

Bats in Brest (Belarus)

Report of a visit to Belarus



Report of a visit of the Region of Brest, Belarus
February 24 - March 03 2010
Anne-Jifke Haarsma,
Eric Jansen &
Fons Bongers



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On request of The Habitat Foundation three members of the Dutch Mammal Society visited the city and the region of Brest in western Belarus from February 24 to March 3, 2010. The purpose of the visit was to gain insight into the importance of the activities of a group of bat conservationists in Belarus and consider possibilities for cooperation between bat researchers and conservationists in Belarus and the Netherlands. The idea for our visit arose from a similar one in the summer of 2009 when employees of Birdlife Netherlands visited Birdlife Belarus. That occasion demonstrated that cooperation between research-

ers and bird conservationists in the Netherlands and Belarus produced good results, and the same could be true for research and conservation of bats. Representatives of a bat working group in the Brest region welcomed the proposal.

Program

After preliminary contacts via e-mail and telephone the trip started on February 24. The program was as follows:

- February 25: arrival in Brest, in the early evening. Settling into an apartment in the south of Brest
- Morning February 26: introductory visit to the city of Brest
- February 26 afternoon: visit "Reserv Barbastella" and 2 nearby bunkers
- Morning and afternoon February 27: visit to Belavezhskaya Pushcha). In the National Park we carried out a bat winter count with 2 members of the bat working group in an animal food storage unit (out of use) and a pump pit. Visiting bison near the winter residence of "Father Frost" (Belarusian Sinterklaas / Santa Claus).
- February 28 morning: visit to Fort V, bat count in fortress museum.
- February 28 afternoon: visit to the fortress of Brest, sightseeing monuments, bat count in the ancient monastic ruins, short visit to basement galleries of Fortress of Brest and visit the former Soviet barracks near the fortress.
- March 1 morning: visit to Academy of Sciences, Brest establishment. Interviews with the head office and several staff. Mini-seminar on bat study in Belarus and the Netherlands.
- March 1 afternoon: visit to the State University of Brest. Mini-seminar in the biology faculty with presentations by Belarusian and Dutch representatives. Visit to the natural history museum in the university building.
- March 1 evening: dinner at the home of Maria and Victor Dziamianchyk.
- On March 2, late afternoon, the train back to Amsterdam.
- Late morning March 3: arrival in Amsterdam and Utrecht.

General impressions Belarus

Belarus is a large country, about 7 times as large as the Netherlands. The country has about 10 million inhabitants. The capital is Minsk. The country is bordered by Latvia, Lithuania, Poland, Ukraine and Russia. A considerable population is (partly) of Polish origin. The country has its own language (Belarusian), but that language plays only a limited role in society. The prevailing language is Russian. Russian is the language used in public, on road signs and advertisements.

During our (too) short stay we experienced Belarus as a beautiful country with friendly people. The people we have met are warm and curious. We were all happy that we had the opportunity to visit the country and to meet our hosts and friends.

During our visit the temperature ranged between zero and +6°C. In most years, winter temperatures fall to minus 10-15°C. Two weeks before our visit the temperature was much lower for some time, the minimum was -26°C. Until our visit there was almost complete snow cover. During the stay the snow melted, especially by night rain.

This report will also focus on the impact of harsh winter weather on the hibernation of bats.

Landscape

The landscapes of Belarus are quite similar to that of mid-eastern Poland. The main landscapes are:

- Wide semi-natural river valleys with extensive agriculture and cattle breeding.
- Large woodlands, interspersed with open agricultural land.
- Areas with lakes and swamps (like the valley of the Prypyat River in Southern Belarus) with a low population density and extensive agricultural use.
- Lowland areas with extensive cattle breeding and crops, interspersed with agricultural villages, river valleys and swamps.
- Semi-natural forest landscapes.



River landscape in the Belavezhskaya Pushcha

The most important natural areas in the Brest Region are:

- Belavezhskaya Pushcha (Беловежская пушча). Since 1945 the Polish-Belarusian border divides the latter more or less natural European lowland forest, behind the Polish border with the Puszcza Białowieska (the Polish natural forest). The Belarusian part is considerably larger than the Polish. We had a brief visit to the forest. The nature reserve is internationally famous for its high biodiversity, with its important elements: bison, wolf, lynx, beaver, moose, four species of eagle, black stork and eight species of woodpecker. The forest area (191,300 hectares) was designated in 1993 as a UNESCO Biosphere Reserve. (see also <http://www.unesco.org/mabdb/br/brdir/directory/biores.asp?mode=all&code=BYE+02>).



