

# **The history and current state of the *Bison bonasus* L. population in Western Ukraine**

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**Abstract:** The last bison were eliminated through hunting in Western Ukraine in early 18th century. Numerous attempts to re-acclimatize the species in the beginning of 20th century were not successful. In the second part of the 20th century, during the period between 1965–1980, these animals were brought into five areas in the west of the country, thus, creating the following six populations: three in mountains – and three lowland. In the 1990s, bison numbers reached their peak i.e. 470 to 480 individuals. In the early 21-st century, a decrease of this population was recorded, due to poaching, diseases, forage shortage, and some other reasons. As of 2011, the total number of this species amounts to about 80 individuals. Two sub-populations (Klevan and Nadvirna) ceased to exist while Bukovyna and Tsuman are endangered.

**Key words:** re-acclimatization, population number, increase, sub-population.

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## **Introduction**

According to historical records, European bison were numerous at present territory of Ukraine in the past. They vanished due to intensive hunting and destruction of their natural habitat by changes in land use and management. At the end of the 17th century, only few animals remained available for hunting. The last E. bison in Western Ukraine (in the eastern part of Carpathian Mountains), was hunted in the early 18th century (Nakhlyk 1992). Numerous attempts to re-acclimatize the species early in the 20th century failed. Successful restitution of this species in Western Ukraine has started in the beginning of the second part of the 20th century (Bondarenko *et al.* 1999). Their largest number (470–480 individuals) was recorded in 1991–1992. During the 1990s, mostly due to poaching, diseases, and forage shortage, occurred a decrease in the number of the species (Khoyetskyi 2010). At the beginning of the 21-st century only four sub-populations still exist out of the six sub-populations created earlier (three mountain – and three in plains). Currently, the number of European bison in western Ukraine is estimated for mere 80 individuals.

## **Results and discussion**

In Table 1 given are details about populations of European bison, established in western Ukraine in 20<sup>th</sup> century.

**Table 1.** History of *Bison bonasus* population in the western part of Ukraine

Oblast (District)	Name of the population	Year of establishment	Initial numbers of animals	Termination of population existence	Longevity of population (in years)	Present Numbers of Animals
Volynska	Tsuman	1965	15	–	46	17
Lvivska	Maydan	1965	10	–	46	11
Lvivska	Lopatyn	1980–81	12	–	31	20
Rivenska	Klevan	1967	8	1978	11	–
Chernivetska	Bukovina	1970	19	–	41	about 30
Ivano	Nadvirna	1976	8	1999	23	–
Frankivska		1978	2	1982	8	

First herds were established in Lviv and Volyn regions in 1965. Animals were brought to the area of present Zvirivske Game Hunting Enterprise (Volyn region) twice: on May 21 – ten individuals (5 males and 5 females) and on June 3 – five individuals (1 males and 4 females). These animals were kept for almost six months in a 38 ha – sized enclosure (Tatarynov, Dyakun 1969). Animals of reproductive age made up 80% of the overall number of introduced animals, prevailed groups, in the age of 2 or 3 years. There were also two 8 year old females – these all point to a successful selection of individuals when forming the herd for re-acclimatization. Except for a one-year-old male (named Byedreniec), all the other animals were about the same age, thus, allowing the participation of several males in the reproduction rather than one dominant bull (Tabl. 2).

