Memorandum 2/11/2018

KNO14: Leading by example: lessons from Arctic biodiversity monitoring programs

This memo provides a summary of reports submitted on the session KNO14 organized at the Arctic Biodiversity Session in Rovaniemi, Finland, October 9-12 organized by Aarhus University, Zackenberg Research Station and Polar Knowledge Canada: Canadian High Arctic Research Station.

Attendance: 45

Arctic Biodiversity Assessment recommendation themes most prominently addressed in the session:

- Climate change
- Ecosystem-based Management
- Mainstreaming biodiversity
- Identifying and safeguarding important areas
- Improving knowledge and public awareness

Key points raised in the session that were important to note:

- General Status Ranking Program:
  - GNWT collects > 100,00 data points annually
  - These data should be shared to facilitate better land management
  - Helps lead to conservation status using NatureServe Canada methods
- Falk - Arctic Raptor Populations:
  - Arctic Falcons Specialist Group
  - Focal Ecosystem Components are reported to the CBMP terrestrial
  - Peregrines show generally no change or positive trends
- Gyrfalcon:
  - Driven by ptarmigan fluctuations
  - Hatching date moving forward
  - A useful species for tracking contaminants
- Sokolov-Yamal terrestrial Monitoring:
  - Area is warming rapidly
  - Oil and gas development, accounts for 80% of national production
  - Largest reindeer herd in the world
  - Long term biodiversity data back to 1950s
  - CAVM Zones E-B - N-S transect the 4 research stations
  - Rodent cycles linked directly to buzzard abundance
  - Rain on snow caused the death of 100,000 reindeer
  - Red fox abundance increasing
- Soininen - COAT Monitoring Site - Svalbard/Varanger (northern Norway mainland)
  - adaptive management approach
  - conceptual models and food webs linked to management and mitigation

  - link target species to state variables
  - will link state models to statistical models in the future
- Patterson - Inuit IK and Avian cholera in Common Eiders
  - Avian cholera is a widespread conservation issue and was first detected in Arctic in Nunavik in 2004
  - Birds die within 48 hours of infection
  - Important Inuit species - meat, eggs and down
  - IK and local observations provided the baseline data for understanding outbreaks
  - Many observations would never have been detected by biologists due to remote vast areas
- Gilg - Interactions Working Group
  - Direct and indirect effects on predator-prey interactions
  - Circumpolar study sites - focus on harmonizing protocols
  - Informal observations of lemmings provides the same general information as live trapping
  - Shorebird nesting success and use can be estimated using a simple temp gauge - HOBO
- Biodiversity monitoring is expensive and laborious; therefore, it is often best to establish monitoring for few main taxonomic groups to start with and add new groups in later stages
- The decision-making (conservation, sustainable use of resources) needs reliable, up-to-date forecasting models. Models for predicting environmental effects should be “flexible” and easily updated when new information is available.
- Civil science and traditional knowledge can be used to enhance spatial and temporal coverage of biodiversity data.
- Important role that Inuit IK played in detecting avian cholera and confirming science research hypotheses in Common Eiders in Nunavik

Recommendations/actions identified for how to deal with the issues raised in the session:

- Relatively simple and monitoring approaches, like inexpensive temperature sensors, can detect important changes (residence, use) and activities (predation rates) in shorebird nests
- Allocate limited resources to monitoring of selected taxon groups with high indicator value. Increase knowledge on other taxons when funding allows (screening campaigns etc.).
- Develop models which allow easy and quick update and input of additional data and indicators.
- Alternative data sources (Civil science, TK, big data) should be utilized in Biodiversity monitoring.

Take home message from the session:

- International collaboration and harmonizing monitoring protocols provide a useful circumpolar picture of biodiversity change in terrestrial predator - prey systems.
- Allocate available monitoring resources to key taxons and groups, and add new groups, when resources are available. Create easily up-dated predictive models. Use additional data sources and monitoring methods.