nominee's qualifications and interest in serving on the Committee. Self-nominations are acceptable. The following contact information should accompany each nominee's submission: name, address, phone number, fax number, and e-mail address (if available).

Nominations should be sent to (see **ADDRESSES**) and must be received by (see **DATES**). The full text of the Committee Charter and its current membership can be viewed at the NMFS's web page at *www.nmfs.noaa.gov/mafac.htm.*

Dated: October 2, 2006.

William T. Hogarth,

Assistant Administrator for Fisheries, National Marine Fisheries Service.

[FR Doc. E6–16486 Filed 10–4–06; 8:45 am]

BILLING CODE 3510–22–S

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

[I.D. 090706B]

Incidental Takes of Marine Mammals During Specified Activities; Seismic Testing and Calibration in the Northern Gulf of Mexico, Fall 2006

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

ACTION: Notice; proposed incidental take authorization; request for comments.

SUMMARY: NMFS has received an application from the Lamont-Doherty Earth Observatory (L-DEO) for an Incidental Harassment Authorization (IHA) to take small numbers of marine mammals, by harassment, incidental to conducting an acoustic calibration and seismic testing program in the northern Gulf of Mexico in Fall, 2006. Under the Marine Mammal Protection Act (MMPA), NMFS is requesting comments on its proposed IHA for these activities.

DATES: Comments and information must be received no later than November 6, 2006.

ADDRESSES: Comments on the application should be addressed to Michael Payne, Chief, Permits, Conservation and Education Division, Office of Protected Resources, National Marine Fisheries Service, 1315 East-West Highway, Silver Spring, MD 20910–3225. The mailbox address for providing email comments is *PR1.090706B@noaa.gov*. NMFS is not responsible for e-mail comments sent to addresses other than the one provided here. Comments sent via e-mail, including all attachments, must not exceed a 10–megabyte file size.

A copy of the application containing a list of the references used in this document may be obtained by writing to the address specified above, telephoning the contact listed below (see **FOR FURTHER INFORMATION CONTACT**), or visiting the internet at: *http://www.nmfs.noaa.gov/pr/permits/incidental.htm.*

Documents cited in this notice may be viewed, by appointment, during regular business hours, at the aforementioned address.

FOR FURTHER INFORMATION CONTACT: Jolie Harrison, Office of Protected Resources, NMFS, (301) 713–2289, ext 166.

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.

Authorization shall 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 mitigation, 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 June 2, 2006, NMFS received an application from L-DEO for the taking, by Level B harassment, of several species of marine mammals incidental to conducting, with research funding from the National Science Foundation (NSF), an acoustic calibration and seismic testing program in the northern Gulf of Mexico in Fall, 2006. This project will be conducted with L-DEO's new seismic vessel, the *R/V Marcus G. Langseth* (*Langseth*), which will deploy different configurations of airguns and a different bottom-mapping sonar than used previously by L-DEO. L-DEO requests that it be issued an IHA allowing Level B Harassment takes of marine mammals incidental to the planned seismic surveys in the Gulf of Mexico.

The primary purpose of the calibration program is to obtain measurement data to better understand the sound fields around various configurations of the 36–airgun array and the GI guns, during seismic operations in different water depths. The data will be used to verify and refine model-based estimates of ''safety radii'' for different configurations of the 36–airgun array and the GI guns that will be used during future seismic surveys to be conducted by L-DEO. Such data are important to better define the distances within which mitigation may be necessary in order to avoid exposing marine mammals to received sound levels above those believed to have adverse effects, as well as to develop a better general understanding of the impact of man-made acoustic sources on marine mammals.

Description of the Specified Activity

The *Langseth* is expected to depart Mobile, AL in late October 2006 (at the earliest) and will transit to the survey area in the northern Gulf of Mexico. The survey will encompass an area between 24oN. and 31oN. and between 83°W. and 96°W., which is within the Exclusive Economic Zone (EEZ) of the U.S.A. The proposed study will consist of three phases: (1) an initial testing/

shakedown phase, (2) measurements of the sounds produced by various airgun arrays to be used by the *Langseth* (calibration), and (3) a three-dimensional (3D) seismic testing phase. The entire survey, calibration and testing included, will take approximately 25 days and include approximately 1420 km (174 hours) of airgun operation. Measurements will be made during seismic operations in three categories of water depth: shallow (<100 m or <328 ft), intermediate/slope (100–1000 m or 328–3281 ft), and deep (>1000 m or >3281 ft). The vessel will transit to Miami after the study is completed. The exact dates of the activities will depend on logistics and weather conditions.

Vessel Specifications

The *Langseth* is owned by NSF and operated by L-DEO. The *Langseth* will tow the airgun array and, at times, up to four 6–km (3.7–mi) streamers containing hydrophones along predetermined lines. The *Langseth* will also deploy a floating spar buoy and a bottom-moored hydrophone array.

The *Langseth* has a length of 71.5 m (235 ft), a beam of 17.0 m (56 ft), and a maximum draft of 5.9 m (19 ft). The gross tonnage is 2925 and the *Langseth* can accommodate 55 people. The ship is powered by two Bergen BRG–6 engines each producing 3550 hp; the vessel also has an 800–hp bowthruster. The operation speed during seismic acquisition is typically 7.4–9.3 km/h (4–5 kt). When not towing seismic survey gear, the *Langseth* can cruise at 20–24 km/h (11–13 kt). The *Langseth* has a range of 25,000 km (13,500 nm).

Given the presence of the airgun array (and at times streamer(s)) behind the vessel, the turning rate of the ship while the gear is deployed is limited to five degrees per minute. Thus, the maneuverability of the vessel is limited during operations.

Acoustic Source Specifications

Airguns

The full airgun array on the *Langseth* consists of 36 airguns, with a total discharge volume of 6600 in^3. The array is made up of four identical linear arrays or strings, with 10 airguns on each string. For each operating string, nine airguns will be fired simultaneously, while the tenth is kept in reserve as a spare, to be turned on in case of failure of another airgun. The calibration phase will use the full 36–airgun array and subsets thereof. The subsets will consist of either 1 string (9 airguns, 1650 in^3) or 2 strings (18 airguns, 3300 in^3). In addition, sounds from a single 45 in^3 GI gun and 2 GI guns (210 in^3) will be measured. During the seismic testing phase, the 2–string array will be used at most times, although the full 36–airgun array may also be used.

The 36–airgun array will consist of a mixture of Bolt 1500LL and 1900LLX airguns, ranging in size from 40 to 360 in^3. The airguns will fire for a brief (0.1 s) pulse every 30 s and will be silent during the intervening periods. The airgun array will be towed approximately 50–100 m (164–328 ft) behind the seismic vessel at a depth of 6–12 m (20–39 ft). The dominant frequency component is 0–188 Hz.

The specifications of each source planned for use are described in Table 1.

	1 GI Gun	2 GI Guns	1 Single Airgun	9-Airgun Array (1 String)	18-Airgun Array (2 Strings)	36-Airgun Array (4 Strings)
Airgun Specifications						
Energy Source	One 45 in^3 GI Airgun	Two 105 in^3 GI Airguns	One 2000 psi Bolt Airgun	Nine 2000 psi Bolt Airguns of 40-360 in^3	Eighteen 2000 psi Bolt Airguns of 40-360 in^3	Thirty-six 2000 psi Bolt Airguns of 40-360 in^3
Air Discharge Volume (in^3)	45 in3	210 in^3	40 in^3	1650 in^3	3300 in^3	6600 in^3
Towing Depth of Source	2.5m	3m	6 m	6m	6m	6m or 12m
Source Output (dB re 1 miPa m) 0-pk (pk.pk)*	225.3 (230.7)	237 (243)		246 (253)	252 (259)	259 (265)
Proposed Approximate Airgun Use						
Calibration Phase						
Shallow Site (30-60m)	10km	10km		34km	34km	34km
Intermediate/Slope Site (475m)				34km	34km≤	34km
Deep Site (1500m)	10km	10km		45km	45km	45km
Testing Phase						
Shallow Site (<100m)			89km	24km	175km	58km
Intermediate/Slope (100-1000 m)			89km	24km	175km	58km
Deep (>1000 m)			89km	24km	175km	58km

Table 1. L-DEO airgun configurations and proposed approximate use for each configuration by depth and phase.

* The root mean square values (typically discussed in biological literature) for these sources will generally be about 10-15 dB lower than those reflected here

Multibeam Sonar

The ocean floor will be mapped with the 12–kHz Simrad EM120 MBB sonar. This sonar will be operated from the *Langseth* simultaneous with the airgun array during the seismic testing program, but will likely be operated on its own during the acoustic calibration study. The Simrad EM120 operates at 11.25–12.6 kHz and will be hull-mounted on the *Langseth*. The beamwidth is 1° fore-aft and 150° athwartship. The maximum source level is 242 dB re 1 μPa. The pressure level is expected to drop to 180 dB at a distance of 1 km or 0.5 nm (this distance is the maximum estimate for on-axis and with no defocusing); pressure level does not vary with water depth. Each ''ping'' consists of nine successive fan-shaped transmissions, each ensonifying a sector that extends 1° fore-aft and 16° in the cross-track direction. The transmission length varies with water depth; each of the nine transmissions is approximately 2 ms in shallow water, 5 ms at intermediate water depths, and 15 ms in deep water. The nine successive transmissions span an overall cross-track angular extent of about 150°, with 16 ms gaps between the pulses for successive sectors. A receiver in the overlap area between two sectors would receive two pulses separated by a 16–ms gap. The ''ping'' interval varies with water depth and ranges from 0.2 s in really shallow water, to approximately 5 s at 1000 m (3281 ft) and 20 s at 4000 m (13,124 ft).

