

# Highway fencing and moose migrations in northern Sweden

Jan Olof Helldin [j-o.helldin@cbm.slu.se](mailto:j-o.helldin@cbm.slu.se)

Andreas Seiler [andreas.seiler@ekol.slu.se](mailto:andreas.seiler@ekol.slu.se)

Per Widén [Per.Widen@kau.se](mailto:Per.Widen@kau.se)

Mattias Olsson [mattias.olsson@kau.se](mailto:mattias.olsson@kau.se)

Owe Geibrink [owe.geibrink@jagareforbundet.se](mailto:owe.geibrink@jagareforbundet.se)

Jan Olof Helldin, Swedish Biodiversity Centre, SLU, Box 7007, 750 07 Uppsala, Sweden

*Key words:* Barrier, Moose migrations, Road fencing

## *Abstract:*

We studied the effects of road fencing and snow depth on moose migration in northern Sweden. A coastal highway, perpendicular to the expected migration direction for moose, was fenced. Snow tracking before and after fencing showed that the barrier effect of fencing was about 80 %. In the first years after fencing, large numbers of moose accumulated along the road, particularly during early winter, causing severe local damage to pine plantations. The fenced road prevented moose in the dense population found along the coastal strip of land to transpose to inland locations. But also after fencing, moose occasionally passed the road at available openings at road crossings and lakes, and the number of such successful crossings increased slightly with time. In addition, the road manager responded to a major moose winter accumulation by temporarily opening the fence, to let the animals pass. Observations of marked moose showed that individuals “trapped” on the coastal side moved frequently along the coast and between islands in the archipelago, thereby forming an elongated but continuous population. A meta-analysis of moose migration studies showed that the migration distance, and probably also the proportion of migrants in the population, was higher in areas with deeper average snow layer. The results suggest that landscape fragmentation by roads can be a problem to moose demography and management. The study suggests that snow depth can be used as an indicator for barrier effects by roads on the moose population. Our study highlights the importance of maintaining landscape connectivity for large animals, particularly in times of environmental change, when dispersal and migration mechanisms are expected to be of vital importance for population stability.