Moose: Like having wild livestock in the woods

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Credit: AI-generated image (disclaimer)

Moose prefer to browse on deciduous trees. Then conifers take over and affect the species diversity in the forest. One researcher contends that Norwegian wildlife management is not good enough to address what happens in the wake of these large herbivores.

Many places in Norway have as many as one to two moose per km^2. Yet, there's no real overview of how this king of the forest affects its habitat.

"Not to put too fine a point on it, but the moose is a 500 kg animal on stilts that tromps around and tramples the soil. It eats as much as 40 kg of plant material and produces 13 litres of urine and 2.5 kg of droppings daily. When we consider how many moose we have in Norway, this species clearly has a huge impact on the natural landscape," says Anders Lorentzen Kolstad.

Kolstad is a researcher at the NTNU University Museum. He has written his doctoral dissertation on how the moose affects nature and society.

"Rangelands are the most widespread form of land use we have in Norway, and the moose as a species is so tightly regulated by humans that it can almost be considered to be wild livestock. The final responsibility for moose management actually lies with the Norwegian Ministry of Agriculture and Food," Kolstad says.

But Norway lacks a comprehensive management plan that takes into account how much the moose impacts all other species in the forest, he says.

"The relationship between forests and moose is so close that you could actually say they're two sides of the same issue. Currently, however, they're largely managed separately. It would be a major benefit to the entire ecosystem if forests and moose were managed as one resource," he said.

Consequences for species diversity

In his doctoral thesis, Kolstad examined how moose browsing affected 31 different forest areas in Trøndelag and Telemark counties. Each of

these sites had a 20-by-20 metre exclosure in a logged area, so the moose could not feed there. The longest-standing fences were up for eight years.

"Eight years is short compared with the life cycle of a tree, so this only gives us a snapshot of how vegetation is affected at an early stage of its growth. However, it's long enough so that variations from year to year—like the weather—don't affect the data to any large degree," he says.

The difference between the inside and outside of the fence is huge. The deciduous forest thrives where moose don’t have access. Credit: Audun Hageskal, Jakt & Fiske

The study period was also long enough to confirm that today's grazing pressure from moose makes life hard on deciduous trees.

"But what was surprising was that we didn't find a single rowan tree that had escaped the moose's appetite in the entire study area. Out of several thousand trees, it appeared that not a single one of them would grow to maturity," says Kolstad.

When deciduous trees disappear, conifers—especially spruce—start taking over. This in turn has consequences for species diversity, since deciduous trees—in particular, rowan, aspen and goat willow—are important for everything from birds and insects to moss and lichens.

"Could we be doing more to ensure more large rowan trees in the Norwegian commercial forests? An important first step would be to start assessing the overall load on rowan trees from both forestry and browsing. But who speaks for the rowan since it has no economic value?" Kolstad asks.

He adds that the change in forest composition also extends to the soil and undergrowth.

"Moose are heavy and they compact the soil in areas where the moose population is high. But this relationship would need to be investigated for many more years than I've done in my study to truly understand how the soil reacts to moose, " he says.

A website that collects knowledge

Kolstad's study of the consequences of severe browsing pressure is only part of his doctoral dissertation. He has also created an interdisciplinary and collaborative online learning tool that brings together the knowledge of the forest ecosystem and the moose's role in it.

"Today it's difficult for people who work in moose management to get an overview of the moose's many roles in nature and society. The process is simply not designed to allow you to capture the full range of viewpoints. What often happens is that the interest group that shouts the loudest gets the most attention," Kolstad says.

"On the website we try to collect all the pieces—both positive and negative—so that the whole picture becomes clear. Then it's easier to make good decisions."

Who speaks on behalf of the rowan tree since it has no economic value? asks Anders Lorentzen Kolstad. Credit: Audun Hageskal, Jakt & Fiske

He adds that this website is not enough. Further efforts and innovation are needed to create good meeting places for researchers and social actors, so that moose can begin to be managed in a more integrated way.

Kolstad explains, "Today, nature management is often very sector specific, in the sense that only one species at a time is considered—whether it's moose or spruce trees. The tendency is also for business interests to be given priority over non-economic interests."

"Achieving sustainable development requires more equitable management, which needs to include more varied perspectives and interests," he adds.

Carrying two thoughts simultaneously

When contacted about Kolstad's dissertation, officials from the Norwegian Environment Agency had the following to say:

"In general, we can say the following: Forestry and moose are strongly related and clearly impact each other. The forest stands starting in the 1970s proved favourable for moose, and the moose population has grown dramatically, partly as a result of this and partly through selective culling.

"Forest management and moose management are therefore closely linked, where perhaps moose management, with the species' high density in recent years, has had a greater impact on the forest than the other way around. In some places, sizable moose herds exert high browsing pressure on younger pine forests, making it difficult to restore logged areas with pine.

"It's no doubt difficult for a forest owner to manage for both forest and moose and in the best interest of both. In most cases (pine) forests end

up becoming the losing party, since the landowner's desire for a dense wildlife population often exceeds their forestry interests. .

"Nevertheless, we would argue that many forest owners manage to carry these two thoughts simultaneously and do this to the best of their ability."

Provided by Norwegian University of Science and Technology

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