

The Conservation Strategy and Recommended Action Plan

The objective of the conservation strategy is to create conditions that are conducive for the long-term survival of viable wild (or naturalised) populations of European bison (Lowland and Lowland-Caucasian lines). European bison can only be saved from extinction as a wild species and a natural element of the forest and steppe-forest ecosystems of central and East Europe. This could be achieved by creating large (1,000 animals, or more) viable populations of the species. A target number of 3,000 free-ranging animals as a single genetic population is recommended as a management goal for self-sustaining populations for each genetic line [recommendations from the joint meeting of IUCN/SSC Bison Specialist Group, IUCN/SSC Conservation Breeding Specialist Group and European Endangered Species Programme (EEP), 1996]. At present, we are far from reaching such a satisfactory conclusion.

Two basic directions in European bison recovery should be maintained and continued, namely:

1. Captive breeding in zoological gardens and reserves
2. Development of free-ranging (or semi-free) populations

Consequently, it is necessary to create the following foundations for the European bison action plan:

1. To continue captive breeding of the species. The captive population constitutes an extremely valuable reserve of the species gene pool. According to data presented in Tables 6.1–6.4, the gene pool of the captive population is unique for every line. The pedigree of animals in captivity is well known, and can be traced to the founders of the species. This portion of the European bison world population primarily serves as a reserve gene pool and aids protection against any catastrophic genetic losses; and secondly, as a source of animals for further reintroduction, or possible supplementation of under-represented genetic material in free-ranging populations. Special attention should be given to the long-term conservation of the whole gene pool and genetic variability, including the part of the genome not represented in the free-ranging population. The captive part of the world population should be subject to a programme of genetic variability conservation, which treats European bison as one world population. The programme should ensure:

- a) Separation between the existing breeding lines, i.e., between the pure Lowland bison and the Lowland-Caucasian line, which is particularly important for preserving the genetic variability of the latter.

- b) Avoidance of the possibility of contact and breeding with any European and North American bison hybrids or cattle, or pure American bison introduced for farming/ranching in several European countries. Europe is the range of European bison so any imports of American bison should be avoided [!]
- c) Application of a coordinated programme aimed at maintaining genetic variability. This requires professional methods focusing on the conservation of unique genes, maximisation of effective population size, increasing the tendency towards the equalisation of the founders' genotypes contribution, and minimisation of inbreeding or kinship coefficient.
- d) Successful cooperation between herds in the genetic programme and improved management conditions.
- e) An increase in the number of herds and animals, i.e., the contribution of the Lowland line to the world herd [?]

To realise the above goals, genetic material must be exchanged between enclosed herds, which should be treated jointly, as one population, within the respective lines.

The genetic programme of bison breeding ought to be based on genealogical analysis of EBPB data (Ballou *et al.* 1995) and simulation analysis of demographic characteristics and reintroduction results in the respective populations, or herds (Soulé 1987; Seal 1991). The EEP (European Endangered Species Programme) should be extended to encompass the whole captive population.

A Gene Resource Bank (semen collection in the first phase) should be created to serve as a security against the loss of important genetic variation, to decrease the number of animals required for maintaining optimal genetic variability, and to facilitate the exchange of genes between herds. Studies in this direction have already been undertaken in Russia. Methods for the collection of sperm, its conservation and use have already been worked out (Sipko *et al.* 1993, 1997). Much more has to be done for obtaining sperm from the most important animals for the protection of the species and its heterogeneity. Adequate resources for its continuous collection, supplementation and preservation are very important for obtaining satisfactory results.

2. To continue the process of reintroduction of the European bison into forests or other ecosystems, including vast areas where human activities are abandoned (former farmland or military training grounds). According to the

1987 IUCN position statement – *Translocation of Living Organisms: Introductions, Re-introductions and Re-stocking*, this process should be based on adequate scientific knowledge and requires identification of new reintroduction or introduction sites, particularly within the historical range of the species, but also outside it.

A target number of 3,000 free-ranging animals is recommended as a management goal for a self-sustaining population for each genetic line (Pucek *et al.* 1996b). If this is to be achieved it would mean that the total world population of European bison would increase (at least be doubled) in the near future. Additional sites are therefore required in order to establish such a high number of bison. The separation of the Lowland line and the Lowland-Caucasian line should be maintained in free-ranging populations for as long as possible, or at least until they make contact naturally. European bison from both lines have been released on different occasions with little regard to their separation (*cf.* Chapter 8.2). More genetic studies are required to determine the differences between lines and the future consequences if they are merged.

It is necessary to link isolated populations, one with another, to form a common metapopulation for exchange of animals in a natural way (e.g., ‘building’ ecological corridors) or stimulated transfers of individuals from one herd to another. These practices should incorporate knowledge of the genetic structure of respective populations and the history of their development. This is particularly important, since many populations originate directly or indirectly from material obtained from Poland or from larger enclosed breeding centres, which did not have descendants from all the founders. Recent reintroductions in Belarus are a good example of this (see below).

