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The present state of the Pripyat grouping of the Lowland European bison (*Bison bonasus bonasus* L.)

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Abstract: The work presents data on sex and age structure, population dynamics and growth of the Pripyat grouping of the European bison in Belarus. Presented are data on this population between 1987 and 2017.

Key words: European bison, Belarus, Pripyat grouping, numbers, population structure

Introduction

The present fauna of Belarus includes about 80 species of mammals. The largest of its representatives is the European or Bialowezha bison - *Bison b. bonasus* L. This species is an example of how timely actions led to the salvation from the complete extinction. The European bison both inhabits and is maintained in captivity in 33 countries with a total of 5,553 individuals (at the beginning of 2015), of which 3,543 animals dwells in the wild. Belarus made a significant contribution to the revival, increase in numbers and the study of European bison. In Belarus, a “metapopulation model or strategy” was developed and partly implemented to preserve the Belovezhskaya population of the E. bison in 1994–2000 (Kozlo 1999). On the territory of Belarus the species is distributed unevenly, in the form of separate populations. The current number of E. bison in Belarus minimizes the threat of their extinction, but does not ensure the long-term preservation of this species. At present, there are 9 such groups, of which 1 was formed in 2013. The number of E. bison in Belarus (as of December 2017) was 1827 individuals.

On the territory of the GPU “National Park Pripyatsky” there are three herds: Ozeran, Naidyanskaya, Laskovichi, which jointly form so called Pripyat grouping. The number of E. bison in these three herds was 100 individuals or about 6% of the total numbers of this species in Belarus.



Materials and methods

The following methods were used to record population numbers of E. bison in Belarus: visual observations at feeding grounds and towers, questionnaire survey of the game service representatives for monitoring observations and year-round identification of observations and E. bison tracks. Visual methods were used in the winter period when animals aggregate into relatively large herds and visit feeding grounds and agricultural fields. In case of difficulty in visual inventory, photographs were taken in order to determine the number of individuals in a large herd, according to which the number of animals in the herd was established in office conditions.

Results

The Pripjat grouping of E. bison began to form in 1987. The founders of the Ozeran herd were E. bison brought from the Prioksko-Terrasny reserve. Later, animals were supplemented into this population from the National Park “Belovezhskaya Pushcha”. The Lyaskovichi herd was established in 2005, and Nyadyanskaya in 1999. The founders of these herds were individuals from the National Park “Belovezhskaya Pushcha” (Kozlo and Buniewicz 2009). In general, it should be noted that the rate of development (increase of numbers) of this grouping is rather low. The maximum rate of growth (62.9%) was recorded in 1999 and it was because of the creation of the Nyadyanskaya herd. The minimum rate of growth (15.3%) was recorded

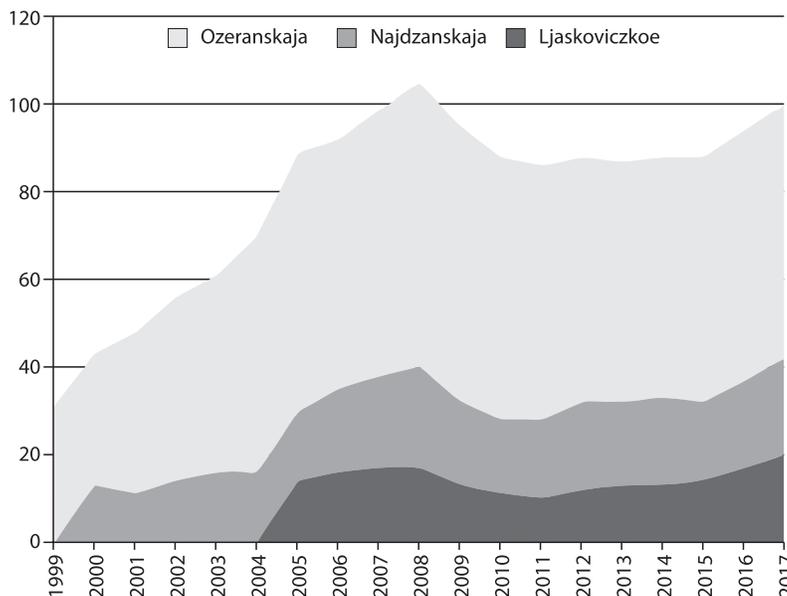


Figure 1. The population dynamics of the Pripjat grouping of European bison.

in 2009 (Fig. 1). The average annual increase of animals' numbers was 8.9%. For the whole Belorussian metapopulation, this value equals to 6.2%. The rather high annual growth is explained primarily not by the birth of young individuals, but by the creation of new herds within this territory i.e. due to the importation of animals.

During the whole existence of the Pripyat group, 164 individuals were born. During the same period, 126 individuals died. The average annual fertility rate for the grouping is 1.75 individuals, with a decrease of 1.67. The annual increment for three micropopulations is about 0.9 individuals/year. For Naidyanskaya and Lyaskoviczskoe herds, in the first five years of their existence, there was no increase in their numbers. The largest annual increase was noted for the Ozeranskaja herd: in average 1.7 individuals/year (Table 1).

Ozeranskaja herd is the largest in the Pripyat grouping. Its home range covers lands of the Ozeran and Rychevskoye forest ranges of the NP "Pripyatsky", a transitional zone between the forest and the field, as well as large areas of agricultural fields. For this herd characteristic are long migrations to the territory of the former Polesie military forestry. Perhaps it may be the reason for high mortality of those animals. By December 2017, this population counted 57 individuals (Table 1).

Table 1. Changes in European bison numbers in the Ozeranskaja herd during the period of free ranging.

