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REINDEER HERDING AND NORTHERN ECOSYSTEMS UNDER WARMING CLIMATE

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Our transdisciplinary research tackles the interaction between the ecological phenomenon of top-down impacts in food webs and climate–vegetation interactions in a changing climate and integrates this perspective with the reindeer husbandry and the Sámi culture dependent on it¹. The Arctic region will warm more rapidly than the global mean, and mean warming over land will be larger than over the ocean. These physical changes will influence the northern ecosystems. Potential impacts include the transformation of arctic-alpine tundra to forest or dense scrubland with global scale climate consequences due to decreasing albedo. As people and nature are closely coupled in a social-ecological system (SES), change in one element may trigger consequences in the other. Climate change will affect both the elements and the way they interact with each other. Sometimes administrative and ecological processes do not correspond (Figure 1): national and international management priorities may conflict with local social and ecological processes, bringing about environmental degradation, defeat of traditional livelihoods and loss of biodiversity. We have produced high resolution vegetation map across Northern Fennoscandia using satellite imagery and compared those with climate data. Our ecological research demonstrates the important role of herbivory on arctic vegetation communities. Interactive workshops with reindeer herders offer indigenous knowledge of state and changes of the ecosystems, and reflect the threats and expectations of the herders. We test the plausibility to utilize the migratory reindeer grazing system of the Sámi as a management tool for mitigating the impact of global climate change – this would also support the indigenous reindeer herding livelihood against rapid external changes brought about by modern societies. We are currently establishing models of the complex social-ecological system of Northern Fennoscandia and will report the first findings of the exercise.

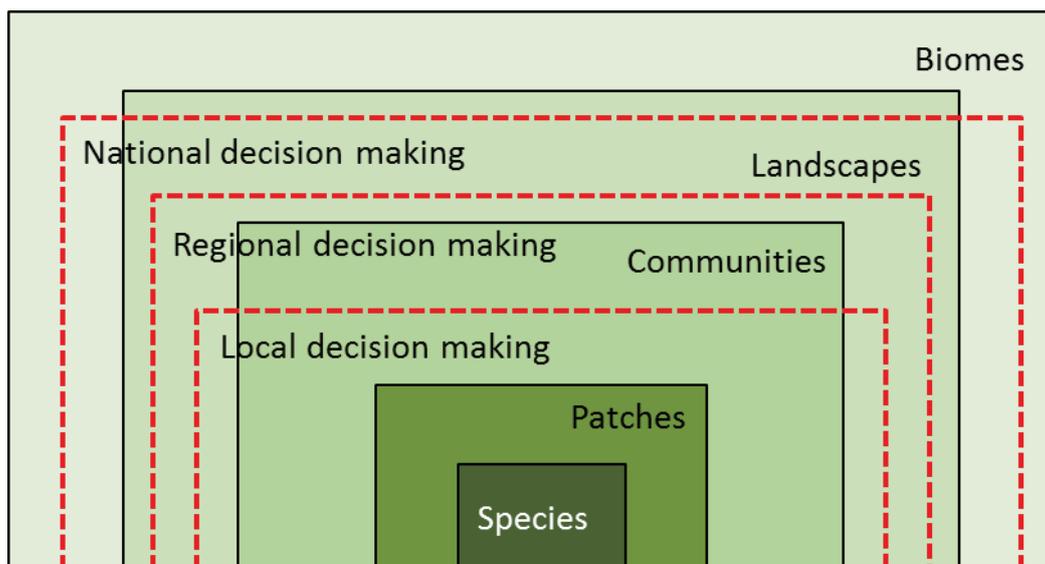


Figure 1. The scales of administrative and ecological processes do not always coincide causing challenges in managing the social-ecological systems.

¹ www.ncoetundra.utu.fi