CAFF
Conservation of Arctic Flora and Fauna

Memorandum 2/11/2018

KNO5: Intraspecific diversity in Arctic freshwater systems and its relevance in biodiversity and conservation: from pattern to process

This memo provides a summary of reports submitted on the session KNO5 organized at the Arctic Biodiversity Session in Rovaniemi, Finland, October 9-12 organized by Hólar University College.

Attendance: 30

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

- Climate change
- Addressing stressors
- Improving knowledge and public awareness
- Mainstreaming biodiversity

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

- Biodiversity monitoring tends to focus on the species level and identifying the relative abundance and diversity of species within a particular ecosystem or area - however, changes in phenotype within a species (in a particular area) can be the first indicator of environmental change impacting biodiversity.
- Changes to phenotype can affect performance, which then can affect populations.
- Freshwater systems are highly susceptible to intraspecific diversity.
- Environment affects phenotype - and can lead to population effects.
- The species number is low in arctic ecosystems (e.g. freshwaters), but the diversity within species is high.
- The changes in phenotype (appearance, e.g. body structure) and also genotype of population can be very fast (few generations) due to changes in environment, e.g. food quality. Similarly, the sub-populations and sub-species may be extinct rapidly.
- The intraspecific sub-species diversity is currently minutely included in monitoring. There's a need for more information.

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

- The importance of intraspecific diversity should be taken into account and acknowledged in arctic biodiversity research and conservation.
- The protection of sub-species should be considered more prominently.
- The sufficient data for evaluation of distribution and conservation value of sub-species should be collected.

Take home message from the session:

- Phenotype morphology might be an early indicate of the effects of climate change on a species/population.

- Monitor phenotypic variation and environmental parameters with the possibility of intervening before population effects occur.
- Intraspecific changes due to environmental stress may be surprisingly fast, and sub-species may be lost rapidly. Monitoring, research and conservation measures are needed if we want to save sub-species diversity.