DOI: <http://dx.doi.org/10.15679/bjwr.v1i1.10>

DISTRIBUTION AND POPULATION CHARACTERISTICS OF GAME MAMMALS OF WEST-SIBERIAN TAIGA – TRENDS FROM “PERESTROYKA” BEGINNING

Piminov V. N., Sinitsyn A. A., Saveljev A. P.¹

Summary: The population, distribution characteristics and the exploitation of hunting mammals in the taiga region of West Siberia under the industrial anthropogenic factors of the territory are given in the paper. Materials which were used included: data from expeditions to developing fields of Khanty-Mansiysk and Yamalo-Nenetskiy regions, for the period of 2004-2012; census estimates of mammals and birds species from the transformed territories in the vicinity to oilfields; data from hunting associations of Khanty-Mansiysk and Yamalo-Nenetskiy regions on population abundance and harvest for the period from 2001 to 2013. Industrial intrusion into territory of West Siberia especially affects the distribution and population characteristics of reindeer. It has some negative effect on moose population, but bear and sable species suffer much less from anthropogenic factors and an increase in its populations is marked in some regions. Mountain hare, American mink and some other hunting species kept their dynamics in connection to habitat conditions changes.

Key words: West Siberia, anthropogenic activity, hunting mammals, harvesting, poaching.

Introduction

The development of new oil and gas fields on the territory of West Siberia is followed by an intensive impact on animals and their habitats. Building the gas-oil industrial objects causes wide habitat transformations for game animals such as a decrease in their food supply, nesting and protecting conditions. As a result there is a decline in the number of hunting mammals and birds in the transformed areas. This is especially noticeable on hunting species which take part in the economic use of the indigenous population minorities of the North being the basic resource of their survival. In the recent decades of natural resources exploitation, the Government has taken nature preservation into consideration. One of the main goals which nature users are facing nowadays is to save as much of the biocenosis we can save on the industrially modified territories. Present scientific discoveries and technologies offer sustainable use of renewable natural resources as a way of minimizing the negative human impacts.

Material and Methods

During the preparation of the manuscript, materials which were used included: data from expeditions to developing fields of Khanty-Mansiysk and Yamalo-Nenetskiy regions, for the period of 2004-2012; census estimates of mammals and birds species from the transformed territories in the vicinity to oilfields; data from hunting associations of Khanty-Mansiysk and Yamalo-Nenetskiy regions on population abundance and harvest for the period from 2001 to 2013; questionnaires for hunters and hunting ground specialists; VNIIOZ questionnaires data of hunters correspondence and specially prepared filling forms; published materials and handwritten library funds.

¹ Vladimir Piminov, PhD, Leader researcher, Dept. of Game Resources, Russian Research Institute of Game Management and Fur Farming, Preobrazhenskaya str. 79, 610000 Kirov, Russia; Andrei Sinitsyn, PhD, Leader researcher, Dept. of Game Resources, Russian Research Institute of Game Management and Fur Farming, Preobrazhenskaya str. 79, 610000 Kirov, Russia; Alexander Saveljev, Dr Biol. Sci., Head of Department of Animal Ecology, Russian Research Institute of Game Management and Fur Farming, Preobrazhenskaya str. 79, 610000 Kirov, Russia.

Corresponding author: Alexander Saveljev, saveljev.vniioz@mail.ru

Results

Moose – *Alces alces* is normal low numbered wide spread species in the taiga region of West Siberia. These animals penetrate the area along the watercourses in forest areas to the Southern tundra. Moose distribution on the territory is explained by the presence of summer and winter food supply availability. In winter, mooses are concentrated in the areas with a large twig supply – willowed floodplains, around burned grounds with newly growing plants and fellings. In summer, to protect themselves from the midges, moose move to the open areas with a good wind, to the grounds with nutritious rich fodders: burned grounds, fellings, swamps and floodplain complexes of big rivers. Floodplain surroundings of Ob and Irtysh rivers are summer food lands and places for the females with calves. By winter, due to decline in safety and increase the stress factor (including direct chasing), the majority of animals leave the floodplain and move to the taiga areas of interflaves (Bornovolokov et al., 2014). Moose lives solitary or in small groups. During the seasonal habitat change, animals quite often migrate to large distances wherein a part of them dies (Filonov, 1983; Glushkov, 1988; Novikov, Kotov, 1990). In the last 20 years, the moose population in Khanty-Mansiysk region ranges from 17 to 25, and in Yamalo-Nenetskiy region – from 4.5 to 7.8 thousand individuals (Figure 1), as estimated by specialists. The population dynamic is mainly determined by habitat conditions. Population density of the animals is not high and in inherent habitats changes from 0.02 to 1.5 individuals per 1000 ha. In preserved areas, moose population could reach 5.5 individuals per 1000 ha (Bornovolokov et al., 2013). As a rule nowadays, moose cannot be found in the vicinity of big cities and industrial objects. In the territories exposed to industrial transformation bounded with gas and oilfields development, roads and tubes are being built, which prevents moose from moving freely, causes their deaths from car accidents, increases poachers activities, leads to air pollution and pollution of food objects (Bornovolokov et al., 2012). Since old times, moose has been considered the main game object for Khanty people and therefore defined the high level of the aborigine population's well-being. In the past, they hunted on moose and reindeer collectively dividing the catch according to the number of participants in the hunt. Hunters put fences and built crossbows along the migration routes where forest narrows among swamps (Salymsky Territory, 2000). In present time, due to intensive fossil resources development in the region, the flow of people significantly increased and, as a result, the hunting press on moose. It happens that the animals are killed during occasional meetings being purposely chased with the use of aviation, off-road vehicles and cars, which sometimes catch moose with the help of loops being put on their migration routes.

