

THE STATUS AND MANAGEMENT OF MOOSE IN THE MURMANSK REGION, RUSSIA

Olga A. Makarova and Anatoly M. Khokhlov

Pasvik State Nature Reserve 184424, Raiakoski, Petchenga rajon, Murmansk region, Russia.

ABSTRACT: The moose population in the Murmansk region has changed considerably in the past century. Moose appeared in the forest-tundra zones in the 1950s, occupied the Ponoy River area in the 1960-1970s, and population growth occurred to the north of the forest zone along the tributaries and rivers flowing into the Barents Sea. Some wintered in open tundra, but more commonly moose migrated between tundra and forested winter habitat. Official harvests began in the 1950s and were managed by Murmanskiy, a state owned company. A 5-year harvest ban was initiated in 1982 to recover the population; however, current harvest remains about a third of previous levels and the proportional harvest of calves and yearlings is higher. The current population is in good condition based upon weight and productivity data, occupies suitable winter habitat, and is not impacted by severe winter conditions. Because the Murmansk region is at the northern extent of moose range, management should focus upon regulated harvests, adequate population surveys, seasonal habitats and migratory corridors, the impact of harvest quotas and poaching, and the possible influence of global warming.

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The Murmansk region is located in north-west Russia on the Kola Peninsula that borders the Barents Sea and northernmost areas of Finland and Norway (Fig. 1). It is characterized by unique ecosystems and habitats including tundra, belts of tundra-forest, and forest that largely influence the optimal habitat conditions and distribution of large mammals, specifically moose (*Alces alces*). Although moose were common in the Murmansk region during the 20th century, their population in northwest Russia has changed considerably in the past 100 years. Moose were not common at the end of the 19th century, and only a small population was retained into the 1920s. They appeared in the area of the future Lapland Reserve in 1910, and their northern distribution was in the vicinity of the Notozero, Pulozero, and Ponoy Rivers in the 1940s. Moose appeared in the forest-tundra zones in the 1950s and occupied the Ponoy River area in the 1960-1970s. Strong population growth was also documented to the

north of the forest zone along the tributaries and rivers flowing into the Barents Sea. Moose were reported to winter in open tundra, but typically used forested habitats. Seasonal migrations to and from the tundra and forest habitats were noted at that time.

Moose were distributed on the Kola peninsula near the settlements of Borisoglebskiy, Pechenga, the towns of Kola and Lyavozero, along the Iokanga Rover to the mouth of the Sukhoy River, further north to the settlement of Kanevka, and south to the White Sea. In general, the area is "lacy" in character and in some places practically coincides with the southern border of the tundra (Makarova 1996). All major moose wintering areas are along the northern border of the forest zone except the Ponoy area. The area occupied by moose changes sharply twice a year; it is reduced by about half during winter and covers nearly the entire region during snowless seasons. Such seasonal shifts are adaptive



Fig. 1. Location of the Murmansk region on the Kola Peninsula, Russia.

for species occupying northern areas where resource availability and mobility are restricted seasonally.

The Murmansk region might be the largest area occupied by moose on the Kola Peninsula; this may be related to habitat and environmental changes associated with the recent, milder climate in this area. It is known that no moose were north of 64-65° northern latitude in the first half of the 19th century, but moose moved gradually to 69-70° northern latitude over the past 15 decades. Similar northward expansion in moose range has occurred in other areas as well; however, the reason for such northern expansion is unclear but is probably not due to warming entirely. It is possible that moose will eventually reoccupy areas associated with their prehistoric range (Vereshchagin et al. 1995).

The moose of the Kola peninsula are quite large with adult moose weighing >500 kg (Makarova 1981, 1990, 1991) and harvested moose tend toward the largest in Europe. Investigation of osteological material indicated that a rather vital population of moose has formed in the northern range over a relatively short period of time; there is little evidence that habitat conditions are restrictive in this northern area (Korablev and Makarova 1993).

The moose population number has varied measurably over the past 50 years in the Murmansk region. Aerial surveys were used initially to document population status in the middle of the 20th century. Subsequent methods included both aerial surveys and winter track counts that provided a better estimation of population size and distribution. The largest population occurred in the late 1950s and early

1960s, and an official harvest was initiated in 1952. Murmanskiy, a state owned industrial company, was established in 1966 to manage this activity. On average, harvests were not less than 7% of the estimated population, or about 450 moose annually from 1967-1982. Because of a sharp reduction in the estimated population, a ban on the official moose harvest was instituted for 5 years. This ban resulted in subsequent growth of the population within 2-3 years, and the harvest was reinstated in 1988. Despite the quota reduction, the population failed to return to the levels realized in the 1950-60s. The harvest rate dropped to only 2-3% of the population estimate, with annual harvests of about 150 moose. The official harvest was stopped again and Murmanskiy was closed in the 1990s. Licensed hunting continues, mainly for trophy bulls in the rutting period.

