

environmental review should be directed to the NMFS at the addresses or telephone numbers provided above (see **ADDRESSES**). All comments and material received, including names and addresses, will become part of the administrative record and may be released to the public.

The environmental review of this project/proposed action will be conducted in accordance with the requirements of the National Environmental Policy Act of 1969, as amended (42 U.S.C. 4321 *et seq.*), National Environmental Policy Act Regulations (40 CFR 1500–1508), other appropriate Federal laws and regulations, and policies and procedures of the Services for compliance with those regulations.

Dated: July 28, 2005.

**Walter L. Wadlow,**

*Acting Chief Executive Officer, Santa Clara Valley Water District, Santa Clara, California.*

Dated: July 29, 2005.

**Donna Wieting,**

*Deputy Director, Office of Protected Resources, National Marine Fisheries Service.*  
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## DEPARTMENT OF COMMERCE

### National Oceanic and Atmospheric Administration

[I.D. 020405A]

#### Small Takes of Marine Mammals Incidental to Specified Activities; Marine Seismic Survey off the Aleutian Islands in the North Pacific Ocean

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

**ACTION:** Notice of issuance of an incidental harassment authorization.

**SUMMARY:** In accordance with provisions of the Marine Mammal Protection Act (MMPA) as amended, notification is hereby given that an Incidental Harassment Authorization (IHA) to take small numbers of marine mammals, by harassment, incidental to conducting oceanographic seismic surveys in the Aleutian Island area has been issued to Lamont-Doherty Earth Observatory (L-DEO).

**DATES:** Effective from July 18, 2005 through July 17, 2006.

**ADDRESSES:** The application and authorization are available by writing to Steve Leathery, Chief, Permits, Conservation and Education Division,

Office of Protected Resources, National Marine Fisheries Service, 1315 East-West Highway, Silver Spring, MD 20910–3225, by telephoning the contact listed here and are also available at: [http://www.nmfs.noaa.gov/prot\\_res/PR2/Small\\_Take/smalltake\\_info.htm#applications](http://www.nmfs.noaa.gov/prot_res/PR2/Small_Take/smalltake_info.htm#applications).

Documents cited in this notice can be viewed by appointment during regular business hours at the address provided here.

#### FOR FURTHER INFORMATION CONTACT:

Kenneth Hollingshead, Office of Protected Resources, NMFS, (301) 713–2289, ext 128.

#### SUPPLEMENTARY INFORMATION:

##### Background

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

An authorization may be granted if NMFS finds that the taking will have a negligible impact on the species or stock(s), will not have an unmitigable adverse impact on the availability of the species or stock(s) for subsistence uses, and that the permissible methods of taking and requirements pertaining to the monitoring and reporting of such takings are set forth. NMFS has defined “negligible impact” in 50 CFR 216.103 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.”

Section 101(a)(5)(D) of the MMPA established an expedited process by which citizens of the United States can apply for an authorization to incidentally take small numbers of marine mammals by harassment. Except with respect to certain activities not pertinent here, the MMPA defines “harassment” as:

any act of pursuit, torment, or annoyance which (i) has the potential to injure a marine mammal or marine mammal stock in the wild [Level A harassment]; or (ii) has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering [Level B harassment].

Section 101(a)(5)(D) establishes a 45–day time limit for NMFS review of an application followed by a 30–day public notice and comment period on any proposed authorizations for the incidental harassment of marine mammals. Within 45 days of the close of the comment period, NMFS must either issue or deny issuance of the authorization.

#### Summary of Request

On December 23, 2004, NMFS received an application from L-DEO for the taking, by harassment, of several species of marine mammals incidental to conducting a low-energy, shallow-penetrating seismic survey and scientific rock dredging program around the Aleutian Islands. The purpose of the proposed study is to examine the east-to-west change in the angle of the convergence of the Pacific-North America plates, which implies systematic westward decreases in the rate of subduction and sediment delivery to the Aleutian trench. The Aleutian Island Arc is the only island arc where systematic changes in physical aspects of the subduction system have been well correlated with magma output rates and with the geochemistry of the melts that the system produces. Despite its potential importance, studies of volcanism in the Aleutians are lacking. In particular, the western Aleutians (west of Adak Island) are now playing a key role in the evolving view of subduction magma genesis, yet it remains a poorly studied area. Few volcanic rock samples are available from that area, and it has not been studied substantially at sea.

In addition to an emphasis on magma genesis and its relationship to tectonics, volcanism in the Aleutians and southern Alaska is important because it is known to present a hazard to air traffic. However, the seismic and geochemical studies proposed by L-DEO are not directly hazard-related. They are aimed at understanding the deep-level processes that underlie the volcanic eruptions, and are thus relevant to the broad goals of understanding volcano behavior and hazard assessment in the Aleutians and elsewhere.

#### Description of the Activity

The seismic survey will involve one vessel, the *R/V Thomas G. Thompson* (*Thompson*). The *Thompson* replaces the *R/V Kilo Moana* that was originally proposed for use during this survey. The *Thompson* will deploy one Generator-injector (GI) airgun as an energy source (discharge volume of 105 in<sup>3</sup>), plus a towed hydrophone streamer up to 300 m (984 ft) long, or possibly as short as

50 m (164 ft). The *Thompson* has a length of 83.5 m (274 ft), and a beam of 16 m (52.5 ft). As the GI gun is towed along the survey lines, the receiving system will receive the returning acoustic signals. The proposed program will consist of approximately 4112 km (2220 nm) of seismic survey, and scientific rock dredging at 10 locations. The seismic survey will take place in water depths from less than 50 m (164 ft) to 3.5 kilometers (km) (1.9 nautical miles (nm)). More than 99 percent of the survey will be in depths greater than 100 m (328 ft), and scientific rock dredging will be conducted in water depths 100–1800 m (328–5906 ft), mostly in depths greater than 400 m (1312 ft).

The proposed program will use conventional seismic methodology with a single towed GI-airgun as the energy source, and a towed hydrophone streamer as the receiver system. The energy to the airguns is compressed air supplied by compressors on board the source vessel.

In addition to the GI gun, additional acoustic systems will be operated during much or all of the research cruise. The ocean floor will be mapped with a 30-kHz multi-beam sonar (Simrad EM300) and a dual-frequency (3.5 and 12 kHz) hydrographic echo sounder (Knudson 320B/R). These two systems are commonly operated simultaneously with an airgun array. Other acoustical systems are a 75-kHz acoustic Doppler current profiler (ADCP)(RDI Ocean Surveyor), a Hydrosweep multi-beam sonar will be used as a backup to the Simrad, an 80-kHz navigational echosounder (Abyss Technologies Model IES-10) and a 200-kHz doppler sonar (Ocean Data Equipment Corporation DSN-450 Mark II). Multi-beam bathymetric and single channel surveys will be conducted prior to scientific rock dredging to ensure that dredging is done as accurately and productively as possible. The surveys will also affect the number of dredges that can be completed. While on station for rock dredging, a 12-kHz pinger will be used to monitor the depth of the dredge relative to the sea floor. A detailed description of the acoustic sources proposed for use during this survey can be found in the L-DEO application, which is available at: [http://www.nmfs.noaa.gov/prot\\_res/PR2/Small\\_Take/smalltake\\_info.htm#applications](http://www.nmfs.noaa.gov/prot_res/PR2/Small_Take/smalltake_info.htm#applications).

#### GI-Airgun Description

The L-DEO portable high-resolution seismic system will be installed on the research vessel for this cruise. The seismic vessel will tow the single GI-

airgun and a streamer containing hydrophones along predetermined lines. Seismic pulses will be emitted at intervals of 5–10 sec. The 5–10 sec spacing corresponds to a shot interval of about 13–26 m (43–85 ft).

The GI airgun will have a total discharge volume of up to 105 in<sup>3</sup>. The gun will be towed 44.3 m (145.3 ft) behind the stern at a depth of about 3 m (9.8 ft). The GI-airgun has a zero to peak (peak) source output of 231 dB re 1 microPascal-m (3.6 bar-m) and a peak-to-peak (pk-pk) level of 237 dB (7.0 bar-m). The dominant frequency components of the airgun are in the range of 0–188 Hz. For a one-gun source, the nominal source level represents the actual level that would be found about 1 m (3.3 ft) from the GI gun. Actual levels experienced by any marine organism more than 1 m (3.3 ft) from the GI gun will be significantly lower.

The rms (root mean square) received levels that are used as impact criteria for marine mammals are not directly comparable to the pk or pk-pk values normally used to characterize source levels of airguns. The measurement units used to describe airgun sources, pk or pk-pk decibels, are always higher than the “root mean square” (rms) decibels referred to in much of the biological literature. The rms pressure is an average over the pulse duration. For example, a measured received level of 160 dB rms in the far field would typically correspond to a pk measurement of about 170 to 172 dB, and to a pk-pk measurement of about 176 to 178 decibels, as measured for the same pulse received at the same location (Greene, 1997; McCauley *et al.*, 1998, 2000a). The precise difference between rms and pk or p-pk values depends on the frequency content and duration of the pulse, among other factors. However, the rms level is always lower than the pk or pk-pk level for an airgun-type source.