European bison in Belavezhskaya Pushcha

- At 60 km south of Brest, near the border of Belarus and Ukraine, is Pribuzhskoye Polesie, a large area with lakes, swamps, forests and semi-natural grasslands in the basin of the Bug. An area of 48,000 hectares is bounded in 2004 as a UNESCO Biosphere Reserve (see also <http://www.unesco.org/mabdb/br/brdir/directory/biores.asp?code=BYE+03&mode=all>).
- In the southern part of Belarus the landscape is dominated by the river and the valley of the Prypyat (marshes, forests and semi-natural grasslands). This river flows from west to east, and north of Kiev it joins the Dnieper.

Monitoring of bats in Belarus.

Belarus has only begun monitoring wintering bats recently, beginning in 1995. The system in use attempts to assess the distribution of species across the country and to obtain quantitative data from surveys of hibernating sites of bats.

Monitoring of hibernating sites is carried out in a different way than in the Netherlands. In Belarus not only the numbers of bats are assessed, but also the development of the use of the hibernating sites during the winter. Some sites are visited up to four times in the winter. Besides the numbers of bats, their location in the hibernating site is also recorded. Repeated counts during a winter supply information that the Dutch method misses. Especially in severe cold periods, bats appear to move in one system, or even leave the hibernating site. Also, hibernating bats in sites where the temperature is poorly buffered can be threatened by severe cold spells. Data from repeated counts during the winter supplies information that is very relevant for the protection of Belarusian hibernation sites and bats. The quality of the hibernaculum is essential for winter survival of hibernating bats.

During the winter count of the fort "Reserv Barbastella" a recording was made for national television. One of us was interviewed in depth about the Netherlands, the reasons for our visit, about nature and the Netherlands in comparison with Belarus. Last but not least was the question "Are bats good for humans?". That question appeared in the Netherlands at the time of the introduction of the "Law of Useful Animals" (1880, first legal protection of bats in the Netherlands). In Belarus bats do not have legal protection, and so there is no legal support for conservation and protection. Sometimes people kill bats. The television report will (hopefully) help to increase the protection and respect for these animals. In the photo, the presenter, a



sort of Belarusian Katja Schuurmans, holds in one hand an active barbastelle and in her other hand an active brown long-eared bat brought from another site to be released in the reserve.

The culture of bat researchers and conservationists in Belarus differs slightly from current Dutch standards. In Belarus, the value of land and buildings is given a high priority. As a result human activity (including scientific investigation of bats) can detrimentally affect hibernation sites and bats. In the past 6 years there have been improvements. During the winter, for example, bats are rarely touched or handled.

In the Netherlands, attitudes among scientists and conservationists are influenced by the high degree of legal protection, at a national and European level. This legal status in the Netherlands provides the justification for research and for the protection of bats, their habitats and roosts (trees, caves, mines, buildings). This legal protection is absent in Belarus. The protection enjoyed by bats in Belarus is dependent on the efforts of bat researchers and conservationists. Reserv Barbastella is well protected as a structure, and as a result protects otherwise unprotected hibernating bats there.

Bats in Belarus

Victor and Maria Dziavianchyk reported in 2006 and 2008 the status of bat species in Belarus for Eurobats. During our recent visit to Belarus we examined and discussed the status of these species in the country, based on the known information. Maria Dziavianchyk presented a summary of the status of the bat species during the mini-symposium on 01 March 2010. Viktor Dziavianchyk provided a summary table of this status (attached to this report).

• Barbastelle (*Barbastella barbastellus*)

This species is known only from the western edge of the country and has only been recorded once during the summer months. It is noteworthy that this is the most commonly found species during winter, but the summer habitats are unknown. The only bat reserve in Belarus, "Reserv Barbastella" is located in Brest. Although it is difficult to estimate the total number of

hibernating bats in the reserve it is known to be at least 3,600. This roost site is one of the main hibernacula for of this species in Europe, if not the most important.