Airgun Operations

Acoustic Calibration Study

Location of Sites – L-DEO will work together with Texas A&M University to choose the exact study sites at the three depths, however, the approximate locations are indicated in Figure 1 of L-DEO's application. Site locations will depend on currents, surface ducts, and concentrations of marine mammals. Sites will be chosen to avoid high currents with large vertical shear, as were encountered during the 2003 study. Conductivity/Temperature/Depth (CTDs) and Expendable Bathythermograph (XBTs) measurements will be taken at each site to confirm local water column properties. Near-surface ducts may play a significant role in the propagation of sound, so a deep site with and without a surface duct will be surveyed if practical. Areas with concentrations of marine mammals will be avoided.

L-DEO proposes to start with the shallow site, where the instrument redundancy will allow some flexibility in gain settings to ensure that signals will not be clipped. This information will be used to optimize gain settings at the slope and deep sites. The water depths at the three different depth sites are expected to be 30–60 m (98–197 ft) at the shallow site, approximately 475 m (1,558 ft) at the intermediate/slope site, and approximately1500 m (4922 ft) at the deep site. This phase of the study will take approximately 14 days.

Acoustic Measurements – The 2006 program is designed to document the received levels of the airgun sounds, relative to distance, during operation of the *Langseth*'s 36–airgun 4–string array and subsets thereof, and up to 2 GI guns. During the calibration study, three configurations (1, 2, and 4 strings in equal amounts) of the 36–airgun array will be measured in three different water depths (deep, intermediate/slope, and shallow). A single and two GI guns will be measured in deep and shallow water only. Measurements will be made at varying distances from the guns using suitable electronics installed in the spar buoy and a bottom-moored hydrophone array. In addition, one 6–km (3.7–mi) long hydrophone streamer will be used at times for calibrations of shallow-water safety radii. The hydrophones will be deployed and retrieved by the *Langseth*.

At each of the three sites, the *Langseth*, towing various configurations of the 36–airgun array at a depth of 6 m (20 ft), will travel toward the spar buoy and/or moored hydrophone array from a distance of approximately10–15 km (5.4–8.1 nm) away and will pass over the receiving system. The *Langseth* will then continue out to a distance of approximately 10–15 km beyond the hydrophones. The approximate 15 km distance will be used at the shallow and slope sites (total line length of 30 km or 16 nm), and the approximate 10 km distance will be used at the deep-water site (total line length of 20 km or 11 nm). Longer lines are planned at the shallow and slope sites than at the deep site because in 2003, received sound levels diminished below 160 dB re 1 μPa (rms) well within 10 km at the deep site, but not at the shallow site (Tolstoy *et al*., 2004a,b). After completing the straight line, the airgun array will then be towed in a spiral fashion towards the hydrophones in order to measure received levels as a function of distance when the receiving hydrophones are to the side of the trackline. The spirals are designed such that the radius will decrease linearly with time.

At each site, the *Langseth* will make one straight line pass over the receiving hydrophones with the 36–airgun array, followed by the spiral pattern towards the hydrophones. At the deep site, two additional 20–km (11–nm) straight lines will be shot, for a total of three 20–km straight lines at that site: (a) with the airgun array at 6 m (20 ft) tow depth, (b) with the array at a tow depth of 12 m (39 ft), and (c) in waters with/without a surface duct [whichever was not the case in (a) and (b)]. In addition, two 10–km (5.4–nm) straight line passes will be made at the deep as well as the shallow-water sites; one pass at each site will be made with a single GI gun, and one pass will be made using 2 GI guns.

The total number of kilometers and hours of airgun shooting during the calibration phase of the project are indicated in Table 1. However, operations at each site will require approximately 36 hours, allowing for the time needed to deploy and recover the hydrophones as well as the time to shoot the survey. Although the lines will be longer for the slope and shallow sites, the deep site is likely to take the longest, because of the increased drop and surfacing time for the instruments plus the plans to shoot three 20 km (11 nm) lines.

Airguns will fire every 30 s, and operations are proposed to occur 24 hours per day to maximize effective and economic use of the limited ship time and to maximize the amount of calibration data collected. Operating airguns over 24–hour periods will also reduce the overall duration of airgun operations at each site, thus reducing the span of time when marine mammals in those areas will be exposed to airgun sounds.

Systematic Testing Phase

The exact site of the seismic testing phase has not yet been chosen, but is planned to range from shallow (approximately 30 m or 98 ft) to deep (>1000 m or 3281 ft) water and will fall within the general area described earlier. During the testing phase, the *Langseth* will deploy the 2–string 18–airgun array (and at times the 36–airgun array) as an energy source; a single 40 in3 airgun will be fired during turns. The *Langseth* will also deploy a receiving system consisting of up to four 6–km (3.7–mi) towed hydrophone streamers. There will be 200 m (656 ft) separation between adjacent pairs of the four streamers. As the airgun array is towed along the survey lines, the receiving system will receive the returning acoustic signals and transfer the data to the on-board processing system. The airgun array will be towed at a depth of 9 m (30 ft).

The testing phase will consist of a series of tracklines in a racetrack-type configuration. This racetrack will consist of 17 loops, with a total of 35 tracklines. Each trackline will be approximately 20 km (10.8 nm) long, for a total of approximately 700 km (378 nm) of shooting along tracklines. The spacing between adjacent tracklines will be 400 m (1312 ft). An additional 10 km (5.4 nm) of seismic will be shot during each turn between lines and during the ensuing run-in (the distance from the end of the turn to the start of the line during which the airgun array will be ramped up). In total, this will account for an additional 340 km (183 nm). Of this 340 km, approximately 73 km (39.4 nm) will consist of ramp ups, and 267 km (144.2 nm) will be shot with a 40 in^3 airgun during turns. These numbers are also presented in Table 1.

In total, 1040 km (562 nm) of seismic will be shot. The seismic testing program will take approximately 4 to 7 days.

Characteristics of Airgun Pulses

Discussion of the characteristics of airgun pulses has been provided in Appendix B of L-DEO's 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.

Safety Radii

To aid in determining at what point during exposure to seismic airguns (and other acoustic sources) marine mammals are harassed, pursuant to the MMPA, and in developing effective mitigation measures, NMFS applies certain acoustic thresholds. The distance from the sound source at which an animal would be exposed to these different received sound levels may be estimated and is typically referred to as a safety radii. These safety radii are specifically used to help NMFS estimate the number of marine mammals likely to be harassed by the proposed activity and in deciding how close a marine mammal may approach an operating sound source before the applicant will be required to power-down or shut down the sound source.

L-DEO has estimated the safety radii around their proposed operations using a model, but also by adjusting the model results based on empirical data gathered in the Gulf of Mexico in 2003. Additional information regarding how the safety radii were calculated and how the empirical measurements were used to correct the modeled numbers may be found in Section I and Appendix A of L-DEO's application. Using the modeled distances and various correction factors, Table 2 shows the distances at which three rms sound levels (190 dB, 180 dB, and 160 dB) are expected to be received from the various airgun configurations in shallow, intermediate, and deep water depths.

Source and Volume	Tow Depth (m)	Water Depth	Predicted RMS Radii (m)		
			190 dB	180 dB	160 dB
		Deep	9	25	236
Single GI gun	2.5	Intermediate/Slope	13.5	38	354
45 in^3		Shallow	113	185	645
		Deep	20	69	670
2 GI guns	3	Intermediate/Slope	30	104	1005
210 in^3		Shallow	294	511	1970
		Deep	12	36	360
Single Bolt	6	Intermediate/Slope	18	54	540
40 in^3		Shallow	150	267	983
1 string		Deep	200	650	6200
9 airguns	6	Intermediate/Slope	300	975	7880
1650 in^3		Shallow	1450	2360	8590
2 strings/ENT≤		Deep	250	820	6700
18 airguns	6	Intermediate/Slope	375	1230	7370
3300 in^3		Shallow	1820	3190	8930
4 strings		Deep	410	1320	8000
36 airguns	6	Intermediate/Slope	615	1980	8800
6600 in^3		Shallow	2980	5130	10670
4 strings		Deep	620	1980	12000
36 airguns	12	Intermediate/Slope	930	2970	13200
6600 in^3		Shallow	4500	7700	16000

Table 2. Modeled distances towhich sound levels 190,180, and 160 dB re 1uPa (rms) might be received in shallow (>100 m), intermediate/slope (100-1000 m), and deep (<1000 m) water from the various sources planned for use during the Gulf of Mexico study, fall 2006.

Description of Marine Mammals in the Activity Area

In the Gulf of Mexico, 28 cetacean species and one species of manatee are known to occur (Jefferson and Schiro, 1997; Wursig *et al.*, 2000; Table 3). In the U.S., manatees are managed by the U.S. Fish & Wildlife Service (USFWS), are unlikely to be encountered in or near the open waters of the Gulf of Mexico where seismic operations will occur, and are, therefore, not addressed further in this document. Most of these species of cetaceans occur in oceanic waters (>200 m or 656 ft deep) of the Gulf, whereas the continental shelf waters (<200 m) are primarily inhabited by bottlenose dolphins and Atlantic spotted dolphins (Mullin and Fulling 2004).

