

Key note address:

Reindeer in the USSR: problems of protection and rational use

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Abstract: There are approximately 2.2 million domestic and 1 million wild reindeer in the USSR today. It is unlikely that the number of domestic reindeer will increase further but there is a tendency for further growth in several large populations of wild reindeer. All middle-sized and small populations of wild reindeer need protection. During the whole initial period of penetration and adaptation of man to the north, the life of ancient inhabitants was closely linked to hunting wild reindeer. Neolithic relics of North Eurasia witness the wide distribution of a relatively monotonous Stone Age reindeer hunting culture. Domestication of reindeer began not less than a thousand years ago. Large-scale reindeer husbandry developed only 300-400 years ago and prospered for about 200 years. Social changes impeded its development after the 1950s, resulting in the restoration of wild reindeer herds.

Key words: distribution, number, migration

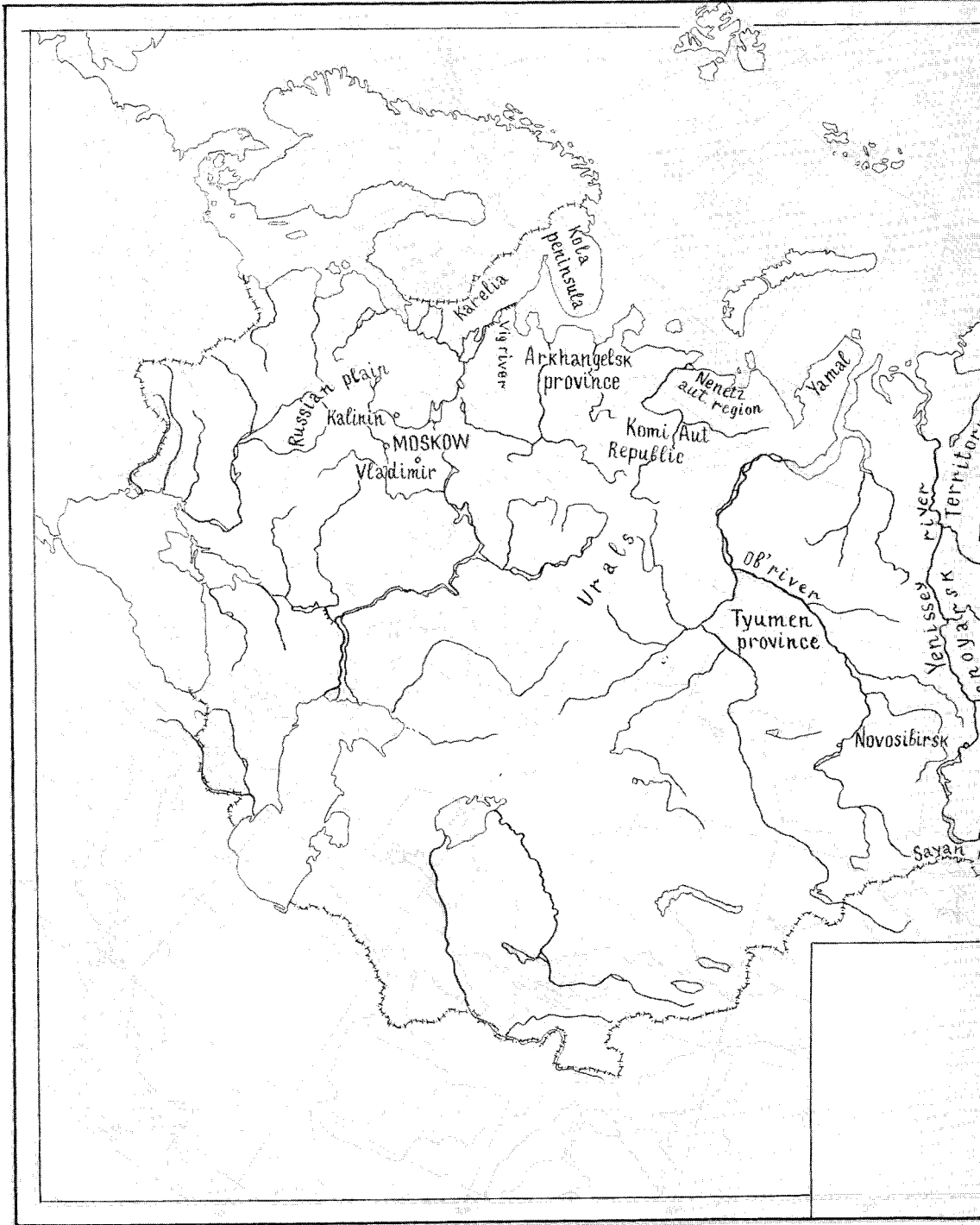
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Introduction

