Reindeer Ranching in Fennoscandia

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Highlight

Reindeer in Fennoscandia make use of a forage resource which would otherwise be of limited value. This article discusses the status of reindeer ranching, its economics, and the attempts to improve the animals and grazing practices.

In Russia and Fennoscandia hundreds of thousands of domesticated reindeer utilize the rangelands of the Arctic and Subarctic regions. Since vast areas in northern Alaska and northern Canada are suitable for similar production, I have always had a strong desire to establish closer contacts with coworkers in Northern Europe and to study their research techniques and management methods. My employer, the Canadian Wildlife Service of the Department of Northern Affairs and National Resources, made it possible for me to travel to Norway, Sweden, and Finland for this purpose during the summer of 1964. I am indebted to Mr. Skuncke, Dr. Ahti, and Dr. Skjenneberg who provided me with well-planned itineraries several months in advance of my visit. Such careful organization allowed me to see a good cross-section of the reindeer industry during my seven-week stay. Appreciation is also extended to others who provided me with such warm hospitality throughout my travels. My impressions of the reindeer industry follow.

The reindeer population in Norway, Sweden, and Finland totals approximately 710,000 animals (Table 1). These are all domesticated animals except for 40,000 wild reindeer in Norway and a few wild ones along the Finnish-Russian boundary. These reindeer graze approximately 40,000,000 hectares (98,840,000 acres) and in 1963 they produced a revenue of $5,590,000 (Canadian). In Sweden and northern Norway the ownership of reindeer is largely restricted to Lapps. There is no such restriction in southern Norway or Finland. Sweden has 50 grazing districts or sidas, with 34 in the mountains and 16 in the forests. About 2,800 families make their living totally or partially from the reindeer industry. In Norway 500 families own approximately 150,000 reindeer. Reindeer are owned by companies in southern Norway. In Finland some 500 families make their living from the reindeer industry. Additional families in the 62 grazing districts in Finland receive part of their income from the reindeer industry. Most of the rangelands used by reindeer within the three countries are grazed without payment of fees.

Both the mountain reindeer and the forest reindeer have been domesticated in Fennoscandia. Forest reindeer are more sedentary and spend most of the year within the forest. Mountain reindeer migrate considerable distances and use alpine areas as summer pasture. Mountain reindeer have short, triangular faces and are somewhat smaller than the forest reindeer, which have more rectangular faces. Also, some workers feel there are marked behaviour differences. The taxonomic status of these two groups is now being investigated.

<table>
<thead>
<tr>
<th>Country</th>
<th>Approximate number of reindeer</th>
<th>Approximate area of rangeland in hectares</th>
<th>Approximate income from reindeer industry (1963)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Norway</td>
<td>40,000 Wild 200,000 Domestic</td>
<td>11,000,000</td>
<td>7,500,000 krone ($1,140,000 Canadian)</td>
</tr>
<tr>
<td>Sweden</td>
<td>250,000 Domestic</td>
<td>16,000,000</td>
<td>9,000,000 krone ($1,910,000 Canadian)</td>
</tr>
<tr>
<td>Finland</td>
<td>30 Wild 220,000 Domestic</td>
<td>13,000,000</td>
<td>7,500,000 marks ($2,540,000 Canadian)</td>
</tr>
<tr>
<td>Total</td>
<td>710,030</td>
<td>40,000,000</td>
<td>$5,590,000 (Canadian)</td>
</tr>
</tbody>
</table>

1 One hectare = 2.471 acres.
2 Not including hides, antlers, hunting, and tourist values.
Canada, are particularly fond of those kinds of lichens which reach their greatest abundance in the pine and spruce woodlands of the boreal forest or taiga. Although spruce-lichen forests are abundant in Canada, they are extremely rare in Northern Scandinavia and Finland and are replaced in importance by the pine-lichen forests that form the basis for the reindeer industry in many regions. For more than half the year lichens are a favourite item in the diet of reindeer. In Norway the main rangelands for reindeer are birch forests and other mountain pastures.

