UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Silver Spring, MD 20910

AUG 11 2010

Jonathan R. Childs
Geophysicist
U.S. Geological Survey
Pacific Coastal and Marine Science Center
Mail Stop 999
345 Middlefield Rd.
Menlo Park, California 94025

Dear Dr. Childs:

Enclosed is an Incidental Harassment Authorization (IHA) issued to the U. S. Geological Survey, under the authority of Section 101(a)(5)(D) of the Marine Mammal Protection Act (16 U.S.C. 1361 *et seq.*), to harass small numbers of marine mammals, by Level B harassment, incidental to the marine seismic survey conducted from the Canadian Coast Guard vessel CCGS *Louis S. St. Laurent*, which will be accompanied by the U.S. Coast Guard Cutter *Healy*, in the Arctic Ocean during August to September, 2010.

You are required to comply with the conditions contained in the IHA. In addition, you must cooperate with any Federal, state, or local agency monitoring the impacts of your activity and submit a report to the National Marine Fisheries Service's (NMFS) Office of Protected Resources within 90 days of the completion of the cruise. The IHA requires monitoring of marine mammals by qualified individuals before, during, and after seismic activities and reporting of marine mammal observations, including species, numbers, and behavioral modifications potentially resulting from this activity.

If you have any questions concerning the IHA or its requirements, please contact Howard Goldstein or Jolie Harrison, Office of Protected Resources, NMFS, at 301-713-2289.

Sincerely,

James H. Lecky
Director
Office of Protected Resources

Enclosures

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NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

NATIONAL MARINE FISHERIES SERVICE

Incidental Harassment Authorization

U.S. Geological Survey (USGS), Pacific Coastal and Marine Science Center, Mail Stop 999, 345 Middlefield Road, Menlo Park, California 94025, is hereby authorized under section 101(a)(5)(D) of the Marine Mammal Protection Act (MMPA) (16 U.S.C. 1371(a)(5)(D)) and 50 CFR 216.107, to harass small numbers of marine mammals incidental to a marine geophysical survey conducted from the Canadian Coast Guard vessel CCGS *Louis S. St. Laurent* (*St. Laurent*), and accompanied by the U.S. Coast Guard Cutter *Healy* (*Healy*), in portions of the Arctic Ocean, August to September, 2010:

1. This Authorization is valid from August 11 through October 21, 2010.

2. This Authorization is valid only for the *St. Laurent* and *Healy*'s activities associated with seismic survey operations that will occur in the area bounded approximately by 145° to 158° West longitude and 71° to 84° North latitude within the Exclusive Economic Zones (EEZ) of the United States and international waters, as specified in USGS's Incidental Harassment Authorization application and Environmental Assessment. The Geological Survey of Canada (GSC) has written a Categorical Declaration stating that "while in U.S. waters, the GSC operators will comply with any and all environmental mitigation measures required by the U.S. National Marine Fisheries Service and/or the U.S. Fish and Wildlife Service."

3. Species Authorized and Level of Takes

(a) The incidental taking of marine mammals, by Level B harassment only, is limited to the following species in the waters of the Arctic Ocean:

(i) Mysticetes – see Table 3 (attached) for authorized species and take numbers.

(ii) Odontocetes – see Table 3 (attached) for authorized species and take numbers.

(iii) Pinnipeds – see Table 3 (attached) for authorized species and take numbers.

(iv) If any marine mammal species are encountered during seismic activities that are not listed in Table 3 (attached) for authorizing taking and are likely to be exposed to sound pressure levels (SPLs) greater than or equal to 160 dB re 1 μPa

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(rms) for seismic airgun operations or greater than or equal to 120 dB re 1 μPa (rms) for icebreaking activities, then the Holder of this Authorization must alter speed or course, power-down, or shut-down the airguns to avoid take.

(b) The taking by injury (Level A harassment) serious injury, or death of any of the species listed in 3(a) above or the taking of any kind of any other species of marine mammal is prohibited and may result in the modification, suspension or revocation of this Authorization.

4. The taking of any marine mammal in a manner prohibited under this Authorization must be reported immediately to the Alaska Regional Administrator at 907-586-7221 or designee in Anchorage 907-271-3023, and the Office of Protected Resources, National Marine Fisheries Service (NMFS), at 301-713-2289.