Barbastelles in hibernation

- **Pond Bat (*Myotis dasycneme*)**

This species has a wide European distribution, from the Netherlands in the west to the centre of Russia in the east. In the majority of its range this species is rare or very rare. This is also the situation in Belarus. The only summer colony of the country is known near lake Vygonoschanskojo, 160 km northeast of Brest. The species is very rarely found in hibernating sites. Where the Belarusian bats roost in the winter is unknown.

As in the Netherlands, the summer colony in Belarus occupies a landscape with a continuous network of rivers, canals and (natural and artificial) lakes, in a mosaic of woodlands and open agricultural landscapes. Given the absence of natural caves in Belarus, it may be assumed that the hibernating sites are distant from Vygonoschanskojo.

- **Whiskered Bats (*Myotis brandtii* and *Myotis mystacinus*)**

Both species of whiskered bats are rare in Belarus, and are found only in the summer. *Myotis brandtii* is known only in the far western region of Brest.

- **Natterer's bat (*Myotis nattereri*)**

Natterer's bat is one of the rare species in Belarus. The species is difficult to find in the summer, but is known from the Belavezhskaya Pushcha. In hibernation sites it is found in low numbers. During our visit we found some animals, in "Reserv Barbastella" and in the basement galleries at the fortress of Brest. The species is on the Belarusian Red List.

- **Five common species:** Common pipistrelle bat (*Pipistrellus pipistrellus*), Nathusius' pipistrelle bat (*P. nathusii*), Daubenton's bat (*Myotis daubentonii*), brown long-eared bat (*Plecotus auritus*) and serotine (*Eptesicus serotinus*)

These five species are widespread in the country. They are species that roost in trees (except for serotines) but are increasingly found in buildings. The first three species are migratory in Belarus, and the location of the hibernating sites is unknown. Daubenton's bats are found in low numbers in hibernating sites, especially in the Brest region. The brown long-eared bat is a widespread species. In winter the species is not uncommon in low numbers in underground constructions. Serotines are often found in hibernating sites like fortresses and bunkers.



Daubenton's bat (L) and brown long-eared bat (R): two common species in Belarus

- **Soprano pipistrelle bat (*Pipistrellus pygmaeus*)**

The actual status of the species, although established in Belarus, is still unknown.

- **Kuhl's pipistrelle bat (*Pipistrellus kuhlii*)**

This rare species is recorded in the south part of the country.

- **Three rare species:** lesser horseshoe bat (*Rhinolophus hipposideros*), greater noctule bat (*Nyctalus lasiopterus*) and greater mouse-eared bat (*Myotis myotis*)

All three species are at the extreme edges of their natural ranges. Greater mouse-eared bat has been recorded 7 times in Belarus, the last occasion in 1995. The other two species have been found only once (both in 1930).

- **Grey long-eared bat (*Plecotus austriacus*)**

This species is rare, known only from western Belarus. During our visit we found a hibernating animal in the vehicle workshop of the former Soviet barracks in the fortress of Brest.

- **Parti-coloured bat (*Vespertilio murinus*)**

This species is rare in Belarus. It is known from high buildings in urban areas, a characteristic also known from other European countries.

- **Leisler's bat (*Nyctalus leisleri*)**

This species is not well known in Belarus. It is known from the Belavezhskaya Pushcha, north of Brest, first recorded there in 1990. It may be that this bat is more widespread in the older forest areas in Belarus.

- **Noctule (*Nyctalus noctula*)**

This species is common in areas with large forests.

- **Northern bat (*Eptesicus nilssonii*)**

This species is found throughout Belarus, but is rare. It is found in various hibernating sites, for example in the museum of Brest fortress.

Major hibernating sites in Belarus

Our visit focused on the city of Brest and its surroundings. This region is not only the best surveyed for bats, but it looks likely that this region is the most important area for hibernation in Belarus. This is mainly due to the country's situation during its long history bordering Russia and the Soviet Union. In 1870 Brest was a strategic location in the west of the Russian empire, located at the confluence of the rivers Moechavets and Bug. A number of major defence objects like fortresses and bunkers were built to defend the Russian Empire. The main building material in those years was brick. In the first 20 years of the 20th century, these defensive structures were enlarged and modernized. Developments in military techniques and the invention of new types of guns and explosives resulted in the strengthening of these defensive structures. This was mainly achieved with the use of (unreinforced) concrete. The aggregates in this concrete were mostly granite or other hard stone. Compared with similar (unreinforced) concrete outer forts of Antwerp (Belgium), the Brest fortresses are in excellent condition.