Artificial feeds are being developed to substitute for the lichens on the winter range. Such feeds are necessary to prevent the serious losses of reindeer which have occurred during severe winters in the past. Feeding trials in Sweden and Norway suggest that the rations developed are suitable. Such feeding practices could carry more animals through the winter. Additional benefits should accrue such as higher calf weights at birth and at market age, higher calf survival, and higher milk production by the mother. Reindeer owners have not readily accepted the possible values of such a feeding program.

Reducing the number of herd sires is a second method of making better use of the winter range. Breeding experiments in Norway suggest the male-female ratio could be 1:15 with young bulls and 1:20 to 1:30 with mature bulls without causing any decrease in the calf crop.

Another method by which the summer herds could be expanded would be to market at an early age all animals not being retained for breeding. It appears pointless to carry steers on the range beyond two years, because gain per kilogram of food consumed is slight. The most economical age for the slaughter of reindeer appears to be about six months of age. Gain in weight per kilogram of forage consumed decreases after that age.

Improved breeding practices would also allow for the selection of animals which are the most efficient in terms of forage use per kilogram of gain. All of these methods should produce more salable meat without increasing the use of the winter range.

In an effort to integrate farming practices with the reindeer industry, grazing trials are being carried out on grass pastures at the Apukka Agricultural Experimental Station, a few miles north of Rovaniemi, Finland. One-half hectare of such pasture supported 10 reindeer for four weeks. Grass pastures could also be used to advantage in fattening animals for the autumn slaughter. Such trials tend to support the idea that lichens are not a necessary component of the reindeer diet.

The proper utilization of lichen rangelands is still a question of prime importance. It is generally agreed that the maximum quantity of forage is produced by the major forage lichens at the end of the first phase of growth, which lasts approximately 10 years. The Russians are recommending a three-year pasture rotation utilizing 30 to 35% of the lichens every third year. Near the breeding station of Askankylä, Finland, a pasture of 4 square kilometers (400 hectares) supported 200 reindeer for 16 months. Now that the animals have been removed from the heavily grazed pasture, it would be interesting to study the recovery of this now protected area. Several advantages may accrue from such intensive use. These include less herding, the possibility for easier and better management during calving and slaughtering periods, and better utilization of the less preferred forage species.

Such a grazing system might be based on an 8 to 10-year rotation. At the Askankylä breeding station two sets of twins occurred in 120 births during the last year. Females of the year become pregnant, much to the displeasure of the owners. Such happenings may reflect the excellent rangelands that surround the Askankylä area. Neither of these conditions has been reported for caribou in Northern Canada. Conception of calves has been reported from Norway, also.

*Cladonia alpestris,* regarded by many as the most important reindeer lichen, was one of the last to be eaten in the newly constructed holding pens at Askankylä. Lichens such as *Cladonia*...
sylvatica, C. rangiferina, and C. uncialis were preferred over C. alpestris. This observation confirms those made in northwestern Manitoba by the writer.

My studies in Northern Canada showed that arboreal lichens may contribute substantially to the diet of caribou, particularly under severe weather conditions when other food sources are less available. The use of arboreal lichens by reindeer was clearly demonstrated at the Kuolpa Reindeer Research Station near Gällivare, Sweden. These lichens have been utilized so persistently that a definite high line on the branches and trunks of trees is discernable. One of the major conflicts between the forest and reindeer industries involves these arboreal lichens. The arboreal lichens are so favoured by the reindeer that animals concentrate in winter felling areas and many are injured or killed by falling trees. The forest industry must report such losses. Foresters report that the buzz of the power saws attracts the reindeer to the immediate cutting area.

Wild Reindeer in Norway.—Perhaps the most interesting reindeer range in Fennoscandia is one near Kongsvoll used by about 10,000 of Norway’s 40,000 wild reindeer. In that district there is considerable controversy between sportsmen and government agencies regarding the number of reindeer and the condition of the range. The sportsmen claim that the winter range has been overgrazed and that more reindeer should be harvested. Some of the sportsmen have pointed out that in September wild reindeer calves weigh about one-half the amount of domestic reindeer calves. Trophy antlers have decreased in size, and the condition and weight of the animals have decreased compared with former years. Although I could not verify those claims, the extremely overgrazed condition of the range examined is good evidence that changes have occurred. From my appraisal of the range, it would appear that the government should allow greater harvests of reindeer. This case is in sharp contrast to North America, where government agencies recognize the need for more liberal harvests of game in many areas, but are thwarted by a conservative public.