5. The Authorization for taking by Level B harassment is limited to the following acoustic sources without an amendment to this Authorization:

(i) a three Sercel G-airgun array (two 500 in^3 and one 150 in^3 airguns) with a total capacity of 1,150 in^3 (or smaller);
(ii) chirp echosounder (i.e., Knudsen 320BR);
(iii) multi-beam echosounder (i.e., Kongsberg EM122);
(iv) sub-bottom profilers (i.e., Towed 3-5 kHz, Knudsen 320BR));
(iv) a piloting echosounder (i.e., ODEC Bathy-1500);
(v) two acoustic Doppler current profilers (i.e., RD Instruments Ocean Surveyor 75 and 150 Hz); and
(vi) icebreaking

6. The Holder of this Authorization is required to cooperate with NMFS and any other Federal, state or local agency monitoring the impacts of the activity on marine mammals.

7. Mitigation and Monitoring Requirements

The Holder of this Authorization is required to implement the following mitigation and monitoring requirements when conducting the specified activities to achieve the least practicable adverse impact on affected marine mammal species or stocks:

(a) During operations in U.S. EEZ waters, a complement of five Protected Species Observers (PSOs) will work on the source vessel, the *St. Laurent*, and two will be stationed on the *Healy*. Three PSOs will board the *St. Laurent* in Canada. Three PSOs and one Alaska Native community observer will be aboard the *Healy* at the outset of the project. Before survey operations begin in U.S. waters, two of the PSOs on the *Healy* will transfer to the *St. Laurent* to provide additional PSOs during airgun operations. When not surveying in U.S. waters, the distribution of PSOs will return to three on the *St.*

Laurent and four on the *Healy*. PSOs on the *Healy* will report sightings to the PSOs on the *St. Laurent* to alert them of possible needs for mitigation.

(b) Utilize two, NMFS-qualified, vessel-based PSOs (except during meal times and rest room breaks, when at least one PSO will be on watch) to visually watch for and monitor marine mammals near the seismic source vessel during daytime airgun operations (from nautical twilight-dawn to nautical twilight-dusk) and before and during start-ups of airguns day or night in U.S. waters. The *St. Laurent* and *Healy*'s vessel crew will also assist in detecting marine mammals, when practicable. The crew will be given instruction on mitigation requirements and procedures for implementation of mitigation prior to the start of the seismic survey. Members of the *Healy* crew will be trained to monitor for marine mammals and asked to contact the *Healy* PSOs for sightings that occur while the PSOs are off-watch. PSOs will have access to reticle binoculars (7x50), laser range finding binoculars, and night vision devices. PSO shifts will last no longer than 4 hours at a time. PSOs will also make observations during daytime periods when the seismic system is not operating for comparison of animal abundance and behavior, when feasible.

(c) PSOs will conduct monitoring while the airgun array and streamers are being deployed or recovered from the water.

(d) Record the following information when a marine mammal is sighted:

> (i) species, group size, age/size/sex categories (if determinable), behavior when first sighted and after initial sighting, heading (if consistent), bearing and distance from seismic vessel, sighting cue, apparent reaction to the airguns or vessel (e.g., none, avoidance, approach, paralleling, etc., and including responses to ramp-up), and behavioral pace; and
>
> (ii) time, location, heading, speed, activity of the vessel (including number of airguns operating and whether in state of ramp-up or power-down), sea state, visibility, and sun glare; and
>
> (iii) the data listed under 7(d)(ii) will also be recorded at the start and end of each observation watch and during a watch whenever there is a change in one or more of the variables.

(e) Visually observe the entire extent of the exclusion zone (190 dB for pinnipeds, 180 dB for cetaceans; see Table 1 [attached] for distances) using NMFS-qualified PSOs, for at least 30 minutes (min) prior to starting the airgun (day or night) on the *St. Laurent* and *Healy*. If the PSO finds a marine mammal within the exclusion zone, USGS must delay the seismic survey until the marine mammal(s) has left the area. If the PSO sees a marine mammal that surfaces, then dives below the surface, the PSO shall wait 30 min. If the PSO sees no marine mammals during that time, they should assume that the animal has moved beyond the exclusion zone. If for any reason the entire radius cannot be seen for

the entire 30 min (i.e., rough seas, fog, darkness), or if marine mammals are near, approaching, or in the exclusion zone, the airguns may not be started up. If one airgun is already running at a source level of at least 190 dB, USGS may start the second airgun without observing the entire exclusion zone for 30 min prior, provided no marine mammals are known to be near the exclusion zone (in accordance with condition 7(g) below).

