

Reindeer husbandry/hunting in Russia in the past, present and future

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The dynamic state of reindeer husbandry in northern Russia during the 20th century was studied as a basis for predicting the consequences of the current drastic changes taking place there. Similar forms and methods of reindeer husbandry were used with different frequencies and effectiveness throughout the century. In the future reindeer husbandry will conform to market requirements, landscape features and national traditions. In some areas, the more sophisticated methods of management developed in conjunction with large-scale, highly productive reindeer husbandry, could be lost and a subsistence economy, including hunting, could predominate.

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Since 1991, in the Russian North, social and economic reconstruction of the rural economy has had a strong impact upon reindeer husbandry. By the 1980s, in northern Russia, reindeer husbandry was highly productive (2.3 million domestic reindeer produced for consumption; 41.9 thousand tonnes live weight). A steep decline occurred in the 1990s, and at present in Russia there are ca. 1.6 million domestic reindeer. In Chukotka (see Fig. 1) their numbers declined from 500 000 to 130 000, and large declines were observed in Evenkiya, Yakutiya and Kamchatka. Only in Yamal has significant growth of the reindeer

population taken place in response to market requirements from the gas and oil industry development (Khrushchev & Klovov 1998). These events are important for the human population of northern Russia (about 12 million) of which about 130 000 belong to minorities who are closely connected with exploitation of reindeer as an important food and fur resource.

This paper's aim is to evaluate the ecological and social consequences of ongoing changes in reindeer husbandry. I take as a starting point for my predictions the study of reindeer husbandry development during the last century. It is observed that



Fig. 1. Localities mentioned in the paper; settlements are marked ●.

the same principal features have occurred in different times and areas (Baskin 1991). The drastic changes occurring in reindeer husbandry in recent years will probably lead to situations that have occurred in the past. In addition, I point out that the reindeer is one of the few species whose domestication could occur without taming and while the species is also being hunted (Baskin 1974; Hudson 1989). All types of reindeer hunting and husbandry can be practised along a "procurement-production" gradient (Hudson 1989). Sophisticated methods of hunting, when humans used knowledge of migratory routes as well as directing reindeer herds to stone traps or to human settlements (Spiess 1979; Skogland 1989), were the first stages of husbandry. Control of reindeer in husbandry is based on aboriginal peoples' traditional knowledge of pastures, reinforcing herding behaviour and regulation of feeding. I suggest that any future changes in the human-reindeer relationship, even the replacement of husbandry by hunting, will remain on the same procurement-production gradient and will use the same methods of management.

The main advantage of reindeer husbandry, in comparison with hunting, is the possibility it provides for harvest at any moment; to have a guarantee of labour and survival. History gives us plenty of tragic examples of famine and extinction of hunting indigenous peoples, but prosperity of people who have husbanded reindeer (Vdovin 1965; Gurvich 1982). For northern Eurasia, fluctuations of wild reindeer numbers have a periodicity of 115-130 years (Krupnik 1975). Now, when the possibility of a complete crash of reindeer husbandry exists, we need to consider whether it is theoretically possible to exchange husbandry with hunting of wild or feral reindeer.

By the 1930-40s, political reforms were instituted to establish large-scale, maximum production husbandry under the management of state bureaucrats. To attain high productivity, the experience of native herders, as well as scientific knowledge, were used. In this paper, I shall review the most important methods of reindeer husbandry intensification and consider their prospects.

Comparing features of reindeer husbandry in different areas and periods

The main social event in reindeer husbandry in the 1930-40s was the alteration of property rights.

State managers followed communist doctrine, which aspired to eliminate rich owners, to unite small owners, and to arrange for maximum state control. Large properties were expropriated (sometimes purchased) and incorporated into state farms. Small-scale owners were united into cooperative farms (*kolkhoz*), which were also under the supervision of state authorities. On many occasions the same individuals, families or groups of families became the staff of new state or *kolkhoz* farms, and therefore managed the same animals which had been their property only a year before. Currently we observe the opposite process in the privatization of herds. Herders deprived of state control and subsidies use the animals for their own needs. In Soviet times private persons also owned reindeer, which comprised up to 10% of the total number of state and *kolkhoz* animals. D. Khorolia (pers. comm.) suggests that the modern growth of Nentsi reindeer husbandry in the Yamal and Bol'shezemel'skaya Tundra is an example of the rapid development of private properties.

