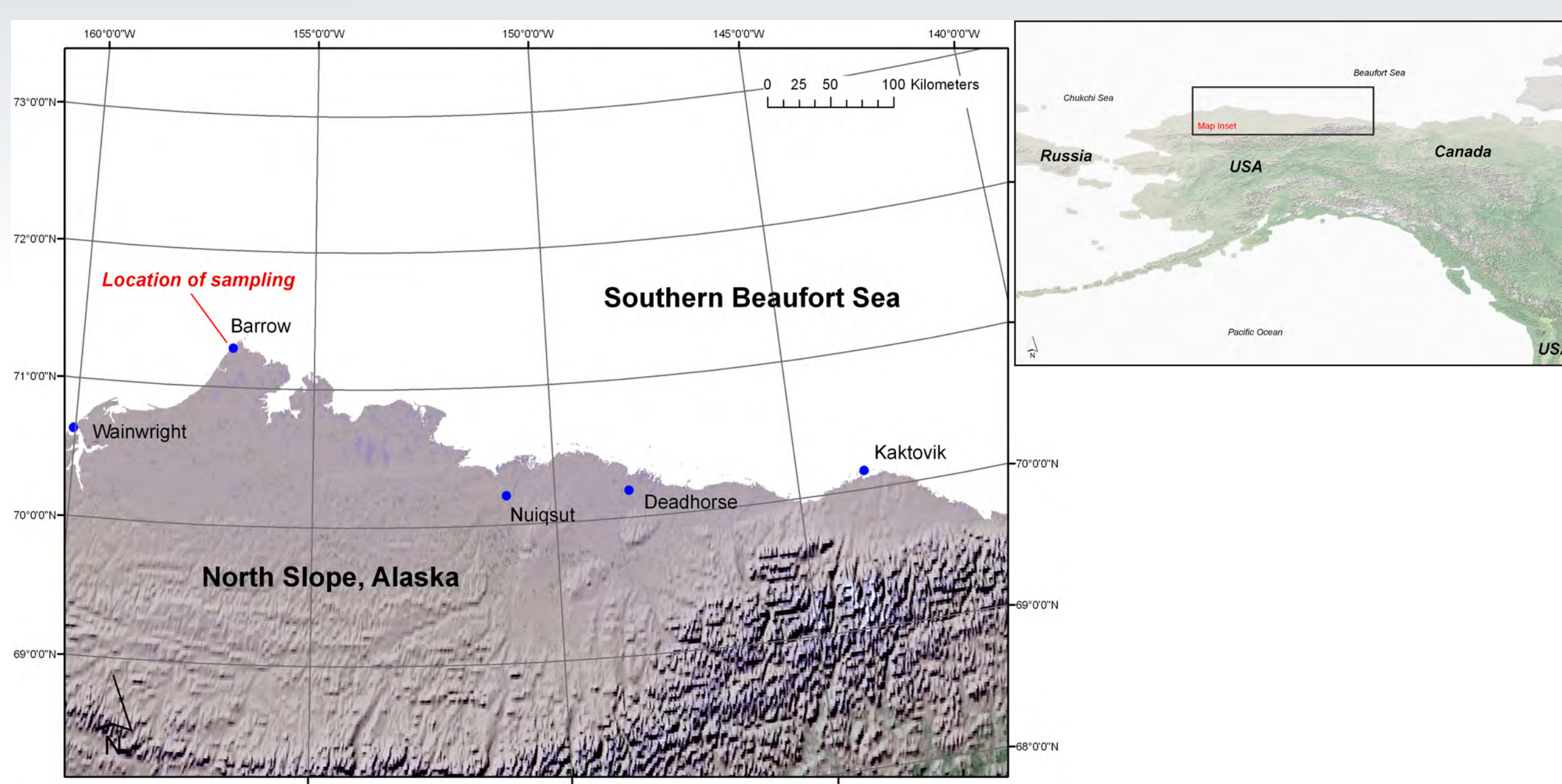
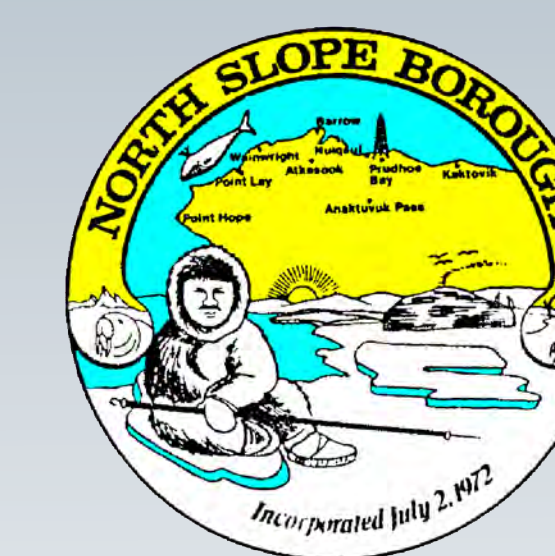


