Project information

Keywords
Moose (Alces alces), space use, migrations, habitat use, resource selection, monitoring, management, ecosystem services.

Project title
Moose in Finnmark – spatial ecology and management in a changing landscape

Year
2017

Project leader
Erling Meisingset, Norwegian Institute of Bioeconomy Research (NIBIO)

Geographical localization of the research project in decimal degrees (max 5 per project, ex. 70,662°N and 23,707°E)
70.144°N, 28.391°E

Participants

Erling Meisingset, NIBIO

Rolf Rødven, UiT – Arctic University of Norway

Erling J. Solberg, Norwegian Institute for Nature Research (NINA)

Rolf Ims, UiT– Arctic University of Norway

Flagship
Terrestrial

Funding Source

Framsenteret, Regionalt Forskningsfond Nord (REFFNORD), Finnmark fylkeskommune (viltfondsmidler), Finnmarkseiendommen (FeFo), NIBIO, Nasjonalparkstyre for Stabbursdalen nasjonalpark (Miljødirektoratet).

Summary of Results

The overall purpose of the project is to investigate spatial use of moose in Finnmark, focused on large-scale seasonal movements, and small-scale habitat use and resource selection.

As described in the application, the main focus in 2016 and 2017 has been capturing and marking moose with GPS collars. The fieldwork in 2017 was carried in March and 22 individual moose were marked. Together with 19 individuals marked in 2016, the project has now marked all together 41 moose, which 10 males and 31 females. In 2017 moose where captured in Tana, Nesseby and Båtsfjord municipalities. The animals were tracked by helicopter, and darted from the helicopter using a dart-gun (CO_2-powered rifle; see figure 1 for marking locations). The marked moose's age were estimated to be from 1,5 to 7,5 years old, and other relevant measures and samples was taken. Capturing caused no significant complications for the moose's; neither could we notice deviating movement patterns the subsequent couple of days after capture and release. However, the collar on one cow has not sent any positions after marking. Capturing and marking was approved by the Norwegian Environment Agency

(Miljødirektoratet) and the Norwegian Animal Research Authority (Mattilsynet).