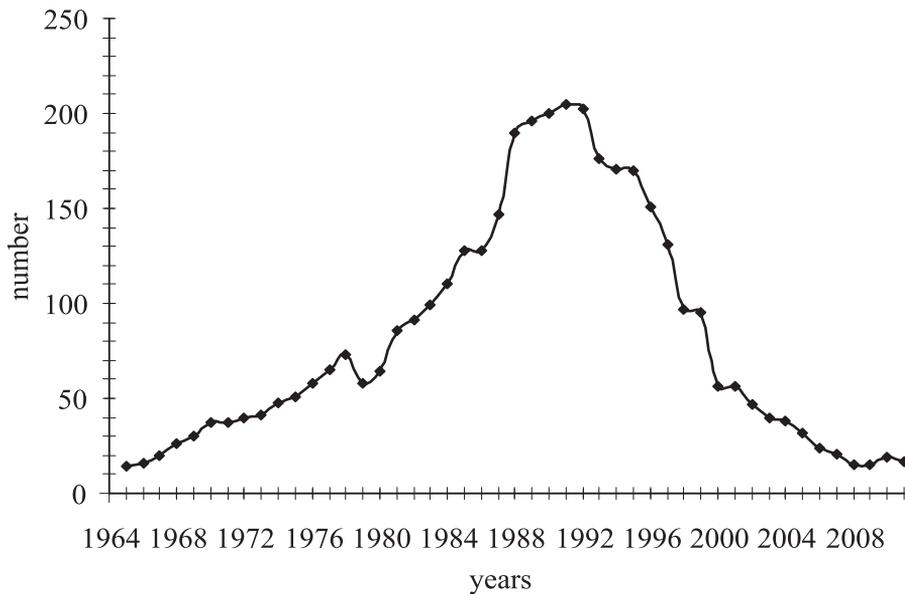
Thus, this bison sub-population originates from 15 individuals of the Lowland and Lowland-Caucasian lines released in October 1965.

In summer 1965, the group was supplemented with three calves, namely: females Bilosnizhka and Bila gave birth to two male calves and Beza gave birth to a male in July. In the same year three bison died: a newborn at the end of June, male Berat in July, and Besposhchadnyi at the end of November. Despite of mortality (in 1968 two more animals have died), the size of the herd increased as follows: in 1966, the herd was constituted of 16 individuals, and 21 individuals in the following year. During the period from 1965 to 1971, seven bison died for various reasons but 29 calves were born (Tatarynov, 1973). In the early 1971, thirty-seven bison were recorded in the area (16 males and 21 females). Females and young males formed together one herd while adult males remained separately as solitary or in groups of two or three animals (1970).

A general trend towards an increase of bison numbers could be observed over a long period of time (over 20 years). Annual increase varied within the range of 2 (1999) to 25.6% (1981), on average 11.6 + 1.4%. However, some

**Table 2.** Register of *Bison bonasus* brought to the game enterprise in Volyn region

Parents		Name of the animal	Date of birth	Gender
male	female			
Puchatek	Byera	Berat	June 1963	male
	Byezaca	Bedrenets	April 23, 1963	male
	Byelianka	Biliachok	September 8, 1964	male
		Bilobrovych	June 1963	male
		Biezhenets	1960	male
	Byezyca	Bezposhadnyi	June 4, 1964	male
		Bila	1962	female
		Bezdna	1962	female
		Bida	1962	female
	Byerloga	Biloborodka	April 25, 1962	female
		Bezha	1957	female
		Bilka	1957	female
	Pul	Byeloduszka	Bilosnizhka	September 1962
Byedowoja		Bezimianka	June 27, 1964	female
		Bezhda	1963	female



**Figure 1.** Dynamics of the numbers of *Bison bonasus* in the Zvirivske Game Enterprise

**Table 3.** Register of *Bison bonasus* brought to the Maydan Game Enterprise

Parents		Name of the animal	Date of birth	Gender
male	female			
Pustosoz	Pliszka	Behoniia	August 22, 1952	female
	Byeta	Bezdna	May 3, 1955	female
	Purpura	Besiedka	May 3, 1955	female
Puchatek	Byeza	Berendei	November 7, 1960	male
	Byezumnaja	Bezumets	May 17, 1963	male
	Byerdanka	Berdiansk	May 11, 1963	male
		Beha	1965	female
Pul	Begonia	Bezsmertnyi	June 21, 1960	male
	Byeljanka	Belena	May 11, 1962	female
	Byeloczka	Belohlazka	June 1963	female

years of decrease (1979) or years without increase (1971 and 1986) were recorded during 26-year period. Since 1992 though, there was a decrease, at average level of  $17.5 \pm 4.6$  annually (Fig. 1).

