applicable. *See Certain Welded Carbon Steel Pipe and Tube Products from Turkey; Final Results of Countervailing Duty Administrative Review*, 53 FR 9791 (March 25, 1988). The ''all others'' rate shall apply to all non–reviewed companies until a review of a company assigned this rate is requested.

This notice also serves as a reminder to parties subject to administrative protective order (''APO'') of their responsibility concerning the disposition of proprietary information disclosed under APO in accordance with 19 CFR 351.305(a)(3). Timely written notification of the return/destruction of APO materials or conversion to judicial protective order is hereby requested. Failure to comply with the regulations and the terms of an APO is a sanctionable violation.

This administrative review and this notice are issued and published in accordance with section 751(a)(1) and 777(i)(1) of the Act.

Dated: July 25, 2006.

David M. Spooner,

Assistant Secretaryfor Import Administration.

APPENDIX I - ISSUES AND DECISION MEMORANDUM

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[FR Doc. E6–12227 Filed 7–28–06; 8:45 am]

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DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

[I.D. 042606H]

Small Takes of Marine Mammals Incidental to Open-water Seismic Operations in the Chukchi Sea

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

ACTION: Notice; issuance of Incidental Harassment Authorization.

SUMMARY: Notification is hereby given that NMFS has issued an Incidental Harassment Authorization (IHA) to Conoco Phillips Alaska, Inc, (Conoco) to take small numbers of marine mammals, by harassment, incidental to conducting open-water seismic data aquisition in the Chukchi Sea during the summer and fall of 2006.

DATES: The authorization is effective July 7, 2006, through December 31, 2006.

ADDRESSES: Copies of the IHA and the application are available by writing to Michael Payne, Chief, Permits, Conservation, and Education Division, Office of Protected Resources, National Marine Fisheries Service, 1315 East-West Highway, Silver Spring, MD 20910–3225, or by telephoning the contact listed here. A copy of the application containing a list of references used in this document may be obtained by writing to this address, by telephoning the contact listed here (**FOR FURTHER INFORMATION CONTACT**) or online at: *http://www.nmfs.noaa.gov/pr/permits/incidental.htm*. Documents cited in this notice may be viewed, by appointment, during regular business hours, at the aforementioned address.

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

SUPPLEMENTARY INFORMATION:

Background

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

Authorization shall be granted if NMFS finds that the taking will have a negligible impact on the species or stock(s), will not have an unmitigable adverse impact on the availability of the species or stock(s) for subsistence uses, and that the permissible methods of taking and requirements pertaining to the mitigation, monitoring and reporting of such takings are set forth. NMFS has defined ''negligible impact'' in 50 CFR 216.103 as ''...an impact resulting from the specified activity that cannot be reasonably expected to, and is not reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival.''

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

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

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

Summary of Request

On February 2, 2006, NMFS received an application from Conoco for the taking, by harassment, of several species of marine mammals incidental to conducting open-water seismic data acquisition in the Chukchi Sea from July through November, 2006. Seismic surveys such as the one described here provide accurate data on the location, extent, and properties of hydrocarbon

resources as well as information on shallow geologic hazards and seafloor geotechnical properties to explore, develop, produce, and transport hydrocarbons safely, economically, and in an environmentally safe manner. This information is utilized by both the oil and gas industry and the Minerals Management Service (MMS).

Description of the Activity

Conoco seeks an IHA for conducting open-water seismic surveys between July 1 and November 30, 2006. The seismic vessel planned for use is the motor vessel (MV) *Patriot*. Mobilization of operations will occur in mid-July, and seismic operations are scheduled to begin in late July. Open water seismic operations are ordinarily confined to no more than this five-month period because of the timing of ice melt and formation, which typically occurs during a four to five month period. The geographic region of activity encompasses a 2500–3600 km^2–area (965–1390 mi^2–area) in the northeastern Chukchi Sea. The approximate boundaries of the region are within 158°00′ W. and 169°00′ W. longitude and 69°00′ N. and 73°00′ N. latitude with eastern boundary located parallel to the coast of Alaska, north of Point Hope to Point Barrow, and ranging 40–180 km (25–112 mi) off the coast. The nearest approximate point of the project to Point Hope is 74 km (46 mi), Point Lay 90 km (56 mi), Wainwright 40 km (25 mi), and Barrow 48 km (30 mi). Water depths are typically less than 50 m (164 ft).

Conoco anticipates a work schedule of approximately 90–100 days to complete the planned 16,576 km (10,300 mi) of trackline, with about 30–percent downtime due to weather, ice conditions, repairs etc. In addition to the primary activity of the seismic vessel, there will also be support vessels. A supply vessel and a fuel bunkering vessel will be employed to bring supplies to the seismic vessel. The seismic crew will most likely be changed out by helicopter and fixed-wing support may be used to report ice conditions if necessary.

Description of Marine 3–D Seismic Data Acquisition

In the seismic method described here, reflected sound energy produces graphic images of seafloor and sub-seafloor features. The seismic system consists of sources and detectors, the positions of which must be accurately measured at all times. The sound signal comes from arrays of towed energy sources. These energy sources store compressed air which is released on command from the towing vessel. The released air forms a bubble which expands and contracts in a predictable fashion, emitting sound waves as it does so. Individual sources are configured into arrays. These arrays have an output signal which is more desirable than that of a single bubble and also serves to focus the sound output primarily in the downward direction which is useful for the seismic method. This array effect also minimizes the sound emitted in the horizontal direction.

The downward propagating sound travels to the seafloor and into the geologic strata below the seafloor. Changes in the acoustic properties between the various rock layers result in a portion of the sound being reflected back toward the surface at each layer. This reflected energy is received by detectors called hydrophones, which are housed within submerged streamer cables (4 to 4.5–km long (2.5 to 2.8–mi long)) which are towed behind the seismic vessel. Data from these hydrophones are recorded to produce seismic records or profiles. Seismic profiles often resemble geologic cross-sections along the course traveled by the survey vessel.

Vessel and Seismic Source Specifications

The MV *Patriot* is owned by Western Geco. The MV *Patriot* has a length of 78 m (256 ft), a beam of 17 m (56 ft), a maximum draft of 5.9 m (19.4 ft), and 3586 gross tonnage. During seismic operations, the MV *Patriot* typically travels at 4–5 knots (7.4–9.2 km/hr). The MV *Patriot*'s average speed when not using seismic is 12 – 15 knots (22 – 28 km/hr).

The energy source for the planned activity will be air gun array systems towed behind the vessel. There will be six to eight cables approximately 4 km (2.5 mi) in length spaced 100 m (328 ft) apart. Each source array consists of identically tuned Bolt gun sub-arrays operating at 2000 pounds per square inch (psi) air pressure operating about 8 m (26 ft) below the surface. The dominant frequency components are in the range of 5–70 Hz, the source level at those frequencies is about 209 dB, and the pulse length is 50 ms. The arrays will fire on interleaved 50–meter (164–ft) intervals (i.e., approximately every 15 seconds) and they are designed to focus energy in the downward direction. The proposal is to have two air-gun arrays, each approximately 1695–in^3 size (27,776–cm^3)(and spaced approximately 50 m (164 ft) apart). Together the two arrays will total approximately 3390^3 in (55,552–cm^3). The airgun array will fire approximately every 25 m (82 ft) as the vessel is traveling at 4 to 5 knots (7.4–9.2 km/hr). The sub-array is composed of six tuning elements; two 2–gun clusters and four single guns. The clusters have their component guns arranged in a fixed side-by-side fashion with the distance between the gun ports set to maximize the bubble suppression effects of clustered guns. A near-field hydrophone is mounted about 1 meter (3.28 ft) above each gun station (one phone is used per cluster), one depth transducer per position is mounted on the gun's ultrabox, and a high pressure transducer is mounted at the aft end of the sub-array to monitor high pressure air supply. All the data from these sensors are transmitted to the vessel for input into the onboard systems and recording to tape. See Appendix A of the application for additional information on the array configuration.

Conoco will also operate two additional pieces of equipment throughout the planned study that emit sound at a frequency at or near that which a marine mammal could hear. The Simrad EA500 echo-sounder operates at 200 kHz, the maximum output is 185 dB re 1 µPa @ 1m, and the beam is directed downwards and can be up to 33° wide. The Sonardyne SIPS–2 acoustic positioning system operates at 55–110 kHz, the maximum output is 183 dB re 1 Pa @ 1m, and the beam is omnidirectional.

Characteristics of Airgun Pulses

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

Description of Marine Mammals and Habitat Affected by the Activity

A description of the Beaufort and Chukchi sea ecosystems and their associated marine mammals can be found in several documents (Corps of Engineers, 1999; NMFS, 1999; MMS, 2006, 1996 and 1992), though NMFS notes that there are some data gaps regarding abundance and distribution of marine mammals in the Chukchi Sea (as noted in NMFS' Finding of No Significant Impact (FONSI)). MMS' Programmatic Environmental Assessment (PEA) - Arctic Ocean Outer Continental Shelf Seismic Surveys - 2006 may be viewed at: *http://www.mms.gov/alaska/*.

Marine Mammals

A total of five cetacean species (bowhead, beluga, killer, gray, and

minke whales) and four pinniped species (ringed, bearded, spotted seals, and ribbon seals) are known to occur in the project area. The Alaska Eskimo Whaling Commission (AEWC) submitted a comment during the public comment period indicating that ribbon seals are occasionally seen in the Chukchi Sea at the time of year the seismic surveys are scheduled (they were not mentioned in the proposed IHA). However, little information is known about the abundance and distribution of this species during late summer and fall, local biologists present at the Open-water peer-review meeting in May did not raise concerns regarding this species, and NMFS believes that harassment of this species is unlikely (and authorization for this species unnecessary). Both minke whales and killer whales are very uncommon in the area and are not expected to be encountered during the seismic survey. One of the species, the bowhead whale, is listed as endangered under the Endangered Species Act (ESA). Polar bears and the Pacific walrus also occur in the project area, but the U.S. Fish and Wildlife Service is responsible for both of these species and is conducting a separate process under the MMPA. Therefore, they are not discussed further in this document.

Table 1 includes estimated abundances and densities for the species expected to be potentially encountered during Conoco's seismic surveys. Abundance and density information for bowhead, gray, and beluga whales are based on the estimates provided in LGL's Healy Arctic Cruise Application (2005). In the Conoco application, ringed seal density was based on Bengston *et al.*'s (2005) estimates of density in the Chukchi Sea recorded in 1999 and 2000. Also in the Conoco application, bearded seal densities were obtained by adjusting the density for ringed seals based on the ratio of bearded to ringed seals observed during surveys in the Chukchi Sea by Brueggerman *et al.* (1990, 1991). Both the bearded and ringed seal densities are likely high, since Bengston *et al.* (2005) surveys included an area south of the project area, where they reported ringed and bearded seal densities were considerablye higher than north of Point Hope, which corresponds to the seismic project area. Accordingly, NMFS also provides the densities estimated by LGL (2005) for comparison. Additional information regarding the distribution of these species and how the estimated densities were calculated may be found in Conoco's application and NMFS' Updated Species Reports at: (*http://www.nmfs.noaa.gov/pr/readingrm/MMSARS/2005alaskasummarySARs.pdf).*

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Table 1. Estimated local abundance and density of marine mammals potentially encountered during Conoco's survey. *Estimated take column indicates estimated number of animals that may be exposed to 160 dB during the proposed survey. **The far right column is the estimated take divided by the abundance in the third column. Note that for ringed seals the population extends throughout the Arctic and the abundance here is based only on a survey of the eastern Chukchi (so the percent is an overestimate, and additionally, ringed seals are far denser near shore/ice than in open water).

Species		Abundance	Density	Estimated Take* (w/o mitigation)	Percent of Local Abundance**
Bowhead Whale	*Balaena mysticetus*	10,545	0.0064	399 - 418	3.8 - 4
Beluga Whale	*Delphinapterus leucas*	42,968	0.0034	347 - 361	0.76 - 0.8
Gray Whale	*Eschrichtius robustus*	18,813	0.0045	460 - 481	2.47 - 2.6
Killer Whale	*Orcinus orca*	> 100	N/A	0	0.0
Minke Whale	*Balaenoptera acutorostrata*	No est. available	N/A	0	0.0
Ringed Seal	*Phoca hispida*	> 249,000	0.25 - 0.53	54120 - 56458	10.2 - 22.7
Bearded Seal	*Erignathus barbatus*	250,000-300,000	0.01 - 0.24	24509 - 25567	0.48 - 9.3
Spotted Seal	*Phoca largha*	59,214	0.0001	10	0.019 - 0.2

Potential Effects on Marine Mammals

Summary of Potential Effects of Airgun Sounds on Marine Mammals

Disturbance by seismic noise is the principal means of taking by this activity. Support vessels and aircraft may provide a potential secondary source of noise. The physical presence of vessels and aircraft could also lead to non-acoustic effects on marine mammals involving visual or other cues. NMFS does not expect any takings to result from operations of the other sound sources discussed (echosounder and acoustic positioning system). For the echosounder , produced sounds are beamed downward, the beam is narrow, the pulses are extremely short, and the sound source is relatively low, and with the acoustic postioning system, the beam is spherical, but the sound source is relatively low. Additionally, in the case of both of these pieces of equipment, the small area ensonified to a level that could potentially disturb marine mammals is entirely subsumed by the louder levels of airgun noise (which will also be running when these equipment are used.)

As outlined in previous NMFS documents, the effects of noise on marine mammals are highly variable, and can be categorized as follows (based on Richardson *et al.*, 1995):

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

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

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

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

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

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

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

Effects of Seismic Surveys on Marine Mammals

NMFS anticipates that the effects of Conoco's seismic surveys on marine mammals will primarily consist of behavioral disturbance, masking (the animals cannot hear the other sounds around them as well while the seismic noise is present), TTS (temporary damage to the auditory tissues), and low-level physiological effects.

When the received levels of noise exceed some behavioral reaction threshold, cetaceans will show disturbance reactions. The levels, frequencies, and types of noise that will elicit a response vary between and within species, individuals, context, locations, and seasons. Behavioral changes may be subtle alterations in surface, respiration, and dive cycles. More conspicuous responses include changes in activity or aerial displays, movement away from the sound source, or complete avoidance of the area. The reaction threshold and degree of response are related to the activity of the animal at the time of the disturbance. Whales engaged in active behaviors, such as feeding, socializing, or mating, may be less likely than resting animals to show overt behavioral reactions, unless the disturbance is directly threatening.

