

**THE AGREEMENT ON THE CONSERVATION OF POPULATIONS OF
EUROPEAN BATS (EUROBATS)
Report on the implementation of the Agreement in Poland
2003–2005**



Warsaw, April 2007

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A. General information

Name of Party: Poland
Date of Report: December 10th 2006
Period Covered: January 2003 – December 2005
Competent Authority: Polish Ministry of Environment

B. Status of bats within the territory of the party

1. Summary details of resident species

So far, the permanent residency of 20 bat species has been confirmed in Poland. There are 19 species of vespertilionid bat and 1 horseshoe bat species (the lesser horseshoe bat, *Rhinolophus hipposideros*). Single individuals of greater horseshoe bat, *Rh. Ferrumequinum*, have been regularly observed, as well as individuals of the greater noctule *Nyctalus lasiopterus*. However, breeding records of these two species have not been reported in Poland yet.

In December 2004, a male pipistrelle bat was brought to the bat hospital in Warsaw, having been found in a flat in the city. It was recognized as Kuhl's pipistrelle, *Pipistrellus kuhlii* at the beginning of 2005. It was the first observation of this species in Poland. It remains unknown how and from where this specimen appeared in the centre of Poland, although the pigmentation suggests South-East origin (Popczyk, 2005).

2. Status and trends

Nine bat species are on the Red List of threatened animals in Poland (Głowaciński, 2002). These are:

species	IUCN category
<i>Rhinolophus ferrumequinum</i>	LC
<i>Rh. hipposideros</i>	EN
<i>Myotis bechsteinii</i>	NT
<i>Myotis dasycneme</i>	EN
<i>Myotis emerginatus</i>	EN
<i>Vespertilio murinus</i>	LC
<i>Eptesicus nilssonii</i>	NT
<i>Nyctalus leisleri</i>	VU
<i>Barbastella barbastellus</i>	DD

Although in some important winter shelters a slow growth in the number of some bat species has been observed (e.g. *Rh. Hipposideros* In hibarnacula of Śnieżnik Massie) there is still no sufficient scientific proof that this is a result of a real number increase in populations throughout Poland.

3. Habitats and roost sites

In Poland in the years 1980 – 2005, at least 72 winter shelters were known to have 100 or more hibernating bats. Among these, 6 shelters were known to have over 1000 hibernating bats and one which has harbored over 30,000 bats (the largest result of over 32,200 bats was observed in 2005). A new important hibernaculum of about 1870 *B. barbastellus* was discovered in 2005 in an old tunnel in the West of Poland. The most important hibernacula are listed in Appendix II to his Report. Data obtaining during winter inventories are presented in this appendix which was conducted by different chiropterological centers. Only these data are presented which was got by licensed expert and verified by long-term investigation or published.

In the years 2003 – 2005 several important breeding sites were discovered, U. Anikowska Ciechanowski, J. Furmankiewicz, G. Hebda, K. Mielcarek, A. Nowakowski, A. Przesmycka, K. Sachanowicz, PTOP „Salamandra”, PTPP „pro Natura” – unpublished data) e.g.:

- The biggest known breeding colony of *Myotis dasycneme* in Poland – 391 individuals in Lubinia village, in Pomorskie Voivodship;
- 10 breeding colonies of *Rh. hipposideros* and 5 of *M. myotis* in the South of Poland;
- The first nursery colony of *Rh. hipposideros* in Dolnośląskie Voivodship (Nowa Morawa, Masyw Śnieżnika, Sudety). This is not a big colony (ca. 20 individuals) but it is situated on the northern border of the species range;
- The biggest nursery colony of *Pipistrellus nathusii* – 720 individuals in Miechucin in Pomorskie Voivodship;
- New breeding colonies of 3 species of genus *Pipistrellus*: *P. pipistrellus* in Łysomice near Słupsk and in Strzecz in Łeba Valley (>100 ind.); *P. nathusii* in Szludron in Wdzydzki Landscape Park (> 100 ind.; unfortunately this roost was destroyed after the end of the breeding season) and *P. pygmaeus* in Dębki in Nadmorski Landscape Park.
- Breeding colony of *M. myotis* in Dąbrówka Dolna (Opolskie Voivodship) – ca. 200 females with juveniles;
- *Breeding colony of M. myotis in Zagwizdzie* (Opolskie Voivodship) – ca. 250 females with juveniles.

4. Threats

General threats for bats in Poland are similar to menaces in many European countries. Among the most significant are:

- habitat fragmentation,
- decrease in the number of shelters,
- extermination by people, especially in winter refuges,
- environmental pollution.

Nowadays, some of these threats are not as significant as they were during previous years. However they can still be a real danger for local bat populations.

During the years 2003-2005 several particular threats for bats' shelters were reported. These are:

- a) Unfavourable changes for bats in buildings where breeding colonies have been reported. Many openings have been closed during renovation. Strong illumination of buildings (mostly churches) disturbed bat emergence from their roosts.
- b) Pulling down and burning litter in entrances of caves, so the smoke modifies air composition and microclimate in caves and the fire changes the character of cave entrances.

- c) Intensive use or management of hibernation sites mainly resulting from intensity of illegal exploration tourism during autumnal and winter seasons as well as accessibility a legal tourist path to tourists throughout the year especially in sites defining as the biggest hibernacula.
- d) modernization, changes of management or type of use in important hibernacula sites which are conducted without any consultancy with nature conservation bodies and without taking into consideration bats conservation needs.
- e) Devastation of hibernation sites or damage their safety devices caused which was stolen as metal elements in order to recycle (specially in forts), underground shelters were buried or closed so that bats are unable to get inside
- f) Cave exploration. Speleologists frequently visit the caves being important hibernacula sites throughout the year, which leads to the disturbance of bats.
- g) Increase number of bat collision with technical barriers, e.g. especially when they cross bats' permanent flight routes (e.g. to foraging areas) like expressways or wind farms.
- g) A lack of rehabilitation centres for bats to rescue animals being founded, injured or staying without previous shelter.
- h) recommendations of veterinary authorities related to applying of extreme methods in case of rabid bats, frequently tend to exterminate known nursery colonies of bats in the immediate area.
- i) A lack of detailed information about migration routes, important swarming places or foraging habitats.

5. Data collection, analysis, interpretation and dissemination

Although the majority of scientific institutions and NGOs interested in bat protection are engaged in winter monitoring of bat numbers in many important hibernacula, there is no central system of collection and analysis of obtained data. A considerable part of the results are collected by the Polish Agreement for Bat Protection – a union of 8 NGOs together with scientists. The system of bat research licenses introduced voluntarily by the Agreement helps in data collection.

There is a similar situation with the results of summer monitoring and with research made using bat rings, but the scale of such activity is smaller than the winter census.

Reports on bat research activity submitted by licensed researchers

in 2003	in 2004	in 2005
57 persons	56 persons	45 persons

These reports lack information gathered by other institutions which are not organized in the Agreement for Bat Protection (e.g. Chiropterological Information Centre) as well as by independent research workers who have individual permission for conducting studies on bats from the Minister of Environment. It is practically impossible to collect obtained data all together.

The main Polish forum to exchange information, ideas and experience of research and protection of bats is the annual Polish Bat Research Conference. In the years 2003-2005 the 17th, 18th and 19th Polish Bat Research Conferences were organized.

C. Measures taken to implement article III of the Agreement

6. Legal measures taken to protect bats, including enforcement action

On 28 September 2004 the new Regulation of the Ministry of Environment about the protection of animal species was signed. There are 3 important new rules in this law.

- In the case of three species, *Rhinolopus hipposideros*, *Myotis dasycneme* and *M. emarginatus*, their protection has priority over the business activity of people.
- A special protection zone can be established in any winter shelter in which, during the previous 3 years, over 200 bats were observed at least once. In such a zone any changes harmful to bats are prohibited.
- To make films or take photos of bats in shelters the special permission of the Minister of Environment or voivoda (governor of province) is required.