Management of reindeer is complicated by the fact that both in the USSR and in Eurasia as a whole the species occurs in two forms; populations of wild reindeer and herds of semi-domesticated ones. These two forms use the same habitats and occupy practically the same ecological niche in the tundra and taiga ecosystems. Effective management, however, is impossible where both wild and domesticated reindeer occur together on the same ranges. Hence an urgent problem arises. What is preferable; development of reindeer husbandry

or protection and rational use of wild reindeer populations? This problem is both acute and complex. In addition to the economic value of the animals, their great ecological and cultural significance as well as the interests of conservation must be considered.

The main ecological distinctions between the two forms of reindeer are as follows. First, wild reindeer (especially tundra forms) are nomadic and undertake long migrations. Domestic reindeer also migrate but over much shorter distances. Keeping these animals within strictly



Map of the Northern and Central Regions of the Russian Federation. Compiled by the Institute of Geography, Russian Academy of Sciences.

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limited areas, especially within fences, is quite contrary to the genetically consolidated ecological and physiological characteristics of the species.

Secondly, wild reindeer eat much less lichen than domestic ones. Dependence on lichens is a secondary phenomenon linked with the first stages of domestication. Lichens do not provide full nutrition for reindeer. They are rich in carbohydrates but very poor on protein and relatively poor in vitamins. Lichens for reindeer are, according to their chemical composition, analogous to root crops for cattle. When reindeer feed on lichens alone they have to draw on their reserves of important nutrients; protein, calcium and phosphorus. As a result physiological starvation occurs even though the animals eat well; starvation ceases when they begin to consume green vegetation. Lichens cannot support reindeer all the year round, even though the animals like them very much.

The natives of the north domesticated reindeer using this ecological "lichen factor". It was easier to feed reindeer on the ranges rich in lichens, where it was both more convenient to pasture them as well as being easier to retain them at the same place. As a result, populations of domesticated animals, formed over many centuries, prefer lichen habitats and lichen feeding.

Lichens are often only an accessory component of the diet of wild reindeer. This makes wild reindeer much more ecologically flexible than domestic ones. Wild reindeer, with less specialized nutrition, can use a large variety of foods and are therefore capable of exploiting the tundra and taiga more fully than domesticated reindeer.

Domesticated reindeer can manage with only a small portion of lichens in their diet or even without them. For example, domesticated reindeer introduced on to subantarctic islands have successfully colonised ranges without lichens. In the north-east of the USSR a special form of domesticated reindeer, the so-called "kharg-

hin", has been bred successfully almost without lichen feeding.

The conflict between wild and domesticated reindeer has developed during last 300-400 years, simultaneously with the development of large-scale reindeer husbandry in North Eurasia.

During the initial period of penetration and adaptation of man to the north a special circumpolar hunting culture arose which relied mainly on hunting wild reindeer. One can say with certainty that here, on the edges of Eukumene, the man lived in close contact with wild reindeer. The norther peoples depended almost completely on this animal. Traces of this hunting culture existed until the beginning of the 20th century among the Nnganassana (Taimyr).

The initial number of wild reindeer in the USSR is unknown but it may have reached 5-7 million in the period before the development of reindeer husbandry. Reindeer husbandry developed probably not less than a thousand years ago but it remained relatively small-scale and important chiefly for transport until the 17th century. Large-scale reindeer husbandry began to develop in the 18th century. In the 17th - 18th centuries there were probably never more than one million domesticated reindeer in Russia but large-scale reindeer herding began to force out wild reindeer from the beginning of the 18th century. The number of wild reindeer diminished sharply.