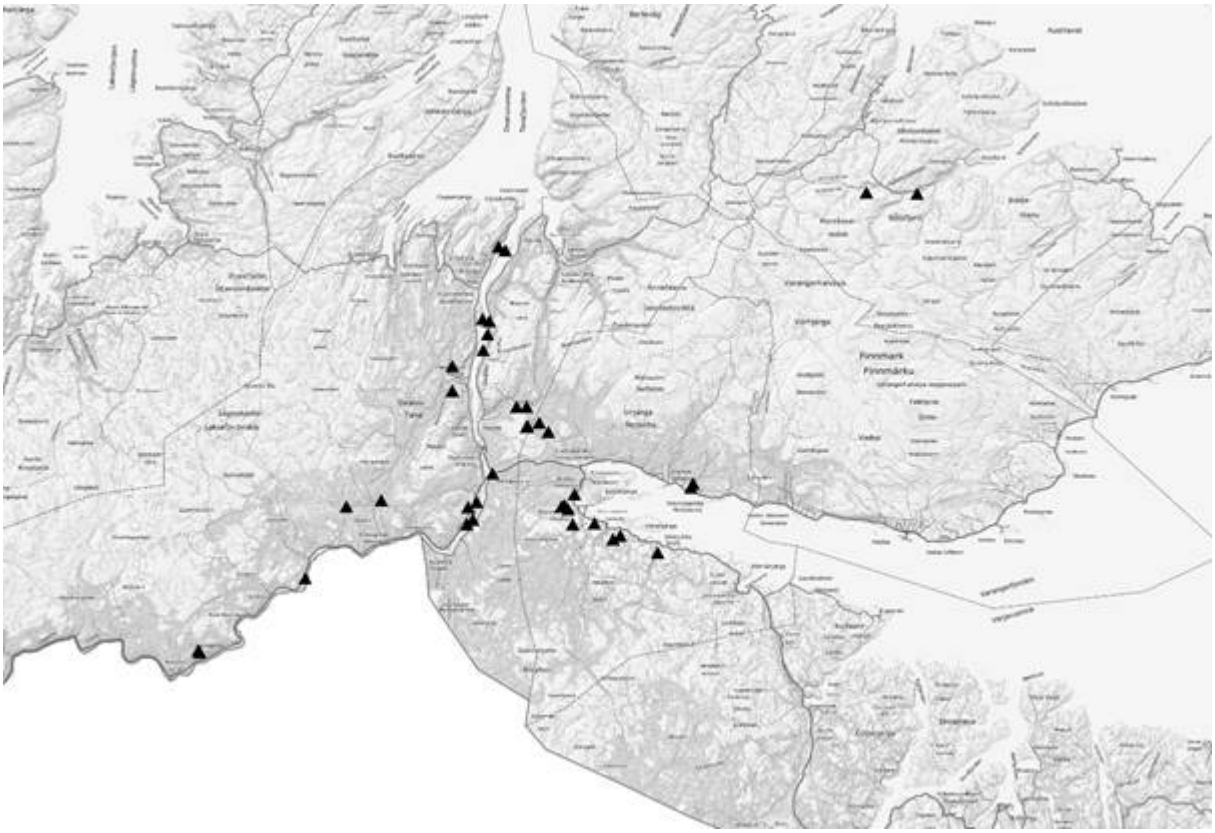

Figure 1. Positions of marking sites of 41 moose in Finnmark. Marking took place in Tana, Nesseby and Båtsfjord municipalities in March 2016 and 2017.

In addition, 3 individual moose cow's were equipped with cameras attached to the GPS collars, with the purpose to study behavior and diet selection in areas which important browse vegetation for moose has been heavily attacked by geometrid moths (figure 2). After our knowledge is this the first moose's ever equipped with HD video cameras. The cameras was able to store up to 16 hours with recordings, and were programmed to record 20 seconds video-sequences every 3 hour from first of May to October. The collars (with cameras) were released from the moose's in mid-September with a drop-off function in the collar. The data is not analyzed yet, but the quality of the films look very good. It is very likely that we are able to register the activity of the moose in each sequences and selection of browse species.

Initial analyses of moose space use shows that about 60 % of the moose may be classified as migratory, which mean they migrate from a distinct winter area to a summer area. About 30 % of the moose seems to be sedentary all year, whereas about 10 % had a nomadic space use. Migratory moose migrated between 8 and 60 km (Euclidean distance or straight-line distance) from the winter-areas to the summer-areas, with a mean of about 23 km. This shows that the moose cover quite large area through the year and many moose's has large home ranges. As a significant proportion of the individuals showed high mobility, whereas other stayed sedentary most of the year, which may be a considerably challenge for management of the moose population. One individual crossed across the national border into Finland for some weeks, before returning to Norway.