The depth at which the source is towed has a major impact on the maximum near-field output, because the energy output is constrained by ambient pressure. The normal tow depth of the source to be used in this project is 3 m (9.8 ft), where the ambient pressure is 3 decibars. This also limits output, as the 3 decibars of confining pressure cannot fully constrain the source output, with the result that there is loss of energy at the sea surface.

Received sound levels have been modeled by L-DEO for the single GI-airgun in relation to distance and direction from the gun. This publically available model does not allow for bottom interactions, and is most directly

applicable to deep water. Based on the model, the distances from the single GI-airgun where sound levels of 190-, 180-, and 160-dB re 1  $\mu$ Pa (rms) are predicted to be received are shown in the greater than 1000-m (328 ft) line of Table 1.

TABLE 1. ESTIMATED DISTANCES TO WHICH SOUND LEVELS 190, 180, AND 160 DB RE 1 MICROPA (RMS) MIGHT BE RECEIVED FROM THE ONE 105 IN3 GI GUN THAT WILL BE USED DURING THE SEISMIC SURVEY AROUND THE ALEUTIAN ISLANDS DURING 2005. THE SAFETY RADII USED DURING THE SURVEY WILL DEPEND ON WATER DEPTH (SEE TEXT).

Water depth	Estimated Distances at Received Levels (m)		
	190 dB	180 dB	160 dB
>1000 m	10	27	275
100–1000 m	15	41	413
<100 m	125	200	750

Empirical data concerning the 180- and 160-dB distances have been acquired based on measurements during the acoustic verification study conducted by L-DEO in the northern Gulf of Mexico from 27 May to 3 June 2003 (Tolstoy *et al.*, 2004a,b). Although the results are limited, the data showed that radii around the airguns where the received level would be 180 dB re 1 microPa (rms), the safety criterion applicable to cetaceans (NMFS 2000), vary with water depth. Similar depth-related variation is likely in the 190-dB isopleth that is applicable to pinnipeds. The 180- and 190-dB distances are typically used as safety radii during seismic surveys. For all sea turtle sightings, the 180-dB distance will be used as the safety radius. The proposed study area will occur in water approximately 30–3000 m (98–9842 ft), although only about 3 percent of the survey lines are expected to occur in shallow (<100 m; 328 ft) water.

The empirical data indicate that, for deep water ( $\leq$ 1000 m; 3281 ft), the L-DEO model tends to overestimate the received sound levels at a given distance (Tolstoy *et al.*, 2004a,b). However, to be precautionary pending acquisition of additional empirical data, L-DEO has proposed using safety radii during GI-airgun operations in deep water that correspond to the values predicted by L-DEO's model for deep water (Table 1). The assumed 190- and 180-dB radii for one GI-airgun are 10 m (33 ft) and 27 m (88 ft), respectively.

Empirical measurements were not conducted for intermediate water

depths (100–1000 m (328–3281 ft)). On the expectation that results will be intermediate between those from shallow and deep water, L-DEO has applied a 1.5X correction factor to the estimates provided by the model for deep water situations. This is the same factor that was applied to the model estimates during L-DEO cruises in 2003. The assumed 190 and 180 dB radii in intermediate-depth water are 15 m (49 ft) and 41 m (134 ft), respectively (Table 1). L-DEO has requested NMFS use these values for calculating safety ranges in intermediate-depth waters.

Empirical measurements were not made for a single small source operating in shallow water (<100 m (328 ft)). However, the measured 180-dB radius for the 6-airgun array operating in shallow water was 6.8X that predicted by L-DEO's model for operation of the 6-airgun array in deep water. This conservative correction factor was used to predict the radii for two GI airguns. The radii for one GI-airgun were assumed to be half of that predicted for two GI guns. Thus, the 190- and 180-dB radii in shallow water are assumed to be 125 m (410 ft) and 200 m (656 ft), respectively (Table 1) and L-DEO has requested NMFS use these values for establishing safety zones in shallow water.

#### *Characteristics of Airgun Pulses*

Discussion on the characteristics of airgun pulses have been provided in the application and in previous **Federal Register** notices (see 69 FR 31792 (June 7, 2004) or 69 FR 34996 (June 23, 2004)). Reviewers are referred to those documents for additional information.

#### **Comments and Responses**

A notice of receipt and request for 30-day public comment on the application and proposed authorization was published on March 21, 2005 (70 FR 13466). During the 30-day public comment period, comments were received from the Marine Mammal Commission (Commission), the Center for Biological Diversity (CBD) and L-DEO.

#### *Activity Concerns*

*Comment 1:* L-DEO noted that the seismic vessel will be the *Thompson* and the scheduled cruise dates have been modified. The cruise will begin on July 19, 2005. Also, the *Thompson* has different sonar instrumentation than the R/V *Kilo Moana*.

*Response:* NMFS has made the appropriate changes and analyses in this document.

#### *Marine Mammal Protection Act Concerns*

*Comment 2:* The CBD believes NMFS has not demonstrated that the LDEO project will take only small numbers of marine mammals.

*Response:* NMFS believes that the small numbers requirement has been satisfied. The U.S. District Court for the Northern District of California held in *NRDC v. Evans* that NMFS' regulatory definition of "small numbers" improperly conflates it with the "negligible impact" definition. Even if that is the case, in the proposed IHA notice and in this document, NMFS has made a separate determination that the takes of the affected marine mammal species will be small. The species most likely to be harassed during the seismic survey is the Dall's porpoise, with a "best estimate" of 376 animals being exposed to sound levels of 160 dB or greater. This represents less than 0.1 percent of the Alaska regional population of that species, a relatively small number. Moreover, this does not mean that 376 Dall's porpoises will be taken by Level B harassment. Dall's porpoise have their best hearing at high frequencies, not the low frequencies used by seismic airguns and may not even hear seismic sounds. If in fact, Dall's porpoise cannot hear the low-frequency seismic sounds, then no taking of this species will occur. Finally, NMFS notes that during this project, no marine mammal stock other than the killer whale stock will exceed 1 percent of its stock being potentially subject to Level B harassment. For killer whales a best estimate is that about 46 animals, or about 3.1 percent of the Alaska population, will be exposed to low-frequency noise. See Table 2 for more information on Level B harassment take estimates.

*Comment 3:* The CBD believes that NMFS does not define the geographical limits of the "regional" populations that form the basis of its analysis or provide an analysis of impacts on stocks that overlap the project area. The appropriate geographical scale should be populations and stocks inhabiting the survey area, not the entire "northeast Pacific Ocean." Any analysis of small numbers and negligible impact cannot be conducted independently of this information. For example, for the killer whale, NMFS does not mention or distinguish between transient, offshore, and resident stocks that all exist in the Aleutian Islands. As a result, the requested authorization for a take of 157 killer whales is not of detailed enough scale to permit reasoned analysis of the small numbers and negligible impact

requirements. This analysis must be redone for this and other species.

*Response:* NMFS agrees that impacts should be assessed on the population or stock unit whenever possible. L-DEO's application (see especially Table 4) provides information on stock abundance in the northern Gulf of Alaska and Aleutian Islands (when available) and larger water bodies (such as the North Pacific Ocean). The data source for each stock estimate is provided. NMFS believes that these data are the best scientific information available for estimating impacts on marine mammal species and stocks. However, information on marine mammal stock abundance may not always be satisfactory. When information is lacking for defining a particular population or stock of marine mammals then impacts are assessed with respect to the species as a whole (54 FR 40338, September 29, 1989). As a result, NMFS disagrees that this analysis must be redone. For example, information on the killer whale stocks was provided on pages 16 and 17 of the L-DEO application and in NMFS' proposed authorization (see 70 FR 13466, March 21, 2005 especially Table 2). It was not separated out for additional discussion in NMFS' notice since, as noted later, the killer whale is less likely to be impacted than most other species and, therefore, did not warrant additional analysis. For clarification in calculating killer whale density, L-DEO used the survey data of Wade *et al.* (2003) and Zerbini *et al.* (2004) for the Northern Gulf of Alaska and Aleutian Islands. Referencing these recent marine mammal surveys, L-DEO notes that the best scientific information currently available indicates that 66 percent of the killer whale groups sited were resident, 24 percent were transient, 3 percent were offshore, and 7 percent were unknown. On June 3, 2004 (69 FR 31321), NMFS published a rule designating the AT1 killer whale group of the transient stock as a depleted stock under the MMPA. This group, found east of the Aleutians and, therefore, unlikely to be affected, has 9 or fewer whales and was part of the Eastern North Pacific Transient stock prior to this designation.