In 2005 two legal acts were introduced that have a direct influence on bat protection and research. These are:

- **Law from January 21st 2005, on experiments on animals.** Thanks to lobbying mainly by chiropterological NGOs on this Act, a new regulation was introduced which allows Polish NGOs to carry out (with the permission of the Minister of Environment) some simple research on bats – such as net catching for biometry and species identification or ringing. Before, only official scientific institutions were allowed to do this. More sophisticated experiments – such as telemetry – are still reserved for institutions listed in the Act and NGOs are excluded.
- **Resolution of the Ministry of Environment from May 16th 2005, on types of natural habitats as well as plant and animal species, which require protection in the form of designation of Natura 2000 sites.** In this resolution a special point system was introduced for the designation of bats shelters as Natura 2000 sites. Winter or summer bat roosts which have 10 or more chiropterological points should be proposed to the Natura 2000 network. This system was developed by the Polish Agreement for Bats Protection in 2003 and the Resolution adopted it with some small changes.

7. Important sites for the conservation of bats identified and taken under protection.

The arrangements regarding the creation of the Natura 2000 network in Poland were very intensive. Many NGOs and scientific milieu were deeply engaged in the process. In the Polish government's Natura 2000 proposal that was sent to the European Commission in April 2004, uncomplete representation of areas for bats were to be a part of the network. It included only a small selection of winter and summer bat shelters. The proposal didn't cover the migration route, foraging nor swarming areas because of a lack of detailed information. 29 sites important for protection at least one species have been send in the first official list of proposed sites. This selection in base on data collecting during annual bat census but often without detailed a filed verification of boundaries proposed sites.

In autumn 2004 a group of NGOs, with the significant help of scientists, prepared the so-called "Shadow List". It provided credible and comprehensive opinion on the governmental conception of the Natura 2000 network in Poland, taking into consideration the protection of all species and habitats listed in the Habitat Directive. Among them were 7 bat species.

In the Resolution for Natura 2000 network creation a special score system was created in order to estimate the roost range for the protection of national bat species (listed in Appendix II to Habitat

Directive) populations. Thanks to that in the first governmental proposal, there were a satisfactory number of roosts for the efficient protection of only one species: *Myotis dasycneme* which according in the best expert knowledge guarantee favourable conservation status for this species. Moreover, *Rhinolophus ferrumequinum* should be removed from the Reference List as there were only few accidental individuals observed in Poland. Whereas for the five other remaining species (especially *Rhinolophus hipposideros* and *Myotis emarginatus*), there is still an inadequate number of habitats in the Natura 2000 network in Poland. In the case of *Myotis bechsteinii* and *Barbastella barbastellus* estimating is possible only for winter shelters because the summer roost information is too scarce.

In 2005 the Ministry of Environment prepared another list with various supplements. There were 9 changes (new areas or adjustments of previous ones) improving bat protection terms. Adding new areas will significantly improve the habitat state of *Myotis emarginatus* and of other species to a lesser degree. After taking these changes into account, *Rhinolophus hipposideros* sites are the worst represented in the network. Currently, further work is still ongoing in order to add more bat habitats. Furthermore, investigations to determine important foraging areas have just begun. The next groups of bat habitats to be added to the Natura2000 network are scheduled to be proposed in spring 2007.

The following summary contains habitats important for bat protection in Poland that are proposed for the Natura 2000 network. In the table there are roosts which were officially reported (2004); roosts which are prepared to report in 2006 and others which were suggested in the Shadow List but weren't included in the governmental proposal at the end of 2005.

Site	Access to Natura 2000 network	<i>Rhinolophus hipposideros</i>	<i>Barbastella barbastellus</i>	<i>Myotis dasycneme</i>	<i>Myotis emarginatus</i>	<i>Myotis bechsteinii</i>	<i>Myotis myotis</i>	Number of chiropterological points
Beskid Sądecki Mts.	2004	X			X	X	X	102
Cooling system in Cieszkowie	2004		X				X	21
Biebrza Valley	2004		X	X				64
Prądnik Valley	2004	X	X	X	X	X		48
Jurassic Valleys	2004	X		X	X			63
Nysa Forts	2004		X		X			19
Torun Forts	2004		X	X			X	13
Fortifications in Poznań	2004		X				X	62
Gierłoż	2004		X					19
Jeleniewo	2004			X				150
Mines in Złoty Stok	2004	X			X	X		6
Kopanki	2004						X	15
Church in Konradów	2004						X	10
Chuch in Radziechowach	2006	X						24
Spalskie Forest	2004		X			X		54
Lubnia	2004			X				33
Łabowa		X						44

Mamerki	2004		X					90
Babastelle tunel near Krzystkowice	2006		X					180
Nietoperek	2004		X	X		X	X	925
Magurska Site	2004/2006	X			X	X		28
Nałęczowski Plateau	2004		X	X		X	X	64
Tarnogórsko-Bytomskie Undergrounds	2004						X	16
Police canals	2004		X				X	18
Rudawy Janowickie	2004	X	X	X			X	6
Sieraków	2004						X	20
Stoleckie Rocks	2004		X					21
Strzalinny near Tuczna	2006					X	X	42
Szachownica	2004		X	X		X	X	160
Galleries in Leśna	2004		X			X		7
Galleries in Senderkach	2004		X	X		X		5
Tatry Mts.	2004			X		X	X	>6
Salis Soglio Forts	2006		X			X		16
Site of Bats near Bukowiec	2006	X						37
Monastery in Łosie near Ropa (<10 p.>)	2006	X						10
Highwayman Cave at Łopień	2006	X		X	X		X	171
Cistercian Abbey in Szczyrzyc	2006	X		X	X		X	126
Charch in Górkach Wielkich	2006	X					X	20

8. Consideration given to habitats which are important to bats

- In 2003 in Obory village near Kwidzyń, some renovation activities were carried out in a building where the biggest known nursery colony of *Vespertilio murinus* (ca. 155 adult females) in Poland was situated. During the redecoration a substitute, isolated shelter for bats was installed according to the project of University Chiropterological Activity Group of the Polish Society for Nature Protection “Salamandra” from Gdańsk. In 2004 this shelter was successfully inhabited by a parti-coloured bat colony in similar number to that of previous years.
- The tunnel in the quarry in Opole – a significant hibernaculum for *P. auritus* and *M. myotis* – was protected from the illegal exploration by people during winter 2003–2004.
- In spring 2005 Polish Society of Wildlife Friends “pro Natura” finalised works started in 2003 concerning conservation of the biggest Polish summer roost of *Myotis myotis* in the attic of a house in Rościszów (Dolnośląskie Voivodship). A colony of up to 1000 bats has been troubling the inhabitants and the administration of the building. Finally most of the attic was designated for exclusive use by bats. The floor and ceiling below was protected with a special platform to prevent guano collecting. The project engaged the administration of the building from Pieszyce, the voivodship nature conservator and the landscape park management in Wrocław. Installation of the platform was co-financed by the Voivodship Fund for Environmental and Water Management in Wrocław. The site was included in the Polish Natura 2000 Shadow list.
- Also in spring 2005, the Polish Society of Wildlife Friends “pro Natura” finished a project begun in 2004 concerning the protection one of the biggest breeding roosts of *Myotis myotis* in

Lower Silesia in a church in Konradów (Dolnośląskie Voivodship). In this site up to 500 specimens of this species roost. Over the wooden ceiling of the church, a wooden floor close to 300 square metres was reconstructed and serves as a platform for guano. The site is on the official list proposed for Natura 2000.