Establishing sufficiently large populations or a network of metapopulations is necessary for minimising the effects of stochastic gene loss in small isolated populations. The reproducing size (75–100 individuals) of these populations should exceed at least 50 effective individuals – the bigger the better. Simulations, conducted using the Białowieża population, have indicated that free-ranging populations need a carrying capacity of at least 100 to be demographically safe. If small groups (15–20 individuals, selected according to pedigree, age and sex) are chosen, they should be allowed to grow quickly, at least, up to 100 to found a new population. Theoretical population models that guarantee steady long-term development indicate that only effective populations of approximately 500 unrelated and intensively reproducing animals can fulfil these conditions (Franklin 1980; Soulé 1987; Nunney and Campbell 1993). Analysis of the size and genetics of the European bison population show that there is still a long way to go until this goal is achieved.

It is also very important to **include all the founder’s genes into free-ranging populations** as represented in the captive world population. In practice, the process of releasing

captive animals into free-ranging conditions would initially require pre-release adaptation centres. There are some special centres in Poland and Russia for adaptation and breeding of European bison for release, but more are required. During the last few years, only a few transfers of European bison from zoos into such breeding centres took place. The process has to be more intensive. The future of the species lies in managing free-ranging populations of various sizes. Successful cooperation between captive breeders, adaptation centres and free-ranging herds needs special attention and financial support. Greater international and regional funds should be provided for scientific research.

The creation of a **more compact geographic range** for the species should be initiated. Certain possibilities seem to exist in the Carpathians (Lowland-Caucasian line), on the border between Poland, Slovakia and Ukraine, and even more probably, between Ukraine and Romania, because of the existing large Bukovynska population. The Polish-Ukrainian agreement signed for the protection of border territories and free-ranging populations of European bison inhabiting that part of the Carpathians creates a solid base for the reconstruction of the bison’s geographic range there (Flint *et al.* 1986; Pucek 1994; Perzanowski and Kozak 1999; Perzanowski and Paszkiewicz 2000).

The Russian Federation has begun to create large populations in the Orel–Bransk region and the neighbouring areas of north-east Ukraine (Desnjansko-Starohutski National Park, Sumy region), as well as, the Vologda region.

Similar initiatives could be suggested for the Lowland line in the region of Belarus, if northern Poland and Lithuania sub-populations are included (see under Belarus, this chapter).

European bison reintroductions are most frequently located in forest ecosystems, which are far from areas affected by anthropogenic alterations. Such populations require constant control by man. This refers particularly to the regulation of bison numbers and the species adaptation to current environmental resources available for the large herbivore community. Locally, regulation is necessary and intended for the good of the species whose unlimited increase could exceed the carrying capacity of the habitat. Despite the status of the European bison as an Endangered species (IUCN 2003), the regulation of its numbers is a necessary practice for the sake of the species and its further restitution. However, **models of bison population management** should be elaborated to ensure effective actions.

European bison habitat should be properly managed, with the formation of watering places, cultivated meadows or feeding glades for use by other ungulates. European bison feeding pressure on the forest can be considerably decreased by creating properly managed large glades and forest meadows.

Poaching is a serious threat to the European bison in several countries. Regulations that are more restrictive are necessary to preserve free-ranging bison. Financial support and a system for compensation should be developed in particular countries. Including the European bison in the Habitat Directive of the European Union, especially in Appendix II (which lists animals in need of specially protected areas) and Appendix IV (listing endangered species in need of special protection), may guarantee **better protection for the species**. It has also been suggested that the European bison – an endangered species of the IUCN Red List (2003) – should be placed in Annex 2 (strictly protected fauna species) of the Bern Convention. There are also some general problems, which should be addressed, and included in an action plan for European bison. These are:

- The **European Bison Pedigree Book (EBPB)** has been published for 70 years nearly unchanged in terms of basic format and the scope of data presented. Poland is responsible for this task, sometimes with differing success rates in the regularity of publication. However, all European bison owners take responsibility for the accuracy of the actual data published.

The role of EBPB cannot be overstated (*cf.* Chapter 1). It is the only source of information about European bison registered in the world and the basic source of data about number, location, and the genealogy of the species. Breeders use the EBPB editorial office to make contacts and find information about the species.

