

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

7 April 2009

Mr. Timothy J. Van Norman  
Chief, Branch of Permits  
Division of Management Authority  
U.S. Fish and Wildlife Service  
4401 North Fairfax Drive  
Arlington, VA 22203

Re: Sea Otter Mortalities under Permit No.  
MA672624 (Western Ecological Research  
Center, U.S. Geological Survey)

Dear Mr. Van Norman:

The Marine Mammal Commission, in consultation with its Committee of Scientific Advisors on Marine Mammals, has reviewed the permit-holder's final report on the deaths of three sea otters surgically implanted with time-depth recorders and VHF tags under Permit No. MA672624. We offer the following recommendation and comments.

### RECOMMENDATION

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

- authorize resumption of the research, provided that the proposed modifications to the permit-holder's research protocols are implemented;
- request an explanation as to why the proposed modified research protocol does not include the option of using intra-operatively a single dose, broad-spectrum antibiotic that has a longer half-life than those currently used to provide additional protection from bacterial infection; and
- request that the permit-holder clarify what would constitute "excessive stress" as discussed in the proposed modified research protocol.

### RATIONALE

Three sea otters (one male and two females) died during November 2008 at Big Sur, California, subsequent to capture, handling, and surgical implantation of TDR and VHF tags under Permit No. MA672624. Only two of the carcasses were recovered. The necropsy reports for the animals identify bacterial sepsis as the likely primary cause of death in both cases.

Regarding otter 1093, it appears that bacteria (*Vibrio alginolyticus*) gained access to the subcutis and body cavity through the surgical incisions and then spread to the local lymph nodes and beyond, resulting in septicemia and death. The report states that "[i]solation of the same bacterium

from the feces at the time of capture and at necropsy, combined with the history of this animal soiling its coat prior to surgery, may suggest a possible route for parenteral inoculation of bacteria sufficient to withstand pre-surgical disinfection with betadyne-based disinfectants.” The report recommends adopting husbandry practices such as minimizing holding times on land and using false-bottom flooring in kennels to minimize the risk of fecal soiling of the pelage. The report also recommends using intra-operatively a single dose, broad-spectrum antibiotic that has a longer half-life than those currently used to provide additional protection from bacterial infection.

In the case of otter 1090, the necropsy report states that the presence of suppurative inflammation and vascular thrombosis in tissues of the animal’s hind limbs, adjacent draining lymph nodes, and heart is “highly suggestive” of bacterial sepsis as one major contributor to the animal’s death. The report further notes that “the timing of muscle lesion development is suggestive of, but not definitive for associations with the capture event.” The report cites accidental transcutaneous implantation during surgery as one possible source of the bacterial infection, given that “[t]he same bacterium (*Photobacterium damsel*) was isolated from multiple sites, including the surgical incision, VHF transmitter surface and the right inguinal lymph node.” The report also cites the animal’s severely worn and damaged teeth as another plausible source of bacterial infection.

Based on these findings, the permit-holder is proposing to modify the current research protocol by—

- using raised, slotted platforms inside all capture boxes;
- thoroughly cleaning and rinsing all capture boxes and chew toys between uses;
- monitoring captive animals more closely for signs of excessive stress and releasing them prior to anesthesia/surgery if advised to do so by the attending veterinarian;
- mitigating physiologic stress by immersing captive otters in half-submerged capture boxes, net bags, or net pens;
- assuring that the animals have adequately recovered from anesthetic agents and surgical procedures prior to release;
- attempting to identify dental abscesses;
- attempting to reduce the potential for iatrogenic infection when there is concern for unusually high bacterial contamination of the pelage or when there is significant concern for the immune status of the animal (i.e., using secondary surgical drapes, using a separate scalpel blade and surgical gloves following skin incision, or releasing the animal without surgical implantation); and
- reviewing, updating, and modifying the “animal processing check-list” to ensure the completion of all necessary actions, including activation of TDRs before implantation, testing of the VHF transmitter frequency before and after implantation, and other tasks.

These proposed modifications appear to be warranted and appropriate, and the Marine Mammal Commission recommends that they be implemented. In addition, the Commission notes that Dr. Melissa Miller, in her necropsy report on otter 1093, recommends using intra-operatively a

Mr. Timothy J. Van Norman  
7 April 2009  
Page 3

single-dose, broad-spectrum antibiotic that has a longer half-life than those currently used to provide additional protection from bacterial infection. The permit-holder does not address this recommendation in the proposed modified research protocol. The Marine Mammal Commission recommends that the Fish and Wildlife Service request an explanation as to why this recommendation is apparently not being adopted.

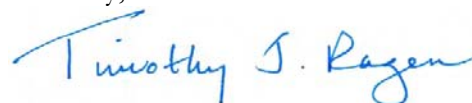
The permit-holder is proposing to monitor captive animals more closely for signs of excessive stress and to release them prior to anesthesia/surgery if advised to do so by the attending veterinarian. The protocol does not explain what is meant by "excessive stress" or how such determinations will be made. The Marine Mammal Commission recommends that the permit-holder clarify what would constitute excessive stress. As a related matter, the permit-holder's report states that the capture team noted that animal 1068 "appeared to be shivering slightly while it was held in a net bag in the water prior to transfer to the large vessel for surgical processing." The report did not, but should, indicate how long the animal was held in the net bag prior to its transfer for surgery.

Finally, the Commission commends the research team on its following the animals after the surgery, reacting conscientiously in treating otter 1093, and conducting thorough postmortem examinations of both animals.

The Commission believes that the activities for which it has recommended approval are consistent with the purposes and policies of the Marine Mammal Protection Act and other applicable laws. The Commission requests that it be provided with a copy of the permit-holder's responses to the Commission's questions.

Please contact me if you have any questions concerning these recommendations.

Sincerely,



Timothy J. Ragen, Ph.D.  
Executive Director