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Distribution and status of bats in Sweden

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Abstract: A total of 16 bat species have been reported in Sweden. The northernmost regularly occurring bats live at about 67 degrees north. *Eptesicus nilssonii* extends most to the north and is also the most abundant species even in the south. A few other species extends into the boreal region, *Myotis brandii* (64° N), *Myotis daubentoni* and *Plecotus auritus* (63° N), *Myotis mystacinus* (62° N). *Myotis nattereri*, *Nyctalus noctula*, *Pipistrellus pipistrellus* and *Vesperugo murinus* are distributed up to the southern boundary of the boreal forest region, running at about 60—61 degrees north. Some data on distribution, occurrence and conservational status are given for the remaining rare or occasional species, *Myotis dasycneme*, *Myotis bechsteini*, *Pipistrellus nathusii*, *Barbastella barbastellus*, *Eptesicus serotinus*, *Myotis myotis* and *Plecotus austriacus*.

Introduction

Since the work by Ryberg (1947) there is no published review of the Swedish bat fauna. During the last ten years, the knowledge about the status and distribution of most bat species has increased rapidly, mainly because of census work with detectors, some research projects and some amateur activities. The distribution patterns of the bats are especially interesting in a country where almost all species have their natural northern boundaries. Bats are commonly regarded as threatened animals in need of protection and special conservation measures. For these reasons it is justified to evaluate the present knowledge

about the group. Are available data indicating any population trends? Which species are endangered or rare? Do we get a biased picture of the status because of the methods?

Material and methods

We have used published data, collections in museums, dead specimens sent in according to enquiries and what we consider to be reliable observations made in census work in the field.

Bat studies with ultrasound detectors started in Sweden in 1978 and have now given detailed material on distribution and abundance of bats in a number of provinces (Skåne, Öland, Gotland, Uppland and parts of Västmanland, Södermanland, Östergötland, Västergötland, Småland, Dalarna, and Gästrikland). A total of about 2000 localities or small areas have been covered with species mapping method (Ahlén 1981) and several thousand kilometers line transects on roads have been done. From other parts of the country there are only scattered observations or nothing at all.

Results

In all 16 species of bats are now observed in Sweden. For only 11 of these, nursery colonies have been found. It is very likely, however, that 3 more species have breeding populations, while remaining 2 species are regarded as occasional until further knowledge is available.

The number of species is largest in south and decreases almost linearly with latitudes towards north (Ahlén 1983).

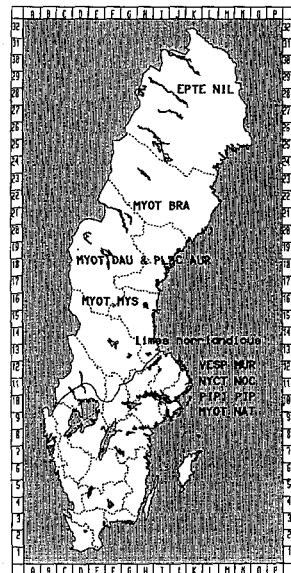
Eptesicus nilssonii is the species which extends most to the north. It is regularly occurring at about 67 degrees north or a little beyond the arctic circle. At the same time it is by far the most abundant species throughout Sweden, also in the southernmost parts. According to data from line transects and census plots it is probably more than ten times as numerous as all the other species together. In many coniferous forest areas it is the only occurring species. Its choice of habitats in urban areas suggests that a recent population growth has taken place.

A few other species also extend up into the northern boreal region. *Myotis brandti* is found up to 64 degrees north (Gerell 1987), *Myotis daubentoni* and *Plecotus auritus* up to 63 degrees and *Myotis mystacinus* to 62 degrees north (Gerell 1987). Older records of whiskered bats, not referred to either *M. brandti* or *M. mystacinus*, are known up to the arctic circle (Ryberg 1947).

M. brandti and *M. mystacinus* are widely distributed but obviously rare or absent in some southern areas. However they can form very large colonies, especially in the southern boreal region. Partly because of difficulties to separate these two species in the field, we still lack knowledge about ecological differences between them. From our since 1978 intensely censused areas in south and middle Sweden we have got the impression that these bats are decreasing and disappearing from some local areas.

Myotis daubentoni is very common throughout most of its range. It can be

Fig. 1. Approximate northern boundary for the nine most abundant bat species in Sweden.



very numerous. In some places one can watch many hundreds of bats hunting in the same small area. It is not only linked to water bodies and streams but is also regularly hunting in broadleaved deciduous forest and have probably increased in such habitats in middle Sweden during the last ten years.

