

Memorandum 2/11/2018

EBM5: Species specific conservation actions in the time of ecosystem-based management

This memo provides a summary of reports submitted on the session EBM5 organized at the Arctic Biodiversity Session in Rovaniemi, Finland, October 9-12 organized by the Arctic University of Norway and the Norwegian Institute for Nature Research.

Attendance: 60

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

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

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

- Conservation programs focussing on a charismatic species such as the arctic fox or the lesser white-fronted goose in Fennoscandia receive attention and support from the public, and get easier access to funding.
- Predators may be not so well suited as indicators for food web state, because many of them are quite flexible regarding which resources they use.
- Careful monitoring including important ecosystem components in addition to the focal species which has a conservation concern is necessary to assess the effectiveness of management actions.
- Ecosystem based management appears to be the way things should be done, but it is often difficult to implement in practice.

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

- When implementing management actions, in particular quite resource demanding actions or actions which may raise ethical concern such as culling of red foxes, it is important to implement a careful monitoring including important ecosystem components in addition to a species which should be protected in order to assess whether the management action actually leads to the expected result. This means, implement ecosystem based monitoring and adaptive management.
- In the early 20th century, Finnmark was a core area for the arctic fox in Norway. There has been a decline in the already small population and the lack of lemmings in some years and the increasing population of the red fox is affecting the number of arctic fox. The number of red fox in Finnmark is increasing. In order to increase the number of individuals there is a captive breeding program going on in Norway (453 pups born) and also a number of feeding stations across Scandinavia (n 247). The Arctic fox population is slowly increasing in Norway and Sweden but not in Finland. At the moment there are 200-260 individuals in Scandinavia but the minimum viable population is considered to be 500. In the fragmented Arctic landscape it is reasonable to think, that the

number for a robust viable population is closer to 2000 individuals. This might take 10-20 years to establish.

- Expansion of boreal species towards the Arctic environment are a threat to native tundra species. The Arctic is a highly dynamic ecosystem and seasonability should not be ignored. There is very strong top-down effects (predation + competition) in the relationship between the arctic and red fox.
- Proportion of successful breeding pairs of the lesser white-fronted goose and the average brood size is affected by predation of the red fox in Fennoscandia. The potential drivers of predation pressures includes the abundance of lemmings and the number of reindeer carcasses. The average brood size goes up/down with rodent abundance. There is a positive effect of culling of red fox on the number of adults staying after the nesting season in certain areas. The birds that fail at reproduction, take a risky migrating route further to the east, and are a potential prey to hunting. The successful nesting birds take a shorter and safer migrating route.
- Could large scale Arctic raptors monitoring be seen as an alternative to the ecosystem-based approach? The ecosystem approach can include many obstacles on the way to conclusion and if common species could be used as indicators of change, it could have certain advantages on circumpolar monitoring. Another advantage is field protocols that could be made easier to implement. Disadvantage is to understand what species to focus on.
- Decline of arctic foxes in all Fennoscandia for almost a century, despite protection in 1930; reasons for this are small size of populations, lack of lemmings, and changes in lemming cycle.
- Arctic foxes depend on lemmings, for which no other resource compensates; arctic fox does not thrive when red foxes present, but red fox culling alone is not sufficient as management measure.
- Red fox expansion supported by lemmings, reindeer when/where lemmings absent; immigration stronger in years with lemming peaks.
- Action plan for Norway and Sweden, identified also as a climate change flagship species.
- Management also includes supplemental feeding year-round (dog pellets), captive breeding and release.
- Through management actions arctic fox populations have been restored and strengthened.
- The arctic fox population is still below viability, minimum viable population 500 individuals (can be reached in 8 – 10 years), robust viable population 2000 (16 – 20 years).
- The Arctic fox is an easy species to raise funding and interest, a scholar example by which to explain the complexity of an ecosystem
- Social carrying capacity for the arctic fox is in general high (except for occasionally taking reindeer calves).
- The threat of a warmer climate over northern latitudes: switch from bottom-up to top-down regulation, expansion of boreal species, a threat to native tundra species.
- Bottom-up interactions may still prevail over top-down effects in winter and when resources are low (seasonality should not be ignored, neither the effects of rodent cycles).
- Potential drivers of red fox predation pressure on the lesser-white fronted goose include alternative resource supply (reindeer carcasses, rodents).
- In order to implement the ecosystem approach, potential changes in funding system are needed; sustainability threshold might be reached before data are sufficient.

- Why focus on a species first when it becomes rare? – Assessment is challenging at that point, as there are no baseline data.
- For arctic fox conservation, existing management actions include red fox culling, supplemental feeding and captive breeding and release.
- It is important to conserve existing distribution areas, as many habitats are turning unfavourable
- There is a need for rapid action before sustainability threshold is reached.
- More funding needed for implementation of ecosystem approach.
- Need to concentrate more also on species that are not (yet) rare.
- There is a need for dedicated funding of a robust and long-term monitoring, possibly through some intergovernmental agency of the Arctic: especially to establish and maintain regular field work and analysis sample from unknown areas.
- Presently there are various ongoing research programs at national level, which often have limited time duration, different research objectives with clearly defined end result. Basing monitoring of the pan-Arctic on such a conglomerate of different research programs is rather limited and inadequate in the long run.
- Closer collaboration among these various national and local monitoring programs, would though allow more robust synthesis of ongoing biotic changes across the Arctic region. It is also emphasized that such an effort needs a properly funded intergovernmental mechanism, to develop further a properly standardized pan-Arctic monitoring protocols, like sample collection, preservation of voucher specimens, genetic analyses, standardized taxonomic identification, and data sharing among scientists and reporting to the greater general community.
- Mending of the information gaps of the vast and remote Arctic marine areas needs special consideration. Again, such an effort requires directions and additional funding through some intergovernmental mechanism of the Arctic nations.
- The SAMBR report summarizes what is known, and unknown, about the status and trends in some key components of the Arctic marine ecosystem. It is based on a synthesis of various local and regional studies throughout the Arctic. It is clear that any further development of a pan-Arctic monitoring will need special funding and a mechanism to realize effective cooperation among the Arctic nations.
- A more thorough inclusion of traditional knowledge of the indigenous communities is needed refine our understanding the Arctic and to identify additional actions and benefits to the objectives covered in SAMBR.

Take home message from the session:

- Conservation programs focussing on a charismatic species receive more support from the public and from funding organizations.
- Ecosystem-based management should be applied to develop effective conservation actions leading to the expected outcomes.
- The threat of a warmer climate in northern latitudes: switch from bottom-up to top-down regulation, expansion of boreal species, a threat to native tundra species.
- The arctic fox population is still below viability.
- Arctic foxes depend on lemmings, red fox culling is not sufficient as management.

- Climate change interferes with the top-down vs. bottom-up control in the ecosystems.
- Drivers of red fox predation pressure on the lesser-white fronted goose include alternative resource supply.
- Why focus on a species only when it becomes rare - also baseline data are needed.
- Pollution and destruction of natural habitats has profound impact on the Arctic ecosystem. This can be controlled by concerted effort of the Arctic nations. However, the Arctic nations alone have limited force to control global warming, except in collaboration with other world nations. The words of Charles Dudley Warner, (usually attributed to Mark Twain) come to mind: "Everybody complains about the weather, but nobody does anything about it." Given due fairness, to what is being done to control release of carbon dioxide, seems way to too little and slow – and meanwhile the Arctic melts away.