

**NATIONAL REPORT ON THE IMPLEMENTATION OF
THE AGREEMENT
ON THE CONSERVATION OF POPULATIONS
OF EUROPEAN BATS
(EUROBATS)**

2000 - 2003

POLAND

A. GENERAL INFORMATION:

- * Name of Party: Poland
- * Date of Report: 14 October 2003
- * Period Covered: 2000 – 2003
- * Competent Authority:
 - Ministry of the Environment,
 - Department of Nature Conservation
- * Appointed member of the Advisory Committee:
 - Professor dr. Bronisław W. Wołoszyn
 - Chiropterological Information Centre
 - Institute of Animal Systematic and Evolution
 - Polish Academy of Sciences in Krakow

B. STATUS OF BATS WITHIN THE TERRITORY OF THE PARTY

1. SUMMARY DETAILS OF RESIDENT SPECIES

The occurrence of 22 species of bats has been confirmed so far in the territory of Poland. There are 2 horseshoe bat species, the greater and the lesser horseshoe bats (*Rhinolophus ferrumequinum* and *Rhinolophus hipposideros*), along with 20 species of vespertilionid bat. To date, breeding records of the greater horseshoe bat and noctule (*Nyctalus lasiopterus*) have not been obtained in Poland.

The presence of the midge pipistrelle bat (*Pipistrellus pygmaeus*) was confirmed in 2001 by way of the analysis of echolocation calls (Gas, Postawa 2001, Rachwald, Szkudlarek 2001, Wołoszyn 2001). The occurrence of two additional species, lesser mouse-eared bat (*Myotis blythii*) and Schreibers' bat (*Miniopterus schreibersii*), is possible in the southern part of Poland.

2. STATUS AND TRENDS

Of the 22 species, eight (*Rhinolophus ferrumequinum*, *Rhinolophus hipposideros*, *Myotis bechsteinii*, *M. emerginatus*, *M. dasycneme*, *Vespertilio murinus*, *Eptesicus nilssonii* and *Nyctalus leisleri*) were listed in the new edition of the Polish Red Data Book of Animals (Vertebrates) (Wołoszyn, in: Głowaciński *et al.* 2001), and nine species (+ barbastelle) are mentioned in the "Red list of threatened animals in Poland (Głowaciński, 2002).

Species of bats listed in the new edition of the Polish Red Data Book of Animals:

2.1. Lesser horseshoe bat

Rhinolophus hipposideros (Bechstein, 1800)

Order - Chiroptera

Family - Rhinolophidae

IUCN Red List Categories: EN

Status: Lesser horseshoe bat is strictly protected by law

Distribution: The distribution of Lesser horseshoe bat in Poland includes East Sudetes, West and East Beskids, Kraków-Częstochowa Upland, Bieszczady Mountains and Sandomierz Lowland, in which area the extreme north-east locality of whole distribution of this species is recorded.

Population: Lesser horseshoe bat occurs locally in the south of the country, numbered only in hundreds. The catastrophic decline of the lesser horseshoe bat in Poland has been noted in recent decades. It has been decreased the number of this bat inhabiting the caves of the Kraków-Częstochowa Upland.

Protection: The sites need to be dispersed among suitable feeding areas, and free from excessive human disturbance. One of these sites may be used for breeding if number of animals is high, otherwise a suitable building is needed which has one or more attics warmed by the sun. This species is threatened mainly by human disturbance of its roosts, loss of habitat through restoration or demolition of old buildings, and chemization of the cultivated areas. *Rhinolophus hipposideros* occurs in Poland on the northern edge of its range so its decline may be attributed partly to natural factors affecting small, peripheral populations. Protection of its roosting sites is needed.

2.2. Greater horseshoe bat

Rhinolophus ferrumequinum (Schreber, 1774)

Order - Chiroptera

Family – Rhinolophidae

IUCN Red List Categories: LC

Status: Greater horseshoe bat is strictly protected by law

Habitat: Mostly cave dwelling but has adapted to larger buildings for nurseries, especially in northern part of its area of distribution. It feeds on very low altitudes.

Distribution: The Greater horseshoe bat occurs in the entire Palearctic from Britain to Japan. It is known in Poland from only four localities, i.e. three from Kraków-Częstochowa Upland: from Nietoperzowa Cave, near Kraków, where it was found for the first time in 1962, from Wierna Cave near Myszków and recently found (2002) in the Łokietka Cave in Ojców National Park. Fourth locality is Szkieletowa Cave in Beskid Niski Mts.

2.3. Bechstein's bat

Myotis bechsteinii (Kuhl, 1817)

Order - Chiroptera

Family - Vespertilionidae

IUCN Red List Categories: NT

Status: Strictly protected by law. The present population of the Bechstein's bat is declining due to loss of natural shelters (i.e. removal of old trees), human intruding to winter quarters, and use of insecticides which reduce its food supply.

Distribution: The distribution of Bechstein's bat is limited to eastern, southern, central and western Poland. This species probably does not occur in the north-eastern part of the country.

Population: The number of the individuals of this species has been estimated at several thousand.
Protection: Safeguarding of its hibernacula and hanging of bat boxes in forest is postulated.

2.4. Geoffroy's bat

Myotis emarginatus (Geoffroy, 1806)

Order - Chiroptera

Family - Vespertilionidae

IUCN Red List Categories: EN

Status: Strictly protected by law. It is known from a dozen or little more localities situated mainly in vicinity of Kraków. In Poland the Geoffroy's bat reaches the northern limit of its range

Distribution: Geoffroy's bat occurs in Poland in a small number of localities, distributed in the Kraków-Czestochowa Upland, West Beskid and Bieszczady Mts.

Population:

Protection: At present the Geoffroy's bat is endangered with extinction. Its population is very low and number of its former breeding places have been abandoned. Human intruding to winter quarters, loss of suitable roosting places are probably responsible for its decline. On other hand some recent observations seems to indicate that

Increased protection of its natural shelters (caves) is suggested. Its potential summer roosts in old buildings also should be safeguarded.

2.5. Pond bat

Myotis dasycneme (Boie, 1825)

Order - Chiroptera

Family - Vespertilionidae

IUCN Red List Categories: EN

Status: Strictly protected by law. The population of pond bat has declined substantially most probable due to remedial timber treatments and pollution of waterways.

Habitat: Hibernates in caves, cellars and mines but probably also in the woods.

Distribution: The geographical range of the pond bat include the whole Poland.

2.6. Leisler's bat

Nyctalus leisleri (Kuhl, 1817)

Order - Chiroptera

Family - Vespertilionidae

IUCN Red List Categories: VU

Status: Strictly protected by law. It is one of the most rarely encountered species of bat in Poland but is probably more common and widely distributed than present knowledge suggests.

Habitat: This bat finds shelters in hollow trees. Small colonies are sometimes found in garrets

Distribution: Only a relatively few records of the lesser noctule is known from Poland

Population: It is one of the rarest native forest species of bats and we have no exact data on the population of this species.

2.7. Northern bat

Eptesicus nilssonii (Keyserling et Blasius, 1839)

Order - Chiroptera

Family - Vespertilionidae

IUCN Red List Categories: NT

Status: Strictly protected by law. Northern bat occurs in different parts of the country in forest areas

Habitat: Northern bat

Distribution: The northern bat is recently known from the majority of Polish territory.

Population: Northern bat seems to be rare, except the mountains regions where the greatest part of records were made (in some mountains regions this species seems to be relatively common).

