



MARINE MAMMAL COMMISSION

28 April 2014

Dr. Tammy Adams, Acting Chief
Permits and Conservation Division
Office of Protected Resources
National Marine Fisheries Service
1315 East-West Highway
Silver Spring, MD 20910-3225

Re: Permit Application No. 18534
(Alaska SeaLife Center)

Dear Dr. Adams:

The Marine Mammal Commission (the Commission), in consultation with its Committee of Scientific Advisors on Marine Mammals, has reviewed the above-referenced permit application with regard to the goals, policies, and requirements of the Marine Mammal Protection Act (the MMPA). Alaska SeaLife Center (ASLC) is seeking to renew permit 14334 to conduct research activities on captive Steller sea lions during a five-year period.

RECOMMENDATION

The Marine Mammal Commission recommends that the National Marine Fisheries Service issue the permit, but condition it to require researchers conducting activities at ASLC to consult with its husbandry staff prior to any research activities to ensure the individual sea lions subject to any particular procedure have not been exhibiting behavioral changes, medical issues, or signs of stress (e.g., decreased activity, loss of appetite).

RATIONALE

ASLC proposes to conduct research on up to 18 captive Steller sea lions year-round. The objectives are to continue long-term research investigating (1) reproductive physiology, (2) survival and growth, (3) foraging ecology, (4) non-invasive sampling techniques, and (5) new methods and technology for monitoring wild Steller sea lions.

ASLC would conduct research on up to 2 adult males, 6 adult females, and 10 offspring (pups or subadults) of either sex in any given year. ASLC currently maintains seven permanently captive sea lions and could transfer up to six sea lions to or from Mystic Aquarium, Oregon Zoo, Vancouver Aquarium, and the Dolfinarium in The Netherlands. Those transfers help to ensure a healthy level of genetic diversity in the captive population, provide improved socialization in a facility housing conspecifics, and provide new homes for offspring. Transfers from ASLC to any of those facilities would occur under existing memoranda of understanding or new agreements. Sea lions would be medically stable prior to transport. Transport to or from another facility could be either by ground or aircraft and would comply with Animal Plant and Health Inspection Service

standards, Convention on International Trade in Endangered Species of Wild Fauna and Flora guidelines, and International Air Transport Association regulations.

ASLC would allow captive breeding to occur for up to six adult females and two males at any given time. Breeding activities are monitored in person and by remote video cameras. If any male sea lion exhibits abnormal behaviors (e.g., repeated biting producing excessive puncture wounds) during mating, husbandry staff would use a recall signal to deter the male. If the recall signal is ineffective, staff would use adverse stimuli (e.g., air horn, water hose, paintball gun, bean bag rounds) to stop the aggression. If those stimuli are unsuccessful, the male would be sedated using remotely-delivered medication or the pool would be drained to separate the animals. If all attempts fail, a female sea lion could be severely injured or killed. If that were to occur, the remaining females would be separated from the male and all research would cease. If the sea lions do not breed naturally, ASLC could use artificial insemination techniques. Breeding activities would occur until a maximum of nine pups are produced. If after two successful fetal confirmations, a female does not successfully produce offspring (including fetal abortions) and/or abandons her pup, no further breeding attempts would be made with that female and she would be separated permanently from adult males during the breeding season. ASLC is committed to lifelong care of its current adult population and all progeny.

Pregnancies would be confirmed and monitored via hormone concentrations from feces, vaginal swabs, and ultrasound (Table 1). Specific fish (e.g., flatfish, sand lance, and eulachon) would be provided during pregnancy and lactation to validate estimation of diet using fatty acid analyses. During the first week post-parturition, mother-pup pairs would be monitored closely to ensure that the pups are nursing. Pups may have to be fed by veterinary or husbandry staff, if necessary¹. After a pup is stabilized, it would be reintroduced to the mother to establish the mother-pup bond. Pups would be supervised for several weeks to ensure they can enter and exit any pool unassisted.

ASLC would conduct various research activities on the captive sea lions, many of which are possible through trained voluntary behaviors. Researchers would weigh/measure, conduct ultrasound on (for body condition, organ size/density, pregnancy status, and fetal development), restrain, sedate, sample, radiograph, videotape/photograph (including thermal infrared images), track dentinal development (via orthodontic bite registration materials for pups and juveniles), and mark/instrument the sea lions at various times per year (Take Tables 1-5). ASLC semi-retires its sea lions that are 17 years of age or older. At that time, research activities are limited to those described in Table 3. Ultrasound could be conducted using remotely-controlled vehicles (RCVs)², in addition to standard procedures. The RCV would slowly approach a sleeping sea lion or an animal lying under behavioral control. The ultrasound wand would make brief contact with the sea lion prior to retreating. The RCV also would be used to collect fecal, placental, and regurgitated milk samples. If the RCV proves effective at conducting those activities in a captive setting, it likely would be used in the wild. Various identifiers (e.g., berries, corn, rice, food coloring, beads, sesame seeds) could be provided to individual sea lions to identify each sea lion's feces. Depending on the age class and sex of the animal, researchers could collect blood, feces, milk (via lavage in pups and manual palpation and/or oxytocin administration in adult females), semen, swabs, saliva, blubber, and post-partum

¹ Milk could be collected from the mother via manual palpation or administration of oxytocin. In addition, electrolytes, formula, and/or a mix of all sustenance types could be fed to any given pup.

