Based on the lack of sea otter disturbance response or any other reaction to the 1980's playback studies and the absence of a clear pattern of disturbance or avoidance behaviors attributable to underwater sound levels up to about 160 dB resulting from low-frequency broadband noise, we assume 120 dB is not an appropriate behavioral response threshold for sea otters exposed to continuous underwater noise.

Thresholds based on TTS have been used as a proxy for Level B harassment (*i.e.,* 70 FR 1871, January 11, 2005; 71 FR 3260, January 20, 2006; and 73 FR 41318, July 18, 2008). Southall *et al.* (2007) derived TTS thresholds for pinnipeds based on 212 dB peak and 171 dB $SEL_{cum.}$ Exposures resulting in TTS in pinnipeds were found to range from 152 to 174 dB (183 to 206 dB SEL) (Kastak *et al.* 2005), with a persistent TTS, if not a PTS, after 60 seconds of 184 dB SEL (Kastak *et al.* 2008). Kastelein *et al.* (2012) found small but statistically significant TTSs at approximately 170 dB SEL (136 dB, 60 minutes (min)) and 178 dB SEL (148 dB, 15 min). Finneran (2015) summarized these and other studies, and the NMFS (2018) has used the data to develop TTS threshold for otariid pinnipeds of 188 dB SEL_{cum} for impulsive sounds and 199 dB SEL_{cum} for non-impulsive sounds.

Exposure to impulsive sound levels greater than 160 dB can elicit behavioral changes in marine mammals that may lead to detrimental disruption of normal behavioral routines. Thus, using information available for other marine mammals as a surrogate and taking into consideration the best available scientific information about sea otters, the Service has set 160 dB of received underwater sound as a threshold for Level B take by disturbance for sea otters for this proposed IHA based on the work of Ghoul and Reichmuth (2012a, b), McShane *et al.* (1995), NOAA (2005), Riedman (1983), Richardson *et al.* (1995), and others. Exposure to unmitigated in-water noise levels between 125 Hz and 38 kHz that are greater than 160 dB—for both impulsive and non-impulsive sound sources—will be considered by the Service as Level B take; thresholds for potentially injurious Level A take will be 232 dB peak or 203 dB SEL for impulsive sounds and 219 dB SEL for continuous sounds (Table 1).

The area in which underwater noise in the frequency range of sea otter hearing will exceed thresholds is termed

the ''zone of ensonification.'' The ensonification zone in which noise levels exceed thresholds for Level A harassment is often referred to as the Level A harassment zone. The Level B harassment zone likewise includes areas ensonified to thresholds for Level B harassment of sea otters and extends from the sound source to the 160-dB isopleth.

TABLE 1—SUMMARY OF THRESHOLDS FOR PREDICTING LEVEL A AND LEVEL B TAKE OF NORTHERN SEA OTTERS FROM UNDERWATER SOUND EXPOSURE IN THE FREQUENCY RANGE 125 HZ–38 KHZ

Marine mammals	Injury (Level A) threshold		Disturbance (Level B) threshold
	Impulsive [1]	Non-impulsive [1]	All
Sea otters	232 dB peak; 203 dB SEL_{CUM}	219 dB SEL_{CUM} [2]	160 dB_{RMS}.

[1] Based on National Marine Fisheries Service acoustic exposure criteria for take of otariid pinnipeds (NMFS 2018).
[2] SEL_{CUM} = cumulative sound exposure level.

Evidence From Sea Otter Studies

The available studies of sea otter behavior suggest that sea otters may be more resistant to the effects of sound disturbance and human activities than other marine mammals. For example, at Soberanes Point, California, Riedman (1983) examined changes in the behavior, density, and distribution of southern sea otters that were exposed to recorded noises associated with oil and gas activity. The underwater sound sources were played at a level of 110 dB and a frequency range of 50 Hz to 20 kHz and included production platform activity, drillship, helicopter, and semi-submersible sounds. Riedman (1983) also observed the sea otters during seismic airgun shots fired at decreasing distances from the nearshore environment (50, 20, 8, 3.8, 3, 1, and 0.5 nautical miles (nm)) at a firing rate of 4 shots per minute and a maximum air volume of 4,070 in^3. Riedman (1983) observed no changes in the presence, density, or behavior of sea otters as a result of underwater sounds from recordings or airguns, even at the closest distance of 0.5 nm (<1 km or 0.6 mi). However, otters did display slight reactions to airborne engine noise. Riedman (1983, 1984) also monitored the behavior of sea otters along the California coast while they were exposed to a single 1,638-cm^3 (100-in^3) airgun and a 67,006-cm^3 (4,089-in^3) airgun array. Sea otters did not respond noticeably to the single airgun, and no disturbance reactions were evident when the airgun array was as close as 0.9 km (0.6 mi).

While at the surface, turbulence from wind and waves attenuates noise more quickly than in deeper water, reducing potential noise exposure (Greene and Richardson 1988; Richardson *et al.* 1995). Additionally, turbulence at the water's surface limits the transference of sound from water to air. A sea otter with its head above water will be exposed to only a small fraction of the sound energy travelling through the water beneath it. The average time spent above the water each day resting and grooming varies between male and female sea otters and seasonally. Esslinger et al. (2014) found in the summer months (*i.e.,* the season when the proposed action will take place), female otters foraged for an average of 8.78 hours per day, while male otters foraged for an average of 7.85 hours per day. Male and female sea otters spent an average of 63 to 67 percent of their summer days at the surface resting and grooming. The amount of total time spent at the surface may help limit sea otters' exposure during noise-generating operations.