Protection: Protected by law. Northern bat as the most of native bats is threatened by contamination of the environment and lost of natural shelters due to destruction of old tree stands with hollow-trees.

2.8. Parti-coloured bat

Vespertilio murinus Linnaeus, 1758

Order - Chiroptera

Family - Vespertilionidae

IUCN Red List Categories: LC

Status: Strictly protected by law. Parti-coloured bat is reported from some tens of localities in different parts of Poland. The species often occurs in mixed colonies with other bats.

Habitat: It is a forest species,

Distribution: Parti-coloured bat occurs probably on whole territory of Poland

2.9. Barbastelle

Barbastella barbastellus (Schreber, 1774)

Order - Chiroptera

Family - Vespertilionidae

IUCN Red List Categories: DD

Status: Strictly protected by law. Barbastelle occurs probably in whole territory but lack information on its distribution in west Pomeranian Region. It chiefly occurs in forested areas and in the mountains. In summer barbastelle takes refuges in attics, hollow trees and birdboxes. In winter it hibernates in caves, tunnels and cellars in cool places in temperature close to 0°C.

3. HABITATS AND ROOST SITES

There are quite many roost sites, which are used by bats, such as the caves, cellars and mines, old buildings and hollow trees in the forests and parks. The largest hibernaculum “Nietoperek” is protected by law. It was established Management Plan for this reserve in 2000. This Plan will be implemented until 2019.

There are many foraging habitats used by bats, such as forests, river valleys, parks, mountains, etc. Actions undertaken to conservation of foraging habitats are mentioned at point 11.

For more information about habitats and roost sites see at points 2, 7 and 11 of this report.

4. THREATS

The main threats to bat populations are considered to be as follows:

4.1. Threats to summer roost:

- a) damaging or destruction of roost in buildings,
- b) disturbance in the roosts due to human activities,

4.2. Threats to winter roost:

- a) disturbance in the roosts due to human activities for example illegal spelunking.

4.3. Loss of habitats by unsuitable management.

5. DATA COLLECTION

Specialists from national scientific institution, Chiropterological Information Center Institute of Animal Systematic and Evolution Polish Academy of Sciences and NGO bat research and protection groups collect and evaluate data concerning bat conservation. Data are mainly used to assess species distribution and trends of populations. These researches are mentioned

in this report (see points 11 and 12).

C. MEASURES TAKEN TO IMPLEMENT ARTICLE III OF THE AGREEMENT

6. LEGAL MEASURES TAKEN TO PREVENT THE DELIBERATE CAPTURE, KEEPING OR KILLING OF BATS.

In Poland bats have been legally protected since 1952. Now all bat species are under the protection of the Decree of the Minister of the Environment concerning the species protection of animals, as signed on 26.09.2001. This implements provisions of the Nature Conservation Act passed on 16.10.1991, with subsequent amendments (main text and texts of amendments are available in the Official Journal of Laws – see: *Dz. U.* 1991 No 114 item 492, *Dz. U.* 2001 No 99 item 1079, *Dz. U.* 2001 No 100 item 1085, and *Dz. U.* 2001 No 145 item 1623

The Decree of the Minister of the Environment concerning the species protection of animals prohibits:

- 1) the intentional killing, injuring, catching, possessing or keeping of live bats, as well as the possession of dead bats or parts thereof;
- 2) the frightening, disturbing, photographing, filming and observing of bats from a distance where this causes disturbance during hibernation, breeding or the birth of offspring, without permission from the Voivod;
- 3) the intentional destruction of bat habitats;
- 4) the stuffing of dead bats (whole or parts) and the keeping of stuffed bats or their parts without permission from the Voivod;
- 5) the moving of bats from the places they occur naturally to other places (as well the release to nature of bats that were born and brought up in the captivity);
- 6) the purchasing, offer for sale, exchange, giving as a present, import or export of bats, either alive or dead, including entire stuffed specimens, their parts or derivatives. In accordance with the same Decree, the aforementioned prohibitions do not apply to:
 - the photographing or filming of bats in buildings and in places accessible to the public,
 - the catching of stray bats in housing areas by an authorised person or institution, and their subsequent removal to places of regular occurrence,
 - the catching of injured or weak bats with a view to their being given veterinary help and or delivered to a rehabilitation centre,
 - actions taken within the confines of rational human management, especially that concerning agriculture, forestry and fisheries.

7. SITES IDENTIFIED AND PROTECTED WHICH ARE IMPORTANT TO THE CONSERVATION OF BATS

(The most important hibernation sites for bat's protection are listed in appendix 1)

7.1. THE MOST IMPORTANT SUMMER SHELTERS OF BATS

No.	Name of locality	Region	Kind of colony	Max. Number of bats	Year of observation	Observation or bibliography
1.	St Mikołaj's church (Wleń)	Dolnośląskie voivodeship	Breeding colony of <i>Myotis myotis</i>	1000-1300	2000	Furmankiewicz and Zajac 1999; Kliś et al. 2001
2	Church in Jaszkowa Góra	Dolnośląskie voivodeship	Breeding colony of <i>Myotis myotis</i>	160	2002	Furmankiewicz and Kokurewicz, unpubl. data.

3	Jaszkowa Górna	Dolnośląskie voivodeship	<i>Breeding colony of Myotis Brandtii</i>	90	2002	Furmankiewicz and Kokurewicz, unpubl. Data
4	Stary Wielisław	Dolnośląskie voivodeship	<i>Breeding colony of Myotis myotis</i>	60	2002	Furmankiewicz and Kokurewicz, unpubl. data
5	Chapel in Muszkowice	Dolnośląskie voivodeship	<i>Breeding colony of Myotis mystacinus</i>	50	2001	Furmankiewicz and Gottfried, unpubl. data.
6	Wejherowo, Church	Pomorskie voivodeship	<i>Breeding colony of Myotis myotis</i>	56	2001	Ciechanowski, inf. personal
7	Płęsy	Pomorskie voivodeship	<i>Breeding colony of Pipistrellus nathusii</i>	130	2001	Ciechanowski, inf.personal
8	Leśnictwo Czarne	Pomorskie voivodeship	<i>Breeding colony of Pipistrellus nathusii</i>	180	2001	Ciechanowski, inf.personal
9	Leśniczówka Lubnia	Pomorskie voivodeship	<i>Breeding colony of Myotis dasycneme and Pipistrellus nathusii</i>	107 and 40 respectively	2002	Ciechanowski, inf.personal
10	Obory	Pomorskie voivodeship	<i>Breeding colony of Vespertilio murinus</i>	155	2002	Ciechanowski, inf.personal
11	Loryniec	Pomorskie voivodeship	<i>Breeding colony of Pipistrellus nathusii</i>	280	2002	Ciechanowski, inf.personal
12	Luzino	Pomorskie voivodeship	<i>Breeding colony of Pipistrellus pipistrellus</i>	75	2002	Ciechanowski, inf.personal
13	Sieraków	Wielkopolskie voivodeship	<i>Breeding colony of Myotis myotis</i>	390	2001	Jaros inf.personal
14	Plytnicas	Wielkopolskie voivodeship	<i>Breeding colony of Pipistrellus nathusii</i>	234	2001	Jaros inf.personal
15	Krzyż Wielkopolski	Wielkopolskie voivodeship	<i>Breeding colony o Myotis myotis f</i>	100	2001	Jaros inf.personal
16	MRU	Wielkopolskie voivodeship	<i>Breeding colony of Myotis myotis</i>	700	2001	Jaros inf.personal
17	Kopanki	Wielkopolskie voivodeship	<i>Breeding colony of Myotis myotis</i>	Ca. 50	2001	Jaros inf.personal
18	Suchy Las	Wielkopolskie voivodeship	<i>Breeding colony of Eptesicus serotinus</i>	Ca. 90	2001	Jaros inf.personal
19	Sierczynek	Lubuskie voivodeship	<i>Breeding colony of Myotis myotis</i>	Ca. 100	2001	Jaros inf.personal
20	Skwierzyna	Lubuskie voivodeship	<i>Breeding colony of Myotis myotis</i>	Ca. 300	2001	Jaros inf.personal