The tasks performed by the EBPB should increase in the near future according to the recent state of the species. These should include:

1. Evaluation of the global European bison population, based on knowledge of pedigree and calculation of coefficients, for example inbreeding, genetic uniqueness or contribution of founders to the gene pool of the species. The evaluation should be based on an official register for the European bison (individual registration in captivity and group registration for free-ranging and semi-free herds).
2. The information provided by EBPB should be extended to include results from the genetic evaluation of animals in captive herds and free herds as a tool helpful in the conservation of genetic variability.
3. The EBPB office should serve as an advisory and information centre for breeders and for reintroduction purposes, in order to obtain the best results for the species restitution.
4. The EBPB should be located in an established institution, (currently Białowieża National Park, Poland), but not in *ad hoc* specialist groups, societies, ministries, etc.). The main products of EBPB are archives and databases of great importance for the recovering species. All this information should be

based on accurate genealogies supplied to the studbook keeper.

5. EBPB should develop other databases, for example with species bibliography, photos, etc.
 6. Governmental authorities for nature protection should supervise the activity of European bison breeding centres.
- Establishing an **International European Bison Breeding Centre (IEBBC)** is proposed for the coordination of restitution, reintroductions, monitoring of captive and free-ranging herds, and most of all – gene pool preservation and genetic management of particular herds. The EBPB database – as the main source of information on European bison worldwide – should have its role extended and cooperate very closely with the proposed IEBBC, or be a part of it. This centre must provide all kinds of information and be available to all interested users, possibly free of charge. A mutual agreement should be achieved in cases of data publication, and appropriate acknowledgements given.
 - Detailed **methods of transportation** of European bison should be worked out to minimise eventual losses during international transfer (refer to IATA 2003).
 - The creation of a **web site** at the centre and an official European bison newsletter (EBNL) available on the internet is essential for the quick exchange of ideas, recommendations and instructions for breeders and those seeking information on European bison.

13.1 Details concerning an Action Plan for European bison developed in particular countries

13.1.1 Belarus

The forest ecosystem of Białowieża Primeval Forest (now Belarus and Poland) was the last sanctuary for wild Lowland European bison in the beginning of the 20th century. However, this does not mean it was the most adequate habitat. The first free-living herds of the species (Lowland subspecies, *Bison bonasus bonasus*) were re-established in the 1950s. Today, the forest complex is divided by a state border and a frontier fence (Chapter 8.2.2). The Belarus part of Białowieża Forest is sufficient for 200–250 European bison only, but this is not enough for the long-term survival of the species. There are no other sufficiently large ranges for free-living populations of European bison in Belarus.

The main purpose of the regional Belarus State Programme on Resettlement, Conservation and Use of the European Bison (1998) is to establish 10–12 small (50–100 animals) free-living populations (“satellite micro-populations”) of the Lowland line, connected with

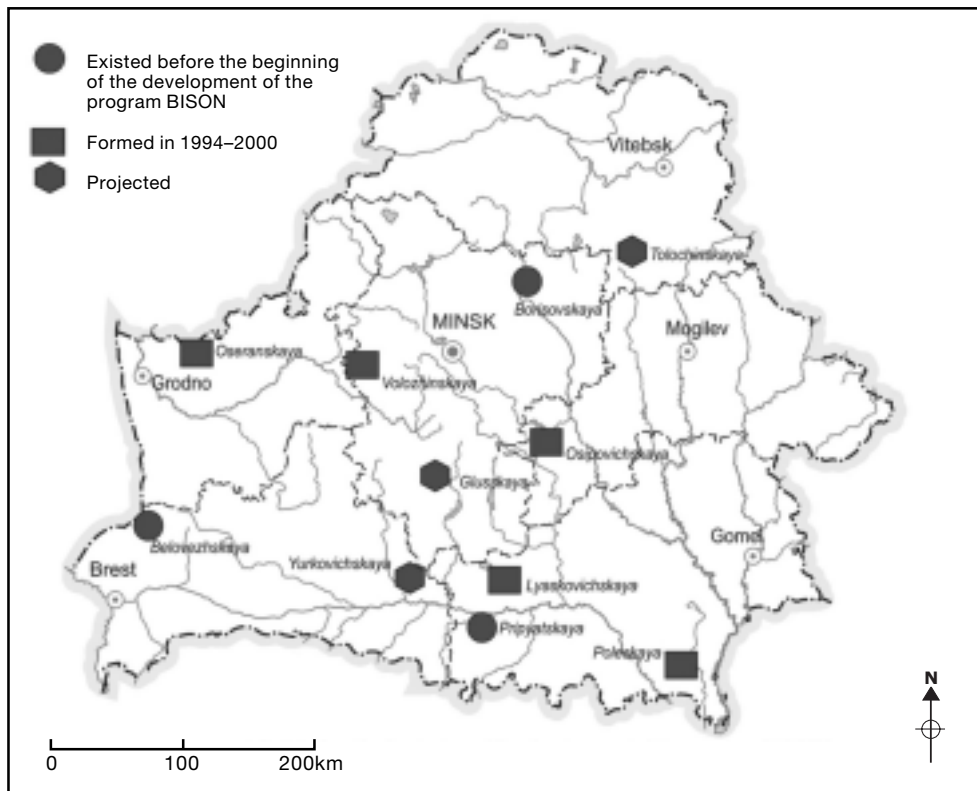


Figure 13.1.
Distribution of free-ranging populations of European bison in Belarus (acc. to P. Kozlo, pers. comm.).