Fort V is the finest fort we visited. This fort is now a museum, but like the other forts, in the winter thoroughly surveyed for hibernating bats. Visiting researchers have to buy entrance tickets like any other visitor to the museum. The most bizarre observation during our visit to Fort V was the presence of a hibernating barbastelle behind a painting of a World War II battle scene (see photo).

The situation regarding bats using the museum causes some concern. In total, we counted 60 animals. Fifty of these were in a cluster in the roof of a corridor where all visitors pass through. Conflicts between visitors and bats are unavoidable since the animals have no legal protection. The other 10 animals were in deep cracks in the walls and between stone and wood (and one behind the painting), so will be less disturbed. Those bats, (1 serotine, 1 Daubenton's bat and 8 barbastelles) were found only after a systematic search in deep cracks.

The future for bats in Fort V is not optimistic. Although the fort does not become completely frozen in extreme winter conditions, because of its temperature buffering capacity, the value as a hibernating site is declining as a result of the high degree of disturbance by museum visitors. Also building restoration work is unfavourable for bats; holes in the thick walls have been partly filled with mortar, reducing the number of hibernation sites.



Entrance of Reserv Barbastella. From left to right: Fons Bongers, Anne-Jifke Haarsma, Eric Jansen, Olga Shcherba, reporter TV, Victor Dziamianchyk (Sr), reporter TV and Maria Dziamianchyk. Photo of Victor Dziamianchyk (Jr)

By far the most outstanding site that we visited is the "Reserv Barbastella". This reserve is part of a fort on the north side of town, a few hundred meters from the Polish border. The bat researchers and conservationists succeeded in establishing an official status as a nature reserve (in 2000). The reserve is an exceptional hibernating site for barbastelles. The fort was originally made of brick and reinforced in 1905-1915 with (unreinforced) concrete. Most of the rooms and corridors were strengthened by steel beams, covered by a 10cm thick layer of asphalt. This asphalt is also covered by a thick layer of concrete, and finally a layer of soil. The total thickness of the cover is about 3 meters. The reason for the application of asphalt was probably explained the desire by the fortress constructors to protect the underlying structure from exploding grenades. The energy of impacts and explosions is absorbed and spread by the asphalt.

In the last 90-95 years, in places where the steel beams have been removed, the upper asphalt has collapsed. This has revealed the parent concrete layer in places. During winter counts bats have never been found in or on these asphalt layers.

In 1985 barbastelles appeared in significant numbers hibernating between the steel beams in the roof of the entrance area of the fort. These animals proved very difficult to count (see photo of barbastelles above two beams, next page). Brest bat researchers soon realized that the number of hibernating bats was exceptionally high, from a national and international perspective. To improve the accuracy of counting these hibernating bats, the bat workers attached various types of objects (concrete corrugated iron, wooden structures) to the walls, which could provide alternative roost sites to the roof beams. This proved successful, and now thousands of barbastelles hibernate behind these objects. However the numbers counted are still approximate. Clusters of 500 animals are found in a single square meter.



Hibernating barbastelles in Reserv Barbastella. These animals are visible between two steel beams in the ceiling of a corridor in the reserve. The number of bats cannot be determined.

Two other sites that were visited are part of the Fortress of Brest; an old monastery and a gallery of cellars. Both objects have unfortunately had some restoration work that is unsafe for both the structures and the hibernating bats. In the old monastery the renovation work only consist of cutting open bricked windows and doors. The building is therefore open to further deterioration.

In the basement gallery most of the tops of the ventilators have been uncapped (in Dutch: "koekoek"). This is likely to have serious consequences for the building, because in periods of extreme cold the entire construction can freeze. An increase of temperature leads to condensation. As a result, layers of ice form at the bottom of the brick structure. In three of the 15 cellars the lower brick vaulting had collapsed as a result of frost action.