- In June 2005, the Polish Society of Wildlife Friends “pro Natura” together with “Pogranicze” Association from Lubań Śląski protected one of the mines in Leśna (Dolnośląskie Voivodship) with a steel grid. This underground complex in Leśna is one of the most important winter sites in south west Poland and is placed on the list for the NATURA 2000 network. The activity was financed by “pro Natura”, Euroregion “Nysa” and the Voivodship Marshal.
- In autumn 2005, the Polish Society of Wildlife Friends “pro Natura” within the framework of the project “Conservation of the lesser horseshoe bat and other bat species in mountainous regions in Poland” co-financed by EcoFund Foundation protected entrances to the mines gallery in Głuchołazy (Opolskie Voivodship) – a precious and known roost of the Lesser horseshoe bat – with steel grills. The function of this grid with the special roof is not only to stop people from entering in winter but also to protect it from mud and stones sliding down from the slope.
- In 2005, the Polish Society of Wildlife Friends “pro Natura”, within the framework of the same project mentioned above, co-financed by EcoFund Foundation, helped to finance and supervise the conservation of the church in Rozdziel (Małopolskie Voivodship) in a safe way for bats. For many years there has been a nursery colony of the Lesser horseshoe bat in the church attic.
- Autumn 2005. Intervention of Polish Society of Wildlife Friends “pro Natura” in order to save the winter site of bats in the mines in Złoty Stok (Dolnośląskie Voivodship). The underground entrance was covered by stones during renovation of the neighbouring road. Thanks to this intervention the entrance was reopened. Further works on the entrance were continued the following year. The Złoty Stok mines are officially proposed for inclusion in the Natura 2000 network.
- In early spring and autumn 2005, the Polish Society of Wildlife Friends “pro Natura” took action to clean the guano from under the biggest nursery colony of *Myotis myotis* of Lower Silesia. These nursery colonies have been under constant care for several years. The sites are in Wleń, Konradów, Rościszów, Paszowice and Sulistrowiczki.
- University Chiropterological Activity Group of the Polish Society for Nature Protection “Salamandra” from Gdańsk, in cooperation with the Gdańsk City Historical Museum, carried out an adaptation of Prochownia na Szańcu Wschodnim of Wisłoujście Fortress (the old powder-magazine) in order to increase its value as a winter roost for bats. This work was done as compensation for the losses caused by the renovation of another Fort – Bastion Artyleryjski.
- University Chiropterological Activity Group of Polish Society of Nature Protection “Salamandra” from Gdańsk, in co-operation with Culture Park “Twierdza Gdańsk”, built two water tanks underground at Reduta Napoleńska in Gdańsk – protected as a so-called environmental use object “Fort Nocek” in order to improve microclimatic condition (increase of air humidity). Numbers of bats in this site have been decreasing recently.
- The Landscape Parks Directorate of Wielkopolskie Voivodship is running a pilot project for conservation of small winter sites of bats such as cellars and earth cellars in the area of Puszcza Zielonka Landscape Park. The goal of this project is to ensure proper conditions for bats to winter in small sites in this area. This is achieved through placing new doors in old and

deteriorating objects that might serve as bat winter roosts and by placing bricks with holes in on the ceilings and walls of those winter sites.

9. Activities to promote the awareness of the importance of the conservation of bats

- Activity Group of Polish Society of Nature Protection “Salamandra” from Olsztyn organized workshop on bat ecology and protection for about 80 school teachers.
- In 2003 the Association for Nature “Wolf” organized bat workshops in “Cysterskie Kompozycje Krajobrazowe Rud Wielkich” Landscape Park.
- In 2003 Association for Nature “Wolf” organized lectures concerning bats in the kindergarten in Czaniec village.
- In 2003 and 2004 many local activities and initiatives were taken as part of International Bat Night. Activities were aimed at increasing society’s awareness of bats and their protection and were led mainly by NGOs.
- In August 2004 bat research workers of Polish Society for Nature Protection “Salamandra” took part in the “Fledermausfest” arranged by Berliner Artenschutz Team in Berlin.
- Educational activities to raise public awareness of bats and their need for protection were carried out, mainly by NGOs (e.g. SdN “Wilk”, PTOP “Salamandra”, SOP “BIOS”, PTPP “pro Natura”, TP “Bocian”). Several programmes were held in schools, universities and kindergartens in various regions in Poland. Over 120 lectures for school groups or the public were organised. Some exhibitions on this topic were made. The media were often used to publicise these activities.
- Every year several hundred people visit the Bat Observatory “Batmanówka” in Kopanki, a *Myotis myotis* nursery colony in the attic of an old school. The colony can be observed by visitors while the bats remain safe and lectures about bats are provided. The observatory was made by the Polish Society for Nature Protection “Salamandra” in 2002. For instance, in 2005, 837 tickets to “Batmanówka” were sold.
- Within the research programmes and conservation campaigns, training for participating volunteers was provided. Sometimes educational campaigns addressed to local communities were combined with surveys and protection projects.
- The Regional Centre for Environmental Education – Fund for Ecological Library in Poznań organized some workshops for children and young people concerning bats. Each participant underwent theoretical and field training.
- In 2003 the Association for Nature “Wolf” arranged lectures concerning bats for pupils of a secondary school in Węgierska Górka.
- On October 25th 2005 in Cieszków (near a big hibernaculum of *B. barbastellus*) in Dolnośląskie Voivodship there was a third Bat Picnic “Nie tylko gacki” (“Not only long-eared bats”). The organizers were the primary school in Cieszków, the Commune Office of Cieszków, the forestry district Zwierzyniec, Polish Society of Wildlife Friends “pro Natura” and Educational Centre “Dolina Baryczy”. 13 different schools were present at the Picnic. There were various educational games for young children. Older ones could hear and learn to distinguish bat sounds and photos. A film made in Cieszków hibernaculum was shown as well. All participants could visit an exhibition of bat photos.

- Summer field educational camps were arranged. For instance, in 2005 4 such camps were held:
 - in Mazowiecki Landscape Park,
 - in Welski and Górznieńsko-Lidzbarski Landscape Park,
 - in Sławniowice (Opolskie Voivodeship) ,
 - and in Zapust (Dolnośląskie Voivodeship) – this was intended for Polish and German young people.

There were about 50 participants in these camps. They were hanging and checking bat-boxes and carried out some research on bats.

- The Polish Society of Wildlife Friends “pro Natura” together with the Active Group “Chiropterek” from Wrocław University organised an annual “Basic Course in Chiropterology”.
- Landscape Parks Directorate of Wielkopolski Voivodship edited and distributed a brochure concerning bats in small cellars.
- On September 25th 2005, the Polish Society for Bat Protection and Wildlife Society “Bocian” took part in the Festival of Science in Jabłonna near Warsaw, presenting information about research and protection of bats in Poland.
- An exhibition called “Bats of the MRU” was opened and accompanied a tourist route in Pniewo in Międzyrzecki Rejon Umocniony (in co-operation with Phil Richardson).
- A special bat protection workshop was organized, aimed at underground guides in Międzyrzecki Rejon Umocniony (Boryszyn, January 15–16th 2005).
- An educational programme for school children in Międzyrzecz Commune was prepared. The programme was accomplished by translating, extending and adapting to Polish school conditions the Bat Conservation Trust (UK) educational project.
- On January 17th 2005 there was a lecture concerning bats in Międzyrzecki Rejon Umocniony at a school in Boryszyn near “Nietoperek” Bat Reserve.
- University Chiropterological Activity Group of the Polish Society for Nature Protection “Salamandra” organized about 40 lectures for pupils in schools of Pomorskie Voivodship in the years 2003-2005 (10 lectures each season). Moreover, in 2005 there were educational workshops (trip, lecture and art classes) held for the “Nasze Dzieci” Foundation.
- As part of the 1st, 2nd and 3rd Baltic Festival of Science there were lectures and night bat expeditions organized for the public under previous reservation (in 2003 – 1, in 2004 – 1, in 2005 – 2). It was a great opportunity to observe various foraging bat species in their characteristic biotopes and to familiarize people with new chiropterological research methods (e.g. ultrasonic detectors).
- Chiropterological Seminars of Centre for Chiropterological Information PAS, Kraków. In the period covered by the Reported there were 20 Seminars organized.

10. Responsible bodies, in accordance with Article III.5 of the Agreement, nominated for the provision of advice on bat conservation and management.

