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ALASKA FISH AND WILDLIFE RESEARCH CENTER

**Mammals Section
Walrus Project**

**Cape Seniavin Field Report
30 April-15 May 1988**

**Susan Hills
Fairbanks, Alaska**

I. Introduction

Work Unit I of the AFWRC Pacific walrus project calls for development of a functional satellite-linked telemetry system for walrus that incorporates sensors for haulout and dive data. Development of a satellite telemetry system implies not only the transmitter (PTT) itself, but also a reliable means of attaching it to an animal. The current transmitter package is large enough that, to attach it securely to the walrus' tusk, the animal must be immobilized. The new immobilizing drug, Telezol, was to be tested first, then, if it proved unsatisfactory, carfentenil or other immobilizing drugs would be tried. Work at Round Island in summer 1987 showed, among other things, that walrus could be immobilized with Telezol but that results were unpredictable, that Telezol and the jab stick method of administration might not be satisfactory for use on the ice and that a PTT with a saltwater switch could be attached to a walrus' tusk and function for at least 136 days (Hills 1987). In autumn 1987, two PTTs with pressure sensors and new software arrived for testing from Telonics, Inc. of Mesa, Arizona. The experience with Telezol at Round Island was discussed with veterinarians, drug manufacturers and other researchers who have immobilized marine mammals. After the Round Island field season, the next reasonably reliable opportunity to approach walrus hauled out on land was at Cape Seniavin on the north side of the Alaska Peninsula. Walrus have hauled out there since 1980, but the timing and numbers are variable (Frost et al. 1982). In order to have the longest time possible for further testing or to make changes in the PTT, the decision was made to go to Cape Seniavin even though the walrus haulout there is not as reliably used as is, for example, Round Island.

II. Objectives

The primary objectives of the Cape Seniavin field effort were:

1. Deploy a satellite transmitter incorporating a pressure sensor as well as the saltwater switch that was on the prototype deployed at Round Island in August 1987.
2. Further test immobilizing drugs on Pacific walrus and make final choice of drug and delivery system to use on female walrus hauled out on ice.
3. Gather data to test the hypothesis that time, weather and sea state conditions can be used to predict peak haulout periods for walrus in Bristol Bay in summer.

III. Methods

- A. Study area and Schedule. Cape Seniavin is a 224-foot high point of land on the north side of the Alaska Peninsula between Port Moller and Port Heiden (Map 1). Walrus have been seen hauled out on the sloping black sand beaches both north and south of the Cape itself (R. Hood pers. comm.). The Cape is made up of loose rock that falls onto the beach more and more often as the weather warms, making it a hazardous place for both walrus and researchers.

The Alaska Peninsula National Wildlife Refuge (APNWR) and Fish and Wildlife Law Enforcement were to install and maintain a camp at Cape Seniavin from mid March through early May 1988 to deter illegal hunting of walrus. By mid March, unusual northerly winds and cold temperatures had created much new ice in Bristol Bay and piled chunks of ice up on the beach at the Cape. Weather and ice conditions and the lack of walrus hauled out on the beach repeatedly postponed deployment of the camp until, on 21 April, Ron Hood, manager of APNWR, made a "no go" decision for their camp at the Cape for 1988 but said they would help support any effort there by AFWRC. A few walrus were seen at the Cape 23 and 24 April, the decision was made to put in an AFWRC camp 27 April, and Hills and Rimer arrived at Cape Seniavin 30 April. Coady arrived 6 May, Cornell was there 11-14 May, and the camp was finally pulled 15 May.

- B. Immobilization and Drug Delivery. Telezol was to be tested further according to a revised protocol (Attachment 1) from 6-11 May with Dr. Coady. Small numbers of walrus on the beach and their reaction to approach by researchers prevented Telezol testing until 10 May when one dart was delivered via crossbow. When Dr. Cornell arrived, xylazine, etorphine and carfentanyl were tested in accordance with Dr. Cornell's recommendations. All were delivered via Telinject compressed air gun.
- C. Transmitter attachment and marking. PTT and VHF transmitters were attached to tusks with stainless steel bands and epoxy as was done at Round Island in 1987. In addition, animals were marked with green tattoo ink, black nyanzol dye, blue sheep marking liquid and red flipper tags. All marks, natural and applied, were noted and the animals were photographed. Personnel at Round Island and Cape Peirce will continue monitoring the VHF radios during the summer. They will also visually scan any walrus that are hauled out to

look for marks, flipper tags and transmitters that may have ceased functioning.

- D. Environmental Conditions and Haulout Cycles. The number of walruses hauled out, temperature, wind speed and direction, barometric pressure, sea state, and disturbances were recorded at least daily, often several times each day.

IV. Results and Discussion

- A. Immobilization and Drug Delivery. Twelve walruses were injected with chemical immobilizing agents 10-14 May with no mortalities (Table 1). In addition to the 7 animals injected with Telezol at Round Island in 1987, one additional animal was Telezol. Then four other drugs or drug combinations were tried in an attempt to find one with a shorter induction time and that had an antagonist. Xylazine, in combination with acepromazine (3 animals) and diazepam (1 animal), had no effect at the dosages given. Etorphine was acceptable on 2 of 3 animals, and carfentanyl worked well on 4 of 4 animals. Two manuscripts on the results of the chemical immobilization trials are currently in preparation.

