

ADF&G Report to ISC March 2024

ADF&G Arctic Marine Mammal Program lead: Lori Quakenbush

lori.quakenbush@alaska.gov, 907-459-7214

Anna Bryan, anna.bryan@alaska.gov

Alex Sletten, alex.sletten@alaska.gov

Justin Crawford, justin.crawford@alaska.gov

Justin Olnes, justin.olnes@alaska.gov

Biomonitoring (contact Anna Bryan)

Seal samples are collected from the subsistence harvest to monitor diet, body condition, productivity, age at maturity, survival to weaning, disease, and other health-related measures. In addition, we contribute samples and data to others for important projects. Current projects include:

- Body condition, productivity, age at maturity, and survival to weaning are good indicators of population health and currently are positive for ringed, bearded, and spotted seals.
 - In 2024, we intend to collect tissues at Utqiagvik (by the NSB), Point Hope, Shishmaref, and Gambell. We will also be working with Alex Whiting and the Native Village of Kotzebue again to collect bearded seal jaws for close-kin mark-recapture.
 - Investigate relationship between polar bear body condition and productivity and seal body condition, assessed from blubber depth measurements collected as part of the biomonitoring program. Results indicate that when seals are healthy, polar bears are also healthy (USGS). A manuscript titled "Identifying indicators of polar bear population status" was accepted in Ecological Indicators in January 2024.
- Genetic studies.
 - Use close-kin mark-recapture methods to estimate the abundance and demographics of bearded seals. A tooth and tissue sample are collected from harvested bearded seals. The tooth provides age for population dynamics modeling. DNA, extracted from the tissue sample, provides genetics for kinship determination. We found that some of the adult males are not breeding, which increases the preliminary abundance estimate to ~409,000. We also found that there are no full sibling pairs suggesting that females do not mate with the same male. *More samples from bearded seals (a lower jaw for a tooth and muscle) are needed for a more accurate abundance estimate and to learn more about survival and productivity.* Samples collected annually can also provide population trend information, not currently available by any other method (NMFS).
 - Contribute spotted, ringed, and ribbon seal tissues for genetic studies looking at the population structure and genetic diversity of each seal species (University of Copenhagen, Denmark).

- Other health studies.
 - Disease. In 2023, we tested 14 bearded seals and one spotted seal for avian influenza, all were negative.
 - Microplastics. We provided bearded seal samples to an undergraduate to determine the amount of microplastics in bearded seal tissues. (UAF)
 - Compare trace element concentrations in ice seal tissues in the 2000's and 2010's. All trace element concentrations were within ranges that were similar to or below what has been measured for these species throughout their range in the Arctic and subarctic.

- Diet-Investigate the role of spotted seals as fish predators. Fish otoliths found in the stomachs of harvested spotted seals are used to determine the number, species and size of fish eaten. These diet data are integrated with fish energy content analysis and estimates of seal abundance, distribution, and seal age structure to assess total biomass of fish consumed annually (NMFS).

Harvest monitoring (contact Justin Olnes)

- Harvest surveys are currently underway for Togiak, Hooper Bay, and Chevak.
- **We would like to survey Nome for the 2024 harvest year.** Have reached out to Chuck Menadalook (ISC and Kawerak) and the local tribal council offices to initiate this effort.
- An updated “The Subsistence Harvest of Ice Seals in Alaska— a Compilation of Existing Information, 1960 – 2018” is complete and ready for the ISC to review and approve.

Winter ringed seal density study (contact Justin Crawford)

Determine the density of ringed seals within areas of oil and gas development near Prudhoe Bay using dogs trained to find seal breathing holes and lairs. The density of seal structures and snow depth will be compared to a previous study conducted during 1982–1983. Field work was conducted in May of 2022 and 2023. We found more ringed seal structures in 2023 (0.83 structures/km²) than in 2022 (0.69 structures/km²). In 1983, a smaller area (42 km²) within our study area (88 km²) had 34 seal structures and a similar density (0.81 structures/km²; Kelly et al. 1986). In 2023, we mounted cameras at 10 breathing holes that had been opened for basking to record use; we recorded 70 haul-out bouts (basking) that averaged 9 hours and we saw two seals hauled out at the same time on six occasions. In 2023, we also documented other species at seal structures including arctic foxes, polar bears, gulls, a red fox, and a ptarmigan. Results suggest that structure density varies annually, however, winter use of the Prudhoe Bay area has not decreased since the 1980s.

Kelly, B.P., L.T. Quakenbush, J.R. Rose. 1986. Ringed seal winter ecology and effects of noise disturbance. Final Report OCSEAP RU 232 61:447-536.

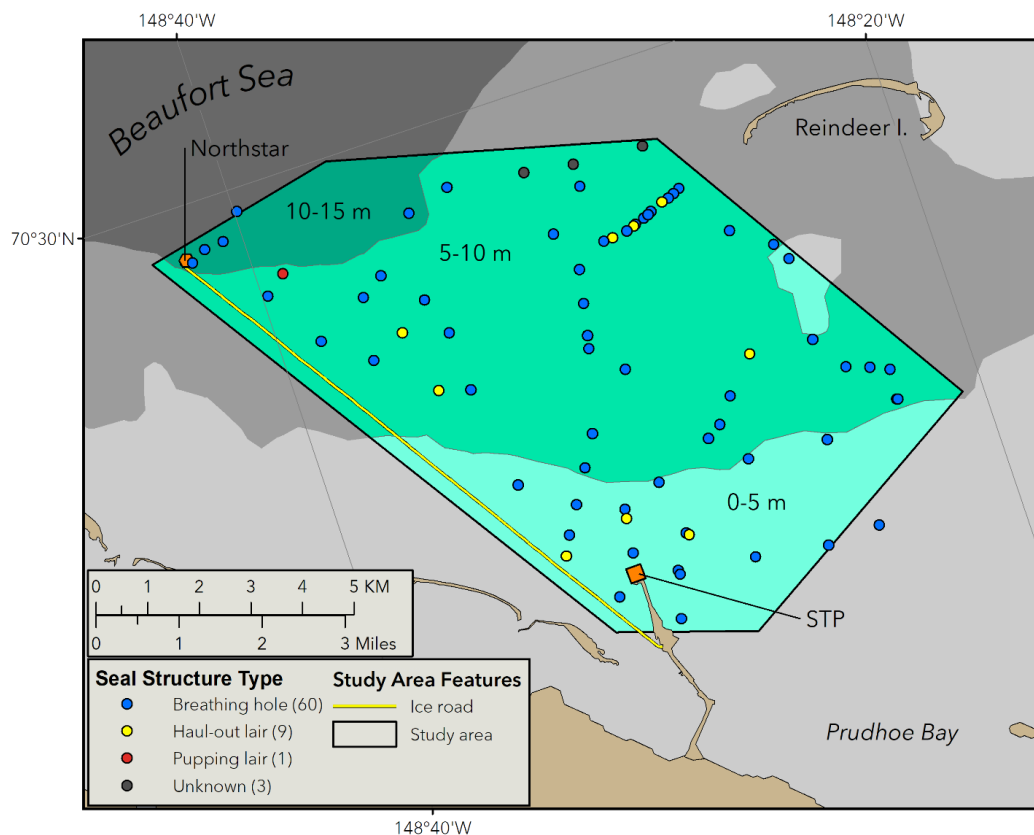


Figure 1. Distribution of ringed seal breathing holes and lairs found by wildlife detection dogs in Prudhoe Bay in May 2023.