

Project information

Project title

Moth-reindeer-birch dynamics in northernmost Fennoscandia

Year

2011/2012

Project leader

Jane U. Jepsen, NINA

Participants

- Jane U. Jepsen (NINA)
- Rolf A. Ims (UiT)
- Martin Biuw (NCoE, NINA)

Flagship

Terrestrial, Theme: Vegetation state and herbivore management

Summary of Results

The funding granted by the Fram Centre was used to cover salaries of a postdoctoral researcher (Biuw) at NINA. The work carried out is closely linked to ongoing activities as part of 1) the *EcoFinn/Miljø2015* (2008-2011) program, focusing on encroachment of the northern Fennoscandian tundra, and the potential role of reindeer grazing as a preventive method, 2) *ClimMoth/Norklima* (2008-2011) which focuses on the causes and effects of climate-driven pest insect outbreaks on sub-Arctic forests, and 3) activities under NCoE-Tundra's Work Package 4: *Moth-reindeer-birch dynamics in northernmost Fennoscandia*.

During the summer field season in 2011, **two new activities and installations** were established at field sites in Finnmark to capitalize on the opportunity presented by the establishment of the NCoE and the Fram Centre funding.

The first activity focuses on the effects of grazing by herbivores on the regeneration and successional pathways in birch forest systems heavily affected by the recent outbreak of geometrid moth in the region. Twelve 30x30 m reindeer enclosures were built along the Norwegian/Finnish border in Polmak. Six enclosures were positioned on the Finnish side of the border fence, in a region heavily grazed by reindeer throughout the year, while the remaining six enclosures were placed on the Norwegian side, in regions where less heavy grazing occurs, and only in winter. Within each enclosure, 10 smaller enclosures were established to separate the grazing effects of reindeer grazing from that of rodents. Each enclosure (reindeer as well as rodent) was also matched by an open control plot. These sites will remain in place for a long period (at least 10 years), and will be monitored annually for plant community composition and diversity as well as for the presence of rodents and larger grazers through pellet counts. In addition, 20 individually marked birch trees in each control and enclosure plot will also be monitored for size as well as rejuvenation/grazing (counts of grazed and ungrazed basal shoots) and overall state decomposition. As well as the establishment of enclosures, initial data were collected in all enclosures, providing a baseline against which future changes will be assessed.

The second activity aims to examine the effectiveness of logging as a management approach for stimulating rejuvenation and re-establishment of birch forests following moth outbreaks. Similar to the setup in Polmak described above, 30x30 m plots were established in areas of rich or poor birch forest areas. Individual birch trees were marked and will be followed to monitor succession, rejuvenation and decomposition, both in control plots (which will be left intact), and in study plots (in which the individually marked trees will be cut). Information on plant abundance and community structure has been collected, along with pellet counts for rodents and large herbivores. The logging study is done in collaboration with local forest management authorities and landowners (Finnmarkseiendommen and Fylkesmannen in Finnmark).

A further activity, towards which the additional funding from the terrestrial flagship contributed, is the submission of a research proposal to the NFR NORKLIMA program which relates thematically closely to the NCoE-Tundra. Despite an excellent scientific evaluation, the project was not awarded funding in this round. The solid group of collaborators put together during this process forms a very strong team for future projects.

Published Results/Planned Publications

Article published at framsenteret.no and forskning.no describing the motivation and objectives of this newly initiated project. Peer reviewed publications are currently in preparation and will be submitted and published during 2012.

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Communicated Results

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Interdisciplinary Cooperation

Funding from the NCoE-Tundra project will only become available from this autumn/winter. The funding from the Fram Centre allowed us an early start on this project, and provided the additional means to the establishment of study sites and field logistics during the 2011 season.

The NCoE-Tundra WP4 activities form an integral part and natural continuation of ongoing activities. The Fram Centre funding provided a crucial boost to provide the continuity while awaiting the NCoE funding, and allowed us to move rapidly into the implementation stage of the specific NCoE activities.

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Could results from the project be subject for any commercial utilization

No

Conclusions

The activities during 2011 have established a unique basis for long-term experimental studies in the birch forests of Finnmark. We envisage that this setup will continue to provide important information about this system in general, and the dynamics, consequences and management implications of severe moth outbreaks. It will become an integral component of the Forest-Tundra module of COAT-Climate Ecological Observatory for Arctic Tundra.

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