

## Agreement on the conservation of bats in Europe National implementation report from Sweden 2006

### A. General information

Name of Party: Sverige (Sweden).

Date of Report: 29 November 2006.

Period covered: 2004-2006.

Competent Authority: Swedish Environmental Protection Agency, S-106 48 Stockholm.

Appointed Member of the Advisory Committee: Ms Marie Nedinge.

Membership of other committees/working groups: Bat Conservation and Forestry.

Writer of this report: I. Ahlén with assistance from M. Nedinge and J. de Jong.

### B. Status of bats in Sweden

#### 1. Summary Details of Resident Species

*Myotis bechsteinii*. A rare species in Sweden, never found outside Skåne. For many years only found hibernating in small numbers in some old mines and caves in northeast. A nursery roost in a house was reported in the 1960's. Hunting bats regularly observed in an area in the 1980's. Since then there are no summer observations and for many years no search efforts in the field. In the winter 2004/2005 5 bats were found hibernating in an old limestone mine and in 2005/2006 6 bats were found in two mines in the same area. A new search to locate summer populations in suitable habitats in Skåne and Blekinge have been initiated but there are still no results.

*Myotis brandtii*. A common species in forest areas from southern Sweden to middle Norrland. Not found on the island Öland but common on Gotland. Is difficult to separate from *Myotis mystacinus* with detector, so increased use of nets is now a part of the survey methods. All available information indicate stable populations and it is widespread in most areas within its range.

*Myotis dasycneme*. A rare species in Sweden but regularly observed in some areas in south and east Sweden. A nursery roost with up to 60 adults lived in an area in Skåne during the years 1986 – 1989. In Uppland the pond bat has been observed at many sites, including hibernating in two places. Regular observations are also made on Gotland and Öland. During the last few years there are new observations in Småland (mainly in coastal areas), Blekinge and in Kalmarsund (the strait between Småland and Öland) the species is regularly found hunting insects near offshore wind turbines. Special efforts are needed to confirm breeding populations.

*Myotis daubentonii*. One of the most common species in southern Sweden with a distribution up to middle Norrland. New observations more to the north has moved the known northern boundary to Ångermanland. The species is most often observed at lakes and rivers but is also living in forest areas several kilometres from open water. It is believed to have increased during the last 25 years and has probably also expanded into new habitats.

*Myotis mystacinus*. Was earlier considered as one of the common species in Sweden up to southern Norrland. Data from surveys and from research projects indicate a serious decline. The population decline in Uppland during 20 years was assessed to about 40%. Surveys on Gotland and in Skåne confirm the decline, while surveys in Småland and southern Östergötland show that it is not uncommon there. The causes for a decline are unclear but studied in a research project.

*Myotis myotis*. A hibernating bat of this species was found in an old iron mine in Skåne (Fyledalen) on 2 February 1985. There have not been investigations enough to determine the status. Bats that might belong to this species have recently been observed and recorded in Skåne.

*Myotis nattereri*. A relatively rare species with patchy distribution in southern Sweden, including Öland and Gotland, up to the river Dalälven. A nursery colony was recently found at 63° 24' N, north of Örnsköldsvik, in Ångermanland, which is the northernmost occurrence in the world. This indicates that the species can have a population along the coastland of Norrland. Many sites where this species were found 20 years ago are now empty. On the other hand, many new sites with the species have been found, especially in the highlands of Småland, but also on Gotland.

***Pipistrellus nathusii***. A rare species that has increased and probably expanded geographically during the last two decades, with populations established in Skåne, Blekinge, Småland, Öland, Gotland, Södermanland, Uppland, Dalsland and probably Västmanland. Nursery colonies are now found north of 60° N which is probably the northernmost occurrence in the world. It is also recently found in Gästrikland and southernmost Hälsingland. On Gotland, which has been surveyed four times since 1980, it has increased from a few individuals to being found on 39 sites in 2005, spread all over the island. The species is quite numerous as migrant on Gotland, Öland, Blekinge and Skåne. A number of points where they leave the coasts and cross the sea on the autumn migration have been located. It has now also been observed out on the Baltic Sea from boat and by automatic recording of bats at offshore wind turbines. Bats coming in from the sea in spring have been observed, collected and identified, in Skåne, Blekinge, Öland and Gotland.