Since there is insufficient information to indicate which of these stocks, if any, might be within the relatively small impact area at the same time the *Thompson* is conducting seismic, NMFS believes the proper method is to divide the estimated incidents of harassment among the current stocks. Since this species is unlikely to be in the vicinity of the *Thompson* at the time seismic is operating (L-DEO, 2004), and is highly

visible to observers, no killer whales will be injured or killed (i.e., no removals from the species or stock) as a result of the *Thompson's* seismic operations. Therefore, the only potential taking might be by Level B harassment. As indicated in Table 2 in this document, L-DEO has provided a best estimate that approximately 46 killer whales (maximum estimate, 144) might be within the 160-dB (rms) isopleth and, therefore, presumed to be harassed. Forty-six individuals is 3.1 percent of the Alaska regional killer whale population. If subdivided according to stock size, NMFS estimates that approximately 32 Resident, 12 Transient and less than 2 Offshore killer whales may be within the 160 dB isopleth. Moreover, since the killer whale's optimum hearing range is not in the low frequency used by seismic sources, this number should not be interpreted as the number being "taken" by Level B harassment, only the number that might be exposed to seismic noise at SPLs greater than or equal to 160 dB. Therefore, NMFS believes that the effect of any taking will be negligible.

*Comment 4:* The CBD states that the application provides Alaskan population estimates for the following species: sperm whale, beluga whale, Pacific white-sided dolphin, killer whale, harbor porpoise, Dall's porpoise, humpback whale, minke whale, Steller sea lion and harbor seal. However, the proposed authorization neglects to explain how this delineation corresponds to populations or stocks or to use this information for its take estimates. For example, the application estimates the northern Gulf of Alaska (GOA) and Aleutian Island population of humpback whales to be 2,866 individuals. Yet, the proposed authorization's best estimate of how many humpback whales will be exposed to sound levels greater than 160 dB is 54 individuals, which it concludes represents only 0.9 percent of the "regional population." However, 54 individuals represents 1.8 percent of the northern GOA and Aleutian population of humpback whales, which is the proper geographic scope of the take analysis. The same flaw pervades NMFS' take analysis for those species for which Alaskan populations are known. It is also unclear how some Alaska populations (e.g., Steller sea lion, harbor porpoise) are listed as larger than their regional populations.

*Response:* NMFS recognizes that there is some confusion in the presentation of the regional population estimates. In a few cases, such as the killer whale, minke whale, and harbor porpoise, the population estimates for various parts of

the relevant range are listed in the table rather than the sum of all of the estimates. For most species/stocks the numbers of individuals exposed are so small that the stock proportions are still very small even though the regional population is understated. However, for the killer whale the stock proportions potentially affected are larger, so L-DEO estimated the regional population.

The L-DEO application contains very detailed descriptions of the biology, distribution and movements of all species considered to be potentially affected. With very few exceptions, the species have seasonal ranges much larger than the proposed northern GOA and Aleutians area for this survey. There are movements by specific individuals into and out of the GOA and Aleutians during any one season and in different years. The number of different individuals of a species that uses an area is much larger than the number that is there at any specific time. Thus any potential impacts on the proportion of the population must reflect all individuals that use the area, which is best reflected in the regional population estimate. In addition, in almost all cases, the regional population estimates are from only part of the range of the stock, and the real population/stock sizes are likely much larger. Therefore, using the regional abundance estimates to estimate the proportions of populations that might be impacted is conservative because the actual regional abundance is usually much higher than the estimates that are presented, and the actual proportion of the population affected is likely lower than estimated proportion affected.

The killer whale is one species that has resident populations that typically do not wander throughout the killer whale range, but they also have transient populations that do move throughout the North Pacific Ocean (NPO). Therefore, the number of different individuals that might be impacted is somewhere between the northern GOA and Aleutians estimate (1472) and the sum of the southern and northern estimates (2812) (or higher since much of the offshore habitat has not been surveyed and therefore is not included in the two estimates). In this case, L-DEO has conservatively considered only the Alaska population estimate rather than the Regional abundance, but a better (but still very conservative) estimate of the Regional population size for killer whales is 2063 as described here. Perhaps the percentage that might be impacted should reflect the still very conservative estimate of 2063 for the Regional population size. Therefore, the estimate

of the regional population affected by this activity should be somewhere between 1472 and 2812 (or higher) consisting of (1) the Resident populations in the south (Washington-Oregon-California and Southern British Columbia, 83 based on Carretta *et al.* 2005), plus (2) the resident population in Alaska (723 based on Angliss and Lodge 2004) plus (3) the transient population that ranges throughout California to Alaska, plus (4) the Offshore population that ranges farther offshore from California to Alaska. Based on the estimate of 1340 killer whales that occur within 300 nm of the CA/OR/WA coastline and assuming that 83 of these whales are the southern resident population (see previous comment), then there are at least 1257 transient and offshore killer whales in the CA/OR/WA population. If we add these to the resident numbers for CA/OR/WA/BC (83) and Alaska (723), the minimum regional population size is 2063. This is very conservative for a number of reasons: only identified animals are counted as residents (some unidentified animals are likely to exist and some animals that have been photographed have not been assigned to any of the populations); all of the southern resident population of 83 was assumed to be in the CA/OR/WA survey area though probably only a few were there at the time of the survey; only a small part of the offshore habitat has been surveyed and therefore is included in the estimate; and it is assumed that all offshore and transient whales seen off Alaska are part of the estimate for CA/OR/WA and at the time of the survey some killer whales are likely to have been present in BC or Alaska waters and are not included in the above estimate.

*Comment 5:* The CBD states that surveys should be conducted prior to authorizing the IHA for those species for which the Alaskan marine mammal populations are not known, asserting that any analysis of small numbers and negligible impact cannot be conducted independently of this more detailed information.

*Response:* NMFS disagrees. As noted previously, when information is unavailable on a local population stock size, NMFS uses either stock or species information on abundance. Since NMFS uses the best information that is available, estimating impacts on marine mammals in this manner is appropriate. Therefore, additional surveys are unnecessary.

*Comment 6:* The Commission believes that NMFS' preliminary determinations are reasonable if the proposed mitigation and monitoring activities are

adequate to detect marine mammals in the vicinity of the proposed operation and to ensure that marine mammals are not being taken in unanticipated ways or numbers. The Commission remains concerned about whether the proposed monitoring effort will be sufficient to determine that no marine mammals are within the safety zones at start-up or will be an effective means of detecting when marine mammals enter the safety zone during operations. This is particularly true for cryptic species that may be difficult to detect. The need for effective monitoring is especially important in light of the diversity and abundance of marine mammal species in the western Aleutian Islands.

*Response:* For this activity, the radius of the zone of potential impact ranges from 10 to 200 m (33 to 656 ft) depending upon water depth. Considering the small size of the conservative shutdown zones, the speed of the vessel when towing the airgun (9 kts), the length of daylight at this time of the year, and the marine mammal avoidance measures that are implemented by the vessel for animals on the vessel's track, it is very unlikely that any marine mammals would enter the safety zone undetected. If a marine mammal enters the small safety zone, operational shutdown will be implemented until the animal leaves the safety zone.

*Comment 7:* The Commission recommends that if the proposed monitoring and mitigation measures do not provide sufficient assurance that marine mammals will not be exposed to sound levels that may cause serious injuries or mortalities, authorization of these additional types of taking should be pursued under section 101(a)(5)(A) of the MMPA.

*Response:* As noted in this document and in previous documents, the best scientific information indicates that marine mammals are unlikely to be injured or killed incidental to seismic operations unless the sound pressure level (SPL) is significantly above the levels calculated for the safety zone established to prevent injury. For this research cruise, using only a single airgun, the conservative 180 dB (cetacean) and 190-dB (pinniped) safety zones will vary from 10–27 m (33–88.6 ft) in deep water to 125–200 m (410–656.2 ft) in shallow (<100 ft (30.5 m) water. With approximately 97 percent of the survey conducted in deep water, with the *Thompson's* length at 83.5 m (274 ft), and a beam of 16 m (52.5 ft), and with the hydrophone streamer extending 300 m (984 ft) long (or possibly as short as 50 m (164 ft)) astern of the *Thompson* during most of the

survey, the safety zones will not extend beyond the perimeter of the vessel and its hydrophone array. Therefore, no marine mammals are likely to be injured or killed by the *Thompson's* research cruise and the issuance of an IHA is appropriate.

#### *Mitigation and Monitoring Concerns*

*Comment 8:* The CBD states that there is no discussion or consideration of additional monitoring or mitigation measures, such as use of passive acoustics. Without requiring such additional measures, or at a minimum discussing why they are not practical, NMFS cannot lawfully issue the requested authorization.

*Response:* Prior to issuing an IHA, NMFS thoroughly investigates all measures that might reduce the incidental taking of marine mammals by an activity to the lowest level practicable. Some of these mitigation measures are mentioned elsewhere in this document. Mitigation measures, such as aerial overflights or support vessels to look for marine mammals prior to an animal entering a safety zone, are generally given consideration if the safety zone cannot be adequately monitored from the source vessel. Additional consideration must be given to aircraft/ vessel availability, access to nearby airfields, aircraft flight duration and personnel safety. There are serious safety issues regarding aircraft flights over water that must be considered prior to requiring aerial overflights. Additional consideration must be given to the potential for the aircraft itself to also result in Level B harassment since a plane or helicopter would need to fly at low altitudes to be effective. Because the safety zones for this proposed activity are very small and can be easily monitored from the *Thompson*, use of aircraft for mitigation purposes is not warranted. Also, because of the small size of the airgun and its zone of marine mammal influence, beach monitoring for strandings is unnecessary.