Year	Number of individuals			
	Born	Losses	No. by the end of the year	Growth
1999	4	0	31	4
2000	6	7	30	-1
2001	7	0	37	7
2002	7	2	42	5
2003	7	4	45	3
2004	13	4	54	9
2005	11	6	59	5
2006	8	10	57	-2
2007	9	5	61	4
2008	6	2	65	4
2009	8	10	63	-2
2010	6	9	60	-3
2011	7	9	58	-2
2012	4	6	56	-2
2013	3	4	55	-1
2014	2	2	55	0
2015	1	0	56	1
2016	1	0	57	1
Total	110	80		30

In this herd, the proportion of adults (over 4 years) is 87.7%. Calves up to a year – 1.7%. The proportion of yearlings is – 10.5%. Over the past five years, there has been a trend towards a decrease of the proportion of young animals from 46.4 to 12.3%. The sex ratio is also far from the optimal – 1♂: 1,17♀. In the future, these demographic parameters of the population may negatively affect its ability for reproducing.

Naydianskaya micropopulation inhabits the territory of the Naidyansky and Lyaskovichsky forestries of the ELOH “Lyaskovichi” NP “Pripjatsky”. The range of habitats there includes forest complexes with some wetlands, a mosaic of forest and openings, as well as agricultural fields. Such habitat structure is quite favorable for the species. The number of European bison in the Naydianskaya herd was 20 individuals at December 2016 (Table 2). The maximum values of population numbers were recorded there in 2008.

The proportion of adults in the population as of 2016 was 70%. Over the past five years, the proportion of adult animals was fairly stable, amounting to 69.2%. The sexual structure of adult animals is close to an acceptable 1♂: 2,4♀. Despite this, the number of animals born decreased comparing to the year 2011. On average, over the past five years, the number of semi-adult animals was 5.3 individuals. In years: 2013, 2014 and 2016 there was only one individual with an age of up to 1 year.

Table 2. Population dynamics of the Naydianskaya herd

Year	Number of individuals			
	Born	Losses	No. by the end of the year	Growth
2000	1	1	13	0
2001	1	3	11	-2
2002	3	0	14	3
2003	3	1	16	2
2004	2	2	16	0
2005	2	2	16	0
2006	3	0	19	3
2007	4	2	21	2
2008	3	1	23	2
2009	2	6	19	-4
2010	2	4	17	-2
2011	2	1	18	1
2012	2	0	20	2
2013	1	2	19	-1
2014	1	0	20	1
2015	0	1	19	-1
2016	1	0	20	1
Total	33	26		7

The smallest herd of the Pripyat group is the Lyaskovichi. Currently, it dwells within the game reserve “Safari Park”, and has the status of a semi-free, equivalent to a demonstration herd. Its home range is limited by the boundaries of this farm. Forest cover there amounts to 79.0%. Significant part of this area (14.8%) is occupied by open fields and cultivated meadows. Remaining 1.9% consists of openings within the forest.

According to the inventory in 2016, the percentage of adults in the population is about 58.8% of the total number (Table 3). The average number of calves (<1 year) for a five-year period was 1.6, with a maximum in 2016 – four individuals. The average annual increase since the creation of this herd was 2.7%. Sex structure of adult animals is also far from optimal: 1♂:1,5♀. Perhaps in connection with a small number of founders of this herd there is a fairly low increase of its numbers.

Table 3. Population dynamics of the Lyaskovichskoe herd.

Year	Number of individuals			
	Born	Losses	No. by the end of the year	Growth
2005	2	4	14	-2
2006	2	0	16	2
2007	2	1	17	1
2008	2	2	17	0
2009	2	6	13	-4
2010	1	3	11	-2
2011	1	2	10	-1
2012	2	0	12	2
2013	1	0	13	1
2014	1	1	13	0
2015	1	0	14	1
2016	4	1	17	3
Total	20	19		1

Conclusions

At the territory of the National Park “Pripiatskiy” there are three herds: Ozeran, Naidyanskaya, Laskovichi, which are united in the Pripyat grouping. The European bison number in these three herds is ca. 100 individuals or above 6% of the total population of the Belarus. All micropopulations of the Pripyat grouping are characterized by low increase of number. The average annual fertility rate for the grouping is 1.75 individuals, but the mortality indexes are high. Sex ratio of adult animals from the grouping is not optimal: 1♂:1,39♀.

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Aktualny stan grupy stad żubrów (*Bison bonasus* L.) w Parku Narodowym Prypeci

Streszczenie: Obecna fauna Białorusi obejmuje około 80 gatunków ssaków. Największym z jej przedstawicieli jest żubr europejski podgatunku nizinnego *Bison b. bonasus* L. Ten gatunek jest przykładem tego, jak podjęte w ostatnim możliwym momencie działania doprowadziły do uratowania żubra od całkowitego wyginięcia. Żubr zamieszkuje w 33 krajach, w sumie 5553 osobników (na początku 2015 r.), z których 3543 jest w stadach wolnych. Białoruś wniosła znaczący wkład w uratowanie, wzrost liczebności i badania żubrów. Na Białorusi opracowano i częściowo wprowadzono w latach 1994–2000 „model lub strategię metapopulacji” aby zachować populację gatunku. Na terenie Parku Narodowego Prypeci istnieją trzy mikropopulacje: Ozeran, Naidyanskaya, Laskovichi, które są połączone w grupę Prypeć. Liczebność tych trzech mikropopulacji wynosiła 100 osobników lub około 6% całej populacji na Białorusi. W pracy przedstawiono dane dotyczące płci i struktury wiekowej, dynamiki populacji oraz rozwoju tej grupy żubrów.
