



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

JUL 13 2009

Woody C. Sutherland
Shipboard Technical Support
Scripps Institution of Oceanography
8602 La Jolla Shores Drive
La Jolla, California 92037

Dear Mr. Sutherland:

Enclosed is an Incidental Harassment Authorization (IHA) issued to the Scripps Institution of Oceanography, under the authority of Section 101(a)(5)(D) of the Marine Mammal Protection Act (16 U.S.C. 1361 *et seq.*), to harass species of marine mammals incidental to the R/V *Wecoma*'s low-energy seismic survey in the Northeast Pacific Ocean during July, 2009.

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 Ken Hollingshead, Office of Protected Resources, NMFS, at 301-713-2289.

Sincerely,

James H. Lecky
Director
Office of Protected Resources

Enclosure





UNITED STATES DEPARTMENT OF COMMERCE
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DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL MARINE FISHERIES SERVICE

Incidental Harassment Authorization

Scripps Institution of Oceanography (SIO), 8602 La Jolla Shores Drive, La Jolla, California 92037, 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 low-energy marine seismic survey conducted by the R/V *Wecoma* (*Wecoma*) in the Northeast Pacific Ocean, July, 2009:

1. This Authorization is valid from July 14, 2009 through August 14, 2009.
2. This Authorization is valid only for the *Wecoma*'s activities associated with low-energy seismic survey operations that will occur in the area 44° and 45° N, and 124.5° and 126° W within the Exclusive Economic Zone of the United States, as specified in SIO's Incidental Harassment Authorization application and Environmental Assessment.

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 off of Oregon:

- (i) Mysticetes – see Table 2 (attached) for authorized species and take numbers.
- (ii) Odontocetes – see Table 2 for authorized species and take numbers.
- (iii) Pinnipeds – see Table 2 for authorized species and take numbers.
- (iv) If any marine mammal species are encountered during seismic activities that are not listed in Table 2 (attached) for authorized taking and are likely to be exposed to SPLs greater than or equal to 160 dB re 1 μ Pa (rms), then the Holder of this Authorization must shut-down the airgun.

(b) The taking by Level A harassment (injury), 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 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 single GI airgun array with a total capacity of 45 in³;
- (ii) a sub-bottom profiler; and
- (iii) an acoustic release transponder used to communicate with ocean bottom seismometers (OBS).

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:

(a) Utilize a NMFS-qualified, vessel-based marine mammal visual observer (MMVO) to watch for and monitor marine mammals near the seismic source vessel during daytime airgun operations (from civil twilight-dawn to civil twilight-dusk) and before and during start-ups of airguns day or night. The *Wecoma's* vessel crew will also assist in detecting marine mammals, when practicable. MMVOs will have access to reticle binoculars (7x50 Fujinon), big-eye binoculars (25x150), and night vision devices. MMVO shifts will last no longer than 4 hours at a time. MMVOs will also make observations during daytime periods when the seismic system is not operating for comparison of animal abundance and behavior, when feasible.

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

(c) 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, cloud cover, and sun glare; and

(iii) the data listed under 7(c)(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.

(d) Visually observe the entire extent of the safety zone (190 dB for pinnipeds, 180 dB for cetaceans; see Table 1 [attached] for radii distances) using NMFS-qualified MMVOs, for at least 30 minutes prior to starting the airgun (day or night). If the MMVO finds a marine mammal within the safety zone, SIO must delay the seismic survey until the marine mammal(s) has left the area. If the MMVO sees a marine mammal that surfaces, then dives below the surface, the observer shall wait 30 minutes. If the MMVO see no marine mammals during that time, they should assume that the animal has moved beyond the safety zone. If for any reason the entire radius cannot be seen for the entire 30 minutes (min) (i.e., rough seas, fog, darkness), or if marine mammals are near, approaching, or in the safety radius, the airguns may not be started up.

(e) Establish 180 dB and 190 dB safety zones for cetaceans and pinnipeds, respectively, before the GI airgun array (45 in³) is in operation. See Table 1 (attached) for distances and safety radii.