ecological corridors and treated as one population. Before 1994, three micro-populations of European bison had been established, in 2000 this had increased to seven, the process of enlarging their size and number still continues (see Figure 13.1). In 2001, there were 520 European bison living free in Belarus. There has been some artificial exchange of Lowland line animals between all bison populations in Belarus and other herds situated elsewhere (Poland, Lithuania). Herds inhabiting national parks and reserves have the status of an insured species. Herds formed in managed forests have the status of a reserve species; once their numbers sufficiently increase, there may be regulated hunting (Kozlo 1999; pers. information).

Priorities for this project (running until 2005), include the formation of further micro-populations in this scheme, arranging contacts with other populations of this genetic line (outside Belarus) and monitoring and scientific investigation of the process of reintroduction.

13.1.2 Latvia

Southern Latvia is within the historical distribution range of the European bison (Figure 8.1).

In the 1980s and 1990s, animals from Lithuania frequently crossed the border with Latvia but were poached (Balčiauskas, pers. comm). WWF-Latvia started a programme aimed at the reintroduction of the species into the region (Mednis, pers. comm), and in 2004 five European bison were transported from the Netherlands and Germany

to a 200 ha enclosure in the Liepaja district. It has been decided that all future animals will be reintroduced in consultation with the EBPB. In the future this semi-free herd will be released to the wild and contact with the Lithuanian free herd will be possible.

The European bison will be included into the Latvian fauna listing and the proper legislation process will be undertaken.

13.1.3 Lithuania

There is no official conservation strategy for European bison in Lithuania. The status of free-ranging animals is under discussion at the Red Data Commission of the Ministry of Environment. It is worth noting that Lithuania is an exclusive example, where the European bison's existence is in a highly anthropogenic agricultural landscape, with different ecology and human dimension aspects.

Details on the status of the European bison, and the potential for the extension of its range in Lithuania, have recently been published (Balčiauskas 1999). European bison from Panevezys-Pasiliu migrate widely throughout Lithuania, and animals from Belarus or Poland are believed to be spreading northwards into southern regions of the country (Figure 13.2). This natural process is worthy of support and the new free-ranging herd in the region of the Bukta or Kalniškės forest is thought to be established. Together with Belarus and the herds in northern Poland,

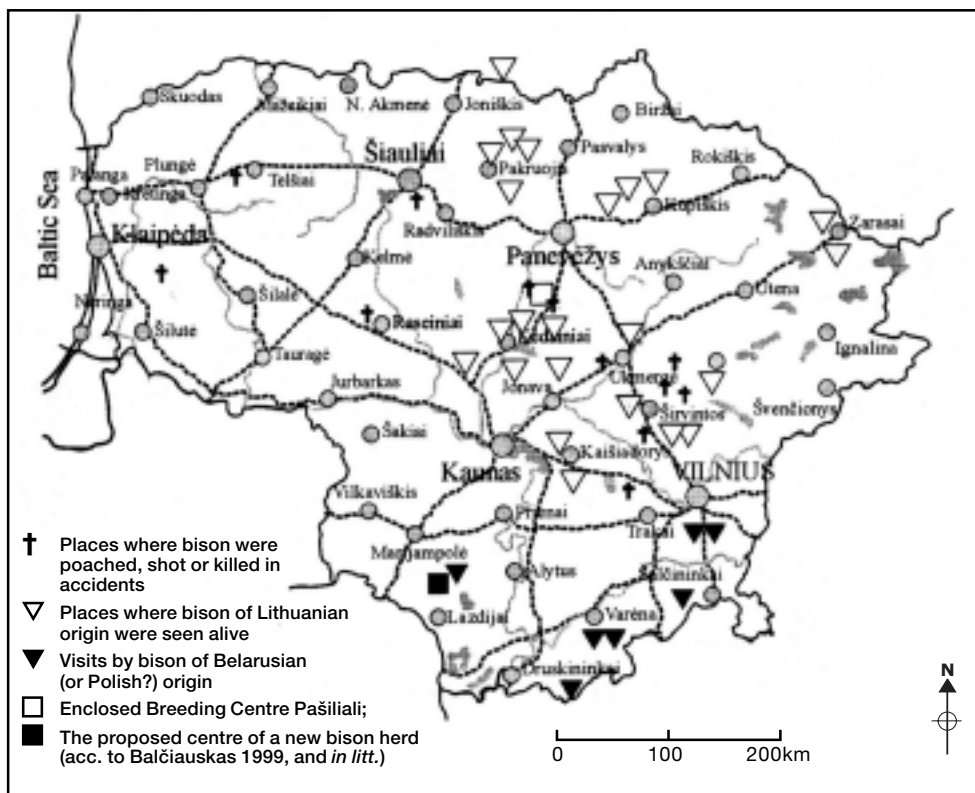


Figure 13.2. Movements of free-ranging European bison outside the Pašiliari area and the proposed site for the new bison herd.

this could be part of a more compact range of Lowland European bison. When Lithuanian bison herds increase in size it is proposed that they are regulated by means of hunting and that their status be changed to ‘game animal’ (Balčiauskas 1999; also see Chapter 9).