Chiropterological Information Centre (unit of Institute of Animal Systematics and Evolution, Polish Academy of Sciences in Kraków, Poland).

11. Additional action undertaken to safeguard populations of bats

- In summer 2005 Polish Society of Wildlife Friends “pro Natura” in co-operation with business partner “Marmur” in Sławniowice made an artificial hibernaculum available to bats underneath the marble cutting factory. This site is in the centre of the planned reserve of the lesser horseshoe bat proposed by the Polish Society of Wildlife Friends “pro Natura” located in the southern part of Opole Voivodship. The site is on the Polish Natura 2000 Shadow List. In autumn 2005 the first two individuals of this threatened species have already been observed. Further work on adapting the underground shelters will be continued.
- University Chiropterological Activity Group of Polish Society of Nature Protection “Salamandra” from Gdańsk in co-operation with Agencja Mienia Wojskowego (Agency of Military Property) carried out a project to adapt a bunker located on the disused military area (unit) in Gdańsk-Sobieszewo as a winter roost for bats.
- University Chiropterological Activity Group of Polish Society of Nature Protection “Salamandra” from Gdańsk carried out a project to leave open entrances to the cracks in the walls of concrete block houses in Sopot-Brodwin. The project was financed and carried out together with the Teachers’ Cooperative Housing Association in Sopot.
- Wildlife Society “Bocian” together with Brodnickie Ecological Association cleared an old German bunker, removing rubbish and protecting its entrance in order to prevent entry by people.
- In 2005 began the supervision of renovating activities of two chapels in Łagiewnicki Forest in Łódź. Thanks to the co-operation of restoring orderer (The City of Łódź Office) and the renovator company, the work schedule and a list of wood-restoring products possible to use were established in order to minimize negative impact on bats breeding at that time in the buildings. Redecoration of chapels should be finished in 2006 (M. Stopczyński).
- In 2004 the redecoration of the church in Jeleniewo (where one of two and the biggest at the same time breeding colony of pond bat in Poland is situated; it is also one of sites proposed to Polish Natura2000 network) was suspended until the redecoration project would include the safety of roosting bats (T. Kokurewicz and Phil W. Richardson).
- In the years 2004-2005 University Chiropterological Activity Group of the Polish Society for Nature Protection “Salamandra” and Zielona Szkoła (“Green school”) in Schodnia installed bat boxes in forest of Wdzydzki Landscape Park (Forest Inspectorate Kościerzyna). Bat boxes were also installed in “Dolina Słupi” Landscape Park and in Kaszubski Landscape Park in cooperation with the aforementioned University Activity Group.
- In 2005, workers of “Dolina Słupi” Landscape Park in agreement with University Chiropterological Activity Group of the Polish Society for Nature Protection “Salamandra” accomplished the adaptation of a brick tunnel in forests near Modre Lake in order to make it available for hibernation. During renovation, two protective metal grids and walls made of cavity brick were installed.

12. Recent and ongoing programmes (including research and policy initiatives) relating to the conservation and management of bats.

12.1. Finished projects

- “Roost-site selection and roosting ecology of the noctule bat, *Nyctalus noctula*, in Żerkowsko-Czeszewski Landscape Park and Zielonka Forest Landscape Park” (Maciej Łochyński).
- “Ecology of *Pipistrellus nathusii* during seasonal migration on Mierzeja Wiślana” (Tomasz Jarzembowski, Gdańsk University).
- “Differences in bat activity near streams and rivers in various kinds of landscapes” (Leszek Koziróg, University of Warmia and Mazury, Olsztyn).
- “Re-naturalisation of Pond bat *Myotis dasycneme* habitats in Poland”. – (2004, Projekt PHARE nr PL0105.02, T. Kokurewicz, P. Richardson).
- “Temporal and spatial differentiation of bat winter clusters in Szachownica Cave” (Grzegorz Radzicki, Łódź University).
- “Factors influencing roost selection and occupation by bats in Białowieża Primeval Forest” (Mammal Research Institute PAS, Białowieża).
- “Bat community in relation to area of forest islands in an agricultural landscape” (Grzegorz Lesiński, Warsaw Agriculture University, Marek Kowalski, Błażej Wojtowicz, Judyta Gulatowska, Anna Lisowska, Wildlife Society “Stork”). A study was conducted in forest complexes of different size (between 0.3 and 18 km²) in an agricultural landscape of central Mazovia. The area of forest “island” significantly affected species richness and diversity, mean relative density and number of species per one study location. The characteristics of a bat community, mentioned above, decreased in value rapidly in forests smaller than 1 km².
- “Influence of atmospheric conditions on the activity of bats over “covered” and “uncovered” water courses” (supported by a KBN grant, finished on 31.12.2003, University of Warmia and Mazury, Department of Applied Ecology, Olsztyn). The aim of the study was to determine the influence of illumination, wind, humidity and air temperature on bat activity over rivers in two types of foraging areas, where the vegetation – tree crowns (1) form a dense roof (“covered”), (2) do not form a dense roof (“uncovered”). There was also a food availability study. Dominant species in the community were: *Myotis daubentonii*, *Pipistrellus nathusii*, *Pipistrellus pipistrellus*, *Pipistrellus pygmaeus*.
- Project on the bat fauna of the Landscape Park “Cistercian Landscape Compositions of Rudy Wielkie” (finished in 2003, Association for Nature WOLF). They discovered 14 species of bats: *Myotis myotis*, *M. nattereri*, *M. mystacinus*, *M. brandtii*, *M. daubentonii*, *Eptesicus serotinus*, *Pipistrellus pipistrellus*, *P. nathusii*, *P. pygmaeus*, *Nyctalus noctula*, *N. leisleri*, *Plecotus auritus*, *P. austriacus* and *Barbastella barbastellus*. The richest bat fauna was recorded in the nature reserve “Łęczczok”, proposed nature reserve “Głębokie Doły” and forest “Obora” near Racibórz (Mysłajek et al. 2002, 2004, 2005). During the study the first record of the *Spinturnix helvetiae* – the ecto-parasite of the *Nyctalus leisleri* – was made in Poland (Ferenc & Mysłajek 2003).
- Inventory of bats in Sławniwice area (2004, Przedgórze Paczkowskie)
- Inventory of bats in Wałbrzyskie Mts. And Sowie Mts. (2005, Dolnośląskie Voivodship)
- “The importance of a man-made underground shelter for bats, particularly barbastelle out of hibernation season” (2003, Iwona Dudek, Wrocław University)

- “The importance of underground shelters for barbastelle out of hibernation season. (2003-2005, Iwona Dudek, Wrocław University).