Although NMFS believes that some limited masking of low-frequency sounds (e.g., whale calls) is a possibility during seismic surveys, the intermittent nature of seismic source pulses (1 second in duration every 16 to 24 seconds, less than 7 percent)) will limit the extent of masking. Bowhead whales are known to continue calling in the presence of seismic survey sounds, and their calls can be heard between seismic pulses (Greene *et al.*, 1999, Richardson *et al.*, 1986). Masking effects are expected to be absent in the case of belugas, given that sounds important to them are predominantly at much higher frequencies than are airgun sounds (Western Geophysical, 2000).

Hearing damage is not expected to occur during the Conoco seismic survey project. It is not positively known whether the hearing systems of marine mammals very close to an airgun would be at risk of temporary or permanent hearing impairment, but TTS is a theoretical possibility for animals within a few hundred meters of the source (Richardson *et al.*, 1995). However, planned monitoring and mitigation measures (described later in this document) are designed to avoid sudden onsets of seismic pulses at full power, to detect marine mammals occurring near the array, and to avoid exposing them to sound pulses that have any possibility of causing hearing impairment. Moreover, as mentioned previously, bowhead whales avoid an area many kilometers in radius around ongoing seismic operations, which makes hearing damage highly unlikely.

Reported species-specific responses of the marine mammals likely to be encountered in the survey area to seismic pulses are discussed later in this section. Masking, TTS, and behavioral disturbance as a result of exposure to low frequency sounds have been discussed in detail in other NMFS documents (70 FR 47797), as well as the 2006 MMS PEA.

In addition to TTS, exposure to intense seismic sounds is likely to result in other physiological changes that have other consequences for the health and ecological fitness of marine mammals. There is mounting evidence that wild animals respond to human disturbance in the same way that they respond to predators (Beale and Monaghan, 2004; Frid, 2003; Frid and Dill, 2002; Gill *et al.*, 2000; Gill and Sutherland, 2001; Harrington and Veitch, 1992; Lima, 1998; Romero, 2004). These responses manifest themselves as interruptions of essential behavioral or physiological events, alteration of an animal's time or energy budget, or stress responses in which an animal perceives human activity as a potential threat and undergoes physiological changes to prepare for a flight or fight response or more serious physiological changes with chronic exposure to stressors (Frid and Dill, 2002; Romero, 2004; Sapolsky *et al.*, 2000; Walker *et al.*, 2005).

Classic stress responses begin when an animal's central nervous system perceives a potential threat to its homeostasis. That perception triggers stress responses regardless of whether a stimulus actually threatens the animal; the mere perception of a threat is sufficient to trigger a stress response (Sapolsky *et al.*, 2005; Seyle, 1950). Once an animal's central nervous system perceives a threat, it develops a biological response or defense that consists of a combination of the four general biological defense responses: behavioral responses, autonomic nervous system responses, neuroendocrine responses, or immune response.

The physiological mechanisms behind stress responses involving the hypothalamus-pituitary-adrenal glands have been well-established through controlled experiment in the laboratory and natural settings (Korte *et al.*, 2005; McEwen and Seeman, 2000; Moberg, 1985; 2000; Sapolsky *et al.*, 2005). Relationships between these physiological processes, animal behavior, neuroendocrine responses, immune responses, inhibition of reproduction (by suppression of pre-ovulatory luteinizing hormones), and the costs of stress responses have also been documented through controlled experiment in both laboratory and free-living animals (for examples see, Holberton *et al.*, 1996; Hood *et al.*, 1998; Jessop *et al.*, 2003; Krausman *et al.*, 2004; Lankford *et al.*, 2005; Reneerkens *et al.*, 2002; Thompson and Hamer, 2000; Tilbrook *et al.*, 2000).

The available evidence suggests that: with the exception of unrelieved pain or extreme environmental conditions, in most animals (including humans) chronic stress results from exposure to a series of acute stressors whose cumulative biotic costs produce a pathological or pre-pathological state in an animal. The biotic costs can result from exposure to an acute stressor or from the accumulation of a series of different stressors acting in concert before the animal has a chance to recover.

Although few of these responses have been explicitly identified in marine mammals, they have been identified in

other vertebrate animals and every vertebrate mammal that has been studied, including humans. Because of the physiological similarities between marine mammals and other mammal species, NMFS believes that acoustic energy sufficient to trigger onset TTS is likely to initiate physiological stress responses. More importantly, NMFS believes that marine mammals might experience stress responses at received levels lower than those necessary to trigger onset TTS, and that some of these stress responses rise to the level of Harassment.

The following species summaries are provided by NMFS to facilitate understanding of our knowledge of impulsive noise impacts on the principal marine mammal species that are expected to be affected.

Bowhead Whales

Seismic pulses are known to cause strong avoidance reactions by many of the bowhead whales occurring within a distance of a few kilometers, including changes in surfacing, respiration and dive cycles, and may sometimes cause avoidance or other changes in bowhead behavior at considerably greater distances (Richardson *et al.*, 1995; Rexford, 1996; MMS, 1997). Studies conducted prior to 1996 (Reeves *et al.*, 1984, Fraker *et al.*, 1985, Richardson *et al.*, 1986, Ljungblad *et al.*, 1988) have reported that, when an operating seismic vessel approaches within a few kilometers, most bowhead whales exhibit strong avoidance behavior and changes in surfacing, respiration, and dive cycles. In these studies, bowheads exposed to seismic pulses from vessels more than 7.5 km (4.7 mi) away rarely showed observable avoidance of the vessel, but their surface, respiration, and dive cycles appeared altered in a manner similar to that observed in whales exposed at a closer distance (Western Geophysical, 2000). In three studies of bowhead whales and one of gray whales during this period, surfacing-dive cycles were unusually rapid in the presence of seismic noise, with fewer breaths per surfacing and longer intervals between breaths (Richardson *et al.*,1986; Koski and Johnson,1987; Ljungblad *et al.*,1988; Malme *et al.*,1988). This pattern of subtle effects was evident among bowheads 6 km (3mi) to at least 73 km (3.7 to 45.3 mi) from seismic vessels. However, in the pre–1996 studies, active avoidance usually was not apparent unless the seismic vessel was closer than about 6 to 8 km (3.7 to 5.0 mi)(Western Geophysical, 2000).

Conoco's seismic survey will occur during a time when bowhead whales are migrating west from Canada back across the North Slope of Alaska. Results from the 1996–1998 BP and Western Geophysical seismic program monitoring in the Beaufort Sea indicate that most migrating bowheads deflected seaward to avoid an area within about 20 km (12.4 mi) of an active nearshore seismic operation, with the exception of a few closer sightings when there was an island or very shallow water between the seismic operations and the whales (Miller *et al.*, 1998, 1999). The available data do not provide an unequivocal estimate of the distance at which approaching bowheads begin to deflect, but this may be on the order of 35 km (21.7 mi). It is also uncertain how far beyond (west of) the seismic operation the seaward deflection persists (Miller *et al.*, 1999). Although very few bowheads approached within 20 km (12.4 mi) of the operating seismic vessel, the number of bowheads sighted within that area returned to normal within 12–24 hours after the airgun operations ended (Miller *et al.*,1999).

Inupiat whalers believe that migrating bowheads are sometimes displaced at distances considerably greater than suggested by pre–1996 scientific studies (Rexford, 1996) previously mentioned in this document. Also, whalers believe that avoidance effects can extend out to distances on the order of 30 miles (48.3 km), and that bowheads exposed to seismic also are ''skittish'' and more difficult to approach. The ''skittish'' behavior may be related to the observed subtle changes in the behavior of bowheads exposed to seismic pulses from distant seismic vessels (Richardson *et al.*, 1986).

Gray Whales

The reactions of gray whales to seismic pulses are similar to those documented for bowheads during the 1980s. Migrating gray whales along the California coast were noted to slow their speed of swimming, turn away from seismic noise sources, and increase their respiration rates. Malme *et al.* (1983, 1984, 1988) concluded that approximately 50 percent of the migrating gray whales showed avoidance when the average received pulse level was 170 dB (re 1 µPa). By some behavioral measures, clear effects were evident at average pulse levels of 160 dB or greater; less consistent results were suspected at levels of 140–160 dB. Recent research on migrating gray whales showed responses similar to those observed in the earlier research when the source was moored in the migration corridor 2 km (1.2 mi) from shore. However, when the source was placed offshore (4 km (2.5 mi) from shore) of the migration corridor, the avoidance response was not evident on track plots (Tyack and Clark, 1998).

Beluga

The beluga is the only species of toothed whale (odontocete) expected to be encountered in the Beaufort Sea. Belugas have poor hearing thresholds at frequencies below 200 Hz, where most of the energy from airgun arrays is concentrated. Their thresholds at these frequencies (as measured in a captive situation), are 125 dB re 1 µPa or more depending upon frequency (Johnson *et al.*, 1989). Although not expected to be significantly affected by the noise, given the high source levels of seismic pulses, airgun sounds sometimes may be audible to belugas at distances of 100 km (62.1 mi) (Richardson and Wursig, 1997), and perhaps further if actual low-frequency hearing thresholds in the open sea are better than those measured in captivity (Western Geophysical, 2000). The reaction distance for belugas, although presently unknown, is expected to be less than that for bowheads, given the presumed poorer sensitivity of belugas than that of bowheads for low-frequency sounds.

As noted in the MMS PEA, effects on the immune system from seismic pulses have been documented by Romano *et al.* (2004). They summarized that ''anthropogenic sound is a potential ''stressor'' for marine mammals. Not only can loud or persistent noise impact the auditory system of cetaceans, it may impact health by bringing about changes in immune function, as has been shown in other mammals'' These authors identified neural immune measurements that may be ''implicated as indicates of stress in a beluga and bottlenose dolphin that were either released acutely or changed over time during experimental period.'' Specifically, they found significant increases in aldosterone and a significant decrease in monocytes in a bottlenose dolphin after exposure to single impulsive sounds (up to 200 kiloPascals (kPa)) from a seismic water gun. Neural-immune changes following exposure to single pure tones (up to 201 dB re 1 µPa) resembling sonar pings were minimal, but changes were observed over time. A beluga whale exposed to single underwater impulses produced by a seismic water gun had significantly higher norepinephrine, dopamine and epinephrine levels after high-level sound exposure (>100 kPa) as compared with low-level exposures (<100kPa) or controls and increased with increasing sound levels.

Ringed, Spotted and Bearded Seals

No detailed studies of reactions by seals to noise from open water seismic exploration have been published (Richardson *et al.*, 1995). However, there are some data on the reactions of seals to various types of impulsive sounds (LGL and Greeneridge, 1997, 1998, 1999a; J. Parsons as quoted in Greene, *et al.*, 1985; Anon., 1975; Mate and Harvey, 1985). These studies indicate that ice seals typically either tolerate or habituate to seismic noise produced from open water sources.

Underwater audiograms have been obtained using behavioral methods for three species of phocinid seals, ringed, harbor, and harp seals (*Pagophilus groenlandicus*). These audiograms were reviewed in Richardson *et al.* (1995) and Kastak and Schusterman (1998). Below 30–50 kHz, the hearing threshold of phocinids is essentially flat, down to at least 1 kHz, and ranges between 60 and 85 dB (re 1 µPa @ 1 m). There are few data on hearing sensitivity of phocinid seals below 1 kHz. NMFS considers harbor seals to have a hearing threshold of 70–85 dB at 1 kHz (60 FR 53753, October 17, 1995), and recent measurements for a harbor seal indicate that, below 1 kHz, its thresholds deteriorate gradually to 97 dB (re 1 µPa @ 1 m) at 100 Hz (Kastak and Schusterman, 1998).

While no detailed studies of reactions of seals from open-water seismic exploration have been published (Richardson *et al.*, 1991, 1995), some data are available on the reactions of seals to various types of impulsive sounds (see LGL and Greeneridge, 1997, 1998, 1999a; Thompson *et al.*, 1998). These references indicate that it is unlikely that pinnipeds would be harassed or injured by low frequency sounds from a seismic source unless they were within relatively close proximity of the seismic array. For permanent injury, pinnipeds would likely need to remain in the high-noise field for extended periods of time. Existing evidence also suggests that, while seals may be capable of hearing sounds from seismic arrays, they appear to tolerate intense pulsatile sounds without known effect once they learn that there is no danger associated with the noise (see, for example, NMFS/Washington Department of Wildlife, 1995). In addition, they will apparently not abandon feeding or breeding areas due to exposure to these noise sources (Richardson *et al.*, 1991) and may habituate to certain noises over time.

Safety Radii

NMFS has determined that for acoustic effects, using established acoustic thresholds in combination with corresponding safety radii is the most effective way to consistently both apply measures to avoid or minimize the impacts of an action and to quantitatively estimate the effects of an action. NMFS believes that cetaceans and pinnipeds should not be exposed to pulsed underwater noise at received levels exceeding, respectively, 180 and 190 dB re 1 µPa (rms) to avoid permanent physiological damage (Level A Harassment). NMFS also assumes that cetaceans or pinnipeds exposed to levels exceeding 160 dB re 1 µPa (rms) experience Level B Harassment. Thresholds are used in two ways: (1) To establish a mitigation shut-down or power down zone, i.e., if an animal enters an area calculated to be ensonified above the level of an established threshold, a sound source is powered down or shut down; and (2) to calculate take, in that a model may be used to calculate the area around the sound source that will be ensonified to that level or above, then, based on the estimated density of animals and the distance that the sound source moves, NMFS can estimate the number of marine mammals that may be ''taken''.

In order to implement shut-down zones, or to estimate how many animals may potentially be exposed to a particular sound level using the acoustic thresholds described above, it is necessary to understand how sound will propagate in a particular situation. Models may be used to estimate at what distance from the sound source the water will be ensonified to a particular level. Safety radii represent the estimated distance from the sound source at which the received level of sound would be 190, 180, and 160 dB.

Conoco's application contains their initial proposed safety radii and take estimates. However, the initial model Conoco used did not take into consideration either the physical characteristics of the Chukchi Sea or the fact that the water was only 50–m (164–ft) deep, and NMFS was concerned that the proposed radii were too small. Subsequently, Conoco adopted a new model and submitted new proposed safety and take estimates. They used an advanced airgun array source model to predict the 190, 180, and 160 dB isopleths for the seismic survey in the Chukchi Sea. This model simulates the throttled injection of high-pressure air from airgun chambers into underwater air bubbles, simulates the complex oscillation of each bubble, taking into account the hydrostatic pressure effects of the pressure waves from all other airguns, and includes effects such as surface-reflected pressure waves, heat transfer from bubble to the surrounding water, and the buoyancy of the bubbles. The model also takes into consideration the bathymetry, water properties, and geoacoustic properties of the sea bed layers in the survey area. The calculated safety radii from this model are as follows: the 190–dB radius is 230 m (754 ft), the 180–dB radius is 850 m (2,788), and the 160–dB radius is 4,590 m (2.85 mi).