Throughout the 20th century, different systems of management were used. "Close" herding, defined as keeping reindeer in big herds, was the main technique in the tundra and forest-tundra zones of Bol'shezemel'skaya Tundra, Yamal, Taymyr, Yakutiya, Chukotka and Kamchatka. The "free-camp" system, in which reindeer are kept in the vicinity of human settlements or camps, was used in Tofalariya, Tuva, Buryatiya and Sakhalin. "Loose" herding, in which herders only periodically gather scattered animals and move them to fresh pastures, was practised on the Kola Peninsula and in Khanty-Mansiiskii Okrug, Yakutiya and Evenkiya. In some areas, two or more methods were used. For example, on the Kola Peninsula there are two distinct indigenous traditions. Saami employ loose herding in winter, very strictly control females during the calving season, and release reindeer during the summer period. They gather reindeer in large herds again after the rutting season. Komi people use close herding year round. Their technology provides better results than the Saami method. However, attempts of Soviet authorities to force Saami to use Komi technology were not successful. In a few areas, reindeer are maintained in fenced enclosures (Kola Peninsula, Yakutiya, Khabarovskii Kray) but the high costs of this method limit its feasibility.

Keeping reindeer in large herds occurred in all periods but with different frequency. Since the 1940s, each state or collective farm (*kolkhoz*)

Table 1. Variations in the proportion of herds of different sizes under early development of reindeer husbandry in the Soviet Union, expressed as percent.

	Years	Total number of animals in a herd (%)					
		< 50	51-100	101-300	301-500	501-1000	> 1000
Yamal	1929	64	15	17	4	0	0
Chukotka	1937-38	32	24	22	9	7	6
N. Kamchatka	1933	66	19	13	1.7	0.3	0

possessed about 7000-20 000 animals divided into herds of 1000-2500 animals. These herds were managed by teams of 5-6 herders and 1-2 cooks (usually wives of herders) which received a salary from the farms. Herds were rotated along seasonal routes which were determined by pasture utilization plans developed for each farm.

Before the 1930s, in tundra areas there were a few large family-owned herds, with a maximum of up to 8000 animals (Table 1). Isaev (1935), Anonymous (1939), Shmit (1939) and Ustinov (1956) pointed out that small herds were not able to roam independently and thus their owners united to have at least a hundred animals in each herd. Behavioural research (Baskin 1974) demonstrated that the minimum herd size available for human management is 35. For herding, the optimal size is 100-300 animals, whereas the maximum herd size is 1500-3000 animals (excluding newborns) because larger herds become fragmented.

Prior to the socialist reconstruction, regular and fairly remote routes of migration were typical only for the herds of rich owners (Isaev 1935; Razdelishin 1938, 1940). Those routes usually remained unchanged and were later used by state and kolkhoz farms. Small-scale owners occupied inland areas and moved more or less chaotically, often staying more inside certain restricted areas than following planned routes. Migratory routes often depended on involvement of herders in other activities (harvesting marine animals, fishing, hunting, transporting loads). For example, all inhabitants of the vast treeless areas of Taymyr (Nganasans, Dolgans, Nentsi) in the past, as well as nowadays, adjust their routes in late autumn to the forest line in order to collect firewood for heating. Inhabitants of coastal areas moved from the sea not further than 40-60 km (in winter) in order to be back near the sea in early summer when the sea mammal hunting season begins (Kopylov 1932; Anonymous 1945). These short "circles" of migration were mostly conserved in Soviet times, when reindeer herds inhabiting coastal zones were

the property of kolkhozes whose main activities were fishing and sea mammal harvesting.

Herd size, animal distribution within pastures, speed of pasture rotation and methods which herders use to keep animals under control all strongly depend on landscape features, e.g. whether it is forest or tundra zone, narrow pasture (along canyons) or broad pasture (in flat, monotonous tundra) (Baskin 1970).