***Pipistrellus pipistrellus***. The first observations in Sweden were made in 2000 on southern Öland when this species was found among migrants passing or accumulating at Ottenby. It is now regularly recorded on Öland and in Småland. In 2004 the first colony was found in Småland. It has also been observed in Blekinge (4 records), Västergötland (1 record) and Gotland (2 records).

***Pipistrellus pygmaeus***. Common species in southern Sweden with distribution up to the river Dalälven and coastal areas in Gästrikland. There is only one observation on the island Gotland and probably no population there. It is also absent in large areas in the highlands of Småland. In south the species occurs in almost all habitats with trees, while in areas north of lake Mälaren it is only found in deciduous forests at lakes and rivers. During recent years this species occurs with numerous migrants leaving the coasts of southern Sweden, a phenomenon which might be quite new.

***Nyctalus leisleri***. Until recently there were only a few observations in Sweden, two in Skåne, one on Öland, and two on Gotland. Bats hunting insects observed at Kåsehuvud at the south coast of Skåne 30 August 1993 and 3 September 1997. One bat was observed at Ottenby kungsgård, Öland, 30 August 2003. On the west coast of Gotland one bat was passing at Petes 31 August 2000 and one bat was hunting insects at Alsvik 25 August 2002. During the last few years there are a number of new observations during summertime in Småland, Öland, Västergötland, Blekinge and Skåne (all documented by recordings), and there are also some recent observations at wind turbines in the Baltic Sea east of Blekinge. In 2006 the species was stationary/regular in at least 3 areas. It is now quite obvious that the species is a regular member of the fauna in southern Sweden and that it has been overlooked. It is too early to determine if it is increasing.

***Nyctalus noctula***. Relatively common in some areas in southern Sweden with a distribution up to the river Dalälven and along the coastland of Norrland up to Medelpad. The main areas are found in varied landscapes with agriculture, lakes and deciduous woodlands and also in some coastal areas. Migrants are regularly observed along the coasts, especially on Gotland, Öland and Skåne. The species is frequently hunting insects over the Sea according to recent studies in Öresund, Kalmarsund and off the coast in Blekinge.

***Eptesicus nilssonii***. The most common bat species in Sweden with a distribution from south, including Gotland and Öland, to the northernmost parts of the country, where it is regularly found in Lapland north of the Arctic Circle. Occurs in most types of habitats and landscapes such as agricultural land, forest land, suburbs, villages, parks, coastal areas etc. In many areas it is more abundant than all other species together. Data from surveys indicate a population increase during the last 25 years.

***Eptesicus serotinus***. First observation was made 1982 in Skåne, where it today is more or less regular and found on many places all over the province. The species is also observed on Öland (6 sites), Småland (1 site), Blekinge (1 site), and Södermanland (1 site). It has also been observed at offshore wind turbines in the Baltic Sea east of Blekinge and in Öresund between Denmark and Skåne. Up to now, no nursery colony has been found in Sweden but during the last few years it is regularly observed in one area in Småland.

***Vespertilio murinus***. Has a patchy distribution up to southern Norrland. It is relatively common in some areas but absent in other. Colonies and feeding areas found both in agricultural and forest land. In autumn they come in to towns where territorial song flight is heard at high buildings such as churches, castles, tall hospital buildings etc. This is also where they hibernate. Territorial song is also performed at high mountain cliffs and in open mine shafts. Migrants are observed taking off at Falsterbo (Skåne), Ottenby (Öland), and Hoburgen (Gotland) and often observed at offshore wind turbines in the Baltic Sea.

***Barbastella barbastellus***. A rare species in southern Sweden, known from Skåne up to Östergötland and Västergötland. Observations, most often of single individuals, have been made on scattered localities both in winter and summer. There is only one known hibernation site (Karlsborg fortress, Västergötland) that is regularly used by a larger number of barbastelle bats. In a village in the highlands of Småland, where the species was reported in 1901, a nursery roost was discovered in 1988 and has been followed since then. In 1999 a survey project was initiated to map the distribution and habitat choice of the population. Now, the project has expanded and involves the cooperation with county administrations all over south Sweden and has now resulted in about 100 sites with observations of the species (out of more than 800 investigated localities). The main occurrence is in the highland forest areas of north Småland and south Östergötland. There, most of the observation sites (about 50) are in or near traditional villages with old buildings, hay meadows, pollarded trees and cattle grazing in pastures and forests. More to the south there are also other habitats such as castle and estate parks and old deciduous woods, especially with oak and beech. In the summers 2003 and 2006 radiotracking studies were carried out in Småland and Västergötland to get data on habitat use and movement patterns. An action plan for the barbastelle in Sweden will soon be established to protect and manage the species and its most important roosts and foraging habitats.