The jabstick was not used to inject any animals at Cape Seniavin because it was not possible to approach close enough to use it during the Telezol trials, and because the 10 cc of drug required to fill the tubing between the syringe and the needle cannot be used - a problem with expensive and/or dangerous substances. A crossbow was used to inject Telezol; all others were given using a Telinject compressed air gun. The Telinject gun proved very satisfactory in that it is powerful enough to penetrate through the skin at 30-40 m, is very quiet, and is very light weight and easy to handle.

Table 1. Adult male Pacific walruses injected with chemical immobilizing agents at Cape Seniavin, Alaska, May 1988.

Animal number	Drug/Dose	Observations
88-1	Telezol, 1625 mg (1.25 mg/kg est. wt.)	Animal went in water no apparent effect
88-2	100 mg xylazine 5 mg acepromazine	no apparent effect
88-3	200 mg xylazine 10 mg acepromazine	no apparent effect
88-2	200 mg xylazine 10 mg acepromazine	given 110 min after first dose still no apparent effect
88-4	100 mg xylazine 25 mg diazapam	no apparent effect
88-5	5 mg etorphine 8 mg diprenorphine, IV 20 cc Dopram, IV	acceptable level of immobilization, good response to antagonist. VHF radio.
88-6	3 mg etorphine	no apparent effect
88-7	4 mg etorphine 6 mg diprenorphine IV 2 mg diprenorphine IM 10 cc Dopram IV	acceptable immobilization good response to antagonist PTT and VHF radio
88-8	450 mg xylazine 5 mg acepromazine	no apparent effect
88-9	4 mg carfentanyl 500 mg naloxone IV 500 mg naloxone IM 10 cc Dopram IV 10 cc Dopram IM	acceptable immobilization good response to antagonist VHF radio
88-10	3 mg carfentanyl 300 mg naloxone IV 20 ml Dopram IV	acceptable immobilization good response to antagonist VHF radio
88-11	2 mg carfentanyl 300 mg naloxone IV 20 cc Dopram	acceptable immobilization good response to antagonist VHF radio

88-12 3 mg carfentenil acceptable immobilization
 400 mg naloxone IM moderate response to
 200 mg Naloxone IV antagonist
 20 cc Dopram IV VHF radio

- B. Transmitter attachment and marking. One satellite transmitter with VHF back up and 5 other VHF radios were attached to walrus tusks then monitored daily until camp was pulled. All resightings or transmissions heard are summarized in Table 2.

Table 2. Relocations of transmittered male Pacific walrus at Cape Seniavin, AK. through 15 May 1988.

Animal Number	Date Deployed	Observations
88-5	5/12	5/15 - heard and seen, black dye hard to distinguish from black sand, radio looks good, sounds strong.
88-7	5/13	5/14 - heard and seen, black and green dyes still good, blue paint looks black, radios look good, sound strong. 5/15 - same as above.
88-9	5/13	5/14 - heard but not seen, strong signal
88-10	5/13	5/15 - heard but not seen, strong signal
88-11	5/14	5/15 - not heard or seen
88-12	5/14	5/15 - not heard or seen

- C. Environmental Conditions. Data will not be analyzed until that from this summer's observations at Round Island and Cape Peirce are received. However, barometric pressure, temperature and wind do not appear to be correlated with numbers of animals hauled out although sea state, or more particularly, wave height may be.

V. Future Work.

- A. Chemical immobilization. Carfentenil and/or etorphine will administered via telinject dart to female walrus hauled out on pack ice near Wainwright in July 1988.

- B. Satellite package. Signals from the PTT will be monitored and analyzed for any changes that need to be made in the next units ordered. Personnel at Round Island and Cape Peirce will monitor the VHF units and watch for marked animals. Five PTTs and backup VHF radio transmitters will be attached to females walrus near Wainwright in July 1988.
- C. Environmental Conditions. Personnel at Round Island and Cape Peirce will record the same data as were taken at Cape Seniavin; it will be analyzed to see if peak haulout numbers are correlated with environmental variables.

VI. References

- Frost, K.J., L.F. Lowry and J.J. Burns. 1982. Distribution of marine mammals in the coastal zone of the Bering Sea during summer and autumn. Final report, OCSEAP contract # NA 81 Rac 000 50, RU #613. 188 pp.
- Hills, S. 1987. Round Island field report. Unpubl. rep, Alaska Fish and Wildlife Research Center, Fairbanks field station. 11 pp.
- Hood, Ron. 1988. Personal communication. Refuge manager, Alaska Peninsula/Becharof National Wildlife Refuge, King Salmon, AK.

VII. Attachments

1. Application for marine mammal permit PRT 690715, including immobilization drug protocol.
2. Miscellaneous observations from Cape Seniavin.