12.2. Ongoing projects

- “Community structure and dynamics of activity of bats in forest-agricultural landscape of Northern Poland”. (M. Ciechanowski, Department of Ecology and Zoology of Vertebrates, University of Gdańsk). Grant KBN 3 PO4F 065 24.
- “Analysis of pollution of anthropogenic origin in the greater mouse-eared bat *Myotis myotis* (Borkhausen, 1797) in West Poland” (Katarzyna Kozakiewicz, Chiropterological Information Centre PAS, Poland).
- “Spatial differentiation of trophic niche of Daubenton’s bat in relation to sex and age of animals during the fall” (Dariusz Łupicki, Agricultural University of Wrocław, Department of Zoology and Ecology).
- “Influence of some climate factors on the competition and structure of bat groups in caves of SE Poland” (Jakub Nowak, Agricultural University, Kraków).
- “Winter feeding of Daubenton’s bats (*Myotis daubentonii*), greater mouse-eared bat (*Myotis myotis*) and barbastelles (*Barbastella barbastellus*) in the Międzyrzecz Fortified Front (West Poland)” (Piotr Schick, University of Wrocław, Institute of Zoology).
- “Adaptive strategies in heterothermic bats, using the greater mouse-eared bat *Myotis myotis* (Borkhausen, 1797) and Daubenton’s bats *Myotis daubentonii* (Kuhl 1817) as examples” (Michał Wojciechowski, Nicolaus Copernicus University in Toruń).
- “Mating behaviour of the brown long-eared bat (*Plecotus auritus*)” (Joanna Furmankiewicz, Wrocław University, Institute of Zoology).
- “Microclimatic factors influencing hibernating location selections by *Plecotus auritus* and *Myotis myotis*. An example: Old mine in Tarnowskie Góry, Silesia, Poland” (Grzegorz Kłys).
- “Distribution of bats in the Nysa Forts during a year in relation to microclimatic condition”. The aim of the study is to determine factors influencing the distribution of the barbastelles in underground corridors and which parts are most important for bats.
- “Dynamic of changes in numbers of bats and climate conditions in winter bats’ hibernacula.” (Institute of Systematic and Animal Evolution).
- “Monitoring of numbers of hibernating bats in Poland” (many Polish scientific centres, NGOs and numerous amateurs). The aim is to determine population trends of Polish bats and threats in hibernation roosts. These are several independent projects.
- “Population biology and genetic structure of swarming brown long-eared bats *Plecotus auritus*.” (Joanna Furmankiewicz, Wrocław and Leeds University, Marie Curie Fellowship – the Vth Frame Program EU). The importance of swarming sites for bats coming from different colonies will be determined. This behaviour makes possible exchange of genes between populations and to maintain high genetic diversity of breeding colonies.
- “Bat occurrence in small cellars in Opawskie Mts Landscape Park” (University of Opole). The study is conducted in 7 villages. People are interviewed about bats and informed about the role of these animals in ecosystems and their protection.
- “Biology and ecology of bats in the period of inhabitation of artificial roosts in forests of the Milicz Basin” (Grzegorz Wojtaszyn, Faculty of Biology, A. Mickiewicz University in Poznań) Ph.D. dissertation.

- “The importance for bats, particularly barbastelle, of man-made underground shelters, out of hibernation season” (Iwona Dudek, University of Wrocław).
- “Spatial organization and activity dynamics of bat assemblages in a forest-agriculture landscape” (Mateusz Ciechanowski, Department of Ecology and Zoology of Vertebrates, University of Gdańsk). Grant KBN 3 PO4F 065 24 – finished in June 2005.
- “The influence of foraging and “building” activity of beaver *Castor fiber* on the spatial distribution of bats Chiroptera in small river valleys” (Chair of Ecology and Zoology of Vertebrates, University of Gdańsk). Grant BW/1440-5-0230-5.
- “The sensory ecology of roost selection in bats” (I. Ruczyński, E. Kalko, B. Siemers).
- “The influence of highways on mortality of bat populations in Poland” – continued from 1994 (Grzegorz Lesiński, Warsaw Agriculture University).
- Analysis of vocal repertoire of *Nyctalus noctula* (Radosław G. Urban, Institute of Zoology, Wrocław University)
- Roost and breed-site selection of *Nyctalus noctula* in Wrocław parks. Karolina Działocha, Institute of Zoology, Wrocław University).
- Seasonal changes in noctule activity in foraging areas in Wrocław. (Diana Mańkowska, Institute of Zoology, Wrocław University).
- Species composition and habitat preferences of bats in the Żywiecka basin. (Association for Nature WOLF). They discovered 11 species of bats: *Rhinolophus hipposideros*, *M. nattereri*, *M. mystacinus*, *M. brandtii*, *M. daubentonii*, *Vespertilio murinus*, *Eptesicus nilssonii*, *Nyctalus noctula*, *N. leisleri*, *Plecotus auritus* and *P. austriacus* and described dynamics of number of the *Rh. hipposideros* summer colony in the church in Radziechowy – proposed Natura 2000 site (Mysłajek 2001, Mysłajek et al. 2004). They also searched for the factors affecting bat activity over streams with different plant cover (Kurek 2004, 2006).
- Bat fauna and activity of bats during swarming in the Western Beskidy Mts. (Landscape Park of the Silesian Beskid Mts. and Żywiecki Landscape Park). (Association for Nature WOLF). They discovered 14 species of bats: *Rhinolophus hipposideros*, *M. myotis*, *M. bechsteinii*, *M. nattereri*, *M. mystacinus*, *M. brandtii*, *M. daubentonii*, *Vespertilio murinus*, *Eptesicus nilssonii*, *E. serotinus*, *Nyctalus noctula*, *N. leisleri*, *Plecotus auritus* and *P. austriacus* (Mysłajek 2003, Mysłajek et al., unpublished). During study AfN WOLF identified important swarming sites and hibernacula, including one of the biggest hibernacula of *Rh. hipposideros* – Miecharska cave (56 indiv.).
- Bat fauna inventory of Ciężkowicko-Rożnowski Park (2005-2006, Małopolskie Voivodeship).
- Visual marking of hibernating *M. mystacinus* and *M. brandtii* (Joanna Furmankiewicz, Institute of Zoology, Wrocław University).
- Strategies in echolocation of males and females of *V. murinus* (Marek Wójcik, Mammal Research Institute PAS, Białowieża).
- Biogeography and Ecology of bats in Karpaty Mts. and uplands of the southern Poland. (Centre for Chiropterological Information, Institute of Systematics and Evolution of Animals, PAS Kraków).
- Taxonomy and evolution of bats from the Neogen and Quaternary Period In Karpaty Mts. and uplands of the southern Poland.

In 2003-2005, the Ministry of Environment granted 22 permissions for bat capturing and 11 for bat ringing.

12.3 Summary of bat research conducted within the Chiropterological Licenses System (see also chapter 15) for 2003-2005.

I. INVENTORIES

Licensed chiropterologists with the “catcher” degree controlled in the successive years

year	2003	2004	2005
permanent winter shelters:	1200	916	895
permanent summer shelters:	672	372	175
temporary or accidental shelters:	283	273	350
bat or bird boxes and tree hollows (ca):	1894	2705	3361
other:	0	14	11
total number of controlled shelters	4049	4280	4792

Except from *N. lasiopterus* and *P. kuhlii*, all species observed in Poland were reported during these inventories.

II. CAPTURING BATS

Licensed chiropterologists with the “catcher” degree controlled in successive years

Year	Number of night surveys	Number of captured individuals	Number of captured species
2003	450	6385	20*
2004	236	2009	19
2005	160	2021	19

* *Vespertilio murinus* was caught only in the year 2003, but its occurrence is regularly noticed in Poland – e.g. during the autumn migration it is often found in flats.

III. BAT RINGING

In 2003 there were no bat ringing surveys within the Polish chiropterological licenses system.

In 2004 two licensed chiropterologists with “bat ringer” degree, ringed 427 bat individuals from 9 species: *Barbastella barbastellus*, *Eptesicus serotinus*, *Myotis daubentonii*, *Myotis myotis*, *Myotis nattereri*, *Nyctalus noctula*, *Plecotus auritus*, *Plecotus austriacus*, *Pipistrellus nathusii*.

In 2005 one licensed chiropterologist with “bat ringer” degree, ringed 397 bat individuals from 10 species: *Barbastella barbastellus*, *Eptesicus serotinus*, *Myotis daubentonii*, *Myotis myotis*, *Myotis nattereri*, *Nyctalus noctula*, *Plecotus auritus*, *Pipistrellus pigmaeus*, *Pipistrellus nathusii*, *Myotis brandtii*.

12.4. Selected MSc projects finished [in Polish]:

Białas A. 2005. Spatial and time variability in activity of bats of the genus *Myotis* and *Nyctalus* (Chiroptera: Vespertilionidae) in selected habitats of the Reda Valley (Kaszubskie Seaside). MSc thesis (Chair of Ecology and Zoology of Vertebrates, University of Gdańsk).

Chilińska A. 2005. Knowledge about bats in selected social groups of people and problems of protection of this group of animals. MSc thesis (Warsaw Agricultural University).

