

Post-release dispersal patterns of wisent bulls introduced to Bieszczady Mountains

Przemysław Wasiak¹, Kajetan Perzanowski²

¹ Bieszczadzki National Park

² Carpathian Wildlife Research Station, MiIZ PAN

Abstract: Analysed were dispersal patterns of three wisent (*Bison bonasus*) bulls, fitted with GPS collars, in first four months after their release to the wild at Bieszczady Mountains. Two younger bulls were raised earlier in captivity and the older male originated from the wild herd, dwelling in the area surrounding the acclimatisation enclosure. In general, movements of the older bull were more pronounced, his locations situated further from human settlements, and apparently reflecting his earlier knowledge of the area. Two younger bulls tended to keep together and seemed to be more attracted by baiting stations. All three animals displayed specific for wisents type of habitat use, concentrated in habitat patches, well defined by clusters of their locations.

Key words: European bison, Carpathians, GPS telemetry, movements, habitat use

Introduction

Among key factors decisive for the success of an reintroduction, are dispersal patterns following the release of to the wild. The ability of animals to find the most suitable habitats differs depending on their origin (i.e. whether they were captured from free ranging populations or were raised in captivity and never experienced natural conditions) (Soorae 2013). In most cases, in reintroductions of wisents individuals from breeding stations or zoos are used. This is on one hand because of usually too small size of free ranging herds to be further reduced, and the other reason is known pedigree of animals from captivity, what is crucial for the formation of a new herd in case of such highly inbred species (Krasińska, Krasiński 2004, Olech 2005). In earlier introductions of wisents to Bieszczady, there were no technical means to follow their movements precisely. In last introduction, performed in February 2014, fitted with GPS collars and released were two bulls originating from breeding enclosure, and one bull from the wild herd dwelling in the area surrounding the acclimatisation enclosure. Therefore, for the first time in this area, there was a possibility to compare the behaviour and dispersal patterns of such animals in first few months after release.

Study area, materials, methods

All three bulls were released from an acclimatisation enclosure for wisents at Wola Michowa forestry, Komańcza Forest District in the western part of Bieszczady Mountains. The enclosure is situated close to a side forest road connecting to the main road, running along the bottom of the valley of Osława river. To the south of the road there is a continuous stretch of the forest along the main Carpathian ridge. To the north, there is a forest complex surrounding major mountain peaks of the area: Chryszczata and Kraglica. The main road is the most important locally barrier for wildlife movements, especially within the limits of the Wola Michowa settlement, occupying some 2 km along the road.

Animals were fitted with GPS/GSM collars (ML931XL) made by MMT. Their geographic position was recorded once per hour. Data were saved to the logger and later sent by GPRS to the local server. After initial analyses with XwayMap software, data was converted to KML format and plotted at orthophotomap of the area. Further, after conversion to CSV format, data was analysed using Microsoft Excel. Data obtained in first four months after the release were analysed.

Results

During a short period after release (approximately 2 weeks) three bulls stayed together, close to the acclimatisation enclosure, where at this time of the year they could find the most suitable food in feeders (Fig. 1).

Afterwards, the bull from the wild herd for the most of the time kept separately from other two males. Generally, he was more mobile, he left fairly quickly the surroundings of the enclosure, crossed the main road in a different spot than two other bulls – further from the settlement, and later moved farther to the west, perhaps to the area he already knew (Fig. 2). Two younger bulls however, tended to move around accompanying each other, and apparently to a certain extent followed movements of their older companion. Areas of concentration



Fig. 1. Three bulls together, close to acclimatisation enclosure, shortly after release (17-02-2014).



Fig. 2. GPS records of three bulls during the first 4 months after release (squares represent locations of the wild bull, black spots and white triangles represent locations of two other males). The pentagon denotes the fence of acclimatization enclosure, white arrows show the crossings of the main road by the wild bull (long arrow) and two other bulls (short arrow).

of animals' locations are situated either within abundant in brambles, relatively young forest patches growing at formerly abandoned fields, or around feeding stations for deer.

Two locations recorded the most far to the west show wild bull circling the prison at Nowy Łupków, following a natural corridor formed by a stretch of the forest, which indicates his shyness towards proximity of people (Fig. 3).

A difference in the pattern of habitat use between released wild bull and two bulls from captivity is visible. Concentrations of locations of two younger bulls (sur-



Fig 3. Location of wild bull (white squares) near prison at Nowy Łupków.

