

# Condition of population of European bison in northern region of Russia

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**Abstract:** The history of European bison introduction in the northern region of the European part of the Russian Federation is discussed. During year 1991–2011 20 European bison were released in the Vologda region. The introduced animals preferred the area of 600 hectares within the Ust’Kubenskoye hunting district. Actually herd of 40 animals is observed. There are no problems in reproduction and animals can survive hard conditions in the north.

**Keywords:** Vologda region, European bison, hard condition

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For more than sixty years the biologists have been facing an extremely difficult task of saving the European bison (*Bison bonasus* L., 1758) from extinction.

Elimination of the threat of bison’s disappearance brings the problem of further retaining of the species – the inhabitant of a modern ecosystem. Breeding of closely related individuals often seems to be unavoidable and results in a decrease of viability of the offspring, reduction of fertility in females and sexual activity in males. Moreover, under the conditions of breeding in the breeding centres and zoos, they acquire the features of pampered animals of reduced flexibility. Thus, a development and implementation of basic scientific principles streamlining further retaining and increase of bison numbers by creating of free-ranging populations are extremely topical. Restoration and creation of free-living herds within the former range of the species faces serious difficulties resulted from the fact that the area becomes increasingly affected by anthropogenic pressure.

The possibility of creation of a free-ranging bison population in the northern region of the European part of the Russian Federation, the main objective of the Project, has been studied and special attention has been paid to: the selection of the area, identifying of a maximum living space, the issues of animals’ protection, and the possibility of migration between the populations. The completely virgin areas have probably almost disappeared, but still vast areas close enough to natural conditions suitable for the species remain. The

Vologda region may be of a great interest as the range area of the species, mainly within its former range, is covered with deciduous and mixed forests, with soft or moderate climate and little snow cover. Thus, the objectives of the Project are as follows:

- to make a survey of areas suitable for introduction of the European bison;
- to create a free-ranging bison herd in the northern part of the Russian Federation;
- to detect the biological peculiarities of the animals and their adaptation to the new living conditions.

To meet the objectives, 20 heads of European bison were brought to the Vologda region and released there in the years 1991–2011. The area under investigation covered 553,000 hectares conditionally suitable for the introduction of the species, inclusive of 405,000 hectares of the forest area. The introduced animals preferred the area of 600 hectares within the Ust’Kubenskoye hunting district. During the implementation of the work, a method of creation of a free-ranging bison population in the conditions of the northern region of Russia has been developed.

According to the forestry classification, the area belongs to the sub zone of the southern taiga. The climate is moderate continental with a continual moderately cold winter, short spring, relatively warm summer, and wet autumn. The period with temperatures below 0° C covers 150–165 days and the temperature of –15° C lasts for 55 days, and of + 10° C lasts for 110 days. The average monthly precipitation ranges from 26–74 mm, the relative humidity varies from 67–88%. Wind speed may change from 3.8–5 m/sec. The thickness of snow cover is 50–95 cm.

The predominant type of terrain is the terraced glacier-lake plain with a dense network of rivers and springs. The availability of small upstream marshes is also not excluded. The altitude is about 103–105 m a. s. l. The soil of the area is mainly of podsol, turf-carbonate type.

In the area, a considerable forest tracts alternates with mowing spots, glades and fields. Forests occupy not less than 50–70% of the territory. The desirable type of the forest is deciduous one. Coniferous species may dominate within the forest but the share of aspen, willow and alder comes to not less than 15%. The forest glades, mowing spots and meadows have the composition of herbs corresponding to the phytome of a dry valley.

The estimated home range of a herd consisting of 40 individuals covers up to 30000 hectares. The higher migration activity is observed in autumn. In general, the movements of bison depend on the extent of their mobility and the depth of the snow cover in winter. The area where the herd lives is characterized by a rich species composition of forest phytocytes that create a sufficient feeding base for the animals introduced.

Bison eat variety of plants but cereals as well as composite, rosaceous, leguminous, umbrelliferous and willow family plants constitute the major part. In total, 32 families of herbs consumed by the bison were detected and 6 types of willows which were most eagerly eaten by the animals. During summer, the base of the bison diet is composed of meadow and forest grasses. In autumn the role of browse forage increases and it constitutes the base of the winter diet. Diameter of the twigs consumed ranges from 1 to 1.5 mm. Supplementary feeding bison on hay and crushed grain during winter is being conducted on a random basis and is brought to a minimum. The chemical analysis of the plants consumed by bison revealed that the browse forage was characterized by a great variety of nutrients capable of satisfying the animals' needs.

The coprological analysis showed a low level of infestation with parasites of the bison living in the Vologda region. Moreover, one should notice lack of any pathological symptoms both among the mature and the younger animals.

High inbreeding (25%) is characteristic for a considerable number of animals both imported and born in the wild. Moderate inbreeding (3.12%) is a feature of single individuals only, brought mainly from the forest reserve.

During the acclimatization period all adult females displayed good fertility. Calving with twins was observed twice. Coefficient of reproductive capacity of the female bison was, on average, 1 calf per 1.5 years ( $CRC = 0.616$ ).

The coefficient of the genetic similarity among the animals increased to more than 62%, which testifies to the restricted possibilities of inter-herd breeding.

At present, the free-living population numbers 40 (18,22) heads and is located in the Ust'Kubenskoye hunting district. In the Vologda region conditions the population processes proceed without any influence of man and are totally dependent on the seasonal rhythm of the environment changes. Adaptation to the climatic conditions, utilization of a wide range of tree and shrub plants, and successful breeding of European bison lead to the conclusion that acclimatization of the species under the conditions of the northern region of Russia was successful. The issues being studied and a number of other ones adding to the characteristic of the species demand for further and thorough researches in the following directions:

- implementation of the environment monitoring;
- study on bison's micro-fauna;
- use of various types of forage;
- comparative characteristic of bison diet in different regions inhabited by bison;
- bison ethology;
- health status of the animals.

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**Warunki bytowania populacji żubrów w północnym rejonie Rosji**

**Streszczenie:** Przedstawiona jest historia introdukowania żubra w północnym regionie Europejskiej części Federacji Rosyjskiej. W latach 1991–2011 dwadzieścia żubrów wypuszczono w rejonie Wołogdy. Wypuszczone zwierzęta preferowały obszar 600 hektarów w obrębie łowieckim Ust’Kubenskoye. Obecnie stado liczące czterdzieści żubrów jest obserwowane. Nie stwierdza się żadnych problemów w rozrodzie i żury dają sobie radę w trudnych warunkach północy.

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