

# A chance for the restoration of wisents to Northern Caucasus?

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**Abstract:** The paper is based on the results of the survey, aimed at the evaluation of suitability of two protected areas of North Ossetia: Zakaznik Cejskij and Zakaznik Turmonskej, for the restoration of wisent population within the region. At the moment, in Zakaznik Cejskij dwells a herd of about 50 wisents, established there in 1964, but since 1990s not showing a tendency for an increase. At the area of Zakaznik Turmonskej wisents are not present but their introduction there is under consideration. According to the results of the survey, both areas provide adequate habitat conditions for the maintenance of a wisent population. Some problems may result from a possible contact with domestic livestock, presence of large predators (brown bears and wolves) and poaching. The survey allowed for the formulation of recommendations for potential development of wisent population in both areas.

The survey was performed under framework of European Bison Friends Society.

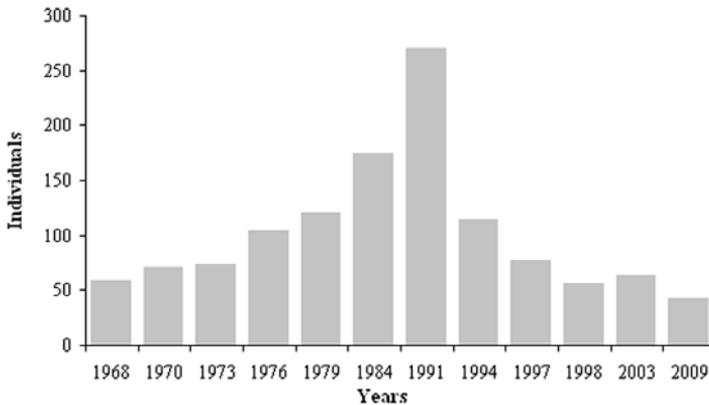
**Key words:** Caucasus, North Ossetia, wisent, restitution

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## Introduction

The region of Caucasus Mountains was inhabited in the past by a subspecies *Bison bonasus caucasicus*, that was slightly different in body features from lowland subspecies *Bison bonasus bonasus*. According to various sources, in 1927 or in 1926, this population became totally extirpated. The only surviving representative of the subspecies, a bull named Kaukasus, was in 1908 transferred to Germany, where until 1925, sired a number of calves with cows belonging to the lowland subspecies. His descendants form now so called mixed or Lowland – Caucasian line constituting little over 50% of the world population of the species *Bison bonasus*.

In 1964, to the area of Cejskij Zakaznik introduced were 14 wisents of Lowland-Caucasian line originating from Prioksko-Terrasnyj Zapovednik, and the Byelorussian part of Białowieża Forest (Komarova & Komarov 2010). Founder group comprised 46 animals and their descendants survived until now. The population grew up until the beginning of the 1900s up to the level of 220–270 individuals (Zhivotnyj Mir Severnoj Osetii i Alanii 2000, Wejnberg & Komarov 2004, Komarova & Komarov 2010). In the 1900s, a sudden decrease of population numbers occurred due to intensified poaching and severe winters (Fig. 1). At present wisent numbers are estimated for over 50 individuals, after the supplementation of the herd with 10 animals from Prioksko-Terrasnyj Zapovednik in 2009.



**Figure 1.** Wisent population dynamics in Cejskij Zakaznik (Komarova & Komarov 2010)

In 2011, an initiative of WWF appeared to facilitate the restoration of wisent population of Northern Caucasus on the basis of the herd from Cejskij Zakaznik. In May 2012, there was an expert survey performed in this area to provide data for a preliminary feasibility study for this initiative.

### **Study area, material, methods**

The area for planned reintroduction of wisents is situated between low mountains (650–1 000 m a.s.l.) up to medium elevations (1 000 do > 2 000 m a.s.l.). In this part of the Caucasus, because of a location to the north from the main mountain ridge, and interception of humid masses of the air coming there from the north, recorded is high precipitation (about 1000 mm annually) (Popov & Komarov 2010). Such hydrological conditions created rich water supplies with a large number of springs and a dense network of rivers and creeks.

