

## **Bringing wisents<sup>1</sup> back to the Caucasus mountains: 70 years of a grand mission**

Taras Sipko<sup>1</sup>, Sergei Trepets<sup>2</sup>, Peter J. P. Gogan<sup>3</sup>, and Ivan Mizin<sup>1</sup>

<sup>1</sup> Institute of Problems Ecology and Evolution RAS, Moscow, Russia

<sup>2</sup> Caucasian Biosphere Reserve, Maikop, Russia

<sup>3</sup> USGS – Northern Rocky Mountain Science Center, Bozeman, Montana, USA

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**Abstract:** We describe the history of mountain wisent restoration in the north-west Caucasus region. We review information on wisent during the 18<sup>th</sup> and 19<sup>th</sup> centuries, contemporary regional development and reasons for wisent extirpation. We emphasize the key role of the Kuban Hunting Reserve as a main factor in preserving wisent in this region between 1888 and 1909. The article provides information on the fate of three known Caucasus wisent and their impact on the common pedigree of European Wisent. The importance of scientist's efforts to conserve the survived wisent in Europe in 1920th and international cooperation is underscored. The issues of hybridization between wisent and American bison and the possible influence of hybridization events on the and taxonomic status of contemporary mountain wisent are discussed. We describes in detail the history of wisent reintroduced to the Caucasus, the establishment of seasonal migration patterns and adaptation to the mountainous region and poaching pressures. Mountain wisent reached a maximum number of 1500 animals in 1991. We review the significant role of the Caucasian Biosphere Reserve and its zoologists in conservation of mountain wisent in its historical area and current research objectives with the support of German conservation organizations.

**Key words:** European bison, wisent, Caucasus mountains, Caucasian Biosphere Reserve, re-acclimatization, history, breeding.

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On June 29, 1940, five wisent in custom-built cages arrived at the Khadzhokh railroad station in the foothills of the northwestern Caucasus. These animals came from Askania-Nova to found what was to become the world's largest and oldest population of wisent<sup>2</sup>, presently roaming the mountain forests throughout the western Caucasus. Many prominent Europeans played a role in the history of these truly royal animals. Numerous political upheavals of the turbulent 19<sup>th</sup> and 20<sup>th</sup> centuries have directly affected their lives.

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<sup>1</sup> Editors' note: The Caucasian wisent became totally extirpated by year 1927. Remnants of its genes exist only in the progeny of bull Kaukasus, surviving in a German Zoo. Present population of so called "Caucasian wisent" consists of hybrids between wisent and American bison.

<sup>2</sup> It must be noted that, in the famous Bialowieza Forest, the first two wisent were released into the wild as late as 1952. Despite the supplementary food received by the wisent here every winter, their numbers have not reached the level of the Caucasian population. Moreover, the border between Poland and Belarus, as it was marked after the World War II, runs through the Bialowieza reserve and cannot be crossed by wisent, thus dividing their population into two isolated parts.

In early historic times, wisent occurred throughout a large part of Europe, and were most abundant on the plains between the Carpathian and Caucasus mountains. At that time, no barriers separated the wisent populations of the Bialowieza forests and Caucasus, so they moved freely. However, hunting and displacement due to the growing agricultural practices increasingly led to range contraction and fragmentation. By the end of the 18th century wisent had disappeared throughout most of their former range survived only due to unprecedented measures taken in Russia to preserve this species.

The first definitive evidence of wisent occurring in Caucasus was provided by a member of the Imperial Academy of Sciences, Johann Anton Gldenstdt in 1770. He reported that in Ossetia wisent skulls had been brought to caves as sacrificial offerings. However, it was too late for him to encounter any live wisent there. In 1836 the Academy received a hide of a Caucasian wisent, sent by the Commander of Russia's Caucasian military corps, Baron Rosen. The Academy member Karl Ernst von Baer compared it with hides from Bialowieza and concluded that it belonged to the same species of animal.

The survival of wisent in the western Caucasus was facilitated by environmental conditions and, in no small part, by the historical setting of the Kuban region. For many centuries the region experienced incessant warfare between nomads and mountaineers. Strange as it may sound now, the area's chief export item of the time was slaves, routinely captured in armed raids and sold at markets in the Black Sea region for subsequent trafficking to the Mediterranean states. The nomads, main defense strategy was their mobility, while the mountaineers protected themselves by building their villages under the protection of inaccessible canyons and cliffs. Due to this pressure of mutual violence, no large settlements could form in the Caucasus foothills, nor in the floodplain of the Kuban River. The resulting under-populated territory served as a refuge to various wild animals, including wisent.

