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Management of Wisent population within a Natura 2000 site

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Abstract: Wisents in Bieszczady Mountains live mostly outside of national park, so their conservation has to be compromised with forest management plans within newly established Natura 2000 site. Analysis of seasonal and annual variability of wisent concentration sites, identified as areas with 50% probability of animals' presence, allowed to indicate most frequented parts of wisents' home range. Through a comparison of those areas with current forest management plan, selected were forest compartments that are not scheduled for logging or major forest works until the end of the validity of this forest management plan. The joint area of those compartments was approved by the Regional Directorate of State Forests as wisent refuges divided into two zones: (1) a zone for the habitat improvement for wisents, and (2) a zone of particular protection. Additionally, in forest compartments situated within seasonal migration corridors ensured will be the continuity of ecosystems. Bieszczady are the first Natura 2000 site having officially approved refuges for a large mammal.

Key words: wisent, *Bison bonasus*, Natura 2000, Bieszczady, management

Introduction

Wisent *Bison bonasus L.*, belongs to species with relatively large annual home ranges, and often undertaking seasonal migrations (Perzanowski, Paszkiewicz 2000; Perzanowski, Januszczak 2004; Kowalczyk *et al.* 2007; Kowalczyk *et al.* 2008). Hence, in most cases wisent herds have to be managed outside of protected areas like nature reserves or national parks, which in Poland are usually too small to encompass their whole home ranges. A chance for well coordinated, consistent management of a population of this species provide newly established Natura 2000 sites, which in many cases are much larger than national parks, and have strict regulations concerning the conservation of priority species like wisent (Makomaska-Juchiewicz, Tworek 2003).

The total area of Natura 2000 site (PLC 180001 Bieszczady) is over 1115 sq. km. Maximal registered annual home ranges of free ranging wisents in this area amounted to about 587 sq. km. Over 90% of estimated wisent ranges are outside of the area of national park (about 30 thousand ha). Since wisents at Bieszczady utilise mostly the area that is administered by State Forests, therefore there is no possibility to establish completely protected refuge of such size excluded from timber exploitation and other human activities. However, a need to fulfil requirements connected with conservation of wisents, according to Natura 2000

rules, was well understood by State Forest Administration which allowed for the establishment of the first in the world, officially approved network of seasonal refuges, and connecting corridors for this species within Natura 2000 site (Perzanowski *et al*. 2008).

Study area, Materials, Methods

Bieszczady Mountains, i.e. the most south – eastern part of Polish Carpathians, border with Slovakia and Ukraine. The total area of this range is estimated for about 2000 sq. km, elevation varies between 500 – 1364 m above sea level. Land cover consists in about 65% of beech – fir forest (Wrona 1985; Przybylska, Kucharzyk 1999).

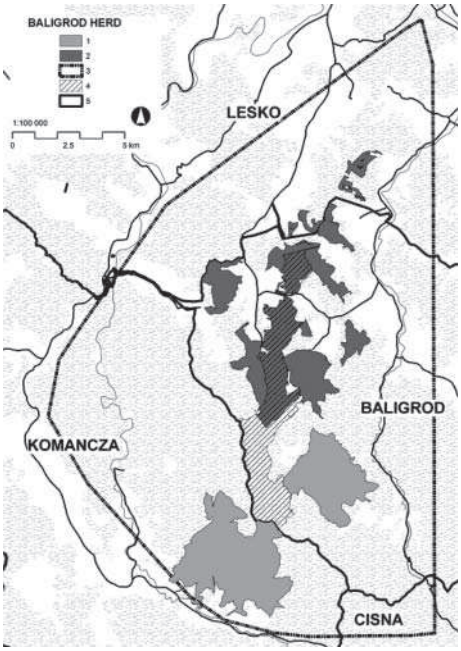

Figure 1. Home range, refuges and migration corridors approved for the western subpopulation of Bieszczady wisents. 1 – summer refuge, 2 – winter refuge, 3 – MCP, 4 – migration corridor, 5 – boundary of a forest district