During the period from 1992 to 2011, due to intensive forest use and an increase of disturbance by hunting and poaching, the number of the bison decreased by 93.0%. Currently, the total number of animals there dropped to 17 individuals.

There are two sub-populations of E. bison in Lviv region: one in the mountain area and the second one in the plains. First, bison (10 animals: 4 males and 6 females) were brought to the region of Skolivski Beskydy, to the Maydan Game Enterprise in May 1965 (Tabl. 3).

According to the recommendations regarding the age and sex structure of the population, the selection of animals brought to the Skolivski Beskydy was satisfactory. Taking into consideration the fact, that only two males and three females have matured, and cows produced calves once every 2 or 3 years, the rate of the population growth over first couple of years can be considered as acceptable. In the period between 1965 and 1971, 14 calves were born. As a rule, bison females give birth to one calf and rarely to twins. Two calves were born every year at Skole, only one calf was born in 1967, and three calves in 1971 (Khoyetskyy 2002).

European bison that were brought to the Skolivski Beskydy, were kept in a 4 ha-sized enclosure for about two years. Since feeding them with beets and potato during winter caused health problems, the animals were released to the wild in April 1967. An increase in the Maydan sub-population had been recorded until the end of 1980s. The average annual increase was  $12.6 \pm 1.5\%$ .

Thirty one individuals were recorded there in 1980 (14 males and 17 females). In the period between 1980 – 1984, 8 calves were born, and 7 adult animals died, mostly in winter, presumably due to food shortage, which happened at the time when animals were kept within areas of their release. In the 1990s, birth and death rates varied greatly. In various years 1 to 7 bison calves were born and 2 to 4 adults died. There were years, however, when no calves were born at all. In this period however, a decrease in bison numbers was mostly due to poaching.

There were no systematic observations made about the process of re-acclimatization of European bison in the Carpathian zone. It was not until the establishment of the Skolivski Beskydy National Natural Park, that the study on the species feeding behavior, spatial distribution, migration patterns etc. in mountain conditions has been initiated. In the course of the study, migration routes, as well as summer and winter biotopes frequented by the bison were identified (Khoyetskyy 2003). In the very beginning of 21<sup>st</sup> century, bison numbers there did not exceed 10 individuals and continued to fall. Death cases were recorded in 2000 and 2006. The last bison of the Maydan sub-population died, probably, during the winter of 2008–2009.

For the purpose of restoring this population, the program "Restoration of the European Bison Population in the Eastern Ukrainian Carpathians", was financed by Large Herbivore Foundation (Holland) and the European Bison Friends Society (Poland) in 2005. Under this project, six bison were brought o a 3 ha-sized enclosure in June 2009 (Tabl. 4).

Selection of individuals for this introduction was not optimal because of their close relatedness. Additionally, these animals were taken from the zoo and were not adapted to natural conditions. Despite the fact that they had been fed additionally in the enclosure with natural food, the animals were in low condition. A bison calf was born in September, however, it died in October. Male Thasidos died also in October due to exhaustion. These bison were released to the wild in May 2010. Five more bison were brought in

**Table 4.** Register of *Bison bonasus* brought to the Skolivski Beskydy NNP (June 2009)

Parents		Name of the animal	Date of birth	Gender
male	female			
Orion	Zwetschke	Theo	October 9, 2006	male
Orion	Lina	Thunderbird	April 30, 2007	male
Orion	Thyria	Thasidos	May 31, 2008	male
Orion	Lina	Thyria	June 21, 2002	female
Orion	Thyria	Thalia	October 5, 2006	female
Orion	Zwetschke	Thoska	July 11, 2002	female

autumn 2010, and placed at the enclosure of the National Natural Park. Animals were released from the enclosure in November 2010, and they joined the free ranging herd. Currently, the number of E. bison there amounts to 11 individuals.