21	Śniaty	Wielkopolskie voivodeship	<i>Breeding colony of Myotis myotis and Eptesicus serotinus</i>	20 and 90 respectively	2001	Jaros inf.personal
22	Prusim	Wielkopolskie voivodeship	<i>Breeding colony of Myotis myotis</i>	Ca. 130	2002	Jaros inf.personal
23	Zielonkowo	Wielkopolskie voivodeship	<i>Breeding colony of Myotis myotis</i>	Ca. 360	2002	Jaros inf.personal
24	Krzyż Wlk.	Wielkopolskie voivodeship	<i>Breeding colony of Myotis myotis</i>	155	2002	Jaros inf.personal
25	Kiszewo	Wielkopolskie voivodeship	<i>Breeding colony of Myotis myotis</i>	Ca. 200	2002	Jaros inf.personal
26	Jaglice	Zachodniopomorskie voivodeship	<i>Breeding colony of Myotis myotis</i>	155	2002	Jaros inf.personal
27	Lichwin, Sierakowski PK	Wielkopolskie voivodeship	<i>Pipistrellus sp.</i>	Ca. 100	2002	Jaros inf.personal
28	Klempicz	Wielkopolskie voivodeship	<i>Pipistrellus sp.</i>	Ca. 145	2002	Jaros inf.personal
29	Borowy Młyn	Lubuskie voivodeship	<i>Pipistrellus sp.</i>	72	2002	Wielkopolskie
30	Studnisko Cave	Śląskie voivodeship	<i>Breeding colonies of Myotis myotis</i>	Ca. 200	2001	Gas, A., Postawa, T. 2001
31	Jaworki, Pieniny Mts.	Małopolskie voivodeship	<i>Breeding colonies of Rhinolophus hipposideros</i>	Ca. 500	2001	

7.2. AREAS OF PARTICULAR IMPORTANCE FOR KEEPING THE ACTUAL STATE OF BATS POPULATION IN POLAND

- The "Nietoperek" and "Nietoperek II" bat reserves. These underground fortifications of the Międzyrzecz Fortified Front (MFF) form the largest bat hibernaculum in Poland. The maximal number of hibernating bats, 29 493 individuals, was observed in February 1991 (Urbańczyk, in Wołoszyn 1994). 12 bat species (*Myotis bechsteinii*, *M. brandtii*, *M. dasycneme*, *M. daubentonii*, *M. myotis*, *M. mystacinus*, *M. nattereri*, *Pipistrellus pipistrellus*, *Eptesicus serotinus*, *Barbastella barbastellus*, *Plecotus auritus* and *P. austriacus*) have been found hibernating there, and a further one, the northern bat (*Eptesicus nilssonii*), has been observed in the area of MFF, but not yet in the main underground system. In 1980, approximately one-third of the surface area of corridors was embraced by protection as the "Nietoperek" Bat Reserve. On account of increased tourist traffic in this area in the early 1990s, as well as the small area covered by the Reserve, the protection afforded to bats began to look insufficient. Thus September 1997 saw an area of 5 117.72 ha surrounding the underground fortifications become constituted as a "Natural-Landscape Complex" to protect the bat's maternity colonies, feeding grounds and migratory routes. In October 1998, the National Foundation for Environmental Protection from Warsaw started work on the preparation of a "Nietoperek Management Plan". As a consequence, the December of the same year saw the remaining 67% of the underground corridors embraced by protection as the "Nietoperek II" Bat Reserve. The Plan was finally accepted into local law in June 2000, and will remain in force until 2019. In line with the Plan, the local nature conservancy authorities are

obliged to undertake several protection activities, e.g. to keep the whole system gated in winter, to increase the number of microhabitats available for hibernating bats and, in cooperation with local forestry managers, to commence with changes in forest structure that could be favourable to bats. The Plan also provides that tourist movement is to be forbidden in both bat reserves from 1st November to 31st March, while an increase in the summer months, except places occupied by summer colonies of bats, is recommended. The main threats to the winter colony of bats in MFF are the tourist industry, changes in micro-climatic conditions (esp. water level) and the building of the A3 motorway;

- Darżłubska Forest (Weherowo, northern Poland). Ten species of bats are confirmed for this area, among them some very rare mentioned in Polish red data book of animals : *N.leisleri* and *V.murinus*;
- Dylewskie Hills Landscape Park. Nine species of bats;
- Sierakowski Landscape Park. This area is inhabited by 12 bat species among them by *N. Leisleri*;
- Pszczewski Landscape Park. This area is inhabited by 12 bat species among them by *E. nilssonii*, rare species in central Poland;
- Śnieżnik Massif. Until now for this region is confirmed occurrence of 16 bat species. There is also one of the biggest winter bat shelter on Lower Silesia – Niedźwiedzia Cave (over 250 bats wintering each year);
- Caves in the Mt. Połom (Kaczawskie Mountains) occurrence of ten species of bats is confirmed for this mountains;
- Artificial shelter in Konewka. The biggest winter shelter of bats in Central Poland. Over 300 individuals is wintering there each year;
- Old mine in Tarnowskie Góry, Silesia, Poland. Several hundreds of bats belonging to eight species are hibernating there;
- “Grodzisko” and “Prochownia” winter shelters in Gdańsk;
- "Strzaliny" reserve. This is a project for the creation of a fourth Polish bat reserve in the underground fortification system at "Strzaliny". The multi-species colony in this underground fortification is the fifth largest bat hibernaculum in Poland (see Report 2001);
- “Sokole Góry” forest reserve is the place where the biggest hibernacula of bats on Kraków – Czestochowa Upland are located. In seven caves of the reserve hibernate up to 400 bats belonging to nine species of bats.

8. CONSIDERATION GIVEN TO HABITATS WHICH ARE IMPORTANT TO BATS

The most important bat hibernating sites and some bat summer roosts are now being put forward as a object for protection within the Polish part of the NATURA 2000 network. A proposal of this network is actually under preparation. See point 7.2.

The identification and proper protection of summer bat shelters needs greater efforts at national level. Some new projects in this field have already been initiated in Poland (mostly by local groups), but they need some legislative and financial support.

9. ACTIVITIES CARRIED OUT TO PROMOTE AWARENESS OF THE IMPORTANCE OF CONSERVATION OF BATS:

9.1. Professional and amateur bat researches:

Journals:

- *Acta Chiropterologica* (International Journal of Chiropterology). ISSN 1508-1109 Editor-in-chief: Wiesław Bogdanowicz Museum and Institute of Zoology, Polish Academy of Sciences, Warsaw . Vol. 4 (2002) nos. 1;
- “Bulletin CIC”., Edited by Chiropterological Information Center;

- *Nietoperze* (The Bats). ISSN 1640-2677 Editor-in-chief: Rafał Szkudlarek, The Journal is published by the Agreement for Bat Conservation in Poland. Vol. 2 (2002), nos. 1 and 2, Vol.3, nos 1.