At present (1988) there are about 2.2 million domesticated reindeer in the USSR and about 1 million wild ones. Numbers of semi-domesticated reindeer have stabilized or even declined during the last decades. At the same time wild reindeer populations have increased rapidly; from 200-250000, in 1961-1962 to one million today. At present there is a tendency of further growth of wild reindeer number in the USSR. It is unlikely that the number of domesticated reindeer will increase much more, mainly for socio-economical reasons.

Reindeer herders live either a nomadic life in tundra and taiga or use the so-called "shift method" in which individual herders go to remote ranges only for short periods before changing with one another. In the case of the "shift method" the herdsmen's families remain in their settlements for a considerable time. Neither method conforms with modern social demands or with the standard of life which the native inhabitants of the North now expect. Consequently, the reindeer husbandry is now suffering from an acute shortage of labour.

Geographical distribution and number of wild and domesticated reindeer in the USSR

The historical distribution of wild reindeer in the USSR was considerably more extensive than it is at present. In the past wild reindeer inhabited the whole taiga zone from the tree line to the zone of dense taiga forests. The abundance of wild reindeer is now considerably reduced throughout much of their former range and especially in the European part of the USSR. At the end of the 10th century, wild reindeer existed southwards to the latitude of Moscow and Vladimir and in the vast bogs of the Kalinin province.

At present wild reindeer are found only locally in European USSR, in the Urals and in isolated spots within their former areas in most parts of West Siberia. In West Siberia wild reindeer were formerly found southwards to Novosibirsk. In East Siberia and in the Far East the southern limit of their area remains unchanged. Wild reindeer occur locally in the mountains in the south of Siberia. In the large territory near the economic zone of the Trans-Siberian railway wild reindeer have vanished completely. None of the changes in their distribution in the forest zone of the changes in their distribution in the forest zone of the European part of the country are due to competition from semi-domestic reindeer but are, instead, the

result of direct extermination, of excessive hunting and of loss of habitat.

Wild reindeer disappeared almost completely in the tundra and forest-tundra zones of the north as it was here, in the European and West Siberian tundras and Chukotka that the largest centres of reindeer husbandry was found. These centres were thus responsible for the disappearance of wild reindeer from West Siberia, Evenkia, Yakutia and in the taiga westwards to the Okhotsk Sea in the 18th and 19th century. And today, although reindeer husbandry is declining nearby everywhere the number of wild reindeer is still increasing either only very slowly or not at all owing to industrial development of the taiga zone.

The largest populations of wild reindeer in the USSR at present are in the northern part of Central Siberia (Taimyr) and in Yakutia. Zoologists traditionally distinguish Yakut populations from Taimyr ones, basing their division on the administrative boundary between Yakutia and Krasnoyarsk Territory. Actually the animal use a vast, common area stretching 2500 km from the Yenisey in the west to the Indigirka river in the east. The distribution of wild reindeer is not continuous here at present, especially in Yakutia where reindeer husbandry is more developed. About 300 years ago, when there was no large-scale reindeer husbandry east of the Yenisey, this Chukotka area, was particularly important for wild reindeer. However, the area was not occupied by reindeer permanently during summer in the tundra zone but when they went on long migrations to winter ranges in forest-tundra zone and northern taiga subzone. To the east of the Indigirka river Chukchi reindeer husbandry forced wild reindeer practically completely out. In tundras of Yakutia only small populations of wild reindeer remained.

The biggest wild reindeer population in the USSR today is the Taimyr one. According to recent aerial census data this population comprises more than half a million animals. During

the last 25 years the population grew 5 times and has probably now reached close to its maximum. This is a migratory population, performing an annual roundtrip of 1000 kilometers. The main summer ranges and calving grounds of this immense herd are in the western Taimyr. The winter ranges are in northern taiga subzone of Eastern Evenkia. Recently, Taimyr wild reindeer have started to penetrate in to adjacent regions of Yakutia in winter, and now some times as many as 300 000 animals pass the winter here.

Until relatively recently it was thought that wild reindeer migration routes, calving grounds and winter ranges were constant. However, it now appears that reindeer change their summer and winter ranges, as well as routes of migration quite regularly. By changing ranges they preserve their food resources and use the vast territories of the north more rationally.