Sea otters generally show a high degree of tolerance to noise. In another study using prerecorded sounds, Davis *et al.* (1988) exposed both northern sea otters in Simpson Bay, Alaska, and southern sea otters in Morro Bay, California, to a variety of airborne and underwater sounds, including a warble tone, sea otter pup calls, killer whale calls, air horns, and an underwater noise harassment system designed to drive marine mammals away from crude oil spills. The sounds were projected at a variety of frequencies, decibel levels, and intervals. The authors noted that certain noises could cause a startle response and result in movement away from a noise source. However, the effects were limited in range (no responses were observed for otters approximately 100–200 m (328–656 ft) from the source of the stimuli), and otters stopped moving away as a result of the stimuli within hours or, at most, 3 to 4 days.

In locations that lack frequent human activity, sea otters appear to have a lower threshold for outward signs of disturbance. Sea otters in Alaska have exhibited escape behaviors in response to the presence and approach of vessels. Behaviors included diving or actively swimming away from a boat, hauled-out sea otters entering the water, and groups of sea otters disbanding and swimming in multiple different directions (Udevitz *et al.* 1995). Sea otters in Alaska have also been shown to avoid areas with heavy boat traffic but return to those same areas during seasons with less traffic (Garshelis and Garshelis 1984). In Cook Inlet, otters drifting on a tide trajectory that would have taken them within 500 m (0.3 mi) of an active offshore drilling rig tended to swim to change their angle of drift to avoid a close approach despite near-ambient noise levels from the work (BlueCrest 2013).

Individual sea otters in Southeast Alaska will likely show a range of responses to noise from NSF/L–DEO's survey equipment and vessels. Some otters will likely show startle responses, change direction of travel, diving, or premature surfacing. Sea otters reacting to survey activities may divert time and attention from biologically important behaviors, such as feeding. Some animals may abandon the survey area and return when the disturbance has ceased. Based on the observed movement patterns of wild sea otters (*i.e.,* Lensink 1962; Kenyon 1969, 1981; Garshelis and Garshelis 1984; Riedman and Estes 1990; Estes and Tinker 1996), we expect some individuals, independent juveniles, for example, will respond to NSF/L–DEO's proposed survey by dispersing to areas of suitable habitat nearby, while others, especially breeding-age adult males, will not be displaced by vessels.

Consequences of Disturbance

The reactions of wildlife to disturbance can range from short-term behavioral changes to long-term impacts that affect survival and reproduction. When disturbed by noise, animals may respond behaviorally (*e.g.,* escape response) or physiologically (*e.g.,* increased heart rate, hormonal response) (Harms *et al.* 1997; Tempel and

Gutierrez 2003). The energy expense and associated physiological effects could ultimately lead to reduced survival and reproduction (Gill and Sutherland 2000; Frid and Dill 2002). For example, South American sea lions (*Otaria byronia*) visited by tourists exhibited an increase in the state of alertness and a decrease in maternal attendance and resting time on land, thereby potentially reducing population size (Pavez *et al.* 2015). In another example, killer whales (*Orcinus orca*) that lost feeding opportunities due to boat traffic faced a substantial (18 percent) estimated decrease in energy intake (Williams *et al.* 2006). Such disturbance effects can have population-level consequences. Increased disturbance rates have been associated with a decline in abundance of bottlenose dolphins (*Tursiops* sp.; Bejder *et al.* 2006; Lusseau *et al.* 2006).

These examples illustrate direct effects on survival and reproductive success, but disturbances can also have indirect effects. Response to noise disturbance is considered a nonlethal stimulus that is similar to an antipredator response (Frid and Dill 2002). Sea otters are susceptible to predation, particularly from killer whales and eagles, and have a well-developed antipredator response to perceived threats. For example, the presence of a harbor seal (Phoca vitulina) did not appear to disturb sea otters, but they demonstrated a fear response in the presence of a California sea lion by actively looking above and beneath the water (Limbaugh 1961).

Although an increase in vigilance or a flight response is nonlethal, a tradeoff occurs between risk avoidance and energy conservation. An animal's reactions to noise disturbance may cause stress and direct an animal's energy away from fitness-enhancing activities such as feeding and mating (Frid and Dill 2002; Goudie and Jones 2004). For example, southern sea otters in areas with heavy recreational boat traffic demonstrated changes in behavioral time budgeting showing decreased time resting and changes in haul-out patterns and distribution (Benham *et al.* 2005; Maldini *et al.* 2012). Chronic stress can also lead to weakened reflexes, lowered learning responses (Welch and Welch 1970; van Polanen Petel *et al.* 2006), compromised immune function, decreased body weight, and abnormal thyroid function (Seyle 1979).

Changes in behavior resulting from anthropogenic disturbance can include increased agonistic interactions between individuals or temporary or permanent abandonment of an area (Barton *et al.* 1998). The intensity of disturbance (Cevasco *et al.* 2001), the extent of previous exposure to humans (Holcomb *et al.* 2009), the type of disturbance (Andersen *et al.* 2012), and the age or sex of the individuals (Shaughnessy *et al.* 2008; Holcomb *et al.* 2009) may influence the type and extent of response.

Effects on Habitat and Prey

Physical and biological features of habitat essential to the conservation of sea otters include the benthic invertebrates (urchins, mussels, clams, etc.) that otters eat and the shallow rocky areas and kelp beds that provide cover from predators. Important sea otter habitat in the NSF/L–DEO project area include coastal areas within the 40-m (131-ft) depth contour where high densities of otters have been detected. The MMPA allows the Service to identify avoidance and minimization measures for effecting the least practicable impact of the specified activity on important habitats. Geophysical surveys conducted by NSF/L–DEO may impact sea otters within this important habitat, however, the project is not likely to cause lasting effects to habitat.

The primary prey species for sea otters are sea urchins, abalone, clams, mussels, crabs, and squid (Tinker and Estes 1999). When preferential prey are scarce, otters will also eat kelp, turban snails (Tegula spp.), octopuses (*e.g.,* Octopus spp.), barnacles (Balanus spp.), sea stars (*e.g., Pycnopodia helianthoides),* scallops (*e.g., Patinopecten caurinus),* rock oysters (Saccostrea spp.), worms *(e.g.,* Eudistylia spp.), and chitons (*e.g.,* Mopalia spp.) (Riedman and Estes 1990). A shift to less-preferred prey species may result in more energy spent foraging or processing the prey items; however, the impacts of a change in energy expenditure is not likely seen at the population level (Newsome *et al.* 2015).