For bats, the ventilation is also damaging. Extreme low temperatures can now penetrate the entire structure. Temperature buffering of this complex is limited because the ceiling of the cellar is the floor of the exterior part of the structure (see photo from Google Earth, next page).

Conservation of the bats and also protection of the cultural heritage at this site may be possible by good site management.

Organization of bat research and protection in Belarus

Research on bats in Belarus is not organised officially; In Belarus there is no NGO like a mammal society. About 20 people in Belarus work on bats on a long term basis, all voluntarily. These people provide semi-official networks, for example among the faculties for biology and ecology in the country's universities, and in case of Dr. Victor Dziamianchyk (Sr), in the Academy of Science of the Republic of Belarus. The Academy is not only an organization where scientific research is co-ordinated, it is also a major organization for advising the government on policies for agriculture, water management, pesticides, national parks and nature conservation.

All these people use their professional networks to develop research and protection of bats, in an improvised way. For example: much research is done by students of universities during part of their studies. Some of them remain active in bat research, but most of them move to other areas of study or professional life.



Brest Fortress. Many bats live here during the summer months and during the winter. In the old Soviet camp we found a grey long-eared bat, in the cellars some natterer's bats and in the old monastery some barbastelles and Daubenton's bats



The gallery of cellars in Brest Fortress.

It is our impression that most bat research and conservation in Belarus is done by a group of very persistent and committed people, who give this work a great deal of their time and attention. A model for research and protection in the rest of Europe!



Hibernating barbastelles in Reserv Barbastella. This wooden structure was attached to the wall to provide an alternative roost to the steel beams in the roof. This has proved to be successful. A cluster of approximately 100 barbastelles was seen hibernating within it (just visible).".

Possibilities for cooperation

During our visit, a range of possible forms of cooperation between Belarus and the Netherlands were discussed. Taking the international interest of both the summer bats in Belarus (which hibernate in a significant part in the EU) and the wintering of barbastelles in the border region with Poland, international cooperation is essential for the success of any projects involving EU countries and Belarus. The Bonn Convention, for research and protection of migratory species would be a good basis for this cooperation; unfortunately the Bonn Convention is not yet signed by Belarus. The leader of the Brest branch of the Academy of Sciences, Mihalchuk Nicolaj Vasiljevich, commented that signing the convention will be difficult for Belarus since there would be a considerable financial impact.

Knowledge and use of knowledge

The most important form of cooperation is the sharing and development of knowledge in bat research and conservation. During the visit it was apparent at times that shared knowledge between people from Belarus and the Netherlands could lead to new insights. The joint visit and contribution in symposia and seminars, joint research in summer and winter, the personal visits to each other's areas and sharing of reports and books leads to new knowledge and the beneficial use of this knowledge.

Technology

In Germany and the Netherlands since 1995 new technology has been developed for long-term monitoring of hibernation sites without the risk of disturbance to bats and their roosts. Both the universities of Munster (D) and Leiden (NL) have contributed to the development of automatic recording systems at entrances to hibernations sites. These techniques could also be usefully deployed in Belarus. "Reserv Barbastella" is of a major international importance for barbastelles. Use of monitoring devices throughout the year can help to optimize the conservation of the structure and support the protection of the site. Moreover, such a system can contribute to knowledge of the dynamics of these hibernacula during the winter.

Financial

Bat research and protection costs money. Among other things: (in sequence of importance)

- Organization costs for research and protection of bats in Belarus in a NGO.
- Purchase bat detectors and software for sound editing.
- Purchase of special bat rings from ringing stations Dresden or Bonn (Germany).
- Purchase of specialist books.
- Purchase of digital thermometers for air temperature and radiated temperature of structural parts of hibernation sites.
- Implementation of closure of valuable hibernation sites against unwanted visitors from people (doors, grilles, locks).
- Implementation of closure of valuable hibernation sites in the case of disproportionate predation by animals (stone marten and domestic cat).
- Purchase LED lighting for winter counts.
- Transport of researchers and conservationists throughout the country. Compared with the Netherlands personal car ownership is uncommon in Belarus. Travel in Belarus involves long distances, so the costs for volunteers are high.
- Purchase of equipment for captured bats, (digital) balances, other measuring equipment, registration forms for captured bats, microchip readers, microchips etc.
- Purchase of mist nets and poles to catch bats in foraging areas or swarming periods.
- Organization of seminars, subsistence of volunteers across the country.