However, the situation in this region began to change by the middle of the 18<sup>th</sup> century. After a series of victories over the Crimean Khanate, Russia established a firm foothold on the steppes north of the Caucasus. This was marked by the construction of the Caucasian fortified line along the Kuban and Terek rivers, which became the state's southern border. As a result, raids by nomads stopped for almost a century, which for the first time allowed the mountaineers to spread into the foothills, hunting down and displacing wisent. After 1851 the Caucasian war shifted over to the western Caucasus and ended in a Russian victory in 1864. These events played a major role in the survival of the Caucasian wisent. The war distracted the locals from relentlessly hunting down these animals. Moreover, the war, internal strife, and accompanying plague all reduced the region's human population. The mountaineers, previously populating all the highlands suitable for wisent, had moved down to the plains or emigrated to Turkey. As a result, the mountainous parts of the region became almost deserted. In contrast, the foothills were being actively populated by the mountaineers and migrants from

Russia. The human pressure on the wisent in the foothills was increasing, forcing the animals up into the mountains, where in the past they had been actively hunted down (contemporary records mentioned large cache of processed wisent meat found in mountaineer villages). However, by the 1880s human activity in the mountain forests had increased to such a degree that wisent number quickly declined. Contemporary estimates were that no more than 500 wisent survived. Only the establishment in the western Caucasus of the well-organized game preserve Kuban Game saved the wisent from imminent extinction.

The phenomenon of Grand Ducal "Hunting Reserves" is worth special mention because these reserves played a key role in the preservation of native wisent during the 19<sup>th</sup> and the early 20<sup>th</sup> centuries. In 1888 the Bialowieza forest (126,000 hectares in area) was handed over to the Department of Appanages, thereby becoming the property of the Royal Court. One of the chief missions of the Department was "the care about preservation of wisent and the organization of royal hunting in the future. In the same year the Kuban Hunting Reserve was established with the purposes of "preserving wisent and organizing proper hunting". It was founded by an immediate relative of the Emperor of Russia, the Grand Duke Romanov, who received the rights to hunt on an area of 522,000 hectares. The site was selected by an expert on the Caucasus and hunting, F.I. Kratkiy, who had surveyed the Greater Caucasus Range for this purpose in 1887. In 1888 a contract was signed which granted the Grand Dukes exclusive rights to hunt on the northern slopes of the Greater Range. An experienced forester from Austria, E.K. Yuttner, was appointed the manager of the preserve. He used experience acquired in his home country to organize a highly effective protection program for wisent. A large staff of rangers and substantial expenditures to control predators guaranteed propagation of the animals. Remarkably, even the Grand Duke Sergei Mikhailovich had to apply for a special license to hunt wisent, which were legally protected from killing throughout the entire territory of Russia. In 1909 the lease of the territory of the Kuban Game expired and the Council of the Kuban Cossack Host decided to divide it. A large number of meadow plots along mountain streams and at lower altitudes in general were handed over to private owners. These had been places that wisent and other species of mountain game used to come down to during snowy winters. The scale of poaching during that period has been described in the article by W. Koch.

Only three native Caucasian wisent were captured alive and exported. The first, named Kazbitch, was captured at Verkhniy Urup in 1866 and transported to Moscow, but his subsequent fate is unknown. The second was a young bull, Kazan, captured in 1899 at the Kisha River and transported that same year to the Bialowieza zoo for "refreshing the blood" of the local wisent cows upon the recommendation of Professor G.P. Kartzev. The difficult trip may have stunted the growth of this bull, but he never fell sick. It is definitively known

that in 1903 he was still living at the zoo with other wisent. What happened to him subsequently is unknown because the entire Bialowieza archive was destroyed by fire during World War I. This may have been the end of this bull's lineage, but six wisent exported from the Bialowieza zoo in the 20<sup>th</sup> century to become founders of the modern population could potentially have been his offspring. Debates continue over whether the genes of this bull are preserved. Of the greatest interest however, is the third captured wisent, a male calf named Caucasus, that has played an important role in the restoration of the species. He was captured in May 1907 on the slope of the Mt. Pshekish (or, according to other sources, Mt. Abago) and taken to the Bialowieza forest. In 1908, the Emperor of Russia gave him to Carl Hagenbeck, a well known naturalist and the founder of the Zoological Garden of Hamburg, where the wisent was held until 1922. Then Hagenbeck ceded the animal to Count Adolf Heinrich von Arnim, who took Caucasus to Boitzenburg, where the bull died of natural causes on February 26, 1925. During his lifetime Caucasus sired seven calves from Bialowieza cows. These calves were the founders of the modern Caucasian-Bialowieza wisent line.

