platform. Management for the benefit of Aleutian Canada geese is also central to the other three Alternatives. However, they also expand Refuge management for the benefit of additional wildlife and habitats. Alternative B places greater emphasis on wetland restoration and management and would expand visitor services for all priority public uses, including fishing and hunting. Alternative C focuses on restoration and management of riparian habitats and providing non-consumptive wildlife-dependant recreation opportunities. Alternative D, the preferred alternative, includes a balance of wetland and riparian restoration and management and expands opportunities for all priority public uses, including fishing and hunting.

Public Comments

After the review and comment period ends for this Draft CCP/EA, comments will be analyzed by the Service and addressed in the Final CCP. All comments received from individuals, including names and addresses, become part of the official public record and may be released. Requests for such comments will be handled in accordance with the Freedom of Information Act, the Council on Environmental Quality's NEPA regulations and other Service and Departmental policies and procedures.

Dated: June 16, 2006.

Ken McDermond,

Acting Manager, California/Nevada Operations, Sacramento, California.

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BILLING CODE 4310–55–P

DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

Marine Mammals; Incidental Take During Specified Activities

AGENCY: Fish and Wildlife Service, Interior.

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

SUMMARY: The Fish and Wildlife Service (Service) has received an application from the University of Texas at Austin Institute for Geophysics (UTIG) for authorization to take small numbers of marine mammals by harassment incidental to conducting a marine seismic survey in the Arctic Ocean, including the Chukchi Sea, from approximately July 15 through August 25, 2006. In accordance with provisions of the Marine Mammal Protection Act (MMPA), as amended, the Service requests comments on its proposed authorization for the applicant to incidentally take, by harassment, small numbers of Pacific walrus and polar bears in the Chukchi Sea during the seismic survey.

DATES: Comments and information must be received by July 24, 2006.

ADDRESSES: You may submit comments by any of the following methods:

1. By mail to: Craig Perham, Office of Marine Mammals Management, U.S. Fish and Wildlife Service, 1011 East Tudor Road, Anchorage, Alaska 99503.
2. By fax to: 907–786–3816.
3. By electronic mail (e-mail) to: *FW7MMM@FWS.gov*. Please submit comments as an ASCII file avoiding the use of special characters and any form of encryption. Please also include your name and return address in your message. If you do not receive a confirmation from the system that we have received your message, contact us directly at U.S. Fish and Wildlife Service, Office of Marine Mammals Management, 907–786–3810 or 1–800–362–5148.
4. By hand-delivery to: Office of Marine Mammals Management, U.S. Fish and Wildlife Service, 1011 East Tudor Road, Anchorage, Alaska 99503.

FOR FURTHER INFORMATION CONTACT: Craig Perham, Office of Marine Mammals Management, U.S. Fish and Wildlife Service, 1011 East Tudor Road, Anchorage, Alaska 99503; telephone 907–786–3810 or 1–800–362–5148; or e-mail *craig_perham@FWS.gov.*

SUPPLEMENTARY INFORMATION:

Background

Sections 101(a)(5)(A) and (D) of the MMPA, as amended, (16 U.S.C. 1371(a)(5)(A) and (D)) authorize the Secretary of the Interior to allow, upon request, the incidental, but not intentional, taking of small numbers of marine mammals by U.S. citizens who engage in a specified activity (other than commercial fishing) within a specified geographical region provided that 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 and comment.

Authorization to incidentally take marine mammals may be granted if the Service finds that the taking will have a negligible impact on the species or stock(s), and will not have an unmitigable adverse impact on the availability of the species or stock(s) for subsistence uses. Permissible methods of taking and other means of affecting the least practicable impact on the species or stock and its habitat, and requirements pertaining to the monitoring and reporting of such takings, are prescribed as part of the authorization process.

The term ''take,'' as defined by the MMPA, means to harass, hunt, capture, or kill, or attempt to harass, hunt, capture, or kill any marine mammal. Harassment, as defined by the MMPA, means ''any act of pursuit, torment, or annoyance which—(i) has the potential to injure a marine mammal or marine mammal stock in the wild [the MMPA calls this Level A harassment]; or (ii) has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering [the MMPA calls this Level B harassment].''

The terms ''small numbers,'' ''negligible impact,'' and ''unmitigable adverse impact'' are defined in 50 CFR 18.27, the Service's regulations governing take of small numbers of marine mammals incidental to specified activities. ''Small numbers'' is defined as ''a portion of a marine mammal species or stock whose taking would have a negligible impact on that species or stock.'' ''Negligible impact'' is defined as ''an impact resulting from the specified activity that cannot be reasonably expected to, and is not reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival.'' ''Unmitigable adverse impact'' is defined as ''an impact resulting from the specified activity (1) that is likely to reduce the availability of the species to a level insufficient for a harvest to meet subsistence needs by (i) causing the marine mammals to abandon or avoid hunting areas, (ii) directly displacing subsistence users, or (iii) placing physical barriers between the marine mammals and the subsistence hunters; and (2) that cannot be sufficiently mitigated by other measures to increase the availability of marine mammals to allow subsistence needs to be met.''

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 where the take will be limited to harassment. Section 101(a)(5)(D)(iii) establishes a 45-day time limit for Service 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, the Service must

either issue or deny issuance of the authorization. The Service refers to these authorizations as Incidental Harassment Authorizations (IHAs).

Summary of Request

On March 17, 2006, the Service received an application from UTIG for the taking by harassment of Pacific walrus and polar bears incidental to conducting, with research funding from the National Science Foundation (NSF), a marine seismic survey in the Western Canada Basin, Chukchi Borderland, and Mendeleev Ridge of the Arctic Ocean during July through August, 2006. The seismic survey will be operated in conjunction with a sediment coring project, which will obtain data regarding crustal structure, and will take place far north of the Chukchi Sea. A description of the coring activities is provided in the National Oceanic and Atmospheric Administration's (NOAA) proposed IHA for this same research cruise in the **Federal Register** of May 15, 2006 (71 FR 27997). Walrus do not occur in the area of the coring activities and there is no potential for harassment of walrus. There is a potential that coring activities may encounter a very few isolated members of the Chukchi Sea polar bear stock; however, the effects to those individuals would be no more than minimal. This authorization, therefore, assesses the incidental harassment of walrus and polar bear resulting from the seismic survey activity in the Chukchi Sea.

The purpose of the proposed study is to collect seismic reflection and refraction data and sediment cores that reveal the crustal structure and composition of submarine plateaus in the western Amerasia Basin in the Arctic Ocean. Past studies have led many researchers to support the idea that the Amerasia Basin opened about a pivot point near the Mackenzie Delta. However, the crustal character of the Chukchi Borderlands could determine whether that scenario is correct, or whether more complicated tectonic scenarios must be devised to explain the presence of the Amerasia Basin. These data will assist in the determination of the tectonic evolution of the Amerasia Basin and Canada Basin, which is fundamental to such basic concerns as sea level fluctuations and paleoclimate in the Mesozoic era.

Description of the Activity

The Healy, a U.S. Coast Guard (USCG) Cutter ice-breaker, will rendezvous with the science party off Barrow, Alaska, on or around July 15, 2006. Trained marine mammal observers will also be onboard during the cruise. The Healy will sail north and arrive at the beginning of the seismic survey, which will start more than 150 kilometers (km) (93 miles [mi]) north of Barrow. The cruise will last for approximately 40 days, and it is estimated that the total seismic survey time will be approximately 30 days depending on ice conditions. Seismic survey work is scheduled to terminate west of Barrow about August 25, 2006. The vessel will then sail south to Nome, Alaska, where the science party will disembark. In conjunction with the seismic survey, a sediment coring project will be conducted in the Arctic Ocean, north of the Chukchi Sea. The NOAA's proposed IHA for this same research cruise, published in the **Federal Register** of May 15, 2006, describes the coring project activities.

The majority of seismic survey activities will take place in the Arctic Ocean. The Chukchi Sea segment of the survey is approximately 478 km, located between 75° N and 70.9° N and will occur in mid- to late August. The bulk of the seismic survey will not be conducted in any country's territorial waters. However, the survey will occur within the Exclusive Economic Zone (EEZ) of the United States for approximately 563 km.

The Healy will use a portable Multi-Channel Seismic (MCS) system to conduct the seismic survey. A cluster of eight airguns will be used as the energy source during most of the cruise, especially in deep water areas. The airgun array will have four 500-cubic inches (in^3) Bolt airguns and four 210-in^3 G. guns for a total discharge volume of 2,840-in^3. In shallow water, occurring during the first and last portions of the cruise, a four 105-in^3 GI gun array with a total discharge volume of 420 in^3 will be used. Other sound sources (see below) will also be employed during the cruise. The seismic operations during the survey will be used to obtain information on the history of the ridges and basins that make up the Arctic Ocean.

The airgun arrays will discharge about once every 60 seconds. The compressed air will be supplied by compressors onboard the source vessel. The Healy will also tow a hydrophone streamer 100 to 150 meters (328 to 492 feet [ft]) behind the ship, depending on ice conditions. The hydrophone streamer will be up to 200 m (656 ft) long. As the source operates along the survey lines, the hydrophone receiving system will receive and record the returning acoustic signals. In addition to the hydrophone streamer, sea ice seismometers (SIS) will be deployed on ice floes ahead of the ship using a vessel-based helicopter, and then retrieved from behind the ship once it has passed the SIS locations.

The SISs will be deployed as much as 120 km (74 mi) ahead of the ship, and recovered when as much as 120 km (74 mi) behind the ship. The seismometers will be placed on top of ice floes with a hydrophone lowered into the water through a small hole drilled in the ice. These instruments will allow seismic refraction data to be collected in the heavily ice-covered waters of the region.

The program will consist of a total of approximately 3,625 km (2,252 mi) of surveys, not including transits when the airguns are not operating. The area included in this proposal is the southwest leg, which extends 478 km into the Chukchi Sea (south of 75° N). Water depths within the study area are 40 to 3,858 m (131 to 12,657 ft). Little more than 15 percent (approximately 73 km [45 mi]) of the Chukchi Sea survey segment will occur in water deeper than 1,000 m (3,280 ft); 21 percent (approximately 102 km [63 mi]) will be conducted in water 100 to 1,000 m (328 to 3,280 ft) deep. Most of the Chukchi survey track, 64 percent (approximately 303 km [188 mi]), will occur in water less than 100 m (328 ft). The Principal Investigators (PIs) plan to use the larger, 8-airgun array for only 24 km (15 mi) along the northernmost reach of the Chukchi survey line in deep water (greater than 1,000 m). There will be additional seismic operations associated with airgun testing, start up, and repeat coverage of any areas where initial data quality is sub-standard. In addition to the airgun array, a multibeam sonar and sub-bottom profiler will be used during the seismic profiling and continuously when underway.

Vessel Specifications

The Healy has a length of 128 m (420 ft), a beam of 25 m (82 ft), and a full load draft of 8.9 m (29 ft). The Healy is capable of traveling at 5.6 km/h (3 knots) through 1.4 m (4.6 ft) of ice. A Central Power Plant, consisting of four Sultzer 12Z AU40S diesel generators, provides electric power for propulsion and ship's services through a 60 Hz, 3-phase common bus distribution system. Propulsion power is provided by two electric AC Synchronous, 11.2 MW drive motors, fed from the common bus through a cycloconverter system, that turn two fixed-pitch, four-bladed propellers. The operation speed during seismic acquisition is expected to be approximately 6.5 km/hr (hour) (3.5 knots). When not towing seismic survey gear or breaking ice, the Healy cruises at 22 km/hr (12 knots) and has a maximum speed of 31.5 km/hr (17 knots). It has a normal operating range

of about 29,650 km (18,423 mi) at 23.2 km/hr (12.5 knots).