The changing pattern of range use by groups of animals within the limits of a population area is called by us a "kaleidoscopic effect". This may occur annually, when reindeer change their ranges on a small scale, or, more rarely, on a large scale, when a herd changes its winter or summer ranges by moving into an adjacent geographic region (for example, from Evenkia to Yakutia). This phenomenon can be related to the so-called "pendulous fluctuations" of changing migration routes and wintering grounds (Syroechkovski, 1975, 1986). The "kaleidoscopic effect" is characteristic for all populations of reindeer, especially large herds. It is a remarkable adaptation by the animals to severe natural conditions of the north. Only with a such behaviour can reindeer successfully use the poor ranges of the north, grazing vast territories without destroying their food supply and thus accumulating the mighty biological potential of one big, mobile population. The famous Taimyr herd is one such population.

Knowledge of the spatial dynamics of herds is very important for reindeer management and forms the basis of recommendations for the

rational use of ranges. Failures in the organization of reindeer hunting can be avoided, given adequate knowledge. Great failures took place in game management in 1985-1986, for example. For many years tens of thousands of reindeer were killed at crossing points over the Pyassina river in Taimyr during the migration with no account being taken of possible pendulous fluctuations of the herd. Eventually, and especially in 1986, the animals moved east, away from their ordinary routs, and buildings specially equipped for processing and storing their carcasses were left far from the routes.

Many historical facts indicate that migration routes are labile. In the years when reindeer "did not come" (i.e. changed their migration routes) ethnic peoples of the north, e.g. Nganassans (Taimyr) and Yukaghirs (Northern Yakutia), starved.

There is no significant conflict between wild and domestic reindeer in Taimyr at present. Taimyr and adjacent Evenkia have never been regions of large-scale reindeer husbandry for economic-ethnographical reasons. Between 1965 and 1970 there were approximately 120000 domestic reindeer here but today there are only 20000 animals. The decline was due partly to changes in the lifestyle of the reindeer herding people and partly to competition with wild reindeer. Taimyr natives own approximately 30 000 domestic reindeer. Most of these occupy ranges on the Ghydan peninsula (Tyumen province), on the left bank of the Yenisey. Wild reindeer are no longer able to reach the left bank because their migration is cut off by ice-breakers which navigate as far as Dudinka along the Yenisey all the year round.

The second major area occupied by wild reindeer in the USSR is Northern Yakutia. Here there is a significant conflict between wild and domestic reindeer. At present there are about 150 000 wild reindeer and about 130 000 domestic reindeer in the Yakutian tundras. The number of domestic reindeer is not increasing. Wild reindeer occur in several

separate populations which formerly occupied the tundra of the north-east USSR.

The number of wild reindeer in Yakutia increased to 180 000 by 1975. Biological prosperity of these herds is shown by their high annual rate of increase (up to 12%). The animal here began to be harvested from the early 1970s but the shooting, in contrast with Taimyr, was not organized well. The shooting was carried out by people specialized in reindeer husbandry not in hunting, as in Taimyr. These people had little sympathy for wild reindeer and their increase in numbers stopped as a result of irrational, unreasoned hunting. The number of wild reindeer in Yakut tundras could theoretically have reached 350 000 - 354 000 by 1985 and ultimately 500 - 600 000 owing to an average annual rate of increase of these populations of up to 10%. Under such circumstances there would have been almost twice as many wild tundra reindeer as domestic reindeer in Yakutia. However, this is not the case owing to the irrational hunting.

Yakutia is the second largest zone of habitation of wild reindeer after Krasnoyarsk Territory. There are 250 000 tundra and taiga animals here. The current estimate of 100 000 wild taiga reindeer is not reliable because aerial census of the Yakut taiga populations has not been carried out properly. Numbers seem to be overestimated.