Species	Habitat	Occurrence in GOM	Abundance in GOM and/or North Atlantic	BEST		MAXIMUM	
				Estimated Exposures	Approx. % of Population	Est. Exposures Prop. IHA**	Approx. % of Population
Odontocetes							
Sperm whale	Usually pelagic and deep seas	Common	1349/13190 (add)	22	0.2	27	0.2
Pygmy sperm whale	Deeper waters off the shelf	Common	742/695 (add)	56	3.9		4.1
Dwarf sperm whale	Deeper waters off the shelf	Common					
Cuvier's beaked whale	Pelagic	Rare	159/3196 (add)	10	0.3	21	0.7
Sowerby's beaked whale	Pelagic	Extralimital	106/541 (add)	5	0.8	8	1.2
Gervais' beaked whale	Pelagic	Uncommon		5	0.8	8	1.2
Blainville's beaked whale	Pelagic	Rare		5	0.8	8	1.2
Rough-toothed dolphin	Mostly pelagic	Common	2223/274 (add)	58	2.3	92	3.7
Bottlenose dolphin	Cont. shelf, coastal and offshore	Common	25,320/2239/ 29774 (add)	773	1.3	1713	5.0
Pantropical spotted dolphin	Mainly pelagic	Common	91,321/13117 (add)	1282	1.2	1587	1.5
Atlantic spotted dolphin	Mainly coastal waters	Common	30,947/52279 (add)	876	1.1	1755	0.2
Spinner dolphin	Pelagic in Gulf of Mexico	Common	11,971	168	1.4	921	7.7
Clymene dolphin	Pelagic	Common	17,355/6086 (add)	244	1.0	311	1.3
Stripped dolphin	Off the continental shelf	Common	6505/61546 (add)	91	0.1	134	0.2
Short-beaked common dolphin	Cont. shelf and pelagic waters	Possible	30,768	0	0.0	0(5)**	<0.1
Long-beaked common dolphin	Coastal	Possible	N.A.	0	0.0	0(5)**	0.0
Praser's dolphin	Water>l000m	Common	726	10	1.4	60	8.3
Risso's dolphin	Waters 400-1000 m	Common	2169/29110 (add)	54	0.2	81	0.3
Mellon-headed whale	Oceanic	Common	3451	49	1.4	142	4.1
Pygmy killer whale	Oceanic	Uncommon	408	10	2.6	21	5.1
False killer whale	Pelagic	Uncommon	1038	14	1.4	28	2.7
Killer whale	Widely distributed	Uncommon	133/6600 (add)	3	<0.1	5	0.1
Short-finned pilot whale	Mostly pelagic	Common	2388/780000/ 14524	34	<0.1	98	<0.1
Long-finned pilot whale	Mostly pelagic	Possible	N.A.	0		0(5)**	

Species	Habitat	Occurrence in GOM	Abundance in GOM and/or North Atlantic	BEST		MAXIMUM	
				Estimated Exposures	Approx. % of Population	Est. Exposures Prop. IHA**	Approx. % of Population
Mysticetes							
North Atlantic right whale*	Coastal and shelf waters	Extralimital	291	0		0	
Humpback whale*	Mainly near-shore waters/banks	Rare	11,570/10400	0		0	
Minke whale	Coastal waters	Rare	149,000	0		0	
Bryde's whale	Pelagic and coastal	Uncommon	40/90000	1	2.5	2	5.0
Sei whale*	Primarily offshore, pelagic	Rare	12-13,000	0		0	
Fin whale*	Cont. slope, mostly pelagic	Rare	2814/47300	0		0	
Blue whale*	Coastal, shelf, and oceanic waters	Extralimital	308	0		0	
Pinnipeds							
Hooded seal	Coastal	Vagrant	400,000[z]	0		0(2)**	<0.1
Total				3770		7096	

Table 3. Abundance, preferred habitat, and commonness of the marine mammal species found in the survey area. The far right columns indicate the estimated number each species that will be exposed to 160 dB based on best and maximum density estimates. NMFS believes that, when mitigation measures are taken into consideration, the activity is likely to result in take of numbers of animals less than those indicated by the best column, however, L-DEO has asked for authorization of the maximum.

*Federally listed endangered,

** Parenthetical number indicates take authorization, though exposure estimate is 0

Seven species that may occur in the Gulf of Mexico are listed as endangered under provisions of the U.S. Endangered Species Act (ESA), including the sperm, North Atlantic right, humpback, sei, fin, and blue whale, as well as the West Indian manatee. However, of those species, only sperm whales are likely to be encountered. In addition to the 28 species known to occur in the Gulf of Mexico, another three species of cetaceans could potentially occur there: the long-finned pilot whale, the long-beaked common dolphin, and the short-beaked common dolphin (Table 3). Though any pinnipeds sighted in the study area would be extralimital, hooded seals have been reported in Florida and L-DEO has requested authorization for the take of 2 animals.

During the 2003 acoustical calibration study in the Gulf of Mexico from 28 May to 2 June, a total of seven visual sightings of marine mammals were documented from the *Maurice Ewing*; these included a total of approximately 38–40 individuals (LGL Ltd. 2003). In addition, three sea turtles were sighted. These totals include times when airguns were not operating as well as times when airguns were firing. Visual monitoring effort consisted of 60.9 hours of observations (all in daylight) along 891.5 km of vessel trackline on seven days, and passive acoustic monitoring (PAM) occurred for approximately 32 hours. Most of the monitoring effort (visual as well as acoustic) occurred when airguns were not operating, since airgun operations were limited during the 2003 study. No marine mammals were detected during acoustic monitoring. Marine mammal and sea turtle sightings and locations during the 2003 calibration study are summarized in Appendix C of L-DEOs application.

Detailed information regarding the status and distribution of these marine mammals may be found in sections III and IV of L-DEOs application.

Potential Effects of the Proposed Activity on Marine Mammals

Summary of Potential Effects of Airgun Sounds on Marine Mammals

The effects of sounds from airguns might include one or more of the following: tolerance, masking of natural sounds, behavioral disturbance, and at least in theory, temporary or permanent hearing impairment, or non-auditory physical or physiological effects (Richardson *et al.*, 1995). These effects are discussed below, but also in further detail in Appendix B of L-DEO's application.

The potential effects of airguns discussed below are presented without consideration of the mitigation measures that L-DEO has presented and that will be required by NMFS. When these measures are taken into account, it is unlikely that this project would result in temporary, or especially, permanent hearing impairment or any significant non-auditory physical or physiological effects.

Tolerance

Numerous studies have shown that pulsed sounds from airguns are often readily detectable in the water at distances of many kilometers. A summary of the characteristics of airgun pulses is provided in Appendix B of L-DEO's application. Studies have also shown that marine mammals at distances more than a few kilometers from operating seismic vessels often show no apparent response (tolerance) (Appendix B (e)). That is often true even in cases when the pulsed sounds must be readily audible to the animals based on measured received levels and the hearing sensitivity of that mammal group. Although various baleen whales, toothed whales, and (less frequently) pinnipeds have been shown to react behaviorally to airgun pulses under some conditions, at other times mammals of all three types have shown no overt reactions. In general, pinnipeds, small odontocetes, and sea otters seem to be more tolerant of exposure to airgun pulses than are baleen whales. Pinnipeds and sea otters are not found in the Gulf of Mexico; small odontocetes of numerous species are the predominant marine mammals in the area.

Masking

Masking effects of pulsed sounds (even from large arrays of airguns) on marine mammal calls and other natural sounds are expected to be limited, although there are very few specific data of relevance. Some whales are known to continue calling in the presence of seismic pulses. Their calls can be heard between the seismic pulses (e.g., Richardson *et al.*, 1986; McDonald *et al.*, 1995; Greene *et al.*, 1999; Nieukirk *et al.*, 2004). Although there has been one report that sperm whales cease calling when exposed to pulses from a very distant seismic ship (Bowles *et al.*, 1994), a more recent study reports that sperm whales off northern Norway continued calling in the presence of seismic pulses (Madsen *et al.*, 2002). That has also been shown during recent work in the Gulf of Mexico (Tyack *et al.*, 2003). Masking effects of seismic pulses are expected to be negligible in the case of the smaller odontocete cetaceans, given the intermittent nature of seismic pulses. Also, the sounds important to small odontocetes are predominantly at much higher frequencies than are airgun sounds. Masking effects, in general, are discussed further in Appendix B (d).

Disturbance Reactions

Disturbance includes a variety of effects, including subtle changes in behavior, more conspicuous changes in activities, and displacement. Simple exposure to sound, or brief reactions that do not disrupt behavioral patterns in a potentially significant manner, do not constitute harassment or ''taking''. By potentially significant, we mean ''in a manner that might have deleterious effects to the well-being of individual marine mammals or their populations''. Reactions to sound, if any, depend on species, state of maturity, experience, current activity, reproductive state, time of day, and many other factors. If a marine mammal does react briefly to an underwater sound by minorly changing its behavior or moving a small distance, the impacts of the change are unlikely to be significant to the individual, let alone the stock or the species as a whole. However, if a sound source displaces marine mammals from an important feeding or breeding area for a prolonged period, impacts on the animals could be significant.

There are many uncertainties in predicting the quantity and types of impacts of noise on marine mammals. As mentioned earlier in this document, NMFS applies acoustic criteria developed to help estimate the number of animals likely to be harassed by a particular sound source in a given area and for use in the development of shutdown zones for mitigation. The sound criteria used to estimate how many marine mammals might be disturbed to some biologically-important degree by a seismic program are based on behavioral observations during studies of several species. However, information is lacking for many species. Detailed studies have been done on humpback, gray, and bowhead whales, and on ringed seals. Less detailed data are available for some other species of baleen whales, sperm whales, small toothed whales, and sea otters.

Baleen Whales

Baleen whales generally tend to avoid operating airguns, but avoidance radii are quite variable. There is no specific information about reactions of Bryde's whales-the baleen whales most likely to be encountered in the Gulf of Mexico-to seismic pulses. Whales are often reported to show no overt reactions to pulses from large arrays of airguns at distances beyond a few kilometers, even though the airgun pulses remain well above ambient noise levels out to much longer distances. However, baleen whales exposed to strong noise pulses from airguns often react by deviating from their normal migration route and/or interrupting their feeding and moving away. In the case of the migrating gray and bowhead whales, the observed changes in behavior appeared to be of little or no biological consequence to the animals. They simply avoided the sound source by displacing their migration route to varying degrees, but within the natural boundaries of the migration corridors.

