Features of seasonal migrations and wintering of epy elks (Alces alces) in the Kuznetsk-Salair mountain region

N Skalon1*, P Stepanov1 and A Prosekov1
1 Kemerovo State University, 6 Krasnaya str., Kemerovo 650000 Russia

E-mail: nskalon@kemsu.ru

Abstract. The article presents an analysis of elks seasonal migrations in the Kuznetsk-Salair mountain region, where a largely independent population of the species has developed. Its core is located in the administrative boundaries of the Kemerovo region. In snowless and little snow periods, elks are diffusely located in forest areas of the region. In the Kuznetsk-Salair mountain region, seasonal migrations of moose are caused by the need to move from the snowy slopes and foothills of the Kuznetsky Alatau, the Gornaya Shoria, and the Salairsky ridge to the little snowy slopes of the eastern exposition, to the steppe and forest-steppe parts of the Kuznetsk Basin and the Marinskiy-Tisulsky forest-steppe areas. In some places, these migrations are cross-border in nature, affecting the administrative territories of the Altai and Krasnoyarsk Regions, the Republics of the Gorny Altai and Khakassia, and the Novosibirsk and Tomsk Regions. After the depression of the beginning of the last century, up to 24 winter camps were formed when the elk reappeared on the territory of the Kemerovo region (Kuzbass). Local animals from the Kuznetsk Alatau and Gornaya Shoria and animals from the adjacent areas of the Altai, Novosibirsk, and Tomsk regions migrated regularly to these sites. At the same time, a part of elks from the Kuzbass southern regions migrated to the territory of Altai and Khakassia. In the 1960s and 1980s, the elk winter sites were clearly localized, up to 300-500 animals were concentrated in the largest of them. In the Kemerovo region, a system of regional specially protected natural areas (SPNA) was created. In the 1990s, in the period of the decline in the number of elks, about 15 winter sites remained. And since the 2000s, many wintering sites have become diffuse, seasonal migrations have changed. Currently, with the exception of 4 large sites, in the Kuznetsk Basin, most elks do overwinter in small herds from 2-3 to 20-30 head. They are dispersed in forest areas with low snow cover, well protected or difficult to access for snowmobile transport.

1. Introduction
The Kuznetsk-Salair mountain region occupies the north-western part of the mountains of Southern Siberia, and it is clearly divided into four physiographic provinces [1]. The Kuznetsk forest-steppe basin is located in the center. It is framed by the mountains from three sides: the Salair ridge from the west, the mountain ridge system of Shoria from the south, and the Kuznetsk Alatau from the east. About 80% of the geographical Kuznetsk-Salair mountainous region is within the boundaries of the administrative Kemerovo region (Kuzbass). The western slope of the Salair ridge is divided between the Novosibirsk region and the Altai region, the southeastern slope of the Kuznetsk Alatau, and the Abakan Range is located within the Republic of Khakassia.

In the period of depression in the first half of the twentieth century in Western Siberia, the formerly complete elk habitat got fragmented and narrowed to the southern taiga subzone. At the same time, in
the basin of the upper course of the Ob, an area gap of more than 500 km wide from west to east has been formed. The whole territory of the Kuznetsk-Salair mountain region entered this gap [2]. The elks did not reside permanently in this territory [3, 4]. Only isolated visits from the northeast were recorded [5].

In the late 1940s, the reintroduction of elks into the territory of the Kemerovo region and their subsequent penetration into the Kuznetsk-Salair mountain region began. In 1947-1949, the elks were noted in the northern and eastern regions of Kuzbass, which indicates their introduction from the territory of the Krasnoyarsk and Tomsk Regions. The number of elks grew rapidly. Already in 1952, it was proposed to open a hunt for them in the north-eastern Tyazhinsky and then in the Tisulsky districts. However, hunting for elks in the Kemerovo region was opened only in 1960, when their number reached 2 thousand. The number of elks exceeded 7 thousand individuals by the end of the 1970s. They settled all suitable habitats and formed about 24 large winter sites in low-mountain and low-snow areas in the territory of Kuzbass. In the 1980s, the decline in elks’ numbers began as a result of overfishing. By 1994, the elk population had declined to 1,850 individuals with increasing poaching and an increase in the number of wolves from 200 to 400 individuals. In the 2000s, the nature of wintering and the migration routes of elks changed significantly. Since 2005, a stable increase in the number of elks begins in the conditions of improving the work of hunting users, state hunting authorities and the almost complete extermination of wolves. In 2017, a number of elks exceeded 5 thousand individuals and continues to grow.