Seismic Source Description

A portable MCS system will be installed on the Healy for this cruise. The source vessel will tow along predetermined lines one of two different airgun arrays (an 8-airgun array with a total discharge volume of 2,840 in^3 or a four GI gun array with a total discharge volume of 420 in^3), as well as a hydrophone streamer. Seismic pulses will be emitted at intervals of approximately 60 seconds and recorded at a 2 millisecond (ms) sampling rate. The 60-second spacing corresponds to a shot interval of approximately 120 m (394 ft) at the anticipated typical cruise speed.

As the airgun array is towed along the survey line, the towed hydrophone array receives the reflected signals and transfers the data to the onboard processing system. The SISs will store returning signals on an internal datalogger and also relay them in real-time to the Healy via a radio transmitter, where they will be recorded and processed.

The 8-airgun array will be configured as a four-G. gun cluster with a total discharge volume of 840 in^3 and a four Bolt airgun cluster with a total discharge volume of 2,000 in^3. The source output is from 246 to 253 dB re 1 µPa m. The two clusters are four meter apart, which will result in less downward directivity than is often present during seismic surveys and more horizontal propagation of sound. The clusters will be operated simultaneously for a total discharge volume of 2,840 in^3. The 4-GI gun array will be configured the same as the four G. gun portion of the 8-airgun array. The energy source (source level 239–245 dB re 1 µPa m) will be towed as close to the stern as possible to minimize ice interference. The 8-airgun array will be towed below a depressor bird at a depth of 7–20 m (23–66 ft) depending on ice conditions; the preferred depth is 8–10 m (26–33 ft).

The highest sound level measurable at any location in the water from the airgun arrays would be slightly less than the nominal source level because the actual source is a distributed source rather than a point source. The depth at which the source is towed has a major impact on the maximum near-field output, and on the shape of its frequency spectrum. In this case, the source is expected to be towed at a relatively deep depth of up to 9 m (30 ft).

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

Safety Radii Proposed by UTIG

Received sound fields have been modeled by Lamont-Doherty Earth Observatory (L–DEO) for the 8-airgun and 4–GI gun arrays that will be used during this survey. For deep water, where most of the present project is to occur, the L–DEO model has been shown to be precautionary, *i.e.*, it tends to overestimate radii for 190, 180, 170, 160 dB re 1 µPa rms (Tolstoy *et al.* 2004a, b).

Predicted sound fields were modeled using sound exposure level (SEL) units (dB re 1 μPa^2-s), because a model based on those units tends to produce more stable output when dealing with mixed-gun arrays like the one to be used during this survey. The predicted SEL values can be converted to rms received pressure levels, in dB re 1 µPa by adding approximately 15 dB to the SEL value (Greene 1997; McCauley *et al.* 1998, 2000). The rms pressure is an average over the pulse duration. This is the measure commonly used in studies of marine mammal reactions to airgun sounds. The rms level of a seismic pulse is typically about 10 dB less than its peak level.

Empirical data concerning 190, 180, 170, and 160 dB (rms) distances in deep and shallow water were acquired for various airgun array configurations during the acoustic verification study conducted by L–DEO in the northern Gulf of Mexico (Tolstoy *et al.* 2004a, b). The proposed Chukchi Sea survey track will occur mainly in shallow water with approximately 64 percent of trackline in water depths greater than 100 m, 21 percent in intermediate water depths (100–1,000 m), and 15 percent in water deeper than 1,000 meter.

The L–DEO model does not allow for bottom interactions, and thus, is most directly applicable to deep water and to relatively short ranges. In intermediate-depth water a precautionary 1.5× correction factor will be applied to the values predicted by L–DEO's model, as has been done in other recent NSF-sponsored seismic studies. In shallow water, larger precautionary factors derived from the empirical shallow-water measurements will be applied (see Table 1).

TABLE 1.—ESTIMATED DISTANCES TO WHICH SOUND LEVELS (dB RE 1µ Pa) MIGHT BE RECEIVED FROM VARIOUS GUN-TYPES USED DURING THE HEALY ARCTIC CRUISE

Seismic source volume	Water depth	Estimated distances for received levels (m)			
		190 dB (shut-down criterion for pinnipeds)	180 dB (shut-down criterion for cetaceans)	170 dB (alternate behavioral har-assment criterion for delphinids & pinnipeds)	160 dB (as-sumed onset of behavioral har-assment)
105 in^3 GI gun	>1,000 m	10	27	90	275
	100–1,000 m	15	41	135	413
	<100 m	125	200	375	750
210 in^3 G. gun	>1,000 m	20	78	222	698
	100–1,000 m	30	117	333	1,047
	<100 m	250	578	925	1,904
420 in^3 (4-GI gun array)	>1,000 m	75	246	771	2,441

TABLE 1.—ESTIMATED DISTANCES TO WHICH SOUND LEVELS (dB RE 1μ Pa) MIGHT BE RECEIVED FROM VARIOUS GUN-TYPES USED DURING THE HEALY ARCTIC CRUISE—Continued

Seismic source volume	Water depth	Estimated distances for received levels (m)			
		190 dB (shut-down criterion for pinnipeds)	180 dB (shut-down criterion for cetaceans)	170 dB (alternate behavioral har-assment criterion for delphinids & pinnipeds)	160 dB (as-sumed onset of behavioral har-assment)
2,840 in³ (8-airgun array)	100–1,000 m	113	369	1,157	3,662
	<100 m	938	1,822	3,213	6,657
	>1,000 m	230	716	2,268	7,097
	100–1,000 m	*NA	*NA	*NA	*NA
	<100 m	*NA	*NA	*NA	*NA

*The 8-airgun array will only be operated in deep (greater than 1,000 m) water for approximately 24 km at the northern extent of the Chukchi Sea portion of the survey.

The empirical data indicate that, for deep water (greater than 1,000 m), the L–DEO model tends to overestimate the received sound levels at a given distance (Tolstoy et al. 2004a, b). However, to be precautionary pending acquisition of additional empirical data, it is proposed that safety radii during airgun operations in deep water will be the values predicted by L–DEO's modeling, after conversion from SEL to rms (Table 1). The estimated 190 dB (rms) radii for 8-airgun and 4–GI gun arrays are 230 (745 ft) and 75 m (246 ft), respectively.

Empirical measurements were not taken for intermediate depths (100–1,000 m). On the expectation that results would be intermediate between those from shallow and deep water, a 1.5× correction factor is applied to the estimates provided by the model for deep water situations. This is the same factor that has been applied to the model estimates during L–DEO operations in intermediate-depth water from 2003 through early 2005. The assumed 190 dB (rms) radius in intermediate-depth water is 113 m for the 4–GI gun array (Table 1). The 8-airgun array will only be used in deep water, *i.e.*, greater than 1,000 m.

Empirical measurements were not made for the 4 GI guns that will be employed during the proposed survey in shallow water (less than 100 m). (The 8-airgun array will not be used in shallow water.) The empirical data on operations of two 105 in³ GI guns in shallow water showed that modeled values underestimated the distance to the actual 160 dB sound level radii in shallow water by a factor of approximately 3 (Tolstoy et al. 2004b). Sound level measurements for the 2 GI guns were not available for distances less than 0.5 km (.31 mi) from the source. The radii estimated here for the 4–GI guns operating in shallow water are derived from the L–DEO model, with the same adjustments for depth-related differences between modeled and measured sound levels as were used for 2–GI guns in earlier applications. Correction factors for the different sound level radii are approximately 12× the model estimate for the 190 dB radius in shallow water, approximately 7× for the 180 dB radius, and approximately 4× for the 170 dB radius (Tolstoy 2004a, b). Thus, the 190 dB radius in shallow water is assumed to be 938 m (3,077 ft) for the 4–GI gun array (Table 1).

Pursuant to the mitigation measures of this proposed authorization, the airguns will be powered down (or shut-down if necessary) immediately when walrus or polar bears are detected within or about to enter the appropriate radii. The 190 dB safety criteria are consistent with guidelines listed for pinnipeds, by the National Marine Fisheries Service (NMFS) (2000) and other guidance by NMFS. The UTIG will conservatively apply the same 190 dB criterion to polar bears in water in this IHA request. Although sound effects on the walrus and polar bears have not been studied, the 190 dB criterion was selected because walrus, which are pinnipeds, are expected to react similarly to other pinnipeds. Polar bears normally swim with their heads above the surface and are likely to be less sensitive than pinnipeds to human-caused underwater sounds.

Other Acoustic Devices

Along with the airgun operations, additional acoustical systems will be operated during much of or the entire cruise. The ocean floor will be mapped with a multibeam sonar, and a sub-bottom profiler will be used. These two systems are commonly operated simultaneously with an airgun system. An acoustic Doppler current profiler will also be used through the course of the project.

A SeaBeam 2112 multibeam 12 kHz bathymetric sonar system will be used on the Healy, with a maximum source output of 237 dB re 1 μPa at one meter. The transmit frequency is a very narrow band, less than 200 Hz, and centered at 12 kHz. Pulse lengths range from less than one ms to 12 ms. The transmit interval ranges from 1.5 to 20 seconds, depending on the water depth, and is longer in deeper water. The SeaBeam system consists of a set of underhull projectors and hydrophones. The transmitted beam is narrow (approximately 2°) in the fore-aft direction but broad (approximately 132°) in the cross-track direction. The system combines this transmitted beam with the input from an array of receiving hydrophones oriented perpendicular to the array of source transducers, and calculates bathymetric data (sea floor depth and some indications about the character of the seafloor) with an effective 2° by 2° footprint on the seafloor. The SeaBeam 2112 system on the Healy produces a useable swath width of slightly more than 2 times the water depth. This is narrower than normal because of the ice-protection features incorporated into the system on the Healy.

The Knudsen 320BR will provide information on sedimentary layering, down to between 20 and 70 m, depending on bottom type and slope. It will be operated with the multibeam bathymetric sonar system that will simultaneously map the bottom topography.

The Knudsen 320BR sub-bottom profiler is a dual-frequency system with operating frequencies of 3.5 and 12 kHz:

Low frequency—Maximum output power into the transducer array, as wired on the Healy (125 ohms), at 3.5 kHz is approximately 6,000 watts (electrical), which results in a maximum source level of 221 dB re 1 μPa at 1 m downward. Pulse lengths range from 1.5

to 24 ms with a bandwidth of 3 kHz (FM sweep from 3 kHz to 6 kHz). The repetition rate is range dependent, but the maximum is a 1-percent duty cycle. Typical repetition rate is between one-half second (in shallow water) to 8 s in deep water.

High frequency—The Knudsen 320BR is capable of operating at 12 kHz, but the higher frequency is rarely used because it interferes with the SeaBeam 2112 multibeam sonar, which also operates at 12 kHz. The calculated maximum source level (downward) is 215 dB re 1 µPa at 1 m (3.28 ft). The pulse duration is typically 1.5 to 5 ms with the same limitations and typical characteristics as the low-frequency channel.

A single 12 kHz transducer and one 3.5 kHz, low-frequency (sub-bottom) transducer array, consisting of 16 elements in a 4-by-4 array will be used for the Knudsen 320BR. The 12 kHz transducer (TC–12/34) emits a conical beam with a width of 30°, and the 3.5 kHz transducer (TR109) emits a conical beam with a width of 26°.

The 150 kHz acoustic Doppler current profiler (ADCP™) has a minimum ping rate of 0.65 ms. There are four beam sectors, and each beamwidth is 3°. The pointing angle for each beam is 30° off from vertical with one each to port, starboard, forward, and aft. The four beams do not overlap. The 150 kHz ADCP™'s maximum depth range is 300 m.

The Ocean Surveyor 75 is an ADCP™ operating at a frequency of 75 kHz, producing a ping every 1.4 s. The system is a four-beam phased array with a beam angle of 30°. Each beam has a width of 4°, and there is no overlap. Maximum output power is 1 kW with a maximum depth range of 700 m (2,297 ft).