9.2. Annals:

- *Studia Chiropterologica*. Annals of the Chiropterological information Center in Kraków. Editor-in-chief : Bronisław W. Wołoszyn, Institute of Animal Systematic and Evolution Polish Academy of Science, 31-016 Kraków, c. Sławkowska 17, Poland. [Vol. 3 and 4 are under preparation].

9.3. Publication in a book form:

- 2000 -Proceedings of the VIIIth EBRS, Vol. 1: Approaches to Biogeography and Ecology of Bats. B.W.Wołoszyn (ed.). p. 274. Publication of the Chiropterological Center, Kraków;
- 2000 - Poznajemy nietoperze. ABC wiedzy o nietoperzach ich badaniu i ochronie. OTON, Warszawa, 1-140. M. Kowalski, G. Lesiński, (eds.);
- 2001 - Proceedings of the VIIIth EBRS, Vol. 2: Distribution, Ecology, Paleontology and Systematics of Bats. B.W.Wołoszyn (ed.).p. 318, Publication of the Chiropterological Center, Kraków;
- 2001 - Field Key to the Bats of the Carpathians, By B.W.Wołoszyn and A.T.V.Bashta, p. 168. Publication of the Chiropterological Center, Kraków;
- 2001 - Bats of Poland. Distribution, habitat and conservation status by BW. Wołoszyn, p. 88. Publication of the Chiropterological Center, Kraków;
- 2002, The Bats of the Sudetes (*Nietoperze Sudetów*), Supplement 2 do *Przyrody Sudetów Zachodnich*, Jelenia Góra, 87 pp.Furmankiewicz J., Kokurewicz T. (red.).

9.4. Other publication:

- "Auritus" Bulletin of the Wrocław Chiropterological Group. 1(2)(2002);
- "Mopek" bulletin of the Polish Society for Conservation of Bats;
- "Natural Conventions and Agreement ratified by Poland", National Foundation for Environment Protection, Warszawa 2002: p. 28-33.

9.5. Several actions both regional or national-wide were undertaken:

- Three annual national-wide Chiropterological Conference were organised:
 - 14th. Rogów (near Łódź) 10-12 Nov. 2000. It was organised by Polish Zoological Society, Łódź and University of Łódź,
 - 15th Polish National Bat Conference (Gdańsk - Sobieszewo, 9-11 November 2001). The conference was organised by the Academic Chiropterological Circle of the Polish Society for Nature Protection "Salamandra". Taking part in the Conference were ca. 100 chiropterologists from Poland, The Netherlands and Lithuania,
 - 16th Polish National Bat Conference (Piechowice, 15-16 Nov. 2002). The conference was organised by The Polish Society of Wildlife Friends "pro Natura", Wrocław) in collaboration with The Agreement for Bat Conservation (PON). Almost 100 chiropterologists from Poland participated in the Conference;
- Seventh, Eight and Ninth International Bat Nights were organised on 24 September each year by the Carpathian Landscape Parks in Krosno in collaboration with the Chiropterological Information Centre. During the event the old mine in the village of Czarnorzeki near Krosno was grilled to protect the bat hibernaculum situated there;
- 3rd International Symposium "Sacral Architecture in Animal Protection" 3rd SAAP was organised on 20 and 21 October in Kalwaria Paławska (near Przemyśl). The conference was devoted to the problems of protected animal species (including bats) that inhabit the sacral buildings. During the conference, despite of the lectures, the workshop on the methods of the non-affected the animals building management took place also;

- Second Seminar on the Carpathians Bats(2nd SCB) This seminar was held on 6 and 7 December 2000 in Kraków. Seminar was conducted by Chiropterological Information Center in Kraków, Nature Conservation Committee Polish Academy of Science and Polish Copernicus Society of Natural History. The main purpose of the meeting of the chiropterologists from Czech Republic, Poland, Slovakia and Ukraine was discussion about the current state of realisation of the ABC Project: Atlas of Bats of the Carpathians;
- "The bats of the Sudetes" - 1st Polish-Czech-German Conference on the bats of the Sudety Mts., Jelenia Gora 6 Jul. 2002. The conference was organised by Museum of Natural History in Jelenia Góra and Wrocław Chiropterological Group;
- Bat Education Centre in Poznań, The Polish Society for Nature Protection "Salamandra" organised the Education Centre located at Fort IIa in Poznań. The educational programme of the Centre is oriented mainly towards bats and their conservation;
- Bat Hospital for bats in Poznań, The hospital was created by the Polish Society for Nature Protection "Salamandra". In 2001 ca. 150 injured or weakened bats were hospitalised there. Most of them were released after some veterinary care and feeding;
- Bat Night in Wrocław, Bat Night for the inhabitants of the city was organised by the Wrocław Chiropterological Group on 23/24 of June of 2001 in Wrocław.
- Bat Observatory "Batmanówka". The observatory is located in the loft of the school in the village of Kopanki near Poznań. Due to the installation of a transparent cupola and red light, the maternity colony of greater mouse-eared bats (*Myotis myotis*) situated in the loft can be observed without disturbance. The observatory was made by the Polish Society for Nature Protection "Salamandra". 2001 was the first year in which it was open to the public. During this time it was visited by over a thousand schoolchildren, students and tourists.
- Calendar "International Year of the Bats 2001". This has been edited by the Chiropterological Information Centre PAS, Kraków. (Text and concept: Bronisław W. Wołoszyn, Photographs by Krzysztof Skrok, Design by Sławomir Onyszko).
- Competitions for the best poster popularising bat protection. The Nature of Upper Silesia Heritage Center (organiser) addressed this to around 1600 schools in Śląsk (Silesia) Province. Answers came back from 65 schools and works were presented at a special exhibition.
- Education in the mass-media. Hundreds of articles in newspapers, programmes on regional and national TV, and broadcasts on many radio stations were prepared by all the organisations and institutions working with bat protection. They also included information about bat biology and protection, as well as about the International Year of the Bat.
- Education of foresters. The Chiropterological Information Centre Polish Academy of Science joined the General Directorate of the State Forests in developing a programme of education for foresters in bat biology and conservation.
- Educational lectures. Over 108 lectures for school groups or open to the public were organised only by organisations and groups belonging to the Agreement for Bat Protection (PON). The educational programme carried on by PON is applied to all education levels. It includes also for example field trips with bat detectors.
- Exhibition "Face to face with bats". This was prepared by the Chiropterological Information Centre (Krzysztof Skrok – photographs and Bronisław W. Wołoszyn – text) and presented in autumn 2001 in: Drawieński National Park, Bory Tucholskie National Park, Roztoczański National Park, Górzeńsko-Lidzbarski Landscape Park, Budzyński Landscape Park, Gostyński-Włocławskiego Landscape Park, Mazowiecki Landscape Park, Chojnowski Landscape Park, in the Ministry of the Environment from December 2001 to January 2002) and at the Silesian University in Katowice (January – February 2002).
- Film about the "Nietoperek" Bat Reserve. In March 2001 a film about bat protection and research at the Nietoperek Bat Reserve was produced by Cicada Films (London, UK) in co-operation with Tomasz Kokurewicz PhD (Dept. of Zoology and Ecology, Agricultural

Univ. of Wrocław). The film was shown in October 2001 on the Discovery Animal Planet television channel. The Polish version of the film appeared in January 2002.