To the lowland part of Lviv region (Lopatynske State Game Enterprise), six bison were brought in November 1980 followed by another six animals in February, 1981, from Lithuania (Naujamiestis State Game Enterprise) (Tabl. 5).

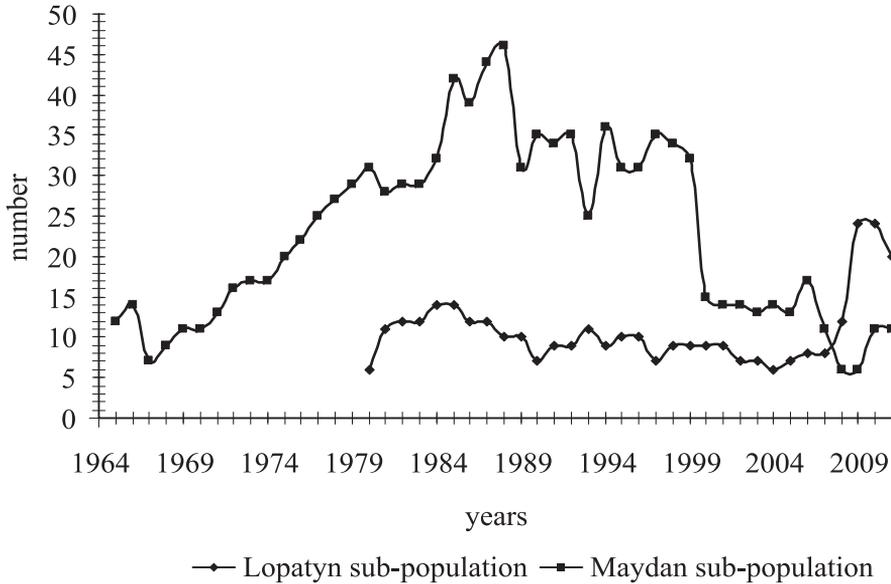
**Table 5.** Register of *Bison bonasus* brought to the *Lopatynske* State Game Enterprise

Parents		Name of the animal	Date of birth	Gender
male	female			
		Unknown	December 1, 1978	male
		Giris	March 8, 1975	male
Morekhod	Mortyra	Girinhas	July 2, 1979	male
		Gislius	June 9, 1976	male
Morekhod	Mokhnatka	Girnalnis	July 15, 1976	male
Motok	Motka	Girenas	December 8, 1976	male
		Unknown	August 5, 1978	male
Motok	Moshna	Giria	September 14, 1971	female
Morekhod	Mortyra	Gitana	June 18, 1972	female
Motok	Motka	Giliia	June 6, 1977	female
		Girna	November 28, 1971	female
Morekhod	Motovka	Gedra	December 5, 1974	female

Animals were released to the wild in March 1981. The reproduction in this herd was poor, and migration of some animals to the territory of the adjacent Rivne and Ternopil regions was observed. Early in the 21st century, this herd decreased to 6–8 animals and now it is facing a risk of extinction (Fig. 2).

In order to restore this sub-population, additional animals were brought gradually from Vinnytsya region during 2008–2009. After acclimatisation in the enclosure (for 2 or 3 months), they were released to the wild. Currently, this herd counts 20 individuals.

Eight bison (3 males and 5 females) were brought to Rivne region in April 1967 from the Belovezhskaya Pushcha. They were kept in the enclosure for about 8 months, and released in December 1967. Between 1967 to 1971 the recruitment rate was 9 animals and 9 individuals died. There were no calves born in 1970 and 1971. This population lasted until 1978 (Khojetsky 2010).