The high scientific value of Caucasian wisent was recognized by both the Tsars and, later, the Soviet governments. Both governments planned a nature reserve to protect these animals. Yet, the plan was impossible to implement until the mid-1920s, and by then the wisent were gradually disappearing. According to the monographic study by I.S. Bashkirov, three wisent killed by Imeretian<sup>3</sup> shepherds on the Mt. Alous in 1927 turned out to be the last wisent in the entire Caucasus. Neither the staff of the reserve, nor dedicated search parties could discover any live wisent or their fresh tracks afterwards. The Bialowieza wisent met the same fate. The last wisent there was killed on April 14, 1919, by the former employee of the Bialowieza forest Varfolomey Spakovich. Contemporaries pointed out that it was an act of protest against the actions of the new administration of the reserve, which began plundering its natural resources and commenced systematic logging of the entire forest. The new authorities gave an unlimited concession to extract timber to the British «Century European Corporation», which started unprecedented logging of the best timber. Several million cubic meters of the best quality timber were exported! Perhaps the frustration of Spakovich can be understood, but nevertheless the last wild Bialowieza wisent was killed.

Thus, despite Russia's decades-long strenuous efforts to preserve wild wisent, no such animal remained anywhere in the world. Fortunately, there were people who cared about the fate of this species. On June 2, 1923, in Paris the Polish zoologist Jan Sztolcman proposed his plan for the restoration of wisent at the opening of the First International Congress for the Protection of Nature. In August of the same year, the International Society for the

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<sup>3</sup> Imereti is a province of Georgia

Preservation of the Wisent was organized in Frankfurt under the presidency of Dr. Kurt Priemel, the director of the Frankfurt Zoo. The zoologists Goerd von der Groeben and Erna Mohr conducted a count of the animals remaining in existence. By 1926 the first worldwide census of wisent documented only 54 animals were remaining worldwide.

A crucial step in the restoration of wisent was made at Askania-Nova. The reserve began when, in the early 19<sup>th</sup> century, the Emperor of Russia Nicholas I gave this land to Ferdinand Friedrich, Duke of Anhalt-Köthen, who founded a colony named Askania-Nova. Later, the land was purchased by a colonist Friedrich Fein. His daughter, Elisabeth Anna, married Johann Gottlieb Falz, thus founding the family of Falz-Feins. Their grandson, Friedrich Eduardowitsch Falz-Fein took interest in zoology and created the now universally renowned zoological garden and research center. Among the experiments on animal hybridization conducted there were the first successful attempts to cross wisent and American bison. The staff of Askania-Nova managed to protect a herd of wisent-bison hybrids during the Russian Civil War, but no true wisent capable of reproduction remained in the USSR. A program for the restoration of wisent in Russia was then initiated under the lead of B.K. Fortunatov, who suggested back-breeding from wisent-bison hybrids via "saturation" crossing with purebred wisent, so that the share of wisent "blood" would gradually increase. This required purchasing purebred wisent.

Viewed in the light of the modern knowledge, the then popular hybridization of wisent with its close relative, American bison, does not seem well justified. It would make more sense to try and save the purebred wisent to the degree possible. Yet, let us not forget the circumstances in which such decisions were made. The data available at that time indicated that wisent did not breed well and their number continued to decline: only 54 individuals remained in existence by 1927. Also, hybridization problems, persisted. Nine wisent (i.e. almost 20% of their total number), given to the Duke of Bedford by Emperor Nicholas II of Russia at the beginning of the 20<sup>th</sup> century, were kept at Woburn Abbey. In defiance of recommendations made by zoologists, the Duke ordered these wisent cross-bred with domestic cattle. The offspring of these animals had to be excluded from pure-line breeding of wisent.

On the other hand, the experiments on hybridization of wisent and American bison, conducted in Askania-Nova by Professor I.I. Ivanov, were successful and the hybrids reproduced well. It is interesting that a similar project on the restoration of wisent was initiated in Germany. It was led by none other than Hermann Göring, who was an avid hunter and Germany's chief gamekeeper and forester. Before 1939 he participated in many shooting parties in Bialowieza and decided to introduce wisent-bison hybrids to game preserves in his own country. By his orders, American bison were acquired and two prominent zoologists, brothers Lutz and Heinz Heck, crossed them with wisent in the Berlin and Munich zoos. These were the researchers who

also worked on breeding back tarpan (the European wild horse) and aurochs. Most unfortunately, none of their wisent-bison hybrids survived Second World War II.

