



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

MAY 15 2015

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 small numbers of marine mammals, by Level B harassment, incidental to the R/V *Roger Revelle's* low-energy marine geophysical (seismic) survey in the Southwest Pacific Ocean, East of New Zealand during May to June 2015.

You are required to comply with the conditions contained in the IHA, which have also been included as Terms and Conditions for incidental take of endangered species in the Biological Opinion. In addition, you must 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 also requires monitoring of marine mammals by qualified individuals before, during, and after seismic operations 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, Jeannine Cody, or Jolie Harrison, Office of Protected Resources, NMFS, at 301-427-8401.

Sincerely,

Donna S. Wieting
Director
Office of Protected Resources

Enclosures



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Incidental Harassment Authorization

The National Marine Fisheries Service (NMFS) hereby authorizes the Scripps Institution of Oceanography (SIO), 8602 La Jolla Shores Drive, La Jolla, California 92037 and the U.S. National Science Foundation (NSF), Division of Ocean Sciences, 4201 Wilson Boulevard, Suite 725, Arlington, Virginia 22230, under section 101(a)(5)(D) of the Marine Mammal Protection Act (MMPA) (16 U.S.C. 1371(a)(5)(D)), to harass small numbers of marine mammals incidental to a low-energy marine geophysical (seismic) survey conducted aboard the R/V *Roger Revelle* (*Revelle*) in the Southwest Pacific Ocean, East of New Zealand, May through June 2015:

1. Effective Dates

This Authorization is valid from May 18, 2015 through July 30, 2015.

2. Specified Geographic Region

This Authorization is valid only for SIO's activities associated with low-energy seismic survey, bathymetric profile, and heat-flow probe measurements conducted aboard the *Revelle* that shall occur in the following specified geographic area:

(a) In selected regions of the Southwest Pacific Ocean off the east coast of New Zealand. The survey sites are located in the Exclusive Economic Zone, outside of territorial waters (located between approximately 38.5 and 42.5° South, and between 174 and 180° East). Water depths in the survey area are expected to be 200 to 3,000 meters (m) (656.2 to 9,842.5 feet [ft]). No airgun operations would occur in shallow (less than 100 m) water depths. Airgun operations will take approximately 135 hours in total and 1,250 kilometers (km) (674.9 nautical miles [nmi]), and the remainder of the time would be spent in transit and collecting heat-flow measurements. The low-energy seismic survey will be conducted as described in SIO's Incidental Harassment Authorization application and the associated NSF and SIO's *Environmental Analysis of a Low-Energy Marine Geophysical Survey by the R/V Roger Revelle in the Southwest Pacific Ocean, East of New Zealand, May to June 2015*.

3. This Authorization does not permit incidental takes of marine mammals in the territorial sea of foreign nations, as the MMPA does not apply in those waters. The territorial sea extends at most 22.2 km (12 nmi) from the baseline of a coastal State.



4. 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 Southwest Pacific Ocean, East of New Zealand:

(i) Mysticetes – see Table 1 (attached) for authorized species and take numbers.

(ii) Odontocetes – see Table 1 (attached) for authorized species and take numbers.

(iii) Pinnipeds – see Table 1 (attached) for authorized species and take numbers.

(iv) If any marine mammal species are encountered during seismic activities that are not listed in Table 1 (attached) and are likely to be exposed to sound pressure levels (SPLs) greater than or equal to 160 dB re 1 μ Pa (rms) for seismic airgun operations, then SIO must alter speed or course or shut-down the airguns to prevent take.

(b) The taking by injury (Level A harassment), serious injury, or death of any of the species listed in Condition 4(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.

5. The sources authorized for taking by Level B harassment are limited to the following acoustic sources, absent an amendment to this Authorization:

(a) A two Generator Injector (GI) airgun array (each with a discharge volume of 45 cubic inches [in^3]) with a total volume of 90 in^3 (or smaller).

6. Prohibited Take

The taking of any marine mammal in a manner prohibited under this Authorization must be reported immediately to the Office of Protected Resources, NMFS, at 301-427-8401.

7. Mitigation and Monitoring Requirements

SIO is required to implement the following mitigation and related monitoring requirements when conducting the specified activities to achieve the least practicable impact on affected marine mammal species or stocks:

Protected Species Observers and Visual Monitoring

(a) Utilize at least one, NMFS-qualified, vessel-based Protected Species Observer (PSO) 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 ramp-ups of airguns day or night. Three PSOs shall be based onboard the vessel.