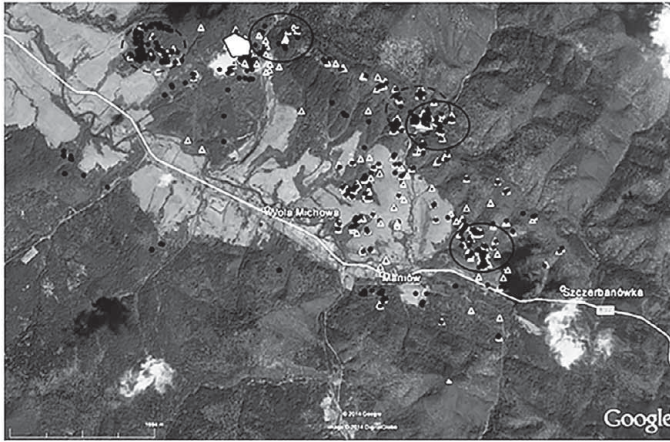


Fig 4. Concentration centres of two younger bulls (black dots and white triangles mark locations of bulls). Solid line ovals mark areas with dominant natural food base. Dotted line ovals denote areas around baiting stations.

rounded with circles) correspond with areas providing good forage (baiting stations for deer with beets and forest patches abundant in brambles) (Fig. 4).

A different pattern of concentrations of locations of the wild bull is notable. Initially, the bull was spending most of the time in the forest, feeding on bramble and near the hunting hides where he was attracted by baits. Initial analyses of the collected data shows that the bull was spending around 70% of the day in the concentration centres (areas with at least 100 locations within 200 m radius). The num-

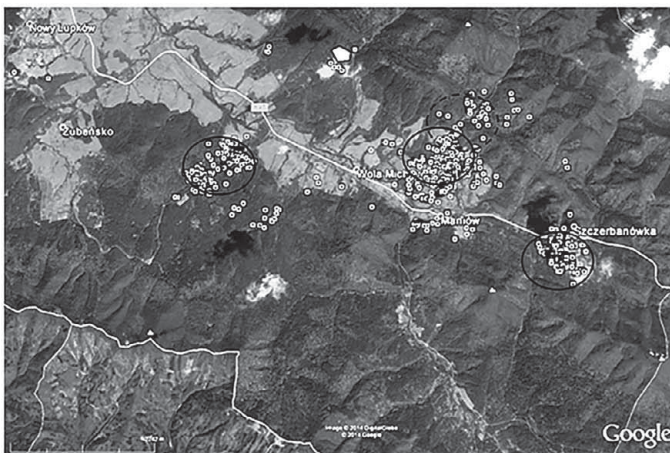


Fig 5. Concentration centres of the wild bull locations (white squares mark locations of bull). Solid line ovals mark areas with dominant natural food base. Dotted line oval denotes area around baiting stations.

ber of hours spent at open meadows increased after middle of March and reached approximately 40% of the 24 hour cycle. The bull stayed at the open mostly at night time, during daylight hours he was foraging in the forest (Fig. 5).

Conclusions

Wisents that are used for reintroductions demonstrate different behaviour and dispersal patterns after release to the wild depending whether they were raised in captivity or were translocated from free ranging herd. Differences in dispersal pattern in this case could also be connected with a different age of animals. Older bulls tend to move for a longer distance, which was also reported in other studies (Kraśńska, Kraśński 2004). Regardless of age and origin, all three monitored animals displayed specific for wisents type of habitat use, concentrated in certain habitat patches (most probably foraging activity), separated by parts of habitat where wisents were just moving through.

References

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Rozprzestrzenianie się byków żubra po introdukcji w Bieszczadach

Streszczenie: Analizowane było rozprzestrzenianie się trzech byków żubra (*Bison bonasus*), zaopatrzonych w obroże GPS, podczas pierwszych czterech miesięcy po ich wypuszczeniu na wolność w Bieszczadach. Dwa młodsze byki pochodziły z hodowli, a starszy samiec z dzikiego stada – przebywającego w okolicy zagrody aklimatyzacyjnej. Generalnie, starszy byk przemieszczał się na dalsze odległości, trzymał się dalej od siedzib ludzkich, co wskazywało na jego uprzednią znajomość terenu. Dwa młodsze samce trzymały się razem i w większym stopniu były zainteresowane punktami dokarmiania zwierzyny. Wszystkie trzy osobniki wykazywały typowy dla żubrów wzorec użytkowania terenu, koncentrując swoją obecność w wyraźnie wyodrębnionych płatach siedlisk.