The basic type of land cover within this range of elevations, are dense beech forests (Kabolov 2006). Inside of dense tree stands, there are small openings with a rich species composition (grasses, sedges, herbs). The remaining part of the area is covered with meadows and pastures with a various composition of the green. For the areas above 1800 m a.s.l. typical is the occurrence of shaped by man alpine meadows created through grazing conducted there in earlier times. Presently they are subject to processes of a slow succession. Local management is limited to disappearing grazing, concentrated mostly at northern, bordering with lowlands boundaries of the area. Two areas for wisent restoration were considered, both protected as "zakazniks" (a category of protected areas in Russia with lower status than a national park): Cejskij Zakaznik and Turmonskij Zakaznik.



Figure 2. The location of zakazniks Cejskij and Turmonskij

Cejskij Zakaznik has been established in 1958 and covers the area of about 30 000 ha. About 1/3 of the area is forested, in the northern part there is one large contiguous forest complex. Some 20 000 ha are considered to be suitable for wisents (Kraśińska & Kraśiński 2007). The purpose for its establishment was the protection of selected game species and complexes of deciduous forests (Kabolov 2006, Komarova & Komarov 2010). The area of the zakaznik stretches from the north, where it reaches 650 m a.s.l. towards the south (peaks reaching almost 3 500 m a.s.l.) (Fig. 2). This area hosts now a population of about 50 wisents.

Turmonskij Zakaznik has been established in 2006 and covers the area of over 12 000 ha. Its purpose was the protection of selected game species (Popov & Komarov 2009). At present, continued are attempts towards an extension of the zakaznik into adjoining areas in two variants: (1) an increase up to 53000 ha or (2) to almost 40 000 ha (Popov & Komarov 2009). The zakaznik stretches between river Ursdon in the east and Uruk at the west, making along a considerable distance a deep canyon. The area of this zakaznik, similarly like the Cejskij is isolated from the south with rocky ridges and from the north with village infrastructure (Fig. 2). It stretches between 650 m a.s.l. at the north up to 3200 m a.s.l. at the south. The area of this zakaznik is proposed for the establishment of a new herd of wisents.

## Results and discussion

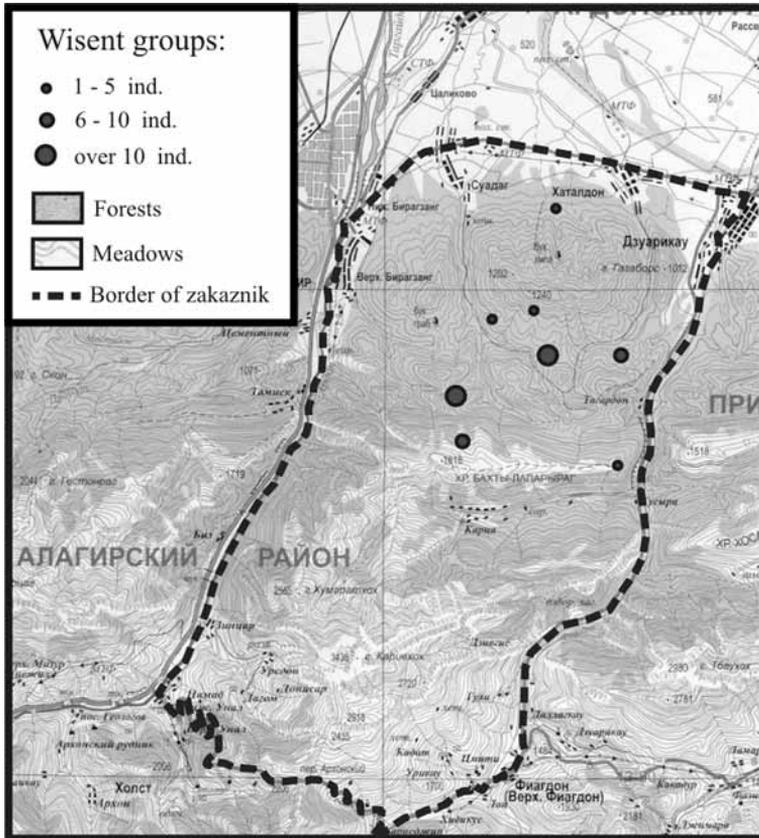
Cejskij Zakaznik, from the north borders with numerous lowland settlements, while its southern reaches are isolated with rocky ridges and communication routes. Western and eastern borders follow large rivers Ardon and Fiagdon. The area is rich in springs and small watercourses. It is divided into a forest zone (up to about 2 000 m a.s.l.) and the alpine zone inhabited by high