It is also important to keep in mind that the breeders had to face the fact that the Caucasian wisent had been completely exterminated, and all that remained was their genes ("blood") preserved in the Caucasian-Bialowieza hybrids. Since no descendants of pure Caucasian wisent survived in the USSR, it was necessary to obtain these from abroad. The staff of Askania-Nova repeatedly asked various foreign owners of wisent to sell or trade their animals, but most of their efforts were not successful. Finally, negotiations with Germany turned out to be successful. In 1933 through the company "Rue-Alfred" Askania-Nova traded some antelopes and Przewalski's horses for a purebred wisent bull from Boitzenburg, named Bodo. Most importantly for the project, he was 25% Caucasian. Thanks to Bodo, the staff of Askania-Nova was able to accomplish the first goal of the program: to prepare a herd of animals, with true Caucasian "blood" and as little admixture of American bison genes as possible, for repatriation to Caucasus.

In 1940 a bull and four cows were sent to Caucasus (another group of wisent was sent in 1937 to the Crimean Nature Reserve). The animals arrived at the railroad station by train and then had to be herded through difficult mountain roads for 35 km. This must have been an extremely challenging task not only because the wisent had grown up among open steppes and were unfamiliar with mountains, but also because the staff of the Caucasian Nature Reserve had never before seen such animals! Yet everything turned out well and the wisent eventually entered the open-air enclosures prepared for them in the valley of the Kisha River, called "Kisha wisent park".

In the same year, two of the wisent cows, which had arrived already pregnant from Bodo, dropped calves. Unfortunately, this initial success (new wisent born in Caucasus for the first time in decades!) did not last. The herd's only bull, named Zhuravl', died the next year. Replacing him was made impossible by the World War II spreading into Russia. Yet, that bull had previously sired three male calves. When the bulls finally matured, by 1944, the herd started growing again. The War came to the Caucasus during the winter of 1942. Fighting took place in the immediate proximity of the wisent park. To save the animals from aerial bombs and other hazards, the staff released them from the enclosures and drove into a remote ravine. As a result, not a single wisent was lost during the war years.

Work on the restoration of Caucasian wisent restarted in 1946 but the strategy changed: the animals were now roaming freely and received fodder and salt only during the winter. At that time Sergei Kalugin became the new project leader on the restoration and re-acclimatization of wisent to the Caucasus. In 1952 he organized the relocation of a group of wisent to the Umpir depression. This hard-to-access depression is located in the remote

eastern part of the Reserve and provides suitable habitat conditions for wisent. Herding 18 wisent for 65 kilometers through mountain passes, cliffs, and mountain streams took three days. Yet, later some of the animals returned back to the park. The next year the journey had to be repeated, except this time the animals were locked in an enclosure to prevent their return. Wisent in the Umpir depression gradually drifted up a chain of meadows along the Umpirka stream eventually reaching the alpine meadows by themselves. Thus, the descendants of animals raised among steppes started making altitudinal migrations just like their aboriginal ancestors. In contrast, wisent of the Kisha park made no such attempts. For five consecutive years starting in 1949 the staff of the reserve had to annually herd them up into alpine meadows before they finally started migrating independently.

The year 1949 was a milestone in the new history of Caucasian wisent. In exchange for some polar bears, camels, and moose the USSR obtained from Poland several purebred wisent. These animals played a key role in the subsequent program of breeding wisent in Russia. Two bulls were given to the Caucasian Reserve. The bull named Pushchanin came first, followed, two years later, by Puhar. In subsequent years a total of 15 purebred wisent, born in Russian nurseries, were introduced to the Caucasian Reserve. Using purebred wisent allowed almost completely elimination of the "blood" of American bison from the breeding program. Beginning in 1960, wisent became so abundant and wild that managing the population became impractical and the latter kept spreading into newer and newer areas of the reserve.

As project leader, Sergei Kalugin was succeeded by Alexander Nemtsev, a prominent zoologist who dedicated 20 years of his life to studying the nature of the Reserve and preservation of its wisent. In 2001 he tragically died in a crash while conducting an aerial survey of the reserve in a single-engine plane. The results of his research have been collected in the superbly illustrated monograph "The Wisent in Caucasus", published only after his death, in 2003.

