

MARINE MAMMAL COMMISSION
4340 East-West Highway, Room 700
Bethesda, MD 20814-4447

29 December 2008

Mr. P. Michael Payne
Chief, Permits Division
National Marine Fisheries Service
Office of Protected Resources
1315 East-West Highway
Silver Spring, MD 20910-3226

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 Lamont-Doherty Earth Observatory 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 conducting a marine seismic survey in the southwestern Pacific Ocean off the coast of Tonga during January and February 2009. The Commission also has reviewed the National Marine Fisheries Service's 25 November 2008 *Federal Register* notice announcing receipt of the application and proposing to issue the authorization, subject to certain conditions.

The proposed survey is scheduled for approximately 19 days between 14 January and 21 February 2009 and would be conducted in the Lau Basin in the southwestern Pacific Ocean (between 19–21° S and 175–176° W). The survey is part of the National Science Foundation's RIDGE program to facilitate the study of mid-ocean ridges and back-arc spreading centers.

The applicant would conduct the survey using the R/V *Marcus G. Langseth*, which would deploy a 36-airgun array (6,600 in³) as an energy source. The array output is 265 dB re 1μPa-m (peak-to-peak). In addition, the applicant would operate an 11.25–12.6 kHz multibeam echosounder during airgun operations and a sub-bottom profiler continuously throughout the cruise. The applicant also would tow a passive acoustic monitoring hydrophone array up to 6 km in length 24 hours a day and deploy 55 to 64 ocean bottom seismometers.

RECOMMENDATIONS

The Marine Mammal Commission recommends that, before issuing 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; such monitoring is essential for determining whether animals are being taken in unanticipated ways or unexpected numbers;

- 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 the safety zone; and
- require that observations be made during all ramp-up procedures to gather the data needed to analyze and report its effectiveness as a mitigation measure.

RATIONALE

The Service has preliminarily determined that the proposed activities would result, at most, in a temporary modification in the behavior of small numbers of up to 29 species of marine mammals and that any impact on the affected species is expected to be negligible. The Service also has preliminarily 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 avoided through the incorporation of the proposed mitigation measures. The Service believes that these determinations are reasonable because, among other things, (1) marine mammals are expected to move away from a noise source that is annoying before it becomes potentially injurious; (2) temporary threshold shift is unlikely to occur, especially in odontocetes, at levels below 180 dB re 1 μ Pa (rms); (3) injurious levels of sound are likely to occur only very close to the vessel; and (4) the monitoring program (visual detection and passive acoustic monitoring) developed to avoid injury would be sufficient to detect with reasonable certainty all marine mammals within or entering the identified safety zones.

As discussed in previous letters commenting on similar activities by this and other applicants, the Commission is concerned about the adequacy of visual monitoring alone to detect all marine mammals within the safety area. As recognized by the Service in its *Federal Register* notice on this application and in previous notices on similar requests, “[v]isual monitoring typically is not effective during periods of bad weather or at night and, even with good visibility, is unable to detect marine mammals when they are below the surface or beyond visual range.” This conclusion is supported by a study by Barlow (1999), which 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.”

The current application states that vessel-based passive acoustic monitoring will be conducted to augment visual monitoring during daytime operations and at night to help detect, locate, and identify marine mammals that may be present. However, as the Service acknowledges, such monitoring is useful only when marine mammals vocalize, and its value is limited by water depth and other environmental factors. The effectiveness of passive acoustic monitoring will depend on the ability of the acoustic system and its operators to locate vocalizing whales and determine whether an acoustically detected whale is within the shutdown radius or in a position such that the ship’s movement will place it within the shutdown radius. Whales that are on the trackline of the ship may be particularly hard to detect but are of relatively greater concern because of their location. Thus, the Marine Mammal Commission reiterates its previous recommendation that 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. Such justification should, at a minimum, (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 observer, (3) describe changes in detection probability at night, and (4) explain how close to the vessel marine mammals must be to achieve the anticipated high nighttime detection rate. If such information is not available, the Service needs to encourage development of alternative means of detecting marine mammals within the specified safety zones or to verify that the proposed monitoring program is likely to detect most marine mammals in or near those zones.