mountain species – chamois and Dagestan tur (Komarova & Komarov 2010). The object of the analysis was the area suitable for the wisent – up to 2000 m a.s.l., where basic type of land cover are rather dense beech stands with an admixture of hornbeam, linden and elm, growing mostly over slopes of northern exposure. At slopes with southern exposure occur also tree stands composed of oak, pine and hornbeam. In river valleys, the most frequent are alder stands consisting chiefly of gray alder (Kabolov 2006, Komarova & Komarov 2010). Together with an increase of elevation grows also the domination of beech in tree stands. Undergrowth and ground flora are diversified depending on the habitat. It is possible to encounter a dense undergrowth of elder, hazel and seedlings of young trees with ground flora rich with herbs, grasses and bramble, but also forest associations with poor understory and with ground vegetation consisting mostly of ferns. Inside of dense tree stands small glades occur with a rich species composition (grasses, sedges and herbs). Above the timberline (artificially lowered by man) occur alpine meadows, originating from earlier grazing with a livestock (Fig. 3). Vicinity of the zakaznik is used by people only to a low degree. Villages are situated mostly near the northern border (in the lowland part) and southern along communication routes. Only the village Karca is situated in the central part of the zakaznik, and local inhabitants support themselves by livestock grazing (mostly sheep and cattle). At alpine meadows, herds of feral horses occur, it would be however difficult to estimate their numbers there.



**Figure 3.** Alpine meadows in Cejskij Zakaznik

The main range of wisents' occurrence is the area to the north of the village Karca, below 1800 m a.s.l. (Fig. 4) (Vejnberg 2004, Komarova & Komarov 2010). During an increase of population numbers increased also its spatial distribution. Some of animals migrated for the summer towards higher situated areas, trespassing through the village Kartsa and therefore being



**Figure 4.** Spatial distribution of wisent groups during winter (2011) in Cejskij Zakaznik (Popov *et al.* 2011, mod.)

exposed to the contact with domestic cattle. The other direction of migration was passing across the river Fiagdon to the east, where are areas of forests, glades and alpine meadows, with similar habitat conditions. Migration across river Ardon to the west was never recorded, a possibility of crossing such large and rapid river by wisents is minimal. Every year, calves are registered there, however herds numbers remain at a low level. Reasons for the lack of population growth are unknown. According to obtained information there were so far no analyses regarding diseases in local wisents.

The area of Cejskij Zakaznik seems to be a site favourable for further introduction of wisents, but with certain qualifications. The area is abundant with water resources, fundamental food base is diversified and rich in grasses, sedges, rushes and various species of herbs. Browse seems to be abundant there as well, but spatially diversifies and therefore difficult to assess. Additionally it has to be mentioned that there are some threats including a possibility for the contact with domestic cattle, unknown reasons for the

maintenance of present population at a low level, despite constant reproductive success, and rather limited (precisely unknown) the carrying capacity of this area. Within the zakaznik, during this expedition, fresh footprints of a brown bear and wolves were found, overlapping with fresh wisents tracts. At this time also calving occurs, which was also ascertained with the help of tracts.