***Plecotus auritus***. A common species with a distribution from south to middle Norrland. Roosts found in trees, churches, and houses of all kinds. Feeding in forests, parks, gardens, indoors in barns etc.

***Plecotus austriacus***. Reported from one site in middle Skåne (a church) two years in 1960's. In the summer 1989 repeatedly observed in the park of Svaneholm in southern Skåne. Search for this species is planned but still not carried out. The status of the species is therefore unknown.

Distribution maps are found at the end of the report. All known data from 2006 are included. Blue dots in two maps are hibernation sites.

## 2. Status and trends

Of the 18 species found in Sweden, 5 species are considered to have **increased** during the last decades, namely *Myotis daubentonii*, *Pipistrellus nathusii*, *Pipistrellus pygmaeus*, and *Eptesicus nilssonii*, while 3 are thought to have **declined**, *Myotis mystacinus*, *Vespertilio murinus*, and *Barbastella barbastellus*. This is mainly based on surveys and impressions from various field studies. As most of the surveys are carried out for the first time, there are very little hard data on population changes. According to the official **redlisting 2005** in Sweden, the following are listed: *Myotis bechsteinii* (CR), *Myotis dasycneme* (EN), *Barbastella barbastellus* (EN), *Myotis mystacinus* (VU), *Myotis nattereri* (VU), and *Pipistrellus nathusii* (NT). *Nyctalus noctula*, earlier redlisted, was removed already 2000. *Eptesicus serotinus* has still an unclear status, being rare and no nursery roosts found. *Nyctalus leisleri* is recently found to be regular but no colonies found as yet (see above) and has therefore still an unclear status. *Pipistrellus pipistrellus* is very rare but regularly reproducing so its status will be evaluated before the next redlisting 2010.

## 3. Habitats and Roost Sites

As a result of research on bats, as well as experience from many surveys, the feeding habitats are now recognised as being the most important factor explaining the species occurrence, abundance and survival of the bat fauna in Sweden. Habitats of special importance are insect rich waters and wetlands with surroundings, especially deciduous woodlands and natural pastures. These are mainly found in lake rich districts, along streams and in coastal areas. Old, traditionally managed, farm-villages with surrounding meadows, pastures, and forests are in some areas very important for a number of bat species. Wet forests and old forest stands with cattle grazing, parks at castles, wooded cemeteries are examples of habitats that sometimes are good for insect hunting.

At periods in early season the available insects are restricted to small areas where bats are feeding before they eventually spread out in the whole landscape. Similar situation also are found in the autumn when bats leave the colony areas to hunt in insect rich habitats such as lakes, shorelines and deciduous woodlands. Recent studies in the Baltic Sea have shown that

many species, both migrants and resident species, go out several kilometres to feed in insect rich patches. It is considered of great importance to locate, protect and manage all these habitat types.

Roosts are mainly found in hollow trees and buildings of many kinds. Especially for the rare and redlisted species roost sites are protected if possible and the land- or house-owners are informed and encouraged to consider the welfare of the colonies. Hibernation sites in Sweden are found in some fortifications and other underground spaces such as old mines. Natural caves are only rarely used by bats in Sweden. Hibernation sites are in many cases protected by gates that are locked in winter. Many bats hibernate in small numbers spread in small cellars and are difficult to find. The majority of them are probably dwelling in small spaces inaccessible for inspection.

Some notes on habitats and roosts are also given under B1 in the species accounts.