- Dudarz J. G. 2005. Number and arrangement of bats in Międzyrzecki Rejon Umocniony area in 2005. (Agricultural University, Wrocław)
- Duma K. 2004. Selected aspects of ecology of brown long-eared bat *Plecotus auritus* (Linnaeus, 1758) in Lower Silesia. MSc thesis (Agricultural University, Wrocław).
- Dunajski R. 2005. Spatial and time variability in activity of bats of the genus *Pipistrellus* (Chiroptera: Vespertilionidae) in selected habitats of the Reda Valley (Kaszubskie Seaside). MSc thesis (Chair of Ecology and Zoology of Vertebrates, University of Gdańsk).
- Gas A., 2003 Dynamics of *Myotis myotis* breeding colony in Studnisko Cave (Częstochowska Upland); cave conditions influence on pace and condition of juvenile bats. Centre for Chiropterological Information, Institute of Systematics and Evolution of Animals, PAS Kraków
- Gulatowska J. 2005. Seasonal changes in bat occurrence in the Janówek fort – implication for conservation. MSc thesis (Warsaw Agricultural University).
- Janocha M. 2005. Changes in numbers of bats (Chiroptera) in the inner gallery of the Prusy Fort (The Nysa Forts) in relation to microclimate. MSc thesis (Chair of Biosystematics, Opole University).
- Korzeniowska K. 2005. Winter roosts of bats (Chiroptera) in the Góry Opawskie Landscape Park: species composition, numbers and shelter preference. MSc thesis (Chair of Biosystematics, Opole University).
- Mazurska K. 2003. Characteristics of synanthropic bat fauna on clearings of the Białowieża Primeval Forest. MSc thesis (Warsaw Agricultural University).
- Mielcarek K. 2004. Selected aspects of ecology of grey long-eared bat *Plecotus austriacus* (Fischer, 1829) in the Śląska Lowland. MSc thesis (Agricultural University, Wrocław).
- Mysłajek R. W. 2003. Selected ecological and biometrical parameters of the population of *Myotis daubentonii* in the “Łęczszak” nature reserve near Racibórz. MSc thesis (Dept. of Forest Zoology and Hunting, Faculty of Forest, Agricultural University, Kraków).
- Pereswiet-Soltan, A. 2005. Zopogeografia Attuale e Fossile della Chiropterofauna della Regione Palearctica.
- Popczyk B. 2005. Spatial location and habitat preferences of bats in Warsaw. MSc thesis (Chair of Genetics and General Rearing of Animals, Warsaw Agricultural University).
- Skrzyniarz P. 2004. Fort IV in Toruń as a hibernation place of bats in years 2002-2004. MSc thesis (Nicolaus Copernicus University. Institute of Ecology and Environment Protection).
- Stec I. 2004. The wintering bats on the Teutonic Castle in Malbork in 2001/2002-2003/2004 seasons. MSc thesis (Nicolaus Copernicus University. Institute of Ecology and Environment Protection).
- Świątkowska A. 2003. Dynamics and biometrics of the bat population inhabiting artificial roosts in Iława Lakeland Landscape Park. MSc thesis (Dept. of Applied Ecology, University of Warmia and Mazury).
- Szubert A. 2005. Parasite – host interactions in ectoparasitic mites *Spinturnicidae* (Acari: Gamasida) and bats (Chiroptera: Vespertilionidae). MSc thesis (Institute of Animal Morphology, Adam Mickiewicz University, Poznań).
- Urban R. 2004. Spatial structure and dynamic of evening departure of the population of a noctule *Nyctalus noctula* (Vespertilionidae, Chiroptera) in the Szczytnicki Park in Wrocław. MSc thesis (University of Wrocław).

Zajac T. 2004. Species composition and changes in activity of bats (Chiroptera) in selected habitat types of Reda Valley near Wejherowo. MSc thesis (University of Gdańsk, Gdańsk).

Ziemińska J. 2004. Changes in numbers and bat activity over some water reservoirs and rivers in the Middle Odra Valley. MSc thesis (University of Wrocław).

12.5. Selected licentiate projects finished [in Polish]:

Kurek K. 2004. Species composition and bat activity over different water bodies in the Żywiec Basin. Licentiate project (University of Warsaw).

12.6. PhD project finished [in Polish]:

Ciechanowski M. 2005. Spatial organization and activity dynamics of bat (Chiroptera) assemblages in a forest-agriculture landscape of northern Poland. PhD thesis (Chair of Ecology and Zoology of Vertebrates, University of Gdańsk).

Furmankiewicz J. 2004. Mating behaviour of long-eared bat *Plecotus auritus* (Linnaeus, 1758). PhD thesis (University of Wrocław).

Kłys G., 2003. Microclimatic deciding factors on hibernation-sites selection strategies of *Plecotus auritus* and *Myotis myotis* in Tarnogórskie Undergrounds. PhD Thesis; Institute of Systematics and Evolution of Animals PAS. Kraków.

Łupicki D., 2003. Division of nutritional niche depending on sex and age of *Myotis daubentonii* during autumnal season. PhD Thesis – Department of Zootechnics, University of Agriculture, Wrocław.

Nowak J., 2005 Characteristics of winter bat groups in caves in the south-eastern Poland. University of Agriculture, Kraków.

Ruczyński I. 2003. Factors determining roost site selection and use by bats in the Białowieża Primeval Forest. PhD thesis (Mammal Research Institute PAS, Białowieża).

13. Consideration being given to the potential effects of pesticides on bats or their food sources and efforts to replace timber treatment chemicals which are highly toxic to bats.

No special measures were taken in the period covered by this Report.

D. Functioning of the Agreement

14. Cooperation with other Range States.

- “ABC” Project – Atlas of Carpathian Mountains Bats. International project led by Chiropterological Information Centre in Kraków. The participants are from: Czech Republic, Hungary, Romania, Serbia, Montenegro, Slovakia, Ukraine and Poland. During the period covered by this Report, two international symposia concerning Carpathian bats were organized in Kraków.
- Project concerning bat migrations to “Nietoperek” reserve conducted in cooperation with chiropterologists from Germany. Polish coordinator: Dr Tomasz Kokurewicz (Department of Zoology and Ecology, Agricultural University in Wrocław).
- In August 2004 the 13th International Bat Research Conference was arranged in Mikołajki. The Conference was organized by the Museum and Institute of Zoology PAS with participation of the Polish Society for Nature Protection “Salamandra”

- Bat winter census in the “Nietoperek” and “Nietoperek II” Bat Reserves. In the census in 2005 co-ordinated by Tomasz Kokurewicz (Department of Zoology and Ecology, Agricultural University in Wrocław) together with specialists from different regions of Poland, chiropterologists from Germany, the Czech Republic and the Netherlands took part.
- Monitoring of bat population sizes and long term population trends in regions of Sudety Mts situated close to the border. This Czech-Polish project is carried out by Wrocław Chiropterological Group, Czech Speleological Society – section “Barbastellus” and ČESON (Czech Bat Conservation Trust) – section from Liberec. Polish coordinators are: Dr Tomasz Kokurewicz (Department of Zoology and Ecology, Agricultural University in Wrocław) and Dr Joanna Furmankiewicz (Department of Zoology, Wrocław University).
- Wrocław Chiropterological Group helped ČESON (Czech Bat Conservation Trust) to organise its Annual Meeting in Wojcieszów (Sudety) on September 16–18th 2005, which was connected with field workshops (ultrasound detection and netting).
- Project called “Biology and ecology of bats in the period of inhabitation of artificial roosts in forests of the Milicz Basin” is conducted in co-operation with Fledermausmarkierungszentrale Dresden – Sächsisches Landesamt für Umwelt und Geologie. Co-operation concerns bat ringing.
- The Polish Society of Wildlife Friends “pro Natura” together with the Society “Pogranicze” organised a workshop for German and Polish young people and several meetings for teachers and local authorities from Poland and Germany, concerning bats and their protection in June 2005.

15. Measures taken to implement Resolutions adopted by Meetings of Parties.

Resolutions 2.8 and 3.8

Accomplished activities with reference to these resolutions are described in chapters 6 and 7.

Resolution 4.4

Activities made in order to identify types of forestry and land management as causing problems for bats in forests.