Though the model considers some of the site-specific characteristics of the Chukchi Sea, because no sound propagation studies have previously been conducted in the survey area (against which model results can be prepared) NMFS believes that it is appropriate and necessary to field-verify the modeled safety radii. Accordingly, field verification will be conducted prior to initiation of the seismic survey and, until that time, Conoco will multiply the modeled 190–dB and 180–dB safety radii by 1.5 (which equals 345 m (1121 ft) and 1,275 m (4, 174 ft), respectively) to conservatively establish the mitigation shutdown zones for marine mammals (see Mitigation section). The 1.5 correction factor will not be used in the take estimations and will not be used after the radii are field-verified.

Field verification will be conducted using an autonomous ocean bottom hydrophone. This hydrophone is suspended (upward, by float) from an anchor dropped to the ocean floor, and then released to the surface for data collection when a particular frequency tone is directed at the hydrophone. The MV *Patriot* will run directly, in a straight line, at, over, and past the hydrophone to establish received sound levels at distances in front of and behind the sound source. Then, the MV Patriot will do a lawnmower type zig-zag sideways to the hydrophone so that received levels at varying distances to the side of the sound source may be measured. Because of the shape of the array, sound propagates farther laterally from the source than forward or backward, so both orientations are measured, then a conservative combination of the two is used to calculate the safety radii. NMFS will use the field verified safety radii to establish power-down and shut-down zones for the MV *Patriot*.

Estimated Take by Incidental Harassment for Conoco's Seismic Survey

Given the required mitigation (see Mitigation later in this document), NMFS anticipates that takes will consist of Level B harassment, at most. The required mitigation measures are expected to minimize or eliminate the possibility of Level A harassment or mortality. Additionally, these numbers do not take into consideration either the effectiveness of the mitigation measures or the fact that some species will avoid the sound source at distances greater than those estimated to result in a take.

It is difficult to make accurate, scientifically robust, and observationally verifiable estimates of the number of individuals likely to be subject to Level B Harassment by the noise from Conoco's airguns. There are many uncertainties: in seasonally varying abundance, in local horizontal and vertical distribution; in marine mammal reactions to varying frequencies and levels of acoustic pulses; and in perceived sound levels at different horizontal and oblique ranges from the source.

NMFS believes the best estimate of potential ''take by harassment'' is derived by multiplying the estimated densities (per square kilometer) of each species within the survey area by the width of the 160–dB safety radii (4,590 m (2.85 mi)) over the length of Conoco's estimated trackline (16,576 km (10,300 mi)). Since Conoco revised its safety radii after submitting their application, the estimated take numbers presented here are higher than those predicted in its application. The total maximum estimated ''take by harassment'' is presented in Table 1. As mentioned previously, the upper limit of estimated take for ringed and bearded seals suggested in Table 1 is most likely an overestimate, as it is based on surveys of the animals conducted nearer to shore, where densities are higher than they are off-shore where the seismic surveys will be conducted. Additionally, the stocks of both of these animals are thought to extend throughout Arctic and the abundance estimates discussed here are minimum abundances.

Potential Effects on Habitat

Conoco states that the seismic survey will not cause any permanent impact on habitats and the prey used by marine mammals. A broad discussion on the various types of potential effects of exposure to seismic on fish and invertebrates can be found in LGL (2005; University of Alaska-Fairbanks Seismic Survey across Arctic Ocean at *http://www.nmfs.noaa.gov/pr/permits/incidental.htm#iha*), and includes a summary of direct mortality (pathological/ physiological) and indirect (behavioral) effects.

Mortality to fish, fish eggs and larvae from seismic energy sources would be expected within a few meters (0.5 to 3 m (1.6 to 9.8 ft)) from the seismic source. Direct mortality has been observed in cod and plaice within 48 hours of being subjected to seismic pulses two meters from the source (Matishov, 1992), however other studies did not report any fish kills from seismic source exposure (La Bella *et al.*, 1996; IMG, 2002; Hassel *et al.*, 2003). To date, fish mortalities associated with normal seismic operations are thought to be slight. Saetre and Ona (1996) modeled a worst-case mathematical approach on the effects of seismic energy on fish eggs and larvae, and concluded that mortality rates caused by exposure to seismic are so low compared to natural mortality that issues relating to stock recruitment should be regarded as insignificant.

Limited studies on physiological effects on marine fish and invertebrates to acoustic stress have been conducted. No significant increases in physiological stress from seismic energy were detected for various fish, squid, and cuttlefish (McCauley *et al.*, 2000) or in male snow crabs (Christian *et al.*, 2003). Behavioral changes in fish associated with seismic exposures are expected to be minor at best. Because only a small portion of the available foraging habitat would be subjected to seismic pulses at a given time, fish would be expected to return to the area of disturbance anywhere from 15–30 minutes (McCauley *et al.*, 2000) to several days (Engas *et al.*, 1996).

Available data indicates that mortality and behavioral changes do occur within very close range to the seismic source, however, the scheduled seismic acquisition activities in the Chukchi are predicted by Conoco to have a negligible effect to the prey resource of the various life stages of fish and invertebrates available to marine mammals occurring during the project's duration. The planned Conoco trackline is 16,576 km (10,300 ft) long, and will encompass approximately a 2500–3600 km2–area (965–1390 mi2–area) in the northeastern Chukchi Sea. Only a small fraction of the available habitat would be impacted by noise at any given time during the seismic surveys, and the constant movement of the seismic vessel would prevent any area from sustaining high noise levels for extended periods of time. Disturbance to fish species would most likely be short-term and temporary. Thus, Conoco's activity is not expected to have any effects on habitat or prey that could cause permanent or long-term consequences for individual marine mammals or their populations, since operations will be limited in duration, location, timing, and intensity.

Potential Effects on Subsistence Use of Marine Mammals

Marine mammals are key in the subsistence economies of the communities bordering the seismic survey area, including Barrow, Wainwright, Point Lay, and Point Hope. Other communities that subsist on marine mammals are considerably beyond the project area, and their subsistence activities are unlikely to be affected by the seismic operations in the Chukchi Sea. The whale harvests have a great influence on social relations by strengthening the sense of Inupiat culture and heritage in addition to reinforcing family and community ties.

Bowhead whales are important for subsistence at all of the villages bordering the project area except Point Lay, which does not hunt bowhead whales. The harvest is based on a quota, established by the International Whaling Commission (IWC) and regulated by agreement between AEWC and NMFS, according to the cultural and nutritional needs of Alaska Eskimos as well as on estimates of the size and growth of the stock of bowhead whales (Suydam and George, 2004). In 2002 the IWC set a 5–year block quota of 67 strikes per year with a total landed not to exceed 280 whales (IWC 2003). The most recent data show that 37, 35, and 36 whales were landed in 2000–2004 for a total of 108 whales (Suydam and George 2004, Suydam *et al.* 2005). Between 23 and 28 were taken at Point Hope, Wainwright, and Barrow during these years, with most (60–90 percent) taken by Barrow each year.

Bowheads are hunted during the spring and fall migrations. Barrow hunts during the spring and fall migrations. Historically, Point Hope and Wainwright have predominantly hunted during the spring migration, however, due to changes in the Arctic weather and sea ice conditions they plan to also undertake fall whaling beginning this year. Barrow takes most bowheads during the spring migration. The spring bowhead hunt occurs after leads open due to the deterioration of pack ice, which typically occurs from early April until the first week of June. Because of the timing, the spring hunts of Point Hope, Wainwright, and Barrow should not be affected by seismic operation,

since the hunt should be completed before the start of seismic operations in July.

The autumn hunt at Barrow usually begins in mid-September, and mainly occurs in the waters east and northeast of Point Barrow in the Beaufort Sea. The whales have usually left the Beaufort Sea by late October (Treacy, 2002a,b). The location of the fall hunt depends on ice conditions, which can influence distance of whales from shore (Brower, 1996). Hunters prefer to take bowheads close to shore to avoid a long tow during which the meat can spoil, but Braund and Moorehead (1995) report that crews may (rarely) pursue whales as far as 80 km (50 mi), and in 2004 hunters harvested a whale up to 50 km (31 mi) northeast of Barrow (Suydam *et al.*, 2005).

Beluga whales are hunted for subsistence at Barrow, Wainwright, Point Lay, and Point Hope, with the most taken by Point Lay (Fuller and George 1997). Point Lay harvests belugas primarily during summer in Kasegaluk Lagoon, where they averaged 40 belugas per year over a 10–year period (Fuller and George, 1997). Compared to Point Lay, small numbers of belugas are harvested by Barrow with intermediate numbers harvested by Point Hope and Wainwright. Harvest at these villages generally occurs between April and July, with most taken in April and May when pack-ice conditions deteriorate and leads open up. Hunters usually wait until after the bowhead whale hunt to hunt belugas. The Alaska Beluga Whale Committee recorded 23 beluga whales harvested by Barrow hunters from 1987 to 2002, ranging from 0 in 1987, 1988 and 1995 to the high of 8 in 1997 (Fuller and George, 1999; Alaska Beluga Whale Committee 2002 in USDI/BLM 2005). The time of the project will not overlap hunts at Point Hope, Wainwright, and Barrow, and in any event Point Hope and Barrow should be largely beyond any influence of the project activities. Point Lay villagers hunt in Kasegaluk Lagoon, which is beyond the influence of the project activities. Furthermore, the lagoon is shallow and close to shore, which would greatly reduce any underwater seismic noise, in the unlikely event noise reached the lagoon.

Ringed, bearded, and spotted seals are hunted by all of the villages bordering the project area (Fuller and George, 1997). Ringed seals comprise the largest part of the subsistence hunt and spotted seal the least, particularly at Barrow where they are primarily hunted near shore. Spotted seals are considerably more abundant in the Chukchi than Beaufort Sea. At Barrow, spotted seals are primarily hunted in Admiralty Bay, which is about 60 km east of Barrow. The largest concentrations of spotted seals in Alaska are in Kasegaluk Lagoon, where Point Lay hunters harvest them. (Frost *et al.* 1993). Braund *et al.* (1993) found that the majority of bearded seals taken by Barrow hunters are within approximately 24 km (15 mi) off shore. Ringed and bearded seals are hunted throughout the year, but most are taken in May, June, and July when ice breaks up and there is open water instead of the more difficult hunting of seals at holes and lairs. The timing slightly varies among villages, with peak hunting occurring incrementally later going from Point Hope to Barrow. Spotted seals are only hunted in spring through summer, since they winter in the Bering Sea. The seismic operation should have little to no effect on subsistence hunting since the seismic survey will no more than minimally overlap the end of the primary period when seals are harvested, and most hunting at the villages will be a considerable distance away from seismic operations, particularly at Point Hope (74 km (46 mi)) and Point Lay (90 km (56 mi)).

Natives in Alaska are very concerned about how seismic operations in the Chukchi Sea will impact their subsistence harvest of marine mammals. NMFS shares these concerns and some of the studies presented in the Effects section of this document further validate them. NMFS notes, though, that some of the types of behaviors that may affect the subsistence harvest may not be considered ''harassment'' (such as a minor migration route deflection). Following are a few of their primary concerns:

(1) Native knowledge suggests that sound from seismic surveys may cause bowhead whales or other subsistence stocks to change their behavior or migratory patterns in such a way that they are not present in traditional hunting grounds or in historical numbers. If so, natives may be unable to harvest any animals, or will have to harvest them from such a distance that the animal may spoil during the long tow back and human safety risks are increased during the extended trip.

(2) Native knowledge indicates that bowhead whales become increasingly ''skittish'' in the presence of seismic noise. Whales are more wary around the hunters and tend to expose a much smaller portion of their back when surfacing (which makes harvesting more difficult). Additionally, natives report that bowheads exhibit angry behaviors in the presence of seismic activity, such as tail-slapping, which translates to danger for nearby subsistence harvesters.

(3) Natives are concerned that the cumulative effects of increased numbers of concurrent seismic surveys in the Chukchi and Beaufort Seas may have population-level effects on subsistence stocks that will permanently affect their subsistence harvest. An additional concern is the perception by the IWC of the increased risk of population-level effects, which could lead to lower, or even no subsistence quotas for Alaska Natives.

Plan of Cooperation

Regulations at 50 CFR 216.104(a)(12)(i) require IHA applicants for activities that take place in Arctic waters to provide a plan of cooperation (POC) or information that identifies what measures have been taken and/or will be taken to minimize any adverse effects on the availability of marine mammals for subsistence uses. Representatives of Conoco have been in continued coordination with the AEWC and met with the whaling captains of the potentially affected villages in March, 2006. Additionally, both Conoco and the AEWC had representatives present at the Open-Water Seismic meeting held in Alaska in April and further negotiated appropriate measures to minimize impacts to the subsistence harvest.

Conoco has signed a Conflict Avoidance Agreement (CAA) with the AEWC. The CAA incorporates all appropriate measures and procedures regarding the timing and areas of the operator's planned activities (i.e., times and places where seismic operations will be curtailed or moved in order to avoid potential conflicts with active subsistence whaling and sealing); communications system between operator's vessels and whaling and hunting crews; provisions for marine mammal observers/Inupiat communicators aboard all project vessels; conflict resolution procedures; and provisions for rendering emergency assistance to subsistence hunting crews.

Based on the contents of the signed CAA, as well as additional mitigation and monitoring measures discussed later in this document (see Mitigation), NMFS has determined that the Conoco's seismic survey will not have an unmitigable adverse impact on the subsistence harvest of the affected species or stocks.

Comments and Responses

On May 12, 2006 (71 FR 27685), NMFS published a notice of a proposed IHA for Conoco's request to take marine mammals incidental to conducting

open-water seismic surveys in the Chukchi Sea, and requested comments, information and suggestions concerning the request. During the 30–day public comment period, NMFS received comments from one private citizen and several sets of comments from non-governmental organizations, including the Center for Biological Diversity (CBD) (which were also on behalf of EarthJustice, Pacific Environment, Alaska Coalition, Alaska Wilderness League, the Natural Resources Defense Council (NRDC), Greenpeace, Inc., Oceana, and the Northern Alaska Environmental Center), joint comments from the AEWC and the North Slope Borough (NSB) Department of Wildlife Management, the Native Village of Point Hope, Conoco Phillips Alaska, Inc., and the Alaska Oil and Gas Association (AOGA).

Comment 1: AOGA asked comments they submitted addressing the PEA be inserted into the admin record for the IHA. CBD suggested that NRDC's comments on the PEA also be considered for the issuance of the IHA.