Plan of Cooperation

The UTIG will consult with representatives of the communities along the Chukchi Sea coast to identify any areas or issues of potential conflict. These communities are Point Hope, Point Lay, Wainwright, and Barrow. A Plan of Cooperation (POC) for the 2006 seismic survey in the Chukchi Sea will be developed if identified as warranted during these consultations and determined to be necessary by the Service. The POC would cover the phases of UTIG's seismic surveys planned in the Chukchi Sea when appropriate for the 2006 project. The purpose of the POC will be to identify measures that will be taken to minimize any adverse effects on the availability of marine mammals for subsistence uses, and to ensure good communication between the project scientists and the native communities along the coast.

Subsequent meetings with community representatives and any other parties to the POC will be held as necessary to negotiate the terms of the plan and to coordinate the planned seismic survey operation with subsistence hunting. The POC may address: Operational agreement and communications procedures; where and when the agreement becomes effective; the general communications scheme; onboard observers; conflict avoidance; seasonally sensitive areas; vessel navigation; air navigation; marine mammal monitoring activities; measures to avoid impacts to marine mammals; measures to avoid conflicts in areas of active hunting; emergency assistance; and the dispute resolution process.

In addition, one (or more) Alaska Native knowledgeable about the mammals and fish of the area is expected to be included as a member of the observer team aboard the Healy. Although the primary responsibilities encompass implementing the monitoring and mitigation requirements, duties will also include acting as a liaison with hunters and fishers if they are encountered at sea. In the unlikely event subsistence hunting or fishing is occurring within 5 km (3 mi) of the Healy's trackline, the airgun operations will be suspended until the Healy is approximately 5 km (3 mi) away.

Description of Habitat and Marine Mammals Affected by the Activity

A detailed description of the Chukchi Sea ecosystem and the associated marine mammals can be found in several documents (Corps of Engineers 1999; NMFS 1999; Minerals Management Service (MMS) 2006, 1996, and 1992). MMS' Programmatic Environmental Assessment (PEA)-Arctic Ocean Outer Continental Shelf Seismic Surveys 2006—may be viewed at: *http://www.mms.gov/alaska*.

The marine mammals that occur in the proposed survey area belong to three taxonomic groups: odontocetes (toothed cetaceans, such as beluga whale and narwhal whale), mysticetes (baleen whales), and carnivora (pinnipeds and polar bears). Cetaceans and pinnipeds, with the exception of walrus, are managed by the NMFS and are being addressed by that agency (71 FR 27997; May 15, 2006). Pacific walrus and polar bear, which are managed by the Service, are the subject of this proposed IHA.

Pacific Walrus

Concentrations of walrus might be encountered in certain areas, depending on the location of the edge of the pack ice relative to their favored shallow-water foraging habitat. There are two recognized subspecies of walrus: the Pacific walrus (*Odobenus rosmarus divergens*) and Atlantic walrus (*O. r. rosmarus*). Only the Pacific subspecies is potentially within the planned seismic survey study area.

The Pacific walrus is represented by a single stock of animals that inhabits the shallow continental shelf waters of the Bering and Chukchi Seas, occasionally moving into the East Siberian and Beaufort Seas. The population ranges across the international boundaries of the United States and Russia, and both nations share common interests with respect to the conservation and management of this species.

Walrus are migratory, moving south with the advancing ice in autumn and north as the ice recedes in spring (Fay 1981). In the summer, most of the population of Pacific walrus moves to the Chukchi Sea, but several thousands aggregate in the Gulf of Anadyr and in Bristol Bay (Angliss and Lodge 2004). Limited numbers of walrus inhabit the Beaufort Sea during the open water season, and they are considered extralimital east of Point Barrow (Sease and Chapman 1988).

The northeast Chukchi Sea west of Barrow is the northeastern extent of the main summer range of the walrus, and only a few are seen farther east in the Beaufort Sea (e.g., Harwood et al. 2005). Walrus observed in the Beaufort Sea have typically been lone individuals. The reported subsistence harvest of walrus by Barrow hunters for the 5-year period of 1994–1998 was 99 walrus (USDI 2000a). Most of these were harvested west of Point Barrow. In addition, between 1988 and 1998, Kaktovik hunters harvested one walrus (USDI 2000b).

Walrus are most commonly found near the southern margins of the pack ice as opposed to deep in the pack where few open leads (polynyas) exist to afford access to the sea for foraging (Estes and Gilbert 1978; Gilbert 1989; Fay 1982). Walrus are not typically found in areas of greater than 80 percent ice cover (Fay 1982). Ice serves as an important mobile platform, floating the walrus on to new foraging habitat and providing a place to rest and nurse their young.

This close relationship to the ice largely determines walrus distribution and the timing of their migrations. As the pack ice breaks up in the Bering Sea and recedes northward in May and June, a majority of subadults, females, and calves migrate with it, either by

swimming or resting on drifting ice sheets. Many males will choose to stay in the Bering Sea for the entire year, with concentrations near Saint Lawrence Island and further south in Bristol Bay. Two northward migration pathways are apparent, either toward the eastern Chukchi Sea near Barrow or northwestward toward Wrangel Island. By late June to early July, concentrations of walrus migrating northeastward spread along the Alaska coast congregating within 200 km of the shore from Saint Lawrence Island to southwest of Barrow. In August, largely dependent on the retreat of the pack ice, walrus are found further offshore with principal concentrations to the northwest of Barrow. By October, a reverse migration occurs out of the Chukchi Sea, with animals swimming ahead of the developing pack ice, as it is too weak to support them (Fay 1982).

Estimates of the pre-exploitation population of the Pacific walrus range from 200,000 to 400,000 animals (USFWS 2000a). Over the past 150 years, the population has been depleted by overharvesting and then periodically allowed to recover (Fay et al. 1989). An aerial survey flown in 1990 produced a population estimate of 201,039 animals; however, large confidence intervals associated with that estimate precluded any conclusions concerning population trend (Gilbert et al. 1992). The most current minimum population estimate is 188,316 walrus (USFWS 2000a). This estimate is conservative, because a portion of the Chukchi Sea was not surveyed due to lack of ice. The Service and U.S. Geological Survey, in partnership with Russian scientists, will conduct a rangewide survey to estimate population size. The results of these survey efforts should be available in 2007 (USFWS 2006).

Pacific walrus feed primarily on benthic invertebrates, occasionally fish and cephalopods, and more rarely, some adult males may prey on other pinnipeds (reviewed in Riedman 1990). Walrus typically feed in depths of 10 to 50 m (Vibe 1950; Fay 1982). Though the deepest dive recorded for a walrus was 133 m, they are more likely to be found in depths of 80 m or less in coastal or continental shelf habitats, where the clams and other mollusks that walrus prefer are found (Fay 1982; Fay and Burns 1988; Reeves et al. 2002). In a recent study in Bristol Bay, 98 percent of satellite locations of tagged walrus were foraging in water depths of 60 m or less (Chadwick and Hills 2005).

Polar bears (*Ursus maritimus*) are known to prey on walrus calves, and killer whales (*Orcinus orca*) have been known to take all age classes of animals. Predation levels are thought to be highest near terrestrial haulout sites where large aggregations of walrus can be found; however, few observations exist for off-shore environs.

Pacific walrus have been hunted by coastal Natives in Alaska and Chukotka for thousands of years. Exploitation of walrus by Europeans has also occurred in varying degrees since first contact. Presently, walrus hunting in Alaska and Chukotka is restricted to meet the subsistence needs of aboriginal peoples. The Service, in partnership with the Eskimo Walrus Commission (EWC) and the Association of Traditional Marine Mammal Hunters of Chukotka, administers subsistence harvest monitoring programs in Alaska and Chukotka.

Intraspecific trauma is also a known source of walrus injury and mortality. Disturbance events can cause walrus to stampede into the water and have been known to result in injuries and mortalities. The risk of stampede-related injuries increases with the number of animals hauled out. Calves and young animals at the perimeter of these herds are particularly vulnerable to trampling injuries.

Most (64 percent or 303 km) of the proposed Chukchi Sea seismic work will take place in water less than 100 m deep. Of those 303 km, 220 km will be surveyed in water greater then 60 m, where walrus prefer to forage (Chadwick and Hills 2005). During a survey through open water in the northern Chukchi Sea in early August of 2005, only three walrus were sighted south of 72.8° N in water 47 to 69 m deep (Haley and Ireland 2006).

The probability of encountering Pacific walrus along the proposed survey line in the Chukchi Sea will depend on the location of the southern margin of the pack ice and the timing of spring break-up. If the Healy crosses the margin when the ice margin is close to depths where walrus prefer to feed, it is likely that walrus will be encountered.

Polar Bear

Polar bears have a circumpolar distribution throughout the northern hemisphere (Amstrup et al. 1986) and occur in relatively low densities throughout most ice-covered areas (DeMaster and Stirling 1981). Polar bears are divided into six major populations and many sub-populations based on mark-and-recapture studies (Lentfer 1983), radio telemetry studies (Amstrup and Gardner 1994), and morpho-metrics (Manning 1971; Wilson 1976). Polar bears are common in the Chukchi and Beaufort Seas north of Alaska throughout the year, including the late summer period (Harwood et al. 2005). They also occur throughout the East Siberian, Laptev, and Kara Seas of Russia and the Barent's Sea of northern Europe. They are found in the northern part of the Greenland Sea, and are common in Baffin Bay, which separates Canada and Greenland, as well as through most of the Canadian Arctic Archipelago.

In Alaska, they have been observed as far south in the eastern Bering Sea as St. Matthew Island and the Pribilof Islands, but they are most commonly found within 180 miles of the Alaskan coast of the Chukchi and Beaufort Seas, from the Bering Strait to the Canadian border. Two stocks occur in Alaska: (1) The Chukchi/Bering Seas stock; and (2) the Southern Beaufort Sea stock. The Chukchi/Bering Seas stock is defined as polar bears inhabiting the area as far west as the eastern portion of the Eastern Siberian Sea, as far east as Point Barrow, and extending into the Bering Sea, with its southern boundary determined by the extent of annual ice.

The world population estimate of polar bears ranges from 20,000–25,000 individuals (ICUN, in prep). Amstrup (1995) estimated the minimum population of polar bears for the Beaufort Sea to be approximately 1,500 to 1,800 individuals, with an average density of about one bear per 38.6 to 77.2 square miles (100 to 200 km^2). Previous population estimates have put the Chukchi/Bering Seas population at 2,000 to 5,000; however, there are no reliable data on the population status of polar bears in the Bering/Chukchi Seas. An estimate was derived by subtracting the total estimated Alaska polar bear population from the Beaufort Sea population, thus yielding an estimate of 1,200–3,200 animals (Amstrup 1995).

The Alaskan polar bear population is considered to be stable or increasing slightly (USFWS 2000b, c). Polar bear populations located in the Southern Beaufort Sea have been estimated to have an annual growth rate of 2.2 to 2.4 percent with an annual harvest of only 1.9 percent (Amstrup 1995). The Southern Beaufort Sea population ranges from the Baillie Islands, Canada, in the east to Point Hope, Alaska, in the west. The Chukchi/Bering Seas population ranges from Point Barrow, Alaska, in the east to the Eastern Siberian Sea in the west. These two populations overlap between Point Hope and Point Barrow, Alaska, centered near Point Lay (Amstrup 1995). Both of these populations have been extensively studied by tracking the movement of tagged females (Garner et al. 1990). Radio-tracking studies indicate significant movement within

populations and occasional movement between populations (Garner et al. 1990; Amstrup 1995).

Although insufficient data exist to accurately quantify polar bear denning along the Alaskan Chukchi Sea coast, dens in the area are less concentrated than for other areas in the Arctic. The majority of denning of Chukchi Sea polar bears occurs on Wrangel Island, Herald Island, and certain locations on the northern Chukotka coast. Females without dependent cubs breed in the spring, and pregnant females enter maternity dens by late November; the young are usually born in late December or early January. Female bears can be quite sensitive to disturbances during this denning period.