The 180-dB safety radius for the single airgun is 27 m (88.6 ft) in deep water, 41 m (134.5 ft) in intermediate-depth waters and 200 m (656.2 ft) in shallow water. Because of the relatively small safety zones, accurately locating vocalizing marine mammals to determine presence within the safety zone by passive acoustic monitoring (PAM) is not practicable with existing technology. Detecting vocalizing marine mammals to determine presence simply alerts observers to their presence and does not initiate shutdown because PAM cannot accurately determine distance and bearing to the vocalizing animal. At such short distances, a

trained marine mammal observer should not have difficulty locating them visually without the PAM. Of the 4111 km (2220 nm) of seismic lines for this survey, the major portion (4080 km (2203 nm)) will be in intermediate or deep water where the safety zones are very small. In shallow water, where the safety zone will be slightly larger, the PAM has proven inefficient due to signal propagation loss and reflection characteristics in shallow water. For these reasons, NMFS is not requiring L-DEO to use the PAM during the Aleutian Islands research program.

*Comment 9:* The CBD questions NMFS permitting the airgun to remain operational throughout the night if it has been operational before nightfall, even though the entire safety radius may not be visible.

*Response:* Standard procedures set in 1994 by NMFS marine mammal scientists for Beaufort Sea seismic operations allow airguns to continue to operate after nightfall if the airgun was ramped up during daylight hours with the entire safety radius visible at the time of ramp-up. It is widely presumed that marine mammals that are capable of hearing low-frequency airgun noises will avoid the area, and, therefore, injury if they find the noise annoying. Years of observation of bowhead whales in the Beaufort Sea indicate this species avoids the source of seismic sounds by tens of kilometers. NMFS presumes that other species will also take similar avoidance measures. However, for this research cruise, the safety radii are so small that they will be fully visible from the vessel, day or night. Night-time observations will utilize night vision devices (NVDs) if darkness precludes safety-zone observations.

In 2003, L-DEO completed two tests of the effectiveness of monitoring using NVDs (Smultea and Holst 2003, Appendix C; Holst 2004, Appendix B). Results of these tests indicated that the Night Quest NQ220 NVD is effective at least to 150 to 200 m (492 to 656 ft) away under certain conditions. That is sufficiently within the range of the NVDs to allow detection of marine mammals visually within the area of potential TTS. Furthermore, most marine mammals that might be within that distance would be expected to move away to avoid airgun operations as the vessel approaches.

*Comment 10:* The Commission recommends that NMFS seek clarification of two aspects of the proposed mitigation and monitoring measures. The application indicates that marine mammal observers would be on duty during all "daytime" airgun operations and that no start-up of the

airguns would occur at night unless the safety zones were visible. In the Aleutian Islands during the month of June there are about 17 hours between sunrise and sunset, and it will be light enough to monitor the safety zones for some time before sunrise and after sunset. Therefore, the Commission recommends NMFS more explicitly define what constitutes daytime and nighttime for purposes of these mitigation measures.

*Response:* Marine mammal observers begin observations when daylight allows them to make marine mammal behavioral observations in the area within the 160-dB isopleth.

*Comment 11:* The Commission notes that the application does not contain sufficient information with respect to the proposed track lines to allow reviewers to assess the likelihood of the applicant's proposal to look for animals possibly injured or killed on recently completed parallel transects. It would be useful if the applicant were to provide additional information as to how close track lines are likely to be and to estimate the time that is likely to transpire between passes through nearby locations.

*Response:* Figure 1 in the application provides a visual illustration of the proposed track lines. Accessing that same figure via the on-line electronic copy allows an interested reviewer to magnify this illustration to better determine distances. Because the chart is to scale, and the vessel towing speed is about 9 knots (16.7 km/hr), one can easily calculate the time and distance between transit lines if that information is needed to assess monitoring effectiveness. However, for this survey, using a single low-intensity airgun, serious injury or mortality is unlikely since SPLs that might cause injury or mortality would not extend beyond the vessel's footprint (see discussion on hearing impairment in the proposed IHA notice (70 FR 13466, March 21, 2005)). When necessary, L-DEO provides spreadsheets to NMFS containing this information.

*Comment 12:* The Commission notes that the applicant does not plan to monitor received noise levels during the survey. The Commission believes that monitoring would be useful for data gathering and animal safety purposes. In addition, the Commission recommends that NMFS, if it has not already done so, notify NMFS' Alaska Fisheries Science Center researchers working in this area about the planned seismic work.

*Response:* Successful acoustic monitoring requires a second vessel, which is not available for this cruise. As indicated in Tolstoy *et al.* (2003)

(available online at [http://www.nmfs.noaa.gov/pr/readingrm/mmpa\\_small\\_take/gom\\_90d\\_report\\_final.pdf](http://www.nmfs.noaa.gov/pr/readingrm/mmpa_small_take/gom_90d_report_final.pdf)), acoustic measurements of the L-DEO array were made during the Gulf of Mexico calibration study. The results from that study are provided in this document. In summary, the single GI-airgun proposed for use during this survey has an impact zone significantly less than airguns used during regular seismic surveys. Airgun attenuation and propagation measurements will be made on an opportunistic basis whenever possible, but considering the location, the small size of the airgun, and the cost to conduct measurements, NMFS does not consider this recommendation to be warranted. As recommended, NMFS notified its scientists working in the Aleutian Island area of the proposed low-intensity seismic survey this summer.

*Comment 13:* The Commission and CBD note that the applicant states that Steller sea lion critical habitat and "no approach" zones occur within the proposed study area, and that the applicant has stated that such areas around haul-outs and rookeries will be avoided to the extent "practicable." The Commission recommends that any IHA issued be conditioned to require that critical habitat areas, "no approach" zones, and other areas where there is commonly a high density of pinnipeds (including females and pups during June and July) be avoided to the extent possible. The CBD believes more appropriate and legally required alternative is for NMFS to require L-DEO to reschedule the project to avoid this sensitive time altogether. Also, the Commission considers it prudent for the applicant to avoid other marine mammal concentration areas, such as passes.

*Response:* "No-approach" zones and critical habitat for Steller sea lions are year-round designations so rescheduling is not a viable option. Also, surveys later in the year could compromise the survey's success and marine mammal monitoring due to weather. NMFS has established additional mitigation measures to protect critical habitat areas during this seismic survey. First, L-DEO will comply with the requirements of 50 CFR 223.202(a)(2)(i) and will not approach within 3 nm (5.5 km) of a Steller sea lion rookery site. In addition, the IHA prohibits SPLs at 190 dB or greater within 3 nm (5.5 km) of a Steller sea lion rookery. For this action, L-DEO will monitor a safety/shutdown radius of 750 m (2461 ft) around the airgun for Steller sea lions whenever the seismic survey is taking place within designated

critical habitats, regardless of the depth of water. Critical habitats in the areas of the survey include 20 nm (37 km) surrounding all Steller sea lion haulouts and rookeries as well as the Segum Pass Foraging Area and Bogoslof Foraging Area (see Figure 3 in the L-DEO application). If any Steller sea lions are found in or seen approaching the safety zone, L-DEO will shut-down the airgun. Finally, this safety zone will be monitored for Steller sea lions prior to start-up of the airgun for at least 30 minutes when in designated critical habitats.

Additional mitigation measures recommended by the Commission have not been accepted by NMFS since such a requirement would have the potential to unnecessarily compromise the proposed activity's success. NMFS believes that areas of high concentration of marine mammals could result in increased numbers of shutdowns. If shutdowns become significant, valuable ship time could be lost and a decision might be made to move to a different area. This is preferable to NMFS and L-DEO than simply making areas off limits due to a theoretical higher abundance of marine mammals.

#### *Endangered Species Act (ESA) Concerns*

*Comment 14:* The CBD states that L-DEO's proposed project may affect 8 species listed as endangered under the ESA. As a result, consultation under section 7 of the ESA must occur prior to authorization of the project. In addition, there is a stock of sea otters present in the proposed survey area that has recently been proposed for listing as "threatened," thus necessitating a conference.

*Response:* Consultation under section 7 of the ESA for both NMFS and the U.S. Fish and Wildlife Service (USFWS) species has been completed. The NMFS biological opinion resulting from that consultation concluded that this action is not likely to jeopardize the continued existence of listed species or result in the destruction or adverse modification of critical habitat. Additional terms and conditions contained in the Incidental Take Statement for the protection of Steller sea lions have been implemented through the IHA (as discussed in the previous response to comment). On March 23, 2005, the USFWS determined that the proposed survey would not adversely affect sea otters or other species under its jurisdiction.

#### *NEPA Concerns*

*Comment 15:* The CBD believes that the Environmental Assessment (EA) is insufficient and that an Environmental Impact Statement (EIS) is required. The

CBD states that NSF and NMFS have never prepared a comprehensive EIS that fully analyzes the environmental impacts of its seismic surveys, either individually or collectively, as well as provide the public with the critical opportunity to participate in the decision making process as required by NEPA for actions of this magnitude. The CBD believes that NMFS must prepare an EIS prior to approving this project.