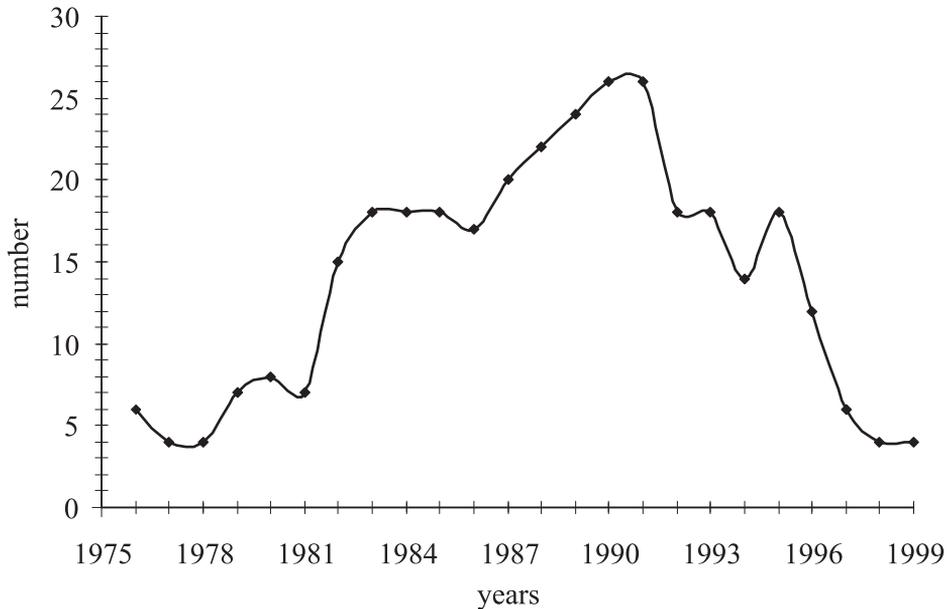


**Figure 2.** Numbers of *Bison bonasus* in Lviv region

In 1976, 8 individuals (4 males and 4 females) belonging to Lowland and Lowland-Caucasian lines were brought to Nadvirna (Ivano-Frankivsk region), from the Oksky Reserve in Russia. Since they originated from a different climatic zone, they were not able to adapt to new conditions over a short period of time. Four of those animals died there during 1976–1977, as a result of snowy winter with long spells of frost, food shortage etc. (Khoyetskyy 2009).

In order to enlarge the population, two more females were transferred from the Prioksko-Terrasny Reserve (Russia) with eight more individuals brought in 1982. In total, 18 bisons were brought from these two reserves. However, during the 15-year period between 1976 and 1991, the number of animals grew up only to 26 animals. Since 1980, a purulent necrotic disease of reproductive organs (so-called purulent balanoposthitis) has been observed in all males. The factors that have led to the reduction of population numbers include the wrong place of their release (heavily populated area of the region), deaths due to road accidents (collisions with vehicles and trains), high level of anthropogenic pressure in the herd habitat. Since 1991, a reduction in animals' numbers was observed. The last four individuals were recorded there in 1999 (Fig. 3).

Between 1976 to 1999, annual increment varied there within the range of 7.7 to 16.7% ( $13.2 \pm 1.7\%$  on the average). During first 8-years numbers of the bison increased, and during following 9-year period a decrease was observed there. However, the rate of decrease was much higher:  $35.9 \pm 9.8\%$  on the average (Khoyetskyy 2010).