Studies of gray, bowhead, and humpback whales have determined that received levels of pulses in the 160–170 dB re 1 μPa rms range seem to cause obvious avoidance behavior in a substantial fraction of the animals exposed. In many areas, seismic pulses from large arrays of airguns diminish to those levels at distances ranging from 4.5 to 14.5 km (2.4–7.8 nm) from the source. A substantial proportion of the baleen whales within those distances may show avoidance or other strong disturbance reactions to the airgun array. Subtle behavioral changes sometimes become evident at somewhat lower received levels, and recent studies have shown that some species of baleen whales, notably bowhead and humpback whales, at times show strong avoidance at received levels lower than 160–170 dB re 1 μPa rms. Bowhead whales migrating west across the Alaskan Beaufort Sea in autumn, in particular, are unusually responsive. Substantial avoidance occurred out to distances of 20–30 km (11–16 nm) from a medium-sized airgun source, where received sound levels were on the order of 130 dB re 1 μPa rms (Miller *et al.*, 1999; Richardson *et al.*, 1999; see Appendix B (e)). More recent research on bowhead whales (Miller *et al.*, 2005), however, suggests that during the summer feeding season, bowheads are not nearly as sensitive to seismic sources, with onset of avoidance at the more typical level of 160–170 dB re 1 μPa rms.

Malme *et al.*, (1986, 1988) studied the responses of feeding eastern gray whales to pulses from a single 100 in3 airgun off St. Lawrence Island in the northern Bering Sea. They estimated, based on small sample sizes, that 50 percent of feeding gray whales ceased feeding at an average received pressure level of 173 dB re 1 μPa on an (approximate) rms basis, and that 10 percent of feeding whales interrupted feeding at received levels of 163 dB. Those findings were generally consistent with the results of experiments conducted on larger numbers of gray whales that were migrating along the California coast.

Blue, sei, fin, and minke whales have occasionally been reported in areas ensonified by airgun pulses. Sightings by observers on seismic vessels off the U.K. from 1997 to 2000 suggest that, at times of good sightability, numbers of rorquals seen are similar when airguns are shooting and not shooting (Stone 2003). Although individual species did not show any significant displacement in relation to seismic activity, all baleen whales combined were found to remain significantly further from the airguns during shooting compared with periods without shooting (Stone 2003).

Data on short-term reactions (or lack of reactions) of cetaceans to impulsive noises do not necessarily provide information about long-term effects. It is not known whether impulsive noises affect reproductive rate or distribution and habitat use in subsequent days or years. However, gray whales continued to migrate annually along the west coast of North America despite intermittent seismic exploration and much ship traffic in that area for decades (Appendix A in Malme *et al.*, 1984). Bowhead whales continued to travel to the eastern Beaufort Sea each summer despite seismic exploration in their summer and autumn range for many years (Richardson *et al.*, 1987). Populations of both gray and bowhead whales grew substantially during this time. In any event, the brief exposures to sound pulses from the proposed airgun source are highly unlikely to result in prolonged effects.

Toothed Whales

Little systematic information is available about reactions of toothed whales to noise pulses. Few studies similar to the more extensive baleen whale/seismic pulse work summarized above and in Appendix B have been reported for toothed whales. However, systematic work on sperm whales is underway (Tyack *et al.*, 2003), and there is an increasing amount of information about responses of various odontocetes to seismic surveys based on monitoring studies (e.g., Stone, 2003; Haley and Koski, 2004; Smultea *et al.*, 2004; Holst *et al.*, 2005a,b; MacLean and Koski, 2005).

Seismic operators sometimes see dolphins and other small toothed whales near operating airgun arrays, but in general there seems to be a tendency for most delphinids to show some limited avoidance of seismic vessels operating large airgun systems. However, some dolphins seem to be attracted to the seismic vessel and floats, and some ride the bow wave of the seismic vessel even when large arrays of airguns are firing. Nonetheless, there have been indications that small toothed whales sometimes move away, or maintain a somewhat greater distance from the vessel, when a large array of airguns is operating than when it is silent (e.g., Goold, 1996a,b,c; Calambokidis and Osmek, 1998; Stone, 2003). In most cases the avoidance radii for delphinids appear to be small, on the order of 1 km (0.5 nm) or less. However, aerial surveys during seismic operations in the southeastern Beaufort Sea recorded much lower sighting rates of beluga whales within 10–20 km (5–11 nm) of an active seismic vessel. These results were consistent with the low number of beluga sightings reported by observers aboard the seismic vessel, suggesting that some belugas might be avoiding the seismic operations at distances of 10–20 km (Miller *et al.*, 2005).

Captive bottlenose dolphins and beluga whales exhibit changes in behavior when exposed to strong pulsed sounds similar in duration to those typically used in seismic surveys (Finneran *et al.*, 2000, 2002; Finneran and Schlundt 2004). The animals tolerated high received levels of sound before exhibiting aversive behaviors. For pooled data at 3, 10, and 20 kHz, sound exposure levels during sessions with 25, 50, and 75 percent altered behavior were 180, 190, and 199 dB re 1 μPa^2 . s, respectively (Finneran and Schlundt, 2004).

Pinnipeds

No pinnipeds are expected to be encountered in the Gulf of Mexico, and thus it is most likely that none will be affected by the proposed activity. At most, up to two extralimital hooded seals might be encountered and potentially be behaviorally disturbed or have a low-level physiological response to the seismic exposure.

Hearing Impairment and Other Physical Effects

Temporary or permanent hearing impairment is a possibility when marine mammals are exposed to very strong sounds, but there has been no specific documentation of this for marine mammals exposed to sequences of airgun pulses. Current NMFS policy regarding exposure of marine mammals to high-level sounds is that cetaceans and pinnipeds exposed to impulsive sounds of 180 and 190 dB re 1 µPa (rms) or above, respectively, are considered to have been incidentally taken by Level A Harassment. These levels are precautionary.

Several aspects of the planned monitoring and mitigation measures for this project are designed to detect marine mammals occurring near the airguns, and to avoid exposing them to sound pulses that could potentially cause hearing impairment. In addition, many cetaceans are likely to show some avoidance of the area with high received levels of airgun sound. In those cases, the avoidance responses of the animals themselves will reduce or (most likely) avoid any possibility of hearing impairment.

Non-auditory physical effects might also occur in marine mammals exposed to strong underwater pulsed sound. Possible types of non-auditory physiological effects or injuries that theoretically might occur in mammals close to a strong sound source include stress, neurological effects, bubble formation, and other types of organ or tissue damage. It is possible that some marine mammal species (i.e., beaked whales) may be especially susceptible to injury and/or stranding when exposed to strong pulsed sounds. However, as discussed below, there is no definitive evidence that any of these effects occur even for marine mammals in close proximity to large arrays of airguns. It is unlikely that any effects of these types would occur during the present project given the brief duration of exposure of any given mammal, and the planned monitoring and mitigation measures (see below). The following subsections discuss in somewhat more detail the possibilities of TTS, permanent threshold shift (PTS), and non-auditory physical effects.

Temporary Threshold Shift (TTS)

TTS is the mildest form of hearing impairment that can occur during exposure to a strong sound (Kryter, 1985). While experiencing TTS, the hearing threshold rises and a sound must be stronger in order to be heard. TTS can last from minutes or hours to (in cases of strong TTS) days. For sound exposures at or somewhat above the TTS threshold, hearing sensitivity recovers rapidly after exposure to the noise ends. Few data on sound levels and durations necessary to elicit mild TTS have been obtained for marine mammals, and none of the published data concern TTS elicited by exposure to multiple pulses of sound.

For toothed whales exposed to single short pulses, the TTS threshold appears to be, to a first approximation, a function of the energy content of the pulse (Finneran *et al.*, 2002, 2005). Sound exposure level (SEL), which takes into account the duration of the sound, is the metric used to measure energy and uses the units dB re 1 µPa2 . s, as opposed to sound pressure level (SPL), which is the pressure metric used in the rest of this document (units - dB re 1 µPa). Given the available data, the received energy level of a single seismic pulse might need to be approximately 186 dB re 1 μPa^2 . s (i.e., 186 dB SEL or approximately 221–226 dB pk-pk) in order to produce brief, mild TTS. Exposure to several strong seismic pulses at received levels near 175–180 dB SEL might result in slight TTS in a small odontocete, assuming the TTS threshold is (to a first approximation) a function of the total received pulse energy. The distances from the *Langseth*'s airguns at which the received energy level would be expected to be 175 dB SEL are the distances shown in the 190 dB rms column in Table 2 (given that the rms level is approximately 15 dB higher than the SEL value for the same pulse). In deep water, where L DEO's model is directly applicable, seismic pulses with received energy levels 175 dB SEL (190 dB rms) are expected to be restricted to radii no more than 200–620 m (656–2034 ft) around the airguns. The specific radius would depend on number of operating airguns (9–36) and their operating depth (6 vs. 12 m). The depth associated with the above radii ranges from about 125 m (410 ft) for a 9–airgun array to =500 m (=1640 ft) for the 36–airgun array. For an odontocete closer to the surface, the maximum radius with 175 dB SEL or 190 dB rms would be smaller. In intermediate-depth and shallow water, the 175 dB SEL or 190 dB rms radius would be larger.

For baleen whales, there are no data, direct or indirect, on levels or properties of sound that are required to induce TTS. However, no cases of TTS are expected given two considerations: (1) the low abundance of baleen whales in the planned study area, and (2) the strong likelihood that baleen whales would avoid the approaching airguns (or vessel) before being exposed to levels high enough for there to be any possibility of TTS.

In pinnipeds, TTS thresholds associated with exposure to brief pulses (single or multiple) of underwater sound have not been measured. Initial evidence from prolonged exposures suggested that some pinnipeds may incur TTS at somewhat lower received levels than do small odontocetes exposed for similar durations (Kastak *et al.*, 1999; Ketten *et al.*, 2001; cf. Au *et al.*, 2000). However, pinnipeds are not expected to occur in or near the planned study area.