Remote Genetic Sampling of Polar Bears (*Ursus maritimus*)

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Point Barrow bone pile and hair-sampling corral

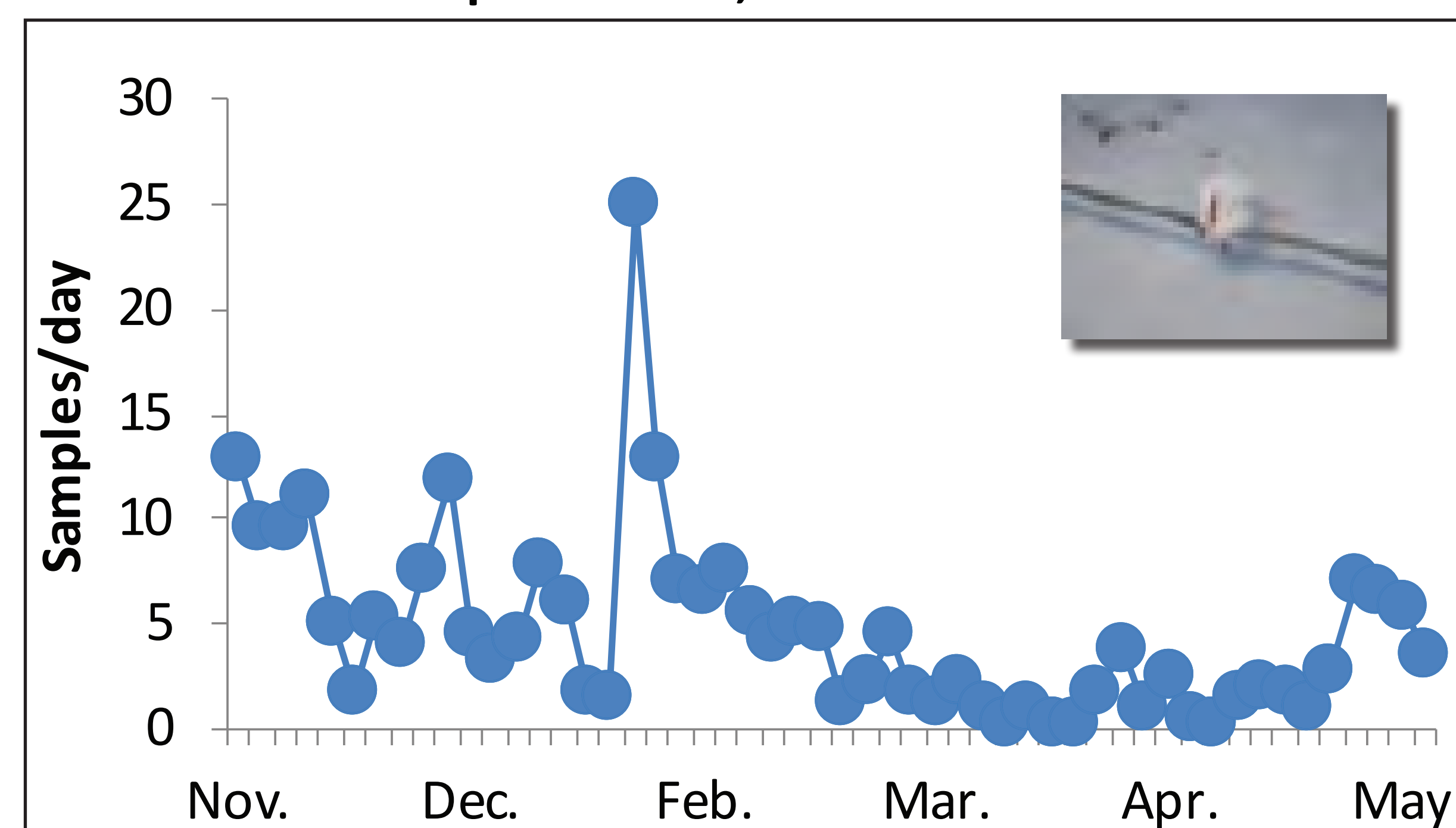


Objectives

A barbed-wire hair snare corral was set up around bowhead whale remains at Barrow, Alaska in the winter of 2010-2011. This allowed for daily observation to effectively develop the field method.

1. Develop a field method for sampling polar bear hair.
2. Obtain individual identities from extracted DNA from hair samples.
3. Quantify and characterize annual and seasonal use of bowhead whale bone piles by polar bears.
4. Include all genetic identities in population-level (Southern Beaufort Sea) database to augment mark-recapture population analyses

Relative use of the bone pile at Point Barrow, AK by polar bears, 2010-2011



Methods

- Single strand of 4-point, 12-gauge barbed wire erected around carcasses in November, 2010
- Fence posts spaced at ~10 m, initially at 0.5 m then adjusted to 0.65 m; spacing between samplings ~0.75 m or 6 barbs
- Fence checked daily for the first 4 days and monitored by cameras, switched to every other day, later monitoring adjusted by bear use
- Hair was not collected if a barb had large quantities of hair that appeared to be from >1 bear
- All unsampled hairs cleaned from fence at each visit with propane torch if T > -10°C
- Fence posts were added and the snare adjusted to deal with snow drift and melt

Preliminary Observations

- 649 hair samples collected between November 2010 and May 27, 2011
- No evidence for injury to bears despite up to 20 bears using the pile at once
- DNA from a subsample of 200 hair samples from first 3 months was amplified at 21 microsatellite loci for individual identification at Wildlife Genetics International.
- The minimum number of polar bears using the bowhead whale remains at Barrow Point, AK over the course of these three months was 97.
- 17% failure rate of hair samples (mostly under fur samples)