- Purchase and maintenance of high speed internet. Communication is vital for national and international knowledge and knowledge use. Internet is the common medium for this.
- Development, acquisition and use of technology such as infrared ports and data logging.
- Transport and accommodation for European Bat Research Symposia. Costs of visas.
- Develop leaflets and brochures.
- Postage for shipping books, leaflets, brochures and equipment.
- Vaccinations for bat workers.

The present economic situation in Belarus and the limited financial opportunities for volunteers means that acquisition of necessary funds is difficult. We hope that co-operation between Belarus and the Netherlands will lead to acquisition of necessary funds and to the implementation of new research and to development of the conservation of bats in Belarus and elsewhere in Europe.

Edited in cooperation with:

Maria Dziamianchyk

Viktor Dziamianchyk Sr.

Olga Shcherba

Viktor Dziamianchyk Jr. (incl. 1 photo)

Florrie de Pater (NL)

Dennis Wansink (NL; The Habitat Foundation)

Anne Youngman and John Haddow (UK)

The Habitat Foundation (NGO in formation)

The Dutch Mammal Society

Anne-Jifke Haarsma

Eric Jansen

Fons Bongers (editor and photos)



Victor Dziamianchyk (Jr) during winter bat census in Museum Fort V: one barbastelle!

Status of bat species in Belarus (=BY), March 2010

Scientific name	English name	Status of presence	Red List BY	Development status BY	Known in summer in BY	Known in winter in BY
<i>Rhinolophus hipposideros</i>	Lesser horseshoe bat	Extremely rare	-	??	Not known	Not known
<i>Myotis mystacinus</i>	Whiskered bat	Very rare	-	??	Very rare	Not known
<i>Myotis brandtii</i>	Brandt's bat	Very rare	Yes	??	+	Not known
<i>Myotis nattereri</i>	Natterer's bat	Very rare	Yes	??	+	+
<i>Myotis myotis</i>	Greater mouse-eared bat	Extremely rare	-	??	Not known	Not known
<i>Myotis daubentonii</i>	Daubenton's bat	Common	-	??	+	+
<i>Myotis dasycneme</i>	Pond bat	Very rare	Yes	??	+	+
<i>Pipistrellus pygmaeus</i>	Soprano pipistrelle bat	?? Present ??	-	??	+	Not known
<i>Pipistrellus kuhlii</i>	Kuhl's pipistrelle bat	Rare	-	??	+	Not known
<i>Pipistrellus pipistrellus</i>	Common pipistrelle bat	Very common	-	??	+	Not known
<i>Pipistrellus nathusii</i>	Nathusius' pipistrelle bat	Common	-	+	+	Not known
<i>Nyctalus noctula</i>	Noctule	Very common	-	??	+	+
<i>Nyctalus leisleri</i>	Leisler's bat	Very rare	Yes	??	+	Not known
<i>Eptesicus serotinus</i>	Serotine	Common	-	??	+	+
<i>Eptesicus nilssonii</i>	Northern bat	Very rare	-	??	+	+
<i>Vespertilio murinus</i>	Parti-coloured bat	Rare	-	??	+	+
<i>Barbastella barbastellus</i>	Barbastelle	Rare	Yes	??	Extremely rare	+
<i>Plecotus auritus</i>	Brown long-eared bat	Very common	-	??	+	+
<i>Plecotus austriacus</i>	Grey long-eared bat	Very rare	-	+	+	+
<i>Nyctalus lasiopterus</i>	Greater noctule	Extremely rare	-	??	Not known	Not known

Source: interview Dr. Victor Dziamianchyk, 01-03-2010



Hibernation site for Daubenton's bats and barbastelles in an old storage for animal food in Belavezhskaya Pushcha. The bats live in the cellar underneath the building.



Impression in Fort V. Conservation of cultural heritage, combined with natural values. In the crack left from the gate a serotine has its hibernation place.



Belarusians of the future on a monument of the past: Brest Fortress