(i) The *Revelle's* vessel crew shall also assist in detecting marine mammals, when practicable.

(ii) PSO(s) shall have access to reticle binoculars (7 x 50 Fujinon) equipped with a built-in daylight compass and range reticles, big-eye binoculars (25 x 150), optical range finders, and night-vision devices.

(iii) PSO(s) shifts shall last no longer than 4 hours at a time.

(iv) PSO(s) shall also make observations during daytime periods when the seismic airguns are not operating, when feasible, for comparison of animal abundance and behavior.

(v) PSO(s) shall conduct monitoring while the airgun array and streamer are being deployed or recovered from the water.

(b) PSO(s) shall 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 shut-down), Beaufort sea state and wind force, visibility, cloud cover, and sun glare; and

(iii) The data listed under Condition 7(b)(ii) shall 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.

Buffer and Exclusion Zones

(c) Establish a 160 dB re 1 μ Pa (rms) buffer zone as well as 180 dB re 1 μ Pa (rms) exclusion zone for cetaceans and 190 dB re 1 μ Pa (rms) exclusion zone for pinnipeds before the two GI airgun array (90 in³ total volume) is in operation. See Table 2 (attached) for distances and buffer and exclusion zones.

Visual Monitoring at the Start of the Airgun Operations

(d) Visually observe the entire extent of the exclusion zones (180 dB re 1 μ Pa [rms] for cetaceans and 190 dB re 1 μ Pa [rms] for pinnipeds; see Table 2 [attached] for distances) using two NMFS-qualified PSOs, for at least 30 minutes prior to starting the airgun array (day or night).

(i) If the PSO(s) sees a marine mammal within the exclusion zone, SIO must delay the seismic survey until the marine mammal(s) has left the area. If the PSO(s) sees a marine mammal that surfaces, then dives below the surface, the PSO(s) shall wait 30 minutes, and if the PSO(s) sees no marine mammals during that time, the PSO should assume that the animal has moved beyond the exclusion zone.

(ii) If for any reason the entire radius cannot be seen for the entire 30 minutes (*i.e.*, rough seas, fog, darkness), or if marine mammals are near, approaching, or in the exclusion zone, the airguns may not be ramped-up. If one airgun is already running at a source level of at least 180 dB re 1 μ Pa (rms), SIO may start the second airgun without observing the entire exclusion zone for 30 minutes prior, provided no marine mammals are known to be near the exclusion zone (in accordance with Condition 7[e] below).

Ramp-up Procedures

(e) Implement a “ramp-up” procedure, which means starting with a single GI airgun and adding a second GI airgun after five minutes, when starting up at the beginning of seismic operations or anytime after the entire array has been shut-down for more than 15 minutes. During ramp-up, the two PSOs shall monitor the exclusion zone, and if marine mammals are sighted, a shut-down shall be implemented as though the full array (both GI airguns) were operational. Therefore, initiation of ramp-up procedures from shut-down requires that the two PSOs be able to view the full exclusion zone as described in Condition 7(d) (above).

Shut-down Procedures

(f) Shut-down the airgun(s) if a marine mammal is detected within, approaches, or enters the relevant exclusion zone (as defined in Table 2, attached). A shut-down means all operating airguns are shut-down (*i.e.*, turned off).

(g) Following a shut-down, the airgun activity shall not resume until the PSO(s) has visually observed the marine mammal(s) exiting the exclusion zone and is not likely to return, or has not been seen within the exclusion zone for 15 minutes, for species with shorter dive durations (small odontocetes and pinnipeds) or 30 minutes for species with

longer dive durations (mysticetes and large odontocetes, including sperm, dwarf and pygmy sperm, killer, and beaked whales).

(h) Following a shut-down and subsequent animal departure, airgun operations may resume, following ramp-up procedures described in Condition 7(e).

Speed or Course Alteration

(i) Alter speed or course during airgun 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 shut-down, shall be taken.

Survey Operations

(j) To the maximum extent practicable, SIO will conduct the low-energy seismic survey (especially when near land) from the coast (inshore) and proceed towards the sea (offshore) in order to avoid herding or trapping marine mammals in shallow water.