(f) Implement the “start-up” procedure at the beginning of seismic operations or anytime after the entire array has been shut-down for more than 15 min. During start-ups the MMVOs will monitor the safety radius, and if marine mammals are sighted, a course/speed alteration or shut-down will be implemented if necessary. Therefore, initiation of start-up procedures from a shut-down requires that the MMVOs be able to view the full safety zone as described in 7(d).

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

(h) Shut-down the airguns if a marine mammal is detected within, approaches, or enters the relevant safety zone (as defined in Table 1, attached). A shut-down means the operating airgun is turned off.

(i) Following a shut-down, the airgun activity shall not resume until the marine mammal has cleared the safety zone, which means it was visually observed to have left the safety zone, or has not been seen within the safety zone 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 sperm, pygmy sperm, dwarf sperm, killer, and beaked whales).

(j) Following a shut-down and subsequent animal departure, airgun operations may resume following start-up procedures described in 7(d).

(k) Low-energy marine seismic surveys may continue into night and low-light hours if such segment(s) of the survey is initiated when the entire relevant safety zones are visible and can be effectively monitored.

(l) 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 safety zone cannot be effectively monitored by the MMVOs on duty.

(m) When operating the sound source(s), minimize approaches to slopes, submarine canyons, seamounts, and other underwater geologic features, if possible, to avoid possible beaked whale habitat.

(n) If concentrations or groups of beaked whales are visually observed at a site such as on the continental slope, submarine canyon, seamount, or other underwater geologic feature just prior to or during the airgun operations, those operations will be shut-down and/or moved to another location along the site, if possible, based on recommendations by the on-duty MMO aboard the *Wecoma*.

(o) If a North Pacific right whale (*Eubalaena japonica*) is visually sighted, the airgun array will be shut-down regardless of the distance of the animal(s) to the sound source. The array will not resume firing until 30 min after the last documented whale visual sighting.

(p) To the maximum extent practicable, schedule seismic operations in inshore and shallow waters during daylight hours and OBS operations during nighttime hours.

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 *Wecoma*'s cruise. This report must contain and summarize the following information:

(i) Dates, times, locations, heading, speed, weather during, sea conditions (including Beaufort Sea State and Wind Force), 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 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 160 dB re 1 μ Pa (rms) and/or 180 dB re 1 μ Pa (rms) 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 160 dB re 1 μ Pa (rms) and/or 180 dB re 1 μ Pa (rms) 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: (A) terms and conditions of the Biological Opinion's Incidental Take Statement (ITS) (attached); and (B) mitigation measures of the Incidental Harassment Authorization. For the Biological Opinion, the report will confirm the implementation of each term and condition, as well as any conservation recommendations, and describe their effectiveness, for minimizing the adverse effects of the action on listed marine mammals.

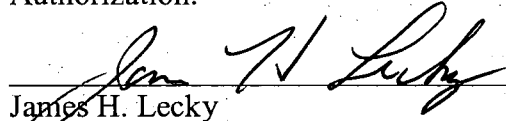
(b) Submit a final report to the Chief, Permits, Conservation, and Education Division, Office of Protected Resources, NMFS, within 30 days after receiving comments from NMFS on the draft report. If NMFS decides that the draft report needs no comments, the draft report will be considered to be the final 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, SIO will immediately report the incident to the Chief of the Permits, Conservation, and Education Division, Office of Protected Resources, NMFS, at 301-713-2289. SIO will postpone the research activities until NMFS is able to review the circumstances of the take. NMFS will work with SIO to determine whether modifications in the activities are appropriate and necessary, and notified the permit holder that they may resume sound source operations.

In the event that SIO discovers an injured or dead marine mammal that is judged to not have resulted from these activities, SIO 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. SIO is required to comply with the Terms and Conditions of the ITS corresponding to NMFS' Biological Opinion issued to both NSF and NMFS' Office of Protected Resources (attached).

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



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

JUL 13 2009

Date

Attachments

Attachment

Table 1. Safety Radii for Triggering Mitigation.