The official harvest data provided an opportunity to compare the age structure of the population from the 1960-70s with that in the 2000s; substantial changes occurred over that period. Harvests remained relatively high and consistent in both periods. Calf moose were 1.6%, yearlings 6.3% and adults 92.1% of the harvest in 1966-1977; corresponding ratios were 16, 10, and 74% in 2000-2006. However, neither the fertility rate, remaining at 1.18 fetus/pregnant moose, or the proportion of cows with 1 (81%) or 2 fetuses (19%) have changed. Conversely, the proportion of barren cows has risen from 37 to 50% for unknown reason and warrants investigation.

Bull moose have always been predominant in the harvest averaging 59% (range = 53-62%) in the period 1966-1977, and are now 62%. Bulls also prevail in all age groups with 63% calves, 57% yearlings and 52% adults in 1966-1977, and 69, 57, and 62%, respectively, in 2000-2006. These ratios presumably reflect the population as a whole, although hunter preference for adult moose is likely. No substantial change in harvest weights has been detected. The current,

average dressed weights of bulls and cows are 167 and 159 kg; corresponding weights from 1966-1977 were 168 kg and 163 kg. Although dressed weights reported on licenses are not official, they should provide reasonable and reliable data for tracking weight trends, and be characteristic of the moose population and associated indices.

The Murmansk region is not uniform in its flora; forest and forest-tundra belts cover >50% of the region. Moose migrate from the tundra to their typical winter habitat in forests during the hunting season (15 November-15 January). Mass migration usually starts in late November ending in late January. Harvest documents contain the most reliable information about harvest time and location of harvest. Most harvest occurs toward the end of the season in January when moose have already lost some weight; the prime harvest areas are in southern forested areas. About half of the harvest quota was filled in the Kandalaksha and Terskiy districts in the 20th century, but central districts started playing a larger role in the harvest at the beginning of the 1970s, especially the Lovozero district by 1976. The largest number of licenses was allotted in the Lovozero, Kola, and Terskiy districts, and the highest harvests were registered there as well; 34, 32, and 15 moose, respectively. Ironically, a major part of the tundra zone and part of the forest and forest-tundra belt are in the northwestern Murmansk region. One speculation is that moose migration to, and occupation of that area, may be indicators of change in the northern forest zone associated with global warming.

Moose have been hunted continuously in the Murmansk region for >100 years. According to all data, the population is in a good condition based upon weight and productivity, occupies suitable winter habitat, and is not impacted by severe winter conditions. The most important element of the management of this population is a regulated harvest based on accurate population estimates and

related harvest quotas, particularly in light of improved access and hunting techniques. There is increased concern about the impact of poaching and its effect on population management. We recommend banning the official moose harvest because no discernable increase in the population (4500-5000) has resulted from the minimum harvest quotas set in recent years.

We also believe that protected natural areas in the Murmansk region play an important role in maintaining the core of the moose population. This “net” of protected natural areas includes 3 state nature reserves and 11 protected territories that cover 7% of the region. Because poaching occurs in the region, these areas provide sanctuary for moose, and anecdotal information indicates that moose move to these areas during hunting season. Importantly, official inspectors on site not only protect these areas, but also promote study of moose and perform population surveys regularly, including winter track surveys. These data provide reliable information about the population size and distribution of moose, as well as the presence of predators and other management considerations.

Nature reserves play a special role in the ecology and management of moose in the Murmansk region. They are located in the south, northwest, and north and include major migratory routes of moose. Their regional distribution provides more and regular winter population surveys invaluable for managers responsible for establishing harvest quotas and moose hunting licenses. Cooperation among scientists at different reserves enriches wildlife research resulting in improved ecological knowledge, better information for moose management and hunting, and conservation of the hunting fauna in general. Given that moose in the Murmansk region exist at the northern range of moose, it is necessary to embrace a management strategy that continues to adequately survey the population and its characteristics, its seasonal habitats and

migratory corridors, the impact of harvest quotas and poaching, and the possible influence of global warming.

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