- Information materials concerning the protection and significance of bats in ecosystem. Posters, postcards, printing, fly-sheets, leaflets and brochures and folders were published by the Chiropterological Information Centre and by the Agreement for Bat Conservation in Poland.
- Interactive CD: "Hanging with Bats". Minnie Cruz, the Peace Corps volunteer working at the Chiropterological Information Centre from 1999 to 2001, prepared an interactive CD: "Hanging with Bats", in Polish and English versions. In 2001, the Chiropterological Information Centre received financial support from the Ministry of the Environment and published 3 000 copies of the CD. The copies are being distributed to National and Landscape Parks, scientific institutions and schools across the country.
- The first International Chiropterological Summer Camp in Nietoperek. The camp was organised 23rd July - 5th August 2001 by the Dept. of Zoology and Ecology, Agricultural Univ. of Wrocław, the Polish Society for Nature Protection "Salamandra" and Wrocław Chiropterological Group. The aims of the camp were: to find and protect summer colonies; to estimate the numbers of bats using tunnels in that period; to identify the main feeding grounds; to increase local interest in bat protection by giving talks about the importance of the "Nietoperek" and "Nietoperek II" Bat Reserves for bat protection in Poland and Germany.
- Exhibition: "Bats of the Sudety Mountains.". This exhibition was prepared by Wrocław Chiropterological Group and Natural History Museum in Jelenia Góra (Western Poland). It was presented in Jelenia Góra: 6.0.Jul. – 15.Sept.2002 and in Lubań: 11 Dec. 2002 – 31 Jan. 2003.
- Monographic lectures "Natural History of Bats" are delivered by Prof. Dr Bronisław W. Wołoszyn and his assistants for students of Biology and Earth Sciences of the Jagiellonian University in Kraków. The course take place during the winter semester.

10. RESPONSIBLE BODIES, IN ACCORDANCE WITH ARTICLE III.5 OF THE AGREEMENT, NOMINATED FOR THE PROVISION OF ADVICE ON BAT CONSERVATION AND MANAGEMENT

The Ministry of the Environment is competent authority. Scientific authority is the State Council for Nature Protection.

11. ADDITIONAL ACTION UNDERTAKEN TO SAFEGUARD POPULATIONS OF BATS

- It has been undertaken preparation of National programme of bat conservation,
- Every year, in the first half of February winter bat censuses in caves and cave-like shelters are organised. This action named: "Winter Bat census" is developed by Chiropterological Information Center and as well as by regional centres, which conduct permanent monitoring of bat population in regions.
- "ABC - project" - Atlas of Bats of the Carpathians. An international project with participation of Czech Republic, Hungary, Rumania, Slovakia, Poland and Ukraine.
- "3rd International Conference on the Carpathians Bats" organised in September 2000 by Ukrainian Chiropterologists in Rachiv (Ukraine). During this Conference we have presented actual results of study of bats in Polish Carpathians.
- "Carpathians North-South - First Polish-Romanian Chiropterological Expedition to the Carpathians" (17 – 30 Sept. 2000). Expedition was organised by Chiropterological Information center PAS in Kraków and Institute of Speleology in Cluj and Museum of Natural History "Grigore Antipa" in Bucuresti. It was an official exchange between Polish Academy of Sciences and Romanian Academy of Sciences (Participants: Polish part: Anna

GAS, Krzysztof MORAWIEC, Katarzyna OCHMAN, Tomasz POSTAWA, Przemysław SZWED, Danuta WOŁOSZYN and Bronisław W. WOŁOSZYN (head of expedition). Romanian part: Andrei GURGINCA, Victor GEORGHIU, Dr. Dumitru MURARIU, Zoltan NAGY, Laszlo SZANTO, with collaboration Daniela BORDA, Dr Vasile DECU, Prof. Constantine RADULESCU, dr. Marton VENCZEL The expedition operated mainly in Bihar Mts. Oltenia and Banat in western Romania.

- Activity of bats at the entrance of underground shelters out of the winter season. The project is co-ordinated by R. Szkudlarek (Polish Society of Friends of Nature „pro Natura”)
- Bats migrations to the "Nietoperek" Bat Reserve. The project is being undertaken in co-operation with German chiropterologists. On the Polish side it is co-ordinated by Tomasz Kokurewicz PhD (Department of Zoology and Ecology, Agricultural University of Wrocław).
- The foraging strategy of the serotine bat *Eptesicus serotinus*. Project co-ordinated by Elzbieta Fuszara, M.Sc.(Institute of Ecology PAS).
- Habitat use, distribution and diversity of bats in northern Poland. The project is being undertaken by Mateusz Ciechanowski, M.Sc. (Gdańsk University, Department of Ecology and Vertebrate Zoology).
- The influence of anthropogenic factors on bats in a forest environment. The project is being implemented by Alek Rachwald PhD (Forest Research Institute, Ecology and Nature Protection Department, Warszawa).
- Monitoring of the natural environment of Poland. The project started in 2000. An integral part of it is the monitoring of bat populations. Every year since 1988, in the first half of February, Winter bat censuses in caves and cave-like shelters have been organised every year since 1988, in the first half of February. The action termed the "Winter Bat Census" (DSN) was carried out in 2001 (14th DSN) and in 2002 (15th DSN). This was developed by the Chiropterological Information Centre (Wołoszyn, B.W. (in press): Chiropterological Information Centre 1987 - 2001. Fifteen years of activity for bat protection. Publication of the Chiropterological Information Centre Polish Academy of Sciences in Poland [*in Polish and English*]. In 2001 and 2002, the monitoring was organised by the Chiropterological Information Centre Polish Academy of Sciences and by regional centres, mainly by non-governmental organisations and Universities.
- Monitoring of population's number and long term population trends of *M. daubentonii*, *M.myotis*, *M. nattereri*, *Barbastella barbastellus*, *Plecotus auritus* in "Nietoperek" bat reserve. The project is being carried out in co-operation with nongovernmental organisations and is co-ordinated by Tomasz Kokurewicz PhD (Department of Zoology and Ecology Agricultural University of Wrocław).
- Monitoring of bat population sizes and long-term population trends on the Śnieżnik Massif (Sudety Mountains). This Czech-Polish project is being carried out in co-operation with non-governmental organisations, the "Wrocław Chiropterological Group", Czech Speleological Society, section „Barbastellus” and Speleological Section in Stronie Śląskie. The project is co-ordinated by Joanna Furmankiewicz M.Sc. (Institute of Zoology, University of Wrocław) and Tomasz Kokurewicz PhD (Department of Zoology and Ecology, Agricultural University of Wrocław).
- Natural and anthropogenic factors affecting bat mortality. The project is being implemented by M. Kowalski and G. Lesiński (Mazovian Society for the Protection of Fauna, Polish Society for Bat Protection)
- Social vocalisation in Nathusius's pipistrelle bat (*Pipistrellus nathusii*). The project is being realised by R. Szkudlarek (Polish Society of Friends of Nature „pro Natura”).
- Summer activity of bats in the area surrounding the "Nietoperek" bat reserve. The project is carried out in co-operation with non-governmental organisations, namely the Polish Society for Nature Protection "Salamandra" and "Wrocław Chiropterological Group".