Greater than 90 percent of a polar bear's diet is ringed (*Phoca hispida*) and bearded (*Erignathus barbatus*) seals; walrus calves are hunted occasionally. Polar bears hunt in areas where there are high concentrations of ringed and bearded seals (Larsen 1985; Stirling and McEwan 1975). This includes areas of land-fast ice, as well as moving pack ice. They hunt along leads and other areas of open water, or by waiting at a breathing hole, or by breaking through the roof of a seal's lair. Lairs are excavated in snow drifts on top of the ice. Bears also stalk seals in the spring when they haul out on the ice in warm weather. The relationship between ice type and bear distribution is as yet unknown, but it is suspected to be related to seal availability. Polar bears are opportunistic feeders and feed on a variety of foods and carcasses, including other marine mammals, reindeer, arctic cod, and geese and their eggs (Smith 1985; Jefferson et al. 1993; Smith and Hill 1996; Derocher et al. 2000). Polar bears are also known to eat nonfood items including styrofoam, plastic, antifreeze, and hydraulic and lubricating fluids.

The most significant source of mortality is man. Before the MMPA was passed, polar bears were taken by sport hunters and residents. Between 1925 and 1972, the mean reported kill was 186 bears per year. Since 1972, only Alaska Natives have been allowed to hunt polar bears for their subsistence uses or for handicraft and clothing items for sale. From 1980 to 2005, the total annual harvest for Alaska averaged 101 bears: 64 percent from the Chukchi Sea and 36 percent from the Beaufort Sea.

MMS bowhead whale aerial surveys since 1979 have documented an increase, starting in 1992, in the proportion of polar bears associated with land vs. sea-ice in the fall season (Monnett *et al.* 2005). In 2004, a large number of bears were observed swimming more than 2 km offshore, and a number of polar bear carcasses were subsequently observed offshore. Monnett *et al.* (2005) suggest that, as the pack ice edge moves northward, drowning deaths of polar bears may increase. The number of polar bears encountered in open water may, therefore, be slightly higher than previously reported.

Polar bears typically range as far north as 88° N (Ray 1971; Durner and Amstrup 1995); at about 88° N their population thins dramatically. However, polar bears have been observed across the Arctic, including close to the North Pole (van Meurs and Splettstoesser 2003). Stirling (1990) reported that, of 181 sightings of bears, only 3 were above 82° N. Three polar bears were observed from the Healy in the northern Chukchi Sea during a survey through this area in August of 2005 (Haley and Ireland 2006). These three sightings occurred along 2,401 km of observed trackline over 14 days between 70° N and 81° N.

Historically, polar bears have preferred the pack ice over coastal areas during the summer (Stirling 1988; Amstrup 1995). However, since the late 1980s, polar bears have been observed in greater numbers near coastal areas during late summer and fall in the central Beaufort Sea (Schliebe *et al.* 2004). This recent observation of bear behavior may be related to the 30-year moratorium on polar bear hunting and the recent success of subsistence whale harvests, the scraps of which appear to have become a reliable, annual food source for polar bears (Schliebe *et al.* 2004). The Healy is likely to encounter polar bears when it enters the pack ice, and small numbers of bears could be encountered anywhere along the entire trackline, as well as in the course of coring activities.

Potential Impacts of Activities on Pacific Walrus and Polar Bear

Potential Effects of Airguns

The effects of sounds from airguns might include one or more of the following: noise, behavioral disturbance, and, at least in theory, temporary or permanent hearing impairment, or non-auditory physical effects (Richardson *et al.* 1995). Because the airgun sources planned for use during the present project involve only 4 or 8 airguns, the effects are anticipated to be less than would be the case with a large array of airguns. It is very unlikely that there would be any cases of temporary or especially permanent hearing impairment, or non-auditory physical effects. Also, behavioral disturbance is expected to be limited to relatively short distances.

Species Perception of Sound and Masking Effects

The underwater hearing of a walrus has been measured at frequencies from 13 Hz to 1,200 Hz. The range of best hearing was from 1 to 12 kHz, with maximum sensitivity (67 dB re 1 µPa) occurring at 12 kHz (Kastelein *et al.* 2002). Most of the energy in the sound pulses emitted by airgun arrays is at low frequencies, with the strongest spectrum levels below 200 Hz and considerably lower spectrum levels above 1,000 Hz. These low frequencies are not generally used by Pacific walrus. Masking effects of pulsed sound (even from large arrays of airguns) on Pacific walrus calls and other natural sounds are expected to be limited, and given the intermittent nature of these seismic pulses, masking effects are expected to be negligible. Any sound levels received by polar bears in the water would be attenuated because polar bears generally swim with their heads out of the water or at the surface and polar bears do not dive much below 4.5 m. Received levels of airgun sounds are reduced near the surface because of the pressure release effect at the water's surface (Greene and Richardson 1988; Richardson *et al.* 1995). Walrus and polar bears on the ice would be unaffected by underwater sound.

Disturbance Reactions

Disturbance includes a variety of effects, including subtle changes in behavior, more conspicuous changes in activities, and displacement. Reactions to sound 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 a disturbance by 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. Alternatively, if a sound source displaces marine mammals from an important area for a prolonged period, impacts on the animals are most likely significant.

Numerous studies have shown that pulsed sounds from airguns are often readily detectable in the water at distances of many kilometers; however, numerous studies have shown that marine mammals at distances more than a few kilometers from operating seismic vessels often show no apparent response. 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.

Seismic operations are expected to create significantly more noise than general vessel and icebreaker traffic; however, data specific to the potential response of walrus to seismic operations is limited. Therefore, we rely on observations of walrus and other pinniped reactions to similar activities and apply these conservatively to determine expected reactions. Potential effects of prolonged or repeated disturbances to Pacific walrus include displacement from preferred feeding areas, increased stress levels, increased energy expenditure, masking of communication, and impairment of thermoregulation of neonates that spend too much time in the water. There are some uncertainties in predicting the quantity and types of impacts of noise on marine mammals; however, appropriate mitigation measures minimize the potential for displacement.

The response of walrus to sound sources may be either avoidance or tolerance. It is possible that noises produced by the icebreaking or seismic activities may cause avoidance behavior in walrus. Walrus on ice have been observed to become alert and dive into the water when icebreakers passed over 2 km (1.2 mi) away (Fay *et al.* 1984; Brueggeman *et al.* 1990, 1991, 1992). In addition, Brueggeman *et al.* (1990) suggest that walrus on ice floes may avoid icebreakers by 10 to 15 km (6.2 to 9.3 mi). Anecdotal observations by walrus hunters and researchers suggest that males tend to be more tolerant of disturbances than females and individuals tend to be more tolerant than groups. Females with dependent calves are considered least tolerant of disturbances.

Pacific walrus are not likely to show a strong avoidance reaction to the medium-sized airgun sources that will be used. Studies in the Beaufort Sea based on visual monitoring from seismic vessels has shown only slight (if any) avoidance of airguns by pinnipeds in general, and only slight (if any) changes in behavior. These studies have shown that pinnipeds frequently do not avoid the area within a few hundred meters of operating airgun arrays (*e.g.*, Miller *et al.* 2005, Harris *et al.* 2001). However, visual studies have their limitations, and initial telemetry work suggests that avoidance and other behavioral reactions to small airgun sources may at times be stronger than evident to date from visual studies of pinniped reactions to airguns (Thompson *et al.* 1998). Even if reactions of the species occurring in the present study area are as strong as those evident in the telemetry study, reactions are expected to be confined to relatively small distances and durations, with no long-term effects on pinniped individuals or populations.

Quantitative research on the sensitivity of walrus to noise has been limited because no audiograms (a test to determine the range of frequencies and minimum hearing threshold) have been done on walrus. Hearing range is assumed to be within the 13 Hz and 1,200 Hz range of their own vocalizations, with maximum hearing sensitivity in the 1 to 12 kHz range (Kastelein *et al.* 2002). Walrus hunters and researchers have also noted that walrus tend to react to the presence of humans and machines at greater distances from upwind approaches than from downwind approaches, suggesting that odor may also be a stimulus for a flight response. The visual acuity of walrus is thought to be less than for other species of pinnipeds. The reaction of walrus to vessels is highly dependent on distance, vessel speed, and possibly vessel smell (Richardson *et al.* 1995; Fay *et al.* 1984), as well as previous exposure to hunting (D.G. Roseneau In Malme *et al.* 1989). Walrus in the water appear to be less readily disturbed by vessels than walrus hauled out on land or ice (Fay *et al.* 1984).

Seismic activities may affect polar bears in a number of ways. Seismic ships and icebreakers may be physical obstructions to polar bear movements, although these impacts are of short-term and localized effect. Noise, sights, and smells produced by exploration activities may repel or attract bears, either disrupting their natural behavior or endangering them by threatening the safety of seismic personnel.

In the Chukchi Sea, during the open-water season, polar bears spend the majority of their time on pack ice, which limits the chance of impacts from seismic activities. Occasionally, polar bears can be found in open water, miles from the ice edge or ice floes.

Vessel traffic could result in short-term behavioral disturbance to polar bears. During the open-water season, most polar bears remain offshore in the pack ice and are not typically present in the area of vessel traffic. If a ship is surrounded by ice, it is more likely that curious bears will approach. Any on-ice activities create the opportunity for bear-human interactions. In relatively ice-free waters, polar bears are less likely to approach ships, although bears may be encountered on ice floes.

Ships and icebreakers may act as physical obstructions in the spring if they transit through a restricted lead system, such as the Chukchi Polynya. Polynyas are important habitat for marine mammals, which makes them important hunting areas for polar bears. Ship traffic in these ice conditions may intercept or alter movements of bears. A similar situation could occur in the fall when the pack ice begins to expand.

Little research has been conducted on the effects of noise on polar bears. Polar bears are curious and tend to investigate novel sights, smells, and possibly noises. Noise produced by seismic activities could elicit several different responses in polar bears. It may act as a deterrent to bears entering an area of operation, or potentially attract curious bears. Underwater noises are probably not a relevant form of disturbance because bears spend most of their time on the ice or at the surface of the water.

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. Currently, the Service does not have specific guidelines regarding ''allowable'' received sound levels for either walrus or polar bears; however, we have adopted the NMFS criterion for Pacific walrus that pinnipeds should not be exposed to impulsive sounds greater or equal to 190 dB re 1 µPa (rms) (NMFS 2000). As a conservative measure, this criterion is also applied to polar bear. This criterion defines the safety (shut-down) radii planned for the proposed seismic survey.

Several aspects of the planned monitoring and mitigation measures for this project are designed to detect animals occurring near the airguns (and multi-beam bathymetric sonar), and to avoid exposing them to sound pulses that might cause hearing impairment. Marine mammal observers will be on watch during seismic operations. In addition, walrus and polar bears 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.

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. In Pacific walrus, TTS thresholds associated with exposure to brief pulses (single or multiple) of underwater sound have not been measured.

A marine mammal within a radius of 100 m around a typical large array of operating airguns might be exposed to a few seismic pulses with levels of 205 dB, and possibly more pulses if the mammal moved with the seismic vessel. However, based on the implementation of the mitigation measures required by this proposed authorization, several of the considerations that are relevant in assessing the impact of typical seismic surveys with arrays of airguns are not directly applicable here. These considerations include the effects on polar bear and walrus of:

Ramping up (soft start), which is standard operational protocol during startup of large airgun arrays in many jurisdictions. Ramping up involves starting the airguns in sequence, usually commencing with a single airgun and gradually adding additional airguns. This practice, which will be employed when the airgun array is operated, requires that the safety radius be visible for 30 minutes prior to the start of operations and that no walrus or polar bear has been sighted within or near the safety radius during the final 15 minutes, thereby avoiding exposure of walrus and polar bears to potential effects of ramping up.