#### **4. Threats**

There are potential threats of many kinds. Most important are the large scale landscape changes caused by forestry, agriculture and urbanization. Important feeding habitats are destroyed by draining, cutting, spruce plantation, abandoning of natural pastures and forest grazing. Renovation of old buildings such as churches, castles, manor buildings, stables, etc plays some role. Disturbance or dumping in old mines is also negative in some areas. Interspecies relations are recently discovered as possible factors that might explain the distribution and habitat use of bats, and also recent declines of some species. There is no indication that pesticides are affecting the populations of any bat species today. Some of the common species with general habitat requirements are probably increasing (see above). The reason for this is unclear but the climatic change with higher summer temperatures might be one factor. It is important to study which consequences this might have, e.g. concerning competition and interactions between these common species and related but rare species

#### **5. Data collection and surveys**

Since ultrasound detectors came into use in Sweden in 1978, the knowledge of the bat fauna is now growing rapidly. Some provinces such as Uppland, Gotland, Öland, Småland, Skåne, and parts of Östergötland, Halland, Blekinge, Västergötland, Dalsland, Närke, Västmanland, Gästrikland, Hälsingland and Ångermanland are now covered by surveys. Today these surveys map the occurrence of species and their distribution in the provinces or counties. It is an effort to find all sites with high species richness and sites with rare species. Monitoring programs for measuring population density has also been carried out in some of these areas such as the counties of Uppsala, Västmanland, Stockholm, Södermanland, and Skåne. However, it is perhaps too early to draw conclusions about nationwide trends from these investigations. Gotland has been surveyed four times and the counties of Stockholm and Upsala three times which allows for analysis of population changes. In all these investigations several thousand sites are now well studied.

Survey of *Barbastella barbastellus* (see under Status of Bats in Sweden above) has been intensified during the last years. This has now become a part of the total county bat surveys where areas with expected populations of *Barbastella* are given priority (chosen before other areas).

Data from these surveys and from some research projects are annually collected to upgrade a site register of all the rare and redlisted species as well as all new data on the distribution limits of the common species. Analyses of population data from the different provinces and counties are published when there results enough. Upgraded information on status and distribution of the bat fauna in Sweden will be made available internationally, e.g. to a revised European Mammals Atlas, the IUCN European Mammal Assessment, or for other needs that arise. The last published

distribution maps are found in the Swedish action plan for implementation of the EUROBATS agreement (February 2006, see below).

#### Educating and training bat observers

Training courses for professional observers working for county governments in Sweden have been arranged a number of times and will continue. The courses have theoretical parts on species identification, survey methods and the use of technical equipment. Efficient use of ultrasound detectors, automatic registration and sound analysis programs are described with special emphasis on the difficult cases such as the *Myotis* species, difference between the three *Pipistrellus* species in Sweden, and the confusion risks in the group *Vespertilio-Eptesicus-Nyctalus*. Identification of bats on morphology and the need to use nets in addition to sound listening and recording is also dealt with. Night excursions are arranged for practical training. The observers have then access to expert help for identification problems, technical questions etc. A follow up course is also planned for coming years to strengthen the knowledge and to solve problems that arise during work.

In the *Barbastella* project special meetings are held with people working in the actual areas. Methods to identify the species, pitfalls and search image are the topics. Photos from all sites with observations of *Barbastella* are shown and discussed with the workers. Today we know that this is a very efficient way to find the species in new areas.

### **C. Measures taken to implement Article III of the Agreement**

#### **6. Legal measures taken**

A new Regulation on Species Protection has recently come into force, but is already under revision. It will strengthen the protection of bats.

#### **7. Sites identified and protected**

There are now a number of important bat sites that are protected as nature reserves, where the bats are not the only reason for the protection. Special protection of bat sites are also being created at a number of hibernation sites, mainly old mines, but also for surroundings of colonies as Natura-2000 areas. Data on these protected areas are not yet available for whole Sweden.

#### **8 Consideration given to habitats**

It is a tradition since the 1970's and now included in laws to consider biodiversity in all land use such as forestry, agriculture, conservation planning of reserves etc. Important habitats for bats have now become a natural part of this.

One example was reported in an earlier National report from Sweden, where the route of the new 4-lane E4-motorroad through Uppland was changed because of the EUROBATS agreement. The route was already decided and planned to cross a lake with very important key habitats for bats on both shores. Since information on the Agreement was given to the responsible authorities, the route was moved 8 km to the west, away from the lake.

More general rules for consideration of important bat habitats are now spread in different ways to people in charge of forestry, agriculture, park and reserve management. A booklet with information and recommendations about bats in the landscape was reported earlier.