There is a project in Latvia aimed at restoring the large herbivore community, including the reintroduction of European bison from north-west Lithuania.

There is a need for a management plan for Lithuanian bison, which should include, among other tasks, new reintroductions, exchange of animals, scientific research, and monitoring.

13.1.4 Poland

There is no official strategy for European bison conservation in Poland yet. Some ideas were previously presented (Pucek 1994). The project of national strategy for European bison (Olech and Perzanowski 2002) is adjusted and will be probably implemented this year. Below are the main points concerning how to better preserve bison in Poland.

The total number of European bison maintained in Poland at the end of 2000 was equal to 717. For many years the numbers have been stable at this level (600–700 animals) but have recently increased (804 at the end of 2002). There are five free-ranging herds (Figure 13.3) containing 75–80% of all bison, six enclosed breeding centres (EBC) (17%) and 10 zoological gardens with approximately 5% of all bison. It has been suggested that

all bison kept in enclosed centres and zoological gardens should constitute one breeding herd of known pedigrees, regulated according to a uniform conservative breeding programme (Olech 1997). The programme assumes the existence of a total effective population of approximately 100 bison in all EBC’s with not less than 10 effective individuals in each centre. The mating system should optimise the exchange of bulls between centres and avoid the introduction of animals from free-ranging herds (i.e., animals of unknown pedigree). More than 60% of captive Lowland European bison are kept in Polish reserves and zoos. As a consequence, Poland plays a special role in the breeding of this line. Unfortunately, the exchange of

The free-ranging herd in Bieszczady, Poland.