Longer term exposure to airgun pulses at a sufficiently high level for a sufficiently long period to cause more than mild TTS. Because the mitigation measures require that the operation of airguns either shut-down or power-down (which procedure is followed depends on the circumstances as described in the section on Mitigation) if a walrus or polar bear approaches or nears the safety radius, long term exposure to airgun pulses at high levels will be avoided.

The predicted 190 dB distances for the airguns operated by UTIG vary with water depth. They are estimated to be 230 m in deep water for the 8-airgun system, and 75 m in deep water for the 4–GI gun system. In intermediate depths, this distance is predicted to increase to 113 m for the 4–GI gun system. The 8-airgun array will only be used in deep water (greater than 1,000 m). The predicted 190 dB distance for the 4–GI gun system in shallow water is 938 m (Table 1). Shallow water (less than 100 m) will occur along 303 km (64 percent) of the planned trackline in the Chukchi Sea. Those sound levels are not considered to be the levels above which TTS might occur.

P*ermanent 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; 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 the strong sound pulses with very rapid rise time.

It is unlikely that walrus or polar bears could receive sounds strong enough (and over a sufficient duration) to cause permanent hearing impairment during a project employing the medium-sized airgun sources planned here. In the proposed project, walrus or bears are unlikely to be exposed to received levels of seismic pulses strong enough to cause TTS, as they would probably need to be within 100 to 200 m of the airguns for that to occur. Given the higher level of sound necessary to cause PTS, it is even less likely that PTS could occur. In fact, even the levels immediately adjacent to the airgun may not be sufficient to induce PTS, especially because an animal 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. The planned monitoring and mitigation measures, including visual monitoring, power-downs, and shut-downs of the airguns when walrus and bears are seen within the safety radii, will minimize the already minimal probability of exposure of animals to sounds strong enough to induce PTS.

Non-auditory Physiological Effects: Non-auditory physiological effects or injuries that theoretically might occur in Pacific walrus or polar bears exposed to strong underwater sound include stress, neurological effects, 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 walrus or bear would be exposed to strong seismic sounds long enough for significant physiological stress to develop. That is especially so in the case of the proposed project where the airgun configuration is moderately sized, the ship is moving at 3 to 4 knots (5.5 to 7.4 km/hr), and for the most part, the tracklines will not double back through the same area.

In general, little is known about the potential for seismic survey sounds to cause auditory impairment or other physical effects in Pacific walrus or polar bears. 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. Marine mammals that show behavioral avoidance of seismic vessels, including some pinnipeds, 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.

Pacific walrus or polar bears close to underwater detonations of high explosives can be killed or severely injured, and auditory organs would be especially susceptible to injury (Ketten *et al.* 1993; Ketten 1995). However, airgun pulses are less energetic and have slower rise times, and there is no evidence that they can cause serious injury, or death, even in the case of large airgun arrays.

Potential Effects of Bathymetric Sonar Signals

A SeaBeam 2112 multibeam 12 kHz bathymetric sonar system will be operated from the source vessel essentially continuously during the planned study. Sounds from the multibeam are very short pulses, depending on water depth. Most of the energy in the sound pulses emitted by the multibeam is at moderately high frequencies, centered at 12 kHz. The beam is narrow (approximately 2°) in fore-aft extent and wide (approximately 130°) in the cross-track extent.

The area of possible influence of the bathymetric sonar is a narrow band oriented in the cross-track direction below the source vessel. Walrus or polar bears that encounter the bathymetric

sonar at close range are unlikely to be subjected to repeated pulses because of the narrow fore-aft width of the beam, and will receive only small amounts of pulse energy because of the short pulses. In assessing the possible impacts of a similar multibeam system (the 15.5 kHz Atlas Hydrosweep multibeam bathymetric sonar), Boebel *et al.* (2004) noted that the critical sound pressure level at which TTS may occur is 203.2 dB re 1 µPa (rms). The critical region included an area of 43 m (141 ft) in depth, 46 m (151 ft) wide athwartship, and 1 m (3.3 ft) fore-and-aft (Boebel *et al.* 2004). In the more distant parts of that (small) critical region, only slight TTS could potentially be incurred.

Walrus communications will not be masked appreciably by the bathymetric sonar signals given the low duty cycle of the sonar and the brief period when an individual mammal is likely to be within the sonar beam. Furthermore, the 12 kHz multibeam will not overlap with the predominant frequencies in walrus calls, further reducing any potential for masking in that group.

We are not aware of any data on the reactions of Pacific walrus to sonar sounds at frequencies similar to those of the multibeam sonar (12 kHz). Based on observations of other pinniped responses to other types of pulsed sounds, and the likely brevity of exposure to the bathymetric sonar sounds, Pacific walrus reactions to the sonar sounds are expected to be limited to startle or otherwise brief responses of no lasting consequence to the animals.

Polar bears would not occur below the Healy or elsewhere at sufficient depth to be in the main beam of the bathymetric sonar, so would not be affected by the sonar sounds.

Potential Effects of Sub-bottom Profiler Signals

A Knudsen 320BR sub-bottom profiler will be operated from the source vessel at nearly all times during the planned study. The Knudsen 320BR produces sound pulses with lengths of up to 24 ms every 0.5 seconds to approximately 8 seconds, depending on water depth. The energy in the sound pulses emitted by this sub-bottom profiler is at mid-to moderately high frequency, depending on whether the 3.5 or 12 kHz transducer is operating. The conical beam-width is either 26°, for the 3.5 kHz transducer, or 30°, for the 12 kHz transducer, and is directed downward. Source levels for the Knudsen 320 operating at 3.5 and 12 kHz have been measured as a maximum of 221 and 215 dB re 1 µPa m, respectively. Received levels would diminish rapidly with increasing depth.

Walrus communications will not be masked appreciably by the sub-bottom profiler signals given its relatively low duty cycle, directionality, and the brief period when an individual animal is likely to be within its beam. The 12 kHz transducer for the Knudsen 320BR will rarely be used because its frequency interferes with the multibeam sonar; however, neither the 3.5 kHz nor the 12 kHz sonar signals overlap with the predominant frequencies in walrus calls, which would avoid significant masking.

The pulsed signals from the Knudsen 320BR while the 3.5 kHz transducer is operating are weaker than those from the bathymetric sonar and those from the proposed 4-or 8-airgun arrays. Therefore, behavioral responses are not expected unless an animal is close to the source. Exposure would be brief and any response would likely be limited and have no lasting consequence to the animals.

Source frequencies of the Knudsen 320BR are much lower than those of the bathymetric sonar when the 3.5 kHz transducer is engaged. When the 12.5 kHz transducer is operating (which will be seldom because it interferes with the SeaBeam), the source frequency is similar to that of the bathymetric sonar. As with the SeaBeam, the pulses are brief and concentrated in a downward beam. An animal would be in the beam of the sub-bottom profiler only briefly, reducing its received sound energy. Thus, it is unlikely that the sub-bottom profiler produces pulse levels strong enough to cause hearing impairment or other physical injuries even in a walrus that is (briefly) in a position near the source.

Polar bears would not occur below the Healy or elsewhere at sufficient depth to be in the main beam of the sub-bottom profiler, so would not be affected by the sonar sounds.

The sub-bottom profiler is usually operated simultaneously with other higher-power acoustic sources. Many marine mammals will move away in response to the approaching higher-power sources or the vessel itself before the animal would be close enough for there to be any possibility of effects from the sub-bottom profiler. In the case of Pacific walrus and polar bears that do not avoid the approaching vessel and its various sound sources, mitigation measures that would be applied to minimize effects of the higher-power sources would further reduce or eliminate any minor effects of the sub-bottom profiler.

Effects of Helicopter Activities

Collection of seismic refraction data requires the deployment of hydrophones at great distances from the source vessel. In order to accomplish this in the ice-covered waters, the science party plans to deploy SISs along seismic lines in front of the Healy and then retrieve them off the ice once the vessel has passed. Vessel-based helicopters will be used to shuttle SISs along seismic track lines. Deployment and recovery of SISs every 10 to 15 km (6.2 to 9.3 mi) along the track line and as far as 120 km (75 mi) ahead or behind the vessel will require as many as 24 on-ice landings per 24-hr period during seismic shooting.

Levels and duration of sounds received underwater from a passing helicopter are a function of the type of helicopter used, orientation of the helicopter, the depth of the marine mammal, and water depth. A civilian helicopter service will be providing air support for this project; however, the type of helicopter has not been determined. Helicopter sounds are detectable underwater at greater distances when the receiver is at shallow depths. Generally, sound levels received underwater decrease as the altitude of the helicopter increases (Richardson et al. 1995). Helicopter sounds are audible for much greater distances in air than in water.

Few systematic studies of Pacific walrus reactions to aircraft overflights have been completed. Documented reactions of pinnipeds range from simply becoming alert and raising the head to escape behavior such as hauled out animals rushing to the water. Disturbances caused by low-flying air traffic may cause walrus groups to abandon land or ice haulouts or to stampede. Reactions of walrus to aircraft vary with range, aircraft type, and flight pattern, as well as walrus age, sex, and group size. Fixed-winged aircraft are less likely to elicit a response than helicopter overflights. Adult females, calves, and immature walrus tend to be more sensitive to aircraft disturbance (Loughrey 1959; Salter 1979). Walrus are particularly sensitive to changes in engine noise and are more likely to stampede when planes turn or fly low overhead. Severe disturbance events could result in trampling injuries or cow-calf separations, both of which are potentially fatal.

Although specific details of altitude and horizontal distances are lacking from many largely anecdotal reports, escape reactions to a low flying helicopter (lower than 150 m altitude) can be expected from walrus

encountered during the proposed operations. These responses would likely be relatively minor and brief in nature. Researchers conducting aerial surveys for walrus in sea ice habitats have observed little reaction to aircrafts above 1,000 ft (304 m).

In order to limit behavioral reactions of Pacific walrus during deployment of SISs, helicopters will maintain a minimum altitude of 1,000 ft (304 m) above the sea ice except when taking off or landing. Sea-ice landings within 1,000 ft (304 m) of any observed walrus will not occur, and the helicopter flight path will remain along the seismic track line. Three or four SIS units will be deployed/retrieved before the helicopter returns to the vessel. This should minimize the number of disturbances caused by repeated over-flights.

While researching the effects of human disturbances on denning polar bears, Amstrup (1993) noted that repeated overflights and the capture and handling of study animals was likely to seriously disturb the bears. In addition, the effects of fleeing from aircraft on a warm spring or summer day may be enough to overheat a well-insulated polar bear. Nonetheless, the studied female's cubs were not smaller and did not suffer decreased recruitment (Amstrup 1993). Aerial surveyors observed 24 polar bears while monitoring marine mammals during BP's Northstar oil development project. One polar bear was sitting on the ice, 6 were looking at the aircraft, 3 were walking, and 14 were running. The surveyors concluded that the running or walking bears had been displaced from a small area and that the bears were not impacted over the long term (Moulton and Williams 2003). Recurring aircraft overflights could result in short-term behavioral disturbances to polar bears. However, reactions will vary among individuals and are not likely to be significant to the individual.

Repeated overflights of any individual polar bear during the helicopter operations are unlikely with the monitoring provisions that are in place. Any reaction to the helicopter work is expected to be limited and of no consequence to the fitness or health of individual animals. However, in order to further limit any potential behavioral reactions of polar bears, the same requirements applied for helicopter operations around observed walrus will be applied to those operations when polar bears are sighted.

Effects of Coring Activities

The sediment coring project to be conducted in the Arctic Ocean north of the Chukchi Sea will have no effect on walrus, because it will not encounter walrus. Walrus do not occur in the areas of the coring project, which are far north of the southern edge of the pack ice. The coring project may encounter a few individual polar bears. The effects of the coring activities on any bears that are encountered would be minimal, consisting of temporary disturbance. The presence of humans and the nature of the activity would likely prevent any encounters because individual bears are expected to alter their course to avoid the coring activity due to unfamiliar scents and noises.