The reindeer husbandry in USSR is concentrated at present in the tundra and forest-tundra zones - mainly in regions where wild reindeer are absent or rare. The greatest area of reindeer husbandry in the USSR (and in the World) is situated in the north-east of the USSR, within the limits of Chukotka (Magan province), Koryak autonomous region (adjacent districts of Kamchatka) and the north-west Yakutia. There are more than one million domestic reindeer in this area. The second great centre of reindeer husbandry is in the northern part of west Siberia and in the tundras of the north Russian plain. There are approximately 700 000 domestic reindeer here,

mainly within the limits of Tyumen and Arkhangelsk provinces and Komi Autonomous Republic. Five ethnic groups are involved in large scale reindeer husbandry in the USSR today. In the North-Eastern region there are mainly Chukchi, Koryaks and Yakuts. In the Europe-west Siberian region there are mainly Nenets but also some Komis.

Circumpolar culture of wild reindeer hunters

The traditional view that the life of native peoples of the North is closely connected with reindeer husbandry is true only for the relatively recent past. It was not like this before. The adaptation of the ancient inhabitants of the north was closely connected with wild reindeer hunting. Reindeer provided food, clothes and shelter. Literally speaking, man moved north side by side with reindeer following the retreating ice. Both penetrated the cold steppes, tundra-like landscapes and sparse forests of the Holocene when these were still populated by mammoths and hairy rhinoceros.

The period of populating the north lasted many thousands years during which northern peoples were largely dependent on wild reindeer. They migrated with these herds, they made long-lasting camps in places where migrating animals gathered and where it were possible to arrange mass hunting. In autumn and spring the ancient hunters killed a lot of reindeer often at the river crossings, and stored the meat. The places of the mass hunts were considered sacred and were carefully protected. Natives did not scare reindeer and they did not kill more animals than they could store. There was ecological equilibrium between Nature and Man.

The origin and formation of the culture of reindeer hunters is poorly studied and remains controversial among archaeologists and ethnographers. First the tundras of the old world were populated. Then, 11 - 38 000 years ago, Man penetrated through the Bering Strait

to North America. Siberia was populated during the epoch of a highly developed hunting culture of the upper palaeolith which formed in north eastern Europe and east of the Urals. It is from here that the most ancient inhabitants of northern Asia moved east and according to academician A.P. Okladnikov, "made their fires for the first time on the banks of the great Siberian rivers - Ob', Yenisey, Angara and Lena". There is recent archaeological evidence from the Taimyr of a non-ceramic culture of wild reindeer hunters dating from as early as the IV-III th millenia B.C.

Unfortunately, neolithic petroglyphs with images of hunting the wild reindeer are unknown to the continental part of north Siberian but they are relatively numerous in Fennoscandia, especially Karelia, where many images of reindeer and reindeer hunting were found on the shores of Lake Onega and the Vyg river. Similar petroglyphs have recently been found in the Kola peninsula and on rocks in Chukotka.

All these facts witness that the tundra and the taiga were inhabited by stone age hunting cultures long before the formation of the present peoples and nationalities of north Eurasia. The ethnogenesis of these tribes is not clear but, according to many ethnographers, neolithic relics in northern Europe and west Siberia are associated with ancient inhabitants of the western Urals. The Yukaghirs of east Siberia and Chukotka may be related to the neolithic inhabitants of that area.

The neolithic relics of north Eurasia witness the wide distribution of a relatively uniform wild reindeer hunting culture on the enormous territory of the Old World and North America.

The domestication of reindeer began probably two thousand years ago in western Eurasia. However, the ecological equilibrium between Man and wild reindeer began to be destroyed only with the arrival of a large scale husbandry approximately 300 years ago. At the same time,

the Nenets, who were reindeer breeders, populated the east European and west-Siberian north, ousting out both wild reindeer and the pre-Samodiy tribes which were dependent on them. Reindeer hunters like the Yukaghirs remained in the northern part of east Siberia until the 17th century when the warlike Chukchi began to force them out from the east. The Chukchi quickly developed a large-scale reindeer husbandry. Evenks and Yakuts advanced from the taiga and the Central Yakut steppes in the south and south-east and defeated the Yukaghirs owing to the superiority of their weapons; they had lances and arrows with iron heads, and their fighting detachments rode on reindeer. The wild reindeer was the enemy of reindeer husbandry, and this was the main reason for its rapid extermination. Reindeer husbandry, however, prospered only for about 200 years. Social factors impeded its development after the middle of the present century and as a result wild reindeer herds have begun to increase again.

