28 September 2010

Mr. P. 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

Dear Mr. Payne:

The Marine Mammal Commission, in consultation with its Committee of Scientific Advisors on Marine Mammals, has reviewed the application submitted by the Scripps Institution of Oceanography seeking authorization under section 101(a)(5)(D) of the Marine Mammal Protection Act to take small numbers of marine mammals by harassment. The taking would be incidental to a marine seismic survey in the eastern tropical Pacific Ocean during approximately 25 days in October and November 2010. The Commission also has reviewed the National Marine Fisheries Service's 3 September 2010 *Federal Register* notice (75 Fed. Reg. 54095) announcing receipt of the application and proposing to issue the authorization, subject to certain conditions.

**RECOMMENDATIONS**

The Marine Mammal Commission recommends that the National Marine Fisheries Service—

- prior to authorization, require the applicant to use location-specific environmental parameters to re-estimate safety zones and then recalculate associated exposures;
- require the applicant to use in-situ measurements to verify and, if need be, refine the safety zones prior to or at the beginning of the survey;
- require the applicant to determine actual exposures based on refined safety zones, sightability, and relevant detection functions;
- provide additional justification for its preliminary determination that the planned monitoring program will be sufficient to detect, with a high level of confidence, all marine mammals within or entering the identified safety zones;
- propose to Scripps Institution of Oceanography that it revise its study design to include collection of meaningful baseline data on the distribution and behavior of marine mammals;
- extend the monitoring period to at least one hour before initiation of seismic activities and at least one hour before the resumption of airgun activities after a power-down because of a marine mammal sighting within a safety zone;
- continue to require ramp-up and power-down procedures as a mitigation measure pending the outcome of a meeting to discuss these procedures; and
- not include detailed information and analyses for species that are not expected to be in the proposed survey area in future *Federal Register* notices.

## RATIONALE

Scripps Institution of Oceanography, in collaboration with Texas A&M University, plans to conduct an integrated geophysical and geochemical survey to investigate the manner in which marine sediments record paleo-oceanographic information in an area from 8ºN to 12ºS latitude, 80 to 91ºE longitude in international waters and within the exclusive economic zones of Costa Rica, Panama, Colombia, and Ecuador. The survey would occur in waters 1,000 to 4,800 m (3,281 to 15,748 ft) in depth and consist of approximately 5,475 km (3,402 mi) of tracklines. Scripps Institution of Oceanography would use the R/V *Melville* for deployment and operation of a two-airgun array (90 $in^3$; with a nominal source level 230.6 dB re 1 μPa at 1 m (0-to-peak)). The *Melville* also would operate a 12-kHz multibeam echosounder and a 3.5- or 12-kHz sub-bottom profiler throughout the survey, except while at the water and core sampling stations. The vessel would tow either of two hydrophone streamers, one streamer being 725 m (2,379 ft) in length with 40 channels and the other streamer being 350 m (1,148 ft) in length with 16 channels. The 40-channel streamer will be used when the airguns are operating for approximately 45 hours at each of the four sites. For the remainder of the survey, the 16-channel streamer will be used during transits to the first site, between sites, and after the last site. Passive geophysical sensors (i.e., a gravimeter and magnetometer) also will be operated continuously throughout the survey.

The Service preliminarily has determined that, at most, the proposed activities would result in a temporary modification in the behavior of small numbers of up to 21 species of marine mammals and that any impact to the affected species or stocks is expected to be negligible. The Service also preliminarily has determined that no take of marine mammals by death or serious injury is anticipated and that the potential for temporary or permanent hearing impairment will be at the lowest level practicable based on the proposed mitigation measures.

### Modeling Safety Zones and Exposures

The application uses corrected empirical measurements of propagation loss from the Gulf of Mexico in 2007–2008 (Tolstoy et al. 2009) as the basis for the safety zones and associated exposures in the eastern tropical Pacific. However, propagation of sound is dependent upon various location-specific environmental parameters including sound speed profiles, surface ducts, wind speed, bathymetry, water depth, and tow depth. The Marine Mammal Commission therefore recommends that the National Marine Fisheries Service, prior to authorization, require the applicant to use location-specific environmental parameters to re-estimate safety zones and then recalculate associated exposures. The applicant should be required to use in-situ measurements to verify and, if need be, refine the safety zones prior to or at the beginning of the survey. Moreover, the applicant should be required to determine actual exposures based on refined safety zones, sightability, and relevant detection functions.

### Visual Monitoring

Visual monitoring serves at least two purposes. First, it is a trigger for mitigation when marine mammals approach or enter safety zones, requiring power-down or shut-down mitigation measures. Similarly, it is essential for determining when marine mammals have left the safety zone.

Second, it provides data that can be used after a survey to estimate the total number of animals exposed to various levels of sound.