Several recent reviews and empirical studies have addressed the effects of noise on invertebrates (Carroll *et al.* 2017). Behavioral changes, such as an increase in lobster (*Homanus americanus*) feeding levels (Payne *et al.* 2007), an increase in wild-caught captive reef squid (*Sepioteuthis australis*) avoidance behavior (Fewtrell and McCauley 2012), and deeper digging by razor clams (*Sinonovacula constricta;* Peng *et al.* 2016) have been observed following experimental exposures to sound. Physical changes have also been seen in response to increased sound levels, including changes in serum biochemistry and hepatopancreatic cells in a lobster species (*H. americanus;* Payne *et al.* 2007) and long-term damage to the statocysts required for hearing in several cephalopod species (Andre *et al.* 2011; Sole *et al.* 2013).

The effects of increased sound levels on benthic invertebrate larvae have been mixed. Desoto *et al.* (2013) found impaired embryonic development in scallop (*Pecten novaezelandiae*) larvae when exposed to 160 dB. Christian *et al.* (2004) noted a reduction in the speed of egg development of bottom-dwelling crabs following exposure to noise; however, the sound level (221 dB at 2 m or 6.6 ft) was far higher than the proposed seismic array will produce.

While these studies provide evidence of deleterious effects to invertebrates as a result of increased sound levels, Carroll *et al.* (2017) caution that there is a wide disparity between results obtained in field and laboratory settings. In experimental settings, changes were observed only when animals were housed in enclosed tanks and many were exposed to prolonged bouts of continuous, pure tones. We would not expect similar results in open marine conditions. It is unlikely that noises generated by survey activities will have any lasting effect on sea otter prey given the short-term duration of sounds produced by each component of the proposed work.

Potential Impacts on Subsistence Uses

The proposed activities will occur near marine subsistence harvest areas used by Alaska Natives from the villages of Pelican, Sitka, and Port Alexander. Between 1989 and 2019, approximately 5,617 sea otters were harvested from these villages, averaging 187 per year (although numbers from 2019 are preliminary). The large majority (95 percent) were taken by hunters based in Sitka. However, harvest activity takes place in coves where the sounds produced by survey equipment will not harass sea otters.

The proposed project area will not occur in inshore waters and, therefore, will avoid significant overlap with subsistence harvest areas. NSF/L–DEO's activities will not preclude access to hunting areas or interfere in any way with individuals wishing to hunt. NSF/L–DEO will coordinate with Native villages and Tribal organizations to identify and avoid potential conflicts. If any conflicts are identified, NSF/L–DEO will develop a Plan of Cooperation (POC) specifying the particular steps necessary to minimize any effects the project may have on subsistence harvest.

Mitigation and Monitoring

If an IHA for the NSF/L–DEO project is issued, it must specify means for affecting the least practicable adverse impact on sea otters and their habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance and the availability of sea otters for subsistence uses by coastal-dwelling Alaska Natives.

In evaluating what mitigation measures are appropriate to ensure the least practicable adverse impact on species or stocks and their habitat, as well as subsistence uses, we considered the manner and degree to which the successful implementation of the measures are expected to achieve this goal. We considered the nature of the potential adverse impact being mitigated (likelihood, scope, range), the likelihood that the measures will be effective if implemented, and the likelihood of effective implementation. We also considered the practicability of the measures for applicant implementation (*e.g.,* cost, impact on operations).

To reduce the potential for disturbance from acoustic stimuli associated with the activities, the applicants have proposed mitigation measures including, but not limited to, the following:

- Development of a marine mammal monitoring and mitigation plan;
- Establishment of shutdown and monitoring zones;
- Visual mitigation monitoring by designated Protected Species Observers (PSO);
- Site clearance before startup;
- Soft-start procedures;
- Shutdown procedures; and
- Vessel strike avoidance measures.

These measures are further specified under Proposed Authorization, part *B. Avoidance and Minimization.* The Service has not identified any additional mitigation or monitoring measures not already incorporated into NSF's request that are practicable and would further reduce potential impacts to sea otters and their habitat.

Estimated Incidental Take

Characterizing Take by Level B Harassment

In the previous section, we discussed the components of the project activities that have the potential to affect sea otters. Here, we describe and categorize the physiological and behavioral effects that can be expected based on documented responses to human activities observed during sea otter studies. We also discuss how these behaviors are characterized under the MMPA.

As we described in *Evidence from Sea Otter Studies,* an individual sea otter's reaction to human activity will depend on the otter's prior exposure to the activity, the potential benefit that may be realized by the individual from its current location, its physiological status, or other intrinsic factors. The location, timing, frequency, intensity, and duration of the encounter are among the external factors that will also influence the animal's response. Intermediate reactions that disrupt biologically significant behaviors are considered Level B harassment under the MMPA. The Service has identified the following sea otter behaviors as indicating possible Level B take:

- Swimming away at a fast pace on belly (*i.e.,* porpoising);
- Repeatedly raising the head vertically above the water to get a better view (spyhopping) while apparently agitated or while swimming away;
- In the case of a pup, repeatedly spyhopping while hiding behind and holding onto its mother's head;
- Abandoning prey or feeding area;
- Ceasing to nurse and/or rest (applies to dependent pups);
- Ceasing to rest (applies to independent animals);
- Ceasing to use movement corridors;
- Ceasing mating behaviors;
- Shifting/jostling/agitation in a raft so that the raft disperses;
- Sudden diving of an entire raft; or
- Flushing animals off a haulout.

This list is not meant to encompass all possible behaviors; other situations may also indicate Level B take.

