

## ADF&G Report to ISC November 2023

**Biomonitoring** – 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 issues. In addition, we contribute samples and data to others for important projects. Current projects include:

- In 2023, tissues were collected at Utqiagvik (by the NSB), Point Hope, Shishmaref, and Gambell. Bearded seal jaws were also collected for close-kin mark-recapture at Kotzebue with the help of Alex Whiting and the Native Village of Kotzebue.
- 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.
- 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 the same female does 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).
- 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).
- Investigate relationship between polar bear body condition and productivity and seal body condition. Results indicate that when seals are healthy, polar bears are also healthy (USGS).

### **Harvest monitoring**

- Last spring, harvest surveys were conducted at Hooper Bay and Chevak, however, both surveys were unreliable due to non-random sampling and sample size, respectively. We will try for another Hooper Bay survey in Spring 2024.
- **We would like to survey Nome in 2024.** Have reached out to Chuck Menadalook (ISC and Kawerak) and the local tribal council offices to initiate this effort.
- Meeting with Togiak Tribal Council on 21 November to discuss a survey February 2024.
- Looking at new ways to approach harvest survey, including use of the ‘SMART’ app’s ‘SMART Collect’ tool (<https://impactsmart.azurewebsites.net/Download/SMART-Collect>).

### Winter ringed seal density study

- 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 the same study area in 2022 (0.68 structures/km<sup>2</sup>) and 2023 (0.83 structures/km<sup>2</sup>) than were found in 1983 (0.44 structures/km<sup>2</sup>). Cameras mounted in lairs identified an interesting behavior in 2022; ringed seals rest in the access hole of lairs for hours at a time without hauling out. Cameras recorded 78 bouts longer than 30 minutes (ranging from 0.5–10.4 hrs.) of seals sleeping and resting in the access hole. In 2023, we mounted cameras at 10 breathing holes that had been opened for basking to record use by multiple seals, visitation by predators, and other behavior.

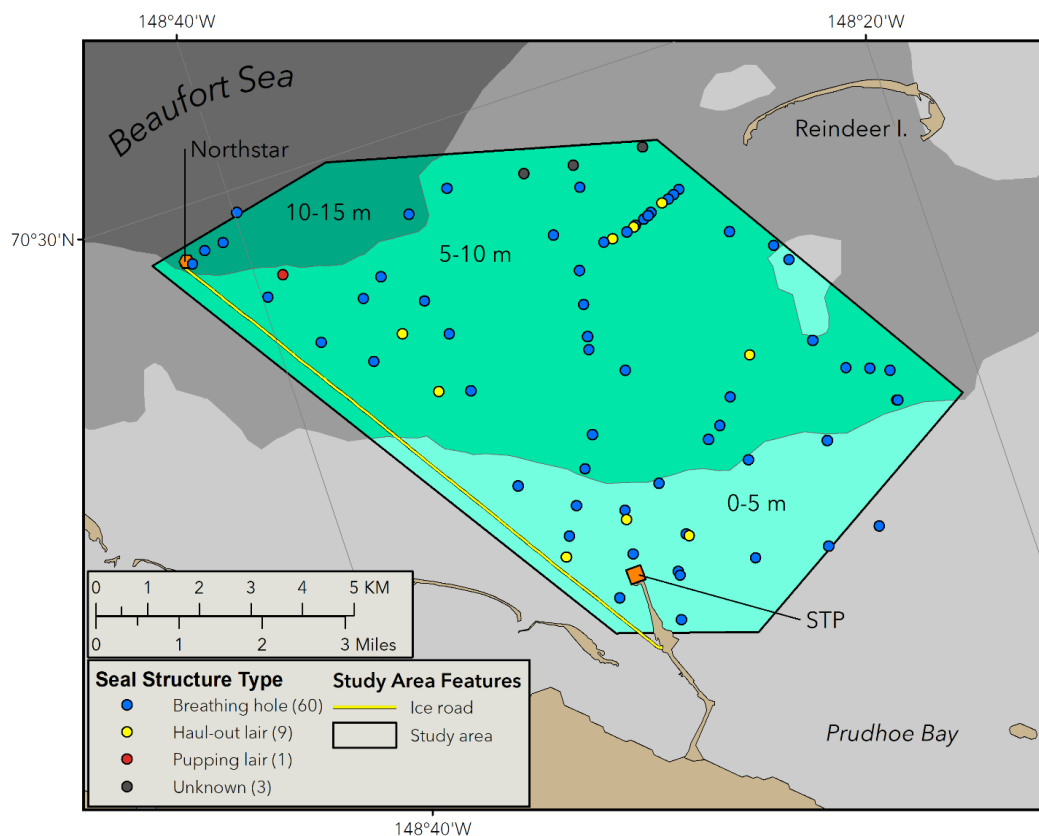


Figure 1. Distribution of ringed seal breathing holes and lairs found by wildlife detection dogs in Prudhoe Bay in May 2023.