(f) Establish a 180 dB and 190 dB exclusion zone for marine mammals before the three G-airgun array (1,150 in^3) is in operation; and a 180 dB and 190 dB exclusion zone before a single airgun (150 in^3) is in operation, respectively. See Table 1 (attached) for distances and exclusion zone radii.

(g) Implement a "ramp-up" procedure when starting up at the beginning of seismic operations or anytime after the entire array has been shut-down for more than 10 min, which means start the smallest airgun first and add airguns in a sequence such that the source level of the array will increase in steps not exceeding approximately 6 dB per 5-min period. During ramp-up, the PSOs will monitor the exclusion zone, and if marine mammals are sighted, a course/speed alteration, power-down, or shut-down will be implemented as though the full array were operational. Therefore, initiation of ramp-up procedures from shut-down requires that the PSOs be able to view the full exclusion zone as described in 7(e) (above).

(h) Alter speed or course during seismic operations if a marine mammal, based on its position and relative motion, appears likely to enter the relevant exclusion zone. If speed or course alteration is not safe or practicable, or if after alteration the marine mammal still appears likely to enter the exclusion zone, further mitigation measures, such as a power-down or shut-down, will be taken.

(i) Power-down or shut-down the airgun(s) if a marine mammal is detected within, approaches, or enters the relevant exclusion zone (as defined in Table 1, attached). A shut-down means all operating airguns are shut-down. A power-down means reducing the number of operating airguns to a single operating 150 in^3 airgun, which reduces the exclusion zone to the degree that the animal(s) is outside of it.

(j) Following a power-down, if the marine mammal approaches the smaller designated exclusion zone, the airguns must then be completely shut down. Airgun activity will not resume until the PSO has visually observed the marine mammal(s) exiting the exclusion zone and is not likely to return, or has not been seen within the radius for 15 min for species with shorter dive durations (small odontocetes and pinnipeds) or 30 min for species with longer dive durations (mysticetes and large odontocetes, including killer whales). Within international waters, the PSOs will apply a 30 min period for all species.

(k) Following a power-down or shut-down and subsequent animal departure, airgun operations may resume following ramp-up procedures described in 7(g).

(l) Marine geophysical surveys may continue into night and low-light hours if such segment(s) of the survey is initiated when the entire relevant exclusion zones are visible and can be effectively monitored.

(m) No initiation of airgun array operations is permitted from a shut-down position at night or during low-light hours (such as in dense fog or heavy rain) when the entire relevant exclusion zone cannot be effectively monitored by the PSOs on duty.

(n) The use of a helicopter to conduct ice reconnaissance flights and vessel-to-vessel personnel transfers is likely to occur during survey activities in U.S. waters. Collection of spot bathymetry data or on-ice landings, both of which required low altitude flight patterns by helicopters, will not occur in U.S. waters.

8. Reporting Requirements

The Holder of this Authorization is required to:

(a) Submit a draft report on all activities and monitoring results to the Office of Protected Resources, NMFS, within 90 days of the completion of the *St. Laurent* and *Healy*'s Arctic Ocean cruise. This report must contain and summarize the following information:

(i) Dates, times, locations, heading, speed, weather, sea conditions (including Beaufort sea state and wind force), visibility, sun glare, and associated activities during all seismic operations and marine mammal sightings.

(ii) Species, number, location, distance from the vessel, and; behavior of any marine mammals, as well as associated seismic activity (number of power-downs and shut-downs), observed throughout all monitoring activities.

