

# **Current state of European bison population “Osipovichskaya”**

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**Abstract:** The paper presents the history and dynamic of one of Belarussian populations of European bison “Osipovichskaya”. In 1997, 15 animals were released there and present population size is equal to 308 individuals. Dynamics of size, growth rate, birth index and causes of mortality are discussed. During years 1997–2014 total number of calves born equals to 295 but only 30 individuals died or were eliminated.

**Keywords:** European bison, ecology, population size, growth rate, birth index

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## **Introduction**

The current population of free-living European bison in Belarus is equal to 1,283 individuals. This high value was achieved, through application of the concept of a dual status of the species and metapopulation model (Sushchenya and Kozlo 1994). Based on the first phase of “The program for conservation, distribution and use of European bison in Belarus” in various regions of the republic new reintroduced herds of European bison were established. Annual population growth rate since 1995 was equal to 7.4%. Currently, the most dynamic growth is observed in “Osipovichskaya” population.

## **Environmental conditions**

The described population is located in central Belarus, at the territory of Mogilev region, Osipovichi district. Forests in this area, belong to the forests of the subzone of hornbeam-oak-conifer forests. There are the most widespread deciduous forests (30.6%), deciduous saplings (11.2%), deforested grounds, waste grounds, glades, hayfields (22.4%), 9.0% alder. As for dry land there is relatively small part of pine forests (5.9%) and spruce (8.8%), i.e., coniferous forests are much less common than in other forests in midland Belarus. Forests are characterized by high completeness regarding a number of species of well-developed undergrowth that provides forage for European bison and other ungulates (Cervidae family). Large reserves of browse are in the stands of oak, aspen, hornbeam, ash and other deciduous spe-

cies. An important environmental factor improving conditions for European bison is the presence of glades, meadows, and overgrown clearings where grass cover is well developed. In late summer, the trophic value of alder stands increases due to well-developed herbaceous vegetation, which longer than in other types of forest maintains its quality and is eagerly eaten by European bison.

The largest feed reserves are concentrated in clearings, forest clearings, abandoned meadows, glades, deciduous young stands, small-leaved forests and swamps. The total biomass available there equals to 253.8 thousand tons. This amount is sufficient to supply food for European bison and other ungulates in the vegetative period (since April until October). Based on the analysis of carrying capacity of the area the optimal number of wisents was determined there for 120–130 individuals.

In February-March 1997 from the National Park “Belovezhskaya Pushcha”, 15 wisents of various age and sex were introduced to Osipovichsky forestry. They were in a condition providing good potential for reproduction and growth of new population. This circumstances, as well as the favorable environmental conditions within the area of reintroduction, led to the successful process of adaptation and population development..

## **Materials**

Main part of data was collected and processed under the supervision of the former head of the theriological laboratory of The State Research-Production Association “The Scientifically-Practical Centre of the National Academy of Sciences of Belarus for Bio-resources” Piotr Kozlo, who died in 2013.

## **Results and Discussion**

As it is seen from the data in the Tabl. 1, during 18 years the size of population has increased from 15 to 308 individuals. In fact the population size has increased 20.5 times, which is a good indicator for the species. But in the last two years there were some difficulties to count the number of animals because of the high numbers of animals in particular herds. From year 1997 to 2006, 67 calves were born. On average 6.7 calves were born annually. Especially high number of calves (45) was observed in 2013, and (52) in 2014. The birth rate ranged from 8.3 to 33.3%, (17.3% on average). Compared to other European bison populations, Osipovichskaya has minimal loss: one yearling was killed by poachers, one male with severely injured forelimb was eliminated, as well as one 6-year-old male with broken scapula. Recent causes of death were collisions with railway. In total 30 individuals died during 18 year period. Among them: 7 individuals died from natural causes and 23 have been eliminated. Diseases and mortality cases due to other reasons were not revealed.

