National Report on Bat Conservation in the Federal Republic of Germany

2000-2003

A. General Information

Date of Report:	July 2003
Period covered:	2000-2003
Competent Authority:	Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU), Godesberger Allee 90, 53175 Bonn, Germany
Appointed Members of the Advisory Committee:	Dr. Gerhard Emonds (BMU) Joachim Schmitz (BMU)
Advisor to committee member:	Dr. Peter Boye (BfN)

This report was prepared by the Federal Agency for Nature Conservation (BfN, FG I 1.1, Dr. Boye) on the basis of contributions provided by the Länder and of the Agency's own activities. The Länder reporters included:

Baden-Württemberg:	Mr. Kuhn, Ministry for Food and Rural Areas (Ministerium für Ernährung und ländlichen Raum), drawing on a publication by Monika Braun, State Museum for Natural History Karlsruhe
Bavaria:	Bernd-Ulrich Rudolph, Bavarian State Institute for Environmental Protection (Bayerisches Landesamt für Umweltschutz), with contributions by Angelika Meschede
Berlin:	Johannes Schwarz, Senate Department of Urban Development Berlin (Senatsverwaltung für Stadtentwicklung), with contributions by Carsten Kallasch
Brandenburg:	Jens Teubner and Dr. Dietrich Dolch, Zippelsförde Nature Conservation Station (Naturschutzstation Zippelsförde), under commission to the Ministry for Agriculture, Environmental Protection and Regional Planning (Ministerium für Landwirtschaft, Umweltschutz und Raumordnung)
Hesse:	Dr. Klaus Richarz, under commission to the Hesse Ministry for Environment, Rural Areas and Consumer Protection (Ministerium für Umwelt, ländlichen Raum und Verbraucherschutz), with contributions from Markus Dietz, Karl Kugelschafter, Matthias Simon and other staff of the Working Group for Bat Conservation in Hesse (Arbeitsgemeinschaft Feldermausschutz in Hessen - AGFH)
Lower Saxony:	Bärbel Pott-Dörfer, Lower Saxony State Ecology Agency (Landesamt für Ökologie), under Commission to the Lower Saxony Environment Ministry (Umweltministerium)
Saxony:	Dr. Ulrich Zöphel, Saxony State Agency for the Environment and Geology (Landesamt für Umwelt und Geologie), under commission to Saxony's State Ministry for Environment and Agriculture (Staatsministerium für Umwelt und Landwirtschaft)

Saxony-Anhalt: Bernd Ohlendorf, Saxony-Anhalt bat reference centre (Referenzstelle Fledermäuse Sachsen-Anhalt) in the "Karstlandschaft Südharz" Biosphere Reserve, and Dr. Wolfgang Wendt, Saxony-Anhalt Ministry for Agriculture and Environment (Ministerium für Landwirtschaft und Umwelt), with contributions from the Saxony-Anhalt Working Group for Bats (Arbeitskreis Fledermäuse Sachsen-Anhalt e.V.)

Schleswig-Holstein: Rüdiger Albrecht, State Agency for Nature and Environment (Landesamt für Natur und Umwelt), under commission to the Ministry for Environment, Nature Conservation and Agriculture, with contributions from Matthias Göttsche, Working Group on Bat Conservation in Schleswig-Holstein (Arbeitsgemeinschaft Fledermausschutz in Schleswig-Holstein)

B. Status of Bats Within the Territory of Germany

1. Summary details of Resident Species

The number of bat species found in Germany has been growing. New species have been added as several species not formerly found in Germany have extended their ranges, from the south, and as species not formerly recognised as separate species have now received full species status and been described. The first group includes Kuhl's pipistrelle (*Pipistrellus kuhlii*), which in 2001 was found to be reproducing in Germany. The find of a Giant noctule bat (*Nyctalus lasiopterus*) in Bavaria may be an indication that this southern distributed bat has extended its range to the north. The Giant noctule is still considered as an irregular guest in Germany, however. Another bat that may soon have to be considered a German species is the Alpine long-eared bat (*Plecotus alpinus*). This species was described by KIEFER & VEITH (2002) as a separate species. It lives in higher Alpine elevations and may also occur in German mountain regions, although it has not yet been found in the latter.

The following section reports on the current situation of various bat species in various German Länder.

Berlin:

A total of 17 bat species have been documented in Berlin. One of these (Barbastelle bat) is considered extinct, since it has not been sighted there since 1976/77.

Saxony:

A total of 17 bat species have reproducing colonies in Saxony. During the reporting period, reproduction was documented, for the first time ever, for the Soprano pipistrelle and the Parti-coloured bat. In addition, individual Nathusius' bats with young were sighted (1957, 1999). No maternity roosts of the Pond bat have yet been documented in Saxony, and no Greater horseshoe bats or Geoffroy's bats have yet been observed in that state.

Saxony-Anhalt:

Saxony-Anhalt's bat population was determined on the basis of 2002 census data. While this data cannot be considered an accurate record of actual population sizes, it does reflect the difficulties involved in counting bat populations, and it gives an indication of species' actual ranges.

The population sizes as determined correlate with relevant figures, as presented in Table 22, from Saxony-Anhalt's new "Red List" of endangered bat species.

1.1 *Rhinolophus ferrumequinum*, Greater horseshoe bat

Baden-Württemberg:

Winter-roost checks carried out over the past years in the Swabian Alb region and along the periphery of the Black Forest have turned up a few individuals of the greater horseshoe bat. Since the summer

and winter habitats of these individuals are not far apart, the bats may be assumed to spend the summer in Baden-Württemberg. The species' last regularly occupied summer roost, comprising just a few females and located within a large colony of Greater mouse-eared bats in south Baden (Südbaden), has remained abandoned since the mid-1990s, in spite of extensive efforts to protect it. In the Waldshut region along the upper Rhine, where individual greater horseshoe bats were regularly sighted, in several winter roosts, as late in the year as May, there is reason to hope that a small population has survived or is undergoing exchanges with a nearby population in Switzerland.

Bavaria:

Estimated population size: no more than 50 to 70 individuals.

Status: In 1992, one nursery roost, and several interim roosts, of this species were found in the Upper Palatinate region. Since the nursery (comprising ca. 20 females) was discovered, reproduction has been quite constant, with nine to 12 young being born and reared each year (Fig. 1). Over the past three winters, the total population found in seven in Upper-Palatinate caves known to serve as winter roosts has developed favourably, reaching a maximum of 36 animals in February 2003 (Fig. 1). The roosts of this population are distributed over an area of about 10 x 10 km. In addition, one individual that must be considered the last of an earlier population in the Altmühl valley area, a population described by ISSEL & ISSEL (1960), has still been overwintering in the Großes Schulerloch area near Kelheim.

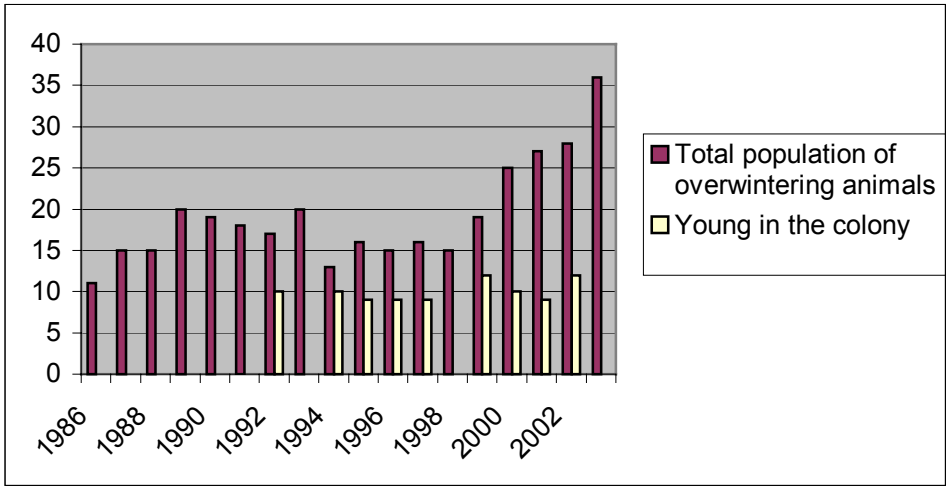


Figure 1: Development of the Greater horseshoe bat (*Rhinolophus ferrumequinum*) population in the Upper Palatinate since 1986. Winter population and number of young in the colony.

Population trend: The population trend – as documented on the basis of the overwintering population – has been positive over the past few years (Fig. 1). This has occurred because the population's winter roosts have been secured against unauthorised entry and because its maternity roost, located in an unused attached building in a village, is being protected via a leasing arrangement. Furthermore, the species is likely to have benefited from the warm weather of the past decade. In the species' main habitat, a military exercise range, the Federal Forest Administration (Bundesforst) has been carrying out biotope improvements such as shaping (thinning) forest periphery and removing shrubs on oligotrophic meadows.

Threats: In contrast to expectations, the Upper Palatinate government's higher-level nature conservation authority was unable to obtain the colony's roost building; the relevant leases were extended until the end of 2002. Funds for the purchase remain available. The building will be purchased as soon as the relevant community of heirs is willing to sell it. In almost every winter, the locks on the building's entryways are vandalised. Such vandalism poses a threat to the bats by disturbing their winter hibernation.

1.2 *Rhinolophus hipposideros*, Lesser horseshoe bat

Bavaria:

Estimated population size: no more than 250 individuals, including ca. 150 adult animals in three colonies and several other summer roosts in southern Upper Bavaria and an assumed number of unknown male roosts.

Status: New discovery of two maternity roosts in a former power station in the community of Aschau (RO district, 37 adult animals 2002) and in the church of Jachenau (TÖL district, 34 adult animals 2002) in the summer of 2000 (HOLZHAIDER et al. 2002). In 2001, the colony in Schloss Herrenchiemsee, which was rediscovered in 1991, comprised 56 animals; in 2002, it comprised ca. 53 adult animals (Fig. 2). On 2 June 2003, a total of 71 bats were counted.

An intensified re-inspection of potential and historically known roosts in the RO, TS and BGL districts, carried out in 2000 and 2001, turned up individual roosts, but it failed to provide any indications of other maternity roosts. One or two individuals have also been occupying winter roosts in the northern Frankenalb region, in the Bayreuth district (1998–2003). This population cannot be considered viable.

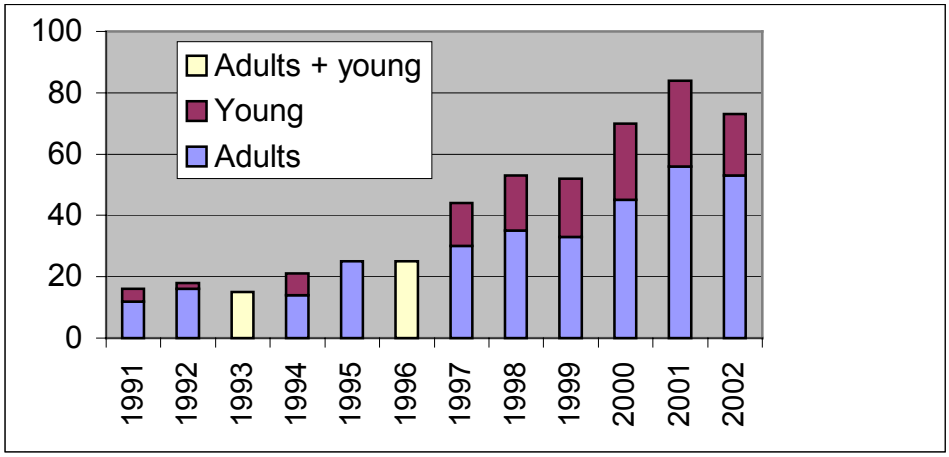


Figure 2: Population development for the Lesser horseshoe bat (*Rhinolophus hipposideros*) in Schloss Herrenchiemsee. Where adult and juvenile animals were counted separately, this is noted. In 1995, the inspection was carried out prior to the births of young, and thus only adult individuals were counted. In 1953, the colony comprised 200 individuals (ISSEL et al. 1978). The figures for young are minimum figures, since young are easy to overlook as they hang on their mothers.

Population trend: The Schloss Herrenchiemsee colony, which was rediscovered in 1991, has been developing favourably (Fig. 2). Populations in the two newly discovered maternity roosts were constant in 2001 and 2002.

Threats: The Lesser horseshoe bat remains critically endangered in Bavaria. Three reproducing colonies of this species, which was once extremely common in many natural areas, are known. At present, the roosts of the colonies seem protected, since they have been accepted by the relevant building owners/administrations. Changes are currently taking place in the Aschau roost building that could affect that building's special attic climate: the power station there is being decommissioned, and this will stop the flow of exhaust heat from the station's turbine into the attic above. This could prove detrimental for this warmth-loving species. What is more, plans call for expansion of a neighbouring larger attic that the animals have to fly through and that they use as an auxiliary roost. Southern Bavaria's co-ordination office for bat conservation has been providing the participating private builder, and the area's lower-level nature conservation authority, with the necessary information for protecting the roost. The ultimate success of these efforts is not assured, however.

Species conservation programme for the Lesser horseshoe bat: The special species conservation programme for the Lesser horseshoe bat in Upper Bavaria has included an intensive search for suitable roosts, advising of (church) communities and efforts to enhance public awareness, all with the aim of locating roosts and providing additional ones. It has also involved study, for a diploma thesis, of the

Schloss Herrenchiemsee bats' habitat selection and of ecological issues related to their food (KAYIKCIOGLU 2002). As part of this study, laboratory feeding experiments were carried out with the species *Rhinolophus rouxi*, which is of comparable size. These experiments revealed that the Lesser horseshoe bat normally catches mosquitoes and midges much more often than was being suggested by examination of bat droppings. This result shows that use of BtI against Chiemsee mosquitoes still may pose a threat to the bats (see last report). Telemetric studies revealed that the bats' most important hunting areas were located in the island's forests and shrubbery. Some individuals regularly crossed the lake, covering a distance of over one kilometre, in order to hunt on the mainland.