Response: These comments have been considered in the Final PEA and in NMFS' and MMS' FONSIs. Many of the comments are specific to the PEA. However, where either of these sets of comments raise issues germane to the IHA issue that have not been addressed already, NMFS has addressed them in this section.

Comment 2: The Marine Mammal Commission submitted comments on the Shell open-water seismic survey IHA application that also reference the Conoco application.

Response: These comments are addressed in the Federal Notice announcing the issuance of the Shell IHA.

Comment 3: One commenter recommends NMFS deny an IHA to Shell unless and until NMFS can ensure that mitigation measures are in place to truly avoid adverse impacts to all species and their habitats.

Response: The requirements of the MMPA are that impacts be reduced to the lowest level practicable, not that no adverse impacts be allowed. NMFS believes that the mitigation measures required under Shell's IHA will reduce levels to the lowest level practicable.

Comment 4: The CBD states that NMFS' failure to address the scientific literature linking seismic surveys with marine mammal stranding events, and the threat of serious injury or mortality renders NMFS' conclusionary determination that serious injury or mortality will not occur from Shell's activities arbitrary and capricious.

Response: The evidence linking marine mammal strandings and seismic surveys remains inconclusive at best. Two papers, Taylor *et al.* (2004) and Engel *et al.* (2004) reference seismic signals as a possible cause for a marine mammal stranding. Taylor *et al.* (2004) noted two beaked whale stranding incidents related to seismic surveys. The statement in Taylor *et al.* (2004) was that the seismic vessel was firing its airguns at 1300 hrs on September 24, 2004 and that between 1400 and 1600 hrs, local fishermen found live-stranded beaked whales some 22 km (12 nm) from the ship's location. A review of the vessel's trackline indicated that the closest approach of the seismic vessel and the beaked whales stranding location was 18 nm (33 km) at 1430 hrs. At 1300 hrs, the seismic vessel was located 25 nm (46 km) from the stranding location. What is unknown is the location of the beaked whales prior to the stranding in relation to the seismic vessel, but the close timing of events indicates that the distance was not less than 18 nm (33 km). No physical evidence for a link between the seismic survey and the stranding was obtained. In addition, Taylor *et al.* (2004) indicates that the same seismic vessel was operating 500 km (270 nm) from the site of the Galapagos Island stranding in 2000. Whether the 2004 seismic survey caused to beaked whales to strand is a matter of considerable debate (see Cox *et al.*, 2004). NMFS believes that scientifically, these events do not constitute evidence that seismic surveys have an effect similar to that of mid-frequency tactical sonar. However, these incidents do point to the need to look for such effects during future seismic surveys. To date, follow-up observations on several scientific seismic survey cruises have not indicated any beaked whale stranding incidents.

Engel *et al.* (2004), in a paper presented to the IWC in 2004 (SC/56/E28), mentioned a possible link between oil and gas seismic activities and the stranding of 8 humpback whales (7 off the Bahia or Espirito Santo States and 1 off Rio de Janeiro, Brazil). Concerns about the relationship between this stranding event and seismic activity were raised by the International Association of Geophysical Contractors (IAGC). The IAGC (2004) argues that not enough evidence is presented in Engel *et al.* (2004) to assess whether or not the relatively high proportion of adult strandings in 2002 is anomalous. The IAGC contends that the data do not establish a clear record of what might be a ''natural'' adult stranding rate, nor is any attempt made to characterize other natural factors that may influence strandings. As stated previously, NMFS remains concerned that the Engel *et al.* (2004) article appears to compare stranding rates made by opportunistic sightings in the past with organized aerial surveys beginning in 2001. If so, then the data are suspect.

Second, strandings have not been recorded for those marine mammal species expected to be harassed by seismic in the Arctic Ocean. Beaked whales and humpback whales, the two species linked in the literature with stranding events with a seismic component are not located in the Cukchi Sea seismic area. Finally, if bowhead and gray whales react to sounds at very low levels by making minor course corrections to avoid seismic noise and mitigation measures require Shell to ramp-up the seismic array to avoid a startle effect, strandings are highly unlikely to occur in the Arctic Ocean. In conclusion, NMFS does not expect any marine mammals will incur injury or mortality as a result of Arctic Ocean seismic surveys in 2006.

Comment 5: Several commenters list concerns regarding cumulative effects (including the other scheduled seismic surveys, activities in other areas, and global warming, among other things) and to what extent they were considered in NMFS negligible impact determination for this IHA.

Response: Under section 101(a)(5)(D) of the MMPA, ''the Secretary shall authorize... taking by harassment of small numbers of marine mammals of a species or population stock by such citizens while engaging in that activity within that region if the Secretary finds that such harassment during each period concerned (I) will have a negligible impact on such species or stock, and (II) will not have an unmitigable adverse impact on the availability of such species or stock for taking for subsistence uses.'' NMFS cannot make a negligible impact determination for an IHA under this provision of the MMPA based on the cumulative effects of other actions.

As stated previously, cumulative impact assessments are NMFS' responsibility under NEPA, not the MMPA. In that regard, the MMS' Final PEA addresses cumulative impacts, as did its Draft PEA. The PEA's cumulative activities scenario and cumulative impact analysis focused on oil and gas-related and non-oil and gas-related noise-generating events/activities in both Federal and State of Alaska waters that were likely and foreseeable. Other appropriate factors, such as Arctic warming, military activities and noise

contributions from community and commercial activities were also considered. Appendix D of that PEA addresses similar comments on cumulative impacts, including global warming. That information is incorporated in this document by citation. NMFS has adopted the MMS Final PEA as its own NEPA document (see NEPA later in this document) and is part of its Administrative Record.

Additionally, NMFS and MMS considered the potential for cumulative impacts in the development of the mitigation measures in the PEA and, because of the need to avoid significance pursuant to NEPA, several additional protective measures (such as expanded shutdown zones and a research monitoring plan) meant to address these concerns, as well as the uncertainty, have been incorporated into the IHA.

Comment 6: The CBD believes that NMFS cannot issue an IHA to Conoco because it has not complied with the MMPA's requirement to specify the specific geographic region where the activity will occur.

Response: NMFS defines ''specified geographical region'' as ''an area within which a specified activity is conducted and which has certain biogeographic characteristics'' (50 CFR 216.103). NMFS believes that Conoco's description of the activity and the locations for conducting seismic surveys meet the requirements of the MMPA. Conoco has provided a well-defined area, within which certain biogeographic characteristics occur (the entire area is approximately 50–m (164–ft) deep or less), in which they will conduct their operations. More specific locations within the Lease Sale area described are considered proprietary.

Comment 7: Commenters say that NMFS does not have evidence to support an unmitigable adverse impact to subsistence hunting finding and point out that Kaktovik and Point Hope have passed resolutions opposing offshore oil development.

Response: NMFS acknowledges that these villages have passed resolutions objecting to offshore oil development. However, the village whaling captains of these villages (in addition to villages of Nuiqsuk and Wainwright and the AEWC) have signed a CAA indicating to NMFS that there will not be an unmitigable adverse impact on subsistence uses of marine mammals. This is discussed in detail later in this document (see Impact on Subsistence).

Comment 8: Commenters state that because the MMPA explicitly requires that ''means effecting the least practicable impact'' on the species, stock or habitat be included [in mitigation measures], an IHA [notice] must explain why measures that would reduce the impact on a species were not chosen (i.e., why they were not practicable). Neither the proposed IHA [notice], Conoco's application, nor the PEA attempt to do this.

Response: Neither the MMPA nor NMFS regulations implementing the incidental take program require NMFS to itemize and discuss all measures that were determined to be impracticable. Such an effort can quickly become a matter of speculation. For example, drones, manned balloons, and satellites are currently considered impracticable for technological and safety reasons and usually need not be discussed in issuing IHAs. Helicopters and other aircraft may be practicable depending upon distance between landing and activity location, weather and safety and are usually discussed if safety zones cannot be visually monitored effectively. Also, active and passive acoustics are often discussed when issuing an IHA if the safety zone cannot be visually monitored effectively. Time and area closures or restrictions are discussed when appropriate. In many cases, monitoring larger zones to simply reduce the Level B harassment take, is viewed as secondary to effectively monitor the Level A harassment zone, in order to prevent marine mammal injury. A final mitigation measure mentioned by commenters to the Draft PEA of using vibroseis technology in winter instead of open water seismic is not practical due to human safety concerns and must be limited to extremely shallow water depths.

NMFS has several standard, recognized mitigation measures for different types of activities. In the case of these Arctic seismic IHAs, the Open-water Seismic meeting is the starting point for development of new, potentially more effective mitigation measures. Suggestions are often both made or dismissed there after an open discussion. If specific recommendations were made during the public comment that had not previously been vetted or addressed, NMFS would address their appropriateness or practicability in this **Federal Register** notice.

Comment 9: Pursuant to Section 7 of the ESA, NMFS may only authorize incidental take of the bowhead whale where such take occurs while ''carrying out an otherwise lawful activity''. One commenter contends that NMFS is not in compliance with the MMPA or NEPA due to some of the issues addressed above and that NMFS is therefore also in violation of the ESA.

Response: For the reasons stated above and throughout the text of this notice, NMFS believes we are in compliance with both the MMPA and NEPA, and, therefore, the ESA.

Comment 10: The CBD states that the tables in the proposed IHA notice provide no support for NMFS' ''conclusion'' on small numbers and negligible impact. For Shell's proposed seismic surveys in the Chukchi, the number of bowheads likely to be exposed to sounds of 160 dB or greater, and, therefore, ''harassed'' according to NMFS' operative thresholds, is 418. In absolute terms these numbers cannot be considered ''small.'' Even relative to population size, the higher estimate represents 4 percent of the estimated population of bowheads. Similar for beluga whales.

Response: NMFS has made a determination that the takes of the affected marine mammal species will be small. The species most likely to be harassed during seismic surveys in the Arctic Ocean area is the ringed seal, with a modeled maximum estimate of approximately 56,000 animals being exposed to sound levels of 160 dB or greater. This number is approximately 22 percent of the abundance measured in the eastern Chukchi Sea, but a much smaller percentage of the entire population. The numbers produced by the model do not take into consideration the implementation of mitigation measures, the likely avoidance of the sound by certain animals and, in the case of ringed seals, the density on which the take calculations were based are overestimates (which means the take estimates are overestimates) because ringed seals are far denser in the inshore and ice areas than in the open ocean where the surveys are to occur. Additionally, Moulton and Lawson (2002) indicate that most pinnipeds exposed to seismic sounds lower than 170 dB do not visibly react to that sound; pinnipeds are not likely to react to seismic sounds unless they are greater than 170 dB re 1 μPa (rms)). Further, these estimates are calculated based upon line miles of survey effort, animal density and the calculated zone of influence (ZOI). While this methodology is valid for seismic surveys that transect long distances, those surveys that ''mow the lawn,'' that is, remain within a relatively small area, transiting back and forth while shooting seismic, numbers tend to be highly inflated. As a result, NMFS believes that these exposure estimates are conservative and may actually affect far fewer animals.

The mitigation measures set forth IHA ensure that there will be negligible

impacts on the marine mammals. Cetaceans are expected, at most, to show an avoidance response to the seismic pulses. Mitigation measures such as visual marine mammal monitoring, and shut-downs when marine mammals are detected within the defined ranges should further reduce short-term reactions to disturbance, and minimize any effects on hearing sensitivity. Due to these mitigation measures, and other reasons discussed in the Conclusions of this document, NMFS believes the impacts will be negligible.

Comment 11: Commenters recommended that Conoco be required to cease operations at night or in low visibility conditions.

Response: It is NMFS opinion that once a safety zone is determined visually to be free of marine mammals, seismic may continue into periods of poor visibility. It should be understood that the safety zone is not stationary but is moving along with the ship at whatever speed the ship is progressing. For example, if the ship is making 5 knots, the safety zone will be 5 nm (9.3 km) upstream in an hour. With a 180–dB exclusion zone of approximately 1.3 km (0.7 nm), marine mammals potentially affected by seismic noise would have ample time to move away from the source, as evidenced by bowhead, beluga and gray whale avoidance behavior. A review of previous monitoring programs indicates these species will not be within a distance to incur Level A harassment. For pinnipeds, NMFS believes that because they are not likely to even react to seismic sounds unless the received levels are >170 dB re 1 μPa (rms), hearing impairment is also unlikely at an SPL as low as 190 dB. Therefore, it is unlikely that marine mammals will be harmed as a result of continuing seismic into periods of poor visibility in Arctic waters. As a result, NMFS has determined that it is only if daytime activities have a large abundance of marine mammals and/or a significant number of shutdowns, should nighttime seismic be prohibited.

Also as a general rule, termination of seismic during nighttime and poor visibility is simply not practicable due to cost considerations and ship time schedules. The cost to operate a large seismic vessel is approximately $40–50,000 per day. If the vessels were prohibited from operating during nighttime, each trip could require several additional Arctic survey operations to complete, depending on average daylight at the time of work. In the Chukchi and Beaufort seas, fog is common even though there is 24 hours of daylight per day until late August, but by late September there is less than 12 hours of daylight and by late October there would be only 3–4 hours of daylight, seriously limiting operations later in the year if a daylight and clear weather requirement were imposed.

Comment 12: One commenter suggested that Conoco should be required to lower their source level to reduce impacts to marine mammals.

Response: In Conoco's application, they requested authorization for take of marine mammals incidental to the operation of both a 16–gun array and a 24–gun array. After discussions with NMFS they changed their action to only include the 16–gun array.

Comment 13: In submitted comments on the MMS Draft PEA, (and referenced by CBD), the NRDC states that harassment of marine mammals can occur at levels below the 160 dB threshold for Level B harassment, and that NMFS should reassess its harassment thresholds for acoustic impacts. To support this recommendation, NRDC reports that harbor porpoises have been reported to avoid a broad range of sounds at very low SPLs, between 100 and 140 dB.

Response: As discussed in reference to bowhead whale reactions, NMFS does not believe that all types of avoidance rise to the level of MMPA harassment.

The 160–dB rms isopleth is based on work by Malme et al. (1984) for migrating gray whales along the California coast. Clark *et al.* (2000) replicating the work by Malme et al. (1984) indicated that this response is context dependent, as gray whales did not respond to simulated airgun noise when the acoustic source was removed from the gray whale migratory corridor. This indicates to NMFS that establishing a 160–dB isopleth for estimating a safety zone for low-frequency hearing specialists when exposed to a low frequency source is conservative. For mid- or high-frequency hearing specialists, a 160–dB ZOI for a low-frequency source is likely overly conservative.

