

Bison Reintroduction in Azerbaijan: What Are the Benefits?

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One of the big-budget environmental projects currently being implemented in Azerbaijan is the reintroduction of Bison into the country's wilderness. Species reintroduction is the process of reintroducing wild animal and plant species to their natural habitat (EIONET 2024). European bison (*Bison bonasus*), also known as the wisent, are a mammal species of the Bovidae family. A typical European bison is about 3,5 meters in length, 2 meters in height, occasionally weighs up to 1.000 kilograms, and dark brown in color (ETSN 2023).

In 2012, the World Wildlife Fund (WWF) Azerbaijan Office and the Ministry of Ecology and Natural Resources launched a project to identify potential sites for the restoration of bison (WWF 2013). The preliminary stage of the project examined 13 sites: 11 mountain and 2 lowland areas. The project concluded that there were sites in Azerbaijan where bison populations could live (WWF 2013).

European bison were chosen as the iconic species for the conservation because: (i) they are a strong symbol for wilderness since the Bison is also an essential species for the Azerbaijani environment; (ii) they are a great attraction for the public and therefore the engine of a new ecotourism in rural Azerbaijan; (iii) they are one of the most threatened species in the world, according to WWF. The WWF reintroduction project in Azerbaijan has short and long-term goals. The short-term goal (0-5 years) is to establish two acclimatization zones that will function as bison breeding centers for Azerbaijan. The long-term goal (over 25 years) is to interconnect, through a network of protected areas, the

different populations of the whole Greater Caucasus range in Azerbaijan and neighboring countries (WWF Azerbaijan 2024).

Caucasian Bison History and the Last Bison Populations

In European literature, the name bison was used for the first time by traveler John de Luca, who visited Circassia in the early 17th century (Vereshchagin 1967). Speaking about the customs of Nogai Tartars, Circassians, Mingrelians, and Iberians, he noted that the Circassians drank wine from the horns of “wild buffalos” rather than from glass (John de Luca 1879, 491). Decree 7994, dated 1738, in Volume X of the complete collection of laws of the Russian Empire from 1649 interestingly notes the annual catching and sending to Moscow of various live animals (Russian National Library 2024, 993). The decree ordered that bison be captured in Kabardia, brought to the fortress of Kyzylar in Dagestan, and from there then sent to Astrakhan and from Astrakhan to Moscow together with other animals.

As for the territory of Azerbaijan, there are practically no historical facts about the existence of bison. When the chronicler Rashid ad-Din described Kazan Khan’s hunting in the Talysh mountains in 1301-1302, he noted: “After that the warriors gathered and chased away hunting animals such as wild buffalos, roe deer, wild goats and asses, jackals, foxes and wolves” (Vereshchagin 1967, 374). The animals referred to here as *wild buffalos* are bison (Sultan-Majid Ganizade 1909). According to Russian zoologist Vereshchagin, the descendants of bison in the forests of Elbrus and Talysh became extinct in the 18th and 19th centuries, and they survived only in the North Caucasus, with a population of 500-700 individuals in 1890 (Vereshchagin 1967). In 1919, a disease likely transmitted from cows caused the death of almost the entire bison population across the Caucasus, and in 1920 only 50 wild bison survived. When 3 bison were killed by hunters in 1926 near Mount Alous (Krasnodar Krai), the species became extinct in the wild (Vereshchagin 1967).

But in May 1907, a bison calf caught near Abago pasture (Republic of Adygea) was taken to the Kuban Hunting Directorate, and from there to Belovezhskaya Pushcha National Park, now in Belarus, adjacent to the Polish border. This male, nicknamed *Caucasus* (original name: *Kaukasus*, animal #100 in the European Bison Pedigree Book (EBPB)), was the last known surviving Caucasian bison. It was bought and transported to Hamburg by Carl Hagenbeck, an internationally known German merchant of wild animals. It lived there until 1925. During its 17 years of life, this male was used to create a new genetic lineage by mating with other European bison subspecies called the Białowieża or Lowland bison, which remained in small numbers (Trepel 2016).

Currently, the bison reintroduced in different parts of Europe derive from a small founder group of 12 animals which follow these 2 genetic lines, (11 Lowland bison and 1 Caucasian bison): a pure Lowland subspecies (Lowland line, originating from 7 founders) and a hybrid of Caucasian and Lowland subspecies (Lowland-Caucasian line, originating from 5 founders) (Raczyński and Bolbot 2009). Interestingly, the negative effects of inbreeding, manifested in reduced reproduction, are more pronounced in the Lowland-Caucasian line, which is a mixture of the two subspecies (Mammal Research Institute, Polish Academy of Science 2002). In general, the low genetic variability of European bison makes it less resistant to diseases (Olech and Perzanowski 2020).