2. Materials and Methods

From 2014 to 2019, the authors conducted field studies to study the migration of elk in the Kuznetsk-Salair mountain region, analyzed the results of departmental winter route surveys (WRS). In 2019, the UAV (Supercam, S250 model) was used to observe the migration of elks in the territory of the Salair reserve (zakaznik). In addition, a survey of district inspectors, hunting specialist, huntsmans, SPNA staff, local hunters, and local historians was conducted. Scientific publications on the topic of research and departmental reports on the registration of the number of elks, on their official prey and other reasons for their death in the Kemerovo region from 1950 to 2018 were also analyzed [6].

3. Results

In the snowless summer-autumn period, the elks are diffusely distributed throughout the forest areas of the region, both in the plains and in the mountains. In winter, the elks are forced to concentrate on limited areas with snow cover not exceeding 70-80 cm. Accordingly, the seasonal migrations of moose in the Kuznetsk-Salair mountain region are caused by the need to move from the snowy slopes and foothills of the Kuznetsk Alatau, Gornaya Shoria and the Salair ridge, to the relatively little snowy slopes of the eastern exposure, and to the low snowy steppe and forest-steppe areas of the Kuznetsk basin and the Mariinsky-Tisulsky forest steppe areas. In some places, these migrations are cross-border in nature, affecting the administrative territories of the Altai and Krasnoyarsk regions, the Republics of the Gorny Altai and Khakassia, and the Novosibirsk and Tomsk regions (Fig. 1).

In the second half of the twentieth century, the elks formed up to 24 winter camps with the most favorable wintering conditions in the Kemerovo region. Animals from the western macroslope of the Kuznetsk Alatau, Gornaya Shoria and the foothills of the Salairsky, including from adjacent areas of the Altai and Novosibirsk Regions, began to migrate there regularly. At the same time, part of the elks from the southern regions of Gornaya Shoria migrated to the territory of Altai and Khakassia. In the 1960-1980s, the elk winter sites were clearly localized. In a limited area, up to 300-500 animals were concentrated in the largest of them.
Figure 1. Migration routes and winter camps (sites) in 1993/1994 and in 2018/2019 (Winter camps: 1 – Sary-Chumyshskaya, 2 – Bungarapsko-Azhendarovskaya, 3 – Saltymakovskaya, 4 – Salairskaya).

In the 2000s, only 4 large and long-standing winter sites remained in the Kemerovo region. The largest of them is located on the border with the Altai Region in the basin of the Sary-Chumysh River. The accumulation of more than 300 elks was noted here in the winter season 2018 - 2019.

The second site is located on the Azhendarovsky Range, jutting into the central part of the Kuznetsk Basin, within the boundaries of the Bungarapsko-Azhendarovsky reserve. In the season 2018-2019, the 80-90 elks are counted here. The Zhendarovsky range is separated by the Tom River from Saltymakovsky, which branches off from the Kuznetsk Alatau in the western direction. The Saltymakovskiy reserve is located here. In the season 2018-2019, about 70-80 elks hibernated in it. The fourth winter site is located in the northeastern part of the Salair ridge along the border with the Novosibirsk and Altai regions, where about 60 elk are counted. The territory of the winter sites is guarded within the boundaries of the Salair reserve.

In recent years, most elks winters in the Kuznetsk Basin and in the northern lowland areas of the Kemerovo region in small groups of 2-3 to 7-10 individuals, sometimes up to 20-30 individuals. At the same time, animals keep in relatively small low snow forests with good fodder and protective properties. In accordance with changes in wintering patterns, the elk migration routes have also changed significantly.