The Service's preliminary determination regarding the potential effects of the proposed survey is based, in part, on the presumed efficacy of visual monitoring. However, visual monitoring typically is not effective during periods of bad weather or at night, as noted in the Commission's previous letters commenting on similar activities by this and other applicants and as recognized by the Service in its previous *Federal Register* notices on similar requests. Even with good visibility, observers are unable to detect marine mammals when they are below the surface or beyond visual range. In fact, one of the Service's own scientists (Barlow 1999) found that "[a]ccounting for both submerged animals and animals that are otherwise missed by the observers in excellent survey conditions, only 23 percent of Cuvier's beaked whales and 45 percent of *Mesoplodon* beaked whales are estimated to be seen on ship surveys if they are located directly on the survey trackline." Thus, at least for certain species, visual monitoring alone is not adequate to detect all marine mammals within the safety zones, including all areas within 400 m (1,312 ft) of the vessel. Therefore, the Marine Mammal Commission recommends that, prior to granting the requested authorization, the National Marine Fisheries Service provide additional justification for its preliminary determination that the planned monitoring program will be sufficient to detect, with a high level of confidence, all marine mammals within or entering the identified safety zones. At a minimum, such justification should (1) identify those species that it believes can be detected with a high degree of confidence using visual monitoring only, (2) describe detection probability as a function of distance from the vessel, (3) describe changes in detection probability under various sea state and weather conditions and at night, and (4) explain how close to the vessel marine mammals must be for observers to achieve the anticipated high nighttime detection rate. If such information is not available, the Service and the applicant should undertake the studies needed to verify that the proposed monitoring program is likely to detect all or nearly all marine mammals in or near safety zones and/or to encourage development of alternative means of detecting marine mammals in or near those zones.

**Baseline Data**

The requirement for an incidental harassment authorization is based on a concern about the potential effects of the proposed activity. Assessment of potential effects depends, at least in part, on the availability of data to compare marine mammal presence and behavior under undisturbed conditions versus their presence and behavior during or in response to the survey. The notion that meaningful comparisons can be made between marine mammal observations when airguns are and are not firing depends on the period of time that the airguns are silent. If firing of the airguns causes marine mammals to depart an area or alter their behavior, a comparison after the airguns are silenced would be meaningful only if sufficient time has elapsed for the marine mammals in the area to return to their normal distribution and behavior. Because such a return may take days, weeks, or longer, baseline information collected during brief, intermittent periods when airguns are not firing does not constitute a reliable basis for comparison. If the Service and the applicant intend to collect meaningful, reliable baseline information—and the Commission believes that they should be doing so—then they should develop a research design that takes into account the species present, their behavioral patterns, and seasonal movements. Otherwise, the Service and the applicant will have no real scientific basis for describing baseline conditions in the survey area and, in turn, the lack of

baseline information undermines the assessment of actual effects. With that in mind, the Marine Mammal Commission recommends that the National Marine Fisheries Service propose to Scripps Institution of Oceanography that it revise its study design to include collection of meaningful baseline data on the distribution and behavior of marine mammals. Such information is essential for a realistic assessment of the impacts of the proposed activities and recovery from those impacts.

**Mitigation**

The Service's *Federal Register* notice states that the applicant will monitor the area for at least 30 minutes prior to the planned initiation of airgun operations. The notice also states that when the applicant has powered down the airguns because observers have detected a marine mammal near or within a proposed safety zone, the applicant will not resume airgun activity until observers have sighted the marine mammal outside the safety zone or 15 (for small odontocetes) or 30 minutes (for large mysticetes or large odontocetes) have passed. However, several species of cetaceans for which the applicant is seeking incidental take authority remain submerged on most dives for more than 30 minutes. Sperm whales and beaked whales, in particular, may stay submerged for periods far exceeding 30 minutes. Blainville's beaked whales dive to considerable depths (> 1,400 m [4,592 ft]) and can remain submerged for nearly an hour (Tyack et al. 2006, Baird et al. 2006). In addition, observers may not detect these animals each time they return to the surface. Accordingly, monitoring for 30 minutes prior to the planned start or resumption of airgun operations is not sufficient to allow detection of those species. Therefore, the Marine Mammal Commission recommends that the National Marine Fisheries Service extend the monitoring period to at least one hour before initiation of seismic activities and at least one hour before the resumption of airgun activities after a power-down because of a marine mammal sighting within a safety zone.

In recent years, the Marine Mammal Commission has recommended to the National Marine Fisheries Service that it require parties that plan to introduce sound into the marine environment to use and collect data on the utility of ramp-up and power-down procedures. Although the rationale behind such procedures seems reasonable, the Commission has argued that the utility of these procedures should be verified on the basis of scientific data. Commission and Service personnel are arranging a meeting to discuss various monitoring and mitigation measures including verification of the utility of ramp-up and power-down procedures. In the meantime, the Marine Mammal Commission recommends that the National Marine Fisheries Service continue to require ramp-up and power-down procedures as a mitigation measure pending the outcome of this meeting.

**Pinnipeds**

Six species of pinnipeds are known to occur in the eastern tropical Pacific Ocean; however, these species are not expected to occur in the offshore waters of the proposed seismic survey areas. As such, the Service indicated in its *Federal Register* notice that "pinnipeds are highly unlikely to occur in the survey area and are not considered in further detail here." The Commission believes that this is appropriate but questions why the Service included the level of detail that it did regarding these species in its *Federal Register* notice. In addition, inclusion of unnecessary information can be confusing to the reader. Because detailed information and analyses of species not expected to be present in the proposed survey area is unnecessary and may cause confusion, the Marine Mammal

Commission recommends that this information and analyses not be included in future *Federal Register* notices.

Please contact me if you have questions about the Commission's recommendations and comments.

Sincerely,

Timothy J. Ragen, Ph.D.
Executive Director

**Literature Cited**

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