Growth of productivity

Organizers of socialist reindeer husbandry aspired to develop highly productive husbandry. To my knowledge, there was a shortage of scientific knowledge of reindeer husbandry at that time. However, the organizers of the state and kolkhoz farms made extensive use of indigenous knowledge. They made estimations of the carrying capacity of pastures and used these data to plan the growth of domestic reindeer numbers (Ivanov 1941; Razdelishin 1938, 1940). They observed that significant portions of small herds were sledge and riding reindeer and that even some females were used for transport. Production derived from small herds was either used by the owners or sold in rural markets. Only the large herds of rich people provided significant commodity production. The policy of increasingly large herds was accepted by the organizers of reforms. Organizers also determined that productivity is dependent on the proportion of females in a population. A high level of barrenness was found to be connected with biased male/female ratios (Table 2). According to the state standard later accepted in the USSR, the herd sex ratio must be one 3-year-old bull per 18 females and one ≥ 4 -year-old bull per 20 females (1:18 on average) (Borozdin et al. 1977).

Dividing herds before calving season into female and male portions, which was in the past done only by rich owners, had also become a

Table 2. Characteristics of reindeer husbandry in the Russian North in 1935.

Area, locality	Native groups	Total human population	Reindeer per holding	% of females ≥ 2 -years	% of bulls used in breeding	% of castrated bulls
Taiga zone						
<i>Evenkiya:</i> Kureyka River	Kety, Evenks, Sel'kupy	140	13	30	2.8	23
<i>Magadan:</i> Sea of Okhotsk shore	Evens	2154	26-58	40	3.6	32
Tundra zone						
<i>Taymyr:</i> Mouth of Enisey River	Nentsi, Yuraki, Dolgane, Evenki	2627	19-124	31-40	*	26-43
Ust'Avam	Nganasans	450	117	*	*	*
<i>Chukotka:</i> Markovo	Chukchi, Evens	*	117	46-77	1.5-5.5	22

*No data.

routine obligatory activity in all state and kolkhoz farms. In the reindeer husbandry of Chukotka and Kamchatka, managing herds with the assistance of dogs became a common practice. In the past, herders of these areas had not used reindeer dogs. Plenty of these useful helpers were transported from the Nentsi region to the eastern regions. Among other innovations introduced in Soviet times were salt supplies for reindeer, permanent and transportable corrals, radio communication, provision of food and other necessities to the herders by airplanes, helicopters or tractors, and field huts equipped with iron stoves and sometimes synthetic covers. As a result, reindeer farms attained high productivity (Table 3).

The future

I predict two possible future scenarios. 1) The

more optimistic one predicts preservation of the modern situation when a number of large farms established under the former USSR were supplemented by a number of small farms. The total number of reindeer, should this system prevail, will be stabilized at the level of local requirements for meat and skins, and ownership of animals will be partly changed because of the conversion of state farms into either cooperative farms or private herds. 2) The more pessimistic scenario predicts that productive reindeer husbandry will be preserved only in areas with optimal conditions for large herd husbandry and with more developed cultures of reindeer management (Nenetskii Okrug and Yamal, Yakutiya, Chukotka, Kamchatka). However, in the taiga zone and in areas with high numbers of wild reindeer, domestic reindeer herds will be preserved only in some localities where they will serve more as sources of transport reindeer than of meat and skins. Some families

Table 3. Maximum survival, calf production and meat production achieved at selected state reindeer farms of the Russian North.

Area	Year	Animals survival rate (%)	Calves per 100 females	Meat production (100 kg per 100 animals)
Nenetski	1949	93	82	*
Yamal	1962	92	67	5.4
Evenkiya	1944	84-90	67-68	14.3
Yakutiya	1975	91	69	22
Chukotka	1989	89	67	19.7
Kamchatka	1960	99	93	32.0

*No data.

will preserve domestic reindeer in localities where the successful hunting of wild reindeer is not guaranteed.

The experience of the drastic growth of the reindeer population of Yamal provides evidence of the significant influence of gas and oil development. There, the strong market for meat coupled with significant financial assistance resulted in peak productivity prior to the collapse of subsidies. Unfortunately, overgrazing of the pastures of Yamal occurs now as a result of chaotic reindeer husbandry development (M. Okotetto, pers. comm.).

Even highly productive farms need subsidies from the state. In Soviet times the state deliberately paid significant additional sums for the produced meat so that income was sufficient to cover the expenses of salary, transport, communication, field tents and cloth. The same situation exists today in some regions. For example, in his 1996 decree the Chukotka governor, A. Nazarov, presented significant subsidies for all meat produced by reindeer farms (Nazarov 1996). According to the calculations of Khokhlenkov (1998), in Chukotka the cost of 1 kg of produced meat is 8 USD but the market cost is only 2.5 dollars. Expenses for venison production include 12% for salary, 6% for transport and fuel, and 21% for corrals and field huts. The cost of dead and lost animals is 61% of total expenses. The latter expense was, in Soviet times, three times less.