Saxony:

Population at its northern distribution limit; eight maternity roosts with a total of about 600 adult and year-old animals in the Dresden area; increases in the populations of five of eight maternity roosts (the largest group comprises 320 adult and year-old animals); major threats to maternity roosts as a result of renovation and ownership changes; three winter roosts have been newly discovered; all in all, only some winter roosts known (the total tally for these is about 93 animals, in 8 roosts).

Saxony-Anhalt:

A second reproducing community, in addition to one that had been known for some time, has been discovered. The population in the "Galgenberg" winter roost, near Freyburg/Unstrut, reached a maximum of 89 individuals, following a total of seven years of protective measures. The group in the area near Mücheln reached 40 individuals following measures carried out by mountain engineers.

1.3 *Myotis myotis*, Greater mouse-eared bat

Baden-Württemberg:

Relatively many populations of the Greater mouse-eared bat, including several numerous nursery colony communities, are still known in Baden-Württemberg. The threats to which this building-dwelling bat species is especially vulnerable include roost destruction (conversions, renovation, demolition) and environmental toxins (wood preservatives, which bats absorb through body contact in their roosts; insecticides, which enter the bats' bodies via the animals' insect prey). Food shortages during rearing of young – caused, for example, by destruction of the bats' traditional hunting areas or by long periods of wet, cool weather - can lead to the loss of a majority of a year's generation of young. In rare cases, barn owls and stone-martens can kill entire colonies. The extent to which gene exchange between individual colonies is possible, and the critical minimum colony size for gene exchanges, are both unknown. In this regard, the Greater mouse-eared bat can be considered representative of all bat species and their threats. It must also be remembered that targeted measures to protect roosts of Greater mouse-eared bats have been carried out in this state since the 1980s. The results of these conservation efforts show that protection of greater mouse-eared bat populations must include efforts to protect the bats' hunting grounds (or the ways in which the areas are managed).

Bavaria:

Estimated population size: From 1998 to 2002, the number of known maternity roosts was no greater than 290. The average number of nursery-colony animals in counted roosts (an average of 257 roosts per year) was 79,900 (the minimum was 77,100 in 2001, and the maximum was 82,000 in 1999). During the same period, southern Bavaria had a maximum of 151 roosts, with an average annual population size of about 27,600 individuals, and northern Bavaria had a maximum of 139 roosts, with average of 52,300 animals. Bavaria's minimum summer population of Greater mouse-eared bats (including males) over the past five years, based on the numbers of animals regularly counted in maternity roosts, is estimated to be 139,000 individuals.

Since the winter of 1999/2000, the Greater mouse-eared bat has been documented in 448 winter roosts. Most of the Greater mouse-eared bat's winter roosts, and especially those in cellars and mine shafts, house only small numbers of bats. A total of 91% of winter roosts counted since 1985 (n = 904) have been found to contain fewer than 30 animals. Caves are the species' most important roost type; eight out of ten of the species' most populous winter roosts are located in caves. This indicates that the

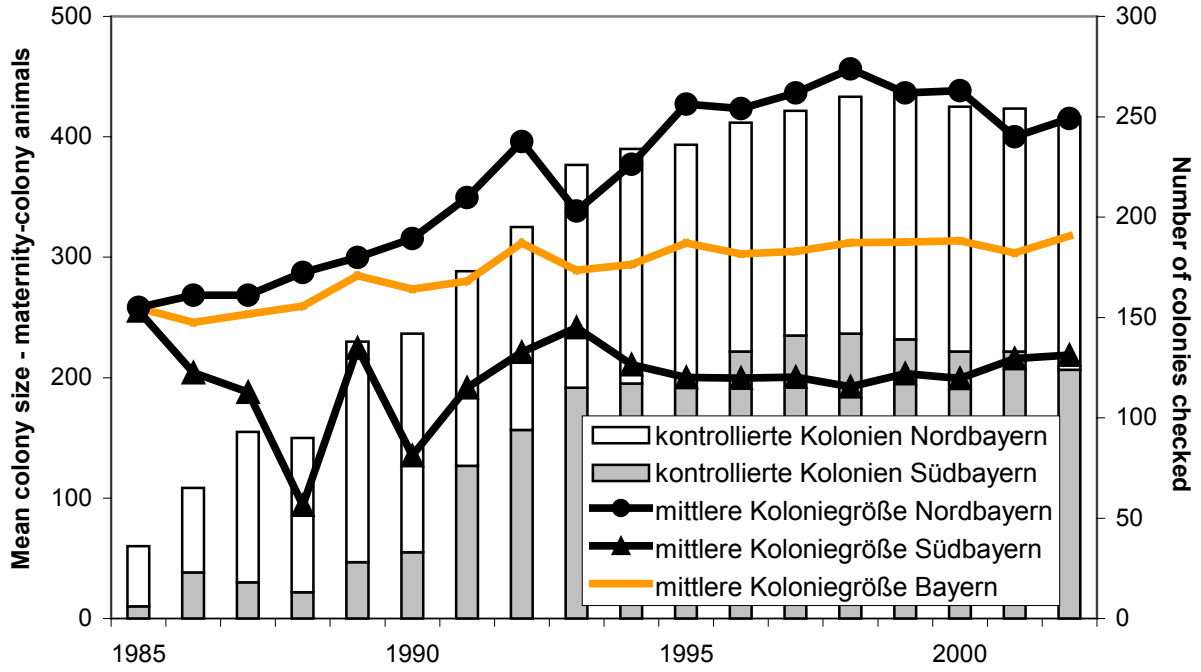


Figure 3: Development of the Greater mouse-eared bat population in Bavaria since 1985: number of colonies checked [kontrollierte Kolonien], mean colony sizes [mittlere Koloniegröße], maternity-colony animals, broken down into northern Bavaria [Nordbayern], southern Bavaria [Südbayern] and Bavaria as a whole [Bayern]. Northern Bavaria = government districts of lower, middle and upper Franconia (Unterfranken, Mittelfranken, Oberfranken) and Upper Palatinate; southern Bavaria = administrative districts of upper and lower Bavaria (Ober- und Niederbayern) and Swabia.

Frankenalb region – and probably the Alps – are the most important overwintering areas for Greater mouse-eared bats in Bavaria. The most populous winter roosts currently known include Hohlloch, near Raitenbuch (WUG district), which comprises 547 animals (March 1999); Bismarckgrotte (AS district), with 357 animals (March 2000); and Grundlose Grube (KEH district), with 299 counted animals in the winter of 2001/2002.

Status: No significant changes since the last National Report. Table 1 shows the 15 largest colonies.

Table 1: The 15 largest Greater mouse-eared bat maternity roosts in Bavaria, and their population sizes for different years (maternity-colony animals; CS = colony size).

Place	District	1985 or 1986	1990 or 1991	1995	1996	1997	1998	1999	2000	2001	2002	Mean CS 1998–2002
Gungolding, church	EI		289	929	630	920	640	1,162	1,100	1,270	1,000	1,034
Diebach, church	KG	130	390	830	1,150	1,200		1,050	1,100	1,075	1,100	1,081
Ullstadt, church	NEA	530	1,000	1,564	1,470	1,590	1,799	971	1,318	1,018	1,117	1,244
A3 bridge near Bettingen	MSP	300	430	1,170	1,400	1,830	1,800	1,740	1,150	700	990	1,277
Laudenbach, castle	MSP	270	1,000	1,100	1,360	1,400	1,400	1,200	1,180	1,100	1,600	1,296
Rodenbach, church	MSP		550	820	870	1,240	1,220	1,150	1,450	1,260	1,400	1,296
Ehrl, church	BA			1,260	1,050	1,200	1,200	1,420	1,490	1,330	1,460	1,380
Au, church	RO	1,105	1,253	1,426	1,479	1,289	1,396	1,294	1,450	1,476	1,384	1,400
Rentweinsdorf, castle	HAS		585	2,000	1,800	1,830	1,985	1,340	1,900	1,050	950	1,445
Happurg, church	LAU	730	1,210	1,550	1,350		1,668	1,784	1,720	1,760	1,800	1,733

Machtilshausen, church	KG	700	1,400	1,870	2,370	2,450	1,800	1,830	1,400	1,500	1,640	1,746
Oberaulenbach, castle	MIL		800	1,800	2,200	2,620	2,000	1,900	1,850	1,365	1,655	1,754
Staadorf, church tower	NM	550	870	1,461	850	1,472	1,697	2,007	1,869	2,038	1,818	1,885
Oberailsfeld, church	BT	1,069	1,550	2,250	1,850	1,800	1,950	2,295	2,270	2,190	2,150	2,171
Neuhaus, church	LAU	1,380	2,169	1,900	1,700		2,265	2,427	1,971	2,250	2,000	2,183

Population trend: After years of growth, most colonies exhibit no further clearly upward trends and are more or less fluctuating around an average (Tab. 1, Fig. 3). An evaluation of the trends in mean colony size, carried out at the natural-area level, has confirmed this result. Clearly, the capacity levels of feeding habitats have been reached in many areas.

Threats: The Greater mouse-eared bat is currently not threatened in Bavaria. Under an intensive monitoring programme, at present nearly 90 % of known colonies are checked annually. As a result, early knowledge is obtained of any planned renovation or other similar measures. Where the checks reveal that renovations are in progress in attic/roof areas, the relevant measures can be stopped or suitably guided (a few instances of required intervention occur almost every year). Thanks to intensive and extensive monitoring, renovation-related threats to maternity roosts have been all but eliminated. The few instances of unannounced renovation that still occur (in the period under review, such renovations were carried out at several populous roosts numbering several hundred animals) indicate, however, that without regular checks and roost protection renovation could again became a serious threat factor.

Berlin:

In summer, only a few Greater mouse-eared bats can be found in Berlin; no maternity roosts are known. In winter, Greater mouse-eared bats are regularly sighted in larger winter roosts (Fig. 4). The species has also been resettling in small roosts since last winter. The population has stabilised at a low level – also as result of intensive protection – and now exhibits positive development (Fig. 5). A newly settled roost in the Tegel waterworks now harbours 187 individuals, making it the species' most important winter roost in Berlin.

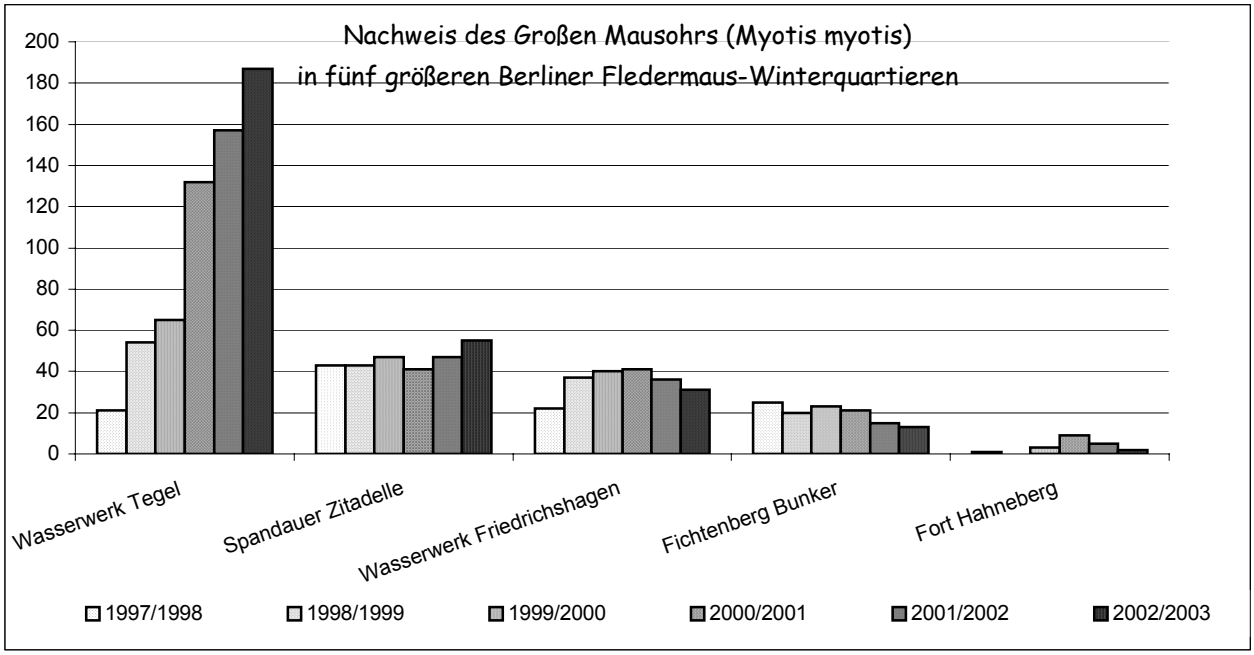


Figure 4: Greater mouse-eared bats (*Myotis myotis*) in five large winter roosts in Berlin, in the winters of 1997/98 to 2002/2003.