All data obtained from field observations and telemetry were pooled together to obtain the variability of home range size in consecutive years and seasons. Areas of wisent concentration were identified with kernel method (Worton 1989), as areas with 50% probability of animals' presence. Concentration areas were plotted over a map of forest compartments to obtain a list of compartments within concentration areas and along seasonal migration routes. Because of seasonal migrations of wisent herds, data for winter (1.XII – 31.III) and vegetative season (16.V – 15.X) were analysed separately. For the delineation of migration corridors, data from the period between 1.IV – 15.V were assumed as belonging to spring movements, and data from the period 16.X – 31.XI as belonging to autumn movements. Nevertheless for some herds like "Lipie", "Tworylne" and "Zakole", there was not possible to identify separate concentration areas for winter and summer, so selected areas represent annual refuges. Finally, this list was confronted with current forest management plan to exclude compartments that are to be significantly altered until the end of the validity of this plan.

Results and Discussion

Between 2002 and 2008, the total area penetrated annually by wisent population in Bieszczady (MCP), ranged between 230 and 460 sq. km. At about 60% of

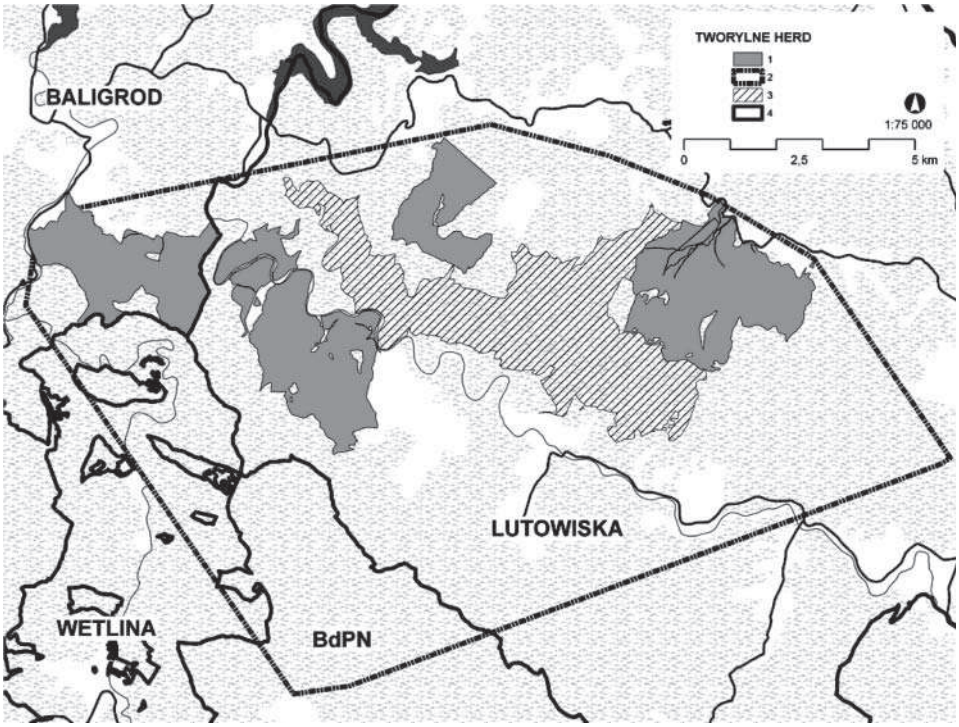

Figure 2. Home range, refuges and migration corridors approved for the "Tworylne" herd in the eastern subpopulation of Bieszczady wisents. 1 – annual refuge, 2 – MCP, 3 – migration corridor, 4 – a boundary of a forest district

this area the probability of wisent presence was about 95%. Areas of wisent concentration (50% probability of animals' presence), occupied between 1.6 – 6.8% in summer, and 1.5 to 8.2% in winter, of the whole home range area (Perzanowski 2002; 2008). Total area penetrated by wisent population (MCP) during years 2002 – 2008 in Bieszczady was 587 sq.km. Pooled area of wisent concentration for this period of time (82.78 sq. km for both seasons) achieved 14.1% of the total home range. The area of migration corridors linking summer and winter areas of concentration was estimated for 33.9 sq. km, i.e. 5.78% of the total home range area.