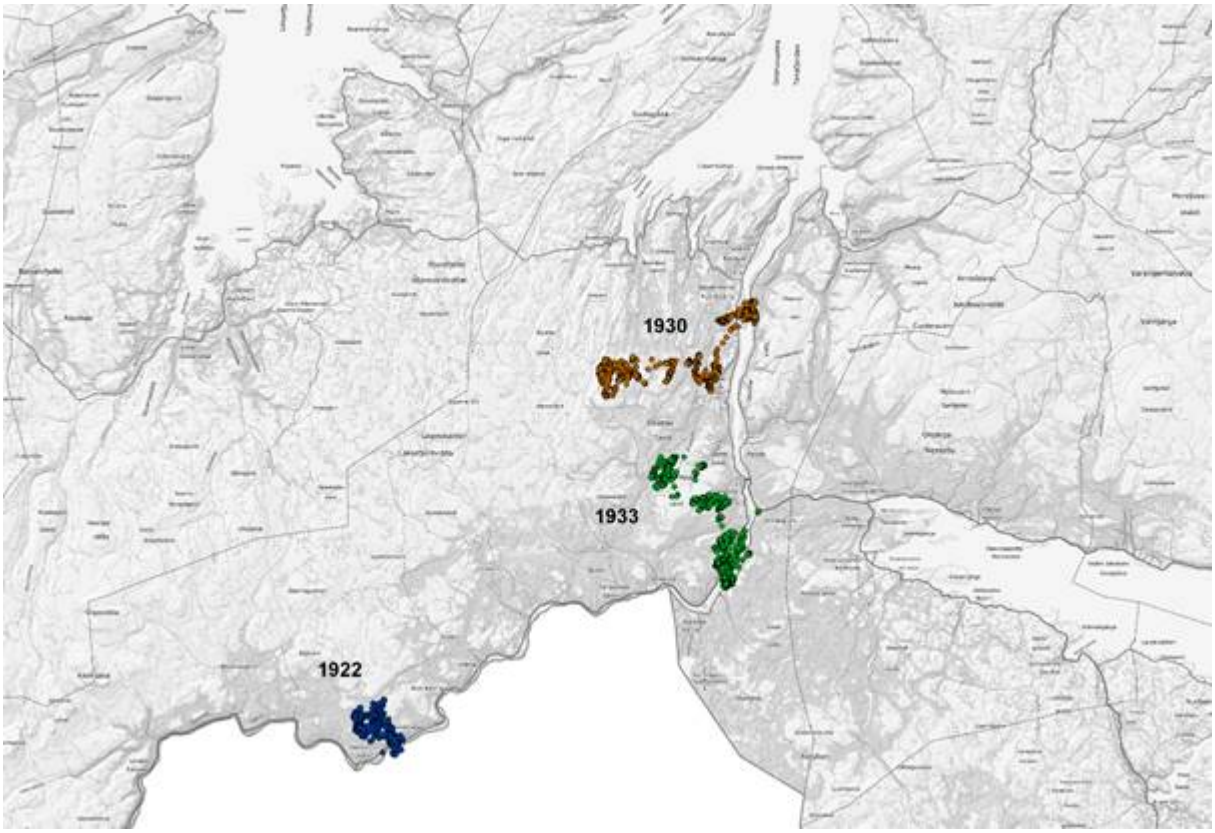

Figure 2. GPS positions of the three individual camera moose's March to September 2017. The moose was marked in areas that has been heavily attacked by geometrid moths.

Master and PhD-students involved in the project

None at the moment, but master projects may be included at a later stage in the project. Especially may this be relevant for the video-recording data.

For the Management

The project is strongly focused on management of moose in Finnmark, both regarding novel knowledge on seasonal movement patterns in the northernmost moose population, as well as coherence between seasonal movement patterns and management areas. In addition, the project will provide information on how moose utilize areas infested by geometrid moths, as well as investigating the use of camera traps as a supplement or replacement of GPS collars.

Published Results/Planned Publications

Article in a Norwegian journal:

Meisingset, Rødven, R. & Solberg, E.J. Elgen i Finnmark – områdebruk og forvaltning i et landskap, www.hjorteviltet.no. Online publication.

Planned publication in peer-reviwed papers:

(i) spatial habitat use of moose in an changing ecosystem,

(ii) habitat use, resource selection and life history of moose, and

(iii) GPS collars versus camera traps – methodological comparisons

Communicated Results

The project has established the Facebook page *Elg i Finnmark*. The page has 626 followers and posts has reached as many as 15 000 users. The facebook page is used as two-way communication to answer questions as well as receiving observations, etc. We also arranged a

The project has been promoted in both national and local media:

Rødven, R, Solberg, E.J., Meisingset, E.L. Presentation of field work and project on NRK regional (Oddasat og Nordnytt) and national (Dagsrevyen) TV news, 23.03.2017.

Rødven, R. News broadcast. NRK Finnmark, Radio. 24.03.2017

Rødven, R. Forskerne ber jegere om å la elgen gå. News article, NRK, 20.09.2017

Rødven, R. News broadcast. NRK Finnmark, Radio. 20.09.2017

The project has been presented orally on meetings:

Rødven, R. Elgen i Finnmark. Sør-Varanger Jeger og fiskeforening. 07.02.2017.

Solberg, E.J., Meisingset, E., Rødven, R., & Rolandsen, C. Elgen i Finnmark – områdebruk og forvaltning i et landskap i endring. Presentation. NGO,s and general public. Tana & Nesseby municipalities, March 2017.

Interdisciplinary Cooperation

The project will cooperate with other projects in the area, like *COAT* and *After the pest,* when analyzing and publishing the data. The project has cooperated with Norwegian Veterinary Institute (VI), represented by Knut Madslien.

Budget in accordance to results

The funding has been used as planned in the application.

Could results from the project be subject for any commercial utilization

No

Conclusions

The project *Moose in Finnmark – spatial ecology and management in a changing landscape* has had a progress as planned in 2017. It has successfully been captured and equipped 22 moose with GPS collars in 2017, together 41 in 2016 and 2017. To our knowledge, this is the northernmost population of moose ever been GPS collared, and may hence provide novel knowledge on spatial use by moose living in the edge of their

natural habitats. So far, the project has reveal that about 60 % of moose is migratory, with large home ranges over a year. Movement patterns indicate considerably movements across management borders, indicating challenges to local management. Marking of moose with “camera collars” was successful and will give important additional knowledge to the “ordinary” GPS collaring of moose.

The project will continue next year. At least 10 moose will be GPS marked in Stabbursdalen national park (Porsanger municipality) in MArch 2018. An important issue there is management and space of the moose population that damages the northernmost pine forests in Norway. We will follow up the marking with camera collars, with additional collars on three moose.

The project would like to thank the terrestrial flagship for vital funding to gain novel knowledge on probably the worlds northernmost moose population!