² RCVs to be used by ASLC are approximately 50 x 30 x 30 cm and weigh 3 kg.

(amniotic fluid, placenta, umbilicus, and meconium³) samples. Deuterium oxide and Evan's blue dye could be administered to individual sea lions, with serial blood sampling occurring before and after administration. Other samples (including muscle, urine, and bone) could be imported opportunistically from other permitted researchers and all samples could be exported for analyses. Any remaining samples would be archived at ASLC.

In addition, researchers may attach instruments via base plates to the pelage of the head, between the shoulders or on the back, and on the flippers using various adhesives (Take Table 1, 2, 3, and 5). Attachment of the base plates would allow for instruments to be attached and removed using trained voluntary behaviors rather than anesthesia for each attachment or removal. The instruments could include accelerometers, time-depth recorders, dataloggers, physiological tags (e.g., jaw motion and stomach temperature/pressure/impedance), video cameras, drag devices⁴, and an integrated video camera/datalogger/GPS/satellite/VHF transmitter. The latter tag would remain on an animal for up to two weeks. ASLC could attach up to three instruments to an animal at any given time, generally one on the head and two on the mid-dorsal region. The combined mass of the instruments would not exceed 1.73 kg. Researchers would not instrument pups less than one year of age or animals participating in breeding activities from 15 May to 15 August of each year. Further, a pregnant female⁵ would be anesthetized to attach a base plate only if she is sedated for other procedures.

Researchers would conduct two different types of foraging trials. The first trial would include the attachment of biotelemetry tags prior to the trial. Then live fish would be released into the pool for the sea lions to feed upon. Results from the study would aid in refining techniques to investigate foraging ecology in the wild. The second trial would measure the increased effort for foraging due to increased drag or altered buoyancy. Syntactic foam or small parachutes would be attached to the base plate to alter drag, buoyancy, or both. To assess how various instruments affect kinematic variables (e.g., turning radius), researchers would mark an individual sea lion's center of gravity, hip joints, and cervical articulation using epoxy and reflective tape, non-toxic paint, or zinc oxide. All devices would be removed after each trial.

ASLC is requesting to kill, unintentionally or intentionally via euthanasia, up to four Steller sea lions during research activities for five-year period⁶. It also proposed that if any female dies during her third trimester of pregnancy, both the female and the unborn pup would be considered unintentional mortalities. The Commission agrees with the approach that only third trimester fetuses be counted towards the number of authorized mortalities. If the National Marine Fisheries Service (NMFS) decides to count the loss of a fetus of any age against the mortality limit, thereby amending the request of the applicant, the Commission would request a meeting to discuss the matter before the permit is finalized.

ASLC has indicated that its Institutional Animal Care and Use Committee has reviewed and

³ Samples would be collected as inconspicuously as possible to minimize disruption of mother-pup bonding.

⁴ Drag devices would measure 30 x 15 x 12 cm and would fit around any telemetry device. Both devices would be attached to the same base plate.

⁵ Non-pregnant females would be anesthetized up to four times per year, in addition to being sedated for other procedures.

⁶ The permit also would authorize the natural mortality or humane euthanasia for medical reasons of all permanently captive sea lions.

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approved the proposed procedures. ASLC would collaborate with researchers at the aforementioned facilities and the University of Alaska Fairbanks. Further, ASLC indicated that discussions would occur between husbandry and veterinary staff to ensure research is not impacting negatively an individual's health.

The Commission appreciates the need for discussions between husbandry and veterinary staff and also notes that, although behavior changes and medical issues may be apparent, symptoms of stress may be subtle and may not be apparent to the researchers performing the procedures. Therefore communication between the researchers and the husbandry staff and attending veterinarian who monitor individuals on a daily basis and know the long-term health trends of individuals could be important to alert the researchers to evidence of stress. Therefore, the Commission recommends that NMFS issue the permit, but condition it to require researchers conducting activities at ASLC to consult with its husbandry staff prior to any research activities to ensure the individual sea lions subject to any particular procedure have not been exhibiting behavioral changes, medical issues, or signs of stress (e.g., decreased activity, loss of appetite).

The Commission believes that the activities for which it has recommended approval are consistent with the purposes and policies of the MMPA.

The Commission appreciates the opportunity to comment on this permit application. Kindly contact me if you have any questions concerning the Commission's recommendation.

Sincerely,



Rebecca J. Lent, Ph.D.
Executive Director