The project is co-ordinated by Alek Rachwald PhD (Forest Research Institute, Ecology and Nature Protection Department, Warszawa) and Tomasz Kokurewicz PhD (Department of Zoology and Ecology Agricultural University of Wrocław).

- The bacterial flora of the alimentary tract of vespertilionid bats. The project has now been completed and a paper summarising the results is in preparation. The project was realised by Tomasz Jarzembowski PhD at the Department of Microbiology, Gdańsk Medical University.
- The bat fauna of the Landscape Parks located in the Ziemia Lubuska and Wielkopolska regions. The project is being realised by the Polish Society for Nature Protection „Salamandra” and local students’ groups (from the Agricultural University of Poznań, and Adam Mickiewicz University).
- The importance of small cellars for bat hibernation in Poland. The project is being realised by The Polish Society for Bat Protection, Mazovian Society for Fauna Protection, and the Polish Society for Nature Protection „Salamandra” (as co-ordinated by G. Lesiński PhD)
- The migration and genetic structure of a population of Nathusius’ pipistrelle *Pipistrellus nathusii* on the southern Baltic Coast. The project is being conducted by Tomasz Jarzembowski PhD, at the Department of Ecology and Zoology of Vertebrates (University of Gdańsk).
- The relationship between sex, age and body reserves and thermal preferences in Daubenton’s bats (*Myotis daubentonii*) during natural hibernation. The project is finished and a paper summarising the results is in preparation. The project was realised by Tomasz Kokurewicz PhD (Department of Zoology and Ecology, Agricultural University of Wrocław) and Michał Wojciechowski, M.Sc. (N. Copernicus University, Department of Animal Physiology, Toruń).
- The vertical differentiation of bat groupings in Tatra Mountain Caves. The project is being implemented by K. Piksa (Pedagogical University of Kraków)
- It has been started the preparation of National action plan on Pond bat *Myotis dasycneme*

Other - see point 9

12. RECENT AND ONGOING PROGRAMS (INCLUDING RESEARCH) RELATING TO THE CONSERVATION AND MANAGEMENT OF BATS:

- Mateusz CIECHANOWSKI (Gdańsk University, Department of Ecology and Vertebrate Zoology): Spatial structure and activity of a bat community in the forest-agricultural landscape of northern Poland;
- Joanna FURMANKIEWICZ (Wrocław University, Institute of Zoology): Mating behaviour of the brown long-eared bat (*Plecotus auritus*);
- Tomasz JARZEMBOWSKI (Gdańsk University) " Ecology of *Pipistrellus nathusii* during seasonal migration on Mierzeja Wiślana (Northern Poland). (2000);
- Grzegorz KŁYS Microclimatic factors influencing hibernating place selections by *Plecotus auritus* and *Myotis myotis*. An example: Old mine in Tarnowskie Góry, Silesia, Poland.(2003);
- Katarzyna KOZAKIEWICZ (Chiropterological Information Centre PAS, Kraków): Analysis of pollution of anthropogenic origin in the greater mouse-eared bat *Myotis myotis* (Borkhausen, 1797) in West Poland;
- Leszek KOZIRÓG (University of Warmia and Mazury, Olsztyn): Differences in bat activity near streams and rivers in various kinds of landscape;
- Maciej ŁOCHYŃSKI Roost-site selection and roosting ecology of the noctule bat, *Nyctalus noctula* in the Żerkowsko-Czeszewski Landscape Park and Zielonka Forest Landscape Park;

- Dariusz ŁUPICKI (Agricultural University of Wrocław, Department of Zoology and Ecology): Spatial differentiation of trophic niche of Daubenton's bat in relation to sex and age of animals during the fall. (2003);
- Jakub NOWAK (Agriculture University, Kraków) Influence of some climate factors on the competition and structure of bat groups in caves of SE Poland;
- Tomasz POSTAWA (Chiropterological Information Centre PAS, Kraków): Comparative analysis of the post-glacial and recent bat faunas of the Kraków-Częstochowa Upland (South Poland). Completed in December 2002;
- Grzegorz RADZICKI (Łódź University): Temporal and spatial differentiation of bat winter clusters in Szachownica Cave;
- Ireneusz RUCZYŃSKI (Mammal Research Institute, PAS, Białowieża): Factors influencing roost selection and occupation by bats in Białowieża Primeval Forest;
- Piotr SCHICK (Wrocław University, Institute of Zoology): Winter feeding of Daubenton's bats (*Myotis daubentonii*), greater mouse-eared bats (*Myotis myotis*) and barbastelles (*Barbastella barbastellus*) in the Międzyrzecz Fortified Front (West Poland);
- Michał WOJCIECHOWSKI (Nicolaus Copernicus University in Toruń): Adaptive strategies in heterothermic bats, using the large mouse-eared bat *Myotis myotis* (Borkhausen, 1797) and the Daubenton's bat *Myotis daubentoni* (Kuhl, 1817) as examples.

13. CONSIDERATION BEING GIVEN TO THE POTENTIAL EFFECTS OF PESTICIDES ON BATS AND EFFORTS TO REPLACE TIMBER TREATMENT CHEMICALS WHICH ARE HIGHLY TOXIC TO BATS

It has been prepared Report on affects on bats the timber treatment chemicals used in Poland.

D. FUNCTIONING OF THE AGREEMENT

14. COOPERATION WITH OTHER RANGE STATES

It has been carried out many activities with other countries, mainly in the Carpatians (See point 11). These activities was carried out mainly for assess species distribution and trends of bats populations occuring in Carpatians.

15. MEASURES TAKEN TO IMPLEMENT RESOLUTIONS ADOPTED BY MEETING OF PARTIES

Resolution 2.7. and 3.3. Format of National Report

This report has been prepared in accordance to the adopted format

Resolution 2.8. and 3.8. On the implementation of the conservation and management plan

As presented in this report, activities to implement the Agreement were taken. (see point 6 and 7). Most important sites for bats are designated to the project of Natura 2000 network. For these sites began preparing management plans.

Resolution 3.5. International Year of the Bat

Several national and regional activities were held to increase the public awareness of the conservation of bats (see point 9). It was carried out mainly by NGO in cooperation with Landscape Parks, local authorities and local communities. These activities oriented mainly towards bats and conservation of their foraging areas and roost sites.

Resolution 3.7. Amendment to the Agreement

Amendments to the Agreement are under ratification.

APPENDIX 1

To: Polish National Report on the implementation of the Agreement on the Conservation of the Populations of European Bats (Eurobats), 2001 - 2002.

Table 1. Winter shelters identified as important to the conservation of bats in Poland, in that at least 50 hibernating bats have been observed. Explanation of abbreviations: FO- fort, BU – bunker, CV-cave, CE- cellar, MI- mine. Data from the years 1988-2002.