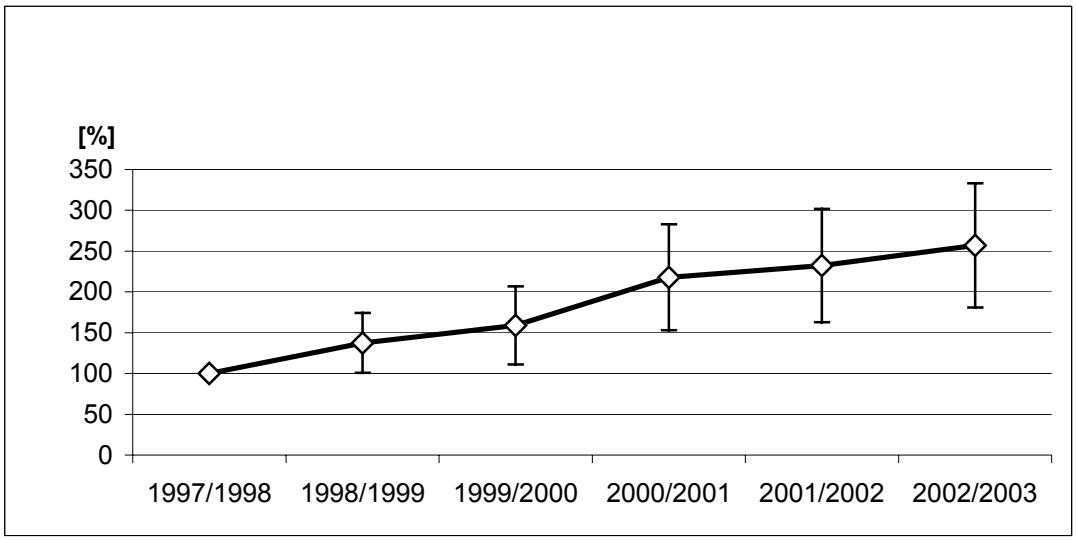


Figure 5: Population index (with standard deviation) for the Greater mouse-eared bat, based on population trends in five large bat roosts in Berlin. The mean population trend of 20.8 % ± 6.8 % per year is highly significantly positive ($p \leq 0{,}01$, calculated with TRIM 3.2, Statistics Netherlands 2002).

Brandenburg:

Status: As a warmth-loving species in the northern part of its distribution – which includes Brandenburg – this species is found here almost exclusively in large, warm attic spaces. Only a few individuals are also found in tree hollows and bat boxes, which in Brandenburg serve primarily as roosts for males and mating. Three maternity roosts in addition to the previously known 15 have been found, and thus the total number of maternity roosts has increased to 18. The numbers of females in these maternity roosts is stable or slightly increasing. In the largest roost, in Bad Freienwalde, the number of females has increased to over 300. The slightly positive trend in the winter roosts has continued.

Population trend: In Brandenburg, the population obviously declined sharply during the 1950s and 1960s and then stabilised at a low level. Presumably, the population has grown again slightly in the past few years. Slow increases in the numbers of overwintering animals indicate that this slightly positive development is continuing.

Threats: The species is particularly vulnerable to use of agricultural and forestry chemicals and, in its roosts, to construction/renovation.

Hesse:

During the period of about ten years (1993-2003), the number of known maternity roosts of the Greater mouse-eared bat has nearly doubled. Colonies of the bat, of which over 50 are known, are found in almost all rural districts in Hesse. The greatest colony density is found in the "Werra- und Wehretal" area, in the Werra-Meißner district in northern Hesse.

Lower Saxony:

Counts and estimates of maternity roosts, along with estimates based on the assumption that the population is evenly divided by sex, indicate that the population could number about 12,000 to 15,000 animals. Recent telemetric studies have identified the following behaviour in greater mouse-eared bats that lack typical, "hall"-type beech-forest hunting areas within a 20 km radius around the roost: during periods in which they are rearing young, each night the bats tend to visit several different small hunting grounds, also within a 20 km radius. The bats visit such hunting areas, which tend to differ in their structures, but always have an open ground structure, only for relatively short periods of time.

Saxony:

22 maternity roosts known in the state's flat and hill country. The total population is about 3,000 individuals; the largest maternity roosts comprise over 900 animals (adults+juv.); threats from

renovation (for example, large attics, bridges) and changes of ownership; since the early 1980s, the population has been growing slowly.

Saxony-Anhalt:

In reproducing roosts, the greater mouse-eared bat's population has not changed. In the summer of 2001, a mass die-off of young occurred in the reproducing roost "Mausoleum Meisdorf" as a result of cold, damp weather (Fig. 6). In the winter roosts in the Harz mountains, the numbers of overwintering individuals fluctuate widely, for unapparent reasons (Fig. 7). The numbers of animals spending the winter seem to be increasing.

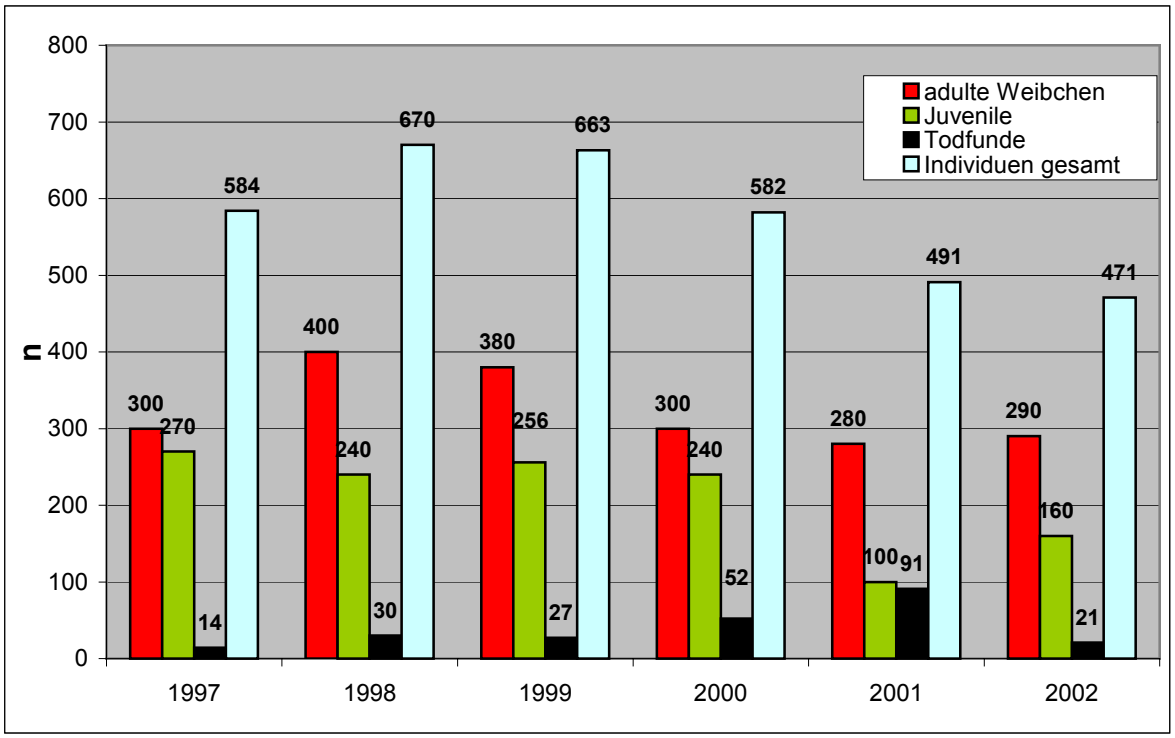


Figure 6: Numbers of Greater mouse-eared bats (*Myotis myotis*) in the maternity colony "Mausoleum Meisdorf", Aschersleben district, Saxony-Anhalt. [Adulte Weibchen = adult females; Juvenile = juveniles; Totfunde = dead specimen found; Individuen insgesamt = total number of individuals].

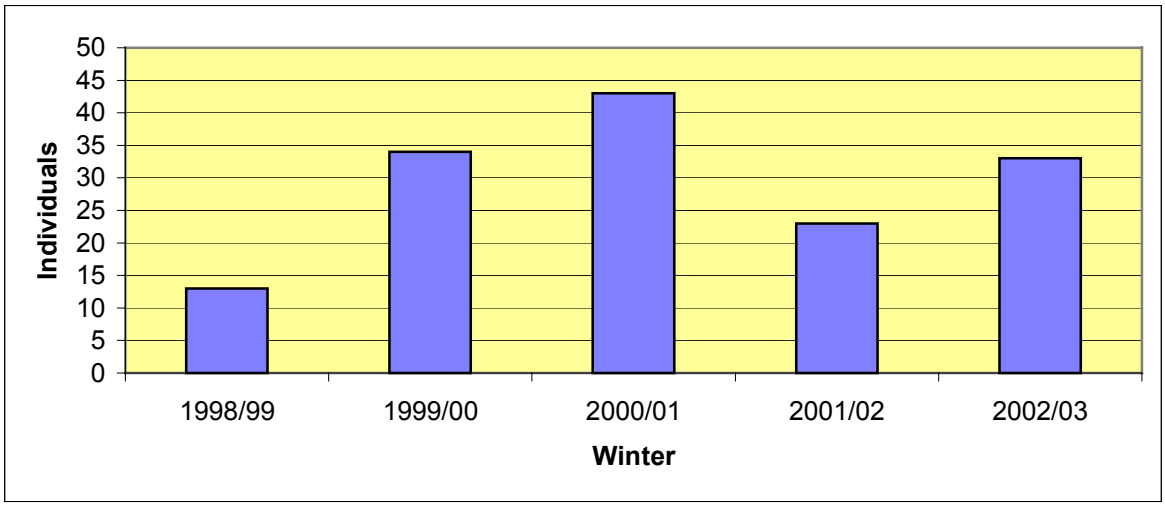


Figure 7: Hibernating Greater mouse-eared bats (*Myotis myotis*) in the rock roost of the Natura 2000 site „Stollensystem Büchenberg", Harz mountains, Saxony-Anhalt.

Schleswig-Holstein:

Summer: The Greater mouse-eared bat's northern distribution limit is in Schleswig-Holstein. The last documented instance of reproduction took place in Mölln, in the south-eastern part of the state, where a maternity roost was known in the 1980s. In the winter of 2002, the former maternity roost's site was examined, and no new traces of Greater mouse-eared bats were found. The former roost is still in its original condition.

Winter: To date, Greater mouse-eared bats have been known to inhabit two winter roosts in Schleswig-Holstein. In recent winters, either no individuals, or only 1-2 individuals, were sighted in the Segeberg cave roost.

Status, threats: The Greater mouse-eared bat is considered extremely rare in Schleswig-Holstein. It is questionable whether there is a summer population.

1.4 *Myotis emarginatus*, Geoffroy's bat

Baden-Württemberg:

Only three roosts (maternity roosts) of Geoffroy's bat are known in Baden-Württemberg. They are located in a regionally limited area in south Baden (peripheral area of the species' range in Germany).

Bavaria:

Estimated population size: > 3,000 individuals (1,550 females, see Tab. 2; sex balance of 1:1 assumed).

Status: In south-eastern Bavaria, 14 maternity roosts, with a total of some 1,550 adult females, are known. Two colonies were discovered in the summer of 2000, and the last colony was discovered in 2002. An interim roost is also known (barn Unterbrunnham, TS district), in which, clearly, animals from the colony in Höbering gather. Documented instances of reproduction, involving individual females with no more than one young, have been reported from Roßholzen church (RO district; this roost is not considered to be a maternity roost). Reliable sightings of males are very rare and involve individual animals in buildings or in net traps over Alpine caves. The winter roosts of Geoffroy's bat are still unknown.

Population trend: The positive development described in the last report has continued over the past three summers. The average number of adult females per colony has apparently remained constant since 1995 (Tab. 2), but this statistics are strongly influenced by new arrivals of smaller colonies. The six maternity roosts known since 1991 exhibit positive development (Fig. 8).

Threats: Geoffroy's bat has a small population in the southern part of Upper Bavaria. In light of its positive population trends, and the positive response to colonies shown by owners/users of roost buildings, the species no longer seems at risk of extinction in Bavaria!

Table 2: Nursery colonies of Geoffroy's bat and their population trends in Bavaria since 1991 (adults only).