*Response:* NMFS disagrees. NMFS believes that the NSF EA provides an in-depth discussion on aspects of the impacts of the subject seismic survey on the marine environment, particularly marine mammals and sea turtles. It discusses and analyzes the potential interaction between marine mammals and seismic operations. In its review of NSF's EA for this action and previous L-DEO actions that were analyzed under individual EAs, NMFS has determined that the individual L-DEO actions are discrete actions that are dispersed geographically (e.g., Bermuda, Norway, Mid-Atlantic, Gulf of Mexico, Caribbean Sea, Eastern Pacific) and/or over time (Hess Deep, 2003 and Blanco Fracture, 2004). As a result, there are no cumulative effects because there are no removals from any marine mammal population, Level B harassment would affect relatively few mammals in widely dispersed marine mammal populations and those affects would not impact animals at the population level.

NMFS announced the availability of the NSF EA for the Aleutian Island project on March 21, 2005 (70 FR 13466), as it does all NSF EAs. In the future, draft EAs will also be posted on NMFS' web-site. In conclusion, NMFS has determined that this project, as described in the NSF EA, does not raise substantial issues requiring an EIS.

#### **Description of Habitat and Marine Mammals Affected by the Activity**

A detailed description of the Aleutian Islands area and its associated marine mammals can be found in the L-DEO application and a number of documents referenced in the L-DEO application. A total of 18 cetacean species and 10 pinniped species may occur in the proposed study area around the Aleutian Islands. The marine mammals that occur in the proposed survey area belong to four taxonomic groups: odontocetes (toothed cetaceans, such as dolphins and sperm whales), mysticetes (baleen whales), pinnipeds (seals, sea lions, and walrus), and fissipeds (sea otter). Of the 18 cetacean species in the area, several are common.

Odontocete whales include the sperm whale, Cuvier's beaked whale, Baird's beaked whale, Stejneger's beaked whale,

beluga whale, Pacific white-sided dolphin, Risso's dolphin, killer whale, short-finned pilot whale, harbor porpoise, and Dall's porpoise;

Mysticete whales include the North Pacific right whale, eastern North Pacific gray whale, humpback whale, minke whale, sei whale, fin whale, and blue whale;

Pinnipeds include the northern fur seal, California sea lion, Steller sea lion, Pacific walrus, bearded seal, harbor seal, spotted seal, ringed seal, ribbon seal, and northern elephant seal. However, only four of these species of pinnipeds are likely to occur in the western Aleutian Islands: Steller sea lions, harbor seals, northern fur seals, and ribbon seals.

The walrus, California sea lion, and ringed, spotted, bearded, and northern elephant seals likely will not be encountered in the study area although they are known to occur in the eastern Aleutians. The sea otter and the walrus are managed by the USFWS and are not the subject of this authorization.

More detailed information on marine mammal species is contained in the L-DEO application.

#### **Potential Effects on Marine Mammals**

The effects of noise on marine mammals are highly variable, and can be categorized as follows (based on Richardson et al., 1995):

(1) The noise may be too weak to be heard at the location of the animal (i.e., lower than the prevailing ambient noise level, the hearing threshold of the animal at relevant frequencies, or both);

(2) The noise may be audible but not strong enough to elicit any overt behavioral response;

(3) The noise may elicit reactions of variable conspicuousness and variable relevance to the well being of the marine mammal; these can range from temporary alert responses to active avoidance reactions such as vacating an area at least until the noise event ceases;

(4) Upon repeated exposure, a marine mammal may exhibit diminishing responsiveness (habituation), or disturbance effects may persist; the latter is most likely with sounds that are highly variable in characteristics, infrequent and unpredictable in occurrence, and associated with situations that a marine mammal perceives as a threat;

(5) Any anthropogenic noise that is strong enough to be heard has the potential to reduce (mask) the ability of a marine mammal to hear natural sounds at similar frequencies, including calls from conspecifics, and underwater environmental sounds such as surf noise;

(6) If mammals remain in an area because it is important for feeding, breeding or some other biologically important purpose even though there is chronic exposure to noise, it is possible that there could be noise-induced physiological stress; this might in turn have negative effects on the well-being or reproduction of the animals involved; and

(7) Very strong sounds have the potential to cause temporary or permanent reduction in hearing sensitivity. In terrestrial mammals, and presumably marine mammals, received sound levels must far exceed the animal's hearing threshold for there to be any temporary threshold shift (TTS) in its hearing ability. For transient sounds, the sound level necessary to cause TTS is inversely related to the duration of the sound. Received sound levels must be even higher for there to be risk of permanent hearing impairment. In addition, intense acoustic or explosive events may cause trauma to tissues associated with organs vital for hearing, sound production, respiration and other functions. This trauma may include minor to severe hemorrhage.

#### *Effects of Seismic Surveys on Marine Mammals*

The L-DEO application and the proposed notice of an IHA for this project (see 70 FR 13466, March 21, 2005) provided information on what is known about the effects on marine mammals of the types of seismic and sonar operations planned by L-DEO. The types of effects analyzed in these documents are (1) tolerance, (2) masking of natural sounds, (2) behavioral disturbance, and (3) potential hearing impairment and other non-auditory physical effects (Richardson et al., 1995), including strandings. Please refer to those documents for information on those subjects.

Given the relatively small size of the single airgun planned for the present project, its effects are anticipated to be considerably less than would be the case with a large array of airguns. L-DEO and NMFS believe it is very unlikely that there would be any cases of temporary or permanent hearing impairment, or non-auditory physical effects. Also, behavioral disturbance is expected to be limited to distances less than 275 m (902 ft) in deep water, 413 m (1355 ft) for intermediate water depths, and 750 m (2461 ft) in shallow water, the zones calculated for 160 dB or the onset of Level B harassment due to impulse sounds.

The *Thompson* will use different sonars and acoustic equipment than the

*Kilo Moana*. However, the changes in mode of operation and energy or “noise” output from the different gear are slight. The effects of the sonars on marine mammals are expected to be similar for the *Thompson* as discussed in the proposed notice for the *Kilo Moana*.

The multi-beam bathymetric sonar that will be used on the *Thompson* has an operating frequency of 30 kHz. The multi-beam sonars that had been planned for use on the *Kilo Moana* were a Simrad EM120 for deep water (>800 m), operating at 11.25 and 12.6 kHz, and a Simrad EM1002 for shallow water (10–800 m), operating at a frequency of 92 to 98 kHz. This leads to the following assessment:

1. The *Kilo Moana*'s deep water unit, which would have been used during the majority of the survey (approximately 66 percent), emits sound pulses centered at 12 kHz. Baleen whales that would have heard the 12-kHz sonar pulses from the *Kilo Moana* are unlikely to hear the 30-kHz pulses from the *Thompson*.

2. The difference in the operating frequencies will be insignificant to odontocetes and pinnipeds, which hear well at both frequencies.

3. The *Kilo Moana* would have used a 98-kHz multi-beam in shallow waters, approximately 34 percent of the survey, whereas the *Thompson* will use its 30-kHz system in shallow as well as deep water. Pinnipeds are less sensitive to the higher frequencies, but mysticetes would not hear either the 98-kHz or 30-kHz sounds. For odontocetes, both frequencies are likely to be audible.

4. The pulse lengths of the multi-beam sonars are not substantially different between the systems on the two vessels in either shallow or deep water. The *Thompson*'s multi-beam has a pulse duration of 2 ms in shallow

water and up to 15 ms in deep water; the *Kilo Moana*'s multi-beam has a pulse length of 0.2, 0.7, or 2 ms in shallow water and up to 20 ms in deep water.

Overall, effects on marine mammals from the multi-beam sonars on either vessel would be similar. For both vessels, the fore-aft beam width is narrow, so a marine mammal below the surface near the trackline is not likely to be exposed to strong sounds from more than 1 (or a very few) pulses. The short durations of the pulses from either vessel mean that the energy received from one or a few pulses is low. Any effects induced by the multi-beam emissions are expected to be negligible with regard to masking and hearing impairment. Brief exposure to a few signals from any of the proposed multi-beam sonar systems might cause momentary, insignificant behavioral reactions in cetaceans and pinnipeds.

The *Thompson*'s hydrographic echosounder emits pulses at 3.5 and 12 kHz whereas the *Kilo Moana*'s sounder operates at 12, 38, and 200 kHz. The *Kilo Moana*'s sounder would have been operated at the lower frequencies. The impact to marine mammals from the use of the *Thompson*'s hydrographic echo sounder would be the same as, or perhaps less than, that from the *Kilo Moana*'s hydrographic echo sounder.

An ADCP will be used during the survey. The *Thompson*'s ADCP operates at a frequency of 75 kHz, and the *Kilo Moana*'s ADCP operates at 38 kHz. Neither system would be audible to baleen whales. Both systems will be audible to various species of odontocetes.