Plecotus auritus is also a very common species. It is the most likely species to be found in churches (Rydell 1987) but is also a common bat of many farm buildings, attics of castles etc., but utilizes hollow trees too. It requires some experience to observe the species outdoors and it can easily be overlooked when only using detectors. However, the light summer nights in Sweden make it possible to identify the species by sight.

The most important zoogeographical border in Sweden is what we call 'LIMES NORRLÄNDICUS'. It is the transition from areas with broadleaved deciduous trees, especially the oak *Quercus robur*, in the south to the boreal coniferous forest region in the north. It is running at about 60–61 degrees north. There are four species with distribution up to LIMES: *Pipistrellus pipistrellus*, *Vespertilio murinus*, *Nyctalus noctula* and *Myotis nattereri*.

Pipistrellus pipistrellus is the most common of these species, especially in the south. Toward its northern distribution limit it becomes narrow in its choice of habitats, only occurring in some special forest types. We don't know of any population changes for this species with the exception of serious die-off in some southern areas because of the three last severe winters.

Vespertilio murinus has probably been expanding somewhat to the north as judged from new observations of bats in display flight in urban areas. In late autumn it is attracted by big buildings and especially new very high hospital buildings have probably favoured its expansion in the north (Ahlén 1986). By detector the species can be heard hunting at very long distances but we know, also from own experience earlier years, that unexperienced detector users have difficulties before they learn the special rhythm. It could be confused with both *Eptesicus* species and also with *Nyctalus*. The species is hunting both over forests and agricultural land. There are observations on *Vespertilio* in display flight in the city of Uppsala since 1958 (Wallin, Ahlén). There is no indication that the number of bats has changed during these 30 years.

Nyctalus noctula is common in the south and occurs more scattered in the north. In late summer and autumn straggling and migrating noctules are observed even in daylight at many places. Flocks of about 500 and 1000 individuals have been reported. Ringing records show that at least parts of the populations migrate to central Europe for hibernation (Gerell 1987). We don't know of any population trend with the exception of local disappearance which has followed the recent severe winters.

Myotis nattereri is obviously rare but scattered throughout Sweden south of limes norrlandicus. The northernmost observations have recently been made in Uppland and Västmanland just north of 60° N. It is difficult to recognize in the field so it could easily be overlooked by an unexperienced bat observer. The species seems to be rather specialized in its habitat choice and many of its preferred habitats have been destroyed during the last 10 years. Despite the fact that we have learnt to detect the species in the field better and better each year, the number of observations do not increase. Therefore we think that the species is unfavoured by habitat changes and probably decreasing at the moment.

The remaining species have more limited distribution areas.

Myotis dasycneme was earlier only known by two old records in Skåne (1852 and 1939). In 1978 it was found in Uppland (Ahlén 1979) and since then it is observed almost annually both in winter and summer. There are also some observations from the neighbouring provinces Gästrikland and Västmanland. During the last few years the species has also been observed in Skåne again. A big colony was found there in 1985 and is still there in 1987. In 1987 the species was observed in Småland. This species is certainly very rare but it is difficult but possible to identify it in the field. We believe that the species is overlooked.

Myotis bechsteini has only been found in Skåne. Most observations consist of single hibernating bats in old mines and caves. Since 1981 there are no