Dist.	Place	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
AÖ	Garching, church	75	65	54	61	44	58	70	69	68	73	79	84
M	Schäftlarn, cloister									15	18	19	23
RO	Dettendorf, church	87	102	60	136	100	147	155	133	135	159	131	130
RO	Maxlrain, brewery	50	72	65	102	102	83	100	150	200	220	240	270
RO	Vagen, castle	10	6	3	7	9	10	21	18	25	26	24	34
RO	Herrenchiemsee, castle	50	50	30	38	50	45	40	30	28	35	35	30
RO	Zaisering, church			10	13	12	12	0	25	20	15	24	15
RO	Wildenwart, castle										15	0	0

TS	Mühlberg, church					421	474	340	327	422	448	411	469
TS	Palling, church	200	176	122	170	241	151	135	200	200	200	170	130
TS	Pertenstein, castle					8	10	13	11	14	15	27	20
TS	Höbering, barn						86	136	13	180	110	137	105
TS	Trostberg, church										34	42	32
TS	Kirchanschöring, church												200
	Total number of animals	**472**	**471**	**344**	**527**	**987**	**1076**	**1010**	**976**	**1307**	**1368**	**1339**	**1542**
	Maternity colonies	6	6	7	7	9	10	10	10	11	13	13	14
	Mean colony size	**79**	**79**	**49**	**75**	**110**	**108**	**101**	**98**	**119**	**105**	**103**	**110**

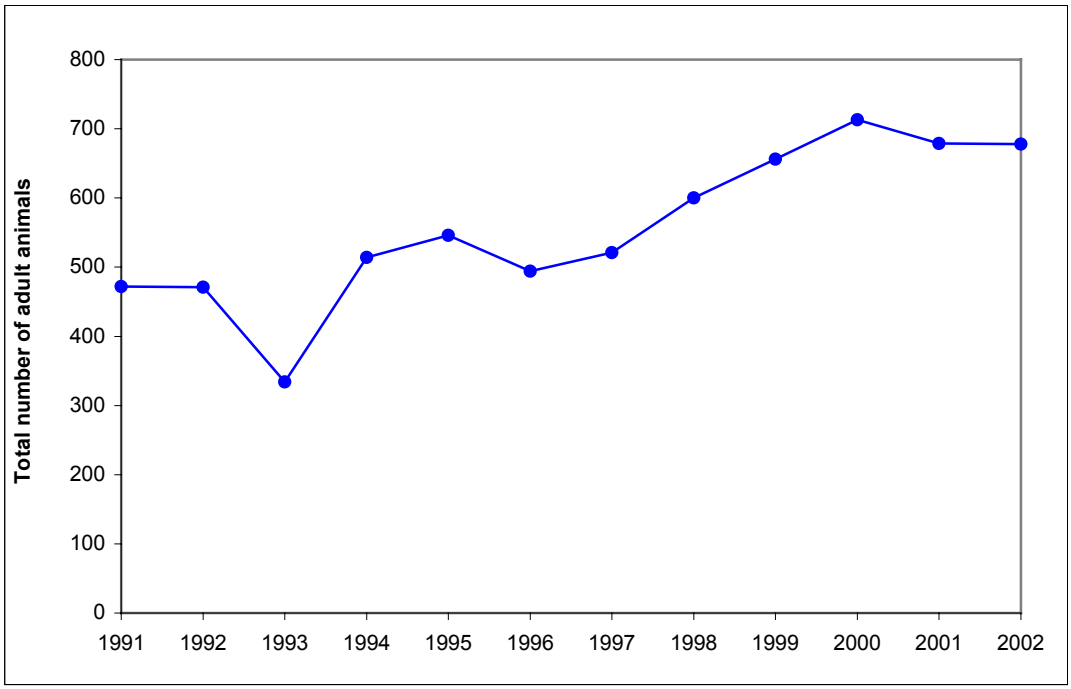


Figure 8: Population development of Geoffroy's bat (*Myotis emarginatus*) in six Bavarian colonies checked regularly since 1991 (adults only).

1.5 *Myotis bechsteinii*, Bechstein's bat

Baden-Württemberg:

Only a few maternity roosts of Bechstein's bat have been documented. For its summer roosts, this species seems to show a strong preference for certain types of forests that are not particularly common in Baden-Württemberg.

Bavaria:

Estimated population size: No reliable data is available; since 1995, 81 instances of reproduction have been documented throughout Bavaria (see Tab. 3).

Status: No change over the 1998-2000 report. Two maternity-colony groups of the species were discovered during the state forest administration's preparation of the management plan for the Natura 2000-site “Hienheim Forest” (Frankenalb, KEH district), which one individual was known to occupy.

Population trend: No change since the last National Report.

Threats: In Bavaria, Bechstein's bat is strongly dependent on beech and beech-oak forests. Gaps in its distribution (for example, in southern and eastern Bavaria) are the result of past conversion of deciduous forests into coniferous forests.

Intensive forest management, with intensified end use of old (deciduous) trees, represents the largest threat. In recent years, for example, the rate at which old beech trees were harvested in Bavaria's state forests has about doubled over the corresponding rate in the 1980s and early 1990s. In some forests, nearly all of the trees in harvestable age classes have been cut, with the result that all of the remaining trees are less than 100 years old. Such younger trees rarely have tree hollows.

Table 3: Documented occurrences of Bechstein's bat in Bavaria (not including individual sightings outside of roosts). Sightings after 1995 are assumed to be still relevant.

Period	Winter roosts	Summer roosts	Documented instances of reproduction	Of these, maternity colonies
since 1995 or the winter of 1994/1995	160	233	81	74
since 2000 or the winter of 1999/2000	67	25	20	14

Brandenburg:

Status: In Brandenburg, the species has its north-eastern distribution limit in Germany. The north-westernmost winter-roost occurrences of the species have been recorded in the Uckermark and Ostprignitz-Ruppin districts. Studies initiated by the state (Land) have confirmed the species' previously known range concentrations in the Fläming and Lausitz areas, as well as in the Märkische Schweiz area, in forests along slopes of the Oder River valley. In these areas, reproduction and maternity roosts have been documented (Lausitz) and indications of a nursery colony have been found (Märkische Schweiz). All in all, a total of 2 (3) maternity roosts are now known in the state. Clearly, in Brandenburg Bechstein's bat prefers predominantly deciduous forests on slopes of glacially formed moraine landscapes.

Threats: Habitat destruction and worsening of habitat conditions, via loss of semi-natural deciduous and mixed forests with old trees (with many hollows), and via loss of insect diversity as a result of intensive forest management. Worsening of the species' food base through insecticide use. Destruction of winter roosts via demolition, renovation and structural changes.

Hesse:

Careful studies have also identified additional maternity roosts of the elusive Bechstein's bat. To date, over 25 colony sites of this "classical forest bat" are known in "wooded Hesse".

Lower Saxony:

The population size cannot be estimated. Nonetheless, some gaps in knowledge about the species' presence in south-western Lower Saxony have been filled in – through intensified use of net traps over caves and mine shafts and in hunting habitats.

Saxony:

Currently, no maternity roost is known (the suspected presence of a larger colony in a free-standing residential building is being checked). No conclusions can be drawn regarding the species' current population trend. Individual sightings in interim and winter roosts (nest boxes, mine shafts, decommissioned mines); net captures in front of a decommissioned mine and mine-shaft system (mid-August – end of September).

Saxony-Anhalt:

In the past two years, the species has been more frequently sighted in the Devonkarst area, near Rübeland/Harz, and in the Sulfatkarst area of the southern Harz mountains, during its swarming periods. In the last three years, the number of documented individuals in winter roosts of the Salzwedel district (Altmark) has grown from 2 to 20 (Klötze ice cellar).

Since the cellars are regularly checked, Bechstein's bat seems to have been choosing cellar roost sites in recent years. The species also seems to be expanding its range northward.

Schleswig-Holstein:

Summer: Since 1998, it has been known that Bechstein's bat is reproducing successfully in Schleswig-Holstein. A small maternity roost colony of the species was discovered in that year in a nest box in a forest near Ahrensbök. Following two years in which the maternity roost colony (14 individuals) was not sighted, on 11 July 2002 it was rediscovered, during a nest-box check, in a 2GR box in the same area, in the northern section of the "Kuhkoppel" forest near Gnissau (SE). The first maternity-colony sightings had been sightings of bats from a group using about 30 nesting boxes. A single male was found in a 2F box only a few meters from the maternity roost colony.

Otherwise, for some time, individual bats – usually males – have been found in the summer (nesting devices, net captures) in the Segeberg, Stormarn and Rendsburg-Eckernförde (Aukrug) and Neumünster districts. The most recent such individual find was made in the Westensee area – in summer 2001, a male was captured along a water body. The Working Group for Bat Conservation (AGF) has launched a multi-year "Bechstein's bat project" that will search for bats in selected forests. In the area around Segeberg, and in other potentially suited forests of Schleswig-Holstein, the project will also set up special bat-box sites tailored especially to Bechstein's bats. Furthermore, a net-capture study will be carried out next year in forests around the "Kuhkoppel" area, including "Waldsdorfer Gehölz", "Schwinkenrader Forst", "Fohlenkoppel" and the forest near "Grebenhagen".

Winter: To date, Bechstein's bat has been sighted in only two winter roosts. Presumably, several hundred individuals of this bat species – which is considered very rare in Schleswig-Holstein – overwinter in the Segeberg cave, in which Bechstein's bat has been regularly sighted since the early 1980s (the species' presence in the cave has been known since 1913, when the cave was discovered). This presumption was formed in connection with net captures in 1999 that yielded about 80 Bechstein's bats in just a few nights.

Two other finds this year, made with net captures during swarming periods, in front of winter roosts, have provided additional information. On 13 September 2002, one Bechstein's bat (a male) was captured in front of the entrance to the winter roost in Jägerslust. On 9 September 2002, another male Bechstein's bat was captured in front of a bunker hall on the GKSS premises near Geesthacht.

Status, threats: The find of Bechstein's bats at almost the southernmost tip of Schleswig- Holstein proves that Bechstein's bat occurs not only in the Segeberg area, but also in the heavily wooded Lauenburg area. Since Bechstein's bats normally carry out no long seasonal migrations (the longest distance measured to date was 35 km), additional maternity roosts can be expected in suitable areas around the Segeberg cave.

1.6 *Myotis nattereri*, Natterer's bat

Baden-Württemberg:

Only a very few maternity roosts of Natterer's bat are known in this state.

Bavaria:

Estimated population size: Cannot currently be estimated; since 1995, 117 instances of reproduction have been documented throughout Bavaria (see Tab. 4).

Status: The species' range must now be assumed to include all of Bavaria. In addition, colonies are settling in forests and villages (buildings). Studies of nest boxes in state-forest areas have been continued, partly under commission to non-governmental organisations (e.g. the LBV at Mantel forest,

NEW district), and partly under commission to the Bavarian State Agency (LfU at Heideck and Röthenbach forests, RH district). The impression has been confirmed that *Myotis nattereri* is a common species in some forests.

Population trend: The winter populations fluctuate widely as a function of weather at the time of inspection. All in all, the population is assumed to be increasing.

Threats: Natterer's bat is primarily at risk from a lack of suitable forest roosting sites. In many medium-aged age-class forests, the species is strongly dependent on bat boxes.

Table 4: Sightings of Natterer's bat in Bavaria (not including individual sightings outside of roosts). Sightings after 1995 are assumed to be still relevant.

Period	Winter roosts	Summer roosts	Documented instances of reproduction	Of these, maternity colonies
since 1995 or the winter of 1994/1995	482	113	117	99
since 2000 or the winter of 1999/2000	304	30	37	32

Berlin:

Natterer's bat is the most common species in Berlin's winter roosts. Populations have been growing in the winter roosts that have been checked regularly for many years. For example, the number of visibly overwintering Natterer's bats at Spandau Citadel increased from 91 in the winter of 1974/1975 to considerably more than 300 (348) in the winter of 2002/2003. This is a significant population increase – especially since 1996/1997. In the last few winters, the population has continued to grow, even though it has already reached a relatively large size. Since the species is one of the first to settle in newly established winter roosts, it benefits especially from such protection.

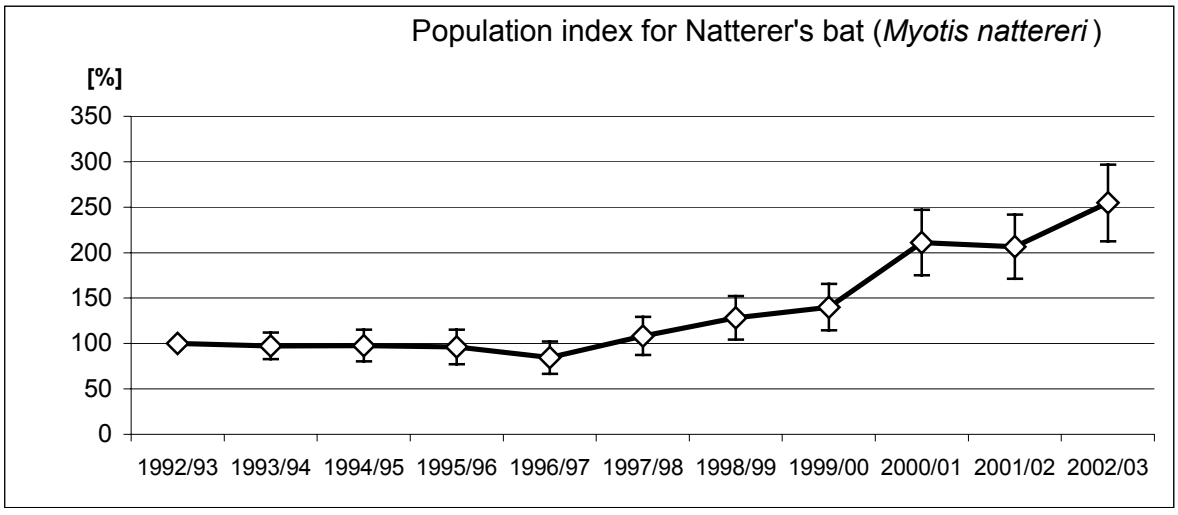


Figure 9: Population index curve (with standard deviation) for Natterer's bat (*Myotis nattereri*) in Berlin, from winter 1992/1992 to winter 2002/2003, based on data for 16 winter roosts. The overall average trend is 10.7 % ±1.7 % annually, which is highly significantly positive ($p \leq 0.01$, calculated with TRIM 3.2, Statistics Netherlands 2002).

Brandenburg:

Status: Sighted throughout Brandenburg, and obviously more widespread than was assumed until recently. Nursery roosts have been located both on/in buildings and in bat boxes. Clearly, the bats prefer wet deciduous and mixed forests and park-like structures. Winter roosts usually contain far fewer than one hundred bats; sometimes, they house only a very few animals. To date, the number of overwintering Natterer's bats in the "Ostbrauerei Frankfurt/Oder" winter roost (an ancient brewery) has grown to over 1,000. In late summer and early fall, many bats apparently fly back and forth between their summer roosts and their potential winter roosts, covering distances of 100 km (and more?).

Population trend: In many winter roosts, Natterer's bat is now the dominant species. This indicates that the species' numbers are increasing slightly.

Threats: Since roosts occur in and on buildings, *Myotis nattereri* is at risk from building renovation and demolition in rural areas. In the very large interim roosts which are presumed to exist, overcrowding is probably a threat.