In this action, empirical research indicates that bowhead whales respond to sounds at levels lower than 160 dB during periods of important biological behavior (migration) but possibly not during other important periods (feeding). As a result, to reduce the uncertainty over whether these same avoidance characteristics will occur in the Chukchi Sea as they appear to have in the Beaufort Sea, MMS and NMFS have established conservative ZOIs where additional mitigation measures can be imposed to further protect these species during critical periods in Arctic waters.

Comment 14: One commenter states that the preparation of an EIS is necessary pursuant to NEPA, especially considering the increased controversy that has arisen.

Response: NMFS has addressed all of the NEPA significance criteria in our Finding of No Significant Impact (FONSI), which may be viewed at our website. (See **ADDRESSES**)

Comment 15: Conoco notes that an important overarching point that is not made in the assessment is the health of the marine mammal populations in the Arctic, following exposure to over 25 years of seismic and other oil and gas activities in the Beaufort and Chukchi Seas. The bowhead whale population has increased to near the carrying capacity of its habitat (Brandon and Wade 2004). The health of the population is reflected further in the high rates of growth and reproduction reported in recent years (George *et al.* 2004a, b). The gray whale population has recovered to its pre-exploitation level while exposed to far more disturbances throughout its range than marine mammals that spend most or all of the year off the coast of Alaska. These populations individually and collectively demonstrate their resiliency to adapt to their environment and prosper. The healthy status of these populations needs to be described by NMFS in their assessment of Conoco's application, since it demonstrates that the short term and temporary effects of seismic operations on marine mammal are biologically insignificant. Moreover, the healthy status of these populations is in direct contrast with the speculation about noise impacts on the behavior, physiology, reproduction, and communication of bowhead whales that is discussed at length by NMFS in their assessment of the application. Conoco suggests that NMFS avoid speculation in the assessment and focus on using the best available science.

Response: NMFS acknowledges the health of the bowhead and gray whale populations. However, we cannot know whether the increases in these populations would have been significantly greater in the absence of exposure to over 25 years of seismic and other oil and gas activities in the Beaufort and Chukchi Seas, as no data were collected that can speak to this issue.

The healthy condition of the whale populations and the anticipated short term and temporary effects of seismic operations were taken into account by NMFS in making our MMPA negligible impact determination based on

Conoco's activities this year in the Chukchi Sea. However, due to our responsibilities under NEPA, which include doing an Environmental Impact Statement unless we can determine that the activity will have no significant impact pursuant to the application of several specific criteria (including uncertainty, which exists regarding the distribution and specific needs of marine mammals in the Chukchi Sea, as described at length in the PEA and FONSIs), NMFS must take a precautionary approach in how mitigation is applied in the issuance of this IHA.

Further, the wide-ranging effects of anthropogenic sound, and seismic noise in particular, on the behavior, physiology, reproduction, and communication of marine mammals is well documented in the literature, as referred to in the PEA and the Biological Opinion in addition to this document. Though data regarding some of the referenced effects of seismic sound on bowhead whales in particular may be lacking, NMFS' effects analysis is far from speculative.

Comment 16: The calculation of the percent of stock represented by the estimated take of ringed and bearded seals is not correct. The population estimates for these two species are minimum values, since the surveys used for the estimates were limited to a relatively small portion of their total habitat as discussed in the text of the **Federal Register**. Consequently, the percent of stock values are exaggerated and convey a much greater impact on the population than warranted by the sizes of the populations. For instance, the actual population estimates for ringed seals could be as high as 1 to 3.6 million seals, based on earlier studies by Frost and Lowry (1988) and Frost *et al.* (1988). The estimated take based on these values would be 1.5 to 5.6 percent of the stock. These values should be substantially adjusted downward to better reflect more realistic estimates of population size.

Response: NMFS notes this overestimation of the percent of stock for ringed and bearded seals in Estimate of Take and Conclusions sections of this document.

Comment 17: The calculations of take and safety radii should be based on a range and not a single value from the model used by Conoco to calculate sound propagation from the air gun array. NMFS used the most conservative of the three scenarios run on the Conoco model. Since the values are estimates that will be validated in the field, a more accurate presentation of take and safety radii would be to use a range to represent the uncertainty of the estimated values. For example, the range of take for bowhead whales from the three scenarios would be 151 to 418 animals, which is a more accurate estimate of take than the 418 value provided by NMFS.

Response: The calculations of take and safety radii are two separate issues. NMFS stands by its use of the most conservative safety radii.

For the take estimates, Conoco presented the results of three propagation models. As suggested above, NMFS has now incorporated the estimated take from two of the models into our take table (bowheads take is estimated as 399 to 418). However, the third model presented safety radii based on Sound Exposure Levels (SELs - an energy metric) instead of Sound Pressure Levels (SPLs). NMFS does not have standard thresholds for SELs as we have for SPLs (190, 180, and 160) and is not prepared to use SEL isopleths as safety radii for this activity. In the first-ever issuance of an IHA using SEL levels (for non-explosive sounds) as thresholds, which was for mid-frequency tactical sonar (71 FR 38710, July 7, 2006), NMFS and the Navy worked hard to establish SEL thresholds that were specifically applicable to mid-frequency tactical signals. NMFS has not yet conducted this level of analysis for seismic noise and, therefore, it is not appropriate to use safety radii or calculate take based on the modeled SEL results.

Comment 18: Conoco notes that NMFS expanded the already conservative safety radii by adding a correction factor of 1.5 times the model values for the 180 and 190 dB shut down distances. The correction factor is scientifically unwarranted and should be eliminated from the safety radii calculations.

Response: Because Conoco will be doing the field verification first, before beginning any surveys, NMFS has decided that the 1.5 correction factor is not necessary. This is reflected in the IHA.

Comment 19: The temporary deflection of migrating bowhead whales during the fall around the active seismic vessel discussed by NMFS in the **Federal Register** ignores several key points. Not only are the deflections short in distance relative to the migration route and temporary, but they occur within the migration corridor. Consequently, there is no evidence that the anticipated deflections cause migrating bowhead to abandon or move outside the migration corridor or change their migratory behavior when encountering an active seismic vessel. They simply go around the seismic vessel and continue along the migration corridor to the wintering grounds. The temporary nature of this behavior is further reflected by the harvest of bowheads during the subsistence hunt, which has been very consistent over the last 5–10 years between 1994 and 2003 where it averaged 40 and ranged from 34 to 49; weather was largely responsible for annual variation (Suydam and George, 2004 and Suydam *et al.*, 2004). In addition, the average number of whales landed by village by year is similar between 1974 and 1977 (before IWC quota) and from 1978 to 2003 (Suydam and George, 2004). Consequently, there is no evidence that the deflection around seismic operations more than temporarily affects the migration of bowhead whales, nor does it affect their availability for subsistence harvest.

Response: This comment does not acknowledge the fact that more than one vessel will be operating seismic in the area at one time, and that we do not know exactly how this combination of effects may elicit more severe or long term responses by nearby animals. Also, as mentioned previously, the capture of any particular number of whales in a given year does not mean that a higher number would not have been captured in the absence of some disturbance factor. Additionally, the absence of evidence regarding effects of these actions on marine mammals does not mean we can assume they will not occur. These points and others supporting NMFS determinations are presented elsewhere in this document and in the PEA.

Comment 20: There is no scientific basis for establishing a 120–dB exclusion zone for bowhead and other marine mammals. The 120–dB restrictions are based on misinterpretation of data reported by John Richardson (1999), which concludes that deflections of migrating whales were not significant to the individual or population of bowhead whales. The commenter expresses a similar concern for the 160–dB safety zone.

Response: The justifications for the 120 dB (and the 160–dB) safety radii have been thoroughly discussed in the PEA. Regardless of the conclusions Richardson makes, absent an EIS NMFS has to make a determination pursuant to NEPA based on several specific criteria, that this action is not significant. Due to the scientific uncertainty surrounding the potential responses of bowheads to multiple seismic vessels in the Chukchi Sea and the lack of knowledge regarding their behavioral patterns and needs in

the Chukchi Sea, NMFS determined that the 120–dB safety zone (and the 160–dB safety zone) was necessary in order to make a FONSI.

Comment 21: The 120 dB level is so conservative that it approaches and at times may be masked by ambient sound levels, which range from 68–100 dB in the Chukchi Sea and under certain ice conditions can increase to 124–137 dB.

Response: This information does not change the fact that NMFS believes this measure is necessary. Additionally, the measure was implemented based on the animal's responses to seismic noise, which is different in character from ice noises and may well be discernible even in the presence of higher level ice noise.

Comment 22: Monitoring a 120–dB exclusion zones would be impracticable, presents significant and unwarranted safety risks and, ultimately, defeats the purpose of the seismic survey program. The enormous size of the zone combined with poor weather conditions and the remote location of the seismic operations in the Chukchi and Beaufort Seas would make monitoring impractical and unnecessarily hazardous.

Response: NMFS appreciates the need for the safety of the crews responsible for monitoring this large area, which is why the IHA only requires this additional monitoring weather permitting and when the area can be aerially monitored safely.

Comments of AEWC on Specific Pages in **Federal Register** *Notice of Proposed IHA*

Comment 23: In the proposed IHA on page 27692, column 1, 1st paragraph: The statement attributed to ''Craig George, personal communication'' is a misleading misrepresentation of what was actually stated. While George did note that ''some whales are being reported off Barrow in summer between migrations,'' he in no way stated that ''subsistence in Barrow should not be affected by seismic operations since the location of the hunt is a considerable distance from the project area'' -in fact, just the opposite. This statement should be retracted and corrected.

Response: This statement was submitted with the Conoco application and NMFS mistakenly inserted it into the FR notice without verifying the reference (additionally, the mistaken statement runs counter to opinions that Craig George has expressed at past Open-water Seismic meetings). NMFS apologizes for the mistake, has removed the inaccurate text, and notes the correction here.

Comment 24: In the proposed IHA on page 27687, Column 2: ''detailed description of the Beaufort and Chukchi ecosystems and their associated marine mammals'' do not exist, contrary to what is stated here. There are many data gaps. Many of the data that do exist are outdated and inappropriate for comparison to the current ecosystem dynamics in the Chukchi and Beaufort Sea regions, especially in light of current climate change concerns.

Response: NMFS amended the text at this page to reflect that there are data gaps, though we do not believe that the data used in this notice are inappropriate.

Comment 25: In the proposed IHA on page 27687, Column 2, 2nd paragraph: There are listed only three pinniped species known to occur in the study area (ringed, bearded and spotted). Ribbon seals also occasionally occur in these areas during the time period of this planned seismic operation. In the same paragraph, it is mentioned that both minke and killer whales are very uncommon in the area, but NMFS does not cite the source of this information. When was the last survey of these species during this time period conducted? We are experiencing a period of rapid change in the area in question and many species that were uncommon 15–20 years ago are being seen more often.

Response: NMFS amended the text of the **Federal Notice** notice to reflect the occasional occurrence of ribbon seals noted by the commenter. NMFS' 2004 stock assessment for killer whales indicates the occasional presence of transient killer whales along the northern coast of Alaska, but does not include the Chukchi Sea in the distribution map. NMFS' 2001 stock assessment indicates that migratory minke whales are sometimes seen in the Bering and Chukchi Seas. Though the comment questioned the surveys for these species, it does not provide information suggesting that these species were more abundant than suggested in the proposed IHA **Federal Register** notice, and local biologists at the Open-water peer review meeting did not express concerns regarding these species. NMFS still believes that the likelihood of encountering, much less harassing, any individuals of these species is very low.

Comment 26: In the proposed IHA on page 27687 Column 3, 3rd paragraph: The ratio of density for ringed seals (from which the density of bearded seals is deduced) is from work that is over 15 years old. It may not be valid to base densities on this information. If the abundance estimates are not current, especially in light of environmental changes that have been noted in the Chukchi and Beaufort Sea regions, it is not scientifically appropriate to use these old population estimates for this exercise, even if this is the only data available. The population estimates should be based on current data, and if none is available, additional population assessments should be conducted. This is an example of one of the many data gaps that exist.

Response: Ringed seal density was based on survey data from 1999 and 2000. The ratio used to calculate bearded seal data from ringed seal data was from was based on data gathered in 1990 and 1991. However, actual bearded seal density surveyed in 1999 and 2000 was 5 to 10 times less than the number used here, but that number was not used because the surveyor was unable to correct for missed animals. Though NMFS has a responsibility to use the best available science and to be precautionary in the absence of data, the MMPA does not mandate that NMFS deny authorizations until data are available.

Comment 27: In the proposed IHA on page 27687, Chart: The estimated take of 10.7–22.7 percent of the ringed seals in the area without mitigation seems like a very high number of animals to take. Additionally, the estimates for gray whales should probably be revised, depending on when the data were collected. From recent tagged gray whale data and hunter observations, increasing numbers of gray whales are remaining in the Bering/Chukchi region for extended periods of time than previously thought. (B. Mate, personal communication). These data should include a seasonality dimension as a fine tuning method, as many of these species are more likely to be present in certain areas at certain times of the year.

Response: The take estimate for ringed seals, and other animals, does not take into account either the effectiveness of the required mitigation or the fact that most animals are expected to move to avoid the seismic sounds. Additionally, these animals are not removed from the populations, nor does their response to Level B harassment far offshore in the Chukchi Sea necessarily affect their behavior at all inshore where they are hunted. The abundance and density data used for calculating gray whales were gathered in 2002. When available, NMFS incorporates seasonally specific abundance information into the calculation of take.

Comment 28: In the proposed IHA on page 27687, Column 3, point 4, below chart: The chronic effects of noise exposure and the fact that we know very

little about this in marine mammals should be included in these points.

Response: Point 6 mentions that chronic exposure to noise could result in noise-induced physiological stress that might in turn have negative effects on the well-being or reproduction of the animals involved.

Comment 29: In the proposed IHA on page 27688, Column 1, point 7: It is not valid to compare seismic effects in terrestrial mammals with those in marine mammals. The sound is perceived in a totally different environment by species that have evolved to receive auditory sounds in a completely different way.

Response: Statements in the paragraph this commenter refers to were actually verified in laboratory TTS research conducted on trained odontocetes so it is not necessary to rely on an extrapolation from terrestrial mammal data. However, NMFS notes that while it may not be appropriate to use terrestrial mammal data to extrapolate to actual levels of different types of sound that may affect marine mammals, the physical construction of the ears bears enough resemblance that experts in the field deem that it is sometimes appropriate to compare processes between the two taxa.

Comment 30: In the proposed IHA on page 27688, Column 1, point 6: In addition to the well being and reproduction, the feeding and migration behaviors of these animals may be affected.

