



MARINE MAMMAL COMMISSION

25 September 2019

Dr. Nature McGinn, ACA Permit Officer
Permit Office, Room 755
Division of Polar Programs
National Science Foundation
2415 Eisenhower Avenue
Alexandria, Virginia 22314

Dear Dr. McGinn:

On 17 September 2019 the National Science Foundation (NSF) published a notice (84 Fed. Reg. 48951) requesting comments on a permit amendment application from Dr. Linnea Pearson, California Polytechnic State University. Dr. Pearson is seeking authorization under the Antarctic Conservation Act (the ACA) to amend her ACA permit 2018-013 to conduct research on Weddell seals in Antarctica. The Marine Mammal Commission (the Commission), in consultation with its Committee of Scientific Advisors on Marine Mammals, reviewed the amendment request with regard to the goals, policies, and requirements of the ACA. Researchers are authorized to harass, capture, handle, restrain, measure/weigh, sedate, mark, sample, conduct procedures on, and/or attach instruments to up to 10 Weddell seal pups per year¹. Researchers also are authorized to conduct ground-based surveys and collect samples from dead seals. The purpose of the research is to (1) determine the thermoregulatory strategies by which Weddell seal pups maintain euthermy in air and in water and (2) examine the development of diving capability as the animals prepare for independent foraging.

The Commission provided extensive comments and recommendations in its [1 July 2019 letter](#)², [13 September 2018 letter](#), and [13 July 2018 letter](#) on Dr. Pearson's amendment requests under the ACA and Marine Mammal Protection Act³—neither NSF nor the National Marine Fisheries Service (NMFS) issued the associated permit modifications in 2018. Dr. Pearson has again requested⁴ to revise the types of drugs and ages of pups to which the drugs would be administered, to add blood sampling for Cohort B animals, to revise the ages at which various tag types would be attached and retrieved, to increase the number of takes, to administer antibiotics as necessary, etc. (see the amendment application and associated tables for specifics). The Commission has

¹ Researchers also are authorized for up to two pup mortalities per year, not to exceed three mortalities during the permit duration.

² NMFS did implement all of the Commission's recommendations from its 2019 letter.

³ Specifically for permit 21006. The Commission also provided extensive comments on Dr. Pearson's original permit application in its [21 July 2017 letter](#) and extensive informal comments on permit application 18879 submitted by Dr. Heather Liwanag, who originally proposed to conduct the activities. Although Dr. Liwanag's application was published for public comment in August 2016, it was subsequently withdrawn. Thereafter, Dr. Pearson became the principal investigator on the related permits and Dr. Liwanag became a co-investigator.

⁴ The only modification that differs from those reviewed in 2018 is the request to collect swabs from all ages of pups in Cohorts A and B.

summarized in Table 1 the specific procedures that would be authorized for the various ages and cohorts under the proposed amendment.

Table 1. Proposed procedure specifics.

	Sample size	1-week-old pups (1 st capture)	3-week-old pups (2 nd capture)	5-week-old pups (3 rd capture)	7- to 8-week-old pups (4 th capture)
Cohort A	N=6 pups	Full physiology workup with sedation including morphometrics ¹ , tritiated water and Evans blue dye, blood samples, muscle and blubber biopsies, swabs, attach dorsal-mounted accelerometer and flipper-mounted TDR.	Full physiology workup with sedation including morphometrics ¹ , tritiated water and Evans blue dye, blood samples, muscle and blubber biopsies, swabs, retrieve dorsal-mounted accelerometer, and attach flipper-mounted VHF tag.	Full physiology workup with sedation including morphometrics ¹ , tritiated water and Evans blue dye, blood samples, muscle and blubber biopsies, and swabs.	Full physiology workup with sedation including morphometrics ¹ , tritiated water and Evans blue dye, blood samples, muscle and blubber biopsies, swabs, vibrissa sample, and retrieve flipper-mounted TDR and VHF tag.
Cohort B	N=6 pups	In-air metabolic measurements (no sedation), sedation, morphometrics ¹ , blood sample, swabs, attach dorsal-mounted accelerometer and flipper-mounted TDR.	In-air and in-water metabolic measurements (no sedation), sedation, morphometrics ¹ , blood sample, swabs, retrieve dorsal-mounted accelerometer, and attach flipper-mounted VHF tag.	In-air and in-water metabolic measurements (no sedation), sedation, morphometrics ¹ , blood sample, and swabs.	In-air and in-water metabolic measurements (no sedation), sedation, morphometrics ¹ , blood sample, swabs, vibrissa sample, and retrieve flipper-mounted TDR and VHF tag.

¹ Also includes thermal imaging and ultrasound of blubber depth. Core body temperature would be monitored as well.

Inconsistencies in the sedation protocols

Inconsistencies have been an ongoing issue with various portions of Dr. Liwanag’s original MMPA permit application, Dr. Pearson’s original MMPA and ACA permit applications, Dr. Pearson’s previous MMPA and ACA amendment applications, and the various IACUC protocols⁵. The sedation protocols in the current ACA amendment application are again inconsistent with the protocols stipulated in the sedation table referenced in the ACA application⁶. The Commission is dismayed that this issue has still not been addressed in the current amendment application.