Major recommendations regarding this area:

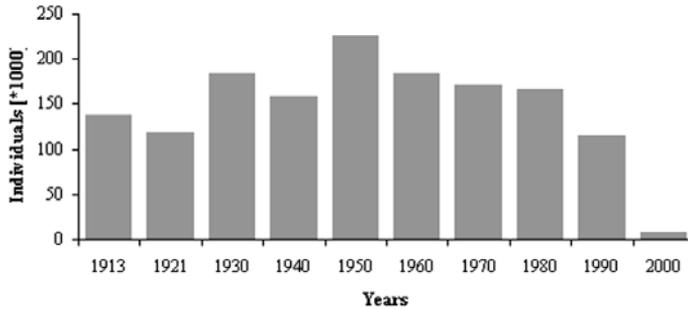
1. In case of undertaking the decision about supplementing the herd with new individuals, recommended is *a priori* survey of dwelling there individuals regarding infectious diseases and parasites.

2. The selection of individuals for such introduction can be done only after precise documenting the source of origin of wisents which were founders of present population and those – supplemented in 2009. Such action should be consulted with European Bison Conservation Centre.

3. An increase of population numbers in the past, caused a migration of the part of the population – apparently the carrying capacity of the area became exceeded in a short time. Similar situation may occur after a supplementation of the herd with new individuals. Therefore, recommended is the earlier or done right after the arrival of new animals, the assessment of carrying capacity of the area, particularly for winter season. Results of such assessment would allow for an appropriate management of this population (e.g. capturing of excess individuals) or its home range (e.g. modification of spatial features towards an increase of carrying capacity).

4. There is also the necessity for performing more precise census of local predators and the estimation of their impact upon wisents. Despite the lack of data on the pressure of bears and wolves upon wisents, their fresh footprints recorded in the vicinity of the herd in the calving period suggest their interest in wisents. This may be a result of a considerable decrease of domestic livestock there. Numbers of sheep, which grazing used to be dominating in the upper parts of the mountains, decreased by 15 fold between 1990 – 2000 (Fig. 5). Additionally, a confirmation of a strong pressure of predators may be a lack of young observed among feral horses at alpine meadows.

Turmonskij Zakaznik, is also quite rich in water springs and small watercourses. It is divided into forested zone (up to about 2000 m a.s.l.) and the alpine zone inhabited by mountain fauna – mostly the chamois. The object of the analysis was the area suitable for wisents – up to 2000 m a.s.l., where the basic vegetation cover, is similar like in Cejskij Zakaznik – rather dense beech stands with an admixture of hornbeam, linden and elm, growing mostly upon slopes of northern exposure. At southern slopes – oak, pine and hornbeam stands occur. In river valleys grow mostly alder stands consisting of grey alder (Popov & Komarov 2009). Similarly, the understory and ground flora are diversified dependently of a habitat type. One may encounter a dense understory consisting of elder, hazel and young trees with a rich ground flora with herbs, grasses and brambles but also forest patches with poorly developed understory and ground flora consisting mostly of ferns.