(iii) An estimate of the number (by species) of marine mammals that: (A) are known to have been exposed to the seismic activity (based on visual observation) at received levels greater than or equal to 120 dB re 1 μPa (rms) (for icebreaking activities), greater than or equal to 160 dB re 1 μPa (rms) (for seismic airgun operations), and/or 180 dB re 1 μPa (rms) (for cetaceans) and 190 dB re 1 μPa (rms) (for pinnipeds) with a discussion of any specific behaviors those individuals exhibited; and (B) may have been exposed (based on modeling results) to the seismic activity at received levels greater than or equal to 120 dB re 1 μPa (rms) (for icebreaking activities), greater than or equal to 160 dB re 1 μPa (rms) and/or 180 dB re 1 μPa (rms) (for cetaceans) and 190 dB re 1 μPa (rms) (for pinnipeds) with a discussion of the nature of the probable consequences of that exposure on the individuals that have been exposed.

(iv) A description of the implementation and effectiveness of the monitoring and mitigation measures of the Incidental Harassment Authorization.

(b) Submit a final report to the Chief, Permits, Conservation, and Education Division, Office of Protected Resources, NMFS, within 30 days after receiving comments from NMFS on the draft report. If NMFS does not provide comments, the draft report will be considered to be the final report.

9. In the unanticipated event that any taking of a marine mammal in a manner prohibited by this Authorization occurs, such as an injury, serious injury or mortality, and is judged to result from these activities, USGS will immediately report the incident to the Alaska Regional Stranding Department at Protected Resources Division, Alaska Region, NMFS, at 907-586-7236, and Chief of the Permits, Conservation, and Education Division, Office of Protected Resources, NMFS, at 301-713-2289. USGS will postpone the survey activities until NMFS is able to review the circumstances of the take. NMFS will work with USGS to determine whether modifications in the activities are appropriate and necessary, and will notify the permit holder when they may resume sound source operations.

In the event that USGS discovers an injured or dead marine mammal that is judged to not have resulted from these activities, USGS will contact and report the incident to the Chief of the Permits, Conservation, and Education Division, Office of Protected Resources, NMFS, at 301-713-2289 within 24 hours of the discovery.

10. Implement the Plan of Cooperation outlining the steps that will be taken to cooperate and communicate with the native communities to ensure the availability of marine mammals for subsistence uses.

11. A copy of this Authorization must be in the possession of all contractors and PSOs operating under the authority of this Incidental Harassment Authorization.

AUG 11 2010

James H. Lecky
Director
Office of Protected Resources
National Marine Fisheries Service

Date

Attachments

Attachment

Table 1. Exclusion Zone Radii for Triggering Mitigation.

Source and Volume	Tow Depth (m) Ice/Open Water	Water Depth	Predicted RMS Distances (m)		
			Shut-down Zone for Pinnipeds 190 dB	Shut-down Zone for Cetaceans 180 dB	Level-B Harassment Zone (Impulsive) for Marine Mammals 160 dB
Single G-airgun 150 in^3	11/6-7	Deep (>1,000 m)	30	75	750
three G-airguns 1,150 in^3 (two 500 in^3 and one 150 in^3)	11/6-7	Deep (>1,000 m)	100	500	2,500

Table 2. Radii for Monitoring Take from Icebreaking.

Source	Predicted RMS Distances (m): Level B Harassment Zone (Continuous) for Marine Mammals 120 dB
Healy Icebreaking	1,750 m (3,500 m swath)

Table 3. Authorized Take Numbers for Each Marine Mammal Species under NMFS jurisdiction in the Arctic Ocean.

Species	Authorized Take in the Arctic Ocean Study Area Seismic Operations/Icebreaking (Total)
Mysticetes	
Bowhead whale (*Balaena mysticetus*)	0
Eastern Pacific gray whale (*Eschrictius robustus*)	0
Humpback whale (*Megaptera novaeangliae*)	0
Minke whale (*Balaenoptera acutorostrata*)	0
Fin whale (*Balaenoptera borealis*)	0
Odontocetes	
Beluga whale (*Delphinapterus leucas*)	182/42 (224)
Narwhal (*Monodon monocerus*)	0
Killer whale (*Orcinus orca*)	0
Harbor porpoise (*Phocoena phocoena*)	0
Pinnipeds	
Bearded seal (*Erignathus barbatus*)	52/15 (67)
Spotted seal (*Phoca largha*)	0
Ringed seal (*Phoca hispida*)	1,032/296 (1,328)
Ribbon seal (*Histriophoca fasciata*)	0