Figure 1. Moose population dynamics (in thousand individuals): Khanty-Mansiysk region – blue, Yamalo-Nenetskiy region – red.

Reindeer – *Rangifer tarandus*. Reindeer distribution in the taiga region of West Siberia has a focal character. Before, the area was completely covered with reindeer, now it is a mosaic of separated, strongly divided herds. The taiga area of the described region is inhabited by some reindeer groups – purovsko-tazovskaya, nadym-purovskaya, sosvinskaya, salimo-uganskaya, vahovskaya and kondinskaya (Novikov, 2011). In the northern part of the territory, in summer, most parts of the groups tend to go to the forest-tundra, while on the southern part - to high swamps. In winter, animals move to the taiga zone. A catastrophic decrease in the reindeer population was observed in the Tyumen region in the beginning of 1980s. This was caused by large-scale forest fellings, surveys and oilfields developments, which were followed by forest fires and activation of poachers' activities (Volkov, Larin, 2007). General reindeer population number in the Yamalo-Nenetskiy region has fallen from 35 to 7 thousand individuals in the past two decades. In the Khanty-Mansiysk region from 15.5 - 16.5 thousand individuals in 1970 to 310 individuals in 2006 (Volkov, Larin, 2007; Novikov, 2013). Now its number doesn't exceed 1,8 thousand individuals (Figure 2). An especially tense situation was observed in the seasonal migration routes of wild reindeer for which even simple winter houses were insuperable obstacles in the beginning of the development stage of the industrial intrusion. Concentrating along the roads, pipelines and power lines, reindeers become an easy catch for predators and poachers. Pipeline corridors, power lines, roads and railways block reindeer movement routes and cause a decline in migration (Piminov et al., 2001; Syshev et al., 2011). A particularly unwell situation is observed in the nadym-purovskaya and salimo-uganskaya group of herds. Nowadays, due to intensive long-term anthropogenic impacts on these highly transformed territories, any arrival of this animal is rather impossible. So, during the expedition to the Purovskiy district in august 2004, trails of the species were noticed almost everywhere between the Yagenetta and Arka-Tabyaha rivers. Small groups (1-3 individuals) were met on the observed areas. During the survey of oilfields in 2011, single animal trails were noticed on the rivers Malhoyaha, Neguyaha and Nyudiesetayaha. In 2012, no sign of the animal's presence were found. Five years of hunting prohibition (1984-1988) in the Yamalo-Nenetskiy region were not effective because illegal hunts were the usual practice.

In the Khanty-Mansiysk region, reindeer hunting is prohibited and this species was included in the Red Book of the Khanty-Mansiysk (Yugra) region (Novikov, 2013). Population of wild reindeer in the region is catastrophically low. It mostly occupies preserved areas. In order to increase its density it is necessary to enlarge territories and increase their status.

Figure 2. Reindeer population dynamics (thousand ind.) Khanty-Mansiysk region – blue, Yamalo-Nenetskiy region – red.

Brown bear – *Ursus arctos*, is a usually low numbered species. It is one of the biggest animals of the region and is distributed everywhere. Most proper habitats for this animal are dark coniferous forests