Survey Operations during Low-Light Hours

(k) Marine low-energy seismic surveys may continue into 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.

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

(m) To the maximum extent practicable, schedule seismic operations (*i.e.*, shooting airguns) during daylight hours, and heat-flow measurements at nighttime hours.

8. Reporting Requirements

SIO 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 *Revelle*'s Southwest Pacific Ocean off the East coast of New Zealand 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), 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 (*e.g.*, 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) (for seismic airgun operations), and/or 180 dB re 1 μ Pa (rms) for cetaceans and 190 dB re 1 μ Pa (rms) for pinnipeds with a discussion of any specific behaviors those individuals exhibited; and (B) may have been exposed (based on modeled values for the two GI airgun array) to the seismic activity at received levels greater than or equal to 160 dB re 1 μ Pa (rms) (for seismic airgun operations), and/or 180 dB re 1 μ Pa (rms) for cetaceans and 190 dB re 1 μ Pa (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: (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 shall 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 Endangered Species Act-listed marine mammals.

(b) Submit a final report to the Chief, Permits and Conservation 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 shall be considered to be the final report.

9. Reporting Prohibited Take

(a) In the unanticipated event that the specified activity clearly causes the take of a marine mammal in a manner prohibited by this Authorization, such as an injury (Level A harassment), serious injury or mortality (*e.g.*, through ship-strike, gear interaction, and/or entanglement), SIO shall immediately cease the specified activities and immediately report the incident to the Chief of the Permits and Conservation Division, Office of Protected Resources, NMFS, at 301-427-8401 and/or by e-mail to Jolie.Harrison@noaa.gov and Howard.Goldstein@noaa.gov. The report must include the following information:

(i) Time, date, and location (latitude/longitude) of the incident; the name and type of vessel involved; the vessel's speed during and leading up to the incident; description of the incident; status of all sound source use in the 24 hours preceding the incident; water depth; environmental conditions (*e.g.*, wind speed

and direction, Beaufort sea state, cloud cover, and visibility); description of marine mammal observations in the 24 hours preceding the incident; species identification or description of the animal(s) involved; the fate of the animal(s); and photographs or video footage of the animal (if equipment is available).

Activities shall not resume until NMFS is able to review the circumstances of the prohibited take. NMFS shall work with SIO to determine what is necessary to minimize the likelihood of further prohibited take and ensure MMPA compliance. SIO may not resume their activities until notified by NMFS via letter, e-mail, or telephone.

Reporting an Injured or Dead Marine Mammal with an Unknown Cause of Death

(b) In the event that SIO discovers an injured or dead marine mammal, and the lead PSO determines that the cause of the injury or death is unknown and the death is relatively recent (*i.e.*, in less than a moderate state of decomposition as described in the next paragraph), SIO will immediately report the incident to the Chief of the Permits and Conservation Division, Office of Protected Resources, NMFS, at 301-427-8401, and/or by e-mail to Jolie.Harrison@noaa.gov and Howard.Goldstein@noaa.gov. The report must include the same information identified in Condition 9(a)(i) above. Activities may continue while NMFS reviews the circumstances of the incident. NMFS will work with SIO to determine whether modifications in the activities are appropriate.

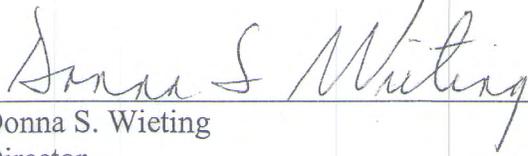
Reporting an Injured or Dead Marine Mammal Not Related to the Activities

(c) In the event that SIO discovers an injured or dead marine mammal, and the lead PSO determines that the injury or death is not associated with or related to the activities authorized in Condition 2 of this Authorization (*e.g.*, previously wounded animal, carcass with moderate to advanced decomposition, or scavenger damage), SIO shall report the incident to the Chief of the Permits and Conservation Division, Office of Protected Resources, NMFS, at 301-427-8401, and/or by e-mail to Jolie.Harrison@noaa.gov and Howard.Goldstein@noaa.gov, within 24 hours of the discovery. SIO shall provide photographs or video footage (if available) or other documentation of the stranded animal sighting to NMFS. Activities may continue while NMFS reviews the circumstances of the incident.