The attempt to establish refuges for wisents was based upon two assumptions: (1) planned refuges should overlap with areas where animals have a natural tendency to aggregate, (2) forest districts at which wisent refuges will be established, should be able to continue their tasks according to forest management plans. The first issue was solved through an analysis of the distribution of wisent concentration areas during last seven years. However those areas show considerable annual and seasonal variability, it was possible to identify sites with the highest degree of overlap, i.e. presumably representing parts of the home range most frequently utilised by wisents. The second aspect

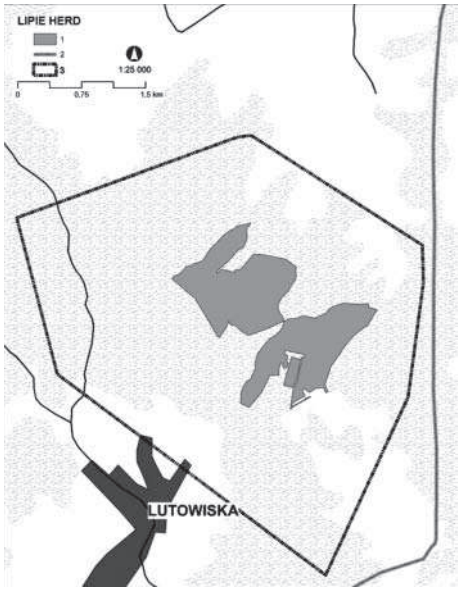

Figure 3. Home range and annual refuges approved for the "Lipie" herd in the eastern subpopulation of Bieszczady wisents. 1 – annual refuge, 2. country border, 3 – MCP

Figure 4. Home range and annual refuges approved for the "Zakole" herd in the eastern subpopulation of Bieszczady wisents. 1 – MCP, 2 – annual refuge, 3 – a boundary of a forest district, 4 – country border

was tackled by a comparison of concentration areas in consecutive years with forest management plan that is valid for 10 years. This allowed to select such parts of the forest that are among the most frequented by wisents and are not scheduled for logging or major forest works until the end of the current forest management plan (Fig. 1–5). To avoid conflicts between the need to exclude disturbance of wisent refuges and necessity to maintain normal functioning of forest districts, following measures to be applied within wisent refuges, were approved by the Regional Directorate of State Forests at Krosno:

1. The list of forest compartments included into proposed refuges for wisents will be consulted with every forest district declaring the presence of this species
2. The area of refuges will be considered by current plans for forest management as the area requiring particular approach.
3. Within refuges delineated will be two zones:
   - a zone for the habitat improvement for wisents, where the main goal of forest management will be to ensure the continuity of the forest existence, and maintenance of the equilibrium in forest ecosystems through the conservation of a concurrence between the biocenosis and the biotop, with simultaneous guaranteeing of timber production.
   - a zone of particular protection (according to §14, point 8.2.c of

Figure 5. Home range and seasonal refuges approved for the "BdPN" (Bieszczady National Park) herd in the eastern subpopulation of Bieszczady wisents. 1 – summer refuge, 2 – winter refuge, 3 – MCP, 4 – a boundary of a forest district, 5 – country border

instruction for forest management) understood as conservation of actual function of the selected area and its role in the ecosystem (not just a formal legal protection).

4. The localisation of zones of particular protection as well as the scope and the character of measures for the habitat improvement for wisents will be determined separately for every forest district because of differences in the structure and composition of tree stands, and the necessity to consider their forest management plans.

5. The list of compartments included into wisent refuges will be verified in consecutive years, in order to consider the dynamics of home range utilisation by wisents. The area of refuges will be verified every time when a new forest management plan will be prepared. In cases of significant changes in wisents' distribution, the area of refuges could be verified independently of current forest management plan, through the update of SILP (Information System for State Forests) and LMN (Forest Numerical Map) databases.

6. Restrictions for forest management within delineated migration corridors will concern only the continuity of ecosystems.

It has been also agreed, that for the whole metapopulation inhabiting the transboundary area of Polish Bieszczady, Slovak Poloniny N.P., Ukrainian Nadsiansky Landscape Park and Skolyvski Beskyd N.P. estimated will be the habitat capacity, considering also the recommendations for the maintenance of genetically and demographically sustainable population of wisents in this region.