with cedar and berry as well as places for the construction of dens. Rich food supply is the main requirement to the habitats during their active period. It is especially important in spring, after long wintering, as well as during fat accumulation before den. In spring, after coming out of their dens, bears move from forests to the open places, where the snow cover disappears more rapidly. Among their natural food preferences are mainly berries, cedar nuts, leaves, stalks, roots and trunks of herbaceous plants. For animal products, the privilege belongs to insects and larvae. Small mammals and birds can be met as well. In case of food shortage predators attack moose and reindeers, pick carrion. Bears can be met in swamps as well, using them as food supply grounds. The bear normally leads a solitary life. It has almost no enemies except for humans. The distance between the places convenient for den constructions from places most comfortable for the summer period is considered to be the main reason for the seasonal movement of bears. This condition negatively influences siblings' survival and the number of adult individuals. The total population number of bear in the Khanty-Mansiysk region in present time is about 5-7 thousand individuals with some tendency to increasing; in the Yamalo-Nenetskiy region, it is steadily low and not over 1000 individuals (Figure 3). Most populated areas are found in Cis-Ural, between the Ob and Irtys rivers, in Big and Small Yugan rivers basins and in the eastern part of the Vakh basin (Novikov, 2004). According to our surveys, bear population density in its best habitats such as cedar forests, reaches 0.5 individuals per 1000 ha in the investigated territories. Current human impact on the population of bear is not significant in the industrial development districts. Primary natural population decrease factors are low reproduction rates and relatively high cubs' mortality.

Bear has an important economic value. Khanty people consider it as a sacred animal. In the past its catch was a result of a collective hunt and was followed by ritual holidays. In present time, the main goals of its hunting are skin trophy and meat value. Bear hunt is regulated by special permissions (licenses). It is often periodic and does not exceed 3-5% of the population. The practice of den hunt was in the last decade. During the periods of crop failure the predator attacks people.

Figure 3. Brown bear population dynamics (thousand individuals) Khanty-Mansiysk region – blue, Yamalo-Nenetskiy region – red.

Sable – *Martes zibellina* is common hunting species. As a result of overhunting in the beginning of the 20th century in the region as well as in the whole areal, sable survived only in small isolated groups in inaccessible places. In West Siberia these places were the upper lands of Salym, Yugan and Demyanka rivers. The main measure for preservation of sable in the region was the local prohibition of hunting in 1926-1931, followed by the Soviet ban in 1936-1940. Kondo-Sosvinski Nature Reserve creation in 1941 also contributed to its preservation, together with strong hunt limitations which were being practiced since 1941,

hunting period limitations and prohibition of some of their exterminatory hunting methods (Bakeev et al., 2003). A lot of state finances have been spent, a huge amount of work has been accomplished to reintroduce original sables and their deliveries from Buryat and Irkutsk regions in 1952-1959. In the Khanty-Mansiysk region, sable was actively distributed and already in the second half of 1960 its areal had been restored. Present day sable areal in the region mainly coincides with forest distribution borders. Cedar and cedar-fir plantings are best habitats for sable. In the Yamalo-Nenetskiy region, sable goes far to the North along the river borders with presence of dark coniferous trees with cedar. Mixed taiga with significant cedar presence is considered to be good feed ground. More rarely, sable can be met in island type light coniferous forests among water separating swamps and deciduous forests of the Ob floodplain complex (Dekov et al., 1977); often animals appear here during young individuals' resettlements and due to food shortage in taiga. Sable can live on burn grounds as well. Their value for sables depends on fire timing, burned grounds' dimensions and reproduction character. Sable more willingly inhabits 10-15 years burn grounds with chaotic fall of trees and thick coniferous and deciduous undergrowth (Pereyaslovets, 1998). Sable leads a terraneous lifestyle and rarely climbs on trees. It can move easily on thick and friable snow cover thanks to the good paws' pubescence. It uses different kinds of animal food (first of all, rodents) and vegetation (berries, cedar nuts). For shelters and nest arrangements it can occupy roots holes, hollows and stone deposits. Sable population number reached the maximum for this habitat in the beginning of 1980. The surveys we made prove that, at the present time, the sable population density is found to be at a high level and in some places reaches 8.0-10.0 individuals per 1000 ha. In unproductive lands, the animals' number does not exceed 1-1.5 individuals per 1000 ha. During the last two decades, the sable population has grown. However, its growth is restricted only to the districts with minimum anthropogenic impact. Sable population is decreasing in the territories where oil and gas fields are actively exploited. Total populations in the Khanty-Mansiysk region for the recent years as 15-56 thousand individuals (average – 45 000), in Yamalo-Nenetskiy region – 5-20 thousand (Figure 4). It is the most valuable hunting object. It has an important economic significance for local hunters.

Figure 4. Sable population dynamics (thousand individuals) Khanty-Mansiysk region – blue, Yamalo-Nenetskiy region – red.