Reactions capable of causing injury are characterized as Level A harassment events. The proposed action is not anticipated to result in Level A harassment due to exposure of otters to noise capable of causing PTS. However, it is also important to note that, depending on the duration and severity of the above-described Level B behaviors, such responses could constitute take by Level A harassment. For example, while a single flushing event would likely indicate Level B harassment, repeatedly flushing sea otters from a haulout may constitute Level A harassment.

Calculating Take

We assumed all animals exposed to underwater sound levels that meet the acoustic exposure criteria shown in Table 1 will experience, at a minimum, take by Level B harassment due to exposure to underwater noise. To estimate the number of otters that may be exposed to these sound levels, we worked closely with the applicant to create spatially explicit zones of ensonification around the proposed survey transects based on expected sound source levels and attenuation models. We determined the number of otters present in the ensonification zones using density information generated by Tinker *et al.* (2019) for the subgroups that comprise the Southeast Alaska stock.

Zones of Level A and Level B ensonification were created using the proposed R/V *Langseth* transects along the Southeast Alaskan coast. We developed sound level isopleths through acoustic modeling by NSF/L–DEO for deep water and an analysis of empirical data collected in a 2012 survey by the R/V *Langseth* along the Cascadia Margin in coastal Washington (Crone *et al.* 2014) for intermediate and shallow waters. The 2012 survey in Cascadia was conducted using a 4-string 0.11-m^3 (6,600-in^3) airgun array at a tow depth of 9 m (29.5 ft), while the proposed activities in Southeast Alaska will use a 0.11-m^3 (6,600-in^3) airgun array at a tow depth of 12 m (39 ft). To account for this difference, the applicant used a scaling factor (see the application available as described under **ADDRESSES** for details). The largest resulting Level A isopleth calculated from the NSF/L–DEO modeling (where sound levels will be greater than 232 dB peak) encompassed areas up to 10.6 m (34.7 ft) from the sound source. The Level B isopleth (where sound levels will be between 160–231 dB) was based on empirical data and encompassed areas up to 12.65 km (7.9 mi) from the sound source when the R/V *Langseth* was in shallow water (<100 m or 328 ft ocean depth) and up to 9.2 km (5.7 mi) when the vessel was in intermediate depths (100–1,000 m or 328–3,280 ft ocean depth).

The Level A and Level B isopleths were then used to create spatially explicit ensonification zones surrounding the proposed project transects using ArcGIS Pro (2018). Using the *proximity* toolset in ArcGIS Pro, we created a buffer with a 45-m (148-ft) width around the proposed project transects to account for the Level A ensonified area on either side of the 24 m-wide (79 ft-wide) airgun array. To determine the Level B ensonified area, points were first placed along the proposed project transects every 500 m (0.3 mi). We then used bathymetry data to determine ocean depth at each point along the transect. We placed a 12.65-km (7.9-mi) buffer around points in water less than 100 m (328 ft) deep, and a 9.2-km (5.7-mi) buffer around points in water 100–1,000 m (328–3,280 ft)

deep. The resulting ocean depth-informed ensonification zone was then modified to remove ''land shadows'' (marine areas behind land features). To do this, we created lines representing ensonification that radiated from each point along the proposed project transects. Lines were then clipped with a landform shapefile to identify areas where underwater sound will be absorbed by land features.

As we described in Description of Marine Mammals in the Specified Area, sea otters are overwhelmingly observed (95 percent) within the 40-m (131-ft) depth contour, although they can be found in areas with deeper water. Thus, high-density sea otter habitat was delineated by the 40-m (131-ft) depth contour, and low-density otter habitat was between the 40-m and 100-m (131-ft to 328-ft) depth contours. Habitat was further divided into subregions established by Tinker *et al.* (2019) as densities of otters in these subregions differed. Otter densities for the affected subregions were determined using 2012 abundance estimates generated using the Bayesian hierarchical model developed by Tinker *et al.* (2019). Abundance estimates are traditionally generated using aerial survey data from high-density habitat (<40 m or 131 ft in depth). To calculate the density of otters in low-density habitat (40–100 m or 131–328 ft ocean depth), we multiplied the density of the adjacent high-density habitat by 0.05. The resulting density estimate accounts for the five percent of otters found in low-density areas.

The Level A ensonification zone did not overlap with either high- or low-density habitat areas. To determine the amount (km^2) of Level B ensonified habitat in each subregion, the high- and low-density habitat shapefiles were clipped using the Level B ensonification shapefiles in ArcGIS Pro. The area impacted in each subregion was multiplied by the estimated otter density in that region to determine the number of otters that will experience Level B sound levels (Table 2). The total number of takes was predicted by estimating the projected days of activity in each subregion using survey start points supplied by the applicant. In several areas, the length and direction of the proposed survey transects make it highly unlikely that impacts will last only one day. In these instances, we estimated two days of disturbance, and thus two takes for each otter.

TABLE 2—ESTIMATED NUMBER OF OTTERS ENSONIFIED BY SOUND LEVELS GREATER THAN 160 dB DUE TO THE PROPOSED ACTIVITIES

[Level B take was calculated by multiplying the area ensonified in each subregion by that subregion's modeled sea otter density, then multiplying by the projected days of ensonification]

Subreg.	Habitat type	Density (otters/km^2)	Area impacted (km^2)	Estimated take/day	Projected days of take	Estimated survey total takes
N06	High (<40 m)	0.778	4.66	4	1	4
S05	High (<40 m)	1.333	8.74	12	2	24
S12	High (<40 m)	0.1748	2.56	1	2	2
N06	Low (40–100 m)	0.034	15.69	1	1	1
S01	Low (40–100 m)	0.084	42.31	4	2	8
S05	Low (40–100 m)	0.123	31.32	4	2	8
S12	Low (40–100 m)	0.0092	647.62	1	2	2
Total				27		49
Current Stock Total.		25,584				
Percentage of Stock.				0.001		

Critical Assumptions

We estimate 49 takes of 27 sea otters by Level B harassment will occur due to NSF/L–DEO's proposed high-energy seismic surveys. In order to conduct this analysis and estimate the potential amount of Level B take, several critical assumptions were made.

