

Dissertation

Jouko Kumpula successfully defended his PhD-thesis in animal ecology "Productivity of the semi-domesticated reindeer (*Rangifer t. tarandus* L.) stock and carrying capacity of pastures in Finland during 1960s-1990s" on 15th



December 2001 at the Department of Biology, University of Oulu, Finland. In the dissertation, Docent Timo Helle, Finnish Forest Research Institute, was the opponent and Professor Markku Orell, University of Oulu, the custodian. Docent Mauri Nieminen, Finnish Game and Fisheries Research Institute, has been the supervisor of the study.

Jouko Kumpula (b. 1961) comes from Sodankylä, northern Finland. He studied at the University of Oulu; the recent six years he has worked at the RKTL Reindeer research station in Kaamanen, studying stock productivity and carrying capacity of pastures in reindeer management. Much of his work has been made in co-operation with the Department of Geography, University of Oulu.

The doctoral thesis of Jouko Kumpula is based on the following papers:

- I Kumpula, J. & Nieminen, M. 1992. Pastures, calf production and carcass weights of reindeer calves in the Oraniemi co-operative, Finnish Lapland. – *Rangifer* 12 (2): 93-104.
- II Kumpula, J., Colpaert, A. & Nieminen, M. 1998. Reproduction and productivity of semi-domesticated reindeer in northern Finland. – *Canadian Journal of Zoology* 76: 269-277.
- III Kumpula, J., Colpaert, A. & Nieminen, M. 2002. Productivity factors of the Finnish semi-domesticated reindeer (*Rangifer t. tarandus*) stock during the 1990s. – *Rangifer* 22 (1): 3-12.
- IV Kumpula, J., Colpaert, A. & Nieminen, M. 2000. Condition, potential recovery rate and productivity of lichen (*Cladonia* spp.) ranges in the Finnish reindeer management area. – *Arctic* 53 (2) 152-160.
- V Kumpula, J., Parikka, P. & Nieminen, M. 2000. Occurrence of certain micro fungi on reindeer pastures in northern Finland during winter 1996-97. – *Rangifer* 20 (1): 3-8.
- VI Kumpula, J. 2001. Winter grazing of reindeer in woodland lichen pasture: effect of

lichen availability on the condition of reindeer. – *Small Ruminant Research* 39 (2): 121-130.

Abstract: Although the present day management of semi-domesticated reindeer (*Rangifer t. tarandus* L.) and its operational environment have changed from the past, knowledge of the ecological mechanisms typical of traditional herding is still important. The main objective of this study was to examine factors related to stock productivity and carrying capacity of pastures in the Finnish semi-domesticated reindeer management area during 1960-1990s in order to clarify the basis of the present management strategies in Finland.

In the Oraniemi district, before 1987, calf production was more affected by the snow conditions of the previous winter, than the weather conditions of the previous summer. Slaughtering mass of calves was more affected by the weather and precipitation in spring and summer than the snow conditions of the previous winter. Thick snow cover and unfrozen soil in early winter also probably affect the quality of natural winter food of reindeer by favouring the growth of certain micro fungi on pastures.

Before the mid-1990s in the northern part of the management area, calf production decreased and its variability increased between the districts when reindeer densities on forest and heath land increased, amount of lichen (*Cladonia* spp.) pastures per reindeer decreased and condition of these pastures deteriorated. Variability in calf production increased especially when the amount of arboreal lichen (*Alectoria*, *Bryoria* spp.) pastures per reindeer decreased. The slaughtering mass of reindeer decreased when reindeer densities on all pastures increased. Intensive calf slaughtering increased reindeer stock productivity although it was density dependent. Because of intensified feeding, reindeer densities on winter pastures did not affect stock productivity in the whole management area between 1993 and 1999. Stock productivity could be increased markedly by feeding. Still, slaughtering mass and meat production per reindeer decreased when reindeer densities on summer pastures increased.

In the Finnish grazing system, reindeer densities should have remained well below 10 reindeer/km² lichen range for maintaining lichen ranges in a good condition. The average lichen biomass of lichen ranges in the management area in the mid-1990s was 13% of the lichen biomass at the maximum production. Lichen ranges should have been ungrazed for an average 18 years to recover to the maximum production. The time needed for the lichen ranges to recover to a good condition, would have been 7 years.

This study showed that the amount and condition of pastures had a fundamental part in the productivity of Finnish reindeer stock. Calf slaughtering and feeding

were effective ways to increase and stabilize stock productivity in the situation where the economic carrying capacity of winter ranges has obviously been exceeded due to overgrazing and the effects caused by the other land use. This has made reindeer management more and

more dependent on feeding. Improvements of the state and condition of winter ranges would only be possible during a long period by regulating reindeer stock size, developing pasture rotation and protecting reindeer pastures from the other land use.

Information

NORDIC COUNCIL FOR REINDEER RESEARCH Grants 2003

The NOR grants for 2003 will primarily but not exclusively be allocated for participation at the 11th Arctic Ungulate Conference (AUC) in Saariselkä, Finland, August 24 - 28, 2003. The grants are paid retrospectively.

Grants will be paid through the applicant's institution (university, research centre, etc.). Successful applicants must submit an expenses report to NOR not later than 1 November, 2003 before reimbursement will be made.

To be considered the application must include the following information:

- applicant's name, university/college address (Nordic institution), current position (student, researcher, other) and type of engagement (salaried, stipend, no financial support),
- means of travel, budget (cheapest maintenance and travel),
- other grants applied for the same purpose,
- presentation in conference (oral/poster),
- if doctoral student, approval from institute/supervisor,
- if masters student, confirmation of supervisor/researcher who is also attending the conference.

Contact NOR's secretary Rolf Egil Haugerud (Phone +47 77 69 48 10, Fax +47 77 69 49 11) for more information or visit web address www.rangifer.no.

Submit applications to the Nordic Council for Reindeer Research, c/o NVH, Department of Arctic Veterinary Medicine, N-9292 Tromsø, Norway, Nor.Rangifer@veths.no **Deadline 1 February, 2003.**