The Service's *Federal Register* notice states that monitoring will be conducted for at least 30 minutes prior to the planned start of airgun operations. The notice also states that when airguns have been powered down because a marine mammal has been detected near or within the proposed safety zone, airgun activity will not resume until the marine mammal is outside the safety zone (i.e., the animal is visually observed to have left the safety zone or has not been seen or otherwise detected within the safety zone for 15 minutes in the case of small odontocetes or 30 minutes in the case of mysticetes and large odontocetes, including sperm, pygmy sperm, dwarf sperm, and beaked whales). The Commission notes that 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, for example, can stay submerged for more than one hour. 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 the safety zone.

The Commission also notes that ramp-up procedures are presumed to be effective but that their effectiveness has yet to be verified empirically. For that reason, the Marine Mammal Commission recommends that the National Marine Fisheries Service require that observations be made during all ramp-up procedures to gather the data needed to analyze and report its effectiveness as a mitigation measure. In the Commission's opinion, the Service cannot continue to assume that ramp-up constitutes effective mitigation without empirical verification. Such verification is not a trivial task. It may require not only the collection of data opportunistically but conducting specifically designed studies. In addition, the data may indicate variable responses depending on the species (or other factors) involved. The Marine Mammal Commission would be pleased to discuss with the Service the collection of such data and the design of such experiments to promote a better understanding of the utility and shortcomings of ramp-up as a mitigation measure.

The Commission provides three comments specific to individual species. First, the application submitted by the Lamont-Doherty Earth Observatory notes that IUCN has classified the humpback whale population in the vicinity of Tonga as "vulnerable." In 2008 IUCN changed its classification for this population to "endangered." Second, the application notes that *Peponocephala electra* is distributed south of 20°S latitude and therefore is unlikely to be affected by the survey.

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Here, it should be noted that the survey will itself straddle this line and therefore may overlap with the distribution of *P. electra*. *P. electra* recently has been involved in several mass strandings (Hawaii and Madagascar) that may have been related to exposure to human-generated noise. In one case (Hawaii), the suspect sound was generated by mid-frequency sonar, whereas in the other situation (Madagascar), the potential source of sound was a seismic survey. Although it is premature to form conclusions about these events and our knowledge about the vulnerability of *P. electra* to noise remains poor, existing information is sufficient to raise the level of concern for this species. As such, there is a need for careful documentation and reporting of interactions between *P. electra* and the survey, should they occur. Third, the application materials cite delphinid estimates in the survey region based on data from the eastern tropical Pacific (Wade and Gerrodette 1993). This is more than a reasonable stretch as the two areas are spatially separate and comprised of significantly different habitat types. In the future, the applicants may find the results in Barlow (2006) and Barlow et al. (2008) to be more relevant and informative.

Finally, most of the concerns raised in this letter have been raised before and little has been done to resolve them. The Commission believes that those seeking authorizations for their activities under the Marine Mammal Protection Act must assume more responsibility for resolving uncertainties related to potential environmental effects. With that in mind, the Commission requests an opportunity to meet with the Service to discuss mechanisms to engage organizations such as the Lamont-Doherty Earth Observatory in conducting the needed research.

Please contact me if you or your staff has questions about the Commission's comments and recommendations.

Sincerely,

Handwritten signature of Timothy J. Ragen in black ink, followed by the word "for" in a smaller, less distinct script.

Timothy J. Ragen, Ph.D.
Executive Director

Literature Cited

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- Barlow, J., S. Rankin, A. Jackson, and A. Henry. 2008. Marine mammal data collected during the Pacific Islands cetacean and ecosystem assessment survey (PICEAS) conducted aboard the NOAA ship *McArthur II*, July–November 2005. NOAA-TM-NMFS-SWFSC-420.
- Wade, P. R., and T. Gerrodette. 1993. Estimates of cetacean abundance and distribution in the eastern tropical Pacific. *Reports of the International Whaling Commission* 43:477–493.