

**REINDEER ECOLOGY AND MANAGEMENT IN SWEDEN.** BY FOLKE SKUNCKE. *Biological Papers of the University of Alaska, Number 8, February, 1969. 6 x 9 inches, 82 pages, 8 figures, 15 tables. \$1.70*

The Department of Wildlife Management and the Co-operative Wildlife Research Unit at the University of Alaska have performed a service to North Americans interested in caribou and reindeer by publishing this distillation of Swedish knowledge. Folke Skuncke, a forester by training, is well known by reputation to English-speaking people working on *Alces* and *Rangifer* but, unfortunately, most of us do not read Swedish. The book contains both published and previously unpublished material.

The author's background in plant ecology is evident in this and his other works. About two-thirds of the book is devoted to range ecology, rating and classification of ranges, range survey techniques, and the response of ranges to grazing and forestry practices. Because most northern plants and plant communities are holarctic, it is easy for a person, like myself, who has never seen the reindeer ranges of northern Europe to visualize what is being described, and to compare conditions with those in Canada and Alaska. Two major differences are apparent. Sweden's pine (*Pinus silvestris*) forests are far more extensive than those of northern North America; and the pine species is different and of a somewhat different growth form from ours (*P. banksiana*).

Lapps have practised reindeer husbandry in Scandinavia since the ninth century, but it was not until 1951 that a research institute was started in Sweden with the overall aim of aiding the industry. The first objectives of the institute were to develop uniform range evaluation techniques, to establish an experimental reindeer herd, to clarify relationships between reindeer herding and forestry, and to gather materials and data for genetic and economic studies. Considerable progress has obviously been made, particularly with the first three objectives. The evaluation techniques, which Skuncke describes in detail, are apparently in general use for both intensive evaluations on the ground and extensive evaluations from aircraft. The techniques have been deliberately developed for management purposes, and for use by persons without a technical education. It would be interesting to see if the techniques could be applied to some of the barren-ground caribou and reindeer ranges in Canada and Alaska which have been studied for two decades or more.

Of particular interest to North American readers is the effort to reconcile forestry with reindeer husbandry, to the advantage of both. Skuncke deals extensively with such things as lichen regeneration following cutting of various sorts, and both controlled and uncontrolled burning. There have been no important confrontations between forestry and reindeer husbandry in North America, but we have been extremely concerned with the effect of uncontrolled forest fires on reindeer and caribou ranges. It is also interesting that some winter ranges in Sweden are under-utilized, presumably because the extent or quality of summer range is sometimes the factor limiting herd size. Summer range is nowhere limiting in North America, except on some islands.

To demonstrate the application of his evaluation techniques, Skuncke presents calculated carrying capacities for 10 of the 50 Swedish samesitas — the individual herd management units. Carrying capacities of high mountain samesitas, where the ecology and vegetation are similar to Canadian and Alaskan forest-tundra and tundra areas, are calculated at 10 to 21 animals per square mile. In forested areas, carrying capacities are somewhat less — about 7 animals per square mile. Such carrying capacities are, of course, only possible under intensive management and a rotational system of range use. One cannot help but wonder what would result if intensive management were applied to the enormous reindeer ranges in Alaska, or to the 18,900-square-mile Reindeer Grazing Preserve in Canada's Mackenzie District, which currently carries less than 0.2 reindeer per square mile. Even though the potential carrying capacities may be much less than in Sweden, the possibilities are there for the development of an enormous new supply of protein for this hungry world.

The book is well printed on glossy paper and the tables and figures are clearly done. Skuncke cites only about 50 references, but I found several of interest from Russia and Scandinavia of which I was previously unaware. There are some short, but fascinating, paragraphs on such topics as taming and handling reindeer, and the design of corrals — and I wish there were more.

This volume is interesting and useful. At the least, it will provoke thought and discussion on the part of North American reindeer and caribou biologists. At best it may provide some specific management techniques that can be applied, with minimal modification, to North American field conditions.

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