#### **9. Activities to promote the awareness**

Sweden has every year held a number of bat walks and bat talks in connection to the European Bat Night. Bat Nights have been arranged in Stockholm, Jönköping, and Malmö, with evening excursions and public information about bats. The largest event has been at the Museum of

Natural History in Stockholm, which every year has attracted around 150 participants. In addition, several bat workers have held a number of bat walks and bat talks open to the public during bat season. On Öland it is regularly performed as part of a program run by an ecological research station.

Scientists working with bats in Sweden give every year a number of lectures to inform about bat ecology, current projects and about the Agreement.

## **10. Responsible bodies nominated for the provision of advice on bat conservation and management**

The Swedish Environmental Protection Agency is responsible for this. The service will be built up by a network of contact persons at the county governments and by other bat specialists.

## **11. Additional actions undertaken to safeguard populations of bats**

### Action plan for *Barbastella barbastellus*

Because of the status of this species in Sweden (see above) and its presence in Appendix II of the Habitat Directive of the European Union, there is a need to coordinate the efforts to protect and manage this species. Knowledge about the distribution, habitat use and other aspects of its ecology is important to enable efficient measures. The results from ongoing surveys and from scientific studies will be summed up in an action plan.

## **12. Recent and ongoing programs relating to the conservation and management of bats**

### Action plan for implementation of EUROBATS agreement in Sweden

A group of scientists at universities and officials at Swedish Environmental Protection Agency have worked out an Action Plan for Implementation of EUROBATS agreement in Sweden. It was published in February 2006 as "Handlingsplan för skydd av fladdermusfaunan - Åtaganden enligt det europeiska fladdermusavtalet EUROBATS. Naturvårdsverket Rapport 5546. 2006." (Summary: Conservation and management of the bat fauna in Sweden - Action plan for implementation of the EUROBATS agreement).

Based on discussions in a reference group, the document formulates the tasks and directions for implementation of the EUROBATS agreement in Sweden.

Brief information on the bat fauna is given with some data in a table and in an appendix with distribution maps of the 18 species found in Sweden. Organization of the work is discussed. A central coordinator function, a reference group of experts and contact persons at regional authorities are suggested.

It is discussed how information can reach authorities such as the government, the parliament, central and regional agencies for nature conservation, forestry, agriculture, historical building restoration, nongovernmental organisations, as well as the media, schools and the general public. Publications, websites, museums, exhibitions, guided tours and excursions are suggested. How advice on problems with bats in houses can be made easily available needs more attention.

The importance of protection and management of important bat habitats is stressed. Habitats of special value for bats are pointed out. Available knowledge on bat ecology must be implemented into the management of forests, parks and nature reserves. Attention is also paid to important habitats and structures in agricultural landscapes.

Bats are often ignored when planning land use, new roads, urbanization, wind power installations, etc. Special studies of bats should always be carried out in such cases and included in environmental impact assessments. In light of the government's ambition to significantly increase the amount of energy emanating from wind power, there is a need to increase the knowledge of the impact of wind power turbines on bats.

Besides general rules for improving bat habitats, it is necessary to establish species-specific recovery plans. In Sweden the first such plan will focus on *Barbastella barbastellus*. This species has been subject to regional surveys for the last 6 years. Further plans will probably be made for *Myotis bechsteinii* and *M. dasycneme* and perhaps one or two more species.

Surveys are in many ways the basis for all actions. They should result in data on distribution and occurrence of all species, location of the most species-rich sites, special habitats for red-listed species and other sites and habitats of special importance for the bat fauna. Techniques and methods are being developed in order to improve efficiency and data quality. There is still a need for more well-trained survey workers.

Scientific research is necessary to acquire a better understanding of why some species are rare or decreasing. It is also important to understand the factors behind the species richness, especially at sites where the regional fauna is more or less complete.

Laws and legal aspects of bat protection and habitat conservation are explained and discussed. The interpretation of Article 12 of the Habitats Directive in relation to the protection of bats is not yet fully known.

Budget and funding of all the proposed actions are not dealt with in detail, only in principle. The document should be seen as a first step to organizing a systematic implementation of EUROBATS by pointing out the most important tasks.