Permanent Threshold Shift (PTS)

When PTS occurs, there is physical damage to the sound receptors in the ear. In some cases, there can be total or partial deafness, whereas in other cases, the animal has an impaired ability to hear sounds in specific frequency ranges.

There is no specific evidence that exposure to pulses of airgun sound can cause PTS in any marine mammal, even with large arrays of airguns. However, given the possibility that mammals close to an airgun array might incur TTS, there has been further speculation about the possibility that some individuals occurring very close to airguns might incur PTS. Single or occasional occurrences of mild TTS are not indicative of permanent auditory damage in terrestrial mammals. Relationships between TTS and PTS thresholds have not been studied in marine mammals, but are assumed to be similar to those in humans and other terrestrial mammals. PTS might occur at a received sound level at least several decibels above that inducing mild TTS if the animal were exposed to strong sound pulses with rapid rise.

Given the higher level of sound necessary to cause PTS as compared with TTS, it is even less likely that PTS could occur. In fact, even the levels immediately adjacent to the airguns may not be sufficient to induce PTS, especially because a mammal would not be exposed to more than one strong pulse unless it swam immediately alongside the airgun for a period longer than the inter-pulse interval. Baleen whales generally avoid the immediate area around operating seismic vessels. The planned monitoring and mitigation measures, including visual monitoring, PAM, power-downs, and shut downs of the airguns when mammals are seen within the ‘‘safety radii’’, will minimize the probability of exposure of marine mammals to sounds strong enough to induce PTS.

Non-auditory Physiological Effects

Non-auditory physiological effects or injuries that theoretically might occur in marine mammals exposed to strong underwater sound include stress, neurological effects, bubble formation, and other types of organ or tissue damage. However, studies examining such effects are very limited. If any such effects do occur, they probably would be limited to unusual situations when animals might be exposed at close range for unusually long periods. It is doubtful that any single marine mammal would be exposed to strong seismic sounds for sufficiently long that significant physiological stress would develop.

Until recently, it was assumed that diving marine mammals are not subject to the bends or air embolism. This possibility was first explored at a workshop (Gentry [ed.] 2002) held to discuss whether the stranding of beaked whales in the Bahamas in 2000 (Balcomb and Claridge 2001; NOAA and USN 2001) might have been related to bubble formation in tissues caused by exposure to noise from naval sonar. However, the opinions were inconclusive. Jepson *et al.* (2003) first suggested a possible link between mid-frequency sonar activity and acute and chronic tissue damage that results from the formation in vivo of gas bubbles, based on the beaked whale stranding in the Canary Islands in 2002 during naval exercises. Fernandez *et al.* (2005a) showed those beaked whales did indeed have gas bubble-associated lesions as well as fat embolisms. Fernandez *et al.* (2005b) also found evidence of fat embolism in three beaked whales that stranded 100 km (54 nm) north of the Canaries in 2004 during naval exercises. Examinations of several other stranded species have also revealed evidence of gas and fat embolisms (e.g., Arbelo *et al.*, 2005; Jepson *et al.*, 2005a; Mendez *et al.*, 2005). Most of the afflicted species were deep divers. There is speculation that gas and fat embolisms may occur if cetaceans ascend unusually quickly when exposed to aversive sounds, or if sound in the environment causes the destabilization of existing bubble nuclei (Potter, 2004; Arbelo *et al.*, 2005; Fernandez *et al.*, 2005a; Jepson *et al.*, 2005b). Even if gas and fat embolisms can occur during exposure to mid-frequency sonar, there is no evidence that that type of effect occurs in response to airgun sounds.

In general, little is known about the potential for seismic survey sounds to cause auditory impairment or other physical effects in marine mammals. Available data suggest that such effects, if they occur at all, would be limited to short distances and probably to projects involving large arrays of airguns. However, the available data do not allow for meaningful quantitative predictions of the numbers (if any) of marine mammals that might be affected in those ways. Marine mammals that show behavioral avoidance of seismic vessels, including most baleen whales and some odontocetes, are especially unlikely to incur auditory impairment or other physical effects. Also, the planned monitoring and mitigation measures include shut downs of the airguns, which will reduce any such effects that might otherwise occur.

Strandings and Mortality

Marine mammals close to underwater detonations of high explosive can be killed or severely injured, and the auditory organs are especially susceptible to injury (Ketten *et al.*, 1993; Ketten, 1995). Airgun pulses are less energetic and have slower rise times, and there is no proof that they can cause serious injury, death, or stranding even in the case of large airgun arrays. However, the association of mass strandings of beaked whales with naval exercises and, in one case, an L-DEO seismic survey, has raised the possibility that beaked whales exposed to strong pulsed sounds may be especially susceptible to injury and/or behavioral reactions that can lead to stranding.

Seismic pulses and mid-frequency sonar pulses are quite different. Sounds produced by airgun arrays are broadband with most of the energy below 1 kHz. Typical military mid-frequency sonars operate at frequencies of 2–10 kHz, generally with a relatively narrow bandwidth at any one time. Thus, it is not appropriate to assume that there is a direct connection between the effects of military sonar and seismic surveys on marine mammals. However, evidence that sonar pulses can, in special circumstances, lead to physical damage and mortality (NOAA and USN 2001; Jepson *et al.*, 2003; Fernandez *et al.*, 2005a), even if only indirectly, suggests that caution is warranted when dealing with exposure of marine mammals to any high-intensity pulsed sound.

In May 1996, 12 Cuvier's beaked whales stranded along the coasts of Kyparissiakos Gulf in the Mediterranean Sea. That stranding was subsequently linked to the use of low- and medium-frequency active sonar by a North Atlantic Treaty Organization (NATO) research vessel in the region (Frantzis 1998). In March 2000, a population of Cuvier's beaked whales being studied in the Bahamas disappeared after a U.S. Navy task force using mid-frequency tactical sonars passed through the area; some beaked whales stranded (Balcomb and Claridge, 2001; NOAA and USN 2001). In September 2002, a total of 14 beaked whales of various species stranded coincident with naval exercises in the Canary Islands (Martel n.d.; Jepson *et al.*, 2003; Fernandez *et al.*, 2004). Some additional related incidents have also been reported, e.g., Southall *et al.* (2006).

Also in Sept. 2002, there was a stranding of two Cuvier's beaked whales in the Gulf of California, Mexico, when the L-DEO vessel Maurice Ewing was operating a 20 airgun, 8490 in3 airgun array in the general area. The link between the stranding and the seismic surveys was inconclusive and not based on any physical evidence (Hogarth, 2002; Yoder, 2002). Nonetheless, that plus the incidents involving beaked whale strandings near naval exercises suggests a need for caution in conducting seismic surveys in areas occupied by beaked whales. No injuries of beaked whales are anticipated during the proposed study, due to the proposed monitoring and mitigation measures.

Possible Effects of Multibeam Bathymetric (MBB) Sonar Signals

The Simrad EM120 12–kHz sonar will be operated from the source vessel at some times during the planned study. Sounds from the MBB sonar are very short pulses, occurring for 15 ms once every 5 to 20 s, depending on water depth. Most of the energy in the sound pulses emitted by this MBB sonar is at frequencies centered at 12 kHz. The beam is narrow (1°) in fore-aft extent and wide (150°) in the cross-track extent. Each ping consists of nine successive fan-shaped transmissions (segments) at different cross-track angles. Any given mammal at depth near the trackline would be in the main beam for only one or two of the nine segments. Also, marine mammals that encounter the Simrad EM120 are unlikely to be subjected to repeated pulses because of the narrow fore-aft width of the beam and will receive only limited amounts of pulse energy because of the short pulses. Animals close to the ship (where the beam is narrowest) are especially unlikely to be ensonified for more than one 15 ms pulse (or two pulses if in the overlap area). Similarly, Kremser *et al.* (2005) noted that the probability of a cetacean swimming through the area of exposure when an MBB sonar emits a pulse is small. The animal would have to pass the transducer at close range and be swimming at speeds similar to the vessel in order to be subjected to sound levels that could cause TTS.

Navy sonars that have been linked to avoidance reactions and stranding of cetaceans (1) generally have a longer pulse duration than the Simrad EM120, and (2) are often directed close to horizontally vs. downward for the Simrad EM120. The area of possible influence of the Simrad EM120 is much smaller-a narrow band below the source vessel. The duration of exposure for a given marine mammal can be much longer for a Navy sonar.

Because of the unlikelihood of an animal being exposed to more than one or two pulses and the low energy the animal would most likely be exposed to due to the short pulses, NMFS does not expect the operation of the MBB sonar to result in the harassment of any marine mammals.

Proposed Monitoring and Mitigation Measures

Monitoring

L-DEO proposes to sponsor marine mammal monitoring of its seismic program, in order to implement the planned mitigation measures and to satisfy the requirements of the IHA. The monitoring work described here has been planned as a self-contained project independent of any other related monitoring projects that may be occurring simultaneously in the same regions. L-DEO is prepared to discuss coordination of its monitoring program with any related work that might be done by other groups insofar as this is practical and desirable.

Vessel Based Monitoring

Vessel-based marine mammal observers (MMOs) will watch for marine mammals and turtles near the seismic source vessel during all daytime airgun operations and during any start ups of the airguns at night. Airgun operations will be suspended when marine mammals or turtles are observed within, or about to enter, designated safety radii where there is concern about effects on hearing or other physical effects. MMOs also will watch for marine mammals and turtles near the seismic vessel for at least 30 min prior to the planned start of airgun operations after an extended shut down of the airguns. When feasible, observations will also be made during daytime periods without seismic operations (e.g., during transits).

During seismic operations in the Gulf of Mexico, five observers will be based aboard the vessel. MMOs will be appointed by L-DEO with NMFS concurrence. At least one MMO, and when practical two MMOs, will watch for marine mammals and turtles near the seismic vessel during ongoing daytime operations and nighttime start ups of the airguns. Use of two simultaneous observers will increase the proportion of the animals present near the source vessel that are detected. MMO(s) will be on duty in shifts of duration no longer than 4 h. The crew will also be instructed to assist in detecting marine mammals and turtles and implementing mitigation requirements (if practical). Before the start of the seismic survey the crew will be given additional instruction in how to do so.