Mitigation

Several important mitigation measures have been built into the design of the project. The UTIG has stated that these mitigation measures will be implemented to avoid or minimize effects on Pacific walrus and polar bear encountered along the tracklines.

(1) No seismic surveys will take place in the Chukchi Sea before July 15, 2006.

(2) Airgun operations will be limited to offshore waters, i.e., greater than 120 km (93 miles) from shore;

(3) When operating in shallower parts (less than 100 m) of the study area, airgun operations will be limited to the smaller source (4 GI guns);

(4) Seismic vessels must observe a 0.5-mile (800-m) exclusion zone around walrus and polar bears observed on land or ice when not conducting seismic operations.

(5) Trained vessel-based observers will be required onboard to monitor marine mammals near the seismic source vessel during all airgun operations. When marine mammals are observed within, or about to enter, designated safety radius (i.e., the distance from the sound source at which the received level of sound would correspond to the acoustic threshold of 190 dB at any given depth), airgun operations will be powered down (or shut-down, if necessary) immediately. Vessel-based observers will watch for walrus and polar bears near the seismic vessel during all periods of shooting and for a minimum of 30 minutes prior to the planned start of airgun operations after an extended shut-down.

(6) If a Pacific walrus or polar bear 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, when practical and safe, be changed in a manner that also minimizes the effect on the planned science objectives. The animal's activities and movements relative to the seismic vessel will be closely monitored to ensure that it does not approach within the 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 power-down or shut-down of the airgun(s).

(7) A power-down involves decreasing the number of airguns in use such that the radius of the 190-dB zone is decreased to the extent that marine mammals are no longer within the safety radius. A power-down may also occur when the vessel is moving from one seismic line to another. During a power-down, one airgun (or some other number of airguns less than the full airgun array) is operated. The continued operation of one airgun will alert marine mammals to the presence of the seismic vessel in the area.

If a Pacific walrus or polar bear is detected outside the safety radius but is likely to enter the safety radius, and if the vessel's speed and/or course cannot be changed to avoid having the mammal enter the safety radius, the airguns will be powered down before the animal is within the safety radius. Likewise, if a walrus or polar bear is already within the safety zone when first detected, the airguns will immediately be powered down. During a power-down of the 4-or 8-airgun array, one airgun (either a single 105 in^3 GI gun or one 210 in^3 G. gun, respectively) will be operated. If a Pacific walrus or polar bear is detected within or near the smaller safety radius around that single airgun (see Table 1), it will be shut-down. Power-downs will only be used in deep water. In shallow and intermediate depth water, an immediate shutdown will occur when Pacific walrus or polar bears are sighted within the designated safety radii.

(8) The operating airgun(s) will be shut-down completely if a Pacific walrus or polar bear approaches or enters the safety radius and a power-down is not practical (or shut-down is specifically prescribed, see Table 1). The operating airgun(s) will also be shut-down completely if a walrus or polar bear approaches or enters the estimated safety radius around the source that would be used during a power-down.

(9) Following a power-down or shut-down, airgun activity will not resume until the walrus or polar bear has cleared the safety zone. The animal will be considered to have cleared the safety zone if it is visually observed to have left the safety zone or has not been seen within the zone for 15 minutes.

(10) A ramp-up procedure will be followed when the airgun array begins operating after a specified-duration period without airgun operations. The

specified period depends on the speed of the source vessel and the size of the airgun array that is being used. Ramp-up will begin with one of the G. guns (210 in^3) or one of the Bolt airguns (500 in^3) for the 8-airgun array, or one of the 105 in^3 GI guns for the 4–GI gun array. One additional airgun will be added after a period of 5 minutes. Two more airguns will be added after another 5 minutes, and the last four airguns (for the 8-airgun array) will all be added after the final 5 minute period. During the ramp-up, the safety zone for the full airgun array in use at the time will be maintained.

If the complete 190-dB safety radius has not been visible for at least 30 minutes prior to the start of operations, ramp up will not commence unless at least one airgun has been operating during the interruption of seismic survey operations. This means that it will not be permissible to ramp up the 4–GI gun or 8-airgun source from a complete shut-down in thick fog or darkness (which may be encountered briefly in late August), when the outer part of the 190 dB safety zone is not visible. If the entire safety radius is visible, then start up of the airguns from a shut-down may occur at night (if any periods of darkness are encountered during seismic operations). If one airgun has operated during a power-down period, ramp up to full power will be permissible in poor visibility, on the assumption that walrus and polar bears will be alerted to the approaching seismic vessel by the sounds from the single airgun and could move away. Ramp up of the airguns will not be initiated during the day or at night if a walrus or polar bear has been sighted within or near the applicable safety radii during the previous 15 minutes.

(11) To limit disturbance, helicopters will follow the survey track line. The UTIG would avoid landing within 1,000 ft (304 m) of an observed walrus or bear, and maintain a minimum altitude of 1,000 ft (304 m), unless weather or other circumstances require a closer landing for human safety. For efficiency, each helicopter excursion will be scheduled to deploy/retrieve three or four SIS units. This will minimize the number of flights and the number of potential disturbances to walrus and polar bears in the area.

(12) The applicant will be required to develop a Service-approved site-specific polar bear and walrus interaction plan prior to initiation of activities. These plans outline the contingency steps that the applicant will take, such as the chain of command for reporting and responding to polar bear or walrus sightings.

(13) No seismic activities will occur within a 40-mile radius of affected communities. This condition will limit potential interactions with walrus hunters in near-shore environments.

(14) Prior to seismic activities, UTIG will contact and consult with the communities of Point Hope, Point Lay, Wainwright, and Barrow to identify any necessary measures to be taken to minimize adverse impacts to subsistence hunters in these communities. A POC will be developed if there is concern from the community that the activities will impact subsistence uses of Pacific walrus and polar bears.

The POC must outline how applicants will work with the affected Native communities and what actions will be taken to avoid interference with subsistence hunting of walrus and polar bear. The POC will address: Operational agreement and communications procedures; where and when the agreement becomes effective; the general communications scheme; onboard observers; conflict avoidance; seasonally sensitive areas; vessel navigation; air navigation; marine mammal monitoring activities; measures to avoid impacts to marine mammals; measures to avoid conflicts in areas of active hunting; emergency assistance; and the dispute resolution process. The Service will review the POC prior to issuance of the final IHA to ensure any potential adverse effects on the availability of the animals are minimized.

(15) At least one Alaska Native knowledgeable about the mammals and fish of the area will be a member of the observer team and will serve as a liaison with subsistence users encountered at sea. Air gun operations will be suspended if the Healy's trackline is less than 5 km (3 miles) from ongoing subsistence hunting or fishing activities.

Estimated Take by Incidental Harassment Due to Chukchi Sea Seismic Survey

All anticipated takes would be non-lethal harassment involving temporary changes in behavior. In the sections below, we estimate take by harassment of the numbers of walrus and polar bears that are likely to be affected during the proposed seismic study in the Chukchi Sea with the implementation of the mitigation measures described above. The estimates are based on data obtained during marine mammal surveys in and near the Chukchi Sea by Brueggeman et al. (1990) and Evans et al. (2003).

This section provides estimates of the number of potential exposures to sound levels greater than or equal to 160 dB and 170 dB re 1 µpa (rms). The 160 dB criterion is applied as a maximum estimate for both species, and the 170 dB criterion is applied as a more accurate criterion based on studies that have determined pinnipeds tend to be less responsive than many other marine mammal species. As a conservative measure, this sound level criteria is also applied to polar bears.

The following estimates are based on a consideration of the number of walrus and polar bears that might be disturbed appreciably by approximately 478 line kilometers of seismic surveys in the Chukchi Sea. An assumed total of 598 km of trackline includes a 25 percent allowance over and above the planned 478 km to allow for turns, lines that might have to be repeated because of poor data quality, or minor changes to the survey design.

The anticipated radii of influence of the bathymetric sonar and sub-bottom profiler are less than those for the airgun configurations. It is assumed that, during simultaneous operations of the airgun array, sonar, and profiler, any walrus or polar bear close enough to be affected by the sonars would already be affected by the airguns. However, whether or not the airguns are operating simultaneously with the sonar or with the profiler, walrus and polar bears are expected to exhibit no more than short-term and inconsequential responses to the sonar or profiler given their characteristics (e.g., narrow downward-directed beam) and other considerations described above. Such reactions are not considered to constitute taking and, therefore, no additional allowance is included for animals that might be affected by the sound sources other than the airguns.

Few surveys of walrus and polar bears have been conducted in the Chukchi Sea area of the proposed project. The best polar bear density data are from one pilot study in the eastern Chukchi Sea testing the viability of aerial surveys from an icebreaker as a tool for monitoring polar bear stock (Evans et al. 2003). Most of the survey (90.7 percent) was flown over areas of ice cover greater than 10 percent. The density of bears was calculated to be 0.0068/km^2. It is expected that the density estimate is greater than that which may be encountered in the Chukchi Sea in open water. In recent years, many polar bears have concentrated near bowhead harvesting sites on land during late summer and would, therefore, not be affected by the proposed seismic survey. Polar bears are not expected to be encountered in areas of open water (Haley and Ireland 2006, Harwood et al.

2005, Evans et al. 2003), but an estimated density of 0.0001 has been used to allow for the chance encounter of a few individuals traversing open water areas (Monnett et al. 2005).

The estimates of walrus densities most relevant to the proposed project are reported by Brueggeman et al. (1990) from seven aerial surveys of ice pack areas occurring in late June through early July. These surveys took place in the Chukchi Sea area of the proposed Healy trackline in optimal ice habitat for walrus, and near the center of the northern migration concentration of the summer population of Chukchi walrus. Brueggeman et al. (1990) reported an average density in open water near the ice margin of 0.0731 walrus/km^2. This value was used as the average density for walrus in open water during the proposed survey. Brueggeman et al. (1990) reported a walrus density along the pack ice edge of 0.62 walrus/km^2. This value was considered to be the maximum density of walrus that will be encountered as the Healy crosses the ice margin in the Chukchi Sea. Pacific walrus most frequently feed in shallow waters (less than 60 to 80 m) (Chadwick and Hills 2005; Reeves et al. 2002), and the deepest recorded walrus dive was to 133 m (Reeves et al. 2002). Because of these reasons, walrus densities have only been applied to areas along the seisimic survey line that are less than 200 m deep.

The potential number of occasions when walrus and polar bears species might be exposed to received levels 160 dB re 1 µPa (rms) was calculated for each of three water depth categories (less than 100 m, 100 to 1,000 m, and greater than 1,000 m) within the Chukchi Sea (south of 75° N) by multiplying:

the expected species density, either average (i.e., best estimate) or maximum; the anticipated line-kilometers of operations with both the 4–GI and 8-airgun array in each water-depth category after applying a 25 percent allowance for possible additional line kilometers;

the cross-track distances within which received sound levels are predicted to be greater than or equal to 160 dB for each water-depth category.

During the Chukchi Sea portion of the survey, 1,931 km^2 would be ensonified within the 170 dB isopleths and 6,455 km^2 would be ensonified within the 160 dB isopleths. After adding the 25 percent contingency to the expected number of line kilometers, the number of exposures is calculated based on 2,414 km^2 for the 170 dB sound level and 8,069 for the 160 dB sound level. The numbers of exposures in the three depth categories were then summed for each species (Table 2).

