



MARINE MAMMAL COMMISSION

11 October 2012

Diane Noda
Field Supervisor
Ventura Fish and Wildlife Office
2493 Portola Road, Suite B
Ventura, CA 93003

Dear Ms. Noda:

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, in cooperation with Pacific Gas and Electric Company (PG&E), 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 geophysical survey to be conducted in the vicinity of a nuclear power plant near Morro Bay, California. The Commission also has reviewed the Fish and Wildlife Service's 26 September 2012 notice announcing receipt of the application and proposing to issue the authorization, subject to certain conditions (77 Fed. Reg. 59211).

RECOMMENDATIONS

The Marine Mammal Commission recommends that the Fish and Wildlife Service—

- incorporate in the authorization, if granted, all previously stipulated mitigation and monitoring measures;
- provide greater assurance that no more than small numbers of sea otters will be taken and that the overall impact will be negligible by basing its determinations on (1) the estimated mean number of otters in the area that may be taken plus some measure of uncertainty in that estimate or (2) the estimated maximum number of sea otters in the survey area that may be taken;
- provide additional justification for its preliminary determination that the proposed vessel-based monitoring program will be sufficient to detect, with a high level of confidence, all marine mammals within or entering the identified exclusion and buffer zones—such justification should (1) describe the efficacy of visual monitoring under the expected environmental conditions (including nighttime and potentially adverse weather conditions), (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 light levels, and (4) explain how close to the vessel sea otters must be for observers to achieve high nighttime detection rates; and
- implement any reduction in the exclusion zone cautiously by (1) specifying the criteria that need to be met for warranting such a reduction, (2) reducing the zone only after a sufficient sample of otters have been observed within the zone so that the Service has a reasonable basis for assessing their response, (3) reducing the zone in relatively small increments (e.g., from 1,000 to 800 m), and (4) requiring intensive monitoring of nearshore areas and

shorelines when those areas are surveyed to ensure a reasonable probability of detecting otters that are disturbed.

RATIONALE

PG&E is funding Lamont-Doherty Earth Observatory to conduct a geophysical survey offshore from the Diablo Canyon Power Plant in central California. The company would use the survey results to evaluate earthquake rupture geometries, earthquake displacements, fault interactions, and fault evolution near the power plant. The incidental harassment authorization would be issued to both PG&E and the Observatory for a one-year period. They expect to conduct additional surveys possibly in the next two years to complete the project.

The applicants are planning to conduct the 2012 survey during the period from 15 November to 31 December. The survey would be conducted in waters up to 400 m deep and would involve approximately 1,418 km of tracklines. The Observatory would use the R/V *Marcus G. Langseth* to conduct the survey and would tow a 36-airgun array (nominal source levels 236 to 265 dB re 1 μ Pa (peak-to-peak)) at 9 m depth. However, at any given time, only 18 airguns would be in operation with a maximum discharge volume of 3,300 in³—hence, in effect, the Observatory will be using an 18-airgun array. The vessel also would tow four 6-km hydrophone streamers. In addition, the Observatory would deploy up to 90 geophones onshore along a 9-km portion of Morro Strand. The Observatory also would operate a 10.5–13 kHz multibeam echosounder and a 3.5 kHz sub-bottom profiler continuously throughout the survey. In addition, it would use a gravimeter, magnetometer, four other vessels, and a twin-engine aircraft. The additional vessels would serve as platforms for marine mammal monitoring and deployment of equipment, as well as managing vessel traffic around the survey. The aircraft would monitor the survey area before, during, and after the survey to detect marine mammals in the area, assess their behavior, and identify behavioral changes that might have occurred in response to the survey.