The *Langseth* is a suitable platform for marine mammal and turtle observations. When stationed on the observation platform, the eye level will be approximately 17.8 m (58.4 ft) above sea level, and the observer will have a good view around the entire vessel. However, neither the actual bow of the vessel nor the stern will be visible from the observation platform, although it will be possible to see the airguns. To monitor the areas immediately at the bow and stern of the vessel, two video cameras will be installed at the bow (one on the starboard and one on the port side), and a wide-angle camera will be installed at the stern. Real-time footage from these cameras will be played on the observation platform, so that the MMO(s) are able to monitor those areas. In addition a high-power video camera will be mounted on the observation platform to assist with species identification.

During daytime, the MMO(s) will scan the area around the vessel systematically with reticle binoculars (e.g., 7 50 Fujinon), Big-eye binoculars (25 150), and with the naked eye. At night, Night Vision Devices (NVDs) will be available (ITT F500 Series Generation 3 binocular-image intensifier or equivalent), when required. Laser rangefinding binoculars (Leica LRF 1200 laser rangefinder or equivalent) will be available to assist with distance estimation. Those are useful in training observers to estimate distances visually, but are generally not useful in measuring distances to animals directly. MMOs will not be on duty during ongoing seismic operations at night. At night, bridge personnel will watch for marine mammals and turtles (insofar as practical at night) and will call for the airguns to be shut down if marine mammals or turtles are observed in or about to enter the safety radii. If the airguns are started up at night, two MMOs will watch for marine mammals and turtles near the source vessel for 30 min prior to start up of the airguns using NVDs, if the proper conditions for nighttime start up exist (see Mitigation below).

The vessel-based monitoring will provide data to estimate the numbers of marine mammals exposed to various received sound levels, to document any apparent disturbance reactions or lack thereof, and thus to estimate the numbers of mammals potentially ''taken'' by harassment. It will also provide the information needed in order to power down or shut down the airguns at times when mammals and turtles are present in or near the safety radii. When a sighting is made, the following information about the sighting will be recorded:

1. Species, group size, age/size/sex categories (if determinable), behavior when first sighted and after initial sighting, heading (if consistent), bearing and distance from seismic vessel, sighting cue, apparent reaction to the airguns or vessel (e.g., none, avoidance, approach, paralleling, etc.), and behavioral pace.
2. Time, location, heading, speed, activity of the vessel, sea state, visibility, and sun glare.

The data listed under (2) will also be recorded at the start and end of each observation watch, and during a watch whenever there is a change in one or more of the variables.

All observations and power-downs or shut downs will be recorded in a standardized format. Data will be entered into a custom database using a notebook computer. The accuracy of the data entry will be verified by computerized validity data checks as the data are entered and by subsequent manual checking of the database. These procedures will allow initial summaries of data to be prepared during and shortly after the field program, and will facilitate transfer of the data to statistical, graphical, or other programs for further processing and archiving.

Results from the vessel-based observations will provide:

1. The basis for real-time mitigation (airgun power-down or shut down).
2. Information needed to estimate the number of marine mammals potentially taken by harassment, which must be reported to NMFS.
3. Data on the occurrence, distribution, and activities of marine mammals and turtles in the area where the seismic study is conducted.
4. Information to compare the distance and distribution of marine mammals and turtles relative to the source vessel at times with and without seismic activity.
5. Data on the behavior and movement patterns of marine mammals and turtles seen at times with and without seismic activity.

Passive Acoustic Monitoring

Passive acoustic monitoring will take place to complement the visual monitoring program. Visual monitoring typically is less effective during periods of bad weather or at night, and even with good visibility, is unable to detect marine mammals when they are below the surface or beyond visual range. Acoustical monitoring can be used in addition to visual observations to improve detection, identification, localization, and tracking of cetaceans. The acoustic monitoring will serve to alert visual observers when vocalizing cetaceans are detected. It will be monitored in real time so that the visual observers can be advised when cetaceans are detected.

SEAMAP (Houston, TX) will be used as the primary acoustic monitoring system. This system was also used during previous L-DEO seismic cruises (e.g., Smultea *et al.*, 2004, 2005; Holst *et al.*, 2004a,b). The PAM system consists of hardware (i.e., the hydrophone) and software. The ''wet end'' of the SEAMAP system consists of a low-noise, towed hydrophone array that is connected to the vessel by a ''hairy'' faired cable. The array will be deployed from a winch located on the back deck. A deck cable will connect from the winch to the main computer lab where the acoustic station and signal conditioning and processing system will be located. The lead-in from the hydrophone array is approximately 400 m (1312 ft) long, and the active part of the hydrophone array is approximately 56 m (184 ft) long. The hydrophone array is typically towed at depths of less than 20 m or 66 ft.

The acoustical array will be monitored 24 hour per day while at the seismic survey area during airgun operations and during most periods when airguns are not operating. One MMO will monitor the acoustic detection system at any one time, by listening to the signals from two channels via headphones and/or speakers and watching the real-time spectrographic display for frequency ranges produced by cetaceans. MMOs monitoring the acoustical data will be on shift from 1–6 h. All MMOs are expected to rotate through the PAM position, although the most experienced with acoustics will be on PAM duty more frequently.

When a vocalization is detected, the acoustic MMO will contact the visual MMO immediately (so a power-down or shut down can be initiated, if required), and the information regarding the call will be entered into a database. The data to be entered include an acoustic encounter identification number, whether it was linked with a visual sighting, GMT date, GMT time when first and last heard and whenever any additional information was recorded, GPS position and water depth when first detected, species or species group (e.g., unidentified dolphin, sperm whale), types and nature of sounds heard (e.g., clicks, continuous, sporadic, whistles, creaks, burst pulses, strength of signal, etc.), and any other notable information. The acoustic detection can also be recorded onto the hard-drive for further analysis.

Mitigation

For the proposed study in the northern Gulf of Mexico, L-DEO will deploy an energy source of up to 36 airguns (6600 in^3). The airguns comprising the array will be spread out horizontally, so that the energy will be directed mostly downward. The directional nature of the array to be used in this project is an important mitigating factor. This directionality will result in reduced sound levels at any given horizontal distance than would be expected at that distance if the source were omnidirectional with the stated nominal source level.

Localized and temporally-variable areas of concentrated feeding or of special significance for marine mammals may occur within or near the planned area of operations during the season of operations. However, L-DEO will avoid conducting the proposed activities near important concentrations of marine mammals insofar as these can be identified in advance from other sources of information, or during the cruise.

Safety Radii

As noted earlier (Table 2), received sound levels were modeled by L-DEO for various configurations of the 36–airgun array in relation to distance and direction from the airguns, and for a single and 2 GI guns. Correction factors based on empirical measurements were applied to estimate safety radii in shallow and intermediate-depth water. The distances from the airguns where sound levels of 190, 180, and 160 dB re 1 μPa (rms) are estimated to be received are shown Table 2. Also, the safety radii for a single (40 in3) airgun are given, as that source will be in operation when the 36–airgun array is powered down. Airguns will be powered down (or shut down if necessary) immediately when marine mammals or turtles are detected within or about to enter the appropriate radius: 180 dB (rms) for cetaceans and turtles, and 190 dB (rms) for pinnipeds, in the very unlikely event that pinnipeds are encountered.

Mitigation During Operations

Mitigation measures that will be required will include (1) speed or course alteration, provided that doing so will not compromise operational safety requirements, (2) power-down procedures, (3) shut-down procedures, (4) special shut-down procedures for any endangered baleen whales, (5) ramp-up procedures, (6) avoidance of areas with concentrations of marine mammal, and (7) shut down and notification of NMFS if an injured or dead marine mammal is found and is judged likely to have resulted from the operation of the airguns.

Speed or Course Alteration - If a marine mammal or sea turtle is detected outside the safety radius and, based on its position and the relative motion, is likely to enter the safety radius, the vessel's speed and/or direct course may be changed. This would be done if practicable while minimizing the effect to the planned science objectives. The activities and movements of the marine mammal or sea turtle (relative to the seismic vessel) will be closely monitored to determine whether the animal is approaching the applicable safety radius. If the animal appears likely to enter the safety radius, further mitigative actions will be taken, i.e., either further course alterations or a power-down or shut down of the airguns.

Power-down Procedures - A power-down involves decreasing the number of airguns in use such that the radius of the 180–dB (or 190–dB) zone is decreased to the extent that marine mammals or turtles are no longer in or about to enter the safety zone. A power-down may also occur when the vessel is moving from one seismic line to another (i.e., during a turn). During a power-down, one airgun will be operated. The continued operation of one airgun is intended to alert marine mammals and turtles to the presence of the seismic vessel in the area. In contrast, a shut down occurs when all airgun activity is suspended.

If a marine mammal or turtle is detected outside the safety zone but is likely to enter the safety radius, and if the vessel's speed and/or course cannot be changed to avoid having the animal enter the safety radius, the airguns will be powered down before the animal is within the safety radius. Likewise, if a mammal or turtle is already within the safety zone when first detected, the airguns will be powered down immediately. During a power-down of the airgun array, at least one airgun (e.g., 40 in^3) will be operated. If a marine mammal or turtle is detected within or near the smaller safety radius around that single airgun (Table 2), all airguns will be shut down (see next subsection).

Following a power-down, airgun activity will not resume until the marine mammal or turtle has cleared the safety zone. The animal will be considered to have cleared the safety zone if it: (1) is visually observed to have left the safety zone; or, (2) has not been seen within the zone for 15 min in the case of small odontocetes and pinnipeds; or, (3) has not been seen within the zone for 30 min in the case of mysticetes and large odontocetes, including sperm, pygmy sperm, dwarf sperm, and beaked whales; or, (4) the vessel has moved outside the safety zone for turtles.