Source and Volume	Water Depth	Predicted RMS Distances (m)		
		Shut-down Zone for Pinnipeds 190 dB	Shut-down Zone for Cetaceans 180 dB	Level-B Harassment Zone 160 dB
Single GI airgun 45 in ³	Deep (>1,000 m)	8	23	220
	Intermediate (100-1,000 m)	12	35	330
	Shallow (<100 m)	95	150	570

Table 2. Authorized Take Numbers for Each Marine Mammal Species in the Northeast Pacific Ocean.

Species	Authorized Take in Northeast Pacific Ocean
Mysticetes	
North Pacific right whale (<i>Eubalaena japonica</i>)	0
Eastern Pacific gray whale (<i>Eschrichtius robustus</i>)	0
Humpback whale (<i>Megaptera novaeangliae</i>)	1
Minke whale (<i>Balaenoptera acutorostrata</i>)	0
Sei whale (<i>Balaenoptera physalus</i>)	1
Fin whale (<i>Balaenoptera borealis</i>)	1
Blue whale (<i>Balaenoptera musculus</i>)	1
Odontocetes	
Sperm whale (<i>Physeter macrocephalus</i>)	1
Pygmy sperm whale (<i>Kogia breviceps</i>)	0
Dwarf sperm whale (<i>Kogia sima</i>)	0
Unidentified <i>Kogia</i> sp. whale (pygmy and dwarf sperm whale)	0
Cuvier's beaked whale (<i>Ziphius cavirostris</i>)	0
Baird's beaked whale (<i>Barardius bairdii</i>)	0
Blainville's beaked whale (<i>Mesoplodon densirostris</i>)	0
Hubb's beaked whale (<i>Mesoplodon carlhubbsi</i>)	0
Stejneger's beaked whale (<i>Mesoplodon stejnegeri</i>)	0
Unidentified <i>Mesoplodon</i> sp. beaked whale (Blainville's, Hubb's, Stejneger's beaked whales)	0

Offshore Bottlenose dolphin (<i>Tursiops truncatus</i>)	0
Northern right-whale dolphin (<i>Lissodelphis borealis</i>)	5
Pacific white-sided dolphin (<i>Lagenorhynchus obliquidens</i>)	6
Striped dolphin (<i>Stenella coeruleoalba</i>)	0
Short-beaked common dolphin (<i>Delphinus delphis</i>)	4
Risso's dolphin (<i>Grampus griseus</i>)	3
False killer whale (<i>Pseudorca crassidens</i>)	0
Killer whale (<i>Orcinus orca</i>)	0
Short-finned pilot whale (<i>Globicephala macrorhynchus</i>)	0
Harbor porpoise (<i>Phocoena phocoena</i>)	0
Dall's porpoise (<i>Phocaenoides dalli</i>)	39
Pinnipeds	
Northern fur seal (<i>Callorhinus ursinus</i>)	3
Steller sea lion (<i>Eumetopias jubatus</i>)	1
California sea lion (<i>Phocaenoides dalli</i>)	2
Harbor seal (<i>Phoca vitulina richardsi</i>)	1
Northern elephant seal (<i>Mirounga angustirostris</i>)	5

Incidental take statement

Section 9 of the ESA and federal regulation pursuant to Section 4(d) of the ESA prohibit the “take” of endangered and threatened species, respectively, without special exemption. “Take” is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined by the NMFS as an act which actually kills or injures wildlife, which may include significant habitat modification or degradation which actually kills or injures fish or wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of Sections 7(b)(4) and 7(o)(2), taking that is incidental and not intended as part of the agency action is not considered to be prohibited taking under the ESA provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

The measures described below are nondiscretionary, and must be undertaken by the NSF and the Permits Division so that they become binding conditions for SIO for the exemption in Section 7(o)(2) to apply. Section 7(b)(4) of the ESA requires that when a proposed agency action is found to be consistent with Section 7(a)(2) of the ESA and the proposed action may incidentally take individuals of listed species, the NMFS will issue a statement that specifies the impact of any incidental taking of endangered or threatened species. To minimize such impacts, reasonable and prudent measures and term and conditions to implement the measures, must be provided. Only incidental take resulting from the agency actions and any specified reasonable and prudent measures and terms and conditions identified in the incidental take statement are exempt from the taking prohibition of Section 9(a), pursuant to Section 7(o) of the ESA.