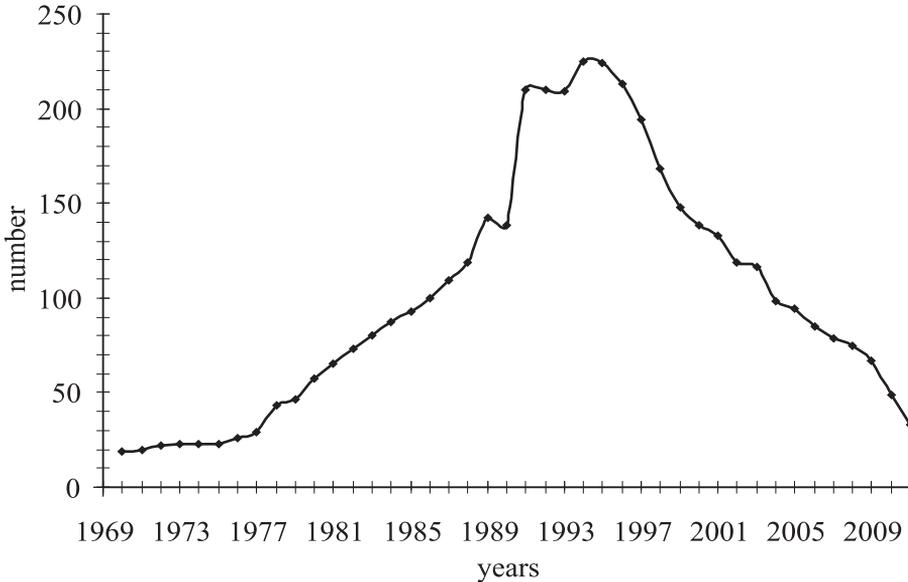
**Rycina 3.** Numbers of *Bison bonasus* in Ivano-Frankivsk region.

To the area of the Bukovynske State Game Enterprise (Chernivtsi region), six bison (2 males and 4 females) were brought at the beginning of October 1970 from the Berezinsky Reserve (Belarus), followed by nine animals (5 males and 4 females) from the Oksky Reserve, and four individuals (2 males and 2 females) from the Prioksko-Terrasny Reserve (Herus, Kryzhanivskyy 2005). An increase of bison numbers was observed within this area over a 20-year period (Fig. 4).

The population increased annually within the range of 4.3 to 32.5% ( $9.8 \pm 1.7\%$ ) on the average. This population reached its peak in 1994–1995 when it counted about 225 individuals. Since 1996 there has been a decrease observed however, in the period between 1996 to 2007 by 2.6 times,  $8.6 \pm 1.6\%$  on the average. The managers of game enterprise, within which the sub-population exists, overestimated its numbers in previous years, thus, making it difficult to conduct an objective analysis of the number dynamics. According to our inventory, between 2009 to 2011, the number of the bison there has dropped to about 30 individuals.

## Conclusions

The re-acclimatization of European bison in Western Ukraine started in the second part of the 20th century. Early in the 1990s, the bison numbers reached its peak (470 to 480 individuals). However from the 1990s until the beginning



**Figure 4.** Numbers of *Bison bonasus* in Chernivtsi region.

of the 21st century, the species' number there decreased by 6 times. Currently, it counts 80 individuals which implies the necessity for the development of the national program on European bison protection, restoration of their numbers, and creation of centers for the species. In mountains, suitable areas for the establishment of such centers are following national natural parks: the Skolivski Beskydy and the Vyzhnystya, while the area of the Zvirivske Game Enterprise seems to be appropriate site for a breeding centre in lowlands.

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### **Współczesny stan populacji żubra (*Bison bonasus* L.) w zachodnim regionie Ukrainy**

**Streszczenie:** Ostatnie żubry w zachodnim regionie Ukrainy zostały schwytane na początku XVIII w. Niejednokrotne próby restytucji gatunku podejmowane na początku XX w. zaznały porażki. W drugiej połowie XX w., w latach 1965–1980 zwierzęta były przywożone na tereny pięciu zachodnich obwodów Ukrainy, gdzie stworzyły sześć populacji: trzy na terenach górskich i trzy na równinach. W latach 90-tych XX w. populacja żubra osiągnęła maksymalną liczebność: 470–480 osobników. Na początku XXI w. z powodu kłusownictwa, chorób, braku pokarmu na obszarach górskich oraz wskutek innych przyczyn odnotowano spadek liczebności gatunku. Według szacunków w 2011 r. ogólna liczba pogłowia żubrów w tej części Ukrainy wynosi około 80 osobników. Dwie subpopulacje (Kłewańska i Nadwirniańska) przestały istnieć, zagrożona jest subpopulacja Bukowińska i Cumańska.

**Słowa kluczowe:** restytucja, liczebność, przyrost, subpopulacja.

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