P. Duell

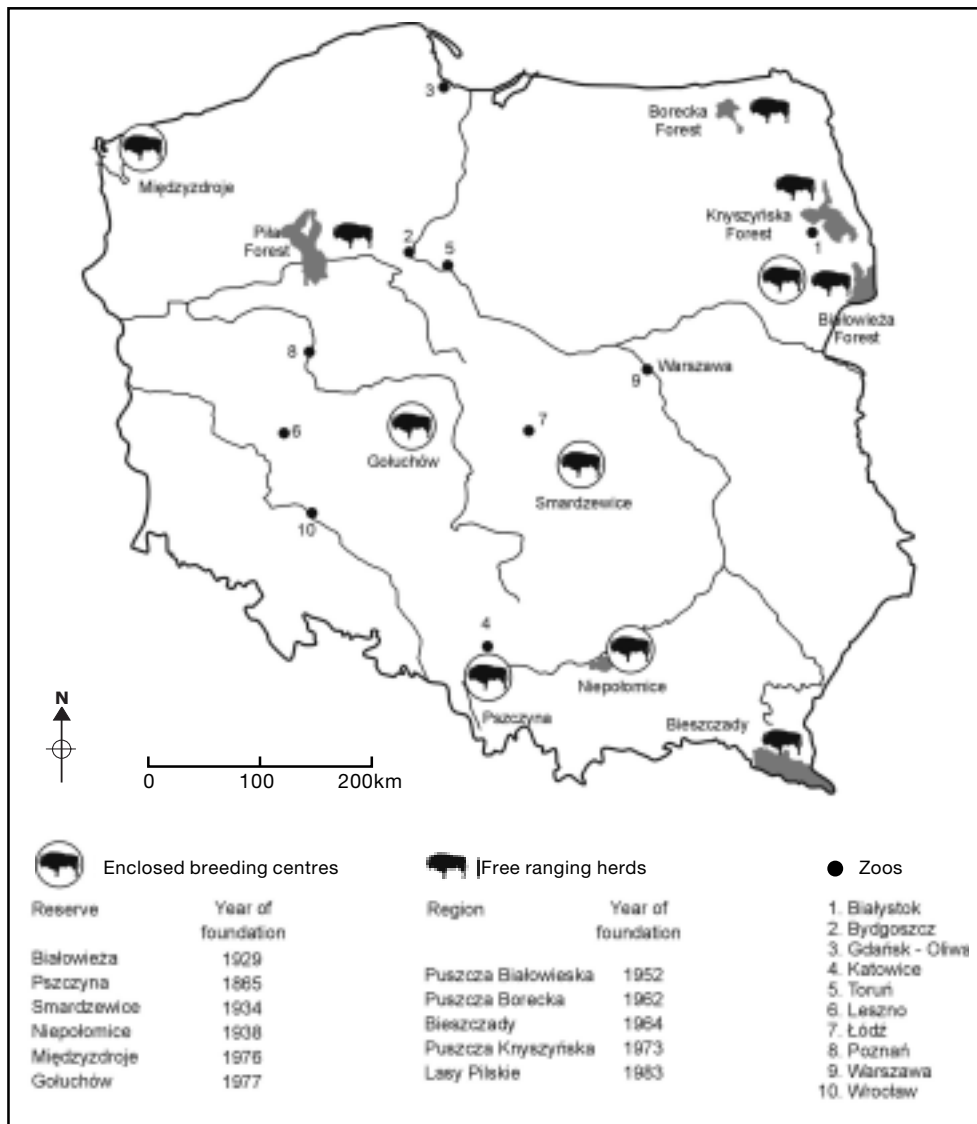


Figure 13.3. Distribution of Enclosed Breeding Centres, free-ranging populations, and Zoos possessing European bison in Poland (acc. to Krasiński 1994, changed).

animals between countries is very limited; therefore, in the future some attention should be focused on developing a coordinated, international network for the captive Lowland line.

Free-ranging populations are found mainly in the large forest complexes of eastern Poland (the Borecka, Knyszyn, Białowieża and Bieszczady Forests) (Figure 13.3). Limited contact may exist between Białowieża and Knyszyn Forest, while the distance to Borecka Forest is too great for bison migration. Contact of these herds with the population in Bieszczady is not recommended since only bison of the Lowland-Caucasian line live there. Eastern Poland was recently suggested for prairie bison breeding but the governmental nature protection authorities did not allow it.

The enlargement of small groups of bison in Knyszyn Forest (up to 30–50) and Borecka Forest (up to 70 heads) has been suggested (Krasiński and Krasińska 1992) and the same also applies to the Wałcz herd (26 individuals in

2000). All these herds should increase in size and be incorporated into a metapopulation if the genetic principles of long-term survival in viable populations of threatened species are accepted (see Chapter 9). The gene flow between herds would be assured through translocations but in the future some natural exchange should be possible.

Białowieża Primeval Forest plays a special role in European bison restitution in Poland. Both the historical aspects and the present size of the population contribute significantly to the whole forest complex – a future trans-border biosphere reserve. This population is also of great significance in the expansion of the Lowland bison population throughout the world. In the post-war period until 2000, 434 bison were transported from the Białowieża to 11 countries (Z. A. Krasiński, *in litt.*).

Białowieża Primeval Forest (now Poland and Belarus) is undoubtedly the last refuge for the European bison, which deserves special attention and priority there (Pucek 1993, 1994). The structure of the deer community and

other models of game management and preservation in this forest complex should offer the best chances for the European bison to thrive.

Territory for further European bison reintroductions is limited to north-east Poland (Lowland bison) and to the Bieszczady (Lowland-Caucasian line). Extension of these ranges and attempts to form more free-ranging bison herds, facilitating contact between already existing ones, is necessary for the progress of bison naturalisation. However, territory expansions have faced objections until now from those involved in the forest economy.

Lowland line bison in Polish EBC's have the same founder contributions and other characteristics as the rest of the world captive herd. Animals of the Lowland line are however strongly inbred. The inbreeding coefficient ranges mainly between 0.3 and 0.5 (Olech 1987, 1998). Therefore, cooperative action for the exchange of males in other countries has already started.

There is a necessity for a definite breeding policy within each European bison herd, covering all bison in Poland, centrally controlled with a supervised breeding system. Therefore, a European bison breeding and management centre should be established. The centre could be located in Białowieża National Park, which is the home of the international bison database and editorial board of the European Bison Pedigree Book.

Serious threats to the future of the European bison in Poland (and elsewhere) lie in its state of health. In the previous century, cases of epizooty were noted among bison in Białowieża Forest (Wróblewski 1927). Foot-and-mouth disease decimated whole herds in Polish reserves in the 1950s (Jaczewski 1960; Podgurniak 1967). The disease which affects male reproductive organs (manifested in the inflammation of the penis and prepuce, leading to diphtheroid-necrotic lesions), is a new phenomenon revealed at the beginning of the 1980s in Białowieża Primeval Forest and in Nadworniański Forest (Ukraine) (Piusiński *et al.* 1997); its etiology has not yet been elucidated. Cases

of tuberculosis were recently recorded in the Bieszczady Mountains (Żórawski and Lipiec 1997). A decision has been made to eliminate the infected herd in the Brzegi Dolne Forest District (about 15 animals). Additionally, all dead bison found in the area of the Bieszczady Mountains are examined to determine the presence of TB.