10. *Endangered Species Act Biological Opinion and Incidental Take Statement*

(a) SIO is required to comply with the Terms and Conditions of the ITS corresponding to NMFS's Biological Opinion issued to SIO, NSF, and NMFS's Office of Protected Resources (attached).

(b) A copy of this Authorization and the ITS must be in the possession of all contractors and PSO(s) operating under the authority of this Incidental Harassment Authorization.



Donna S. Wieting
Director
Office of Protected Resources
National Marine Fisheries Service

MAY 15 2015

Date

Attachments

Attachment

Table 1. Authorized take numbers, by Level B harassment, for each marine mammal species during SIO's low-energy marine seismic survey in the Southwest Pacific Ocean, East of New Zealand, May to June 2015.

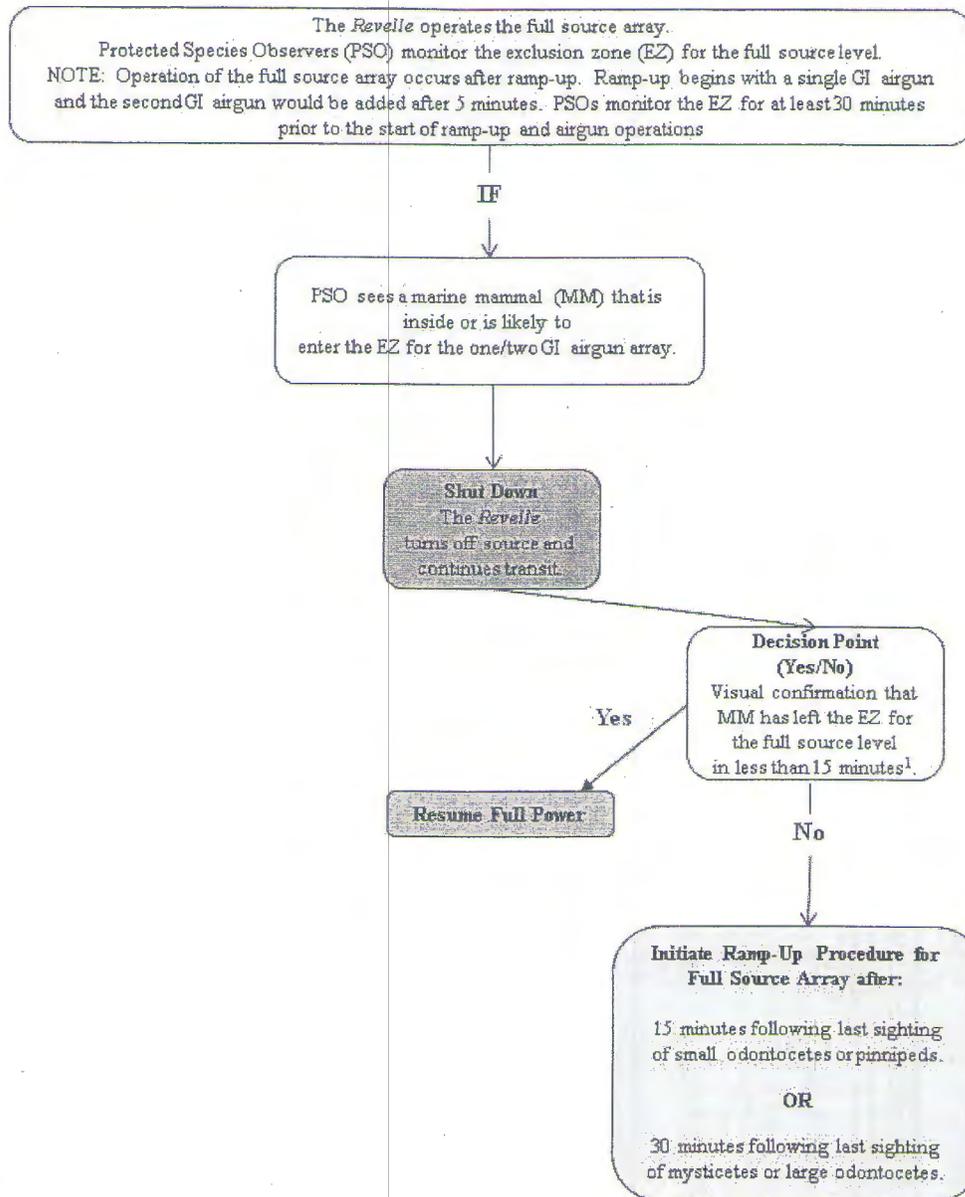
Species	Authorized Take in the Southwest Pacific Ocean, East of New Zealand, Study Area
Mysticetes	
Southern right whale (<i>Eubalaena australis</i>)	2
Pygmy right whale (<i>Caperea marginata</i>)	2
Humpback whale (<i>Megaptera novaeangliae</i>)	2
Antarctic minke whale (<i>Balaenoptera bonaerensis</i>)	2
Minke whale (<i>Balaenoptera acutorostrata</i>)	2
Bryde's whale (<i>Balaenoptera edeni</i>)	2
Sei whale (<i>Balaenoptera borealis</i>)	2
Fin whale (<i>Balaenoptera physalus</i>)	2
Blue whale (<i>Balaenoptera musculus</i>)	2
Odontocetes	
Sperm whale (<i>Physeter macrocephalus</i>)	10
Pygmy sperm whale (<i>Kogia breviceps</i>)	5
Arnoux's beaked whale (<i>Berardius arnuxii</i>)	8
Cuvier's beaked whale (<i>Ziphius cavirostris</i>)	2
Shepherd's beaked whale (<i>Tasmacetus shepherdi</i>)	3
Southern bottlenose whale (<i>Hyperoodon planifrons</i>)	2