- No activities were taken.

Accomplished activities to take bats into account when improving the sustainability of forestry practices.

- 6 NGOs provided an opinion on Principles of Forestry Culture for the State Forests taking bats protection into account (2003, R. Mysłajek).

The use of incentive schemes to provide resources for bat conservation measures in forests.

- No activities were taken

Activities taken to identify, manage and enhance key elements and key areas for bats in forests

- No activities were taken

Resolution 4.6 - Guidelines for the issue of permits for the capture and study of capture wild bats.

The Polish Agreement for Bat Protection (PON) - union of 8 NGOs and institutions dealing with bat protection, established system of bat research certificates. The different range of licenses (“inwentaryzator” – inventory maker, “odławiacz” – catcher, “obrączkarz” – ringer and “instruktor” – instructor) are granted by special qualified committee, in which 12 members are included. The

term of office of the committee lasts two years. The work of the committee is led by the Chairman. Secretariat of the Committee is supported by the Polish Society for Nature Protection “Salamandra” office. 3.7).

The committee verifies candidates’ experience and knowledge in theoretical and field tests. Licenses are not officially recognized. To conduct any research on bats, an official permission signed by Ministry of Environment is required.

Resolution 3.7

Poland has still not ratified amendments to the Agreement.

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Appendix I to Report

SELECTED POLISH PUBLICATIONS ON BATS (printed in 2003–2005)

Niepublikowane raporty i opracowania

- Jędrzejewski W., Nowak S., Stachura K., Skierczyński M., Mysłajek R. W., Niedziałkowski K., Jędrzejewska B., Wójcik J. M., Zalewska H., Pilot M. 2005. Project of the ecological corridors linking Natura 2000 sites in Poland. Unpublished report. Mammal Research Institute Polish Academy of Science, Białowieża, 78 pp. [in Polish].
- Kokurewicz T. 2003. Review of the proposed Natura 2000 network in Poland - the part concerning bats. opinion prepared for Department of Nature Conservation - Ministry of the Environment.
- Kokurewicz T. Problem Ecophysiology of former petrol factory area in Police (Natura 2000 site).

Popular and educational publications (in Polish)

- Baumann A. 2003. XVII Polish Bat Research Conference. *Kraska* 10 (2/2003): 64-65.
- Ciechanowski M. 2003. More protected areas in the pomorskie voivodship. *Magazyn Przyrodniczy "Salamandra"* 1/2003: 66.
- Ciechanowski M. 2004. City forest – ecological area "Wąwozy Grodowe" in Sopot. *Magazyn Przyrodniczy "Salamandra"*. 1/2004: 56-58.
- Ciechanowski M. 2005. Block of flats, foamed polystyrene, ...bats. *Magazyn Przyrodniczy "Salamandra"* 20: 58–59.
- Ciechanowski M., Przesmycka A. 2004. Paper is not the only thing, i.e. what's new in ecological utilities of Trójmiasto? *Magazyn Przyrodniczy "Salamandra"*. 2/2004: 57-60.
- Gulatowska J. 2003. Summer was a half a year ago... *Kraska* 10 (2/2003): 67-69.
- Gulatowska J. 2003. We look for bats in Białowieża. *Kraska* 10 (2/2003): 65-67.
- Jaros R. 2004. Bats' removal. *Magazyn Przyrodniczy "Salamandra"*. 1/2004: 47-48.
- Jaros R. 2004. Bat festival in Berlin. *Magazyn Przyrodniczy "Salamandra"*. 2/2004: 44.
- Jaros R., Ciechanowski M. 2003. Bat winter. *Magazyn Przyrodniczy "Salamandra"*. 1/2003: 58-59.
- Kepel A. 2003. A bat in the evening. *Magazyn Przyrodniczy "Salamandra"*. 1/2003: 41.
- Kepel A. 2004. World meeting of bat workers. *Magazyn Przyrodniczy "Salamandra"*. 2/2004: 45.
- Kepel A. 2005. How to protect "flying mice". *Magazyn Przyrodniczy "Salamandra"* 20: 43-44.
- Kepel A. 2005. Record scores of hanging sleepyheads. *Magazyn Przyrodniczy "Salamandra"* 20: 41-42.
- Kokurewicz, T. (2004): Nietoperze – skrzydlate myszy. *Biuletyn Polskiego Stowarzyszenia Pracowników Dezynfekcji, Dezynsekcji i Deratyzacji*, 4(39): 25–31.
- Kowalski M. 2003. Winter bat countings 2002/2003 are summarized! *Kraska* 9 (1/2003): 26-28.
- Kowalski M., Rzepała M. 2003. Fauna. In: Natural resources of the Mazovia and its anthropogenic transformations. A. Rychling (ed.). Wyższa Szkoła Humanistyczna im. A. Gieysztor, Pułtusk: 197-210.
- Koziróg L. 2003. Bats of the the Lanscape Hława Lake District Park. Zarząd Parków Krajobrazowych w Jerzwałdzie, Jerzwałd.
- Lesiński G. 2003. Day flights of bats. *Kraska* 11: 59-60.
- Lesiński G. 2003. Bats on forest "islands" – chiropterological research in the vicinity of Naruszewo. *Kraska* 11: 57-59.
- Lesiński G. 2003. Owls – researches. *Kraska* 10: 30-32.
- Lisowska A. 2003. Bat delivery in a bat hospital. *Kraska* 9 (1/2003): 31-32.
- Mysłajek R. W. 2003. Bat research in the Beskidy Mts. *Wilcza Sieć* 3-4/2003: 18.
- Mysłajek R. W. 2003. *Myotis* and *Eptesicus* bats. *Echa Leśne* 6: 36-38.
- Mysłajek R. W. 2003. Chiropterological camp in Rudy. *Wilcza Sieć* 3-4/2003: 18-19.
- Mysłajek R. W. 2003. Seminar on Carpathian bats. *Wilcza Sieć* 3-4/2003: 20.
- Mysłajek R. W. 2003. XVII Bat Research Conference. *Wilcza Sieć* 3-4/2003: 20.
- Mysłajek R. W. 2004. Project of bat research and protection. *Wilcza Sieć* 1: 23-27.
- Mysłajek R. W., Henel K., Nowak S. 2005. Bats in the Łęczok reserve. *Przyroda Górnego Śląska* 39: 12.

- Nitkiewicz T. 2003. Bats in aschool. *Kraska* 10 (2/2003): 69-70.
- Olszewski A. 2003. Common pipistrelle –a new bat species in the Kampinos Forest. *Kraska* 9 (1/2003): 30-31.
- Olszewski A. 2003. Results of winter bat countings in the western part of KPN in 2002/2003. *Kraska* 9 (1/2003): 28-30.
- Ruczyński I. 2004. Bats in trees. [In: *Essays on Mammals of Białowieża Forest*. B. Jedrzejewska, J. M. Wojcik (eds)]. Mammal Research Institute, Polish Academy of Science, Białowieża: 121-128.
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Appendix II to the Report

THE MOST IMPORTANT HIBERNACULA OF BATS IN POLAND (100 ind. and more)

