MARINE MAMMAL COMMISSION

1 May 2013

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

Re: Request for Amendment, Permit No. 14535
(Colleen Reichmuth, Ph.D.,
University of California Santa Cruz)

Dear Mr. Payne:

The Marine Mammal Commission, in consultation with its Committee of Scientific Advisors on Marine Mammals, has reviewed the above-referenced permit amendment request with regard to the goals, policies, and requirements of the Marine Mammal Protection Act. Dr. Reichmuth is proposing to add temporary threshold shift (TTS) studies for captive ice seals under her current permit. The proposed amendment would remain in effect for the duration of the permit, which expires 31 December 2014.

RECOMMENDATION

The Marine Mammal Commission recommends that the National Marine Fisheries Service approve the requested permit amendment, provided that the conditions contained in the current permit remain in effect.

RATIONALE

Dr. Reichmuth is authorized to conduct cognitive, hearing, and behavioral studies on up to 12 captive pinnipeds (i.e., two each of California sea lions, Pacific harbor seals, northern elephant seals, spotted seals, ringed seals, and bearded seals) year-round at Long Marine Laboratory. She has conducted TTS studies on captive pinnipeds under previous permits and proposed to continue such studies for the duration of this permit.

Dr. Reichmuth plans to conduct studies on up to two each of captive spotted seals, ringed seals, and bearded seals to determine when TTS begins as a result of exposure to impulsive sounds. Seismic surveys produce impulsive sounds and, given the use of those surveys in the Arctic—where these seal species occur—understanding how the seals respond to such sounds will produce useful information for managing the use of seismic airguns and other sources of impulsive sounds.

Dr. Reichmuth would use either a small-adapted sleeve airgun (up to 5 in^3 and 50 psi) or the smallest commercially available conventional airgun (10 in^3 and up to 1,000 psi) that emit sound

below 500 Hz with sound levels ranging from 200 to 215 dB re 1 μPa_{peak} and 165 to 180 dB re 1 μPa^2-second. Received sound levels, waveforms, and spectra would be measured carefully and calibrated to ensure sound levels are within the specified range.

TTS studies include four components: (1) measurement of hearing thresholds at various frequencies, (2) exposure to a sound stimulus, (3) measurement of hearing thresholds at those frequencies after the sound exposure, and (4) measurement of hearing thresholds at those frequencies within 24 hours following the sound exposure (i.e., at 1, 2, 4 hours etc.). Hearing thresholds are measured during up to 60 trials that last less than 5 seconds each during components 1, 3, and 4. After the sound exposure level associated with the onset of TTS is determined, Dr. Reichmuth would increase gradually the magnitude of the threshold shift during multiple sessions, not to exceed 15 dB and not to exceed 20 sessions per individual animal. If TTS does not occur at the maximum sound levels, testing would be discontinued.

To minimize adverse effects from TTS testing, Dr. Reichmuth's procedure would involve the gradual titration of a fatiguing sound stimulus from a level of no effect to a level of small but reliable TTS that recovers fully within 24 hours. The maximum amount of TTS to be achieved during this study, 15 dB, also is below that which normally causes a permanent threshold shift. Each animal would be exposed to only one impulsive "shot" per day and Dr. Reichmuth would not conduct further testing until the animal's hearing fully recovered. In addition, all measurements of the test seals are voluntary—that is, they can refuse to participate or can leave the testing area at any time by swimming away from the testing apparatus or by hauling out on the adjacent deck. That being the case, testing can occur only when the seals voluntarily approach the trainer during a given session. Finally, Dr. Reichmuth and collaborators would monitor each individual continuously during all studies to observe any behavioral effects from those studies.

Sound disturbance of non-target pinnipeds that are held in adjacent pools would be 20 dB below those sound levels within the test enclosure. However, trainers would hold all non-target pinnipeds out of the water during any sound exposure event to minimize incidental disturbance. Although the in-air sound levels transmitted from the underwater sound source should be below the threshold for Level B harassment, Dr. Reichmuth will measure those in-air sound levels to verify that they are as low as expected. However, to cover situations in which Level B harassment may occur (i.e., in-air sound levels are equal to or greater than the Level B harassment threshold), she has requested incidental disturbance takes of the 11 non-target pinnipeds during any sound exposure event.

Dr. Reichmuth's Institutional Care and Use Committee (IACUC) currently is reviewing the TTS protocols and have approved similar TTS protocols in the past. She will provide the Service with her IACUC's final approval as soon as it is available. Dr. Reichmuth would not conduct the TTS studies until both the permit amendment and IACUC approval are in place.

The Commission believes that TTS studies are necessary to characterize the risks to marine mammals from human-generated sound in the marine environment, including in the Arctic. Such studies can provide the data needed to determine sound thresholds not only for the species to be tested under this permit, but also for other species subject to impulsive sources. Therefore, the Marine Mammal Commission supports this research and recommends that the National Marine

Fisheries Service issue the permit amendment, provided that the conditions contained in the current permit remain in effect.

Please contact me if you have any questions concerning the Commission's recommendation.

Sincerely,

Timothy J. Ragen, Ph.D.
Executive Director