- During winter bears appear to use bone pile at all hours as long as humans are not present. During spring, the majority of bears use the bone pile during early morning or late evening (excepting large adult males)

Conclusions

Barbed wire hair snare corrals around marine mammal bone piles are an effective way to collect hair samples from polar bears for genetic analyses.

- Fence height for polar bears should be ~0.65 m
- During high use periods, after snow drifting events, and during spring melt the fence requires maintenance and adjustment
- Use highest strength barb wire available
- Twisting the wire is the most effective method of tightening
- Alternating wire placement on posts proved highly beneficial
- A continuous piece of wire should be attached to multiple (4) poles

Future Work

1. Analyze data to quantitatively describe the use of the bone piles.
2. Expand sampling to 2 additional sites on the North Slope, AK: Cooper Island, a Guillemot colony used by polar bears; and 2) at bowhead whale bone pile at Kaktovik

Permit #MA134907-1

Introduction

Polar bears are an important subsistence hunted species and an important flagship species for the effects of climate change. Because of the cultural importance of polar bears to arctic peoples, communities such as the Inupiat of the North Slope of Alaska, are key conservation partners for polar bear management. These communities often do not support the physical capture of polar bears for research. As such, there is a need to develop less-invasive methods to collect information. This study reports on a pilot effort to apply a new sampling technique for local polar bear management that is less invasive to the animals and involves community members. We will use this information to investigate the local use of bone piles of subsistence-harvested bowhead whales by polar bears, and also augment data sets from larger-scale population research.

Polar bear approaches to the barbed-wire corral