Hesse:

Natterer's bat has changed its range in striking ways. In just 10 years (the last overview description of bat distribution in Hesse was prepared in 1994, with data from 1993), the number of summer finds has increased nearly tenfold. Special studies and inspections in particular have discovered a number of maternity colonies whose preferred hunting grounds are in cattle pens.

Lower Saxony

There is no recent information on the population size and ecology of this species. The conservation status and Red List category will be proved.

Saxony:

At present, 23 maternity roosts (14 in/on buildings, 9 in forests) are known; many individual sightings in interim and winter roosts along the northern periphery of Germany's central uplands (Mittelgebirge); population trends cannot be assessed at present.

Saxony-Anhalt:

The species has a range concentration in Saxony-Anhalt. It is found in both lowland and Harz mountain areas. In the Altmark area, the number of animals observed in winter roosts grows from year to year. This development is a result of the many protective measures carried out in cellars (Fig. 10). In changing roosts, the species has been known to move to roosts 150 km distant (OHLENDORF 2002).

Schleswig-Holstein:

Summer: Natterer's bat regularly reproduces in Schleswig-Holstein. This is proven by finds of maternity roosts in bat boxes in the Rendsburg-Eckernförde (Aukrug, Illo, Lindau, Sehestedt), Steinburg (Peissen), Plön (Rixdorf) and Segeberg (Rickling) districts. The species is known to have maternity roosts in bat-box sites, in conventionally managed fir forests (Drage, Illo, Rickling) and richly diverse beech forests. Other summer finds of this bat species – usually involving bats in bat boxes – have been made in the Lübeck, Stormarn, Schleswig-Flensburg and Herzogtum-Lauenburg districts.

Winter: To date, the species has been documented in 19 winter roosts. 11 of these roosts contain only a few individuals of *Myotis nattereri* (<10). In four other roosts (Schleswig, Eckernförde, Kropp and Schönwalde), 30 to 100 Natterer's bats congregate annually for hibernation. The Segeberg limestone cave is an especially large and especially important winter roost of *M. nattereri*; recent studies have found that some 7,000 Natterer's bats overwinter in the cave each year. The species seems to be extremely rare throughout the entire Kiel area and along Schleswig-Holstein's west coast (at most, just a few isolated individuals are sighted), and it is still unclear why this is so.

Status, threats: Natterer's bat is found throughout the year in Schleswig-Holstein, and it regularly reproduces in this state (this has been concluded on the basis of just a few documented individual instances of reproduction in nesting boxes). In the winter, *M. nattereri* is regularly sighted in

numerous winter roosts, some of which contain groups of considerable size. The winter population in the Segeberg cave is the largest known world-wide to date.

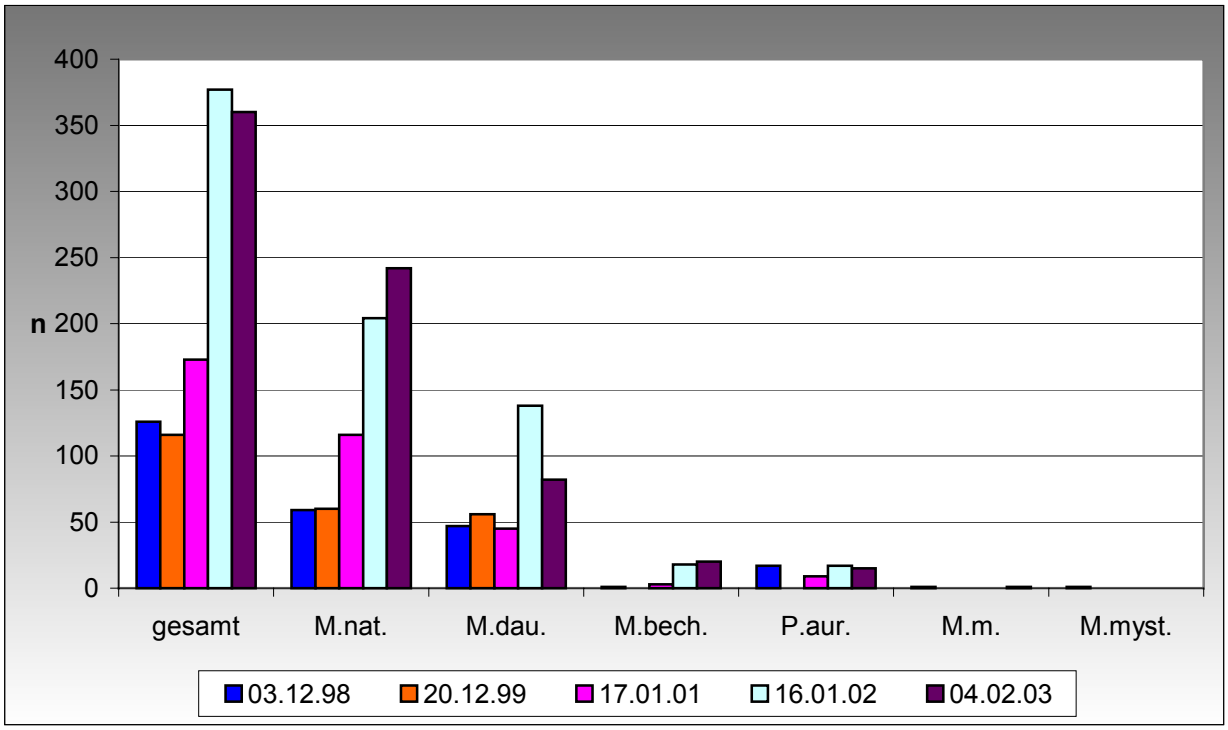


Figure 10: Number of bats in the roost "Eiskeller Klötze", Altmark district, Saxony-Anhalt. The increase of registered Natterer´s bats (*Myotis nattereri*) is obvious.

Gesamt = total number; M.nat. = *Myotis nattereri*; M.dau. = *Myotis daubentonii*; M.bech. = *Myotis bechsteinii*; P.aur. = *Plecotus aurius*; M.m. = *Myotis myotis*; M.myst. = *Myotis mystacinus*.

1.7 *Myotis mystacinus*, Whiskered bat

Baden-Württemberg:

Several maternity roosts of Whiskered bats have been reported from Baden-Württemberg. Most of the summer roosts of this species are located in crevices in (private) buildings. Such roosts are often unknown to the buildings' owners and thus are highly at risk whenever renovation or modifications are carried out.

Bavaria:

Estimated population size: No reliable figures available; since 1995, 187 instances of reproduction have been documented throughout Bavaria (see Tab. 5).

Status: The whiskered bat is widely distributed throughout all of Bavaria's natural areas, including the Alps, and it is considered one of the common bat species. It does not seem endangered at present.

Population trend: Trends for populations of combined groups of whiskered bats and Brandt's bats in winter roosts (232 winter roosts discovered since 1994/1995, and 125 since 1999/2000) indirectly indicate that whiskered bats have been developing positively, since it is assumed that most of the animals in these groups are *Myotis mystacinus*.

Table 5: Sightings of Whiskered bats in Bavaria (not including individual sightings outside of roosts). Sightings after 1995 are assumed to be still relevant.

Period	Winter roosts	Summer roosts	Documented instances of reproduction	Of these, maternity colonies
since 1995 or the winter of 1994/1995	17	116	187	154
since 2000 or the winter of 1999/2000	7	7	31	26

Brandenburg:

Status: Myotis mystacinus is one of the very rare species in the area under review. Only one maternity roost colony, and just a few individuals – usually on buildings or in bat boxes – have been sighted. Very few winter-roost sightings. The relationships between the species' summer and winter roosts are poorly understood. The species prefers forests with many water bodies and park-like areas.

Threats: Nursery colonies and roosts on buildings are threatened by renovation.

Lower Saxony

There is no information on the population size available. The conservation status and Red List category will be proved.

Saxony:

A total of 17 maternity roosts, covering both flat and hilly areas, are known (up to 39 females); threats from renovation; one large winter roost in a ridge area of the Erzgebirge mountains (population estimated at between 70 and 150, size ± stable); otherwise, only individuals have been sighted.

Saxony-Anhalt:

The Whiskered bat is one of the rare species in Saxony-Anhalt. No associations with reproducing groups of Brandt's bat have been found. The species is present in winter roosts in the Harz mountains.

Schleswig-Holstein:

Summer: The only known summer sightings occurred in the south-eastern part of the state. Net captures yielded individual bats in 1992, 1993 and 2001.

Winter: In 2002, one bat was sighted in the winter roost at Jägerslust. *M. mystacinus* was also sighted several years ago in Geesthacht. Whether the "whiskered" species from the Segeberg cave were *M. mystacinus* individuals has not been reliably determined.

Status, threats: Whiskered bats have been sighted less often than their twin species, Brandt's bat. The species' status must thus be considered uncertain, at all times of the year, for the state of Schleswig-Holstein. While representatives of the species are found in the south-eastern part of the state in summer and winter, no clear evidence or confirmation of reproduction has been obtained.

1.8 *Myotis brandtii,* Brandt's bat

Baden-Württemberg:

Brandt's bat has been sighted in just a few small and widely separated sites; fortunately, a few instances of reproduction have been documented.

Bavaria:

Estimated population size: No reliable figures available; since 1995, a total of 12 instances of reproduction have been documented throughout Bavaria (see Tab. 6).

Status: Rare species. Only a few maternity roosts of Brandt's bat are known throughout the entire state; these are concentrated in northern and eastern Bavaria. Since 1985 (when the co-ordination offices for bat conservation were established) 24 such maternity roosts have been discovered. All in all, the species is rarely sighted; summer sightings of Brandt's bat are distributed throughout all of Bavaria. Instances of reproduction have been documented in seven of the state's 19 natural areas, while summer roosts have been found in nine of the natural areas. The species' summer range has three concentrations: the Keuper-Lias-Land area in Franconia – especially the Aischgrund landscapes between Erlangen and Höchstadt, which are dotted with carp ponds; the Oberpfalz part of the Bohemian forest (Oberpfälzer Wald) and the Bavarian (Bayerischer) forest; and the Alps and subalpine foothills and bogs. It must be remembered, however, that relatively extensive distribution studies have been carried out in these areas.

Table 6: Sightings of Brandt's bat in Bavaria (not including individual sightings outside of roosts). Sightings after 1995 are assumed to be still relevant.

Period	Winter roosts	Summer roosts	Documented instances of reproduction	Of these, maternity colonies
since 1995 or the winter of 1994/1995	4	26	12	8
since 2000 or the winter of 1999/2000	3	2	4	3

Population trend: This is difficult to determine, since the species' roosts are not regularly quantitatively inspected. The few colonies that are checked at least somewhat regularly show no indications of any decline. The same applies to the winter roosts in which the species' presence is recorded (but quantitatively inspected only by way of exception).

Threats: The probable threats include a lack of natural roosts (cracks in trees, tree hollows) and damage to roosts in buildings.

Brandenburg:

Status: A rare species, although it is widely distributed. It roosts in and on buildings and in bat boxes. Only a few instances of reproduction have been documented. Very rarely has the species been sighted in winter roosts. The relationships between the species' summer and winter roosts are very poorly understood. Brandt's bat seems to be highly dependent on wet biotopes and water bodies.

Threats: Renovation poses a threat to roosts on buildings and to maternity roosts.

Lower Saxony:

One of two known large maternity roosts, located in north-western Lower Saxony, has declined to about 40 individuals, for unknown reasons (in the mid-1990s, this colony comprised about 250 bats). Brandt's bats often hunt in areas distant from their roosts.

Saxony:

23 maternity roosts known, covering both flatland and hill-country areas (up to 155 females); one large winter roost in a ridge area of the Erzgebirge mountains (population estimated at between 100 and 300, size ± stable); otherwise, only individuals have been sighted.

Saxony-Anhalt:

The species has a range concentration in Saxony-Anhalt and is much more common than the Whiskered bat *M. mystacinus*. In maternity colonies in the north, northeast and east of Saxony-Anhalt, it forms groups with Nathusius' bat (*Pipistrellus nathusii*) and, occasionally, with the Pipistrelle bat (*Pipistrellus pipistrellus*) (B. OHLENDORF et al. 2002). In 2002, an unprecedented observation was made: a young female was observed to leave a reproducing community in the "Kreuzhorst" nature

reserve, near Magdeburg, and to move to a southern-Harz rock roost, "Heimkehle", within the space of a few days. A male was then observed to leave the "Jederitzer Holz" nature reserve, in the Elbe-Havel-Winkel area, and to move to the "Einhornhöhle" cave in the southern Harz mountains (Lower Saxony).

Since 1996, special monitoring programmes have been carried out continuously in selected habitats (OHLENDORF et al. 2000, 2001). Initial conclusions reached via this programme were presented at an international workshop held in June 2003 in Saxony-Anhalt, "On the situation of the Brandt's bat *Myotis brandtii* / Whiskered bat *Myotis mystacinus* group in Europe".

Schleswig-Holstein:

Summer: While the species has been sighted in the summer in Schleswig-Holstein, its population situation in this state is poorly understood. This is due to the small overall number of sightings in question and to the long time (since 1985) that has elapsed since the presence of the only documented maternity roost colony (Segeberg district) was last confirmed.

In recent years, in the south-eastern part of the state (Herzogtum-Lauenburg district), males and females of this species have been regularly identified via net captures and surveys of individual animals in bat boxes. In 2001, in the Westensee area, three females were netted above a forest path. In both the Lauenburg and Kiel-Westensee areas, captures of lactating and gravid females point to the presence of additional maternity roosts. In June 2002, a find of a single juvenile *M. brandtii* in Reinbek was reported by ARTHUR HINKEL. Since it was no longer possible to identify the real finder in Reinbek, the find's precise location was not learned. Attempts to net additional juvenile or lactating *Myotis brandtii*, carried out with A. HINKEL along the Bille watercourse in Reinbek, were unsuccessful.