American mink – *Neovison vison*, is nowadays a wide-spread species. Translocations of American mink had begun in 1935-1940 when 222 animals were released in the Khanty-Mansiyskiy region on the rivers Konda, Agan and Kontseyakh (Pavlov et al., 1973). In the beginning, minks were spread along the rivers' inflows and later were noticed in some places till the end of 1940 (Vasilyev, 1947). In 1950, translocations of minks was expanded. Animals were released in the rivers Nazym, Kunovat and Kazym. Further

acclimatization surveys showed that the Surgut district of the Khanty-Mansiysk region is considered to be the most suitable area for minks. The large harvest region was created there (Vorontsov, 1972). Minks released in other places were running away, and were met in unusual places and were gradually disappearing (Chesnokov, 1967). The actual mink areal is the northern border which goes between the northern and middle taiga (app. 62° N). Minks found more suitable conditions for their existence along small water passages in large rivers floodplains – Ob and Irtysh. Minks can also be met on flow lakes (Sinitsyn, 1984). The mink's settling is very uneven. It prefers highly trashed small and middle-sized rivers rich with fish and amphibians. During the winter period, it can be seen far from the water tanks. Mink feeds on fish, amphibians, crayfish, shellfishes, small birds and rodents. It uses river banks' hollows washed in trees' roots and formed under sunken ice as shelter in winter. Minks avoid water tanks polluted as a result of industrial accidents. In the Yamalo-Nenetskiy region, mink inhabits only the southern part of the Purovskiy district. Here its population is not big and is made up of 4-6 thousand individuals. In the Khanty-Mansiysk region, the number of minks is considered to be 11-17 thousand individuals. In present time mink harvest is limited.

Mountain hare – *Lepus timidus* is a usual settled species, widely spread on the whole territory of West Siberia from the tundra to loess steppe. For this animal, more suitable habitats are interlaced with forest and open places due to its mostly successive nature. Due to this characteristic, hare mostly tends to secondary forests which include scrub of deciduous trees of burned grounds and fellings together with willow brushwoods along river plains and swamps. The species escapes entire forest massive and large swamped areas and instead prefers forest and swamps boundaries. Its normal habitats could be as insular floodplains' forests as bushes. In summer, hare mainly feeds on herbaceous plants, partially leaves and bines of scrub. In winter, its diet consists of branches and barks of willow, aspen, and rarely birch trees. Sometimes hares eat bark and bines of young pine trees (Ponomarev, 1980). Negative effects on their population number include bad weather conditions during spring, as well as the increase in precipitation in warm periods which can cause different diseases (tularemia, pasterellosis, pseudotuberculosis, infestations). Populations with high density, in the swamped taiga regions especially suffer from these types of diseases (Kontrimavicius, 1956). Diseases lead to animals' mortality and decline in the population's reproduction abilities. High and continuous river floods cause hares' population decrease in flood lands. Many of them, especially siblings, die during forest fires, as well as due to sanguivorous insects and ticks (Bakhmutov, Azarov, 2000). Mountain hare population dynamics is very high and can changed a lot over the years. Big "harvests" usually occur one time per 10-15 years. Anthropogenic transformations do not usually influence hare populations. The hare population in the Khanty-Mansiysk area for last 20 years is estimated to range from 65 to 150 thousand ind. In the Yamalo-Nenetskiy region estimates are from 116 to 208 thousands individuals. For the described region, the average density of mountain hare in dark coniferous forests and pine-shrub-sphagnum swamps makes 1-2 individuals per 1000 ha. At the end of winter, it finds the most suitable conditions in foliar forests (up to 5 individuals per 1000 ha). It is an important object of amateur hunt. Harvests are mainly used for private purposes.

Conclusion

Thus, industrial intrusion into the taiga region of the territory of West Siberia especially affects the distribution and population characteristics of reindeer. It has some negative effect on moose population as well. At the same time, bear and sable species suffer much less from anthropogenic factors and an increase in its populations is marked in some regions. Mountain hare, American mink and some other hunting species kept their dynamics in connection to habitat conditions changes.

Acknowledgment

For help in current research we would like to acknowledge the vice-governor of the Khanty-Mansiysk (Yugra) region V.T. Bobylev, the Head of the Forest Recourses Use Committee of Khanty-Mansiysk (Yugra) region A.V. Makarov, the Head of the hunting control department of Khanty-Mansiysk (Yugra) region L.V. Gubin, the senior hunt inspector of the hunting control department V.A. Bornovolokov, the Head of the Purovskiy Biorecources preservation department Yamalo-Nenetskiy region B.K. Sattarov, the Head of the game management department M.V. Bakhin, hunt inspectors of the Purovskiy district hunt department Yamalo-Nenetskiy region V.A. Valashko и A.A. Polokhalo.

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Received: 01.07.2014.

Accepted: 17.12.2014.

Piminov V. N., Sinitsyn A. A., Saveljev A. P. (2014) Distribution and population characteristics of game mammals of West-Siberian taiga – trends from “Perestroyka” beginning, *Balkan Journal of Wildlife Research*, 1(1), pp. 62-68.