The value of the wild reindeer herds in Norway should be considered in the light of the income obtained from licenses, guide fees, purchase of food, and accommodation. Such expenditures by hunters add to both the local and national economies. The potential value of such herds does not seem to be recognized generally.

Compatibility with Forestry and Farming

The first impression one gains when talking with foresters is that there is a conflict between the forest and reindeer industries. Upon further questioning, however, there appears to be little conflict except that during the winter tree-cutting season. During that period foresters incur expense trying to prevent the animals from concentrating near trees which are soon to fall. On the other hand, reindeer grazing produces openings in the lichen cover which may increase the germination of certain forest seeds.

The harvesting of the forests causes an immediate decrease in lichens because of fragmentation by machines, logs, and men. Ten or more years after logging the ranges may produce even more lichens than before because the lichen density is increased by the fragments, and competition from moss is reduced. Lichen regeneration after controlled burns requires a longer period of
time, but still much less than after severe wild fires.

In a heavily grazed district near Inkkomok, Sweden, tree seedlings have been established in a fenced enclosure and in a comparable unfenced area. To date there appears to be little difference in the survival of the protected and unprotected pine seedlings.

There is some conflict between reindeer and farmers in Norway and in the southerly limits of the reindeer industry in Finland. Reindeer are known to have damaged fences and to have trampled and grazed on hay fields.

Research

Research is being conducted on a variety of subjects. fenced enclosures and comparable unfenced plots are being used to study the effects of fire, simulated grazing, simulated trampling, and fertilizer on lichen ranges. The possible uses of artificial winter forage and grass pastures are being studied, as are the influences of female body weight on calf size, calf weight, and the conception rate.

A considerable amount of attention is being paid to stock improvement in Norway, Sweden, and Finland. Scientific breeding experiments are being conducted in each country. The breeding research, at least in part, has been stimulated by the presence of larger and better quality reindeer in Russia. Animals which do not conform to stock improvement standards are now being culled from the herds. Much emphasis is being placed on the selection of bulls but in the writer's opinion little attention is being placed on the selection of females. In some small herds larger calf weights have been obtained by introducing bulls from more distant herds.

In the past it has been a habit of the owners to sell the better animals and to keep the poorer ones for breeding purposes. Some owners even considered it a disgrace to sell poor quality animals and so they were retained for breeding. Light coloured reindeer, although considered as undesirable breeding stock by some scientists, because the animals may be less thrifty and more subject to premature death, are highly prized by many owners for clothing and herd location. They claim that the light-coloured animals can be seen at much greater distances than the darker ones. All these factors may have led to an inferior type of animal.

In Sweden, the Kuolpa Reindeer Research Station started operation in 1955. The major research objectives have been to study winter food habits of reindeer, to determine animal growth rates, to determine whether forest and forest-reindeer are different subspecies, and to study parasites and diseases, artificial feeds, and the best age and method of castration. Also, wobble-fly control studies and cutting-behaviour studies have been made. Effective control of the wobble fly is now possible through the use of injections.

Near Leidingen in Norway, breeding experiments for stock improvement are being conducted as are studies on feeding trials, wobble-fly control, slaughtering methods, and practical herding and management techniques. Preliminary results indicate a 1:20 to 1:30 bull-cow ratio may be suitable for good calf crops. Breeding studies were conducted at Askanyála in Finland, also.

Other research includes studies of the radioactivity levels in the lichen-reindeer-human food chain and studies of reindeer taxonomy. The present radioactivity levels in the food chain are not considered hazardous to humans.

Marketing and Slaughtering

Improved slaughtering methods and facilities are being established in all three countries. Both hygienic and economic aspects have prompted such changes. September was suggested as the best time for slaughtering males and November or December for females. Slaughtering of young animals is being emphasized.

Cooperatives have been established for marketing reindeer meat. Development of luxury markets for calf meat in the finest hotels is being promoted. The promoters hope to obtain a premium price for a quality product. A reindeer meatball canning industry has been established, and possible expansion to United States markets is being considered.

Increased interest in the product might be stimulated in the more southerly regions of the producing countries if recipes for reindeer meat preparation were prepared and distributed. The producers certainly have an excellent product to sell!