**Table 1.** Population dynamics of a European bison population “Osipovichskaya”.

Year	Total number of individuals	Increase or decrease rate [%]	No of calves born	Birth index [%]	Animals which died naturally	Eliminated animals
1997	15	–	3	20,0	–	–
1998	18	+20,0	3	16,6	–	–
1999	21	+16,0	7	33,3	–	–
2000	28	+33,3	4	14,3	–	–
2001	32	+14,3	6	18,7	–	–
2002	40	+25,0	4	10,0	–	1 (1,0)
2003	50	+25,0	12	24,0	1 (1,0)	1 (1,0)
2004	59	+18,0	8	13,5	–	4 (2,2)
2005	63	+6,7	11	17,4	–	–
2006	72	+14,3	9	12,5	–	–
2007	92	+27,8			–	2
2008	114	+23,9			–	4
2009	128	+12,3	24	18,8	2 (2,0)	1 (1,0)
2010	152	+18,8	14	9,2	–	5 (5,0)
2011	186	+22,4	33	17,7	–	1 (1,0)
2012	204	+9,7	17	8,3	1 (0,1)	–
2013	254	+24,5	45	17,7	3 (1,2)	2 (2,0)
2014	308	+21,3	52	16,9	–	2 (2,0)
<b>Total</b>	–	–	<b>295</b>	–	<b>7 (4,3)</b>	<b>23 (15,2,6)</b>
<b>Average</b>	–	<b>19,6</b>	<b>16,4</b>	<b>17,3</b>	–	–

According to those data, European bison population Osipovichskaya develops successfully, it has reached a considerable size, and is only slightly affected by negative influence of anthropogenic factors (poaching).

Due to recently mild winters and large reserves of natural forage, those bison do not visit the places of supplemental feeding regularly. During the increase of population numbers and density, wisents expanded their area of occurrence far away from the enclosure. There has been a shift in their spatial distribution towards north-west direction. After 3 years from the release, animals mostly occur within forest ecosystems, but by the autumn of year 2000, they reached agriculture fields located in straight linesome 10–12 km away from the enclosure. Since the beginning of last year, the agricultural fields that are surrounded by forests have become a major “pasture” for *E. bison* in the autumn, winter and early spring. In year 2003 some damages were observed including 50–70% of winter rape at the area of 90 hectares, winter rye – 50 hectares and 30 hectares of winter triticale. Nowadays, the amount of such damages increased by 4.5–5 times.

The present range of European bison population covers large areas of agricultural fields, which are from three sides surrounded by forests. Such combination

of habitats creates high quality wisents' forage (field) and cover (forest) conditions. Therefore chances for separation of wisents from the agriculture are problematic. The best idea to mitigate this problem would be to rent some of the fields adjacent to the forest, and manage them according to seasonal needs of animals, and/or development of foraging plots designated for wisents at overgrown, abandoned areas. Forest ecosystems on this area are relatively highly mosaic. The area is intersected by landscape channels, willow thickets, and meadows with well developed herbaceous vegetation representing a large diversity of plant species. Many of them are a part of European bison diet and occur in large quantities.

## Conclusions

European bison population “Osipovichskaya” has successfully developed, reached a high number, has good viability, and very low level of losses due to diseases, injuries, and negative influence of anthropogenic factors. The current population size equals to 308 individuals. Long-term birth index is on average 17.3%, and growth rate – 19.6%. Presently the population requires an approach allowing for its efficient use due to migration of animals to other habitats. Because of its present high numberize, the population has significant negative effect upon agricultural fields within its home range.

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### Aktualna sytuacja populacji żubra „Osipovichskaya”

**Streszczenie:** W pracy przedstawiono historię oraz dynamikę populacji żubra bytującej w Białorusi “Osipovichskaya”. W 1997 roku wypuszczono 15 żubrów, a aktualna wielkość populacji to 308 osobników. Omawiana jest dynamika wielkości populacji, tempo wzrostu jej liczebności oraz współczynniki rozrodczości i poziom śmiertelności. W okresie lat 1997–2014 urodziło się w tej populacji 295 cieląt a jedynie 30 zwierząt padło lub zostało wyeliminowanych.

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