Currently, a number of single long-distance migration routes with a length of more than 100 km are well defined. On these routes, the elks gather at large sites in the Sary Chumysh river basin and on the Salair ridge. The trajectory of the routes through the Kuznetsk Basin, which crossed major highways, including the highway under construction between Kemerovo and Leninsk-Kuznetsky, has changed significantly. The number of elks migrating along this route has decreased.

4. Discussion

In southeastern Western Siberia, the migration of elks was largely cross-border in nature, affecting the administrative territories of the Altai and Krasnoyarsk Regions, the Republics of Altai and Khakassia,
and the Novosibirsk and Tomsk regions. The main part of the elk population living in the Kemerovo region during the period of seasonal migrations did not practically go beyond the limits of the Kuznetsk-Salair mountain region. So, the elk from the western slope, administratively related to the Novosibirsk and Altai regions, came to the winter stands located on the eastern slope of the Salair ridge. In the past, in the Sary-Chumysh river basin dividing the Salair ridge and Gornaya Shoria, the elk migrated from the Altai region. At the same time, wolves came after them. At the same time, part of the elk from the eastern regions of the Gornaya Shoria migrate to Khakassia, from the southern regions to the Republic of Altai and from the western areas of the Gornaya Shoria to the Altai Region [6], [7].

Since the 2000s, the cross-border migrations of elk have decreased significantly. In summer time, the elk inhabiting the Kuznetsk Alatau, Kuznetsk Basin, Mariinsky Taiga, practically do not go beyond the administrative borders of the Kemerovo Region. In recent years, the moose migrating to the Sary-Chumysh valley from the Altai Region ceased to be noted, and the elk migration from the Krasnoyarsk and Tomsk regions to the northern Kuzbass regions ceased.

5. Conclusion

Over the past 20 years, the nature of migrations and winter sites has undergone significant changes associated with anthropogenic factors: the impact of hunting, anxiety from snowmobile transport, construction of high-speed motorways, and an increase or decrease in wolves. Since the late 1990s, large sites have almost gone. Most elk in the Kuznetsk Basin hibernate in small herds, usually in 3-10 individuals of heads, dispersed in forest areas that are favorable for wintering and difficult to access for snowmobile vehicles and with low snow cover. In addition, a number of co-wintering elk depends on the area and feeding area.

We believe that the population of elks living in the territory of the Kuznetsk-Salair mountain region and in the northern regions of the Kemerovo region has adapted to the new conditions that have developed in the past 15 years. They are characterized by the absence of wolves and a changed factor of human anxiety. With the widespread use of snowmobiles and their illegal hunting, large concentrations of elk in the winter camps have become more vulnerable. Especially if these sites are poorly guarded. It is easier for small herds and groups to find remote areas for the winter camp. A small group of elk can feed themselves on a small area without making long-distance crossings and remaining inconspicuous for hunters and poachers.

References

[1] Mikhailov N I 1968 Mountains of Southern Siberia: Physical-geographical zoning of the USSR (Moscow, USSR: Moscow State University Press)
[2] Heptner V G, Nasimovich A A, and Bannikov A G 1961 Mammals of the Soviet Union: Even-toed ungulates and Non-even-toed ungulates (vol 1) (Moscow, USSR: High School)
[3] Baranov P V, and Zaitseva A E 2002 Status and prospects of using the elk population in the Kemerovo region InEka Eco-Bulletin 6(77) pp 16-17
[4] Yanushevich A 1931 Inspection of the hunting industry of Gornaya Shoria: Materials on the study of Siberia (vol 3) (Tomsk, USSR)
[5] Laptev I P 1958 Mammals of the taiga zone of Western Siberia (Tomsk, USSR: TSU Publishing House)
[6] Website Archive fund of the Kemerovo region 2019 Reports on the work of the hunting management department at the Kemerovo Regional Executive Committee and reports of the Department for the Protection of Objects of Fauna of the Kemerovo Region (1951-1998, 2008-2018) Available at: http://afond.kuzbassarchives.ru/index.php?act=fund&fund=181 (Accessed 02 03 2019)
[7] Bondarev A Ya, Zhuravlyov V B, and Petrov V Yu 2013 On the dynamics of the number of wolves and elks in Western Siberia Vestnik of the Altai Agricultural University 7(105) pp 56-62