Winter: Sightings of "whiskered bats" (either Whiskered bats or Brandt's bats) in Schleswig-Holstein's known winter roosts, including the Segeberg cave, are regularly reported. In 2001/2002, *M. brandtii* was sighted. Other than Bad Segeberg, the Jägerslust winter roost is the only winter roost in which *M. brandtii* overwinters. In 2002, a total of five individuals wintered in it.

Status, threats: Myotis brandtii seems to be reproducing in Schleswig-Holstein (at least in a few parts of the state), even though no maternity roosts have yet been discovered. The species' status as a winter guest throughout the state is only partially understood; the only available relevant long-term survey data is from the Segeberg cave.

1.9 *Myotis daubentonii,* Daubenton's bat

Baden-Württemberg:

Several colonies and maternity roosts of Daubenton's bat are now known in Baden-Württemberg. Threats exist in that many of these roosts are located in tree hollows of deciduous trees subject to customary forest management regimes. Other roosts are located in cracks of masonry bridges, and most of the bridges in question are either need of renovation or are regularly repaired for safety reasons. Such repairs normally involve filling the cracks in order to increase the structures' overall stability. If additional roosts of this species, indicating a sizeable population, are discovered, and if now-initiated conservation measures take effect, Daubenton's bat could move to a lower category on the Red List of endangered bats.

Bavaria:

Estimated population size: No reliable figures available; since 1995, 89 instances of reproduction have been documented throughout Bavaria (see Tab. 7).

Status: No change since the last National Report.

Population trend: Daubenton's bat populations in continuously surveyed winter roosts have been growing continually.

Threats: Not seriously endangered at present. Forestry, along with water-body maintenance and traffic-safety measures, could pose threats as a result of the species' dependence on tree hollows near water and in forests.

Table 7: Sightings of Daubenton's bat in Bavaria (not including individual sightings outside of roosts). Most sightings after 1995 are assumed to be still relevant.

Period	Winter roosts	Summer roosts	Documented instances of reproduction	Of these, maternity colonies
since 1995 or the winter of 1994/1995	365	79	89	57
since 2000 or the winter of 1999/2000	235	15	17	10

Berlin:

Considerable decreases in populations of overwintering animals, especially in large bat roosts, occurred until the winter of 1994/1995. In the Spandau Citadel, decreases in the numbers of visibly overwintering animals proceeded as follows: 1974/1975: 214 individuals, 1989/1990: 169 individuals, 1999/2000: 69 individuals, 2002/2003: 36 individuals Figure 11 shows the population development in the citadel and in Fichteberg bunker. The population trends in other Berlin winter roosts were also clearly negative until the mid-1990s. Since then, populations have recovered overall, however; this is evidenced in that bats are now settling for the first time in newly established (man-made) roosts. In the summer, Daubenton's bats are sighted along most water bodies, although the number of relevant roosts is not known. In the summer of 2002, a maternity roost colony with 30 bats was discovered in the wine cellar of the historic Berlin palace (Stadtschloss).

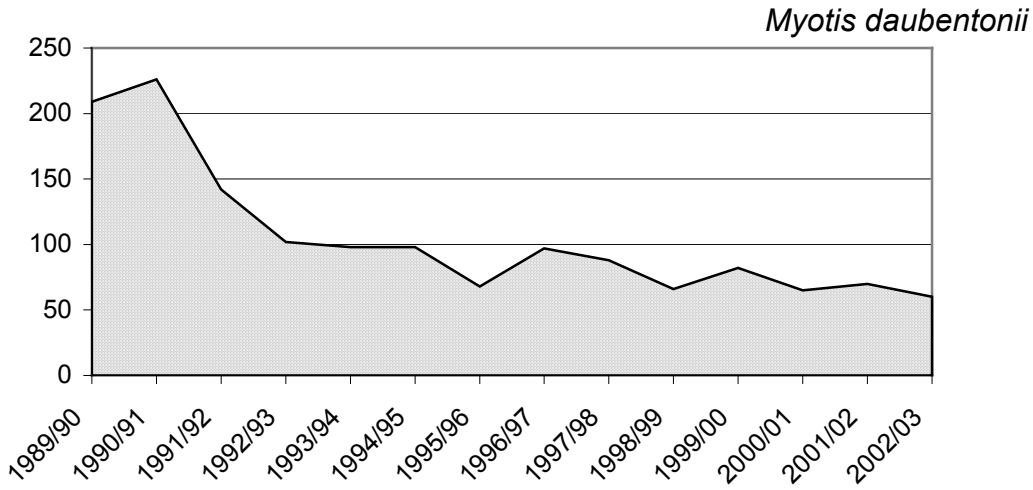


Figure 11: Population development of Daubenton's bat (*Myotis daubentonii*) in Berlin, in regularly surveyed (for many years) winter roosts that formerly housed the largest known Daubenton's bat populations (Spandau Citadel, Fichteberg Bunker).

Brandenburg:

Status: The species has been sighted throughout Brandenburg and is common in some parts of the state. Populations in winter roosts are either remaining constant or are slightly decreasing. The species' maternity roosts are usually found in tree hollows; rarely are they found in buildings. Daubenton's bats also roost under bridges. In the winter, they prefer very damp roosts, apparently even roosts in rocks on the ground. A winter roost in the Rüdersdorf open-pit mine, which use to house several thousand Daubenton's bats, now is home to only a few hundred bats. Other winter roosts usually contain fewer than one hundred animals. Daubenton's bat hunts over water and around water bodies. It benefits from water-body eutrophication. Population stagnation could be a result of successful efforts to improve water quality; over the last 12 years, for example, a large percentage of wastewater discharges have been connected to wastewater-treatment plants.

Threats: Because the species prefers tree hollows for its maternity roosts, forest management measures represent a key threat.

Lower Saxony:

The Daubenton's bat population seems to have remained stable and may even have been increasing slightly. No precise data on population size is available, since only a few colonies are known. Studies in 2000 and 2001 confirmed the presence of a male-roost area in a wet forest area in southern Lower Saxony, thereby supporting findings regarding the existence of areas occupied solely by males. In the case in question, no females were found. Several maternity roosts can be expected in East Frisia, since net captures in hunting habitats in that region almost exclusively yielded nursing and pregnant females.

Saxony:

Maternity colonies with usually 35-40 adult animals (max. 67), with a main concentration in the Upper Lusatian pond landscape area; the current population trend is not known; winter roosts are found primarily in mountain areas.

Saxony-Anhalt:

All hunting bats found along Harz watercourses are males (applies to all Harz watercourses). Females have been sighed at the large "Rappbode" and "Wendefurt" reservoirs and at the Königshütte intermediate reservoir. In the Selke Valley, 350 to 400 males can be found along a 40 km length of the river. Long-term studies in cave areas in the southern and central Harz mountains have found that Daubenton's bat is the second-most common species, after Natterer's bat, during swarming periods.

Schleswig-Holstein:

Summer: Daubenton's bat reproduces in Schleswig-Holstein. This has been proven via finds of maternity roosts in three tree roosts in the Herzogtum-Lauenburg district, as well as via surveys of bat boxes in the Segeberg, Ostholstein, Herzogtum-Lauenburg, Plön, Rendsburg-Eckernförde, Schleswig-Flensburg and Lübeck districts. Surveys of bat-box sites in coniferous-only forests in the drier parts of the Geest area (Iloo and Drage) have failed to find maternity roosts of Daubenton's bat, even though the bats have been provided with numerous roosting aids (several hundred boxes). Maternity colonies have been found, however, in bat-box sites in the water-rich young moraine landscape (Schleswig-Schuby, Rehberger Forst Angeln, Rixdorfer Tannen, Sehestedt) and in forests.

Myotis daubentonii has been sighted in the summer in 14 of 15 districts, in bat boxes and via net captures and detector-aided observations. Only the Flensburg district has registered no confirmed summer sightings of this species (= work that remains to be carried out). The Segeberg limestone cave is a very important roost for male Daubenton's bats even in the summer (especially in May/June).

Winter: A total of 41 winter roosts are now known. *Myotis daubentonii* is regularly sighted in 37 of them. About half of all winter roosts (n = 17) house fewer than 10 overwintering individuals. Large winter roosts, containing over 50 bats, are found in bunkers, air-raid shelters and ice cellars, in Eckernförde, Kiel, Jägerslust, Schleswig, Schönwalde and Schafstedt. The Segeberg cave (Segeberger Höhle), containing up to 8,000 counted bats, is an especially important roost. Three *M. daubentonii* individuals were found in a lethargic state during the species' normal overwintering period (16 February 2002) in a rotting hollow in a beech tree in Bad Segeberg.

Status, threats: The status of Daubenton's bat in Schleswig-Holstein is quite clear. The species reproduces in this state and regularly uses a number of winter roosts. Furthermore, the species is found in 75 % of all subterranean winter roosts. In natural areas with flowing and standing waters, the species may be considered relatively common. All in all, too little is known about this species, however, especially with regard to maternity roosts in natural tree hollows. Significantly, a winter sighting has been made in a rotting tree hollow in Bad Segeberg.

1.10 *Myotis dasycneme*, Pond bat

Brandenburg:

Status: This species is very rare in Brandenburg. As of 2000, one small maternity roost colony had been sighted, in the Ostprignitz-Ruppin district. In 2001, this colony was no longer occupied. A bat from this maternity roost was sighted in a presumed winter roost in the Harz mountains in Saxony-Anhalt; this sighting confirms the assumption that this species migrates to winter roosts within Germany's central upland areas (Mittelgebirge).

Threats: Habitat destruction, and worsening conditions in the species' hunting grounds, as a result of widespread changes in the landscape water cycles. Pesticide use in wetland areas (including use of pesticides for mosquito control).

Lower Saxony:

The population size is difficult to assess. In light of the sizes of known maternity roosts, and assuming a corresponding number of males, it currently seems that western Lower Saxony could harbour some 1,000 bats. Additional roosts have been discovered since 2000, via systematic studies, including telemetric surveys. For example, two maternity roosts and two male roosts have been discovered in western Lower Saxony. Two of these finds – one of the maternity roosts and one of the male roosts – are located in a building.

During maternity periods, Pond bats do not fly the same routes every night. They closely follow the terrain along canals and other water bodies, and may cover considerable distances between their roosts and hunting areas – in some cases, more than 20 km.

Saxony:

Individual sightings in the Rödergebiet area near Großenhain; careful searches along the Mulde and Elbe rivers have thus far been unsuccessful.

Saxony-Anhalt:

A few individuals of the species have been sighted in Harz mountain winter roosts. A long-term monitoring programme begun in 2001, in the Devonkarst area near Rübeland/Harz, has registered up to 15 sightings (= captures) during swarming periods. These included one bat banded in north-eastern Saxony-Anhalt and one banded marked in Brandenburg. One female originated from Brandenburg's first known maternity roost (DOLCH et al. 2001), while one male came from the "Schollener See" lake area in the north-eastern part of Saxony-Anhalt. The valley of Bode river near Rübeland seems to be an important mating and overwintering area for bats from north-eastern Germany.

Schleswig-Holstein:

Summer: Only a few summer sightings of the Pond bat have been reported, and all were made in the eastern part of Schleswig-Holstein. No maternity roosts of this species have been discovered to date in Schleswig-Holstein (although it is likely that such colonies exist in the state).

Recent finds of this species – involving either single bats or groups of just a few individuals, and always occurring in late summer or fall – were made in bat boxes in the Plön and Herzogtum-Lauenburg districts, via net captures at Segeberg lake, in winter roosts in the Jägerslust area and along the Elbe-Lübeck canal near Dalldorf (RZ district). Furthermore, in late summer, individual Pond bats are regularly sighted in the Segeberg cave. And additional finds of this species were made in 2002. One find occurred during an inspection conducted with Ms. HILDEGARD DIETERICH in the vicinity of Schluensee lake. On 23 October 2002, one male Pond bat and a Noctule bat were sighted in a "Stratmann" wood/concrete bat box, in a bat-box site in the "Hohe Köhlen" area. Ms. DIETERICH has reported fall sightings of individual Pond bats at intervals of about two years. On 23 October 2002, HELMUT BAHR from Tesperhude reported a find of Pond bat (sex unknown). The animal, which was in the company of a Daubenton's bat, was sighted in a 2FN bat box near the Elbe River.

Winter: In the winter of 2001/2002, bats were sighted in the Segeberg cave (small numbers of individuals were sighted upon every inspection), two individuals were sighted in the air-raid shelter in Kiel-Wik and five individuals were sighted in the winter roost in Jägerslust. Net captures made in

September in front of the winter roost in Jägerslust produced amazing results: one of the captures yielded four bats and one netted three individuals. Finally, additional winter sightings of individuals were made in Lübeck and at the Levensau viaduct.

Status, threats: As can be surmised in light of the rarity of Pond-bat sightings, almost nothing is known about the status of the bat's summer population, in particular. Since Schleswig-Holstein seems to contain suitable habitats for the bat, it seems possible that maternity roosts could be found in the state. The species' maternity roosts in Schleswig-Holstein may well be located on buildings.

1.11 *Nyctalus noctula*, Noctule bat

Baden-Württemberg:

The Noctule bat is considered a transit and winter visitor; presumably, only a small number of males of the species spend the summer in this state. A small number of summer sightings of individual females, and one find of a juvenile bat, have been made; these sightings imply that the bat reproduces to a small extent in Baden-Württemberg.