	Hibernaculum	Voivodship	Number of bats	Date	Source of data*
1.	Nietoperek	Lubuskie	>32200	2005	T. Kokurewicz et al., unpubl. data
2.	Grudziądz, Citadel	Kujawsko-pomorskie	2435	2003	Kasprzyk et al. 2003
3.	Tunel in Krzystkowice	Lubuskie	1885	2005	G. Wojtaszyn, T. Rutkowski, W. Stephan, D. Wiewióra, R. Jaros, unpubl. data
4.	Szachownica Cave	Śląskie	1860	2004	M. Ignaczak, G. Lesiński, unpubl. data
5.	Police	Zachodniopomorskie	>1400	2005	Drabińska et al., unpubl. data
6.	Poznań, Fort I	Wielkopolskie	1051	2001	M. Jurczyszyn, unpubl. data
7.	Strzaliny, Wisielcza Góra Fortress	Zachodniopomorskie	991	2005	R. Bernard, J. Samoląg, R. Jaros, unpubl. data
8.	Bochotnica, mine I	Lubelskie	599	2002	Piskorski, Urban 2001
9.	Zbójecka Cave	Małopolskie	502	1997	J. Nowak, K. Piksa, unpubl. data
10.	Piła, brewery cellar	Wielkopolskie	482	2005	G. Wojtaszyn, T. Rutkowski, W. Stephan, A. Stanilewicz, unpubl. data
11.	Mamerki, bunker 10 + 11	Warmińsko-mazurskie	465	1997	Fuszara et al. 2002
12.	Piping in Koszalin (4 marca street)	Zachodniopomorskie	441	2005	G. Wojtaszyn, T. Rutkowski, W. Stephan, D. Wewióra
13.	Strubiny, Fort I	Mazowieckie	389	1998	Fuszara, Fuszara 2002a
14.	Warszawa, tunel at Fosa str.	Mazowieckie	382	2003	B. Wojtowicz, B. Popczyk, A. Lisowska, unpubl. data
15.	Tarnowskie Góry, mine	Śląskie	374	2000	Kłys 1994
16.	Studnisko Cave	Śląskie	351	1992	Wołoszyn 1992
17.	Osowiec, Central Fortress	Podlaskie	344	1993	Lesiński 1994
18.	Kostrzyn Fortress, Bastion Król	Lubuskie	340	2001	K. Laskowska, R. Jaros, R. Dzieciołowski, unpubl. data
19.	Gdańsk, Wisłoujście Fortress	Pomorskie	313	2005	M. Ciechanowski et al., unpubl. data
20.	Czarna Cave	Małopolskie	265	1997	Piksa, Nowak 2000

21.	Pod Sokolą Górą Cave	Śląskie	265	1994	Labocha, Postawa 1994
22.	Cieszków	Dolnośląskie	263	1997	A. Jarno, unpubl. data
23.	Świecie nad Wisłą, castle cellars	Kujawsko-pomorskie	263	1992	Gólski 1992
24.	Anusin, bunker 14	Podlaskie	256	2004	A. Lisowska, B. Wojtowicz, unpubl. data
25.	Niedźwiedzia Cave	Dolnośląskie	251	2002	Furmankiewicz, Furmankiewicz 2002
26.	Sławniowice, mine	Dolnośląskie	250	2004	PTPP "pro Natura", unpubl. data
27.	Konewka B	Łódzkie	248	1994	Fuszara, Fuszara 2002b
28.	Stolec, mine	Dolnośląskie	242	1999	PTPP "pro Natura", unpubl. data
29.	Dębina, fort	Mazowieckie	241	2003	M. Fuszara, M. Adamiak, unpubl. data
30.	Koronowo, cellar	Kujawsko-pomorskie	234	1996	Kasprzyk et al. 2002
31.	Malbork, castle	Pomorskie	224	2003	I. Stec K. Kasprzyk, unpubl. data
32.	Chelosiowa Jama/Jaworznicka Cave	Świętokrzyskie	224	1995	J. Gubała, M. Gwardjan, A. Kasza, unpubl. data
33.	Poznań, Fort II	Wielkopolskie	211	1997	R. Dzieciołowski, unpubl. data
34.	Giżycko, Boyen Fortress	Warmińsko-mazurskie	209	2003	M. Fuszara, M. Adamiak, M. Górny, unpubl. data
35.	Nysa Fortress	Opolskie	208	2002/2003	G. Hebda, A. Nowak, unpubl. data
36.	Toruń, Fort XV	Kujawsko-pomorskie	205	1997	Kasprzyk et al. 2002
37.	Szczelina Wojcieszowska Cave	Dolnośląskie	194	2001	Kliś et al. 2001
38.	W Łomie Baumana mine	Dolnośląskie	184	2004	
39.	Tapadła	Dolnośląskie	181	2003	PTPP "pro Natura", unpubl. data
40.	Gierłoż, cellar 13	Warmińsko-mazurskie	180	2003	M. Fuszara, M. Adamiak, M. Górny, unpubl. data
41.	Poznań, Citadel	Wielkopolskie	176	2004	G. Gołębiak, unpubl. data
42.	Kostrzyn Fortress, Bastion Filip	Lubuskie	175	2001	K. Laskowska, R. Jaros, R. Dzieciołowski, unpubl. data
43.	Poznań, Fort VIa	Wielkopolskie	170	2002	W. Grzywiński, unpubl. data
44.	Poznań, Fort III	Wielkopolskie	164	1996	A. Gawlak, unpubl. data
45.	Poznań, Fort IV	Wielkopolskie	164	2005	A. Szubert, unpubl. data
46.	Siedliska, Fort I San Soglio	Podkarpackie	160	1994	Godawa 1994
47.	Drozdowo, old brewery cellars	Podlaskie	157	1992	M. Kowalski, unpubl. data
48.	Włodarz, mine	Dolnośląskie	154	2004	Gottfried et al. 2003
49.	Stadium in Kołobrzeg	Zachodniopomorskie	154	2001	G. Wojtaszyn, T. Rutkowski, W. Stephan, D. Wewióra
50.	Goławice, Fort I	Mazowieckie	151	2000	E. Fuszara, M. Fuszara, M. Kowalski, G. Lesiński, unpubl. data
51.	Konewka A	Łódzkie	147	1997	Fuszara, Fuszara 2002b
52.	Wiercica Cave	Małopolskie	142	1991	Wołoszyn 1991, Postawa et al. 1994

53.	Młoty, mine	Dolnośląskie	141	2002	PTPP "pro Natura", unpubl. data
54.	Szczecin, Światowida bunker		132	2001	Dzięgielewska et al. 2001
55.	Podlesie, mine	Dolnośląskie	132	2001	Gottfried et al. 2003
56.	Diabla Dziura Cave	Małopolskie	127	2000	Mleczek 2002
57.	Miedzianka, mine	Świętokrzyskie	127	2000	M. Gwardjan, A. Kasza, E. Jachimkowska, unpubl. data
58.	Lubiąż, cloister cellar	Dolnośląskie	124	1998	PTPP "pro Natura", unpubl. data
59.	Poznań, Fort VIIa	Wielkopolskie	123	1999	R. Dzięciołowski, unpubl. data
60.	Poznań, sewers	Wielkopolskie	123	2004	Grzywiński, Kmiecik 2003
61.	Szczecin-Zdroje, Na Cmentarzu bunker	Zachodniopomorskie	121	1997	Dzięgielewska 2002
62.	Sokolec, mine	Dolnośląskie	118	2000	Gottfried et al. 2003
63.	Psia Cave	Małopolskie	115	1997	Piksa, Nowak 2000
64.	Toruń, Fort V	Kujawsko-pomorskie	114	1999	Kasprzyk et al. 2002
65.	Janówek, Fort III	Mazowieckie	114	2004	J. Gulatowska, M. Kowalski, unpubl. data
66.	Błogosławie, fort	Mazowieckie	114	1994	Fuszara, Fuszara 2002a
67.	Koralowa Cave	Śląskie	110	1996	Postawa, Zygmunt 2000
68.	Szczecin Goclaw - air-raid shelter I	Zachodniopomorskie	107	2002	
69.	Gierłoż, cellar 11	Warmińsko-mazurskie	104	1996	Fuszara et al. 2002
70.	Bunker PzW 741	Lubuskie	102	2003	
71.	Wojcieszów Dolny, mine	Dolnośląskie	101	2002	PTPP "pro Natura", unpubl. data
72.	Złoty Jar, mine	Dolnośląskie	101	2002	PTPP "pro Natura", unpubl. data
73.	Brewery in Gorzów	Lubuskie	101	2005	G. Wojtaszyn, T. Rutkowski, W. Stephan, D. Wewióra
74.	Zimna Cave	Małopolskie	100	1999	Piksa, Nowak 2000

* List of publications used as sources of data is given in the Report 2003–2004.