Andrew's beaked whale (<i>Mesoplodon bowdoini</i>)	2
Blainville's beaked whale (<i>Mesoplodon densirostris</i>)	2
Gray's beaked whale (<i>Mesoplodon grayi</i>)	2
Hector's beaked whale (<i>Mesoplodon hectori</i>)	2
Pygmy beaked whale (<i>Mesoplodon peruvianis</i>)	3
Spade-toothed beaked whale (<i>Mesoplodon traversii</i>)	2
Strap-toothed beaked whale (<i>Mesoplodon layardii</i>)	3
Killer whale (<i>Orcinus orca</i>)	12
False killer whale (<i>Pseudorca crassidens</i>)	10
Long-finned pilot whale (<i>Globicephala melas</i>)	20
Short-finned pilot whale (<i>Globicephala macrorhynchus</i>)	20
Bottlenose dolphin (<i>Tursiops truncatus</i>)	95
Dusky dolphin (<i>Lagenorhynchus obscurus</i>)	95
Hector's dolphin (<i>Cephalorhynchus hectori</i>)	38
Hourglass dolphin (<i>Lagenorhynchus cruciger</i>)	57
Risso's dolphin (<i>Grampus griseus</i>)	10
Short-beaked common dolphin (<i>Delphinus delphis</i>)	189
Southern right whale dolphin (<i>Lissodelphis peronii</i>)	57
Pinnipeds	
Southern elephant seal (<i>Mirounga leonina</i>)	6
New Zealand fur seal (<i>Arctocephalus forsteri</i>)	15

Table 2. Modeled distances to which sound levels greater than or equal to 160, 180, and 190 dB could be received during the low-energy marine seismic survey in the Southwest Pacific Ocean, East of New Zealand, during May to June 2015. The buffer and exclusion zone radii are used for triggering mitigation. No airgun operations will occur in shallow water depths (<100 m).

Source and Volume	Tow Depth (m)	Water Depth (m)	Predicted RMS Radii Distances (m)		
			Shut-down Exclusion Zone for Pinnipeds 190 dB	Shut-down Exclusion Zone for Cetaceans 180 dB	Level B Harassment Zone 160 dB
Two 45 in ³ GI airguns (90 in ³ total)	2	Intermediate (100 to 1,000)	100 (328.1 ft)	100 (364.2 ft)	600 (1,968.5 ft)
Two 45 in ³ GI airguns (90 in ³ total)	2	Deep (>1,000)	100 (328.1 ft)	100 (364.2 ft)	400 (1,312.3 ft)

Figure 1. Current mitigation procedures for low-energy seismic surveys.



¹ Ramp-Up Procedures

SIO has used similar periods (15 minutes) for previous low-energy seismic surveys. Ramp-up would not occur if a marine mammal has not cleared the exclusion zone for the full airgun array.