Section 7(b)(4)(C) of the ESA specifies that in order to provide an incidental take statement for an endangered or threatened species of marine mammal, the taking must be authorized under Section 101(a)(5) of the MMPA. One of the federal actions considered in this Opinion is the Permits Division’s proposed authorization of the incidental taking of blue, fin, sei, humpback, and sperm whales pursuant to Section 101(a)(5)(D) of the MMPA. With this authorization, the incidental take of listed whales is exempt from the taking prohibition of Section 9(a), pursuant to Section 7(o) of the ESA.

The NMFS anticipates the incidental harassment of the blue whale (*Balaenoptera musculus*), fin whale (*Balaenoptera physalus*), sei whale (*Balaenoptera borealis*), humpback whale (*Megaptera novaeangliae*), sperm whale (*Physeter macrocephalus*), Steller sea lion (eastern DPS) (*Eumetopias jubatus*), leatherback sea turtle (*Dermochelys coriacea*), Lower Columbia River Chinook salmon (*Oncorhynchus tshawytscha*), Upper Columbia River spring-run Chinook salmon (*Oncorhynchus tshawytscha*), Snake River fall-run Chinook salmon (*Oncorhynchus tshawytscha*), Snake River spring/summer-run Chinook salmon (*Oncorhynchus tshawytscha*), Upper Willamette River Chinook salmon (*Oncorhynchus tshawytscha*), Lower Columbia River coho salmon (*Oncorhynchus kisutch*), Southern Oregon & Northern California coast coho salmon (*Oncorhynchus kisutch*), Oregon coast coho salmon (*Oncorhynchus kisutch*), Ozette Lake sockeye salmon (*Oncorhynchus nerka*), Snake River sockeye salmon (*Oncorhynchus nerka*), Lower Columbia River steelhead (*Oncorhynchus mykiss*), Middle Columbia River steelhead (*Oncorhynchus mykiss*), Northern California steelhead (*Oncorhynchus mykiss*), Snake River steelhead (*Oncorhynchus mykiss*), Upper Columbia River steelhead (*Oncorhynchus mykiss*), and Upper Willamette River steelhead (*Oncorhynchus mykiss*) during the proposed seismic activities.

Amount or extent of take

The NMFS anticipates the proposed seismic survey in the Pacific Ocean off Oregon might result in the incidental take of listed species. The proposed action might take 1 blue whale, 1 fin whale, 1 sei whale, 1 humpback whale, and 1 sperm whale by exposing individuals to received seismic sound levels greater than 160 dB re 1 μ Pa. In addition, 1 Steller sea lion might be exposed at this level. These estimates are based on the best available information of whale densities in the area to be ensonified above 160 dB re 1 μ Pa during the proposed activities. This incidental take would result from exposure to acoustic energy during seismic operations, would be in the form of harassment, and is not expected to result in the death or injury of any individuals that are exposed.

We expect the proposed action might also take individual leatherback sea turtles as a result of exposure to acoustic energy during seismic studies, and we expect this take would also be in the form of harassment, with no death or injury expected for individuals exposed. Harassment of sea turtles is expected to occur at received levels above 166 dB re 1 μ Pa. The proposed action might take eight leatherback sea turtles. These estimates are based on the best available information on sea turtle abundance expected in the area to be ensonified above 160 dB re 1 μ Pa during the proposed activities.

Further, we expect the proposed seismic survey might also take individual salmonids as a result of airgun exposure. Take would be in the form of harassment and no lethal take or serious injury is expected. The best available information indicates that salmonids might experience behavioral harassment at roughly 172-176 dB re 1 μ Pa. The number of fish expected to be taken cannot be quantified because density estimates are not available. Salmon are expected to be similarly harassed and temporarily displaced in all survey locations, or 206 km² of habitat.