The Service preliminarily has determined that, at most, the proposed activities would result in temporary modifications in the behavior of small numbers of southern sea otters and that any impact on the species would be negligible. The Service does not anticipate any take of sea otters by death or serious injury. It also believes that the potential for temporary or permanent hearing impairment will be at the least practicable level because of the proposed mitigation and monitoring measures. Those measures include monitoring exclusion and buffer zones and using power-down, shut-down, and ramp-up procedures. When the airguns have been powered down because a sea otter has been detected near or within a proposed exclusion zone, airgun activity would not resume until the sea otter is confirmed or thought to be outside the exclusion zone (i.e., the animal is observed to have left the exclusion zone or has not been seen or otherwise detected within the exclusion zone for 15 minutes). PG&E and the Observatory also would (1) conduct in-situ sound measurements to verify and adjust, if necessary, the proposed exclusion and buffer zones; (2) use protected species observers approved by the Fish and Wildlife Service and placed on two vessels (in addition to the *Langseth*) to monitor for marine mammals (including sea otters) 30 minutes before, during, and 30 minutes after the proposed activities; (3) use those observers to monitor the geophone placement; (4) fund researchers to (a) place passive acoustic devices (i.e., bottom-mounted acoustic recorders) in and near kelp beds and (b) analyze received sound level data to compare with associated sea otter behavioral responses to the surveys (those animals would be instrumented with

telemetry devices by the U.S. Geological Survey prior to the proposed surveys); (5) fund the federal agencies to conduct aerial monitoring of sea otters (and harbor porpoise and other small cetaceans, which would be covered under a separate authorization issued by the National Marine Fisheries Service) before, during, and after the proposed surveys; and (6) fund agency personnel to monitor the surrounding beaches for evidence of newly stranded marine mammals.

The Service has proposed an adaptive management approach for this authorization. During the two-month survey period, the Service would evaluate survey effects on a regular basis, amend the survey plan to address issues that might arise, and—if necessary—suspend the survey. The Service could suspend the survey if (1) a single, dead sea otter strands with evidence of acoustic trauma or barotrauma but with no evidence of any other cause of death or (2) a sea otter is struck by a vessel participating in the surveys. The Service also could approve a reduction in the size of the exclusion zone if sea otters appear to be undisturbed and the extent of the exclusion zone could not be kept clear of sea otters.

The Marine Mammal Commission commends the Fish and Wildlife Service for proposing to supplement the commonly required mitigation and monitoring measures and proposing to include an adaptive management process as a condition of the authorization. The Commission also recommends that the Service incorporate in the authorization, if granted, all previously stipulated mitigation and monitoring measures. It encourages the Service to require such measures and processes in other proposed incidental harassment authorizations.

The Commission has additional concerns regarding this proposed authorization. One pertains to the adaptive management condition that allows the Service to shut down the survey when it finds a dead, stranded sea otter with evidence of acoustic trauma or barotrauma, but only if the otter shows no signs of any other possible cause of death. That stipulation indicates that the Service may not act if agency personnel found a dead, stranded animal with ample signs of acoustic trauma or barotrauma, but also a wound or a broken appendage. The Commission believes that if a stranded animal shows signs of acoustic trauma or barotrauma, that finding should be sufficient to review the survey activities and consider possible adjustments. It also should be noted that this stipulation will not be particularly useful unless the Service is prepared to evaluate all stranded animals immediately. All too often, necropsies are not conducted and the results made available for days or weeks. The Commission understands that the Service would have all necessary personnel, equipment, and supplies available to conduct necropsies immediately after the discovery of any sea otters that might have been killed by acoustic trauma or barotraumas and encourages that effort.

Uncertainty in take estimates

The Service requires take estimates in each application for an incidental harassment authorization. Those estimates provide a basis for ensuring that the proposed activity will not have more than a negligible impact on the affected species or stocks and that only small numbers of marine mammals will be taken. Take estimates are often, if not generally, associated with considerable uncertainty. If, for any given species or stock, the error in the take estimate is relatively symmetrical, then small numbers or negligible impact determinations that are based on an expected (e.g., mean) abundance or density without accounting for uncertainty serves the purpose of the Marine Mammal Protection Act about one-half of the time. That is, if the estimated take is an

unbiased indicator of the actual take and the error around that expected value is symmetrical, then the actual number of takes will be greater than the expected number about half the time and less than the expected number half the time. If the Service makes its small numbers or negligible impact determinations based on the expected numbers of takes but does not account for the associated uncertainty, then its assurance of a negligible impact affecting only small numbers of animals is sufficient for the purpose of the Act about 50 percent of the time.