No.	Name of the locality	Type of locality	Max. number of bats	Year of observation	References
1.	"Nietoperek" Bat Reserve	FO	29 493	1991	Urbańczyk with group, in Wołoszyn, 1994
2.	Szachownica	CV	1 485	2002	Róg, Pawenta, Knop, unpubl.
3.	Grudziądz, Citadel	FO	1 328	2002	Leszczyński, Kasprzyk, unpubl.
4.	Poznań, Fort I	FO	1 051	2001	Jurczyszyn, database of PTOP „Salamandra”
5.	Strzaliny, Wisielcza Góra	FO	895	2000	Bernard, database of PTOP „Salamandra”
6.	Bochotnica, group of stone-pits I	MI	531	2001	Kowalski, Urban, Potakiewicz, Piskorski, unpubl.
7.	Bunker 10 in Mamerki	BU	463	1997	Fuszara <i>et al.</i> , 2002
8.	Strubiny I	FO	378	1996	Fuszara, Fuszara, database of OTON
9.	Osowiec	FO	344	1993	Fuszara <i>et al.</i> , 1996
10.	Kostrzyn on the Odra River – „Król” Bastion	FO	340	2001	Laskowska, Jaros, Dzieciolowski, database of PTOP „Salamandra”
11.	Konewka, train shelter	BU	297	1993	Fuszara <i>et al.</i> , 1996
12.	Beneath Sokola Góra	CV	265	1994	Labocha, Postawa, 1994
13.	Tatra Mountains, Czarna Cave	CV	265	1997	Piksa, Nowak, 2000
14.	Cooler in Cieszków	CE	263	1997	database of PTPP „pro Natura”
15.	Świecie on the Vistula	FO	263	1992	Postawa <i>et al.</i> , 1994
16.	Studnisko	CV	255	1995	Zygmunt, 2000
17.	Kletno, Niedźwiedzia Cave	CV	251	2002	Furmankiewicz, J., Furmankiewicz, M. 2002
18.	Stolec	MI	242	1999	Furmankiewicz, J., Furmankiewicz, M. 2002
19.	Koronowo	CE	234	1996	Kasprzyk <i>et al.</i> , 2002
20.	Tarnowskie Góry	MI	233	1994	Kłys, 1994
21.	Jaworznicka Cave (with old Chelosiowa)	CV	224	1995	Gwardjan, Kasza, Jachimkowska, Gubała, database of OTON
22.	Piła, Old brewery	CE	218	2001	Wojtaszyn, 2002

Table 1a. Winter shelters identified as important to the conservation of bats in Poland, in that at least 50 hibernating bats have been observed. Explanation of abbreviations: FO- fort, BU – bunker, CV-cave, CE- cellar, MI- mine. Data from the years 1988-2002.

No.	Name of the locality	Type of locality	Max. number of bats	Year of observation	References
23.	Poznań, Fort II	FO	211	1997	Dzieciolowski, database of PTOP „Salamandra”
24.	Toruń, Fort XV	FO	205	1997	Kasprzyk <i>et al.</i> , 2002
25.	Szczelina Wojcieszowska	CV	194	2001	Kliś <i>et al.</i> , 2001
26.	Malbork, Castle	FO	191	2001	Ciechanowski & Stec unpubl.
27.	Kostrzyn on the Odra River – „Filip” Bastion	FO	175	2001	Laskowska, Jaros, Dzieciolowski, database of PTOP „Salamandra”

28.	Warszawa, Fosa Street	CE	173	1994	Fuszara, 1995
29.	Poznań, Fort Via	FO	170	2002	Grzywiński, database of PTOP „Salamandra”
30.	Poznań, Fort III	FO	164	1996	Gawlak, database of PTOP „Salamandra”
31.	Siedliska, Fort I "Salis Soglio"	FO	160	1996	Mleczek, 2002
32.	Drozdowo, brewery	CE	157	1992	Fuszara <i>et al.</i> , 1996
33.	Kołobrzeg, stadium, complex of bunkers	BU	154	2001	Wojtaszyn <i>et al.</i> , 2001
34.	Stolec (SW Poland)	MI	152	2001	Furmankiewicz, J., Gorniak, J. 2002
35.	Goławice I	FO	151	2000	Fuszara E., Fuszara M., Kowalski, Lesinski, database of OTON
36.	Konewka, small shelter	BU	147	1997	Fuszara E., Fuszara M. 2002
37.	”Tapadła”	MI	145	1999	database of PTPP „pro Natura”
38.	Wiercica	CV	142	1991	Postawa <i>et al.</i> , 1994
39.	Cave in Młoty	MI	141	2002	database of PTPP „pro Natura”
40.	Toruń Fort V	FO	140	1999	Kasprzyk <i>et al.</i> unpubl.
41.	Forts in Nysa	FO	138	1999	Hebda and Nowak, 2002
42.	Modlin Stronghold, Fort Dębina	FO	135	2000	Fuszara, Fuszara, Cygan, Sergiej; database of OTON
43.	Mine in Podlesie	MI	132	2001	Furmankiewicz, J., Furmankiewicz, M. 2002
44.	Szczecin, Światowida	BU	132	2001	Dzięgielewska <i>et al.</i> , 2001
45.	Miedzianka – group of underground tunnels on Miedzianka mount	MI	127	2000	Gwardjan, Kasza, Jachimkowska, database of OTON
46.	Monastery in Lubiaż	CE	124	1998	database of PTPP „pro Natura”

Table 1b. Winter shelters identified as important to the conservation of bats in Poland, in that at least 50 hibernating bats have been observed. Explanation of abbreviations: FO- fort, BU – bunker, CV-cave, CE- cellar, MI- mine. Data from the years 1988-2002.

No.	Name of the locality	Type of locality	Max. number of bats	Year of observation	References
47.	Poznań, Fort VIIIa	FO	123	1999	Dzięciołowski, database of PTOP „Salamandra”
48.	Bukowiec, Diabla Dziura	CV	121	1993	Mleczek, 2002
49.	Szczecin – Zdroje, cemetery	BU	121	1997	Dzięgielewska 2002
50.	Complex „Włodarz”	MI	120	2002	Furmankiewicz, J., Furmankiewicz, M. 2002
51.	Mamerki Bunker 11	BU	119	1996	Fuszara, Fuszara, database of OTON
52.	Sokolec, Gontowa	MI	118	2000	Furmankiewicz, J., Furmankiewicz, M. 2002
53.	Gdańsk, Wisłoujście Fortress	FO	115	2001	Ciechanowski, unpubl.
54.	Psia Cave	CV	115	1997	Piksa, Nowak, 2000
55.	Błogosławie	FO	114	1994	Fuszara, 1995
56.	Gizycko, fortress	FO	105	2001	Fuszara, Fuszara, database of OTON
57.	Gierłoż 13	BU	104	1996	Fuszara, Fuszara, Gjerde, database of OTON
58.	Mine in Wojcieszów Dolny	MI	101	2002	database of PTPP „pro Natura”
59.	Mines in Złoty Jar and Złoty Stok	MI	101	2002	database of PTPP „pro Natura”
60.	Henryków, SW Poland	CE	Ca. 100	2002	Iwaniuk, Szkuclarek, 2002
61.	Tatra Mountains, Zimna	CV	100	1999	Piksa, Nowak, 2000
62.	Toruń, Armoured Battery	FO	100	1996	Ruczyńska, Kasprzyk, unpubl.

63.	Kopalnia „Kopaliny” in Kletno	MI	100	2001	Buřič <i>et al.</i> , 2001
64.	Poznań, Fort VI	FO	95	1999	Dzięciołowski, database of PTOP „Salamandra”
65.	Toruń, Fort IV	FO	95	1998	Kasprzyk <i>et al.</i> , unpubl.
66.	Kłodzko, fortress	FO	93	1995	Buřič <i>et al.</i> , 2001
67.	Bochotnica, group of stone-pits II	MI	91	2002	Kowalski, Urban, Potakiewicz, Piskorski, unpubl.
68.	Grubno, ice-cellar	CE	91	2002	Tomaszewski <i>et al.</i> , unpubl.

