



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: Permit Application No. 16992
(Paul Nachtigall, Ph.D.,
University of Hawaii)

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. Nachtigall is requesting authorization to conduct research on four captive cetaceans during a five-year period. Similar activities currently are authorized under permit 978-1857, which he is seeking to renew and amend.

RECOMMENDATION

The Marine Mammal Commission recommends that the National Marine Fisheries Service issue the permit but condition it to include Level B harassment takes based on the 120-dB re 1 μ Pa threshold for the three non-target animals during the 52 temporary threshold shift (TTS) sessions that could occur per year.

RATIONALE

Dr. Nachtigall proposes to conduct hearing, echolocation, and behavioral studies on up to four captive cetaceans (i.e., three bottlenose dolphins and one false killer whale) year-round at the University of Hawaii's Coconut Island facility. The objectives of the research are to continue studies of more than 30 years to understand hearing and echolocation processes and to determine onset-temporary threshold shift (TTS) in odontocetes.

Dr. Nachtigall proposes to investigate (1) auditory evoked potentials and hearing during echolocation with noninvasive suction cup sensors on each of the four captive odontocetes and (2) sounds produced by those animals via hydrophones. Each day he could conduct up to two 60-minute study sessions comprised of trials lasting up to 3 minutes each. He and his trainers normally conduct one morning and one afternoon session. Generally, before each session, they have the test animals perform vigorous activities (including jumping and other trained behaviors) to check each animal's physical appearance and attitude to determine their suitability for the day's planned experiments.

For TTS studies, Dr. Nachtigall would use octave-band sound from 500 Hz to 10 kHz with sound levels ranging up to 180 dB re 1 μ Pa. Testing would occur only on one four-year-old captive-born dolphin. The TTS studies would include four components: (1) measurement of hearing thresholds when exposed to a 7.5 kHz tone, (2) exposure to an octave-band sound stimulus, (3) measurement of hearing thresholds at the primary exposure frequency and at higher frequencies after the sound exposure, and (4) measurement of hearing thresholds at those frequencies every two hours until the dolphin's hearing is back to normal. Dr. Nachtigall does not anticipate exceeding 6 dB of TTS. On days when he would conduct TTS trials, the dolphin would participate in only one session per day, not to exceed 52 sessions per year—that is, an average of one TTS session per week.

To minimize adverse effects from TTS testing, Dr. Nachtigall would not conduct sessions within three days of one another (normally not within one week of one another) and would conduct those sessions only if the animal's hearing returned to normal levels. The maximum amount of TTS, approximately 6 dB, also is below that which normally causes a permanent threshold shift. For all studies, measurements of test animals are voluntary, such that they can refuse participation or exit the testing area at any time by swimming away from the testing apparatus. Accordingly, testing can occur only when the animals voluntarily approach the trainer during a given session.

Dr. Nachtigall did not include incidental disturbance of non-target animals that also are held in the test enclosure during TTS testing. He has monitored those non-target animals during past TTS studies and there have been no indications of harassment. In addition, the non-target animals are moved more than 50 m from the sound source that is directed in the opposite direction of the animals. The measured sound levels have not exceeded 140 dB re 1 μ Pa in the area of the non-target animals. However, the Service indicated that it uses a threshold of 120 dB re 1 μ Pa for Level B harassment for non-impulsive sources. The Commission agrees that the 120-dB re 1 μ Pa threshold is appropriate for type of sound that Dr. Nachtigall would be using during his TTS studies. As such, Dr. Nachtigall's permit should account for Level B harassment takes for those three non-target animals. The Marine Mammal Commission therefore recommends that the National Marine Fisheries issue the permit but condition it to include Level B harassment takes based on the 120-dB re 1 μ Pa threshold for the three non-target animals during the 52 TTS sessions that could occur per year.

Dr. Nachtigall's Institutional Care and Use Committee (IACUC) has reviewed and approved the research protocols. The Commission believes that TTS studies are necessary to characterize the risks to marine mammals from human-generated sound in the marine environment.

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

Sincerely,



Timothy J. Ragen, Ph.D.
Executive Director