**Figure 5.** Sheep numbers dynamics in North Ossetia-Alania (Shorin 2001)

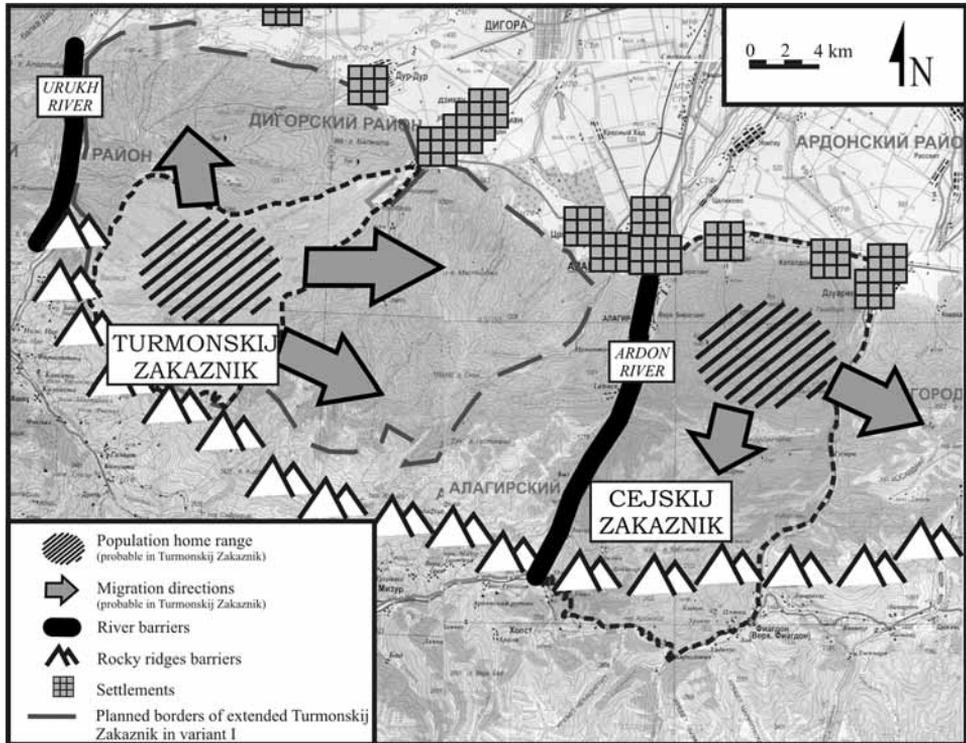
Inside dense tree stands small openings and patches of a forest with less dense canopy occur, with meadow – like ground vegetation (Fig. 6). Above the timberline (artificially lowered by man) alpine meadows exist, created by a former grazing, now abandoned.

Vicinity of the zakaznik is only to a low degree used by man. Villages are situated mostly along its northern border (at lower elevations) and southern (along communication routes), they are however separated with rocky ridges reaching over 3000 m a.s.l. There is a high probability that similarly like in the Cejskij Zakaznik, herds of feral horses occur there.

A possibility of a migration of animals to the west is minimal, because of a deep canyon of Uruk River and rocky ridges. There is however a possibility for a migration towards adjoining areas, planned for an inclusion to the zakaznik in the variant I – i.e. the area of about 53 000 ha. Farther to the east there is difficult for crossing Ardon River, bordering with the Cejskij Zakaznik (Fig. 7). Extended area of zakaznik in the variant I will create the situation, where almost the whole



**Figure 6.** Meadow – like ground vegetation in Turmonskej Zakaznik



**Figure 7.** Possible migration directions and natural barriers in the area proposed for the restitution of wisent population in Northern Caucasus.

area (possibly) occupied by wisent population will be protected and surrounded by natural (rocky ridges, rivers) and anthropogenic (settlements and roads) barriers.

The area of Turmonskej Zakaznik seems to be suitable for wisent re-introduction. The area is rich in water resources, local food supply is heterogeneous and rich in important plant species for wisents such as grasses, sedges, rushes and various herbs. Quite promisingly looks as well the supply of browse, however strongly varying in spatial distribution. Considered should be there certain threats resulting from the possibility of a spontaneous wisent migration to areas surrounding the zakaznik, which because of having a different legal status are much less controlled by state services and more exposed to poaching. Possibilities for a transmission of diseases from cattle are minimal, because of the peripheral situation of villages.

Major recommendations for this area:

1) Particularly favourable for the development of a future wisent population there would be an extension of the zakaznik according to the variant I. It could in an optimal way assure the control over this population and the protection against possible attempts of poachers.

2) Similarly like in Cejskij Zakaznik, it would be beneficial to conduct the evaluation of the carrying capacity which could be used in population management planning including possible supplementation of forage in winter period.

The main aim of planned restoration of wisents to Northern Ossetia was the creation of a wild, stable population within the area of former occurrence of the species, and the establishment of show enclosure planned as a tourist attraction. Planned there is also a breeding centre for wisents, supporting the reintroduction of this species into adjoining areas.