During airgun operations following a power-down whose duration has exceeded specified limits, the airgun array will be ramped up gradually. Ramp-up procedures are described below.

Shut-down Procedures - During a power-down, the operating airgun will be shut down if a marine mammal or turtle approaches within the modeled safety radius for the then-operating source, typically a single 40 in^3 gun or a GI gun (Table 2). If a marine mammal or turtle is detected within or about to enter the appropriate safety radius around the small source in use during a power-down, airgun operations will be entirely shut down.

Airgun activity will not resume until the animal has cleared the safety zone, or until the MMO is confident that the marine mammal or turtle has left the vicinity of the vessel. Criteria for judging that the animal has cleared the safety zone will be as described in the preceding subsection.

Special Shut-down Provision for Highly Endangered Mysticetes - The airguns will be shut down (not just powered down) if an endangered mysticete is sighted anywhere near the vessel, even if the whale is located outside the safety radius. In this cruise, this provision would apply in the unlikely event of sighting any of the following whales: the North Atlantic right whale; the humpback whale; the sei whale; the fin whale; or the blue whale. This measure is planned because of the assumed greater effects of seismic surveys on mysticetes in general (as compared with other marine mammals).

Ramp-up Procedures - A ramp-up procedure will be followed when the airgun array begins operating after a specified-duration without airgun operations. It is proposed that, for the present cruise, this period would be approximately 10 min. This duration is based on provisions during previous L-DEO surveys and on the approximately 180–dB radius for the 4–string array in deep water in relation to the planned speed of the *Langseth* while shooting. Ramp up will begin with the smallest gun in the array. Airguns will be added in a sequence such that the source level of the array will increase in steps not exceeding approximately 6 dB per 5–min period over a total duration of 20–30 min. During ramp up, the safety zone for the full airgun array to be used will be maintained.

If the complete safety radius has not been visible for at least 30 min prior to the start of operations in either daylight or nighttime, ramp up will not commence unless at least one airgun has been operating during the interruption of seismic survey operations. That airgun will have a source level of more than 180 dB re 1 μPa . m (rms). It is likely that the airgun array will not be ramped up from a complete shut down at night or in thick fog (the array will definitely not be ramped up from a complete shut down at night in shallow water), because the outer part of the safety zone for the array will not be visible during those conditions. If one airgun has operated during a power-down period, ramp up to full power will be permissible at night or in poor visibility, on the assumption that marine mammals will be alerted to the approaching seismic vessel by the sounds from the single airgun and could move away if they choose. Ramp up of the airguns will not be initiated if a sea turtle or marine mammal is sighted within or near the applicable safety radii during the day or close to the vessel at night.

Avoidance of Areas with Concentrations of Marine Mammals - Beaked whales may be highly sensitive to sounds produced by airguns, based mainly on what is known about their responses to other sound sources. Beaked whales tend to concentrate in continental slope areas, and especially in areas where there are submarine canyons on the slope. Therefore, L DEO will, if possible, avoid airgun operations over or near submarine canyons within the present study area. Also, if concentrations of beaked whales are observed at the slope site just prior to or during the airgun operations there, those operations will be moved to another location along the slope based on recommendations by the lead MMO aboard the *Langseth*. Furthermore, any areas where concentrations of sperm whales are known to be present will be avoided if possible.

Shutdown if Injured or Dead Whale is Found - In the unanticipated event that any cases of marine mammal injury or mortality are found and are judged likely to have resulted from these activities, L-DEO will cease operating seismic airguns and report the incident to the Office of Protected Resources, NMFS immediately.

Reporting

L-DEO will provide brief field reports on the progress of the project on a weekly basis.

A report will be submitted to NMFS within 90 days after the end of the cruise. The report will describe the operations that were conducted and the marine mammals and turtles that were detected near the operations. The report will be submitted to NMFS, providing full documentation of methods, results, and interpretation pertaining to all monitoring. The 90–day report will summarize the dates and locations of seismic operations, and all marine mammal and turtle sightings (dates, times, locations, activities, associated seismic survey activities). The report will also include estimates of the amount and nature of potential ''take'' of marine mammals by harassment or in other ways.

Estimated Take by Incidental Harassment

Because of the mitigation measures that will be required and the likelihood that some cetaceans will avoid the area around the operating airguns of their own accord, NMFS does not expect any marine mammals to approach the sound source close enough to be injured (Level A harassment). All anticipated takes would be ''takes by Level B harassment'', as described previously, involving temporary behavioral modifications or low level physiological effects.

Estimates of the numbers of marine mammals that might be affected during the proposed seismic program in the northern Gulf of Mexico are based on consideration of the number of marine mammals that might be disturbed appreciably by approximately 1420 km (767 nm) of seismic surveys during the Gulf of Mexico program. The numbers of animals estimated below do not take into consideration the implementation of mitigation measures and, therefore, probably overestimate the take to some degree. These estimates are calculated using density estimates of marine mammals and the total area around the source vessel that is ensonified to 160 dB or more (based on the calculated safety radii, discussed previously), the received sound level at which NMFS estimates marine mammals are behaviorally disturbed to an extent that rises to Level B Harassment. The basis for estimating the densities of marine mammals in the proposed study area is discussed in section VII of L-DEO's application and the estimates are listed in Table 3, in the same section.

The potential number of different individuals that might be exposed to received levels 160 dB re 1 μPa (rms) was calculated for each of the three water depth categories (<100 m or <328 ft, 100–1000 m or 328–3281 ft, and >1000 m or >3281 ft) by multiplying the expected species density, either ''mean'' (i.e., best estimate) or ''maximum'', for a particular water depth, times the anticipated minimum area to be ensonified during operations with each airgun array to be used in each water depth category.

The area expected to be ensonified was determined by entering the planned survey lines (including turns) into a MapInfo Geographic Information System (GIS), using the GIS to identify the relevant areas by ''drawing'' the applicable 160 dB buffer around each seismic line (depending on the water depth and array to be used), and then calculating the total area within the buffers. Areas where overlap occurred (due to closely spaced survey lines or repeat passes) were included only once to determine the minimum area expected to be ensonified.

Due to the spiral pattern of the calibration survey, and the fact that shots from each of the three subsets (1–string, 2–string, and 4–string) of the 36–airgun array will be fired in sequence 30 s apart, the 4–string array was used for area calculations during the calibration phase; the GI guns were considered separately. For the seismic testing survey, the three different airgun configurations that will operate (single 40 in^3 airgun; 2–string and 4–string array) were used to determine the area ensonified. The area for both of those phases was then summed, and a contingency factor of 15 percent was added, because of the initial seismic testing/shakedown phase, for which line-km effort is unknown at this time.

For the maximum estimates for oceanic species, the reported maximum densities were assumed to occur in intermediate and deep waters, and a density of zero was assumed for shallow waters. For species occurring in shallow water (as shown in Table 3), the maximum reported densities were used for intermediate and deep waters, whereas 2x the mean density was used for shallow water.

Applying the approach described above, approximately 9045 km^2 would be within the 160 dB isopleth on one or more occasions. However, this approach does not allow for turnover in the mammal populations in the study area during the course of the study. This might somewhat underestimate actual numbers of individuals exposed, although the conservative distances used to calculate the area may offset this. In addition, the approach assumes that no cetaceans move away or toward in response to increasing sound levels prior to the time the levels reach 160 dB. Another way of interpreting the estimates that follow is that they represent the number of individuals that are expected (in the absence of a seismic program) to occur in the waters that will be exposed to 160 dB re 1 μPa (rms).

To determine the mean number of times an individual might be exposed during the survey, the maximum area ensonified by sounds 160 dB during the survey was used. This area was determined by GIS, as described above, but instead of including all overlapping areas only once, the overlapping segments and areas with repeat coverage were added together. This maximum area was then multiplied by the appropriate species densities to determine the total number of exposures during the survey. The total number of exposures to sound levels 160 dB was then divided by the total number of individuals for each species. The mean number of times an individual may be exposed to levels 160 dB during the survey range from 3x (for two shallow-water species) to 4x.

The ''best estimate'' of the number of individual marine mammals that might be exposed, absent any mitigation measures, to seismic sounds with received levels 160 dB re 1 μPa (rms) is 3770 (Table 3). That total includes 22 endangered sperm whales, 25 beaked whales, and one Bryde's whale (Table 3). Pantropical spotted dolphins, Atlantic spotted dolphins, and bottlenose dolphins are expected to be the most common species in the study area; the best estimates for those species, absent any mitigation, are 1282, 876, and 773, respectively (Table 3). Estimates for other species are lower.

The ''Maximum Estimate'' column in Table 3 shows estimates totaling 7082 individual marine mammals based on maximum densities, and taking into account an adjustment for small numbers of other species that might be encountered in the survey area, even though there were not recorded during previous surveys. These are the numbers for which ''take authorization'' is requested. NMFS does not expect the total number of marine mammal takes to be this high, however, it is appropriate to err on the cautious side to ensure that L-DEO is covered in the event that an unexpectedly large number of any particular species were exposed to >160 dB during the survey and, further, to ensure that this exposure would result in a negligible impact to the species or stock.

Based on numbers of animals encountered during L-DEO's 2003 cruise in the Gulf of Mexico, the likelihood of the successful implementation of the required mitigation measure, and the likelihood that some animals will avoid the area around the operating airguns, NMFS believes that L-DEOs airgun calibration and seismic testing program may result in the Level B harassment of some lower number of individual marine mammals than is indicated by the ''best estimates'' in Table 3. These best estimates compose no more than 3.9 percent of any given species population in the northern Gulf of Mexico, and NMFS has preliminarily determined that these numbers are small relative to the population sizes in the specified geographic area (Table 3). L-DEO has asked for authorization for take of their ''maximum estimate'' of numbers for each species, which includes the take of two hooded seals. Though NMFS believes that take of the maximum numbers is unlikely, we still find these numbers small (up to 8.3 percent of the Fraser's dolphin population and 7.7 percent of the spinner dolphin population, but less than 5 percent the others) relative to the population sizes.