Not all northern natives developed reindeer husbandry. The native peoples of North America never domesticated reindeer. In north Eurasia two peoples, the Nganassans and Yukaghirs, out of eight or nine ethnic groups which once inhabited the tundras and the northern sparse forests maintained their dependence on wild reindeer almost to the present day. We do not know why these two peoples never developed reindeer husbandry. These peoples, remnants of an ancient circumpolar hunting culture declined simultaneously with the disappearance of big herds of wild reindeer.

The protection and conservation of wild reindeer is urgent and closely connected with the principles of their use. At present all middle-sized and small populations of wild reindeer in the USSR i.e. those with <5000 animals need protection. Thus, all our wild reindeer populations, except the Taimyr and big North Yakutian ones, need protection. The following populations are endangered and should be included

in the Red Data Books of the USSR and the RSFSR: Sayan; Sakhalin island; Central-Chukotsk; the taiga populations of west Siberia and the European part of the USSR. The latter belong to the subspecies *Rangifer tarandus fennicus* which is carefully protected in Western Europe. A unique population of wild tundra reindeer of the Nenets autonomous region also needs the urgent conservation. This is the only remaining population of the typical tundra subspecies of reindeer described by Linneus in 1758.

Ecological-economic basis for rational use of wild reindeer

We have estimated that the maximum potential number of wild and domestic reindeer in the USSR is 5-7 million animals. If numbers of domestic reindeer are held constant, then the number of wild reindeer can be trebled. So we have good reason to develop a specialized economy based on the rational use of wild reindeer: a "the hunting reindeer husbandry" (Syroechkowski, 1982, 1986).

Such management is already in practice. In 1971 a State hunting farm "Taimyrski" was organized to exploit the Taimyr population. Later on the State farms of Taimyr joined the wild reindeer hunting. Between 1971 and 1981 these farms shot more than 600 000 wild reindeer yielding 25 000 tons of meat. Nevertheless, the population continued to grow. We estimate that it is possible to shoot up to 100 000 wild reindeer annually without damaging the population. It would therefore be possible to produce annually, in addition to meat, 100 000 skins, 400 000 kamusses (skins from reindeers' legs which are valued highly by hunters) and a lot of stuff for souvenirs and pharmaceutical industries, provided the population is managed rationally. The present output of Taimyr hunting reindeer husbandry is many times greater than the output of domestic reindeer husbandry in Taimyr, Evenkia, west and central Siberia. This does not mean that the development of

domestic reindeer husbandry in Taimyr and Evenkia must be stopped. Domestic reindeer husbandry is necessary for the native peoples for food, for transport etc. Hunting wild reindeer, however, is also an important traditional activity which can provide native peoples with a stable prosperity.

The hunting reindeer husbandry cannot be considered as a purely economic pursuit. It must be closely connected with the native peoples of the north. The chief objective of hunting reindeer husbandry is social and economic progress of their lives. Economic advantage must not prevent the main social objective.

Successful exploitation of wild reindeer requires a herd of not less than 40 - 50 000 animals. Such a herd can yield about 4 - 5 000 reindeer annually and will soon pay for itself.

Hunting husbandry involves more than just organization of a hunt. Ecological monitoring of the herd is indispensable. This must include regular census of reindeer in all seasons; track in the migration, preferably by aerial radio-telemetry and mass marking of animals; control of the sex- and age-structure of the population; control of morpho-physiological state of animals and veterinary control. In addition it is important to control the state of the habitat and to develop a system for its protection and restoration.

Co-existence of wild and domestic reindeer on the same ranges is impossible. Where this already occurs we propose a geographical division of the two forms of husbandry according to the "preference foci" of habitation of wild and domestic animals. "Preference foci" are determined by taking into account social, ecological and ethnographical factors. The recognition of a definite region as a "preference focus" for hunting reindeer husbandry does not necessarily require the complete absence of domestic reindeer. The obvious "preference foci" of hunting reindeer husbandry is Taimyr with the adjacent parts of Evenkia, and the Lena-Indigirka part of Yakutia. The obvious

"preference foci" of domestic reindeer husbandry are Chukotka, Koryak and Nenets autonomous regions, Yamal and the rest of Yakutia.

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