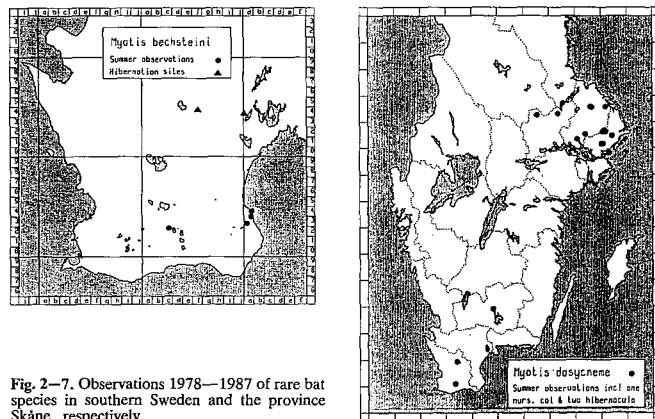
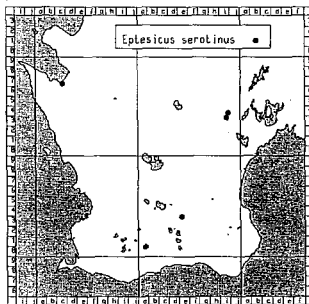
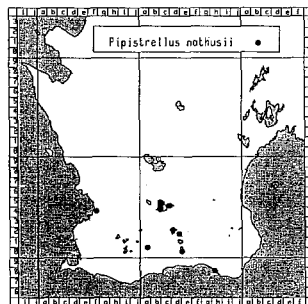
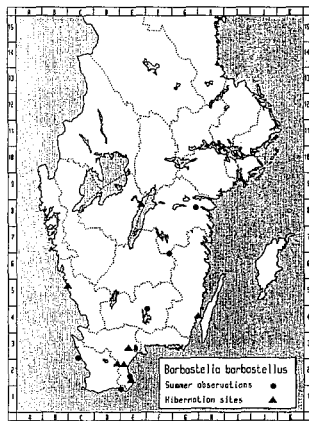
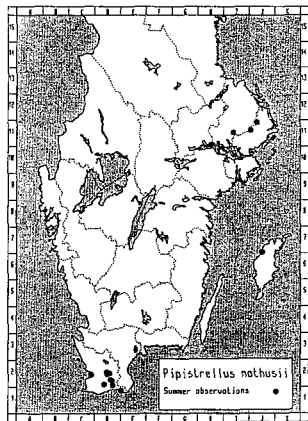


Fig. 2–7. Observations 1978–1987 of rare bat species in southern Sweden and the province Skåne respectively.

observations at the traditional sites. During the years 1984–1986 there are some summer observations in two parishes of easternmost Skåne but no colonies have been found. We consider the species as extremely rare in Sweden but small surviving populations could certainly be overlooked.

Pipistrellus nathusii was regarded as a very rare species only known from four localities in southwestern Skåne (Ryberg 1947). There were doubts whether the species still lived in Sweden. However in the 80's it was found again in Skåne (Gerell & Lundberg 1983). Since we learnt to identify its sonar the species was observed at a number of localities in Skåne, with regular breeding in at least two well studied areas. A retroactive identification was made for three specimens observed on the island of Gotland and in Uppland for one specimen in 1979. During 1986 and 1987 there are several observations from two localities in Uppland where the species definitely did not exist earlier years. In 1987 one observation was also made in the province of Västmanland. Our impression is that the species is rare but probably increasing.

Barbastella barbastellus is obviously rare as no nurseries have been found yet and the number of observations in the field is rather limited. The species is regularly found as hibernating but also hunting on scattered places up to about 58°30' N. An old published record from Stockholm is not accepted as reliable. With some training it is easy to recognize its sonar but without experience the bat observer will most likely fail to identify it. Therefore it is probably still overlooked. Only one very important hibernation place has been discovered (Rydell 1983). Number of bats counted there has decreased but otherwise we have no indications of population changes.



Eptesicus serotinus was discovered in Sweden 1982 in northeastern Skåne (Gerell, Ivarsson & Lundberg 1983) where about ten bats, probably from a colony, have been observed almost annually since then. There are also a few scattered observations of single specimens from other parts of Skåne. The species is fairly easy to detect e.g. by listening from car but there are also possibilities for confusion with *Vespertilio murinus* and *Nyctalus noctula* hunting at low heights.

Myotis myotis. One hibernating bat was found in an old mine in Skåne in 1985 (Gerell & Lundberg 1985).

Plecotus austriacus. Two specimens were found in one locality in the north-western part of Skåne one year in the 60's (Ryberg, pers. com.). The observation was reported at the first European Bat Research Conference in Bonn but has not been published in literature.

Discussion

The knowledge about distribution and status of the Swedish bat fauna is still far from complete. From what is said above we can, however, conclude that 4 or 5 species are increasing, 4 are decreasing while the remaining established species only show local changes. It is possible, however, that most species have suffered from habitat changes earlier during this century. Renovation of buildings, cutting down big hollow trees are examples. When the permanent meadows used for hay-making became cultivated for crops an important food base for the bats probably disappeared.

In the Swedish red list *Myotis bechsteini* is classified as "Endangered", *Barbastella barbastellus* as "Vulnerable", *Myotis dasycneme*, *Pipistrellus nathusii* and *Eptesicus serotinus* as "Rare", *Myotis nattereri* and *Nyctalus noctula* as "Care-demanding".

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