#### **Estimates of Take by Harassment for the Aleutian Islands Seismic Survey**

Given the mitigation measures implemented by L-DEO (see Mitigation later in this document), all anticipated

takes involve a temporary change in behavior that may constitute Level B harassment. The required mitigation measures will minimize or eliminate the possibility of Level A harassment or mortality. L-DEO has calculated the “best estimates” for the numbers of animals that could be taken by Level B harassment during the proposed Aleutian Islands seismic survey using data on marine mammal density and abundance from marine mammal surveys in the region by Brueggeman *et al.* (1987, 1988), Troy and Johnson (1989), Dahlheim *et al.* (2000), Waite *et al.* (2002), Doroff *et al.* (2003), Wade *et al.* (2003), and Tynan (2004), and estimates of the size of the affected area, as shown in the predicted RMS radii table (see Table 1).

These estimates are based on a consideration of the number of marine mammals that might be exposed to sound levels greater than 160 dB, the criterion for the onset of Level B harassment, by operations with the single GI-airgun planned to be used for this project. No animals are expected to exhibit responses to the sonars or pinger given their characteristics (e.g., narrow, downward-directed beam). Therefore, no additional incidental takings are included for animals that might be affected by the multi-beam sonars or 12-kHz pinger.

Table 2 incorporates the corrected density estimates and provides the best estimate of the numbers of each species that would be exposed to seismic sounds greater than 160 dB. A detailed description on the methodology used by L-DEO to arrive at the estimates of Level B harassment takes that are provided in Table 2 can be found in L-DEO's IHA application for the Aleutian Islands survey.

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TABLE 2

Estimates of the possible numbers of marine mammal "exposures" to the different sound levels, and the numbers of different individuals that might be exposed, during L-DEO's proposed seismic program in the Aleutian Islands in July–August 2005.

Species	Number of Exposures to Sound Levels $\geq 160$ dB <sup>a</sup>		Number of Individuals Exposed to Sound Levels $\geq 160$ dB <sup>b</sup>		
			Best Estimate		Maximum Estimate
	Best Estimate	Maximum Estimate	Number	% of Regional Pop'n <sup>c</sup>	
<b>Physeteridae</b>					
Sperm whale	2	8	2	0.0	7
<b>Ziphiidae</b>					
Cuvier's beaked whale	12	12	11	0.1	11
Baird's beaked whale	4	14	3	0.1	13
Stejneger's beaked whale	0	0	0	0.0	0
<b>Monodontidae</b>					
Beluga	0	0	0	NA	0
<b>Delphinidae</b>					
Pacific white-sided dolphin	5	44	4		41
Risso's dolphin	0	0	0		0
Killer whale	50	157	46		144
Short-finned pilot whale	0	0	0		0
<b>Phocoenidae</b>					
Harbor porpoise	46	381	43	0.1	350
Dall's porpoise	409	898	376	0.1	827
<b>Balaenopteridae</b>					
North Pacific right whale	0	3	0	0.0	3
Gray whale	38	90	35	0.1	83
Humpback whale	58	121	54	0.9	112
Minke whale	13	37	12	0.8	34
Sei whale	0	1	0	NA	1
Fin whale	45	120	42	0.4	111
Blue whale	0	0	0	0.0	0
<b>Pinnipeds</b>					
Northern fur seal	4	24	3	0.0	22
Steller sea lion	37	95	34	0.1	87
Harbor seal	61	160	56	0.2	148
Ribbon seal	0	0	0	0.0	0

<sup>a</sup> Best estimate and maximum estimates of density are from Table 5 in L-DEO, 2004.

<sup>b</sup> Estimates of the number of exposures would be about  $1.15 \times$  the number of individuals exposed if there were no allowance for lines that might be resurveyed due to poor data quality. There is no overlap of the 160 or 170 dB received noise level radii between adjacent survey lines.

<sup>c</sup> Regional population size estimates are from Table 4, in L-DEO, 2004. NA indicates that regional population estimates are not available.

## Conclusions

### *Effects on Cetaceans*

Strong avoidance reactions by several species of mysticetes to seismic vessels have been observed at ranges up to 6–8 km (3.2–4.3 nm) and occasionally as far as 20–30 km (10.8–16.2 nm) from the source vessel. However, reactions at the longer distances appear to be atypical of most species and situations, particularly when feeding whales are involved (Miller *et al.* in press). Fewer than 150 mysticetes are expected to be encountered during the proposed survey in the Aleutian Islands (Table 2) and disturbance effects would be confined to shorter distances given the low-energy acoustic source to be used during this project. In addition, the estimated numbers presented in Table 2 are considered overestimates of actual numbers that may be harassed. Odontocete reactions to seismic pulses, or at least the reactions of dolphins, are expected to extend to lesser distances than are those of mysticetes. Odontocete low-frequency hearing is less sensitive than that of mysticetes, and dolphins are often seen from seismic vessels. In fact, there are documented instances of delphinids and Dall's porpoise approaching active seismic vessels. However, dolphins as well as some other types of odontocetes sometimes show avoidance responses and/or other changes in behavior when near operating seismic vessels.

Taking into account the small size and the relatively low sound output of the single GI-airgun to be used, and the mitigation measures that are planned, effects on cetaceans are generally expected to be limited to avoidance of a small area around the seismic operation and short-term changes in behavior, falling within the MMPA definition of Level B harassment. Furthermore, the estimated numbers of animals potentially exposed to sound levels sufficient to cause appreciable disturbance are very low percentages of the affected populations.

Based on the 160-dB criterion, the best estimates of the numbers of individual odontocete cetaceans that may be exposed to sounds  $\geq 160$  dB re 1 microPa (rms) represent 0 to approximately 0.4 percent of the regional species populations, except for approximately 3.1 percent for killer whales (Table 2).

Mitigation measures such as controlled speed, course alteration, observers, and shut downs when marine mammals are seen within defined ranges should further reduce short-term reactions, and minimize any effects on hearing. In all cases, the effects are

expected to be short-term, with no lasting biological consequence. In light of the type of take expected and the small percentages of affected stocks of cetaceans, the action is expected to have no more than a negligible impact on the affected species or stocks of cetaceans.

### *Effects on Pinnipeds*

Two pinniped species (the Steller sea lion and the harbor seal) are likely to be encountered in the study area. Also, it is possible that a small number of northern fur seals may be encountered, and possible (but very unlikely) that a few ribbon seals may be encountered. An estimated 56 individual harbor seals and 34 individual Steller sea lions (<0.1 percent and 0.2 percent of their northeast Pacific Ocean populations, respectively) may be exposed to GI gun sounds at received levels greater than or equal to 160 dB re 1 microPa (rms) during the seismic survey. It is probable that only a small percentage of those would actually be disturbed. It is most likely that only 3 northern fur seals and no ribbon seals will be exposed to sounds greater than or equal to 160 dB. Effects are expected to be limited to short-term and localized behavioral changes falling within the MMPA definition of Level B harassment. As with cetaceans, the short-term exposures to sounds from the single GI-airgun are not expected to result in any long-term consequences for the individuals or their populations and the activity is expected to have no more than a negligible impact on the affected species or stocks of pinnipeds.

### *Potential Effects on Habitat*

The proposed seismic survey will not result in any permanent impact on habitats used by marine mammals, or to the food sources they utilize. The main impact issue associated with the proposed activity will be temporarily elevated noise levels and the associated direct effects on marine mammals.

One of the reasons for the adoption of airguns as the standard energy source for marine seismic surveys was that they (unlike the explosives used in the distant past) do not result in any appreciable fish kill. Various experimental studies showed that airgun discharges cause little or no fish kill, and that any injurious effects were generally limited to the water within a meter or so of an airgun. However, it has recently been found that injurious effects on captive fish, especially on fish hearing, may occur at somewhat greater distances than previously thought (McCauley *et al.*, 2000a,b, 2002; 2003). Even so, any injurious effects on fish would be limited to short distances from

the source. Also, many of the fish that might otherwise be within the injury-zone are likely to be temporarily displaced from this region prior to the approach of the airguns through avoidance reactions to the passing seismic vessel or to the airgun sounds as received at distances beyond the injury radius.

Fish often react to sounds, especially strong and/or intermittent sounds of low frequency. Sound pulses at received levels of 160 dB re 1 microPa (peak) may cause subtle changes in behavior. Pulses at levels of 180 dB (peak) may cause noticeable changes in behavior (Chapman and Hawkins, 1969; Pearson *et al.*, 1992; Skalski *et al.*, 1992). It also appears that fish often habituate to repeated strong sounds rather rapidly, on time scales of minutes to an hour. However, the habituation does not endure, and resumption of the disturbing activity may again elicit disturbance responses from the same fish.

Fish near the airguns are likely to dive or exhibit some other kind of behavioral response. This might have short-term impacts on the ability of cetaceans to feed near the survey area. However, only a small fraction of the available habitat would be ensonified at any given time, and fish species would return to their pre-disturbance behavior once the seismic activity ceased. Thus, the proposed surveys would have little impact on the abilities of marine mammals to feed in the area where seismic work is planned. Some of the fish that do not avoid the approaching airguns (probably a small number) may be subject to auditory or other injuries.