Otter density was calculated using a Bayesian hierarchical model created by Tinker *et al.* (2019), which includes assumptions that can be found in the original publication. The most recently available density estimates and those used for our analysis were for the year 2012. Low-density otter populations exhibit a growth rate that is typically directly related to resource availability, with growth rates slowing as the populations approach carrying capacity (Estes 1990). The populations in Southeast Alaska vary in their densities and estimated carrying capacities (Tinker *et al.* 2019), making it difficult to predict current density values. Thus, we relied on 2012 density estimates to calculate projected take. One subregion within the impact area, S12, was not included in the Tinker *et al.* (2019) published densities. To calculate otter density in this subregion, we used the 2012 aerial survey data that served as the model's primary input. Thus, the S12 density estimate does not benefit from the additional information included in the Bayesian model provided by Tinker *et al.* (2019).

Estimation of ensonification zones used sound attenuation models that focused on absorption and dispersion rather than reflection and refraction. Our models assumed that points of land intercepting high-level noise will effectively attenuate sound levels above 160 dB, and sea otters in areas behind those land features (in land shadows) will be exposed to sound less than 160 dB. This assumption is adequate for this analysis given the offshore location of the survey transects.

Finally, we estimated the repeated take of a portion of the otters affected by the proposed action due to the presence of the R/V *Langseth* for more than one day. We assume, due to the proposed survey transects, start points, and speed of the R/V *Langseth,* that otters within subregions S01, S05, and S12 will be ensonified for two days each. The applicant has listed a number of potential yet unanticipated reasons the R/V *Langseth* may remain in one area for an extended period of time, including poor data quality, inclement weather, or mechanical issues with the research vessel and/or equipment. However, except for the case of a reshoot due to poor data quality, the vessel's airgun array (*i.e.,* the source of

take) will not be operational during extended delays of operations.

We estimate 49 instances of take by Level B harassment of 27 northern sea otters from the Southeast Alaska stock due to behavioral responses or TTS associated with noise exposure. These levels represent a small proportion of the most recent stock abundance estimate for the Southeast Alaska stock. Take of 27 otters is less than one percent of the best available estimate of the current population size of 25,584 animals in the Southeast Alaska stock (Tinker *et al.* 2019) (27÷25,584=0.00105). Although an estimated 49 instances of take of 27 otters by Level B harassment are possible, most events are unlikely to have significant consequences for the health, reproduction, or survival of affected animals.

Sea otters exposed to sound project-produced sounds are likely to respond with temporary behavioral modification or displacement. Project activities could temporarily interrupt the feeding, resting, and movement of sea otters. Because activities will occur during a limited amount of time and in a localized region, the impacts associated with the project are likewise temporary and localized. The anticipated effects are primarily short-term behavioral reactions and displacement of sea otters near active operations.

Sea otters that encounter the specified activity may exert more energy than they would otherwise due to temporary cessation of feeding, increased vigilance, and retreat from the project area. We expect that affected sea otters will tolerate this exertion without measurable effects on health or reproduction. Most of the anticipated takes will be due to short-term Level B harassment in the form of TTS, startling reactions, or temporary displacement. Chronic exposure to sound levels that cause TTS may lead to PTS (which would constitute Level A injury). While more research into the relationship between chronic noise exposure and PTS is needed (Finneran 2015), it is likely that the transition from temporary effects to permanent cellular damage occurs over weeks, months, or years (Southall *et al* 2019).

With the adoption of the measures proposed in NSF/L–DEO's application and required by this proposed IHA, estimated take was reduced.

Findings

Small Numbers

For small numbers analyses, the statute and legislative history do not expressly require a specific type of numerical analysis, leaving the determination of ''small'' to the agency's discretion. In this case, we propose a finding that the NSF/L–DEO project may result in approximately 49 incidental takes of 27 otters from the Southeast Alaska stock. This represents less than one percent of the estimated stock. Predicted levels of take were determined based on estimated density of sea otters in the project area and an ensonification zone developed using empirical evidence from a similar geographic area and corrected for the methodology proposed by NSF/L–DEO for this project. Based on these numbers, we propose a finding that the NSF/L–DEO project will take only a small number of animals.

Negligible Impact

We propose a finding that any incidental take by harassment resulting from the proposed project cannot be reasonably expected to, and is not reasonably likely to, adversely affect the sea otter through effects on annual rates of recruitment or survival and will, therefore, have no more than a negligible impact on the Southeast Alaska stock of northern sea otters. In making this finding, we considered the best available scientific information, including: The biological and behavioral characteristics of the species, the most recent information on species distribution and abundance within the area of the specified activities, the current and expected future status of the stock (including existing and foreseeable human and natural stressors), the potential sources of disturbance caused by the project, and the potential responses of marine mammals to this disturbance. In addition, we reviewed applicant provided materials, information in our files and datasets, published reference materials, and species experts.

Sea otters are likely to respond to proposed activities with temporary behavioral modification or displacement. These reactions are unlikely to have consequences for the long-term health, reproduction, or survival of affected animals. Most animals will respond to disturbance by moving away from the source, which may cause temporary interruption of foraging, resting, or other natural behaviors. Affected animals are expected to resume normal behaviors soon after exposure with no lasting consequences. Twenty-one otters are estimated to be exposed to seismic noise for two days and thus, will have repeated exposure. However, permanent (*i.e.,* Level A) injury due to chronic sound exposure is estimated to occur at the scale of weeks, months, or years (Southall *et al.* 2019). Some animals may exhibit more severe responses typical of Level B harassment, such as fleeing, ceasing feeding, or flushing from a haul-out. These responses could have temporary, yet significant, biological impacts for affected individuals but are unlikely to result in measurable changes in survival or reproduction.