Individuals from these genetic lines were first released into the wild in Poland in 1954. Those reintroduced to Azerbaijan are from the second hybrid line. Currently, 6200-7000 bison live free in the wild across Europe (Olech and Perzanowski 2020; Rewilding Europe 2024).

The Bison's Return to Azerbaijan

The import of bison to Azerbaijan in cooperation with the Berlin Zoo and WWF Germany began in 2019. Released into

Shahdag National Park, these bison have adapted well to the local environment and have begun breeding. Last year, 10 bison calves were born, and their number reached 58 in Shahdag National Park (Rewilding Europe 2023). The overall goal of the reintroduction initiative is to establish a founder population of at least 100 animals at the chosen sites in Azerbaijan. This population will have the potential to expand into a larger free-ranging population throughout the Caucasus (Rewilding Europe 2023). The European bison was included in the third edition of the *Red Book* of the Republic of Azerbaijan, with poaching and cattle-borne diseases being noted as limiting factors for their conservation (ETSN 2023).

Interestingly, in the 1940s, a group of wisent-American bison hybrids were released into the Caucasian Biosphere Reserve in Russia to increase genetic diversity, and they were described as a separate subspecies (mountain bison), although there was no scientific basis for this description. In subsequent years, with the release of European bison into the area, American Bison genes declined to only 5% (Sipko et al. 2008). In order to maintain genetic integrity when establishing contacts between bison populations in the Caucasus Mountains, including our country in the future, it is necessary to make sure that they do not mix with these wisent-American bison hybrids (so-called mountain bison), which are currently isolated. Similarly, cattle genes have been found among some bison which were brought into Azerbaijan but not used in the reintroduction process (Olech and Perzanowski 2020).

Positive and Negative Effects of Bison

The most noted factor in the reintroduction of European bison is that not only are they an important species, but they are also *ecosystem engineers*, meaning they create a mosaic of habitats that supports a variety of plant and animal species.

A study in Denmark revealed the impact of European bison on ground vegetation in forest habitats over a period of eight

years. It turned out that the bison increased the species richness of vascular plants, though mainly to the benefit of graminoids. The effect of bison grazing on vegetation varied among the over 100 plant species studied. Their grazing increased biodiversity in oak forests with dense and abundant ground vegetation, whereas beech forests with full canopy cover were unaffected. Bison also benefitted bryophytes, which increased in abundance, indicating a generally altered competitive environment with reduced dominance (Gottlieb et al. 2021). These results indicate that European bison can promote plant species diversity in forest habitats, by removal of plant biomass, zoochorous seed dispersal, and creation of microhabitat.

New research from *Yale University* found that the European bison herd grazing in an area of nearly 50 square kilometers of grasslands in Romania could potentially capture an additional 54,000 tons of carbon a year, equating to emissions from more than 40,000 cars (Yale Environment 360, 2021). Thus, bison and other wild herbivores play an important role in restoring biodiversity as well as fighting the climate crisis.

Another ecosystem service of bison is related to the tourism potential they create. In Romania, for example, bison have benefited the local economy after their reintroduction. Now more than 100 families are benefiting from the resulting eco-tourism packages, and more than 700 tourists visit the area annually (WWF 2020).

Additional necessary steps

When reintroducing bison, it is important to continuously cooperate with the local population in order to minimize the depredation of their farm crops by bison. For example, in Poland, the compensation to farmers for damage caused by bison to farm crops increased 20-fold in 10 years in parallel with the damage caused, and the total cost of compensation was about €200.000 between 2000 and 2010 (Czyżowski et al. 2012).

Similarly, maintaining control over the potential for hybridization between bison and cattle is extremely important both for the genetic diversity of bison and for the prevention of damage to agriculture.

In addition, in order to reduce human-wildlife conflict, GPS collars should be deployed on bison to monitor their movement in the reintroduction areas. In Azerbaijan, 5 bison have already been collared with GPS collars to monitor them with VHF antennas (WWF 2024).

This is because, in Poland for instance, traffic accidents on roads killed 3,3% of the bison population, (Hilsberg et al. 2014). Even on foot though, it is important that people do not come closer than 100 meters to bison to ensure their own and the animals' safety (WWF 2020). In Azerbaijan, for such reasons it is important to install information signs in areas where bison have been introduced.

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