Zooplankton that are very close to the source may react to the airgun's shock wave. These animals have an exoskeleton and no air sacs; therefore, little or no mortality is expected. Many crustaceans can make sounds and some crustaceans and other invertebrates have some type of sound receptor. However, the reactions of zooplankton to sound are not known. Some mysticetes feed on concentrations of zooplankton. A reaction by zooplankton to a seismic impulse would only be relevant to whales if it caused a concentration of zooplankton to scatter. Pressure changes of sufficient magnitude to cause this type of reaction would probably occur only very close to the source, so few zooplankton concentrations would be affected. Impacts on zooplankton behavior are predicted to be negligible, and this would translate into negligible impacts on feeding mysticetes.

### *Potential Effects on Subsistence Use of Marine Mammals*

Subsistence remains the basis for Alaska Native culture and community. Subsistence hunting and fishing continue to be prominent in the household economies and social welfare of some Alaskan residents, particularly among those living in small, rural villages (Wolfe and Walker, 1987). In rural Alaska, subsistence activities are often central to many aspects of human existence, including patterns of family life, artistic expression, and community religious and celebrator activities.

Marine mammals are legally hunted in Alaskan waters by coastal Alaska Natives. In the Aleutian Islands, Steller sea lions, harbor seals, sea otters, and small numbers of spotted and ringed seals are hunted (ADFG, 1997). In the Pribilof Islands, fur seals and sea lions make up most of the marine mammal harvest in Saint Paul and Saint George (on the Pribilof Islands). In the Aleutian Islands, harbor seals and sea lions comprise the majority of subsistence takes in Atka, Nikolski, Unalaska, and Akutan; and harbor seals are taken most frequently in False Pass, Sand Point, King Cove, and Nelson Lagoon (ADFG 1997). Hunting communities are concentrated along the Eastern Aleutian Islands, and the L-DEO project area is close to only two hunting communities, Nikolski (on Umnak Island) and Unalaska. More detailed information regarding the level of subsistence by species is provided in the application (L-DEO, 2004).

The proposed L-DEO project potentially could impact the availability of marine mammals for harvest in a very small area immediately around the *Thompson*. At any given location, this effect would persist for a only a short time period during seismic activities—probably less than an hour, given the small size of the seismic source to be used in this project. Pinnipeds and sea otters are generally not very responsive to airgun pulses and therefore would not be affected. Considering that behavior, and the limited time and spatial extent of the planned seismic surveys, the proposed project is not expected to have an unmitigable adverse impact on the availability of Steller sea lions, harbor seals, or sea otters for subsistence harvest.

### **Mitigation**

For the proposed seismic survey in the Aleutian Islands, North Pacific Ocean, L-DEO will deploy a single GI-airgun as an energy source, with a total discharge volume of 105 in<sup>3</sup>. The energy from the airgun is directed mostly

downward. The directional nature of the airgun to be used in this project is an important mitigating factor. This directionality will result in reduced sound levels at any given horizontal distance as compared with the levels expected at that distance if the source were omnidirectional with the stated nominal source level. Also, the small size of this airgun is an inherent and important mitigation measure that will reduce the potential for effects relative to those that might occur with large airgun arrays. This measure is in conformance with NMFS policy of encouraging seismic operators to use the lowest intensity airguns practical to accomplish research objectives.

The following mitigation measures, as well as marine mammal visual monitoring (discussed later in this document), will be implemented by L-DEO for the Aleutian Island seismic survey: (1) Speed and course alteration (provided that they do not compromise operational safety requirements); (2) shut-down procedures; (3) special mitigation measures (shut downs) for the North Pacific right whale; (4) avoidance of encroachment upon critical habitat around Steller sea lion rookeries and haulouts; and (5) no start-up of GI-airgun operations at night unless the full 180-dB safety zone is visible.

### *Speed and Course Alteration*

If a marine mammal is detected outside its respective safety zone (180 dB for cetaceans, 190 dB for pinnipeds) and, based on its position and the relative motion, is likely to enter the safety zone, the vessel's speed and/or direct course may, when practical and safe, be changed in a manner that also minimizes the effect to the planned science objectives. The marine mammal activities and movements relative to the seismic vessel will be closely monitored to ensure that the marine mammal does not approach within the safety zone. If the mammal appears likely to enter the safety zone, further mitigative actions will be taken (i.e., either further course alterations or shut down of the airguns).

### *Shut-down Procedures*

Although a "power-down" procedure is often applied by L-DEO during seismic surveys with larger arrays, powering down is not possible during the proposed project, as only a single GI-airgun will be used. Likewise, although "ramp-up" procedures are usually followed by L-DEO prior to airgun operations, ramp ups are impractical for a single GI airgun. Therefore, if a marine mammal is detected outside the safety radius but is

likely to enter the safety radius, and if the vessel's speed and/or course cannot be changed to avoid having the mammal enter the safety radius, the GI-airgun will be shut-down before the mammal is within the safety radius. Likewise, if a mammal is already within the safety zone when first detected, the airgun will be shut down immediately. The GI gun will also be shut down if a North Pacific right whale is sighted from the vessel, even if it is located outside the safety radius.

The GI-airgun activity will not resume until all marine mammals have cleared their respective safety radius. An animal will be considered to have cleared the safety radius if it is visually observed to have left the safety radius, if it has not been seen within the radius for 15 minutes in the case of small odontocetes and pinnipeds, or has not been seen within the zone for 30 minutes in the case of mysticetes and large odontocetes, including sperm, pygmy sperm, dwarf sperm, and beaked whales.

For a 105-in<sup>3</sup> GI airgun, the predicted 180-dB distances applicable to cetaceans are 27–200 m (89–656 ft), depending on water depth, and the corresponding 190-dB radii applicable to pinnipeds are 10–125 m (33–410 ft), depending on depth (Table 1). Airgun activity will not resume until the marine mammal has cleared the safety radius.

To the extent practicable, the *Thompson* will avoid entering the critical habitat around Steller sea lion haul outs by planning operations to remain in water depths  $\leq 30$  m (98 ft). For this action, L-DEO will monitor a safety/shutdown radius of 750 m (2461 ft) around the airgun for Steller sea lions whenever the seismic survey is taking place within designated critical habitats, irregardless of the depth of water. Critical habitats in the areas of the survey include 20 nm (37 km) surrounding all Steller sea lion haulouts and rookeries as well as the Seguam Pass Foraging Area and Bogoslof Foraging Area (see Figure 3 in the L-DEO application). If any Steller sea lions are found in or seen approaching the safety zone, L-DEO will shut-down the airgun. In addition, L-DEO will comply with the no-approach zone requirements of 50 CFR 223.202(a)(2)(i) for Steller sea lion rookeries, and the vessel will neither approach within 3 nm (5.6 km) of the rookeries or allow SPLs of 190 dB or greater within 3 nm (5.5 km) of a Steller sea lion rookery.

### *Start-Up Procedures*

In order for airgun start-up to occur during day or night, the full safety radius must be visible for at least 30

consecutive minutes. During night-time operations, if the entire safety radius is visible using vessel lights and night-vision devices (NVDs) (as may be the case in deep and intermediate waters), then start up of the airgun after a shut down may occur. However, lights and NVDs may not be very effective as a basis for monitoring the larger safety radii around the GI airgun operating in shallow water. Therefore in shallow water nighttime start ups of the GI gun from a shut-down condition are not authorized. However, if the GI airgun has been operational before nightfall, it can remain operational throughout the night, even though the entire safety radius may not be visible.

Comments on past IHAs raised the issue of prohibiting nighttime operations as prescribed mitigation. However, this is not practicable due to cost considerations and ship time schedules. The daily cost to the Federal Government to operate vessels such as *Thompson* is approximately \$33,000-\$35,000/day (Ljunngren, pers. comm. May 28, 2003). If the vessel was prohibited from operating during nighttime, each trip could require an additional three to five days to complete, or up to \$175,000 more, depending on average daylight at the time of work.

If a seismic survey vessel is limited to daylight seismic operations, efficiency would also be much reduced. Without commenting specifically on how that would affect the present project, for seismic operators in general, a daylight-only requirement would be expected to result in one or more of the following outcomes: cancellation of potentially valuable seismic surveys; reduction in the total number of seismic cruises annually due to longer cruise durations; a need for additional vessels to conduct the seismic operations; or work conducted by non-U.S. operators or non-U.S. vessels when in waters not subject to U.S. law.

#### **Marine Mammal Monitoring**

L-DEO must have at least three visual observers on board the *Thompson* and at least two must be experienced marine mammal observers that NMFS has approved in advance of the start of the Aleutian Islands cruise. These observers will be on duty in shifts of no longer than 4 hours.

The visual observers will monitor marine mammals near the seismic source vessel during all daytime airgun operations, during any nighttime start-ups of the airgun (in intermediate and deep waters) and at night, whenever daytime monitoring resulted in one or more shut-down situations due to

marine mammal presence. During daylight, vessel-based observers will watch for marine mammals near the seismic vessel during periods with shooting (including ramp-ups), and for 30 minutes prior to the planned start of airgun operations after a shut-down.