Bavaria:

Estimated population size: No reliable figures available; since 1995, seven instances of reproduction have been documented throughout Bavaria (see Tab. 8). Of these, one instance involved a single female and one involved a single juvenile bat in a colony of males.

Status: No significant since the last National Report. The maternity roosts are not regularly inspected, and thus their status is unknown. Only one maternity roost colony has been found in southern Bavaria (Sulzschneider Forst, OA district, bat box); the remaining maternity roosts are in tree hollows in the Erlangen-Höchstadt area (city of Erlangen, ERH district). During the summer there are dominantly males present in Bavaria which roost in tree holes and buildings. From August onwards there is a significant immigration from northern and north-eastern Central Europe.

In February 2003, the largest noctule-bat winter roost found in over 100 years was discovered as roof repairs were being carried out on a tall building in Schweinfurt. More than 800 bats were found in the insulation in a drop ceiling. B. CORDES, member of the Northern Bavarian Co-ordination Office for Bat Conservation, rescued the bats with assistance from the local fire department. Roosts used by many specimens for migration brakes or hibernation are known mainly from south Bavaria (ZAHN et al. 2000).

Population trend: Currently, not enough monitoring data are available to support any conclusions regarding the species' population development. On the other hand, there are no indications of any negative trends (see Tab. 30, section 15.1).

Threats: The main threats result from the species' dependence on tree hollows (cf. Daubenton's bat) and from its preference for roosts in cracks in tall buildings (buildings with such cracks are always prime candidates for renovation). In some tall apartment buildings, the bats have created disturbances for residents (noise, smells); in some cases, bats have roosted directly above residents' bedrooms. A customary means of attempting to solve such problems is to seal off the relevant roost sections (by installing covers or plates under the roofs).

Table 8: Sightings of the Noctule bat in Bavaria since 1995 (not including individual sightings outside of roosts). The extent to which the maternity-colony sightings are still relevant is not known.

Period	Winter roosts	Summer roosts	Documented instances of reproduction	Of these, maternity colonies
since 1995 or the winter of 1994/1995	88	199	7	5

Brandenburg:

Status: Nyctalus noctula has been sighted throughout the state, and its population is presumably stable at present. In the summer, it exhibits a strong preference for forests. It normally flies out in early twilight and hunts large insects above treetops. The local population migrates to winter roosts – some of which are as far away as Switzerland and northern Italy – in the fall and returns in spring. Noctule bats from north-eastern Europe also pass through Brandenburg in transit. Increasing percentages of these groups have been overwintering (or attempting to overwinter) in the state. For example, several thousand Noctule bats have been overwintering in the façade of a tall building in Potsdam. And increasing numbers of overwintering bats have been found in tree hollows in the Potsdam area in the past few years.

Threats: Overwintering bats are particularly at risk in this state. Since most of the relevant overwintering sites on buildings have probably not been discovered, many bats probably face major risks from renovation. Furthermore, many bats that overwinter in tree hollows choose trees in municipal parks, which are exposed to the warmth of the surrounding urban areas. Bats are at risk in such parks, because the trees they prefer are often felled for traffic-safety reasons (for obvious reasons, hollow trees are considered a strong risk in public parks and along city streets). The trees in question are often felled in the winter, when the bats are particularly vulnerable. Recently, there have been indications that rapidly growing numbers of wind turbines, including wind turbines near the edges of, or even in, forests (former military sites), pose a threat to the Noctule bat.

Lower Saxony:

In 2001, an important winter roost, with more than 400 bats, was discovered in an autobahn bridge on the border to North Rhine-Westphalia. Captures and banding in selected areas of Lower Saxony have indicated strongly that the state has habitats of the species and, presumably, that it contains transit routes for the species.

Saxony:

Nursery roosts (20-35 adults) have been discovered especially in flatland areas (Upper Lusatia); important overwintering sites have been discovered in rock cracks in the Sächsische Schweiz region; only small hibernating colonies have been found in tree hollows (up to 50-100 animals); no conclusions can be drawn regarding population trends.

Saxony-Anhalt:

Tree roosts have been found, in most cases in the lower stretches of the Elbe River valley (OHLENDORF et al. 2000, OHLENDORF 2001a). Sightings, including sightings pointing to reproduction, have been made in all river lowlands in flatland areas.

A remarkable find of a young Noctule bat from the Elbe-Havel-Winkel area was made in the Bergisches Land region (in North Rhine–Westphalia). The bat covered the distance in question, 360 km, in two to four days.

Schleswig-Holstein:

Summer: The Noctule bat has been sighted in all parts of the state. At the same time, the finds are concentrated especially in the eastern and south-eastern parts of Schleswig-Holstein. In these areas – in the rural districts Schleswig-Flensburg, Rendsburg-Eckernförde, Plön, Ostholstein, Lübeck and Herzogtum-Lauenburg – maternity roosts have also been discovered.

The many individual sightings that have been made indicate that more instances of reproduction will probably be discovered – at least in Schleswig-Holstein's Geest and Östliches Hügelland areas. The species' status along the state's western coast (including its islands), and in the lowlands of the lower Elbe River, is still uncertain, since only a few sightings have been made in these areas.

Winter: In Schleswig-Holstein, Noctule bats overwinter in tree hollows, bat boxes and buildings. Relevant finds have been made in the districts of Kiel, Plön, Ostholstein, Segeberg, Rendsburg-Eckernförde, Herzogtum-Lauenburg, Storman, Steinburg and Dithmarschen. In a careful search for overwintering Noctule bats in trees, carried out by members of the Working Group for Bat Conservation, turned up three tree roosts in the winter of 2001/2002 alone – in Bad Segeberg, Gudow

and Börnsen (one in each location). “Schwegler” winter bat boxes have played an especially valuable role in the search for overwintering noctule bats. The bats find these boxes so much to their liking that they occupy the boxes in considerable numbers, even when the boxes are hung closely together. The state’s largest and most important winter roost by far – and also one of the largest for this species in Europe – is the Levensau viaduct (bridge over the North and Baltic Sea Canal) near Kiel. Each year, some 6,000 individuals hibernate in the viaduct’s abutments.

Status, threats: In Schleswig-Holstein, the Noctule bat is one of the bat species for which a relatively large body of summer data has been gathered. In all likelihood, this is due to the facility with which the species can be found via use of bat detectors and bat-box inspections. Useful data for the species is also relatively easy to obtain via net captures.

A current priority for this species is thus to use the aforementioned methods to learn more about the species’ roosts in tree hollows (including winter roosts) and to shed more light on its summertime status along the state’s western coastline.

1.12 *Nyctalus leisleri*, Leisler’s bat

Baden-Württemberg:

Only a few maternity roosts of Leisler’s bat have (yet) been found.

Bavaria:

Estimated population size: No reliable figures available; since 1995, 16 instances of reproduction have been documented throughout Bavaria (see Tab. 9). The colonies comprise 10 to 40 animals; finds have been made primarily in bat boxes, although some bats have been found in tree hollows.

Status: A rare species with populations in several deciduous forests in northern Bavaria (for example, Spessart, Frankenhöhe, Steigerwald) and eastern Bavaria (Passau area). New sightings (summer roosts) have been made south of the Danube, in the Unterallgäu district. To date, no winter sightings of Leisler’s bat in Bavaria have yet been made but one (January 2003, record of a single specimen in an attic in Ansbach district).

Population trend: No significant change since the last National Report.

Threats: Leisler’s bat is still considered strongly endangered as a result of its dependence on semi-natural, old deciduous forests and parks (cf. Bechstein's bat).

Table 9: Sightings of Leisler’s bat in Bavaria since 1995. Most of the documented instances of maternity roosts have been recently confirmed (as of the end of the 1990s).

Period	Winter roosts	Summer roosts	Documented instances of reproduction	Of these, maternity colonies
since 1995 or the winter of 1994/1995	0	40	16	12

Brandenburg:

Status: This species is rare and unevenly distributed in this state and has only a few known maternity roosts. In just a few areas of Brandenburg, Leisler’s bat has been discovered in parks and oak forests (including mixed oak forests). In forests, *Nyctalus leisleri* occupies both tree hollows and bat boxes. Repeat winter finds, in southern France and Switzerland, of bats banded in the summer in Brandenburg have confirmed the assumption that this species migrates to winter roosts in areas to the south and south-west.

Threats: Leisler’s bat may also be at risk from rapidly growing numbers of wind turbines.

Lower Saxony:

Frequent finds, especially finds made with detectors, indicate that the species is not as rare in this state as was previously assumed.

Saxony:

Four maternity roosts in forest areas in western Saxony (bat boxes), and two maternity roosts in buildings (central Saxony, eastern Oberlausitz area); no assessments of population trends are possible at present.

Saxony-Anhalt:

The species prefers hilly country, and it is found throughout the Lower Harz mountains, the Harz foothills and along glacial crests. A female that had been banded in the Altmark region was captured in Spain and then recaptured in the Altmark region (OHLENDORF et al. 2000, 2001).

Schleswig-Holstein:

Summer: Leisler's bat was discovered for the first time in Schleswig-Holstein in 1993, via net capture near Gudow (RZ district). The species has been regularly captured since then – also in the Herzogtum-Lauenburg district. Since 1995, bat-box sightings have been made – also in the same part of the state – that have provided evidence of mating and indicated the presence of maternity roosts. Individual hunting bats have observed, with bat detectors, in the Segeberg and Pinneberg areas. Outside of the south-eastern part of the state, only one other individual find has been made, in the Pinneberg district.

Winter: No known finds. Presumably, *Nyctalus leisleri* does not overwinter in Schleswig-Holstein. In all likelihood, the state's Leisler's bats migrate west and south in the fall.

Status, threats: Undoubtedly, the status of Leisler's bat in Schleswig-Holstein is only incompletely understood. For example, it is highly likely, as summer finds of females clearly suggest, that maternity roosts of *Nyctalus leisleri* will be found in the south-eastern part of the state.

It is still completely uncertain whether the species has also settled in other parts of the state.

1.13 *Nyctalus lasiopterus*, Giant noctule bat

Bavaria:

Status: A rare exception in this state. One recent sighting occurred on 5 October 2001 in southern Bavaria: a seriously injured male, apparently a victim of traffic on the main road in the town of Tegernsee (MB district), was recovered, but it died on 24 October 2001 (the specimen is now in the State Zoological Collection in Munich).

1.14 *Eptesicus serotinus*, Serotine bat

Baden-Württemberg:

While several maternity roosts of the Serotine bat have been found, the roosts – according to the most recent findings – are concentrated in small areas. The threats to this building-dwelling bat species are the same as those mentioned for the Greater mouse-eared bat.

Bavaria:

Estimated population size: No reliable figures available; since 1995, a total of 65 instances of reproduction have been documented throughout Bavaria (see Tab. 10). Most of the sightings made since 1995 are considered to be still relevant. The colonies' sizes range from fewer than 10 to about 100 bats.

Table 10: Sightings of the Serotine bat in Bavaria since 1995 and since 2000 (not including individual sightings outside of roosts).

Period	Winter roosts	Summer roosts	Documented instances of reproduction	Of these, maternity colonies
since 1995 or the winter of 1994/1995	99	41	65	56
since 2000 or the winter of 1999/2000	61	11	29	29

Status: The species is only regionally common – for example, in north Swabia, parts of north-western Bavaria (Windsheimer Bucht) and along the Danube. Overall, there are many gaps in the species' distribution.

Population trend: The small numbers of Serotine bats found in the regularly inspected winter roosts support no reliable conclusions regarding the species' population development. The colonies that are checked at least somewhat regularly show no signs of population declines.

Threats: Presumably, the species is not particularly at risk in its summer roosts, since it tends to choose inaccessible cracks in roof areas for such roosts. On the other hand, no findings have yet been obtained regarding the colonies' need for a roost network in Bavaria. Such a need probably exists. Recent observations of Serotine bats overwintering in insulation in church attics indicate that the bats may well be threatened by renovation; bat conservationists normally recommend that renovation be carried out outside of maternity periods.

Berlin:

In the summer, the Serotine bat is the most common bat species in Berlin's western districts and hunting bats are sighted throughout the city. While only two maternity roosts are known, the existence of a considerable number of unknown colonies and roosts must be assumed. The unknown roosts may be threatened by construction work.

Brandenburg:

Status: The species is widely distributed in this state; its populations are common in some areas and apparently are (still?) stable. *E. serotinus* dwells almost exclusively in and on buildings in towns and farms. It very rarely occupies bat boxes. Its maternity roosts are usually located in attics – often, in ridge areas or behind wall coverings and window shutters. Winter roost sightings have been rare to date. There are indications that this species regularly overwinters in buildings – in attics, in drop ceilings and wall spaces – and that it is rather insensitive to low humidity. It hunts in park-like areas, along the edges of forests, in towns and along water bodies.

Threats: Highly endangered as a result of its strong dependence on buildings.

Lower Saxony:

In this state, a still-sizeable population, in absolute terms, seems to be declining rapidly and continuously. In the species' main ranges in Lower Saxony, gardens – which are valuable hunting areas for this building-dwelling species – continue to be paved and planted with fast-growing, non-native, ecologically valueless coniferous trees. The extent to which the bat lyssa virus has been reducing the Serotine bat population is still unclear. It has been found, however, that the virus-infection rate for this species is higher, by far, than that for any other species.

Saxony:

Populations in this state tend to be most frequent at lower elevations (for example, they are regularly found in villages in the Upper Lusatian area's pond and heath country); 99 maternity roosts are known – most of them with 30-50 females (rarely, 50-100 females); the bats are endangered by building renovations (roofs and facades); to date, 23 winter roosts known (individual bats); population trends cannot be assessed at present.

Saxony-Anhalt:

Only a few maternity colonies are known in Saxony-Anhalt. Sightings indicate that the species must be far more common than the number of known colonies would suggest.