If overt adverse reactions (for example, startle responses, dive reactions, or rapid departures from the area) by listed whales or sea turtles are observed outside of the 160 dB or 166 dB re 1 μ Pa isopleths, respectively, while airguns are operating, incidental take may be exceeded. If such reactions by listed species are observed while the airgun, MBES, or SBP are in operation, this may constitute take that is not covered in this Incidental Take Statement. The NSF and the Permits Division must contact the Endangered Species Division to determine whether reinitiation of consultation is required because of such operations.

Any incidental take of blue, fin, sei, humpback, and sperm whales, leatherback sea turtles, listed salmonids is restricted to the permitted action as proposed. If the actual incidental take meets or exceeds the predicted level, the NSF and Permits Division must reinitiate consultation. All anticipated takes would be "takes by harassment," as described previously, involving temporary changes in behavior.

Reasonable and prudent measures

The NMFS believes the reasonable and prudent measures described below are necessary and appropriate to minimize the amount of incidental take of listed entities resulting from the proposed action. These measures are non-discretionary and must be binding conditions of the NSF funding of the proposed seismic studies and the NMFS' authorization for the exemption in Section 7(o)(2) to apply. If the NSF or the NMFS fail to ensure compliance with these terms and conditions, the protective coverage of Section 7(o)(2) may lapse.

1. All activities must comply with the reasonable and prudent measures for sea turtles and whales listed in this biological opinion. For listed sea turtle and marine mammal species

these measures include the following: immediate shutdown of all seismic sources in the event a North Pacific right whale is detected; vessel-based visual monitoring by marine mammal and sea turtle observers; speed or course alteration as practicable; implementation of a marine mammal and sea turtle exclusion zone within the 180 dB re 1 $\mu\text{Pa}_{\text{rms}}$ isopleth for shut-down procedures; and emergency shutdown procedures in the event of an injury or mortality of a listed marine mammal or sea turtle. The measures for marine mammals are required to be implemented through the terms of the IHA issued under section 101(a)(5)(D) and 50 CFR 216.107.

2. The implementation and effectiveness of mitigation measures incorporated as part of the Reasonable and Prudent Measure mentioned above and the associated Terms and Conditions must be monitored.

Terms and conditions

In order to be exempt from the prohibitions of Section 9 of the ESA, the NSF, Permits Division, and SIO must comply with the following terms and conditions, which implement the Reasonable and Prudent Measures described above. These terms and conditions are non-discretionary.

To implement the Reasonable and Prudent Measures, the NSF and the NMFS shall ensure that

1. SIO implements the mitigation, monitoring, and reporting conditions contained in the IHA and this Opinion.
2. The Chief of the Endangered Species Division is immediately informed of any changes or deletions to any portions of the monitoring plan or IHA.
3. SIO immediately reports all sightings and locations of injured or dead endangered and threatened species to the Permits Division and NSF.
4. The NSF and the Permits Division provide a summary of the implementation and effectiveness of the terms of the IHA to the Chief of the Endangered Species Division. This report shall confirm the implementation of each term and summarize the effectiveness of the terms for minimizing the adverse effects of the project on listed whales and sea turtles.

Conservation recommendations

Section 7(a)(1) of the ESA directs federal agencies to use their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

We recommend the following conservation recommendations, which would provide information for future consultations involving seismic surveys and the issuance of incidental harassment authorizations that may affect listed species

1. *Improve estimates of levels and forms of "take" and responses to seismic sounds.* The Permits Division should review reports submitted for this and other prior geophysical research surveys funded by the NSF and compile and analyze information to improve agency estimates of the number of the different species of marine mammals, sea turtles, and listed fish that are likely to be exposed to sounds from seismic surveys, the response

of those species to this exposure, and the probable consequences of those responses on the life history of individual animals. The results should be provided to the Endangered Species Division as part of requests for consultation on future proposals to authorize incidental harassment.

2. *Effects of seismic noise on sea turtles and fish.* The NSF should promote and fund research examining the potential effects of seismic surveys on listed sea turtle and fish species.

In order for the Endangered Species Division to be kept informed of actions minimizing or avoiding adverse effects on, or benefiting ESA-listed species or their habitats, the Permits Division should notify the Endangered Species Division of any conservation recommendations they implement in their final action.