Use of multiple observers will increase the likelihood that marine mammals near the source vessel are detected. L-DEO bridge personnel will also assist in detecting marine mammals and implementing mitigation requirements whenever possible (they will be given instruction on how to do so), especially during ongoing operations at night when the designated observers are on stand-by and not required to be on watch at all times.

The observer(s) will watch for marine mammals from the highest practical vantage point on the vessel, which is either the bridge or the flying bridge. On the flying bridge of the *Thompson*, the observer's eye level will be 13.8 m (45.3 ft) above sea level, allowing for good visibility around the entire vessel (360° for 2 observers, 310° for one observer). The observer(s) will systematically scan the area around the vessel with reticle binoculars (e.g., 7 X 50 Fujinon) and with the naked eye during the daytime. At night, NVDs will be available (ITT F500 Series Generation 3 binocular-image intensifier or equivalent), when required. Laser range-finding binoculars (Leica L.F. 1200 laser rangefinder or equivalent) will be available to assist with distance estimation. The observers will be used to determine when a marine mammal is in or near the safety radii so that the required mitigation measures, such as course alteration and power-down or shut-down, can be implemented. If the GI-airgun is shut down, observers will maintain watch to determine when the animal is outside the safety radius.

Observers will not be on duty during ongoing seismic operations at night; bridge personnel will watch for marine mammals during this time and will call for the airgun to be shut-down if marine mammal(s) are observed in or about to enter the safety radii. However, a biological observer must be on standby at night and available to assist the bridge watch if marine mammals are detected. If the airgun is turned on at night (see previous section for restrictions), two marine mammal observers will monitor the safety zone for marine mammals for 30 minutes prior to ramp-up and during the ramp-up using either deck lighting or NVDs that will be available.

#### *Post-Survey Monitoring*

In addition, at times the biological observers will be able to conduct monitoring of most recently-run transect lines as the returns along a parallel transect track. This will provide the biological observers with opportunities to look for injured or dead marine mammals (although, for reasons noted elsewhere in this document, no injuries or mortalities are expected during this research cruise).

Taking into consideration the additional costs of prohibiting nighttime operations and the likely impact of the activity (including all mitigation and monitoring), NMFS has determined that the proposed mitigation and monitoring ensures that the activity will have the least practicable impact on the affected species or stocks. Marine mammals will have sufficient notice of a vessel approaching with an operating seismic airgun, thereby giving them an opportunity to avoid the approaching noise source; two marine mammal observers will be required to monitor the safety radii using shipboard lighting or NVDs for at least 30 minutes before ramp-up begins and verify that no marine mammals are in or approaching the safety radii; and start-up may not begin unless the entire safety radii are visible. Therefore as mentioned earlier, it is likely that the single GI-airgun will not be started-up from a shut-down at night when in waters shallower than 100 m (328 ft).

#### **Reporting**

L-DEO will submit a report to NMFS within 90 days after the end of the cruise, which is currently predicted to occur during July and August, 2005. The report will describe the operations that were conducted and the marine mammals that were detected. The report must provide full documentation of methods, results, and interpretation pertaining to all monitoring tasks. The report will summarize the dates and locations of seismic operations, marine mammal sightings (dates, times, locations, activities, associated seismic survey activities), and estimates of the amount and nature of potential take of marine mammals by harassment or in other ways.

#### **Endangered Species Act (ESA)**

NMFS has issued a biological opinion regarding the effects of this action on ESA-listed species and critical habitat under the jurisdiction of NMFS. That biological opinion concluded that this action is not likely to jeopardize the continued existence of listed species or result in the destruction or adverse

modification of critical habitat. A copy of the Biological Opinion is available upon request (see **ADDRESSES**). On March 23, 2005, the USFWS determined that the proposed survey would not adversely affect sea otters or other species under its jurisdiction.

### National Environmental Policy Act (NEPA)

The NSF has made a Finding of No Significant Impact (FONSI) determination based on information contained within its EA that implementation of the subject action is not a major Federal action having significant effects on the environment within the meaning of NEPA. NSF determined, therefore, that an environmental impact statement would not be prepared. On March 21, 2005 (70 FR 13466), NMFS noted that the NSF had prepared an EA for the Aleutian Island surveys and made this EA available upon request. In accordance with NOAA Administrative Order 216-6 (Environmental Review Procedures for Implementing the National Environmental Policy Act, May 20, 1999), NMFS has reviewed the information contained in NSF's EA and determined that the NSF EA accurately and completely describes the proposed action alternative, and the potential impacts on marine mammals, endangered species, and other marine life that could be impacted by the preferred alternative and the other alternatives. Accordingly, NMFS adopted the NSF EA under 40 CFR 1506.3 and made its own FONSI. The NMFS FONSI also takes into consideration additional mitigation measures required by the IHA that are not in NSF's EA. Therefore, NMFS has determined that it is not necessary to issue a new EA, supplemental EA or an EIS for the issuance of an IHA to L-DEO for this activity. A copy of the EA and the NMFS FONSI for this activity is available upon request (see **ADDRESSES**).

### Determinations

NMFS has determined that the impact of conducting the seismic survey in the Aleutian Islands in the North Pacific Ocean may result, at worst, in a temporary modification in behavior by certain species of marine mammals. This activity is expected to result in no more than a negligible impact on the affected species or stocks.

For reasons stated previously in this document, this determination is supported by (1) the likelihood that, given sufficient notice through relatively slow ship speed and ramp-up, marine mammals are expected to move away from a noise source that is

annoying prior to its becoming potentially injurious; (2) recent research that indicates that TTS is unlikely (at least in delphinids) until levels closer to 200–205 dB re 1 microPa are reached rather than 180 dB re 1 microPa; (3) the fact that 200–205 dB isopleths would be well within 100 m (328 ft) of the vessel even in shallow water; and (4) the likelihood that marine mammal detection ability by trained observers is close to 100 percent during daytime and remains high at night to that distance from the seismic vessel. As a result, no take by injury or death is anticipated, and the potential for temporary or permanent hearing impairment is very low and will be avoided through the incorporation of the proposed mitigation measures mentioned in this document.

While the number of potential incidental harassment takes will depend on the distribution and abundance of marine mammals in the vicinity of the survey activity, the number of potential harassment takings is estimated to be small. In addition, the proposed seismic program will not interfere with any legal subsistence hunts, since seismic operations will not take place in subsistence whaling and sealing areas and will not affect marine mammals used for subsistence purposes.

The change of survey vessel and the differences in the timing of the summer 2005 survey are not expected to alter the impacts of the seismic survey on the wildlife resources in the area. The acoustic equipment on both vessels is similar and no substantial differences in impacts to the marine mammal species present and the environment are expected from the use of the *Thompson* instead of the *R/V Kilo Moana*. The description of the animal distributions and abundances in the study area is not expected to change over the approximately two month period of both the original and revised schedules. The take estimates provided in the application also apply to the revised schedule.

### Authorization

NMFS has issued an IHA to L-DEO to take marine mammals, by harassment, incidental to conducting a low-intensity oceanographic seismic survey in the Aleutian Island area of the North Pacific Ocean, for a 1-year period, provided the mitigation, monitoring, and reporting requirements are undertaken.

Dated: July 28, 2005.

**James H. Lecky,**

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

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## DEPARTMENT OF COMMERCE

### National Oceanic and Atmospheric Administration

[Docket Number 050722197-5197-01]

### Partnerships in the Provision of Environmental Information

**AGENCY:** National Oceanic and Atmospheric Administration, Department of Commerce.

**ACTION:** Notice.

**SUMMARY:** The National Oceanic and Atmospheric Administration (NOAA) is proposing to clarify its internal Policy on Partnerships in the Provision of Environmental Information, issued December 1, 2004. This clarification is intended to address apparent misunderstanding regarding the intent of the policy with respect to the role played by the private sector in the environmental information enterprise as a whole.

**DATES:** To be sure that your comments are considered, we must receive them by 12 p.m., e.s.t., November 2, 2005.

**ADDRESSES:** The proposed clarification to the policy is available electronically at <http://www.nws.noaa.gov/partnershippolicy>. Comments are requested electronically; please send comments to [partnershippolicy@noaa.gov](mailto:partnershippolicy@noaa.gov). Requests for hard copies or comments in letter form should be sent to Partnership Policy, Room 11426, 1325 East-West Highway, Silver Spring, MD 20910-3283.

**FOR FURTHER INFORMATION CONTACT:** John Sokich 301-713-0258.  
[john.sokich@noaa.gov](mailto:john.sokich@noaa.gov).

**SUPPLEMENTARY INFORMATION:** The National Oceanic and Atmospheric Administration (NOAA) recognizes there has been some misunderstanding regarding the intent of its "Policy on Partnerships in the Provision of Environmental Information," issued December 1, 2004. The present policy does not adequately express NOAA's views of the critical role played by the private sector in the environmental information enterprise as a whole. NOAA is sensitive to the concerns and prerogatives of the private sector, and has no intent to displace it. We recognize that the public interest is