Specifically, the ACA amendment application indicated that sedation of Cohort A pups at 1 week and Cohort B at all four time points would be determined based on *an individual basis at the*

⁵ The Commission also notes that inconsistent numbers of animals were reported to have been taken during the various activities within and between the MMPA and ACA annual reports.

⁶ And the final sedation table included in the amendment to MMPA permit 21006.

discretion of the veterinarian. However, the sedation table⁷ indicated that sedation would be based on *the animal's activity level and the discretion of the veterinarian.* For 3-week-old pups and older, the ACA amendment application indicated that sedation protocols would depend on *the animal's activity level and the animal's reaction to previous sedation events, at the discretion of the veterinarian;* while the sedation table again indicated that sedation would be based on *the animal's activity level and the discretion of the veterinarian.* For 7- to 8-week-old pups, the ACA amendment application indicated that sedation with midazolam and ketamine would only be used in pups that are refractory to sedation *with midazolam and butorphanol.* The sedation table indicated that midazolam and ketamine would only be used in pups that are refractory to sedation *with midazolam alone or midazolam and butorphanol at that time.*

It is incomprehensible why Dr. Pearson and Dr. Liwanag cannot succeed in specifying consistent sedation protocols and aligning the ACA application with the sedation table. More importantly, during the first year of activities that have already been completed, the researchers, including the veterinarian, did not abide by the underlying NMFS and ACA applications and IACUC protocols regarding what drugs were authorized to be used on various ages of pups or whether sedation was even authorized to be used on some ages of pups. Thus, to ensure the accountability of the researchers to the procedures authorized, it is essential that the sedation protocols be clearly stipulated in the permit amendment.

Given that the documentation again is inconsistent regarding multiple aspects of the sedation protocols, inclusion of a sedation table in the final ACA permit amendment is necessary to eliminate any questions the researchers have in the field regarding what drugs can be used on which pups and to clarify exactly what the permit amendment is authorizing. The ACA sedation table is consistent with the final sedation table included by NMFS in the MMPA amendment. As such, the sedation table should supersede the sedation protocols stipulated in the ACA amendment application. For completeness and clarity, the Commission recommends that NSF include the sedation table⁶ in the final ACA permit amendment.

The Commission understands that California Polytechnic State University's Institutional Animal Care and Use Committee (IACUC) reviewed the revised research protocols that were submitted on 9 June 2019. Although the IACUC approved the protocols on 23 June, those protocols were based on information contained in NMFS's amendment application from June, which included some of the same sedation inconsistencies noted herein. The Commission reiterates that the protocols, specifically the sedation protocols, reviewed and approved by the IACUC should match those authorized under both the ACA and NMFS research permits.

Activities to be authorized

There were a number of other significant deviations from authorized activities in the first year of activities. Dr. Pearson's ACA and MMPA annual reports indicated that VHF tags were attached to two pups in Cohort A and two pups in Cohort B at 3 weeks of age during those activities. Neither the ACA nor the MMPA permit or the IACUC protocols authorized pups in either cohort to be instrumented with VHF tags at 3 weeks of age. Accelerometers were authorized to be attached at 3 weeks of age and VHF tags at 5 weeks of age. Thus, three of the 3-week-old pups were instrumented with both accelerometers and VHF tags attached to the dorsal pelage with epoxy.

⁷ Table 2 in the amendment application.

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In addition, the annual reports indicated that rectal temperatures were taken on pups of all ages in Cohort B. However, the permit applications indicated that rectal temperatures were to be taken only on pups that participated in in-water metabolic trials in Cohort B and were 3 weeks of age and older. Given that the researchers and veterinarians have failed to comply with the requirements of the ACA and MMPA permits and IACUC protocols, the Commission recommends that NSF include Table 1 from the ACA application in the final permit amendment to minimize *any* further confusion on exactly what the permit authorizes.

The Commission reminds the researchers that violations of the ACA and MMPA and any permits issued under those statutes have subjected permit holders to various penalties, including fines, permit revocation, and suspension of the opportunity to obtain new permits. Regardless of whether these were carried out knowingly by either the researchers or the veterinarian or were due to a lack of proper attention on their part to understanding what the permits do and do not authorize, they were violations nonetheless. Thus, Dr. Pearson, Dr. Liwanag, any associated veterinarian, and all other personnel should be advised again that they *must* abide by the procedures and protocols specified in the permit application or any amendment thereto and all permit conditions. Failure to do so will constitute violations of permit 2018-013 issued under the ACA and permit 21006 issued under section 104(c) of the MMPA and may result in permit suspension or revocation and/or other penalties.

Please contact me if you have any questions regarding the Commission's recommendations.

Sincerely,



Peter O. Thomas, Ph.D.,
Executive Director

cc: Ms. Amy Sloan, NMFS
Dr. Barbara Kohn, Animal and Plant Health Inspection Service