Potential Effects on Habitat

The proposed airgun operations 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.

The actual area contacted temporarily by the bottom-moored hydrophone array will be an insignificant and very small fraction of the marine mammal habitat and the habitat of their food species in the area. The use of this equipment would result in no more than a negligible and highly localized short-term disturbance to sediments and benthic organisms. The area that might be disturbed is a very small fraction of the overall area.

One of the reasons for the adoption of airguns as the standard energy source for marine seismic surveys was that, unlike explosives, they do not result in any appreciable fish kill. However, the existing body of information relating to the impacts of seismic on marine fish and invertebrate species is very limited. The potential effects of exposure to seismic on fish and invertebrates can be considered in three categories: (1) Pathological, (2) physiological, and (3) behavioral. Pathological effects include lethal and sub-lethal damage to the animals, physiological effects include temporary primary and secondary stress responses, and behavioral effects refer to changes in exhibited behavior of the fish and invertebrates. The three categories are interrelated in complex ways. For example, it is possible that certain physiological and behavioral changes could potentially lead to the ultimate pathological effect on individual animals (i.e., mortality).

The available information on the impacts of seismic surveys on marine fish and invertebrates provides limited insight on the effects only at the individual level. Ultimately, the most important knowledge in this area relates to how significantly seismic affects animal populations. However, the few available data suggest that there may be physical impacts on eggs and on larval, juvenile, and adult stages at very close range. Considering typical source levels associated with airgun arrays, close proximity to the source would result in exposure to high energy levels. Whereas egg and larval stages are not able to escape such exposures, juveniles and adults most likely would avoid them. In the cases of eggs and larvae, it is likely that the numbers adversely affected by such exposure would be small in relation to natural mortality. The limited data regarding physiological impacts on fish and invertebrates indicate that these impacts are short-term and are most apparent after exposure at close range.

Exposure to seismic surveys may else cause changes in the distribution, migration patterns, and catchability of fish. There have been well-documented observations of fish and invertebrates exhibiting behaviors that appeared to be responses to exposure to seismic energy (i.e., startle response, change in swimming direction and speed, and change in vertical distribution), but the ultimate importance of those behaviors is unclear. Some studies indicate that such behavioral changes are very temporary, whereas others imply that fish might not resume pre-seismic behaviors or distributions for a number of days. There appears to be a great deal of inter- and intra-specific variability. In the case of finfish, three general types of behavioral responses have been identified: startle, alarm, and avoidance. The type of behavioral reaction appears to depend on many factors, including the type of behavior being exhibited before exposure, and proximity and energy level of the sound source. There is a need for more information on exactly what effects seismic sounds might have on the detailed behavior patterns of fish and invertebrates at different ranges.

During the proposed study, only a small fraction of the available habitat would be ensonified at any given time, and fish and invertebrate species would be expected to return to their pre-disturbance behavior once the seismic activity ceased. The proposed seismic survey is predicted to have negligible to low physical and behavioral effects on the various life stages of fish and invertebrates, because of its short duration and 1420 km (767 nm) extent. More detailed information on studies of potential impacts of sounds on fish and invertebrates is provided in Appendix D of L-DEO's application.

The effects of the planned activity on marine mammal habitats and food resources are expected to be negligible, as described above. A small minority of the marine mammals that are present near the proposed activity may be temporarily displaced as much as a few kilometers by the planned activity. Areas with concentrations of marine mammals will be avoided when specific study sites are selected immediately before the start of acoustic measurement activities in deep, intermediate, and shallow regions. In this manner, any major feeding area that might occur in the general vicinity of the project will be avoided. Therefore, the proposed activity is not expected to have any habitat-related effects that could cause significant or long-term consequences for individual marine mammals or their populations.

Negligible Impact Determination

NMFS has preliminarily determined, provided that the aforementioned mitigation and monitoring measures are implemented, that the impact of conducting an acoustic calibration and seismic testing program in the Gulf of Mexico may result, at worst, in a temporary modification in behavior and/or low-level physiological effects (Level B Harassment) of small numbers of certain species of marine mammals. While behavioral and avoidance reactions may be made by these species in response to the resultant noise from the airguns, these behavioral changes are expected to have a negligible impact on the affected species and stocks of marine mammals.

While the number of potential incidental harassment takes will depend on the distribution and abundance of marine mammals in the area of seismic operations, the number of potential harassment takings is estimated to be relatively small in light of the population size (see Table 3). NMFS anticipates the actual take of individuals to be lower than the numbers depicted in the table, because those numbers do not reflect either the implementation of the mitigation numbers or the fact that some animals will avoid the sound at levels lower than those expected to result in harassment. Additionally, mitigation measures requires that the *Langseth* avoid any areas where marine mammals are concentrated.

In addition, no take by death and/or serious injury is anticipated, and the potential for temporary or permanent hearing impairment will be avoided through the incorporation of the required mitigation measures described in this document. This determination is supported by (1) the likelihood that, given sufficient notice through slow ship speed and ramp-up of the seismic array, marine mammals are expected to move away from a noise source that it is annoying prior to its becoming potentially injurious; (2) TTS is unlikely to occur, especially in odontocetes, until levels above 180 dB re 1 μPa are reached; (3) the fact that injurious levels of sound are only likely very close to the vessel; and (4) the likelihood that marine mammal detection ability by trained observers is close to 100 percent during daytime (in good weather) and remains high at night close to the vessel.

Endangered Species Act

Under section 7 of the ESA, the National Science Foundation (NSF) has begun consultation on this proposed seismic survey. NMFS will also consult on the issuance of an IHA under section 101(a)(5)(D) of the MMPA for this activity. Consultation will be concluded prior to a determination on the issuance of an IHA.

National Environmental Policy Act (NEPA)

In 2003, NSF prepared an Environmental Assessment (EA) for a marine seismic survey by the R/V *Maurice Ewing* in the Northern Gulf of Mexico. This EA addressed the potential effects of a different combination of airgun arrays, but with a higher total output (20 airguns, total volume 8580 in3) being operated in the same part of the ocean as is proposed for the *Langseth* in this application. NMFS will either adopt NSF's EA or prepare its own supplemental NEPA document before making a determination on the issuance of an IHA. NSF's EA has been posted on NMFS' website.

Preliminary Conclusions

Based on the preceding information, and provided that the proposed mitigation and monitoring are incorporated, NMFS has preliminarily concluded that the proposed activity will incidentally take, by Level B harassment only, small numbers of marine mammals. NMFS has further preliminarily determined that the proposed activity will have a negligible impact on the affected species or stocks of marine mammals.

Proposed Authorization

NMFS proposes to issue an IHA to L-DEO for an acoustic calibration and seismic testing program in the northern Gulf of Mexico in Fall, 2006 provided the previously mentioned mitigation, monitoring, and reporting requirements are incorporated.

Dated: September 27, 2006.

James H. Lecky,

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

[FR Doc. E6–16412 Filed 10–4–06; 8:45 am]

BILLING CODE 3510–22–S

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

Publication of North American Datum of 1983 State Plane Coordinates in Feet in Idaho

AGENCY: National Geodetic Survey (NGS), National Ocean Service (NOS), National Oceanic and Atmospheric Administration, Department of Commerce

ACTION: Notice.

SUMMARY: The National Geodetic Survey (NGS) will publish North American Datum of 1983 (NAD 83) State Plane Coordinate (SPC) grid values in both meters and U.S. Survey Feet (1 ft = 1200/3937 m) in Idaho, for all well-defined geodetic survey control monuments maintained by NGS in the National Spatial Reference System (NSRS) and computed from various geodetic positioning utilities. The adoption of this standard is implemented in accordance with NGS policy and a request from the Idaho Transportation Department, the Idaho Society of Professional Land Surveyors, and the Idaho Department of Administration GIS Coordinator.

DATES: Individuals or organizations wishing to submit comments on the Publication of North American Datum of 1983 State Plan Coordinates in feet in Idaho, should do by November 6, 2006.

ADDRESSES: Written comments should be sent to the attention of David Doyle, Chief Geodetic Surveyor, Office of the National Geodetic Survey, National Ocean Service (N/NGS2), 1315 East-West Highway, Silver Spring, MD, 20910; fax 301–7313–4324, or via e-mail *Dave.Doyle@noaa.gov.*

FOR FURTHER INFORMATION CONTACT: Requests for additional information should be directed to David Doyle, Chief Geodetic Surveyor, National Geodetic Survey (N/NGS2), 1315 East-West Highway, Silver Spring, MD, 20910; Phone: (301) 713–3178.

SUPPLEMENTARY INFORMATION:

Abstract

In 1991, NGS adopted a policy that defines the conditions under which NAD 83 State Plane Coordinates (SPCs) would be published in feet in addition to meters. As outlined in that policy, each State or territory must adopt NAD 83 legislation (typically referenced as Codes, Laws or Statutes), which specifically defines a conversion to either U.S. Survey or International Feet as defined by the U.S. Bureau of Standards in Federal Register notice 59–5442. To date, 48 States have adopted the NAD 83 legislation however, for various reasons, only 33 included a specific definition of the relationship between meters and feet. This lack of uniformity has led to confusion and misuse of SPCs as provided in various NGS products, services and tools, and created errors in mapping, charting and surveying programs in numerous States due to inconsistent coordinate conversions.

Dated: September 29, 2006.

David B. Zilkoski,

Director, Office of National Geodetic Survey, National Ocean Service, National Oceanic and Atmospheric Administration.

[FR Doc. 06–8512 Filed 10–4–06; 8:45 am]

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