#### Research projects on conservation problems of importance to the bat fauna

There is one ongoing project that focus on the relations between species with similar ecology. It is funded by the Swedish Research Council and includes cooperation with scientists under the Academy of Science in Bulgaria. Some *Myotis* species and *Barbastella barbastellus* have been subject to study by use of radio transmitters. The field work is now completed and followed by analyses of data and publishing results.

Another study going on for many years is about bat migration observed at the coasts of south Sweden including Öland and Gotland in the Baltic Sea. A publication was reported earlier. Data from the last years are now analysed for a new publication (Ahlén & Bach, in prep).

Studies on the effects of wind power turbines on land were studied in a pilot studied and the results presented in a publication (Ahlén, I. 2002. Fladdermöss och fåglar dödade av vindkraftverk. Fauna och Flora 97:3: 14-22. [Summary: Bats and birds killed by wind power turbines]) and an official final report (Ahlén, I. 2003. Wind turbines and Bats — a pilot study. Final report to the Swedish National Energy Administration 11 December 2003. Dnr 5210P-2002-00473, P-nr P20272-1).

In 2005 and 2006 investigations at offshore turbines with risk assessments were carried out in the Baltic Sea east of Småland and Blekinge. A report from 2005 is available while a final report from 2005-2006 is under preparation. (Ahlén, I. 2005. Risker för fladdermöss med havsbaserad vindkraft. Slutrapport från förstudien 2005 (Projektnummer 22316-1). [Summary: Bat casualty risks at offshore wind power turbines. Report from introductory studies.]

### **13. Considerations being given to the potential effects of pesticides.**

There are not any known indications on pesticide problems in the bat fauna at present.

## **D. Functioning of the Agreement**

### **14. Cooperation with other range states**

There is an international cooperation on problems with species identification in the field with the aim to produce a European handbook on field identification of bats, and methods for surveys and monitoring. There is also a lot of cooperation on different research problems with the other Nordic countries, Germany, the Baltic republics, and the Netherlands. There is also cooperation about a number of bat questions with scientists in many other European countries, especially Bulgaria, Austria, France and Spain.



*Myotis brandtii*



*Myotis mystacinus*



*Myotis nattereri*



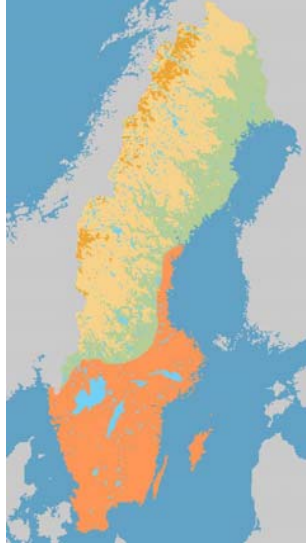
*Myotis daubentonii*



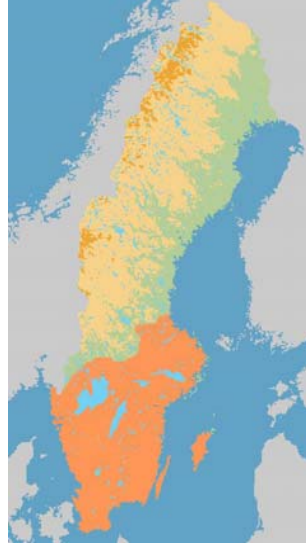
*Eptesicus nilssonii*



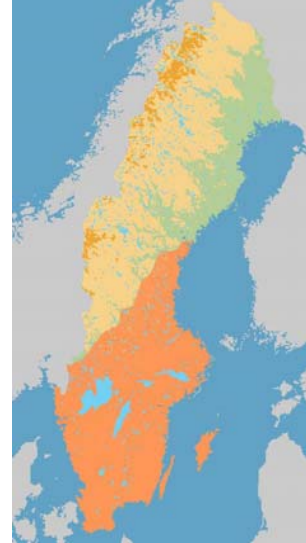
*Pipistrellus pygmaeus*



*Nyctalus noctula*



*Vespertilio murinus*



*Plecotus auritus*





*Barbastella barbastellus* 1800 – 1954



*Barbastella barbastellus* 1978 – 2005



*Myotis dasycneme*



*Eptesicus serotinus*



*Pipistrellus nathusii*



*Myotis bechsteinii*



*Nyctalus leisleri*



*Pipistrellus pipistrellus*



*Plecotus austriacus*



*Myotis myotis*