Therefore as a result of this agreement, Bieszczady became the first Natura 2000 site, with determined refuges for a large mammal species, approved by the major stakeholder (State Forest Administration), and having clearly defined rules for habitat management.

Additionally, it is also the first region in the world, where initiated is a common approach towards the conservation and management of this priority species by three neighbouring countries.

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References

Kowalczyk R., Krasiński Z.A., Krasińska M. 2007. Strategie rujowe byków żubra w Puszczy Białowieskiej. Mat. X Ogólnopolskiej Konferencji Teriologicznej. Warszawa 13–14.02.2007. SGGW: 40–41.

Kowalczyk R., Schneider T.C., Krasiński Z.A., Krasińska M. 2008. Wpływ zimowego dokarmiania na użytkowanie przestrzeni przez żubry w Puszczy Białowieskiej. Mat. VI Międzynarodowej Konferencji Naukowej: Żubr w sieci Natura 2000. Cisna 15–16.09.2008. Stowarzyszenie Miłośników Żubrów: 29–30.

Makomaska-Juchiewicz M., Tworek S. (eds) 2003. Ekologiczna sieć Natura 2000 problem czy szansa. IOP PAN, Kraków: 237pp.

Perzanowski K. 2002–2008. Raporty roczne z programu "Stały monitoring żubrów na terenie nadleśnictw bieszczadzkich. RDLP Krosno.

Perzanowski K., Januszczak M. 2004. Wstępna ocena dynamiki areałów żubrów Bison bonasus w Bieszczadach. Parki Narodowe i Rezerwaty Przyrody 4: 639–646.

Perzanowski K., Paszkiewicz R. 2000. Restytucja i współczesny stan populacji żubrów w Bieszczadach. W: Monografie bieszczadzkie: Kręgowce Bieszczadów Zachodnich (Z. Głowaciński ed.) 9: 219–229.

Perzanowski K., Wołoszyn-Gałęza A., Januszczak M. 2008. Indicative factors for European bison refuges at Bieszczady Mountains. Annales Zoologici Fennici 45: 347 – 352.

Przybylska K., Kucharzyk S. 1999: Skład gatunkowy i struktura lasów BdPN. Monografie Bieszczadzkie 6:11–21.

Worton B. J. 1989: Kernel methods for estimating the utilization distribution in home-range studies. Ecology 70: 164 – 168.

Wrona J. 1985. W Bieszczadach. Polska biblioteczka geograficzna. Wydawnictwo Szkolne i Pedagogiczne, Warszawa: 7–16.

Zarządzanie populacją żubra w ramach obszaru Natura 2000

Streszczenie: Areał populacji żubra w Bieszczadach leży niemal w całości poza obrębem parku narodowego, natomiast pozostaje w obrębie obszaru Natura 2000 (PLC 180001 Bieszczady). Dlatego też ochrona tej populacji musi uwzględniać plany zagospodarowania lasu. Analiza sezonowej i rocznej zmienności rejonów koncentracji żubrów, określanych jako obszary o 50% prawdopodobieństwie obecności tych zwierząt pozwoliła na określenie obszarów najczęściej użytkowanych przez żubry. Poprzez ich porównanie z aktualnym planem zagospodarowania lasu możliwe było wybranie oddziałów leśnych, w których nie planuje się cięć ani innych intensywnych prac leśnych do końca okresu obowiązywania bieżącego planu (Fig. 1–5). Lista tych oddziałów została zaaprobowana przez Regionalną Dyrekcję Lasów Państwowych jako obszar ostoi żubrów, podzielony na dwie strefy: (1) strefę poprawy warunków siedliskowych dla żubra oraz (2) strefę szczególnej ochrony. Dodatkowo, w oddziałach leśnych leżących w obrębie sezonowych korytarzy migracyjnych zapewniona została ciągłość ekosystemów. Bieszczady stały się więc pierwszym obszarem Natura 2000 z oficjalnie zatwierdzonymi ostojami dla chronionego tam gatunku dużego ssaka.