

Project information

Keywords

Ecology; Anthropology; Environmental science; Resource management

Project title

Socio-ecologic modelling of reindeer population dynamics at multiple spatial scales using a Structural Equation Modelling approach

Year

2018

Project leader

- Bård-Jørgen Bårdsen

Geographical localization of the research project in decimal degrees (max 5 per project, ex. 70,662°N and 23,707°E)

Approx. extent of the Norwegian Reindeer Husbandry (in °N, °E): North (71.18552, 25.67560); South (61.87132, 12.17962); East (69.57264, 30.95326); and West (63.87732, 9.83851).

Participants

- **Marius Warg Næss (marius.naess@niku.no), Norwegian Institute for Cultural Heritage Research (NIKU; www.niku.no).**
- **Per Fauchald (per.fauchald@nina.no), NINA, Tromsø, Norway.**
- **Øystein Holand (oystein.holand@nmbu.no), Norwegian University of Life Sciences (NMBU; www.nmbu.no), Ås, Norway.**

Flagship

Terrestrial

Funding Source

The Terrestrial Flagship's WP3 ('Tilpasningskapasitet i lokalsamfunn og urfolk').

Summary of Results

This report covers the second year of a three-year project, and due to unforeseen and uncontrollable factors the project is lagging a bit behind schedule: we are still awaiting access to the necessary official data collected by the *Norwegian Agriculture Agency* (NAA). The timeline for the process of getting access covers >1.5 years; beginning on the 7th of April 2017 when we applied to NAA requesting access to the official data on the reindeer husbandry (e.g. herd size and production measures like number of calves produced and slaughtered). As of the 2nd of November 2018, NAA sent a final draft on an agreement pertaining to the data, and agreement that was subsequently signed by us and returned to NAA. Nevertheless, we have not yet received the data nor has NAA sent us a version of the contract signed by them. Moreover, we are in the process of filing a complaint to get access to all the available data. We are informed that NAA has data at the district-level for more years: for reindeer number the time series goes as far back as 1980/81. In sum, while we finally have an agreement with NAA regarding the data, we are still waiting to get access to the data.

We are also at present in dialogue with the with the *Norwegian Environment Agency* (NEA) regarding a more recently submitted proposal to them regarding access to official data on predator presence/numbers that is possible to link to the data from NAA.

We have spent countless hours on following up our request to NAA. In fact, most of the resources spent within the project in 2018 have been on following up our request for data. The data at the district-level should be easy for NAA to grant us access to, as there are no ethical issues pertaining to personal sensitivity with respect to data aggregated at this spatial level. In the original proposal, we planned to initiate the formal analyses, i.e. the SEMs, by the end of 2018, but due to the issues outlined above this has not been possible. As soon as all these data sources are in place, we are ready to run the analyses.

Master and PhD-students involved in the project

Not relevant.

For the Management

The knowledge generated from this multidisciplinary project will be relevant for informing national/regional policy makers and reindeer herders, and for developing an ecologically/economically sustainable reindeer husbandry, which is important for the Norwegian Government. In this perspective, our goal of disentangling the relative importance of social and ecological factors (and potential interactions between such factors) is challenging yet important. Our analyses also include another important - yet easily forgotten - perspective as we want to assess how various socioecological factors affects the reindeer husbandry at different levels of social organization (siidashare, siida and district).

Published Results/Planned Publications

In line with the proposal, we plan to write up publication(s) during 2019 when we have finalized the statistical analyses. During 2018, however, two papers relevant for the ongoing project have been published:

- J. Du, M.G. Thomas, B.-J. Bårdsen, R. Mace & M. W. Næss. In press. Comparison of social complexity in two independent pastoralist societies. **Behavioral Ecology and Sociobiology**. doi: [10.1007/s00265-018-2611-6](https://doi.org/10.1007/s00265-018-2611-6).
- Thomas, M., B.-J. Bårdsen, and M. W. Næss. 2018. The narrow gap between norms and cooperative behaviour in a reindeer herding community. **Royal Society Open Science** 5:171221. doi: [10.1098/rsos.171221](https://doi.org/10.1098/rsos.171221).

Communicated Results

As we have spent this year on getting access to the official data we have not communicated any results yet.

Interdisciplinary Cooperation

The project consisted of three biologists and one anthropologist.

Budget in accordance to results

The budget is spent in accordance with the proposal.

Could results from the project be subject for any commercial utilization

No

If Yes

Not relevant.

Conclusions

This was the second year of a three-year project where we have focused on preparing data prior to performing statistical analyses, but the project is on schedule as three out of five tasks have been done:

ASSIGMENTS	STATUS	RESPONSIBILITY
Task 1: <i>Data access</i> (April 2017).	In Oct 2018 (after >1.5 years) we finally got an answer to our request to NAA for access to official statistics on reindeer husbandry ('Melding om reindrift', predation etc.).	Led by BJB & MWN
Task 2: <i>Data organization</i> (Aug-Oct 2017).	Data downloading, processed and pre-analyzing (extracting parameters from the double-logistic models and May-Aug averages; for both NDVI and EVI) and gridded meteorological data (precipitation and temperature) for each reindeer district	Led by BJB , includes all personnel
Task 3: <i>Competence enhancement</i> (Oct-Nov 2017).	Learning theory and practical application of SEMs by participation on the workshop "Disentangling complex causal relationships in spatial and temporal ecological data".	BJB
Task 2 (Cont.): <i>Data organization</i> (Mar-May)	Organizing data on: the reindeer husbandry at the district- and owner-/herd-level from NAA; and predator presence/numbers from MAA. Then, to merge these data with environmental data (EVI/NDVI) prior to running the SEMs.	BJB , includes all personnel
Task 4: <i>Statistical analyses</i> (May-Aug 2019)	Running SEMs (and spatiotemporal analyses of the underlying variables) on data from the reindeer husbandry.	Led by BJB & PF , includes all personnel
Task 5: <i>Dissemination & outreach</i> (Aug-Dec 2019)	Producing scientific and popular scientific articles (see Dissemination below for details).	Led by BJB, PF, MWN & ØH