Background

1. Polar bears are harvested annually by Alaska Natives under allowances of the Marine Mammal Protection Act and the Endangered Species Act.
2. Estimating polar bear abundance in the Chukchi Sea is vital for setting an annual sustainable harvest quota as required by the US-Russia Bilateral Polar Bear Agreement.
3. Remote and challenging conditions make data collection difficult and there is ongoing concern over invasive study methods among stakeholders (Alaska Natives), researchers, and agencies.
4. Polar bear conservation will benefit from non-invasive approaches that are less controversial, less expensive, and can be implemented locally by experienced Native hunters.
5. We adapted methods used in the past to sample DNA from the hair of bears and other carnivores.

Key Issues

- Controversy over setting annual harvest limits as required by the Bilateral Agreement with Russia
- Controversy about the boundary for establishing the quota

Objectives

1. Develop local support for field logistics.
2. Determine the feasibility of estimating polar bear numbers moving by coastal communities.
3. Augment larger datasets used for spatial mark-recapture abundance estimates.

Methods

2. Construct portable hair sampling stations that can be easily shipped, assembled, and deployed via snow machine.
4. Two types of hair sampling stations deployed: barbed-wire and wire-brush.
5. Check sampling stations and collect hair as weather permits; preferably 2-3 times per week.

Results

Field work 2016
- Local cooperation was obtained in support of the project
- Utqiaġvik (Barrow) (11 stations)
  - 340 Trap nights (11 March – 15 May); 22 capture events; 45 total samples
- Point Lay (10 stations)
  - 127 trap nights (14 April – 5 May); No polar bear samples, but 6 brown bear samples

Field work 2017
- Total of 9 villages sampled
- 3 stations per village
- HIred local Native hunters as technicians
- Currently waiting for samples to be shipped.

Genetics 2016
- In 28 of 46 samples (60%), >75% of 13 loci were amplified
- Barb-wire:
  - Snagged both guard hairs and under-fur
  - 22 of 26 (84%) guard hair samples with visible follicles amplified at >75% of the loci
- Wire-brush:
  - Snagged mostly under-fur
  - 2 of 2 (100%) guard hair samples amplified at >75% of the loci
- 21 individual polar bears at Utqiaġvik and repeated sampling of a single brown bear (Mrs. Arcado) at the Point Lay
- Overall, results seem promising for subsequent work

Conclusions

- Cooperative effort with Native subsistence hunters was productive
- Approach holds significant promise to remotely sample polar bears for genetic ID.
- Approach lends itself to be “exported” to remote Russian polar bear habitat in Chukotka
- Barbed wire
  - Finer hair/sample but more guard hairs
  - Difficult to collect samples in windy conditions
  - Bears appeared to learn to avoid barbs, got bait but left little/no hair
- Wire brushes
  - More hair/sample, but also more under fur
  - Brushed equally with 50 DNA-cross-contamination events
  - May be more difficult for bears to take bait without leaving hair sample
- Light weight, easy to deploy
- Better public perception

Next steps...

1. Project is ongoing – funding in place
2. Expand sampling into more communities
3. Explore possibility of deployment in Russia
4. Continue to evaluate sampling efficiency, build sample library, resample?
5. Work with captive bears to refine sampling methods

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Cooperators

- U.S. Fish and Wildlife Service – E. Regehr – Polar Bear Program
- S. Talbot – USGS
- Native villages across NW Alaska
- Barrow Whaling Captains’ Association
- Alaska Eskimo Whaling Commission
- Many Alaska Native Co-Management Partners & Stakeholders

Poster background: Two Native hunters from Wales, AK deploy a hair collection station on the sea ice near their village. The cooperation and expertise of Native hunters was vital to the success of this investigation. (Photo: Elizabeth Kruger, WWF)