The elimination of diseased animals can seriously affect a population's structure. To ensure that care is taken during such procedures, a system of elimination based upon sex and age groups/classes is recommended (Pucek *et al.* 1996b).

European bison breeding in Poland is lacking investment with regard to the equipment found in enclosures, means and methods of bison transportation, prophylactics and veterinary supervision. They currently receive food traditionally given to domestic animals, which is very different from the bison's natural diet composition. New methods for feeding captive animals and prophylactics should be developed, and the necessity of supplementary feeding of free-ranging herds during winter re-considered.

13.1.5 Russian Federation

The strategy for European bison conservation in Russia was prepared in 2000 and published in 2002, after acceptance by the Ministry of Environment (Flint *et al.* 2002).

The Russian Federation (as a part of the former USSR) began the programme to re-establish European bison to the forest ecosystems of Europe about 50 years ago. Two large breeding centres worked to produce a stock of young animals annually, adapted for free-living conditions. These animals were used for establishing free-living herds in the Carpathians, lowland Ukraine and the Caucasus region (North Osetia, Chechnya). There has been a very rapid decline of free-living populations in the Caucasus region during the last few years (Table 9.2), and it appears the process cannot be stopped in this politically unstable region.



The semi-free breeding centre in Cherga (Altai Mountains, Siberia, Russia). In these harsh conditions European bison are managed very well.

The main purpose of the regional Russian action plan for the European Bison is to preserve the species as a natural component of the European forest ecosystem, with maximum possible genetic diversity. This is intended to be reached through preserving existing populations and the foundation of at least two large (500–1,000 or more animals) free-living populations. The populations should be designed to contain all the preserved genetic diversity and to have possibilities for long-term viability and survival. Some areas have already been suggested for the foundation of new large free-living populations in the European part of Russia. Such areas are the territories of Brjansk, Smolensk, Kaluga, Novgorod and the western part of Orel regions, in the eastern part of the historical range of the species. Another possibility is the Vologda region (59°N) and the broad-leaved forest of the Ural and Siberia. Further detailed suggestions are found in Russian Strategy (Flint *et al.* 2002). The possibilities for the successful development of large free-ranging populations of European bison in Russia must be examined carefully. Some priority projects for 2002–2005 are indicated below.

Projects of the highest priority:

1. **Population of European bison in Orel-Brjansk region:**
 - a) restoration project of a large complex population on an ecological and genetic foundation;
 - b) reintroduction and development of new free-living herds;
 - c) continuous scientific monitoring of the European bison population;
 - d) extending this population into the north-east regions of Ukraine (for details, see under Ukraine).
2. **The development of an experimental free-living population of European bison in the northern region of the European part of the Russian Federation (Vologda region):**
 - a) projects for establishing a large complex population based on ecological, behavioural and genetic backgrounds;
 - b) the reinforcement of the current experimental population with new animals and its development into a larger population;
 - c) monitoring and scientific investigations of the bison population.
3. **The reconstruction of European bison Central Breeding Centres in State Prioksko-Terrasny Biosphere Reserve and in Oka Reserve include:**
 - a) The reconstruction of the reserve's territory;
 - b) The re-stocking of most breeding groups with animals of high genetic diversity or with rare genomes.
4. **Monitoring and scientific investigation in all current Russian populations of European bison.**



Z.A. Krasinski

European bison in “Dragoş-Voda” Reserve in the Carpathian mountains, Romania.

13.1.6 Romania

Four ‘free-living’[!] European bison populations are located in Romania in *The Atlas of European Mammals* (edited by Mitchell-Jones *et al.* 1999), according to information of D. Murariu and I. Coroiu. Neither of these ‘populations’ have been registered in the EBPB 2001. As far as we know, there is one European bison captive herd (162ha enclosure) in Neagra-Bucşani Reserve, counting 45 animals (2000). Four animals are living in a 4ha enclosure in “Dragoş-Voda” Vanatori-Neamt Reserve and four in Hateg-Slivut Reserve. Except for those in Dragoş-Voda, all Romanian bison are of unknown pedigree (R. Deju, *in litt.*). The National Strategy for Romania is under preparation and further aims are to enrich and create a larger herd in “Dragoş-Voda” Reserve to support the general plan of reintroductions in the eastern Carpathians.

13.1.7 Slovakia

L. Brtek (*in litt.*) prepared a detailed conservation strategy for European bison in Slovakia. It includes active protection of animals migrating in a natural way from Poland (from Bieszczady Mountains), new reintroductions of animals from other countries and from EBC Topolčanki. This should lead to the formation of new free-living herds, in the eastern Carpathians, on the Slovakian side of this mountain chain, and in National Park Poloniny, where the year round occurrence of European bison has been observed since 1997. Acclimatisation enclosures are under construction there (near artificial Lake Starina). The programme also includes modernisation of EBC Topolčanki (Brtek *in litt.*), which was unfortunately removed from EBPB in 2000 because of the lack of official information.