The development of wisent population there, would be a good chance for the replacement of extirpated in the end of the 1920s, population of *Bison bonasus caucasicus*. Present wisent population belonging to the mixed line, bears certain proportion of genes of this lost subspecies. Moreover, it would be a good opportunity to create an alternative for irresponsible attempts to introduce crossbreeds with American bison to the Caucasus.

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### Szansa na przywrócenie populacji żubra na północnym Kaukazie?

**Streszczenie:** W 2011 roku pojawiła się inicjatywa WWF odtworzenia lokalnej populacji żubra na Kaukazie Północnym. Podjęto próbę oszacowania wykonalności tego projektu na podstawie rekonesansu oraz analizy dostępnych danych. Ocenie poddano dwa tereny chronione: Cejski Zakaznik i Turmowski Zakaznik w Północnej Osetii-Alanii, charakteryzujące się zbliżonymi warunkami siedliskowymi. Obszary te znajdują się na północ od głównego pasma górskiego, w rejonie gęstych lasów bukowych oraz antropogennych obszarów łąkowych. Takie usytuowanie umożliwiłoby przejmowanie wilgotnych mas powietrza z północy, co skutkuje dość dużą ilością opadów (ok. 1 000 mm/rok) oraz obfitością cieków wodnych i obszarów źródliskowych.

Cejski Zakaznik został utworzony w 1958 roku na powierzchni 30 000 ha. Jego obszar ograniczają rzeki: Ardon na zachodzie i Fiagdon na wschodzie oraz na północy – zabudowania, a na południu – skaliste grzbiety. Od 1964 roku bytuje tam populacja żubra złożona z osobników dostarczonych z Prioksko-Terasnogo Zapowiednika oraz białoruskiej części Puszczy Białowieskiej. W latach 90. XX wieku, w wyniku kłusownictwa oraz ciężkich zim, liczebność populacji uległa załamaniu i wynosi obecnie ok. 50 osobników.

Turmowski Zakaznik został powołany w 2006 roku i obejmuje ponad dwukrotnie mniejszą powierzchnię. Jego obszar rozciąga się między rzekami Ursdon oraz Urukh. Podobnie jak w przypadku Cejskiego Zakaznika, na północnych krańcach znajdują się zabudowania, a na południu – skaliste grzbiety górskie.

Obydwa obszary wydają się odpowiednie do reintrodukcji żubra, niemniej jednak zaleca się przeprowadzenie bardziej szczegółowych analiz:

(a) oceny zimowej pojemności wyżywieniowej obydwu obszarów – ze względu na trudności w jej oszacowaniu (zwłaszcza zróżnicowania przestrzennego) oraz przypadków migracji obecnej populacji w okresie zwiększonej liczebności;

(b) oceny przyczyn niskiej liczebności istniejącej populacji w Cejskim Zakazniku (mimo stwierdzanego rokrocznie sukcesu rozrodczego) – konieczność oszacowania wpływu drapieżnictwa, kłusownictwa oraz struktury genetycznej;

(c) oceny zdrowotności obecnej populacji pod względem obecności chorób zakaźnych oraz pasożytów w celu uniknięcia zarażenia osobników introdukowanych.

Ponadto zaleca się powiększenie Turmowskiego Zakaznika do powierzchni 53 000 ha (zgodnie z założeniami wariantu I przyjmowanymi przez władze zakaznika), co umożliwiłoby objęcie ochroną niemal całego obszaru możliwego do zajęcia przez przyszłą populację żubrów.

Utworzenie stabilnej populacji żubrów linii białowiesko-kaukaskiej na Kaukazie Północnym jest niewątpliwie wielką szansą na zastąpienie wytrzebionej w końcu lat 20. XX wieku populacji *Bison bonasus caucasicus*. Ponadto, stanowi jedyną alternatywę dla nieodpowiedzialnych prób introdukcji na Kaukazie hybryd żubra i bizona amerykańskiego.

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