The total number of animals affected and severity of impact is not sufficient to change the current population dynamics at the stock scale. Although the specified activities may result in approximately 49 incidental takes of 27 otters from the Southeast Alaska stock, we do not expect this level of harassment to affect annual rates of recruitment or survival or result in adverse effects on the stock.

Our proposed finding of negligible impact applies to incidental take associated with the proposed activities as mitigated by the avoidance and minimization measures identified in NSF/L–DEO's mitigation and monitoring plan. These mitigation measures are designed to minimize interactions with and impacts to sea otters. These measures and the monitoring and reporting procedures are required for the validity of our finding and are a necessary component of the proposed IHA. For these reasons, we propose a finding that the 2021 NSF/L–DEO project will have a negligible impact on the Southeast Alaska stock of northern sea otters.

Impact on Subsistence

We propose a finding that NSF/L–DEO's anticipated harassment will not have an unmitigable adverse impact on the availability of the Southeast Alaska stock of northern sea otters for taking for subsistence uses. In making this finding, we considered the timing and location of the proposed activities and the timing and location of subsistence harvest activities in the area of the proposed project. We also considered the applicant's consultation with subsistence communities, proposed measures for avoiding impacts to subsistence harvest, and commitment to development of a POC, should any concerns be identified.

Required Determinations

National Environmental Policy Act (NEPA)

Per the National Environmental Policy Act (NEPA; 42 U.S.C. 4321, *et seq.*), the Service must evaluate the effects of the proposed action on the human environment. We plan to adopt

NSF's environmental assessment (EA), as we have preliminarily concluded that, as written, the draft EA contains adequate information analyzing the effects on the human environment of issuing the IHA. NSF's EA is available at *https://www.nsf.gov/geo/oce/envcomp/*. If the Service determines that impacts from issuing the IHA would not significantly affect the human environment, we may prepare a Finding of No Significant Impact that would conclude the Service's NEPA process.

We will review all comments submitted in response to this notice as indicated above in **DATES** and **ADDRESSES** prior to concluding our NEPA process or making a final decision on the IHA.

Endangered Species Act (ESA)

Under the ESA, all Federal agencies are required to ensure the actions they authorize are not likely to jeopardize the continued existence of any threatened or endangered species or result in destruction or adverse modification of critical habitat. The proposed activities will occur entirely within the range of the Southeast Alaska stock of the northern sea otter, which is not listed as threatened or endangered under the ESA. The measures included in the proposed IHA will not affect other listed species or designated critical habitat.

Government-to-Government Coordination

It is our responsibility to communicate and work directly on a Government-to-Government basis with federally recognized Tribes in developing programs for healthy ecosystems. We are also required to consult with Alaska Native Corporations. We seek their full and meaningful participation in evaluating and addressing conservation concerns for protected species. It is our goal to remain sensitive to Alaska Native culture and to make information available to Alaska Natives. Our efforts are guided by the following policies and directives:

(1) The Native American Policy of the Service (January 20, 2016);

(2) the Alaska Native Relations Policy (currently in draft form);

(3) Executive Order 13175 (January 9, 2000);

(4) Department of the Interior Secretarial Orders 3206 (June 5, 1997), 3225 (January 19, 2001), 3317 (December 1, 2011), and 3342 (October 21, 2016); and

(5) the Department of the Interior's policies on consultation with Tribes and with Alaska Native Corporations.

We have evaluated possible effects of the proposed activities on federally recognized Alaska Native Tribes and organizations. Through the IHA process identified in the MMPA, the applicant has presented a communication process, culminating in a POC if needed, with the Native organizations and communities most likely to be affected by their work. NSF/L–DEO has engaged these groups in informational meetings. We invite continued discussion, either about the project and its impacts or about our coordination and information exchange throughout the IHA/POC process.

Proposed Authorization

We propose to authorize up to 49 incidental takes of 27 Northern sea otters from the Southeast Alaska stock. We authorize take limited to disruption of behavioral patterns that may be caused by geophysical surveys and support activities conducted by NSF/L–DEO in Southeast Alaska, from July 1 to August 31, 2021. We anticipate no take by injury or death to northern sea otters resulting from these surveys.

A. General Conditions for Issuance of the Proposed IHA

1. The taking of Northern sea otters from the Southeast Alaska stock whenever the required conditions, mitigation, monitoring, and reporting measures are not fully implemented as required by the IHA will be prohibited. Failure to follow measures specified may result in the suspension or revocation of the IHA.

2. If take exceeds the level or type identified in the proposed authorization (*e.g.,* greater than 49 incidents of incidental take of 27 otters by Level B harassment), the IHA will be invalidated and the Service will reevaluate its findings. If project activities cause unauthorized take, such as any injury due to seismic noise, acute distress, or any indication of the separation of mother from pup, NSF/L–DEO must take the following actions: (i) Cease its activities immediately (or reduce activities to the minimum level necessary to maintain safety); (ii) report the details of the incident to the Service's MMM within 48 hours; and (iii) suspend further activities until the Service has reviewed the circumstances, determined whether additional mitigation measures are necessary to avoid further unauthorized taking, and notified NSF/L–DEO that it may resume project activities.

3. All operations managers and vessel operators must receive a copy of the IHA and maintain access to it for reference at all times during project work. These personnel must understand, be fully aware of, and be capable of implementing the conditions of the IHA at all times during project work.

4. The IHA will apply to activities associated with the proposed project as described in this document and in NSF/L–DEO's amended application (LGL 2020). Changes to the proposed project without prior authorization may invalidate the IHA.

5. NSF/L–DEO's IHA application will be approved and fully incorporated into the IHA, unless exceptions are specifically noted herein or in the final IHA. The application includes:

- NSF/L–DEO's original request for an IHA, dated December 19, 2019;
- NSF/L–DEO's response to requests for additional information from the Service, dated January 22, February 19, and February 26, 2020; and
- A revised application, dated October 29, 2020.