Response: NMFS has acknowledged elsewhere in this FR notice that noise may affect the feeding and migration behaviors of marine mammals. This point specifically refers to potential chronic effects and larger-scale effects such as a reduction in fitness or reproductive success.

Comment 31: In the proposed IHA on page 27688, Column 1, paragraph 4: The seismic geological survey work that will also be conducted during the time period (University of Texas Austin (UTA) Institute of Geology) should be added to the list of seismic surveys.

Response: The UTA program is a separate action that is currently under internal NMFS review following a public comment period (see 71 FR 27997, May 15, 2006). Essentially, that program is significantly farther north in the Chukchi Sea than are the oil company surveys, is for a shorter period of time during the summer, will have completed its work prior to the bowhead migration, and establishes very conservative safety zones to protect marine mammals. A final decision on implementation of mitigation measures will be made later this month

Comment 32: In the proposed IHA on page 27688, Column 2, paragraph 2: With respect to masking: some bowhead whales stop calling altogether (C. Clark, pers. comm.), and only one study has found that bowheads continue to call in the present of seismic activity. This needs to be considered as a possible outcome of seismic disturbance.

Response: NMFS acknowledges the fact that a possible outcome of seismic disturbance is that some cetaceans will sometimes stop calling and, in fact, this reaction has been documented in other species besides bowheads.

Comment 33: In the proposed IHA on page 27688, column 2, 2nd paragraph: The absence of masking effects in beluga whales cannot be assumed secondary to the fact that they communicate on higher frequencies. There are no data available on this subject. These noises will most certainly be audible to this species and there is no peer reviewed evidence investigating the impacts of these sounds on beluga whales. Until these investigations are conducted, these conclusions should not be made. It appears here that the lower sensitivity of belugas to seismic pulses is ''presumed''.

Response: The hearing thresholds of belugas have been tested in a laboratory and we know that belugas demonstrate significantly greater sensitivity to sounds of greater frequency than those used in seismic surveys (meaning they hear it at a lower volume). NMFS is not asserting that belugas will not hear the seismic sounds, only that the lower frequency seismic sounds will not mask (meaning block out) the higher frequency sounds that are known to be important to them, such as the vocalizations of conspecifics or predators.

Comment 34: In the proposed IHA on page 27688, column 2, 2nd paragraph: It is true that there is no evidence that there has been damage to auditory systems in bowhead whales, however, there have been no investigations that have focused on this issue. There are no data. This lack of data does not mean this damage does not occur.

Response: This is true. However, based on the limited data, the known avoidance of the sound sources by bowheads, and the protective measures incorporated in this IHA, NMFS does not expect any hearing damage to result from this seismic survey.

Comment 35: In the proposed IHA on page 27688, column 2, 3rd paragraph: ''Moreover, bowheads avoid an area many kilometers in radius around ongoing seismic operations, precluding any possibility of hearing damage.'' This statement is not valid.

Response: NMFS amended the text and removed the words ''precluding any possibility'' and replaced it with ''making hearing damage highly unlikely''.

Comment 36: In the proposed IHA on page 27688, column 2, 3rd paragraph: If bowheads or other marine mammals are involved in feeding or other vitally important functions, they may not move away from seismic operations, potentially resulting in physical harm.

Response: This is true; however, NMFS anticipates that bowheads involved in feeding will be detected by the additional protective measures required in the IHA and that the extended shut-down zones will minimize effects on any marine mammals engaged in these activities.

Comment 37: In the proposed IHA on page 27688, Column 3, 1st paragraph: We wish to emphasize, once again, that there has been very little study on the chronic effects of seismic disturbance on marine mammals. This includes disruption of cow/calf pairs (leading to increased neonatal mortality) and displacement of whales (and other marine mammals) from migratory routes or preferred feeding areas (possibly resulting in suboptimal body condition).

Response: NMFS acknowledges that there has been little study of these specific effects , and that is why we have not specifically addressed these issues in this FR Notice. However, NMFS has included of a summary of potential physiological effects, including stress.

Comment 38: In the proposed IHA on page 27689, center column: NMFS cites Miller et al., (1999) to assert that when the issue of bowhead deflection due to seismic activity was studied, though very few bowheads approached a seismic operation within 20 km (6.5 mi), the few bowheads sighted within that area ''returned to normal'' within 12 to 24 hours after airgun operations ended. This paragraph refers to observations made by Miller *et al.*, in Richardson *et al.* (1999). The study suggested that bowheads reoccupy a previously active seismic area within 12 to 24 hours of cessation of seismic activity. This paragraph overstates the conclusions in Richardson *et al.* (1999). First, Richardson *et al.* stated that their analysis of reoccupation was preliminary but MMS does not treat it as such in the PEA. Secondly, the number of observations within a 20 km (6.5 mi) zone around the previously active seismic activity was small (only 13 whales were observed between zero and 96 hours after seismic activity). This small sample size means that the statistical power (i.e. ability) to detect a

difference is low. Second, the data could reasonably be interpreted in other ways, such as: (1) the overall results (over the entire survey period, 0 to 96 hours after seismic activity, the density of whales in the 0 to 20 km zone was lower than the density in the 20 to 80 km (6.5 to 26 mi) zone, $p<0.001$ indicated that whales did not reoccupy the active seismic zone even after 96 hours, but there were no data collected beyond 96 hours, so the reoccupation might have taken longer than 96 hours; or (2) the whales immediately reoccupied the active zone because the multiple comparison tests (binomial tests) did not show a difference in density of whales between the zones in the category of 1 to 12 hours after seismic. These two wildly different interpretations provide evidence that the analysis was preliminary and the sample size too small to adequately test the question of reoccupation.

Response: NMFS acknowledges the commenter's alternate interpretation of the Miller study. NMFS presented this study as one of several pieces of information that relate to this topic. Though the commenter has presented alternate interpretations, the information is not such that it will affect NMFS' findings.

Comment 39: In the proposed IHA on page 27690, column 2, 2nd paragraph: NMFS recommends the 160–dB isopleth as the level to estimate the numbers of marine mammals taken by level B harassment. This level is inappropriate. Data exist to show that bowheads are essentially excluded from areas with seismic sounds to levels below 120 dB (Richardson *et al.*, 1999). The 120 dB level is the appropriate level to use. If bowheads or other marine mammals are involved in feeding or other vitally important functions, they may not move away from seismic operations potentially resulting in physical harm.

Response: Bowhead whales have been shown to avoid areas ensonified to above 120 dB. Though this deflection could potentially affect the success of the subsistence hunt of this species, NMFS does not believe that this effect rises to the level of MMPA harassment. Based on the work of Malme *et al.*, NMFS believes that 160 dB is the appropriate threshold for Level B Harassment. NMFS does not believe that seismic surveys will result in physical harm to whales at levels lower than 180 dB and the mitigation measures require that Conoco cease operating seismic if an animal approaches this close. Additionally, this IHA includes additional mitigation measures that require a powerdown (or avoidance) when aggregations of feeding mysticetes are found within the 160–dB isopleth.

Comment 40: In the proposed IHA on page 27690, column 3, 1st paragraph: These sound level output radii are highly dependent on the environment. The uncertainty of these figures should be noted. Factors (such as ice cover or permafrost) may alter these radii significantly. Why will the 1.5 factor not be used in take estimations?

Response: NMFS has noted previously that sound level output radii are dependent on the environment, which is why this IHA requires that Conoco field-verify the radii prior to conducting the surveys. For the take estimates, Conoco contracted with Jasco, which ran a model that incorporates the physical characteristics of the area where seismic surveys will be conducted. NMFS believes that this is an appropriate model to use to estimate take (and, as discussed later in this document, the model probably overestimates take as the estimates do not consider avoidance and mitigation). The 1.5 safety radii correction factor is an extra protective measure NMFS added only to be used prior to the field-verification. We do not believe it is appropriate to adjust the take estimates based on this precaution.

Comment 41: In the proposed IHA on page 27690, column 3, 1st paragraph: Will the M/V *Patriot* be towing a passive array for additional acoustic data collection? We strongly support the use of a towed passive acoustic array for monitoring marine mammals. Conducting aerial surveys in conjunction with the passive acoustic monitoring would be more appropriate and effective than either technique alone. Use of acoustic monitoring should routinely be required for seismic exploration in these areas and can only add to the information being gathered about marine mammals.*Response:* The mitigation and monitoring required by this IHA, which includes both an aerial component and a passive acoustic component, is discussed in detail in subsequent sections of this notice.

Comment 42: In the proposed IHA on page 27691, first column: the estimate of take by harassment is calculated by multiplying the estimated densities per km^2 of bowhead whales within the proposed survey area by the width of the 160 dB safety radii (4,590 m (15059 ft)) over the length of Conoco's estimated trackline. However, it is unclear how the estimated densities are calculated. This is important because the estimated take is very sensitive to the estimated density used in the formula. Also, there is no information provided on the time period for which the estimated density figure was measured, nor during which season. These two factors are highly variable and would greatly influence the estimated density figure. Finally, it is important to note that if the migration path is concentrated in the seismic exploration area, then the number of takes could be an order of magnitude higher than .0064 per km2. This is significant because NMFS has predicated its preliminary decision to authorize the harassment on its conclusion that ''the number of potential harassment takings is estimated to be relatively small in light of the population size.'' See page 27695 of the proposed IHA.

Response: The density estimates for bowhead whales are based on Moore et al. (2000), who reported the densities of belugas, bowheads, and gray whales during summer in the Beaufort and Chukchi Seas. Additionally, even if the seismic activities are in the middle of the migration, NMFS believes many whales will avoid the sound source (which equates to avoiding take for some animals), and the successful implementation of the mitigation measures will also decrease the amount of take.

Comment 43: In the proposed IHA on page 27691, column 1, 1st paragraph: There is no way of knowing that only level B harassment will occur, especially in pinnipeds. The lack of data on this subject precludes making this conclusion.

Response: There is no way of absolutely ensuring that Level A Harassment will not occur as a result of this action, however, for the reasons stated in the above-referenced section and throughout the FR notice (mitigation, avoidance of whales, etc.) NMFS believes that it is very unlikely that Level A Harassment will result and, therefore, NMFS is not authorizing Level A Harassment. If any take of marine mammals that is not authorized occurs, Conoco is required to alert NMFS within 24 hours and the authorization may be modified, suspended, or revoked.

Comment 44: In the proposed IHA on page 27691, column 3, 1st paragraph: Please produce a citation for your statement that ''zooplankton consumed by mysticetes would only respond to a seismic impulse very close to the source.'' Recent work in invertebrates has shown that this may not be the case, and it is not only prey number that is a concern, but also prey distribution. Impacts from seismic on the distribution of prey species have been found. If (for example) krill distribution is affected, distributing them in a different area of

the water column or breaking up their distribution (thereby making them a less concentrated resource), bowheads are likely to be impacted. This is yet another example of the data gap related to the proposed seismic exploration.

Response: NMFS could not find the citation and has removed the sentence from the text. However, the commenter did not provide a citation for the information it presented above, either, and therefore, no specific viewpoint regarding the potential effects of seismic on zooplankton is presented.

Comment 45: In the proposed IHA on page 27691: Potential Effects on Subsistence Use of Marine Mammals. There is a statement that Point Hope and Wainwright hunt only during the spring migration. In fact, Point Hope and Wainwright plan to undertake fall whaling beginning in 2006 due to changes in Arctic weather and sea ice conditions.

Response: NMFS has corrected the text per the AEWC's suggestion.

Comment 46: In the proposed IHA on page 27692, column 1, 2nd paragraph: It is important to note that even if direct conflicts with hunting times are avoided, bowheads may still be impacted in ways that will adversely affect the hunt. Examples of this include (but are not limited to): disruption of cow/calf pairs (leading to increased neonatal mortality) and displacement of whales (and other marine mammals) from migratory routes or preferred feeding areas (possibly resulting in suboptimal body condition).

Response: NMFS notes the lack of direct evidence to support the thought that seismic surveys will result in effects on subsistence hunting through the mechanisms discussed above. However, because of the uncertainty surrounding the issue, NMFS has incorporated additional mitigation (including enlarged safety zones, see below) to address the AEWC's concerns.

Comment 47: In the proposed IHA on page 27693, column 2, bullet 3: Bowhead whales are known to hold their breath for 45–60 minutes at a time (H. Brower, pers. comm.). Thus, 30 minutes is not a sufficient waiting time with respect to this species.

Response: Seismic vessels are moving continuously (because of long towed array) and NMFS believes that unless the animal submerges and follows at the speed of the vessel (highly unlikely), the vessel will be far beyond the length of the safety radii within 30 minutes, and therefore it will be safe to start the airguns again.

Comment 48: In the proposed IHA on page 27693, column 3, 2nd paragraph: Night vision goggle devices have proven ineffective for nighttime monitoring of marine mammals in other instances. It is unlikely that these will be of use in visualizing the entire exclusion zone, especially if it is not set at the180 dB isopleth.

Response: NMFS is aware that night vision goggles are not 100 percent effective. However, the airguns will be ramped up, the animals are likely to avoid the ongoing sound, and the goggles are effective to a certain degree. NMFS believes that Conoco will be able to effectively monitor out to the 180 dB isopleth.

Comment 49: In the proposed IHA on page 27695, column 2, paragraph 1: The statement '' no known rookeries, mating grounds, areas of concentrated feeding or other areas of special significance for marine mammals are known to occur within or near the planned areas of operations '' is incorrect. The western Beaufort Sea supports concentrations of feeding bowhead whales. Also, the Chukchi Sea area represents a ''black box'' with respect to data on marine mammal usage in general, and for bowhead whales in particular, but several sensitive life stages occur there for bowheads, belugas, ice seals and walrus for calving, nursing, mating and feeding. For instance, bowhead mother-calf pairs occur there in spring, as well as the feeding of adults and sub-adults.

Response: NMFS has amended this statement to indicate that an important migration pathway is present here. Though mother/calf pairs of bowheads swim through the area and other species do feed in aggregations in the broad area, NMFS stands by its assertion that ''no known rookeries, mating grounds, areas of concentrated feeding, or other areas of special significance for marine mammals are known to occur within or near the planned areas of operations during the season of operations.≥

Comment 50: In the proposed IHA on page 27695: Potential Impacts on Subsistence Uses of Marine Mammals. NMFS predicates its preliminary decision that the proposed seismic activity will not have an unmitigable adverse impact on the subsistence uses of bowhead whales on the timing of the activities, as well as the existence of a CAA between Conoco and the AEWC. We urge NMFS to use caution in relying too heavily on the CAA as a mitigation tool when the proposed activity involves several concurrent operations in what could be a concentrated area of the Arctic. Without knowledge of either where the individual seismic vessels will be located and in consideration of how little is actually known of bowhead distribution and abundance in the Chukchi Sea, the CAA is in fact limited as a mitigation tool. It can only accomplish so much to protect the fall hunt in Barrow because the success of that hunt will depend not only on the effects of multiple seismic operations in the Chukchi Sea, but also potentially adverse effects from Shell's Beaufort Sea seismic operations, seismic operations in the Canadian Beaufort Sea, barging operations attendant to oil and gas development, and production operations at the Northstar facility.