TABLE 2.—ESTIMATES OF THE POSSIBLE NUMBERS OF WALRUS AND POLAR BEAR EXPOSURES TO 160 DB AND 170 DB DURING UTIG'S PROPOSED SEISMIC PROGRAM IN THE CHUKCHI SEA, ALASKA

Species	Number of exposures to sound levels			
	Best estimate		Maximum estimate	
	>160 dB	>170 dB	>160 dB	>170 dB
Walrus	470	143	3,960	1,203
Polar bear	8	2	55	16

Unlike polar bears, whose best and maximum density estimates were multiplied by the entire trackline within the Chukchi Sea survey area to estimate exposures, walrus densities were only multiplied by the proposed seismic trackline in water depths less than 200 m in the Chukchi Sea survey area. Walrus are known to occur offshore but generally remain in waters less than 200 m deep and mostly along the pack ice margin where ice concentrations are less than 80 percent (Fay 1982; Fay and Burns 1988). The location of the ice edge has shown a high degree of interannual variation, but is rarely found north of 75° N. Calculating exposures of walrus along the entire southwestern seismic trackline south of 75° N should somewhat overestimate the number of exposures since concentrations of walrus are only likely to be at the proposed densities for a short distance at the margin of the ice pack.

Based on this method, the best and maximum estimates of the numbers of Pacific walrus and polar bears exposures to airgun sounds with received levels greater than or equal to 160 dB re 1 µPa (rms) were obtained using the average and maximum densities described above and are presented in Table 2.

Based upon information supplied by the applicant, the impact of conducting the seismic survey in the Chukchi Sea it is likely to result in the temporary modification in behavior (Level B Harassment) of up to 143 Pacific walrus and 2 polar bears. The walrus may be exposed to airgun sounds at received levels greater than or equal to 160 dB re 1 µPa (rms) during the seismic survey. It is probable that only a small percentage of those would actually be disturbed.

For polar bears that may be encountered during the survey, almost all of these are expected to be on the ice, and therefore unaffected by underwater sound from the airguns. For the few bears that are in the water, levels of airgun and sonar sound would be attenuated because polar bears generally do not dive much below the surface. Bears on the ice may be impacted by short-term displacements as the vessel traverses the area near the bear.

In addition, we note that the coring project activities to be conducted to the north of the Chukchi Sea in the Arctic Ocean will cause no take of Pacific walrus because no walrus will be encountered that far north. There is a possibility that a few individual polar bears will be encountered; however, any potential disturbance would be limited to temporary behavior changes and does not affect the take estimate for polar bear.

Although current population estimates for the Pacific walrus population and Chukchi Sea polar bear stocks are not available, the best available information indicates that the number of potentially affected animals is small. Furthermore, any impacts to individuals are expected to be relatively short term in duration, are anticipated to be minor behavioral reactions, and are not expected to impact animal health or reproduction.

In 2005, the Healy conducted similar research that began in the same region, but continued across the Arctic Basin to Norway (Haley and Ireland 2006). During the 2005 cruise, seven live walrus were encountered in the Bering Sea. No walrus were encountered in the northern Chukchi Sea (B. Haley, LGL Alaska Research Associates, Inc., pers. comm.). In addition, a total of 24 polar

bears were visually recorded and the Service considers all observations to be takes. Three separate groups consisting of 5 bears were observed north of the Alaska coast between 74° and 79° N latitude. These bears were most likely from the southern Beaufort Sea or Chukchi/Bering Seas polar bear stocks. The remainder of the bears were observed near Svalbard and Franz Joseph Land. These bears most likely belonged to the Svalbard and Franz Joseph-Novaya Zemlya polar bear stocks. The takes for both species during the 2005 cruise through the Chukchi Sea appeared to be limited to Level B harassment of a relatively small number of animals and of relatively a short-term duration.

Potential Effects on Habitat

The proposed airgun operations will not result in any permanent impact on habitats used by Pacific walrus or polar bears, or to the food sources they utilize. The main impact associated with the proposed activities will be temporarily elevated noise levels and the associated direct effects.

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.

In water, acute injury and death of organisms exposed to seismic energy depends primarily on two features of the sound source: (1) The received peak pressure; and (2) the time required for the pressure to rise and decay (Hubbs and Rechnitzer 1952 in Wardle et al. 2001). Generally, the higher the received pressure and the less time it takes for the pressure to rise and decay, the greater the chance of acute pathological effects. Considering the peak pressure and rise/decay time characteristics of seismic airgun arrays used today, the pathological zone for fish and invertebrates would be expected to be within a few meters of the seismic source (Buchanan et al. 2004). For the proposed survey, any injurious effects on fish would be limited to very short distances.

During the seismic study only a small fraction of the available habitat would be ensonified at any given time. Disturbance to benthic invertebrates, fish, and marine mammals would be short term, and they would return to their pre-disturbance behavior once the seismic activity passes or otherwise ceases. Thus, the proposed survey would have little effect on these prey items and, therefore, little, if any, impact on the abilities of walrus and polar bears to feed in the area where seismic work is planned. In addition, the proposed activity is not expected to have any habitat-related effects that could cause significant or long-term consequences for prey species or for individual walrus or polar bears or their populations, since operations at any one location will be limited in duration.

Potential Impacts on Subsistence Needs

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

Pacific walrus and polar bear are legally hunted in the Chukchi Sea by coastal Alaska Natives. For thousands of years, hunting has been an important source of food and raw materials for equipment and handicrafts. Today, hunting remains an important part of the culture and economy of many coastal villages in Alaska. Rural communities in the vicinity of the proposed Chukchi Sea seismic survey area include Point Hope, Point Lay, Wainwright, and Barrow.

Any activity that displaces Pacific walrus beyond the range of coastal hunters has the potential to adversely impact subsistence harvests in these communities. Walrus hunting may occur anywhere along the Chukchi Sea coastline from Cape Lisburne to Point Barrow. Walrus hunting by these communities is generally limited to conditions when sea ice occurs within the range of small hunting boats, typically less than 48 km (30 mi) from shore.

Point Hope hunters typically begin their hunt in late May and June as walrus migrate north. The sea ice is usually well off shore of Point Hope by July and does not bring animals back into the range of hunters until late August and September. Between 2000 and 2004, the average annual reported harvest at Point Hope was 11 animals per year.

Walrus hunting in Point Lay occurs primarily in July. Point Lay hunters reported an average of six walrus per year between 2000 and 2004.

Wainwright residents hunt walrus from June through August as the ice retreats northward. Walrus are plentiful in the pack ice near the village this time of year. Wainwright hunters have consistently harvested more walrus than other subsistence communities; the village averaged 62 animals per year for 2000 through 2004.

In Barrow, most walrus hunting occurs from June through September, peaking in August, when the land-fast ice breaks up and hunters can access the walrus by boat as they migrate north on the retreating pack ice. The average annual walrus harvest for Barrow from 2000 to 2004 was 32 animals.

Although it is possible that accessibility to walrus for subsistence harvest could be impacted during the seismic surveys, it is unlikely. The majority of Pacific walrus are taken less than 48 km (30 mi) from shore, and the Healy will conduct its survey operations significantly farther offshore, *i.e.*, approximately 150 km (93 mi) to 200 km (124 mi) offshore. In addition, the applicant will implement necessary mitigation measures as described above to further minimize or avoid any potential impact.

Depending upon ice conditions, the subsistence harvest of polar bears can occur year-round in the northern Chukchi Sea villages, with peaks in the spring and winter. The period with the lowest harvest of bears occurs in June and July. Hunting success varies considerably from year to year because of variable ice and weather conditions.

For Point Hope, the average annual reported harvest between 2000 and 2004 was eight polar bears. The average for Point Lay during this same time period was less than one bear per year. In Wainwright, the average was four bears per year from 2000 through 2004. And, in Barrow, the average annual polar bear harvest from 2000 to 2004 was 16 animals.

Disruption of polar bear subsistence hunting is not expected because the timing of polar bear hunting occurs primarily during the winter and spring when pack ice is present nearshore and the seismic surveys will take place during the summer and fall open-water seasons. Furthermore, the applicant will implement necessary mitigation measures as described above to insure any potential impact is minimized or avoided.

The harvest information provided for Pacific walrus and polar bears is based on reports provided through the Service's Marking, Tagging, and Reporting Program. Harvest data for 2005 is not presently available. Harvest totals are not corrected for struck and lost animals.

Basis for Findings

Negligible Impact on Species

The Service has determined that the seismic survey in the Chukchi Sea will cause a temporary modification in behavior of small numbers of Pacific walrus and polar bears. Based upon information supplied by the applicant, the seismic survey in the Chukchi Sea could potentially result in the temporary modification in behavior of up to 143 Pacific walrus and 2 polar bears. Any impacts to individuals are expected to be limited to Level B harassment and short term in duration. The potential for temporary or permanent hearing impairment is very low and any potential for hearing impairment will be avoided through the incorporation of the proposed mitigation measures mentioned in this document. We also considered the sediment coring projects potential effect on walrus and polar bears in making the negligible impact finding. Because the coring project will not affect the estimated take of the overall survey, it does not affect the negligible impact finding. No take by injury or death is anticipated. The Service finds that the anticipated harassment caused by the proposed activities are not expected to adversely affect the species or stock through effects on annual rate of recruitment or survival and, therefore, will have a negligible impact on Pacific walrus and polar bears.

Our finding of negligible impact is based on the total level of activity proposed by UTIG and the Service's analysis of the effects of all activities. In making this finding, we considered the following: (1) The distribution of the species; (2) the biological characteristics of the species; (3) the nature of seismic survey program; (4) the potential effects of seismic activities on the species; (5) the documented impacts of seismic activities on the species; and (6) the mitigation measures that will be conditions of the authorization.

Although Pacific walrus are expected to occur in the area of the proposed seismic surveys, the surveys would not be concentrated in any location for extended periods. Most of the proposed activities would occur in areas of open water where walrus densities are expected to be relatively low. In addition, mitigation measures will be followed when walrus are observed within the safety radius.

The number of polar bears present in the open water of the Chukchi Sea during the time of the seismic surveys will also be minimal. Individual polar bears may be observed in the open water during seismic activities, but the majority of the population will be found on the pack ice during this time of year. If polar bears are observed in the area prior to, or even during, seismic surveys, appropriate mitigation measures will be followed.

Based on our review of these factors, we conclude that, while incidental harassment of polar bears and walrus is reasonably likely to or reasonably expected to occur as a result of proposed seismic surveys, the overall impact would be negligible on polar bear and Pacific walrus populations. In addition, we find that any takes are likely to be limited to Level B harassment of a relatively small number of animals and of relatively a short-term duration. Furthermore, we do not expect the anticipated level of harassment from these proposed activities to affect the rates of recruitment or survival of Pacific walrus and polar bear populations.

While the actual number of incidental harassment takes will depend on the distribution and abundance of Pacific walrus and polar bears in the vicinity of the survey activity, the number of harassment takings will be small. Furthermore, the previously mentioned mitigation measures that will be implemented by the applicant insures these measures will provide additional means of effecting the least level practicable impact on Pacific walrus and polar bears.

Impact on Subsistence

Based on the results of harvest data, including affected villages, the number of animals harvested, the season of the harvests, and the location of hunting areas, we find that the anticipated harassment caused by the proposed seismic surveys will not have an unmitigable adverse impact on the availability of Pacific walrus and polar bears for taking for subsistence uses during the period of the activities. In making this finding, we considered the following: (1) Records on subsistence harvest from the Service's Marking, Tagging, and Reporting Program (historical data regarding the timing and location of harvests); (2) anticipated effects of UTIG's proposed activities on subsistence hunting; (3) development of Plans of Cooperation between the applicants and affected Native communities, as appropriate; (4) reliance on an Alaska Native to serve as a liaison with subsistence users encountered at sea; and (5) and suspending air gun operations when the Healy's trackline is less than 5 km (3 miles) from ongoing subsistence hunting or fishing activities.

Most subsistence walrus hunting occurs less than 48 km (30 mi) from shore. Although walrus hunters may encounter vessels and aircraft in open-water areas, these interactions are expected to be limited in area and duration and are not expected to affect overall hunting success.

Only a small fraction of the polar bear harvest occurs during the open-water season. In addition, most polar bears are harvested outside of the area that would be covered by this authorization. Because the polar bear is hunted almost entirely during the ice-covered season, it is unlikely that open-water seismic activities would have any effect on the harvest of that species.