6. Operators will allow Service personnel or the Service's designated representative to visit project work sites to monitor impacts to sea otters and subsistence uses of sea otters at any time throughout project activities so long as it is safe to do so. ''Operators'' are all personnel operating under the NSF/L–DEO's authority, including all contractors and subcontractors.

B. Avoidance and Minimization

7. Seismic surveys must be conducted using equipment that generates the lowest practicable levels of underwater sound within the range of frequencies audible to sea otters.

8. Vessels will not approach within 100 m (328 ft) of individual sea otters or 500 m (0.3 mi) of rafts of otters. Operators will reduce vessel speed if a sea otter approaches or surfaces within 100 m (328 ft) of a vessel.

9. Vessels may not be operated in such a way as to separate members of a group of sea otters from other members of the group.

10. All vessels must avoid areas of active or anticipated subsistence hunting for sea otters as determined through community consultations.

C. Mitigation During Seismic Activities

11. Designated trained and qualified PSOs must be employed to monitor for the presence of sea otters, initiate mitigation measures, and monitor, record, and report the effects of the activities on sea otters. NSF/L–DEO is responsible for providing training to PSOs to carry out mitigation and monitoring.

12. NSF/L–DEO must establish mitigation zones for their 2D seismic

surveys, which generate underwater sound levels at or more than or 160 dB between 125 Hz and 38 kHz. Mitigation zones must include all in-water areas where work-related sound received by sea otters will match the levels and frequencies above. Mitigation zones will be designated as follows:

- Exclusion Zones (EZ) will be established with the following minimum radii: 500 m (0.3 mi) from the source for the full seismic array and 100 m (328 ft) for the single bolt airgun (655 cm^3 or 40 in^3).
- A Safety Zone (SZ) is an area larger than the EZ and will include all areas within which sea otters may be exposed to noise levels that will likely result in Level B take.
- Both the EZ and SZ will be centered on the sound source (the seismic array).
- The radius of the SZs are shown in Table 3 (as calculated based on modeling techniques described herein and in Appendix A of NSF/L–DEO's application).

TABLE 3—ESTIMATED RADIAL DISTANCES FROM THE SEISMIC SOUND SOURCE TO THE 160-dB ISOPLETH

[The area within the isopleth is designated as the Safety Zone (SZ)]

Source and volume	Water depth (m)	Predicted distances (in m) to the 160 dB received sound level
Single Bolt airgun, 40 in^3	>1,000 m	[1] 431
	100–1,000 m	[2] 647
	<100 m	[3] 1,041
4 strings, 36 airguns, 6600 in^3	<1000 m	[1] 6,733
	100–1,000m	[4] 9,468
	<100m	[4] 12,650

[1] Distance is based on L–DEO model results.
[2] Distance is based on L–DEO model results with a 1.5 × correction factor between deep and intermediate water depths.
[3] Distance is based on empirically derived measurements in the GOM with scaling applied to account for differences in tow depth.
[4] Based on empirical data from Crone et al. (2014); see Appendix A of the NSF/L–2012;DEO IHA application for details.

13. PSOs must conduct visual monitoring of the entire EZ and the visible SZ continuously during all seismic work occurring in daylight hours.

14. Prior to seismic work, a ''ramp-up'' procedure must be used to increase the levels of underwater sound at a gradual rate.

- A ramp-up will be used at the initial start of airgun operations and prior to restarting after any period greater than 30 minutes (min) without airgun operations, including a power-down or shutdown event.
- Visual monitoring must begin at least 30 min prior to and continue throughout ramp-up efforts.
- During geophysical work, the number and total volume of airguns will be increased incrementally until the full volume is achieved.
- The rate of ramp-up will be no more than 6 dB per 5-min period. Ramp-up will begin with the smallest gun in the array that is being used for all airgun array configurations. During the ramp-up, the applicable mitigation zones (based on type of airgun and sound levels produced) must be maintained.
- It will not be permissible to ramp-up the full array from a complete shutdown in thick fog or at other times when the outer part of the EZ is not visible.
- Ramp-up of the airguns will not be initiated if a sea otter is sighted within the EZ at any time.
- If sea otters are observed during a ramp-up effort or prior to startup, a PSO must record the observation and monitor the animal's position until it moves out of visual range. Seismic work may commence if, after a full and gradual effort to ramp up the underwater sound level, the sea otter is outside of the EZ and does not show signs of visible distress (for example, vocalizing, repeatedly spy-hopping, or fleeing).

15. The following actions must be taken in response to sea otters in mitigation zones:

- Seismic work will be shut down completely if a sea otter is observed within the 500-m (0.3-mi) EZ for the full array or the 100-m (328-ft) EZ for the 40-cui array.
- When sea otters are observed in visible distress (for example, vocalizing, repeatedly spy-hopping, or fleeing), seismic work must be immediately shut down or powered down to reduce noise exposure.
- The shutdown procedure will be accomplished within several seconds of the determination that a sea otter is in the applicable EZ or as soon as practicable considering worker safety and equipment integrity.
- Following a shutdown, seismic work will not resume until the sea otter has cleared the EZ. The animal will be considered to have cleared the EZ if it is visually observed to have left the EZ or has not been seen within the EZ for 30 minutes or longer.
- Any shutdown due to sea otters sighted within the EZ must be followed by a 30-minute all-clear period and then a standard full ramp-up.
- Any shutdown for other reasons resulting in the cessation of seismic work for a period greater than 30 minutes must also be followed by full ramp-up procedures.

16. Operators may reduce power to seismic equipment as an alternative to a shutdown to prevent a sea otter from entering the EZ. A power-down procedure involves reducing the volume of underwater sound generated. Vessel speed or course may be altered to achieve the same task.