13.1.8 Ukraine

The Carpathians and north-west Ukraine were selected for the reintroduction of European bison in 1965. Some free-living herds were established there, while others were established in the forest complexes of Polesie and one in the forest-steppe zone. All exist in areas containing hunting farms and exploited woods. The populations were successful in most cases, and were used for so-called “experimental/selective hunting”. There are nine sub-populations of European bison in the Ukraine, counting 9–138 individuals (year 2000). Two of them account for more than 100 individuals and the other two for over 50 individuals (Tables 9.1 and 9.2). At the beginning of the restitution, the total number of bison doubled in 10 years (1971–1980), and doubled again during 1980 to 1986 and 1986 to 1990. The maximum number of free-living European bison (664 animals) was registered in 1994; however, declined to 426 in the year 2000, due to social and economical instability, insufficient protection, and poaching.

There is a strategy for the protection and rebuilding of the European bison population in the Ukraine, worked out by the Specialist Group at the Ministry of Ecology and Natural Resources. It proposes the creation of new free-ranging and regulated populations in nature reserves of

different landscape zones – one containing over 500 individuals in the Chernobyl Exclusion Zone, which is believed by Ukrainian authorities to be unique territory for such a herd. This programme has not yet occurred because of the many frequent changes in the authorities responsible for nature conservancy and due to little interest in bison restitution in this country. Even the European Bison Specialist Group has no information about research or management programmes for the species in the Ukraine or about any regional action plan.

A special initiative and reintroduction programme was developed, covering the eastern Carpathians, including the Polish Bieszczady Mountains, Slovakia, Ukrainian Carpathians and even Romania (Figure 13.4). The suggestion to find a more continuous range for the species was expressed earlier (Pucek 1994; Pucek *et al.* 1996b) and is now in progress (Perzanowski and Kozak 1999; Akimov *et al.* 2001). However, such an approach is recommended only for bison herds in the Carpathians. Other Ukrainian herds are effectively isolated either due to considerable distances, or because of impenetrable barriers such as large rivers, highways, railroads or dense settlements (Perzanowski *et al.* 2004). In those cases, active management of the gene pool, including the controlled exchange of individuals, should be applied (Olech and Perzanowski 2002).

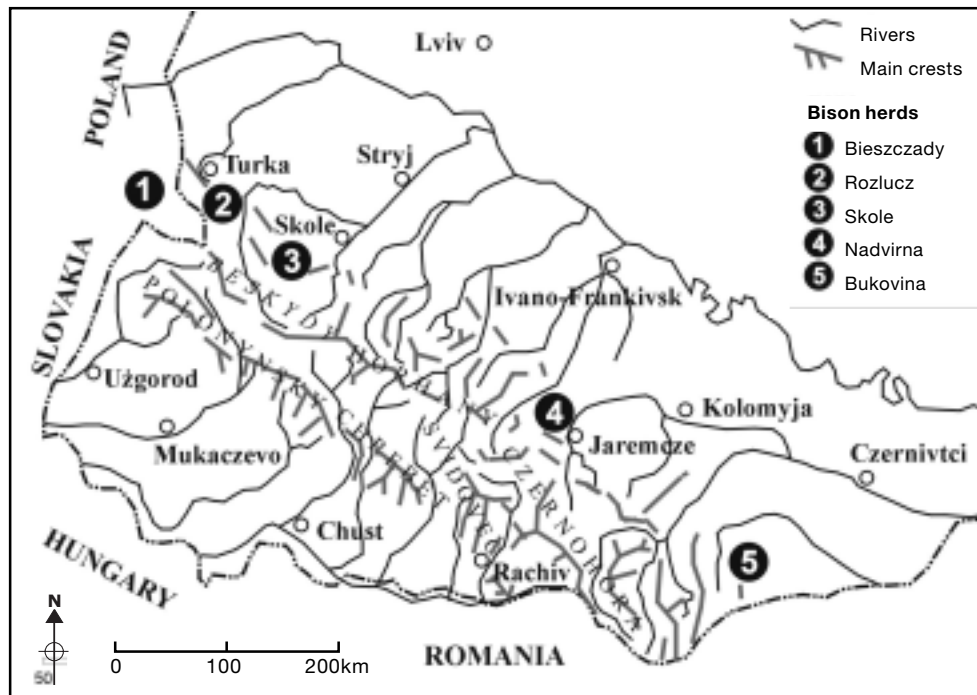


Figure 13.4. Distribution of free-ranging herds of European bison in the Ukrainian Carpathians. Herds 2 and 3 are treated as one population in Figure. 8.4 and Table 9.2 (Majdanska) (acc. to Perzanowski and Kozak 1999, modified).