Response: While sympathetic to the concern of increasing industrialization of the Arctic Ocean and resultant impacts on the subsistence lifestyle of its inhabitants, section 101(a)(5)(D)(i) limits NMFS' authority for making its determination regarding impacts on availability of marine mammals for subsistence uses to the specific activity itself. As a result, NMFS works cooperatively with the AEWC to ensure that activities that might result in marine mammal harassment and have a potential impact on availability for subsistence uses have an authorization under the MMPA and that the applicant enters into discussions with the AEWC regarding a CAA. However, under NEPA, NMFS and MMS are required to look at cumulative effects and, as a result of this analysis we have incorporated additional mitigation measures (research monitoring, expanded safety zones, etc., see below) to address these larger scale concerns.

Mitigation and Monitoring

Three categories of mitigation and monitoring measures are required by the IHA and discussed in the following sections. In the first subsection, the mitigation and monitoring measures proposed by Conoco in their application are discussed. In the second subsection, NMFS discusses an additional set of mitigation measures that are intended to ensure that NMFS' can adopt MMS' PEA and subsequently issue a Finding of No Significant Impact. The third subsection refers to an additional comprehensive monitoring plan that Conoco, Shell, and GXT have agreed to implement, which is intended to further reduce impacts to the subsistence hunt and help fill some of the marine mammal data gaps in the Chukchi Sea.

Mitigation and Monitoring Measures in Conoco's Application

Mitigation

Conoco's proposed mitigation measures include (1) speed or course alteration, provided that doing so will not compromise operational safety requirements, (2) power-or shutdown procedures for the 180–dB safety zone,

(3) no start up of airgun operations unless the full 180–dB safety zone is visible for at least 30 minutes during day or night, (4) ramp-up procedures, and (5) seasonal restrictions near certain whaling villages and communication with whalers to ensure minimization of effects on subsistence hunt pursuant to the CAA. Details regarding these measures are provided below:

Speed or Course Alteration: If a marine mammal 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 way that avoids the marine mammal and also minimizes the effect on the seismic program. The marine mammal activities and movements relative to the seismic vessel will be closely monitored to ensure that the marine mammal does not approach within the safety radius. If the mammal 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).

Power-down Procedures: A power down involves decreasing the number of airguns in use such that the radius of the 180–dB (or 190–dB) zone is decreased to the extent that marine mammals are not in the safety zone. A power down may also occur when the vessel is moving from one seismic line to another. During a power down, one airgun is operated. The continued operation of one airgun is intended to alert marine mammals to the presence of the seismic vessel in the area. In contrast, a shut down occurs when all airgun activity is suspended. If a marine mammal 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 may (as an alternative to a complete shut down) be powered down before the mammal is within the safety radius. Likewise, if a mammal is already within the safety zone when first detected, the airguns will be powered down if doing so leaves the animals outside of the new safety radii around the airguns still operating, else they will be shut down. Following a power down, airgun activity will not resume until the marine mammal has cleared the safety zone. The animal will be considered to have cleared the safety zone if it:

- Is visually observed by marine mammal observers (MMOs) to have left the safety zone, or
- Has not been seen within the zone for 15 min in the case of pinnipeds or belugas, or
- Has not been seen within the zone for 30 min in the case of bowhead, gray, or killer whales.

Shut-down Procedures: The operating airgun(s) will be shut down completely if a marine mammal approaches or enters the safety radius and a power down will not succeed in removing the animal from within the 180 dB isopleth. The operating airgun(s) will also be shut down completely if a marine mammal approaches or enters the estimated safety radius of the source that would be used during a power down. The shutdown procedure should be accomplished within several seconds (of a ''one shot'' period) of the determination that a marine mammal is within or about to enter the safety zone. Airgun activity will not resume until the marine mammal has cleared 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 (beluga and seals) or 30 minutes (bowhead, gray, and killer whales).

Ramp-up Procedures: A ''ramp up'' procedure will be followed when the airgun array begins operating after a specified-duration period without airgun operations. Under normal operation conditions (4–5 knots (7.4–9.2 km/hr)) a ramp-up would be required after a ''no shooting'' period lasting 2 minutes or longer. NMFS normally requires that the rate of ramp up be no more than 6 dB per 5 minute period. 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 the smallest gun in the array that is being used for all subsets of the array. Guns will be added in a sequence such that the source level in the array will increase at a rate no greater than 6 dB per 5–minutes, which is the normal rate of ramp up for larger airgun arrays. During the ramp up (i.e., when only one airgun is operating), the safety zone for the full 16–airgun system will be maintained.

If the complete safety radius has not been visible for at least 30 minutes prior to the start of operations in daylight or nighttime, ramp-up will not commence unless one gun has been operating during the interruption of seismic survey operations. This means that it will not be permissible to ramp up the source from a complete shut down in thick fog or at other times when the full safety zone is not visible (i.e., sometimes at night). If the entire safety radius is visible using vessel lights and/or Night Vision Devices (NVDs) (as may be possible under moonlit and calm conditions), then start up of the airguns from a shut down may occur at night. If one airgun has operated during a power-down period, ramp up to full power will be permissible at night or in poor visibility, on the assumption that marine mammals will be alerted to the approaching seismic vessel by the sounds from the single airgun and could move away if they choose. Ramp-up of the airguns will not be initiated if a marine mammal is sighted within or near the applicable safety radii during the day or a night. For operations in the Chukchi during summer and autumn months, there will be enough daylight to monitor beyond a 12–hour cycle.

Seasonal Restrictions: Once fall bowhead whaling starts, seismic operators (and others) will take all reasonable steps to avoid adverse effects on the bowhead whale subsistence hunt and on the behavior of migrating bowhead whales. If alerted to an adverse effect, the operators will promptly reduce the level and volume of geophysical operations and if such adverse effects continue, operators should promptly move operations to an area where seismic operations are feasible and consistent with the CAA. If adverse effects continue and negotiations are unsuccessful, the seismic operations are to cease in the area of the reported adverse effect until the affected village has completed its bowhead whale hunting for 2006.

If requested, post-season meetings will also be held to assess the effectiveness of the 2006 CAA, to address how well conflicts (if any) were resolved; and to receive recommendations on any changes (if any) might be needed in the implementation of future CAAs.

Monitoring

Vessel-based observers will monitor marine mammals near the seismic vessel during: (1) all daytime hours; (2) 30 minutes before all start ups (day or night), and (3) at night when marine mammals are suspected (based on observations of the bridge crew) of either approaching or being within the safety radii. When feasible, observations will also be made during daytime periods during transits and other operations when guns are inactive.

During seismic operations observers will be based aboard the vessel. Marine mammal observers (MMOs) will be hired by Conoco, with NMFS approval. One resident from the NSB, preferably from Point Hope, Point Lay, Wainwright, or Barrow, who is knowledgeable about marine mammals

of the project area will be included in the MMO team aboard the vessel. Observers will follow a schedule so at least two observers will simultaneously monitor marine mammals near the seismic vessel during ongoing daytime operations and nighttime start ups of the airgun. Use of two simultaneous observers will increase the proportion of the animals present detected near the source vessel. MMO(s) will normally be on duty in shifts no longer than 4 hours. The vessel crew will also be instructed to assist in detecting marine mammals and implementing mitigation requirements (if practical). Before the start of the seismic survey the crew will be given additional instruction on how to do so.

The vessel is a suitable platform for marine mammal observations. When stationed on the flying bridge, the eye level will be approximately 10 m (32.8 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 about 10 m (32.8 ft) above sea level and approx. 25 of the view will be partially obstructed directly to the stern by the stack. During daytime, the MMO(s) will scan the area around the vessel systematically with reticle binoculars (e.g., 7 50 Bushnell or equivalent) and with the naked eye. Laser range finders (Leica LRF 1200 laser rangefinder or equivalent) will be available to assist with distance estimation. They are useful in training observers to estimate distances visually, but are generally not useful in measuring distances to animals directly. During darkness, NVDs will be available (ITT F500 Series Generation 3 binocular-image intensifier or equivalent), if and when required.

MMOs will collect the following data during their watch:

(1) Marine mammals - species, number, age/size/gender, behavior, movement, distance and bearing from ship, point of closest approach;

(2) Ship - location, heading, speed, seismic state, time, other ships; and

(3) Environment - sea state, ice cover, visibility, glare.

All observations and airgun 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 shut-down and power-down).

(2) Information needed to estimate the number of marine mammals potentially taken by harassment, which must be reported to NMFS.

(3) Data on the occurrence, distribution, and activities of marine mammals in the area where the seismic study is conducted.

(4) Information to compare the distance and distribution of marine mammals relative to the source vessel at times with and without seismic activity.

(5) Data on the behavior and movement patterns of marine mammals seen at times with and without seismic activity.

Additional Mitigation and Monitoring Measures Required by NMFS

Chase Boat Monitoring of 160–dB Isopleth

In addition to MMOs onboard the seismic vessels, Conoco will also have MMOs onboard a ''chase boat'' or ''guard boat''. During seismic operations, a chase boat remains very near to the stern of the source vessel anytime a member of the source vessel crew is on the back deck deploying or retrieving equipment related to the seismic array. Once the seismic array is deployed the chase boat then serves to keep other vessels away from the seismic vessel and its array (including the hydrophone streamer) during production of seismic data and provide additional emergency response capabilities. Whenever source vessel members are not working on the back deck and radar indicates no vessels approaching the source vessel, the chase boat will conduct observations of the area delineated by the 160–dB isopleth to look for bowhead and gray whale aggregations.

Conoco's chase boat will have MMOs onboard to collect marine mammal observations. The observations collected will likely be limited in scope due to the typical operating location of the chase boats (described previously). However, the observers aboard the chase boat will provide additional observations on the water to document any marine mammals in the vicinity of seismic operations. MMOs on the chase boat will be able to contact the seismic vessel if marine mammals are sited. To maximize the amount of time during the day that an observer is on duty, observers aboard the chase boat will rarely work at the same time. As on the source vessel, shifts will be limited to 4 hours in length and 12 hours total in a 24–hour period.

Aerial Monitoring of 120–dB Isopleth

Based on the PEA, NMFS has determined that in order to make a Finding of No Significant Impact under NEPA regulations, Conoco must conduct aerial monitoring in the Chukchi Sea after September 25, once research vessel monitoring has detected 5 or more cow/calf pairs during a vessel transit (see Research Monitoring) or once bowhead whale hunters have determined that cow/calf pairs are passing Barrow AK in significant numbers (a ''pulse'' of cow/calf pairs, verified by the AEWC), whichever is sooner. Once initiated, aerial monitoring will take place daily (weather permitting), whenever Conoco's seismic vessel is conducting seismic surveys and is operating within an area of the Chukchi Sea that can be covered safely and practically. The primary objectives of the offshore aerial surveys will be to (1) document the occurrence, distribution, and movements of bowhead and gray whales, and other marine mammals in and near the area where they might be affected by the seismic sounds and (2) detect bowhead whale cow/calf pairs in or near the area ensonified to a 120–dB SPL near the seismic survey vessel.

Mitigation Associated With 120– and 160–dB Safety Radii

NMFS notes that the additional mitigation measures described here are project-specific. They do not establish NMFS policy applicable to other projects or other locations. These mitigation measures apply exclusively to the Chukchi and Beaufort seas and seismic survey activities conducted there during the 2006 open water season. These measures have been developed based upon available data specific to the project areas and times. NMFS and MMS intend to gather and receive additional information from all sources, including industry, non-governmental organizations, Alaska Natives and other federal and state agencies. MMS and NMFS anticipate that mitigation measures applicable to future seismic and other activities will change and evolve based on newly-acquired data.

160–dB Feeding Aggregation Shutdown: Whenever the support ''chase'' vessel monitoring program described in the monitoring section above detects an aggregation of 12 or more non-migratory balaenopterid whales (bowhead or gray whales) within an acoustically verified 160–dB rms zone ahead of, or perpendicular to, the

seismic vessel track, Conoco must: (a) Immediately power-down the seismic airgun array and/or other acoustic sources to ensure that sound pressure levels at the shortest distance to the aggregation do not exceed 160 dB rms; and (b) Refrain from powering up the seismic airgun array until biological observers on board the support ''chase'' vessel(s) or survey aircraft confirm that no balaenopterid aggregations have been detected within the 160–dB zone based upon ship course, direction and distance from last sighting and the last aggregation sighting.

120–dB Bowhead Cow/Calf Shutdown: Whenever the aerial monitoring program described in the Monitoring section above detects 4 or more bowhead whale cow/calf pairs within an acoustically-verified 120–dB monitoring zone, Conoco must: (a) Immediately power-down or shut-down the seismic airgun array and/or other acoustic sources to ensure that sound pressure levels are reduced by at least 50 percent; and (b) Refrain from ramping up the seismic airgun array until two consecutive aerial or support vessel surveys confirm that there are no more than 3 bowhead cow/calf pairs within the area to be seismically surveyed within the next 24 hours.

Passive Acoustic Optional 120–dB Shutdown: If an aerial monitoring program cannot be implemented due to human safety concerns, and vessel surveys are used to monitor the 120–dB monitoring zone instead, a dedicated passive acoustic monitoring program capable of locating the position of the vocalization must be employed and monitored at all times that seismic is operating on the vessel. If the passive acoustic system detects one or more bowhead vocalizations within the 120–dB zone, the holder of this Authorization must: (a) Immediately shut-down the seismic airgun array and/or other acoustic sources; and (b) not proceed with ramping up the seismic airgun array until the passive acoustic monitoring program confirms that bowhead whales are not within the eastern portion of the 120–dB zone ahead of the ship's trackline over the next 24 hours.