- Whenever a sea otter is detected outside the EZ and, based on its position and motion relative to the seismic work, appears likely to enter the EZ but has not yet done so, the operator may power down to reduce high-level noise exposure.
- When a sea otter is detected in the SZ, an operator may choose to power down when practicable to reduce Level B take, but is not required to do so.
- During a power-down, the number of airguns in use will be reduced to a single mitigation airgun (airgun of small volume such as the 655-cm^3 (40-in^3) gun), such that the EZ is reduced, making the sea otters unlikely to enter the EZ.
- After a power-down, noise-generating work will not resume until the sea otter has cleared the EZ for the full airgun array. The animal will be

considered to have cleared the EZ if it is visually observed to have left the EZ and has not been seen within the zone for 30 minutes.

17. Visual monitoring must continue for 30 minutes after the use of the acoustic source ceases or the sun sets, whichever is later.

D. Monitoring

18. Operators shall work with PSOs to apply mitigation measures and shall recognize the authority of PSOs up to and including stopping work, except where doing so poses a significant safety risk to vessels and personnel.

19. Duties of PSOs include watching for and identifying sea otters, recording observation details, documenting presence in any applicable monitoring zone, identifying and documenting potential harassment, and working with vessel operators to implement all appropriate mitigation measures.

20. A sufficient number of PSOs will be onboard to meet the following criteria: 100 percent monitoring coverage during all daytime periods of seismic activity; a maximum of four consecutive hours on watch per PSO; a maximum of approximately 12 hours on watch per day per PSO; and at least one observer each on the source vessel and support vessel.

21. All PSOs will complete a training course designed to familiarize individuals with monitoring and data collection procedures. A field crew leader with prior experience as a marine mammal observer will supervise the PSO team. New or inexperienced PSOs will be paired with experienced PSOs so that the quality of marine mammal observations and data recording is kept consistent. Resumes for candidate PSOs will be made available for the Service to review.

22. Observers will be provided with reticule binoculars (10×42), big-eye binoculars or spotting scopes (30×), inclinometers, and range finders. Field guides, instructional handbooks, maps and a contact list will also be made available.

E. Measures To Reduce Impacts to Subsistence Users

23. Prior to conducting the work, NSF/L–DEO will take the following steps to reduce potential effects on subsistence harvest of sea otters:

- Avoid work in areas of known sea otter subsistence harvest;
- Discuss the planned activities with subsistence stakeholders including Southeast Alaska villages and traditional councils;
- Identify and work to resolve concerns of stakeholders regarding the project's effects on subsistence hunting of sea otters; and
- If any concerns remain, develop a POC in consultation with the Service and subsistence stakeholders to address these concerns.

F. Reporting Requirements

24. NSF/L–DEO must notify the Service at least 48 hours prior to commencement of activities.

25. Reports will be submitted to the Service's MMM weekly during project activities. The reports will summarize project work and monitoring efforts.

26. A final report will be submitted to the Service's MMM within 90 days after completion of work or expiration of the IHA. It will summarize all monitoring efforts and observations, describe all project activities, and discuss any additional work yet to be done. Factors influencing visibility and detectability of marine mammals (*e.g.,* sea state, number of observers, fog, and glare) will be discussed. The report will describe changes in sea otter behavior resulting from project activities and any specific behaviors of interest. Sea otter observation records will be provided in the form of electronic database or spreadsheet files. The report will assess any effects NSF/–DEO's operations may have had on the availability of sea otters for subsistence harvest and if applicable, evaluate the effectiveness of the POC for preventing impacts to subsistence users of sea otters.

27. Injured, dead, or distressed sea otters that are not associated with project activities (*e.g.,* animals found outside the project area, previously wounded animals, or carcasses with moderate to advanced decomposition or scavenger damage) must be reported to the Service within 24 hours of discovery. Photographs, video, location information, or any other available documentation shall be provided to the Service.

28. All reports shall be submitted by email to *fw7_mmm_reports@fws.gov.*

29. NSF/L–DEO must notify the Service upon project completion or end of the work season.

Request for Public Comments

If you wish to comment on this proposed authorization, the applicability of NSF's draft EA to the proposed action, or the proposed adoption of NSF's EA, you may submit your comments by any of the methods described in **ADDRESSES**. Please identify if you are commenting on the proposed authorization, draft EA, or both, make your comments as specific as possible, confine them to issues pertinent to the proposed authorization or draft EA, and explain the reason for any changes you recommend. Where possible, your comments should reference the specific section or paragraph that you are addressing. The Service will consider all comments that are received before the close of the comment period (see **DATES**).

Comments, including names and street addresses of respondents, will become part of the administrative record for this proposal. Before including your address, telephone number, email address, or other personal identifying information in your comment, be advised that your entire comment, including your personal identifying information, may be made publicly available at any time. While you can ask us in your comments to withhold from public review your personal identifying information, we cannot guarantee that we will be able to do so.

Gregory Siekaniec,

Regional Director, Alaska Region.

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DEPARTMENT OF THE INTERIOR

Geological Survey

[GX21EE000101100]

Public Meeting of the National Geospatial Advisory Committee

AGENCY: U.S. Geological Survey, Interior.

ACTION: Notice of public meeting.

SUMMARY: In accordance with the Federal Advisory Committee Act of 1972, the U.S. Geological Survey (USGS) is publishing this notice to announce that a Federal Advisory Committee meeting of the National Geospatial Advisory Committee (NGAC) will take place.

DATES: The meeting will be held as a webinar on Tuesday, June 29, 2021 from 1:00 p.m. to 5:00 p.m., and on Wednesday, June 30, 2021 from 1:00 p.m. to 5:00 p.m. (Eastern Daylight Time).

ADDRESSES: The meeting will be held on-line and via teleconference. Instructions for accessing the meeting will be posted at *www.fgdc.gov/ngac.* Comments can be sent to Ms. Dionne Duncan-Hughes, Group Federal Officer by email to *gs-faca-mail@usgs.gov.*

FOR FURTHER INFORMATION CONTACT: Mr. John Mahoney, Federal Geographic Data Committee (FGDC), USGS, 909 First Avenue, Suite 800, Seattle, WA 98104; by email at *jmahoney@usgs.gov;* or by telephone at (206) 220–4621.