In the early 1980s, the value of the program of restoration of wisent in the Caucasian Nature Reserve was challenged because of the hybrid status of the population. Preparations to eliminate wisent from the fauna of the western Caucasus were already underway but, thanks to research and vigorous defense by A. Nemtsev, those plans were abandoned. Clearly, the determination of the taxonomic status of those animals, already known under the name "mountain wisent", requires the use of modern genetic tools. Yet, preliminary calculations indicate that the share of the "blood" of American bison in that population is only 5%, and that natural selection has already fixed in it the external habitus identical to that of the exterminated Caucasian wisent. Moreover, some other mammal species also contain foreign genes. For example, the red deer, nowadays so widespread in Europe, has the admixture of "blood" of the closely related North American wapiti. Similarly, most of the existing Przewalski's

horses carry genes of a different species, the domestic horse. Furthermore, it is already known that the adaptive potential displayed by the mountain wisent is an order of magnitude higher than that observed in the purebred animals. Numerous attempts to reacclimatize purebred wisent in the Carpathian or Caucasus mountains were almost completely fruitless: in montane environments those animals lead a truly miserable existence, reproducing and dispersing poorly.

But let us return to the subsequent fate of the mountain wisent, saved from absurd administrative decisions. Their population continued flourishing in the western Caucasus, reaching close to 1,500 animals (in 1991 year) and having dispersed throughout the territory of the reserve and beyond its borders. The external phenotype and the behavior of the wisent became identical to those of their exterminated ancestors. Yet, the circumstances changed again in the early 1990s. Funding of nature conservation efforts practically stopped and the social and economic structures of the region collapsed. Poaching, even with the use of helicopters, the sound of which still causes panic among wisent, spun out of control and eradicated mountain wisent throughout most of their former range. Only due to the difficult mountain terrain and unprecedented efforts of the Caucasian Reserve staff that the animals were not exterminated completely. Zoologists estimated that only 150 wisent had survived and these were in the hard-to-reach Umpir depression! Surviving wisent even changed their behavior. Previously, prior to the onset of winter, mountain wisent migrated down into the foothill forests where snow was usually less abundant and wisent could still find food. These forests, however, were most accessible to poachers. Surviving wisent started migrating upward to the wind-blown, snow-free mountain tops, where they now spend the entire winter season. Currently the conservation status of Caucasian wisent is improving, with numbers exceeding five hundred.

Although the work on the restoration of wisent has been carried out in several countries over the past 80 years, the results to date cannot be considered successful. Unlawful hunting continues to be a hindering factor. The scarcity of good wintering sites on the territory of the Caucasian Reserve and the lack of necessary hunting controls in the adjacent areas hinder wisent range expansion. Also, the taxonomic status of mountain wisent has not been fully clarified and remains a subject of debate.

Currently the mountain wisent preservation program in the Caucasus is being carried out by the largest German conservation organization, Nature and Biodiversity Conservation Union or NABU (Naturschutzbund Deutschland). The main goal of the first stage of this program is evaluating the current condition and options for further preservation of the population. The study is being conducted by the research staff of the Caucasian Nature Reserve and a scientist from the A.N Severtsov Institute for Ecology and Evolution, Moscow. In addition to traditional population biology parameters, the genetic

structure of the population is being studied. The applied part of the project includes development and implementation of conservation measures to preserve the mountain wisent and to introduce these animals to other regions. This work will also help reinforce the endangered status of mountain wisent at the federal and international levels in order to facilitate its long-term preservation in the Caucasus.

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### Powrót żubrów w góry Kaukazu: 70 lat wielkiej misji

**Streszczenie:** W pracy przedstawiono informacje o żubrach podgatunku kaukaskiego pochodzące z 18 i 19 stulecia, dane na temat rozwoju tego regionu i przyczynach wyginięcia populacji żubra. Zwrócono uwagę na dużą rolę łowieckiego ośrodka w Kubaniu w ochronie żubrów kaukaskich w latach od 1888 do 1909. W pracy przedstawiono informację o trzech żubrach kaukaskich mających wpływ na europejską populację tego gatunku oraz międzynarodowe wysiłki związane z ratowaniem gatunku podjęte w latach 20-tych XX wieku. Szeroko opisano zagadnienie krzyżowania żubra z bizonem amerykańskim oraz wyjaśniono w jaki sposób utworzono populację "górskich żubrów" z wypuszczonych w góry Kaukazu mieszańców żubra i bizona. Szczegółowo opisano badania sezonowej migracji stad oraz stopień zagrożenia kłusownictwem. Najwyższą liczebność osiągnęła populacja w 1991 roku - około 1500 osobników. W pracy zwrócono uwagę na rolę Kaukaskiego Rezerwatu Biosfery oraz zoologów zajmujących się tymi zwierzętami oraz na ostatnio podjęte badania wspierane przez niemiecką organizację ochrony przyrody.

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