Maintenance of more complicated, highly productive methods of herding and hunting requires increased investments and labour, more sophisticated management and highly qualified herders, and better personal discipline among herders. As an example, a delay of only one week in the departure of a reindeer herd from winter grounds towards calving grounds will be followed by a chain of unfortunate events: the herd will not be able to cross large rivers on ice; it will arrive in summer pastures too late, when fresh vegetation will become scarce; the animals will suffer from insect harassment; the development of calves will be delayed, as well as the fattening of adult animals; the chances of hoof disease will increase; lean reindeer will suffer during the following winter; and calving in the next spring will suffer because of lean females will give birth to weak calves.

Hunting wild reindeer was always an important part of the subsistence economy. The low numbers of wild reindeer in the first part of the 20th century

stimulated the development of reindeer husbandry as a more reliable mode of production. Before the 1930s, in Taymyr, Nganasans used domestic reindeer more for transport than as productive animals. They were compelled by Soviet authorities to become more dependent on reindeer husbandry. However, in the 1970s, when the harvest of wild reindeer became the most important activity, Nganasans willingly returned to their traditional way of life. The same was true of the Evenks in Evenkiya (Anonymous 1945; Savel'ev 1971). In future subsistence economies wild reindeer will occupy a much more important position than in previous times.

A decline in the number of domestic reindeer may stimulate the growth of wild reindeer populations on recently freed pastures. The Taymyr population of 600 000 wild reindeer and the Wrangel Island population of 3000 feral reindeer have been harvested since 1993 only on a small scale. However, observations from these areas during 1993–98 have not provided evidence of significant growth of these populations. In northern Eurasia we know of only two examples of reindeer declining as a result of population crashes. This occurred twice with Bering Island's population of feral reindeer (Abolits 1987). Another example, more disputable, was given by Semenov-Tien-Shanskiy (1989) for the Laplandskii Nature Reserve. Thus, we have few observations upon which to predict a catastrophic growth of wild reindeer populations.

Unique features of particular indigenous herding traditions as well as local ecological conditions must be considered to provide a sound prognosis. For some natives (Komi, Nentsi, Yakuts, Chukchi, Koryaks), commodity reindeer husbandry is traditional. For others, such as Nganasans, Evens and Evenks, who are more deeply involved in hunting and fishing, reindeer husbandry is only a subsidiary activity. Yet in Soviet times these peoples were compelled to develop commodity reindeer husbandry. In areas inhabited by these natives which experienced a decline in reindeer husbandry, the return of the people to hunting and fishing occurred quickly.

Among Chukchi and Koryaks the division between coastal and inland populations is well known. Coastal inhabitants showed more inclination to harvest sea mammals and fish than to breed reindeer. The same situation existed in Soviet times; reindeer husbandry in coastal areas primarily served the local market for meat and skins. At

present, coastal reindeer husbandry in Chukotka has almost completely declined, but inland husbandry has survived. Sooner or later the situation of the 1930s may again be repeated: inland husbandry will produce meat and skins for consumption in coastal settlements, receiving in exchange necessary goods.

Conclusion

Reindeer is the most important biological resource of the North and the different ways it is exploited will not be abandoned but will undergo major changes. However, dependence on state subsidies can lead to the degradation of traditional indigenous economies. Among the various forms of reindeer exploitation, hunting wild or feral reindeer will remain important for subsistence economies and the rural market. In some areas (Taymyr, Yakutiya) hunting may provide meat and skins for a market provided by fishermen, miners, and military settlements. In the areas where there are few wild reindeer, the existence of such markets will stimulate the conservation of large-scale reindeer husbandry. Cultural traditions of the native peoples of northern Russia will also contribute to the conservation of reindeer husbandry. The drastic decline of husbandry in some areas may lead to the loss of technology necessary for highly productive husbandry. Scientific description of the indigenous practices and beliefs associated with reindeer herding, combined with its publication in both technical and general books, will be necessary to preserve indigenous culture for future generations.

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