Table 1c. Winter shelters identified as important to the conservation of bats in Poland, in that at least 50 hibernating bats have been observed. Explanation of abbreviations: FO- fort, BU – bunker, CV-cave, CE- cellar, MI- mine. Data from the years 1988-2002.

No.	Name of the locality	Type of locality	Max. number of bats	Year of observation	References
69.	Grodziec, Palace	CE	88	2002	Dzięciołowski, database of PTOP „Salamandra”
70.	Na Świniuszcze Cave	CV	88	1990	Postawa, 1994
71.	Szczecin – Gocław shelter I	BU	86	1998	Dzięgielewska 2002
72.	Frombork,	CE	85	2001	Ciechanowski <i>et al.</i> , 2001
73.	Kostrzyn on the Odra River, Fort Sarbinowo	FO	84	2002	Jaros, Dzięciołowski, Wojciechowski, database of PTOP „Salamandra”
74.	Miedzianka	MI	84	1989	Wołoszyn, 1994 a
75.	Poznań, Fort IIIa	FO	84	1996	Adamus, database of PTOP „Salamandra”
76.	Poznań, Fort IV	FO	84	2002	Szubert, database of PTOP „Salamandra”
77.	Poznań, Fort VIII	FO	84	1999	Gawlak, database of PTOP „Salamandra”
78.	Gdańsk – Oliwa	BU	83	2000	Ciechanowski, unpubl.
79.	Fortress Boyen, Giżycko	BU	83	1999	Fuszara <i>et al.</i> 2002
80.	Pieniężno Castle	CE	82	2002	Różewicz-Witkowska, Witkowski, 2002
81.	Nietoperzowa	CV	81	1999	Węgiel <i>et al.</i> , 2001
82.	Samsonów, Zygmunt Ironworks	CE	81	1999	Gwardjan, Jachimkowska, database of OTON
83.	Raj	CV	80	1994	Wąsikowski, Snoch, database of OTON
84.	Mine near Biały Flins, Mine near Rozdroże Izerskie	MI	78	2002	database of PTPP „pro Natura”
85.	Koralowa	CV	77	1988	Wołoszyn, 1994 b
86.	Mine above tunnel Szklarska Poręba Dolna	MI	77	2001	data base of PTPP „pro Natura”
87.	Poznań, Cytadela	FO	77	2002	Jaros, Dzięciołowski, database of PTOP „Salamandra”
88.	Pustelnia	MI	77	1994	Mleczek, 2002
89.	Complex of mines near Baworowo Factory in Leśna	MI	75	2002	database of PTPP „pro Natura”

Table 1d. Winter shelters identified as important to the conservation of bats in Poland, in that at least 50 hibernating bats have been observed. Explanation of abbreviations: FO- fort, BU – bunker, CV-cave, CE- cellar, MI- mine. Data from the years 1988-2002.

No.	Name of the locality	Type of locality	Max. number of bats	Year of observation	References
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90.	Wojcieszów, Jaskinia Północna	CV	75	2002	Furmankiewicz, J., Furmankiewicz, M. 2002
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91.	Wojcieszów, Nowa Cave	CV	75	2002	Furmankiewicz, J., Furmankiewicz, M. 2002
92.	Kołobrzeg, Stadion, shelter III	BU	75	2000	Wojtaszyn <i>et al.</i> 2001
93.	Tatra Mountains, Bańdzioch Kominiarski	CV	73	1999	Piksa, Nowak, 2000
94.	"Osówka" Complex	MI	71	2002	data base of PTPP „pro Natura”
95.	Szczecin, Gocław – bunker II	BU	71	2001	Dzięgielewska <i>et al.</i> , 2001
96.	Mine in Kolorowe Jezioro near Wieściszowice	MI	69	2002	data base of PTPP „pro Natura”
97.	Staropole, PzW 708	BU	69	2001	Szkudlarek <i>et al.</i> , 2001
98.	Szczecin, Bogumińska I	BU	69	2000	Dzięgielewska <i>et al.</i> , 2000
99.	Za Kratą Cave	CV	69	1991	Kowalski, Lesiński, 1994
100.	Mine in Kletno	MI	68	2002	data base of PTPP „pro Natura”
101.	Chobienia – palace cellars	CE	67	1997	data base of PTPP „pro Natura”
102.	Skotniki, palace	CE	67	2001	Hejduk, Pawenta, Róg, unpubl.
103.	Brody	FO	65	2001	Fuszara, Adamiak, data base of OTON
104.	Radochowska	CV	65	1991	Burič <i>et al.</i> , 2001
105.	Zalesie, well	MI	65	1995	Kowalski, Rusin, Witkowski, Mikołajski, Ostrach-Kowalska data base of OTON
106.	Puławy, palace cellars	CE	64	2002	Urban, Potakiewicz, Piskorski, unpubl.
107.	Staropole, PzW 712	BU	64	2001	Szkudlarek <i>et al.</i> , 2001
108.	Pieski, PzW 741	BU	63	2001	Szkudlarek <i>et al.</i> , 2001
109.	Węglówka, Jasna Mine	MI	62	2000	Mleczek, 2001
110.	Szczecin – Gocław, bunker IV	BU	61	1994	Bernard, 1995
111.	Ojcowski National Park, Ciemna Cave	CV	60	2000	Węgiel <i>et al.</i> , 2001
112.	Complex ”Soboń”	MI	59	1999	data base of PTPP „pro Natura”
113.	Toruń, Fort XIII	FO	58	1995	Ruczyńska, Kasprzyk, unpubl.
114.	Gocław, Shelter 2	BU	56	1999	Dzięgielewska, 2002

Table 1e. Winter shelters identified as important to the conservation of bats in Poland, in that at least 50 hibernating bats have been observed. Explanation of abbreviations: FO- fort, BU – bunker, CV-cave, CE- cellar, MI- mine. Data from the years 1988-2002.

No.	Name of the locality	Type of locality	Max. number of bats	Year of observation	References
115.	Gilów	MI	55	2002	Furmankiewicz, Urban, unpubl.
116.	Kołobrzeg, Solna street	BU	55	1999	Wojtaszyn <i>et al.</i> , 2001
117.	Poznań, Wojska Polskiego street	BU	55	1997	Dzięciołowski, data base of PTOP „Salamandra”
118.	Mine Helena in Ciechanowice	MI	54	1999	data base of PTPP „pro Natura”
119.	Uznam island (Świnoujście)	FO	54	1994	Bernard, 1995
120.	Cellar of castle in Śmigród	CE	53	2000	data base of PTPP „pro Natura”
121.	Tatry, Śpiących Rycerzy Niznia Cave	CV	53	1999	Piksa, Nowak, 2000
122.	Gdańsk, Reduta Napoleńska	FO	52	1997	Jarzebowski <i>et al.</i> , 2000
123.	Twierdza Modlin, Fort Janówek III	FO	52	1998	Lesiński, data base of OTON
124.	Wolin (Świnoujście)	FO	52	1994	Bernard, 1995

125.	Poznań, Fort Va	FO	51	1998	Gawlak, data base of PTOP „Salamandra”
126.	Mine of Radon Inhalatorium in Kowary	MI	50	1999	Szkudlarek, data base of PTPP „pro Natura”
127.	Poznań, Fort IVa	FO	50	1992	Bernard, Jurczyszyn, 1994

APPENDIX 2.

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