In addition, helicopter operations will occur far offshore where the seismic operations take place in the ice-pack. Thus any reaction of walrus or polar bears to the helicopter operations will have no effect on their availability for subsistence. These helicopter operations will be conducted in a manner that will minimize effects on walrus and polar bears.

Finally, UTIG will develop a POC for the proposed 2006 seismic survey in the Chukchi Sea, as appropriate, in consultation with representatives of communities along the Chukchi Sea coast including Point Hope, Point Lay, Wainwright, and Barrow.

Monitoring

The UTIG will conduct marine mammal monitoring during the seismic surveys, in order to implement the mitigation measures that require real-time monitoring, and to satisfy monitoring called for under the MMPA.

Vessel-based observers will monitor Pacific walrus and polar bears near the seismic source vessel during all seismic operations. There will be little or no darkness during this cruise. Airgun operations will be shut-down when Pacific walrus or polar bears are observed within, or about to enter, designated safety radii. Vessel-based observers will also watch for Pacific walrus and polar bears near the seismic vessel for at least 30 minutes prior to the planned start of airgun operations after an extended shut-down of the airgun. When feasible, observations will also be made during daytime periods without seismic operations (e.g., during transits and during coring operations).

During seismic operations in the Chukchi Sea, four observers will be based aboard the vessel. These observers will be appointed by UTIG with Service concurrence. An Alaska native resident knowledgeable about the mammals and fish of the area is expected to be included as one of the team of observers

aboard the Healy. At least one observer, and when practical, two observers, will monitor Pacific walrus and polar bears near the seismic vessel during ongoing operations and nighttime startups (if darkness is encountered in late August). Observers will normally be on duty in shifts of duration no longer than 4 hours. The USCG crew will also be instructed to assist in detecting Pacific walrus and polar bears and implementing mitigation requirements (if practical). The necessary instructions will be provided to the crew prior to the start of the seismic survey.

The Healy is a suitable platform for marine mammal observations. When stationed on the flying bridge, the eye level will be approximately 27.7 m (91 ft) above sea level, and the observer will have an unobstructed view around the entire vessel. If surveying from the bridge, the observer's eye level will be 19.5 m (64 ft) above sea level and approximately 25° of the view will be partially obstructed directly to the stern by the stack (Haley and Ireland 2006). The observers 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. During any periods of darkness (minimal, if at all, in this cruise), NVDs will be available (ITT F500 Series Generation 3 binocular-image intensifier or equivalent), if and when required. The survey will take place at high latitude in the summer when there will be continuous daylight, but night (darkness) is likely to be encountered briefly at the southernmost extent of the survey in late August. Laser rangefinding binoculars (Leica LRF 1200 laser rangefinder or equivalent) will be available to assist with distance estimation; these are useful in training observers to estimate distances visually, but are generally not useful in measuring distances to animals directly.

When walrus or polar bears are detected within, or are about to enter, the designated safety radius, the airgun(s) will be powered down or shut-down immediately. To assure prompt implementation of shut-downs, additional channels of communication between the observers and the airgun technicians will be established. During power-downs and shut-downs, the observers will continue to maintain watch to determine when the animal(s) are outside the safety radius. Airgun operations will not resume until the animal is outside the safety radius. The animal will be considered to have cleared the safety radius if it is visually observed to have left the safety radius, or if it has not been seen within the radius for 15 minutes.

All observations and airgun power 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 or shut-down).

(2) Information needed to estimate the number of Pacific walrus and polar bears potentially taken by harassment, which must be reported to FWS.

(3) Data on the occurrence, distribution, and activities of Pacific walrus and polar bears in the area where the seismic study is conducted.

(4) Information to compare the distance and distribution of Pacific walrus and polar bears relative to the source vessel at times with and without seismic activity.

(5) Data on the behavior and movement patterns of Pacific walrus and polar bears seen at times with and without seismic activity.

Development and participation in a cooperative research program is not a requirement for obtaining an IHA. However, the Service encourages research of walrus and polar bear, such as projects funded and supported by the National Fish and Wildlife Foundation. The UTIG stated it will coordinate the planned marine mammal monitoring program associated with the seismic survey in the Chukchi Sea with other parties that may have interest in this area and/or be conducting marine mammal studies in the same region during operations. This type of coordination could provide additional insight into the relationship between seismic activities and the basic biological requirements of the two species of concern. The UTIG will also coordinate with other applicable Federal, State, and Borough agencies, and will comply with their requirements.

Reporting

Polar bear and walrus observation forms will be provided by the Service to the applicant. Any walrus or polar bear sighting that occurs during the seismic surveys must be submitted to the Service within 24 hours of the animal sighting or as soon as practicable. A report must be submitted to the Service within 90 days after the end of the cruise. The report will describe the operations that were conducted and the walrus and polar bears that were detected near the operations. The report will be submitted to the Service, 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 walrus and polar bear sightings (dates, times, locations, activities, associated seismic survey activities). The report will also include estimates of the level and type of take, numbers of walrus and polar bears observed, direction of movement of observed individuals, and any observed changes or modifications in behavior or travel direction resulting from the seismic surveys.

Proposed Authorization

The Service proposes to issue an IHA for small numbers of Pacific walrus and polar bears harassed incidentally by UTIG while conducting marine seismic surveys in the Arctic Ocean from July 15 through August 25, 2006. The purpose of the surveys is to collect seismic reflection and refraction data in the western Amerasia Basin in the Arctic Ocean. The final IHA would incorporate the mitigation, monitoring, and reporting requirements discussed in this proposal. The UTIG will be responsible for following those requirements. All activities would be conducted during the 2006 open-water season. Authorization for the seismic surveys would be for approximately 40 days. These authorizations do not allow the intentional taking of polar bear or Pacific walrus.

If the level of activity exceeds that described by the UTIG, or the level or nature of take exceeds those projected here, the Service would reevaluate its findings. The Secretary may modify, suspend, or revoke an authorization if the findings are not accurate or the conditions described herein are not being met.

Endangered Species Act

The Service has determined that no species under its jurisdiction listed as threatened or endangered under the Endangered Species Act of 1973, as amended, would be affected by issuing an IHA under section 101(a)(5)(D) of the MMPA to the applicants for the proposed open-water seismic surveys.

National Environmental Policy Act (NEPA)

The applicant provided a *Draft Environmental Assessment (EA) of a Marine Geophysical Survey by the USCG Healy of the Western Canada Basin, Chukchi Borderland and Mendeleev Ridge, Arctic Ocean, July-August 2006,* prepared by LGL Alaska Research Associates, Inc. of Anchorage, Alaska and LGL Ltd., environmental research associates of King City, Ontario dated March 1, 2006. The Service has adopted this draft EA as the foundation of the Service's EA and finds that it meets NEPA standards for analyzing the effects of the issuance of this IHA. For a copy of the EA, contact the individual identified under **FOR FURTHER INFORMATION CONTACT.**

Government-to-Government Relations With Native American Tribal Governments

In accordance with the President's memorandum of April 29, 1994, ''Government-to-Government Relations with Native American Tribal Governments'' (59 FR 22951), Executive Order 13175, Secretarial Order 3225, and the Department of the Interior's manual at 512 DM 2, we readily acknowledge our responsibility to communicate meaningfully with federally recognized Tribes on a Government-to-Government basis. We have evaluated possible effects on federally recognized Alaska Native tribes. Through the POC identified above, applicants will work with the Native Communities most likely to be affected and will take actions to avoid interference with subsistence hunting.

Public Comments Solicited

The Service requests interested persons to submit comments and information concerning this proposed IHA. Consistent with section 101(a)(5)(D)(iii) of the MMPA, we are opening the comment period on this proposed authorization for 30 days (see **DATES**).

Our practice is to make comments, including names and home addresses of respondents, available for public review during regular business hours. Individual respondents may request that we withhold their home address from the record, which we will honor to the extent allowable by law. If you wish us to withhold your name and/or address, you must state that prominently at the beginning of your comment. However, we will not consider anonymous comments. We will make all submissions from organizations or businesses, and from individuals identifying themselves as representatives or officials of organizations or businesses, available for public inspection in their entirety.

Dated: June 15, 2006.

Tom Melius,

Regional Director.

[FR Doc. 06–5589 Filed 6–21–06; 8:45 am]

BILLING CODE 4310–55–P

DEPARTMENT OF THE INTERIOR

Bureau of Indian Affairs

Advisory Board for Exceptional Children

AGENCY: Bureau of Indian Affairs, Interior.

ACTION: Notice of meeting.

SUMMARY: In accordance with the Federal Advisory Committee Act, the Bureau of Indian Affairs is announcing that the Advisory Board for Exceptional Children will hold its next meeting in Denver, Colorado. The purpose of the meeting is to meet the mandates of the Individuals with Disabilities Education Improvement Act of 2004 on Indian children with disabilities.

DATES: The Board will meet on Saturday, July 22, 2006, from 6 p.m. to 9 p.m., Sunday, July 23, 2006, from 8 a.m. to 4 p.m., and Monday July 24, 2006, from 8 a.m. to 4 p.m. Local Time.

ADDRESSES: The meetings will be held at the Marriott Denver Tech Center, 4900 South Syracuse, Denver, Colorado 80237.

Written statements may be submitted to Mr. Thomas M. Dowd, Director, Bureau of Indian Affairs, Office of Indian Education Programs, 1849 C Street, NW., Mail Stop 3609–MIB, Washington, DC 20240; Telephone (202) 208–6123; Fax (202) 208–3312.

FOR FURTHER INFORMATION CONTACT: Lyann Barbero, Acting Supervisor, Education Specialist—Special Education, Bureau of Indian Affairs, Office of Indian Education Programs, Division of Compliance, Monitoring and Accountability, P.O. Box 1088, Suite 332, Albuquerque, New Mexico 87104; Telephone (505) 563–5270.

SUPPLEMENTARY INFORMATION: The Advisory Board was established to advise the Secretary of the Interior, through the Assistant Secretary—Indian Affairs, on the needs of Indian children with disabilities, as mandated by the Individuals with Disabilities Education Improvement Act of 2004 (Pub. L. 108–446).

The following items will be on the agenda:

- State Performance Plan.
- Special Education Supervisor Report.
- Part B allocation.
- Parent Involvement Activities.
- Updates on priority issues.
- Office of Special Education new organizational information.
- Compliance and Monitoring.
- Procedural Safeguards.
- Title Programs.
- Institutionalized Handicapped Program.
- Coordinated Service Plan.
- Update on meeting between State Education Agency and Bureau of Indian Affairs.

The meetings are open to the public. The Advisory Board will accept public comments during a teleconference session.

Dated: June 15, 2006.

Debbie Clark,

Acting Principal Deputy Assistant Secretary—Indian Affairs.

[FR Doc. 06–5581 Filed 6–21–06; 8:45 am]

BILLING CODE 4310–6W–M

DEPARTMENT OF THE INTERIOR

Bureau of Land Management

[WO–310–1310–PB–24 1A; OMB Control Number 1004–0185]

Information Collection Submitted to the Office of Management and Budget Under the Paperwork Reduction Act

The Bureau of Land Management (BLM) has submitted the proposed collection of information listed below to the Office of Management and Budget (OMB) for approval under the provisions of the Paperwork Reduction Act (44 U.S.C. 3501 *et seq.*). On September 20, 2005, the BLM published a notice in the **Federal Register** (70 FR 55160) requesting comments on this proposed collection. The comment period ended on November 21, 2005. The BLM received no comments. You may obtain copies of the proposed collection of information and related forms and explanatory material by contacting the BLM Information Collection Clearance Officer at the telephone number listed below.

The OMB is required to respond to this request within 60 days but may respond after 30 days. For maximum consideration your comments an suggestions on the requirement should be made within 30 days directly to the Office of Management and Budget, Interior Department Desk Officer (1004–0185), at OMB–OIRA via facsimile to (202) 395–6566 or e-mail to *OIRA_DOCKET@omb.eop.gov*. Please