Economic Outlook

Throughout the tour I asked research and management personnel about the long term economic outlook for the industry. Without exception, they considered it bright. In Finland, for example, the income from the reindeer industry has nearly doubled in the last ten years. Further improvement is anticipated. Inflated money value is no doubt responsible for some of the recent increase.

One of the present problems is to reduce the number of very small owners and absentee owners, and to increase the number of families obtaining all or a large portion of their livelihood from the reindeer industry. In Finland, for example, there are 25,000 owners in 5,500 families. An economic unit for a family would appear to be from 300 to 600 reindeer. Owners of small herds of animals, in general, are less concerned about improving the management of their reindeer.

Education Programs

One of the great problems in the reindeer industry is to get the owners to accept and practice the methods and techniques which research and management have shown to be desirable.
Practices such as improved breeding, winter feeding, and warble-fly control, all accepted by the livestock industry in North America, are making slow advances. Education is, of course, the answer to the problem. In Norway a film is being made to illustrate some of the desirable procedures. More effort to translate the findings of research and management into the language of the reindeer owners would seem worthwhile.

The Association of Reindeer Owners (Paliskuntain Yhdistys) has been established to protect, perpetuate, and promote the reindeer industry in Finland. The organization, whose expenses are met by taxing each member on the basis of the number of animals owned, has done much to encourage and to organize the industry.

Conclusions
Reindeer in Fennoscandia utilize a land resource which would otherwise be of little value. For this and other reasons the industry should be encouraged and promoted. Although there is still room for improvement, the reindeer industry has become more efficient in recent years. Efficiency could possibly be increased in the following ways:
1. It is generally agreed that winter range is the factor which will curtail the expansion of the reindeer industry. More effective range use can be obtained by reducing the number of males in the herds, by slaughtering younger animals, by selecting animals which are more efficient in forage utilization, and by artificial feeding.

2. The quality of reindeer has deteriorated because of poor breeding practices. Improved breeding practices such as culling of the inferior animals and changing of the gene pool by introducing males from other herds should increase both size and quality.

3. Research and management results are not widely used by the owners. An education program is required.

4. Development of a luxury market for reindeer meat should be encouraged.

5. The number of reindeer owners should be reduced and restricted to those who derive a large part or all of their income from the animals.

The outlook for the industry would appear to be fairly bright.

Highlight
Range Study Tour in the Soviet Union
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Range management and utilization in the semi-arid and arid zones of Kazakhstan, Turkmen, and Uzbekistan were presented to a group of Fellows who attended a nine-week Study Tour sponsored by F.A.O. Lectures and field trips disclosed the vast extent of these ranges, many in good condition, and the methods of handling of livestock on State and Collective Farms. Methods of research and grazing management and reseeding practices showed many similarities with developments in other regions of the world with similar climate and vegetation.

A group study tour organized in the Spring of 1964 provided an unusual opportunity for observing and studying the progress of range research and the status of range and livestock management in some little known portions of the Soviet Union. The tour was sponsored by the Food and Agriculture Organization of the United Nations. Arrangements for the tour and the lectures were made by the Ministry of Agriculture, Republic of Kazakhstan, U.S.S.R. The headquarters of the group was in the capital city of Alma Ata, and field trips extended over much of the arid and semi-arid regions of the Kazakhstan as well as of the Republics of Turkmen and Uzbekistan. Nine Fellows, from Argentina, Iran, Israel and Pakistan, participated in the tour which lasted for nine weeks.

The lectures, which covered a total of twenty days, presented a detailed review of the vegetation, its distribution, botanical, taxonomic and ecological relationships and forage value. Range improvement by reseeding, soil and water conservation and other practices, and physical improvements through, for instance, road building, were also discussed. Herbarium specimens, wall maps and charts were used. All lectures were given in Russian with translation into English, the common language of the Fellows.

For the most part the lecturers were mature and experienced scientists with an intimate knowledge of their subject. They generally took the classical approach of basic botany with emphasis on detailed descriptions of a qualitative nature although in some cases, as in describing the physical resources of the area, many statistics were provided. The younger lecturers, although apparently capable, had restricted their thinking to their special field of interest and found it difficult to understand...