Additional Comprehensive Monitoring Plan

On April 19–20, 2006, NMFS held a scientific open-water seismic meeting in Anchorage, AK to discuss appropriate mitigation and monitoring measures for Arctic Ocean seismic activities in 2006. The workshop participants recommended several monitoring measures to increase our knowledge of marine mammal distribution and abundance in the Chukchi Sea. These included use of passive acoustics, either towed from a vessel or set out in a series of arrays along the Chukchi Sea coast. Conoco has agreed to participate in a joint monitoring plan with Shell and GXT, the two other companies conducting surveys semi-concurrently with Conoco. The details of the plan have been reviewed by NMFS staff, NSB biologists, and representatives of the AEWC. The major components of the plan are summarized below, however, some of the finer details of the plan are still being discussed and may still be modified. The Comprehensive Monitoring Plan may be viewed at: *http://www.nmfs.noaa.gov/pr/permits/incidental.htm#iha.*

Aerial Surveys

Shell, CPA and GXT will conduct a joint aerial survey of coastal areas approximately 20 miles offshore between Point Hope and Point Barrow to collect data and report on the distribution, numbers, orientation and behavior of marine mammals, particularly beluga whales, near traditional hunting areas in the eastern Chukchi Sea. This aerial survey will begin in early July and will continue until mid-November or until all seismic operations in the Chukchi Sea are completed, whichever comes first. Weather and equipment permitting, aerial surveys will be conducted twice per week during this time period. Transects will be flown in a saw-toothed pattern extending from Point Barrow to Point Hope. This design will permit completion of the survey in one day and will provide representative coverage of the nearshore area from the mainland or outer barrier island shore to 20 nm (37 km) offshore. This includes waters where belugas would be available to subsistence hunters. Survey altitude will be at least 305 m (1000 ft) with an average survey speed of 100–120 knots (185–222 km/hr). Coordination will be undertaken with coastal villages to avoid disturbance of the beluga whale subsistence hunt. Three MMOs will be aboard the aircraft during key beluga hunting periods. When large concentrations of belugas are encountered during the saw-toothed pattern surveys or during return (direct) flights, the survey will be interrupted to photograph the groups in order to obtain counts of the number of belugas present. Detailed information on this survey can be found in LGL (2006).

Dedicated Vessel-Based Marine Mammal Surveys

Shell, CPA and GXT will sponsor a dedicated vessel-based marine mammal survey to collect systematic visual data and acoustic information on the distribution and abundance of marine mammals in the Chukchi Sea during the 2006 open water season. The MV *Torsvik* (or another vessel, depending upon its capability to tow the passive acoustic array) will be used for these surveys. Visual observations will be made by two teams of three observers each following standard marine mammal ship survey line transect procedures. Acoustic data will be collected using a towed hydrophone passive acoustic monitoring (PAM) equipment. The PAM will be monitored in real time by an acoustics technician and continuous recordings will be made during all on-effort periods.

Three dedicated marine mammal surveys will be conducted during the course of the open-water period. During each of these dedicated surveys, a systematic survey route composed of ten, 50 nm (92 km) line transects (in a saw-toothed pattern) will be run by the vessel (weather, ice and logistics permitting). The transect line has been designed to be covered in approximately 3 days of surveying. The start of the survey route will be randomly selected from within a 10 nm (19 km) area and the entire survey line shifted based on that start location. The survey route has been designed to cover a large portion of the Outer Continental Shelf (OCS) Chukchi Sea lease sale area and remain in waters of similar depths. The three surveys are scheduled to occur in early July, mid-August, and mid-October. By repeating nearly the same route during each survey, seasonal differences in sighting rates and densities may be more readily detected. In addition to dedicated marine mammal surveys, whenever Shell, Conoco and/or GXT's seismic vessel is conducting surveys in an area too distant for safe aerial surveys during the fall bowhead migration in the fall, the M/V *Torsvik* (or another similar vessel) will undertake surveys to look for bowhead cow/calf pairs within the upcurrent portion of the area delineated by the 120 dB isopleth of the vessel's seismic array (see Mitigation).

Passive Acoustic Monitoring

A towed hydrophone array will be used to monitor for vocalizing marine mammals during the dedicated marine mammal surveys. The array will contain two hydrophone elements designed to receive sounds in approximately the 100–Hz to 45–kHz range. This range covers the frequency of calls known to be produced by cetaceans and pinnipeds likely to be encountered in the Chukchi Sea during the open-water season (gray and bowhead whales

ranging from 100 Hz–4 kHz; beluga whales ranging up to approximately 10 kHz; pinnipeds ranging up to 5 kHz). The hydrophone array will be monitored during all daylight hours during the research portion of the survey and day and night during the mitigation phase (as mentioned above and later in this document). One bioacoustician will be required during the research phase and two or more during the mitigation phase if seismic vessels operate outside the zone for safe and effective aerial monitoring. Information on operations of the PAM can be found in LGL's Marine Mammal Monitoring, Mitigation, and Investigatory Plan (2006).

Acoustic Net Array

In addition to using PAM onboard the dedicated research vessel, an acoustic ''net'' array has been designed and will be deployed along the Chukchi Sea coast to collect information on the occurrence and distribution of beluga, and possibly bowhead whales that may be available to subsistence hunters near coastal villages. A suite of autonomous seafloor recorders (pop-ups) will be deployed by the industry to collect acoustic data from strategically situated sites in the Chukchi Sea. The basic plan will be to deploy horizontal line arrays (HLA) of pop-ups in four areas from approximately Pt. Hope to the western Beaufort Sea east of Barrow, Alaska. Each of the four HLAs will contain 4 pop-ups separated by approximately 6–8 nm (11–15 km) so as to have an end-to-end length of approximately 18–24 nm (33–44 km) thus forming an inshore-to-offshore ''net.'' An additional 4 pop-ups will be deployed at sites about 50–75 nm (92–139 km) offshore. The specific geometries and placements of the arrays are primarily driven by the objectives of (1) detecting the occurrence and approximate offshore distributions of beluga and possibly bowhead whales during the July to mid-August period and primarily bowhead whales during the mid-August to late October period, (2) measuring ambient noise, and (3) measuring received levels of seismic survey activities. Timing of deployment, number of pop-ups, and final positions will be subject to equipment availability, weather and ice conditions, and consultation with local villages so as to not interfere with subsistence hunting or fishing activities.

Reporting

Conoco will submit a report to NMFS approximately 90 days after completion of the 2006 season. The 90–day report will: (1) present the results of the 2006 shipboard marine mammal monitoring; (2) estimate exposure of marine mammals to industry sounds; (3) provide data on marine mammal sightings (e.g., species, numbers, locations, age/size/gender, environmental correlates); (4) analyze the effects of seismic operations (e.g., on sighting rates, sighting distances, behaviors, movement patterns); (5) provide summaries of power downs, shut downs, and ramp up delays; (6) provide an analysis of factors influencing detectability of marine mammals; (7) provide summaries on communications with hunters and potential effects on subsistence activities; and (8) present the results of the field verification of the safety radii.

Following the 2006 open water season, Conoco, Shell, and GXT will submit a single comprehensive report describing the acoustic, vessel-based, and aerial monitoring programs for all industrial seismic programs covered by IHAs will be prepared. This comprehensive report will describe the methods, results, conclusions and limitations of each of the individual data sets in detail. The report will also integrate (to the extent possible) the studies into a broad based assessment of industry activities and their impacts on marine mammals in the Chukchi Sea during 2006. The report will help to establish long term data sets that can assist with the evaluation of changes in the Chukchi Sea ecosystem. The report will also incorporate studies being conducted in the Beaufort Sea and will attempt to provide a regional synthesis of available data on industry activity in offshore areas of northern Alaska that may influence marine mammal density, distribution and behavior.

This comprehensive report will consider data from many different sources including two relatively different types of aerial surveys; several types of acoustic systems for data collection (net array, PAM, and Ocean Bottom Hydrophone systems), and vessel based observations. Collection of comparable data across the wide array of programs will help with the synthesis of information. However, interpretation of broad patterns in data from a single year is inherently limited. Many of the 2006 data will be used to assess the efficacy of the various data collection methods and to help establish protocols that will provide a basis for integration of the data sets over a period of years. Because of the complexity of this comprehensive report, NMFS is requiring that this report be submitted in draft to NMFS by April 1, 2007, in order for consideration, review and comment at the 2007 open water meeting prior to completion of a final comprehensive report.

Endangered Species Act

NMFS has issued a biological opinion regarding the effects of this action (among others) on ESA-listed species and critical habitat under the jurisdiction of NMFS. That biological opinion concluded that this action is not likely to jeopardize the continued existence of listed species or result in the destruction or adverse modification of critical habitat. A copy of the Biological Opinion is available upon request (see **ADDRESSES**).

National Environmental Policy Act (NEPA)

The MMS prepared a Draft PEA for the 2006 Arctic Outer Continental Shelf (OCS) Seismic Surveys. NMFS was a cooperating agency in the preparation of the MMS Draft and Final PEAs. NMFS noted that the MMS had prepared a PEA for the 2006 Arctic seismic surveys and made this Draft PEA available upon request (71 FR 26055, May 3, 2006). In accordance with NOAA Administrative Order 216–6 (Environmental Review Procedures for Implementing the National Environmental Policy Act, May 20, 1999), NMFS has determined that the MMS Final PEA contains an in-depth and detailed description of the seismic survey activities, reasonable alternatives to the proposed action, the affected environment, mitigation and monitoring measures identified to reduce impacts on the human environment to non-significant levels, and the potential effects of the action on the human environment. In view of the information presented in this document and the analysis contained in the supporting PEA, NMFS has determined therefore that issuance by NMFS of an IHA to Conoco and other companies for conducting seismic surveys this year in the Arctic Ocean will not significantly impact the quality of the human environment as described above and in the supporting Final PEA and hereby adopts MMS' final PEA. Therefore, an Environmental Impact Statement is not necessary.

A determination of non-significance is predicated however on full implementation of standard mitigation measures for preventing injury or mortality to marine mammals, in addition to area specific mitigation measures, such as implementation of (1) a 120–dB rms monitoring-safety zone for cow/calf pairs of bowhead whales in the Beaufort and Chukchi seas; (2) a 160–dB rms monitoring-safety zone for aggregations of feeding bowheads and gray whales in the Beaufort and

Chukchi seas; (3) seismic shut-down criteria to protect bowhead and gray whales when inside the 120–dB or 160–dB monitoring-safety zones; and (4) a joint industry cooperative program on marine mammal research in the Chukchi Sea. A copy of the MMS Final PEA for this activity is available upon request and is available online (see **ADDRESSES**).

Preliminary Conclusions

Summary

Based on the information provided in Conoco's application and the MMS PEA, and dependent upon the implementation of the required mitigation and monitoring measures, NMFS has determined that the impact of Conoco conducting seismic surveys in the northeastern Chukchi Sea in 2006 will have a negligible impact on marine mammals and that there will not be any unmitigable adverse impacts to subsistence communities, provided the mitigation measures required under the authorization are implemented and a CAA is implemented.

Potential Impacts on Marine Mammals

NMFS has preliminarily determined that the relatively short-term impact of conducting seismic surveys in the U.S. Chukchi Sea may result, at worst, in a temporary modification in behavior by small numbers of certain species of marine mammals and/or low-level physiological effects (Level B Harassment). While behavioral and avoidance reactions may be made by these species in response to the resultant noise, this behavioral change is expected to have a negligible impact on the affected species and stocks of marine mammals.

While the number of potential incidental harassment takes will depend on the distribution and abundance of marine mammals (which vary annually due to variable ice conditions and other factors) in the area of seismic operations, the number of potential harassment takings is estimated to be relatively small in light of the population size (see Table 1). NMFS anticipates the actual take of individuals to be lower than the numbers depicted in the table because those numbers do not reflect either the implementation of the mitigation numbers or the fact that some animals will avoid the the sound at levels lower than those expected to result in harassment. Additionally, for both ringed seals and bearded seals, the abundance estimates used to calculate the percentages only represent part of the population (which means the estimated percentages are further over estimates). Further, for ringed seals, the numbers are even lower because the density used for the calculation did not account for the fact that ringed seals are much denser near the shore and ice than they are in the open ocean where the seismic survey is primarily being conducted.

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

Finally, aside from the migration pathway (which has been addressed in this document) no known rookeries, mating grounds, areas of concentrated feeding, or other areas of special significance for marine mammals are known to occur within or near the planned areas of operations during the season of operations.

Potential Impacts on Subsistence Uses of Marine Mammals

NMFS believes that the seismic activity by Conoco in the northern Chukchi Sea in 2006 will not have an unmitigable adverse impact on the subsistence uses of bowhead whales and other marine mammals. This determination is supported by the following: (1) Seismic activities in the Chukchi Sea will not begin until after July 10 by which time the spring bowhead hunt is expected to have ended; (2) the fall bowhead whale hunt in the Beaufort Sea will be governed by a CAA between Conoco and the AEWC and village whaling captains, which includes conditions that will significantly reduce impacts on subsistence uses; (4) while it is possible, but unlikely, that accessibility to belugas during the spring subsistence beluga hunt could be impaired by the survey, very little of the planned survey is within 25 km (15.5 mi) of the Chukchi coast, meaning the vessel will usually be well offshore away from areas where seismic surveys would influence beluga hunting by communities; and (5) because seals (ringed, spotted, bearded) are hunted in nearshore waters and the seismic survey will remain offshore of the coastal and nearshore areas of these seals, it should not conflict with harvest activities.

Authorization

As a result of these preliminary determinations, NMFS has issued an IHA to Conoco for conducting a seismic survey in the northern Chukchi Sea in 2006, provided the previously mentioned mitigation, monitoring, and reporting requirements are incorporated.

Dated: July 7, 2006.

James H. Lecky,

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

[FR Doc. 06–6584 Filed 7–28–06; 8:45 am]

BILLING CODE 3510–22–C

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

[I.D. 072606B]

Caribbean Fishery Management Council; Public Meeting

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

ACTION: Notice of public meetings.

SUMMARY: The Caribbean Fishery Management Council (Council) and its Administrative Committee will hold meetings.

DATES: The meetings will be held on August 15–16, 2006. The Council will convene on Tuesday, August 15, 2006, from 9 a.m. to 5 p.m., and the Administrative Committee will meet from 5:15 p.m. to 6 p.m., on that same day. The Council will reconvene on Wednesday, August16, 2006, from 9 a.m. to 5 p.m., approximately.

ADDRESSES: The meetings will be held at The Buccaneer Hotel, 5007 Estate Shoys, Lt. 7, St. Croix, Christiansted, U.S.V.I.

FOR FURTHER INFORMATION CONTACT: Caribbean Fishery Management Council, 268 Munoz Rivera Avenue, Suite 1108, San Juan, Puerto Rico 00918–1920, telephone: (787) 766–5926.

SUPPLEMENTARY INFORMATION: The Council will hold its 122nd regular public meeting to discuss the items contained in the following agenda:

August 15, 2006

9 a.m. – 5 p.m.

Call to Order