For the proposed survey, PG&E and the Observatory estimated the expected number of takes using the size of the buffer zone (and associated ensonified areas) and estimates of sea otter density derived from U.S. Geological Survey data. The density data were obtained in the same area and during the same season as proposed for the survey. However, the applicants did not account for the uncertainty in the density estimates. Instead, they used a three-year running mean of counts. The U.S. Geological Survey uses a three-year running mean as a way of smoothing out variation, which facilitates assessment of the population trend. In this case, however, the Service should be accounting for that variation as it estimates how many sea otters may be at risk during the survey. Undoubtedly, some of the variation in counts is measurement error, but some of it probably reflects real changes in abundance as a result of birth and deaths or—more likely—otter movements within their range. The key here is that the Service has given due consideration to the actual number of otters that may be taken when it makes its small numbers and negligible impact determinations. To address this concern, the Marine Mammal Commission recommends that the Fish and Wildlife Service provide greater assurance that no more than small numbers of sea otters will be taken and that the overall impact will be negligible by basing its determinations on (1) the estimated mean number of otters in the area that may be taken plus some measure of uncertainty in that estimate or (2) the estimated maximum number of sea otters in the survey area that may be taken.

Mitigation and monitoring measures

As discussed in the Commission's previous letters commenting on similar activities by this and other applicants, visual monitoring is not effective during periods of bad weather or at night, especially when the radius of the exclusion zone is approximately 1 km. Although the application indicated that multiple vessels would be used for monitoring and that the National Marine Fisheries Service believes that on average observers can monitor to the horizon (i.e., 10 km), it is unclear how PG&E and the Observatory expect to see sea otters at those distances even in good weather during daylight hours. Aerial surveys would be conducted to supplement vessel-based monitoring, but it appears that those surveys would occur only on a weekly basis. Therefore, the Marine Mammal Commission recommends that, prior to issuing the requested authorization, the Fish and Wildlife Service provide additional justification for its preliminary determination that the proposed vessel-based monitoring program will be sufficient to detect, with a high level of confidence, all marine mammals within or entering the identified exclusion and buffer zones. At a minimum, such justification should (1) describe the efficacy of visual monitoring under the expected environmental conditions (including nighttime and potentially adverse weather conditions), (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 light levels, and (4) explain how close to the vessel sea otters must be for observers to achieve high nighttime detection rates. If such information is not available, the Service and the applicant should conduct the studies needed to describe the

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efficacy of existing monitoring methods and develop alternative or supplemental methods to address current shortcomings.

Finally, the Service noted that it may reduce the size of the exclusion zone if (1) the survey operation is repeatedly shut down when the vessel (or airgun array) is inshore where the exclusion zone will overlap sea otter habitat and (2) visual observations indicate that otters within the exclusion zone do not appear to be disturbed. The Commission appreciates the dilemma faced by the Service and applicants: repeated shutdowns also may not be in the best interest of the otters if delays prolong the survey period by a substantial amount. This approach, however, is confounded by possible delay in the expression of potentially serious effects from the survey and uncertainty regarding their detection. First, some of the effects that might occur may not be manifested until after the survey (e.g., physiological effects that do not cause immediate death but may lead to reduced survival over time). Second, other effects might not be readily detectable (e.g., stranded animals where the cause of death may not or cannot be immediately determined). Given the uncertainty regarding the manifestation and detection of potentially significant effects and the lack of specific criteria for reducing the exclusion zone, the Marine Mammal Commission recommends that the Fish and Wildlife Service implement any reduction in the exclusion zone cautiously by (1) specifying the criteria that need to be met for warranting such a reduction, (2) reducing the zone only after a sufficient sample of otters have been observed within the zone so that the Service has a reasonable basis for assessing their response, (3) reducing the zone in relatively small increments (e.g., from 1,000 to 800 m), and (4) requiring intensive monitoring of nearshore areas and shorelines when those areas are surveyed to ensure a reasonable probability of detecting otters that are disturbed. The Commission recognizes that the Service would be monitoring both treatment (within the buffer zone of the survey area) and control areas (outside the buffer zone of the survey area) and encourages them to review those results to help inform any reduction to the exclusion zone as well.

Please contact me if you have questions about the Commission's recommendations or rationale.

Sincerely,

A handwritten signature in blue ink that reads "Timothy J. Ragen". The signature is fluid and cursive, with the first name being the most prominent.

Timothy J. Ragen, Ph.D.
Executive Director

Cc: P. Michael Payne, National Marine Fisheries Service