Schleswig-Holstein:

Summer: The Serotine bat is found throughout the entire state. Still-relevant finds have been reported from all of the state's districts. A total of 30 maternity roosts – some of which are very large (some have over 100 bats) have been found in the districts Schleswig-Flensburg, Nordfriesland, Dithmarschen, Rendsburg-Eckernförde, Plön, Segeberg, Ostholstein, Lübeck and Stormarn.

Winter: Winter sightings of the Serotine bat – unlike summer sightings – are very rare. This is not unusual for this bat species, however, since it is rarely found in the state in "conventional" winter roosts (such as bunkers, cellars, caves). As a result, all reported winter finds involved overwintering individuals in above-ground roosts in or on buildings. Such finds have been reported from the districts Segeberg, Kiel (Levensau viaduct), Ostholstein (Ratekau) and Dithmarschen. A Serotine bat found in the winter of 2001/2002 in an air-raid-shelter passageway on Pilkenstrasse, in Flensburg, proved to be an exception.

Status, threats: The Serotine bat's status in Schleswig-Holstein is largely understood. It reproduces and regularly overwinters in Schleswig-Holstein. As to the threats to this quite common bat, its maternity roosts are increasingly being affected by renovation or intentional closure. Serotine bats are often a nuisance – as a result of their droppings, crawling noises and social cries. It thus seems appropriate for the species to be included in the category "near threatened" of Schleswig-Holstein's red list of mammals.

1.15 *Eptesicus nilssonii*, Northern bat

Baden-Württemberg:

A few maternity roosts of the Northern bat have been found in small regions of Baden-Württemberg.

Bavaria:

Estimated population size: No reliable figures available; since 1995, a total of 45 instances of reproduction have been documented throughout Bavaria (see Tab. 11). Most finds since 1995 are still considered relevant. Maternity colonies in Bavaria comprise ten to 100 females, although a majority (68 %) comprise between ten and 50 animals.

Status: The Northern bat is one of the most common bat species in the Bavarian Alps and in north-eastern and eastern Bavarian uplands. It seems not to be threatened there. In the summer, it is also regularly sighted in the Frankenalb and Oberpfalz/Obermain hill country areas. It is unclear why the species' distribution outside of these natural areas tends to be insular. Finds in winter roosts in northern and southern Bavaria almost always involve only a few individuals.

Population trend: Population trends cannot currently be assessed reliably.

Threats: The species' insular-pattern distribution in many parts of Bavaria may be due to an earlier population decline. Colonies that roost in building cracks are at the mercy of building residents – an instance of the destruction of a colony, or of a part of a colony, has been reported. For this reason, looking at the whole of Bavaria the northern bat is considered endangered.

Table 11: Sightings of the northern bat in Bavaria since 1995 or since 2000 (not including individual sightings outside of roosts).

Period	Winter roosts	Summer roosts	Documented instances of reproduction	Of these, maternity colonies
since 1995 or the winter of 1994/1995	46	28	45	33
since 2000 or the winter of 1999/2000	61	11	29	29

Brandenburg:

Status: The rarest species in this area. Its status is unclear; it may have migrated into the state very recently. No winter sightings have been made to date. Presumably, the bats that dwell in the state in the summer migrate to distant winter roosts. Recently, a maternity roost colony was discovered in a tree hollow in a previously known observation area, the Niederer Fläming. A juvenile bat found in the Dahme-Spreewald rural district may indicate that the species is more widely distributed than is currently known. The few roosts found to date have all been located in tree hollows. The bat apparently hunts high above towns and covers wide areas.

Threats: The northern bat hunts in areas in which wind turbines pose a threat. Presumably, its range in Brandenburg is tightly limited. Large wind farms are being planned in the species' known range, however.

Lower Saxony:

In light of the small regional coverage of known populations, and of the numbers of known maternity roosts, and including an equal number of males (i.e. equal to the number of known females), careful estimates suggest that the total population may be quite small. Current studies being carried out for a PhD thesis are expected to provide insights into the species' hunting habitats (as well as other information).

Saxony:

Maternity colonies and solitary individuals have been sighted only in mountain areas (Vogtland, Erzgebirge, Oberlausitz mountains, Zittau mountains), and regularly at elevations of at least 400 m above sea level (sometimes beginning at 280 m above sea level). Maternity colonies usually contain 30-60 adults+juv. (up to 80 adults+juv.). The species is endangered by renovation of buildings (slate and wood coverings): Its winter roosts are in mine shafts and mines; overall, the population is ± stable.

Saxony-Anhalt:

Almost the whole population is concentrated in the Harz mountain area (OHLENDORF 2001b). One captured female was found to have moved over 30 km, during the swarming period, from its banding site in the central Harz mountains to the northern Harz uplands. The presence of juveniles in the northern Harz uplands was confirmed by NICOLAI & OHLENDORF (1991). The south-easternmost populations along the periphery of the Harz mountains were found in the Gipskarst area, near Questenberg, during the 2002 swarming period.

1.16 *Pipistrellus pipistrellus*, Pipistrelle bat

Baden-Württemberg:

Pipistrelle bats dwell in cracks in buildings, in close proximity to human beings. In such habitats, they absorb large amounts of environmental pollutants with their food, pollutants that females then pass on to their young via their milk. Relatively high toxin levels have been found in analysed Pipistrelle bats, and it is very likely that a large percentage of the pipistrelle bats in Baden-Württemberg now contain high levels of environmental toxins in their bodies. Currently, relatively large populations of this species are distributed throughout the entire state. It remains to be seen how stable these populations are and what effect the conservation measures carried out in recent years will have.

Bavaria:

Estimated population size: No reliable figures available; since 1995, a total of 341 instances of reproduction have been documented throughout Bavaria (see Tab. 12). Most of the sightings since 1995 are still considered to be relevant today. As a rule, fewer than 100 individuals have been sighted in each maternity roost colony; the usual size is between 11 and 50 individuals. Only 19 maternity roosts (since 1985) are relatively large, i.e. comprise at least 150 individuals.

Now that the Soprano pipistrelle is differentiated from the Pipistrelle bat, the Pipistrelle bat's status is no longer absolutely clear, since existing status information was based on the older combined

Pipistrelle-bat sighting data. Reviews of colonies and sightings have found that *P. pipistrellus* is the far more common species, however, and thus it may be assumed that the great majority of sightings of the "Pipistrelle bat" actually involved *Pipistrellus pipistrellus*.

Status: No change since the last National Report.

Population trend: No indications of any negative population development.

Threats: The Pipistrelle bat is not endangered at present.

Table 12: Sightings of the Pipistrelle bat in Bavaria since 1995 or since 2000 (not including individual sightings outside of roosts).

Period	Winter roosts	Summer roosts	Documented instances of reproduction	Of these, maternity colonies
since 1995 or the winter of 1994/1995	63	109	341	296

Berlin:

It is not yet known whether all of the pipistrelle bats observed in Berlin belong to the species *P. pipistrellus* or whether some are members of the newly described species "Soprano pipistrelle" *P. pygmaeus*.

In the summer, the Pipistrelle bat is the most common bat species in Berlin's eastern districts, and hunting pipistrelles can be observed throughout the city. Unknown roosts are surely threatened by renovation, and thus the population is expected to be endangered in future. Since the summer of 2000, a number of maternity roosts have been found in the city's outlying western districts.

In the winter of 1999/2000, a large winter roost, containing several hundred animals, was found. The colony proved impossible to count precisely, however.

Brandenburg:

Status: In light of current differentiation of the former species into two species, no precise assessments of the population's status are possible. Presumably, the most numerous communities known in settled areas belong to the species *Pipistrellus pipistrellus*. The overwintering pipistrelle bats in Rüdersdorf, in both the open-pit mine and the industrial ruins there, are *Pipistrellus pipistrellus*. In spite of the differentiation of the two species, it is still assumed that *Pipistrellus pipistrellus* occurs in both towns and forests. In one case, recorded in a bat-box site in the Ostprignitz-Ruppin district, the two species were sighted alongside each other.

Threats: Since the species' most important habitats, presumably, are buildings, the species is highly at risk from renovation.

Lower Saxony:

It is impossible to assess the population size, although it can safely be assumed that the population has at least stabilised in large parts of Lower Saxony.

Saxony:

A total of 61 maternity roosts, with up to 195 bats, in flat, hilly and mountainous areas; winter sightings in rock cracks in the "Sächsische Schweiz" region. The species is threatened by building renovation. No conclusions about population trends can be drawn at present.

Saxony-Anhalt:

Pipistrelle bats are distributed throughout extensive parts of the state. This must be seen in light of the fact that no concerted efforts to find Soprano pipistrelles have been made, however. In one instance,

the Soprano pipistrelle was sighted in the Elbe River valley, near Burg, and then the Pipistrelle bat was sighted only 5 km away, on the moraines of the "Colbitz-Letzlinger-Heide" heath area.

Schleswig-Holstein:

Many sightings, including many finds of maternity roosts, have been reported, from a total of 10 rural districts. In late summer 2002, several invasions of Pipistrelle bats were reported in Schleswig-Holstein. The two largest involved one group of 64 individuals, in the Eiderkaserne barracks in Rendsburg, and a group of 63 Pipistrelle bats, at a private home (the BECKER family) in Lübeck. Past finds, made before a twin species – the Soprano pipistrelle (*Pipistrellus pygmaeus*) – began to be differentiated, cannot be classified with either of the two species. As a result, all known maternity roosts must now be reinspected.

A few winter roosts of *P. pipistrellus* are also known. The largest of these is the Levensau viaduct, near Kiel, which comprises some 1,000 individuals (1994). The church in Mölln, which is also thought to house one of Schleswig-Holstein's large winter roosts, was inspected in the winter of 2002, but only three individuals were found. According to the local sexton, only in very cold winters do large numbers of bats overwinter in the church. Another winter roost, with an unknown number of bats, is located in the bicycle cellar of a school in Meldorf.

Status, threats: A large number of sightings, including many finds of maternity roosts, have been reported, from a total of 10 rural districts.

1.17 *Pipistrellus pygmaeus*, Soprano pipistrelle

Baden-Württemberg:

The first reliable find of a living Soprano pipistrelle, a mysterious twin of the Pipistrelle bat that had long remained undiscovered, was not made in Baden-Württemberg until 1999 (cf. BRAUN & HÄUSSLER 1999). Studies of the distribution, biology and ecology of this "new" species were immediately initiated and are still underway. Due to a lack of data, it is still impossible to estimate the Soprano pipistrelle's population size or assess its population trends.

Bavaria:

Estimated population size: No reliable figures available.

Status: Since the appearance of the last National Report, reliable sightings of the Soprano pipistrelle were made at a number of locations in Bavaria. Table 13 lists the relevant locations. The species is relatively common especially in Nuremberg, and it must be assumed that it is distributed throughout Bavaria and reproduces throughout the state.

Table 13: Sightings of the Soprano pipistrelle in Bavaria 1998-2002.

Date	Place	Status	Roost type, circumstances	Number, sex	Remarks/ source
15.8.1998 30.7.1999	City of Bayreuth: Eremitage	Summer or mating roost	Regularly seen in the fall in bird nesting boxes; large, semi-natural park with many small and large water areas	1 M, 1 F	KOCH & V. HELVERSEN (2000)
7.9.1998	Rhön uplands near Waldfenster (Schwärzelbach) (NES)	Hunting area	Evening flights over the edge of a mixed forest (recordings)		O. V. HELVERSEN

Date	Place	Status	Roost type, circumstances	Number, sex	Remarks/ source
	City of Nuremberg:				
1.3.2000	Schmausenbuck Bingstraße, Altenstift	Individual	Entry via an elevator shaft	1 M, 3 F	M. KRAUS
18.8.2000 29.9.2000	Dutzendteich, South shore of Silbersee lake and northern shore of Wöhrder See lake	Hunting area	Detector observation (recording)	1 40	B. CORDES
21.8.2000	Vocational training centre	Individual		2 M, 1 F	B. CORDES
23.2.2001	Cramer-Klett Park	Winter roost	Behind the peeling bark of an old maple tree; together with a Nathusius' bat female	1 F	B. CORDES
24.8.2000	City of Ansbach: Edge of the Silberwald forest, north of the Silberbachweiher pond	Summer roost	Schwegler bat boxes	3	B. WALK B. ZACHARIAS
24.7.2001	Neuburg/Danube (ND): city centre	Individual	Entry into an apartment	1 M	B. SCHWARK, C. LIEGL
21.6.2002	Herrenchiemsee (RO)	Hunting area	Detector observation (recording)		K. SCHORR
	City of Landshut:				
28.6.2002 8.7.2002 12.7.2002 13.7.2002	Old city Freihung district Old city (centre) Neustadt	Individuals/ documented instances of reproduction	Had just learned to fly	1 F, juv. 1 M, juv. 1 F, juv. 1 M, juv.	M. LEITNER, C.& M. WINKLER, A. ZAHN
21.7.2002	Manteler Forst (forest near Weiden/Opf. (NEW)	Male roost, maternity roost ?	Bat boxes and flat boxes near hunters' lookouts	Indiv. M, adult and juv. F	R. LEITL
26.9.2002	Hohenwart near Klosterberg (PAF)	Dead animal		1 M	G. MAYER, F. SEIDLER, C. LIEGL
December 2002	City of Nuremberg: Schmausenbuck Bingstraße, Altenstift	Winter roost	Entry from exterior sheathing into stairway, together with 40 *P. pipistrellus*	60	B. CORDES
20.12.2002	City of Nuremberg, Amtsgericht, Flaschenhofstraße	Winter roost	Dead animal under a known *P. pipistrellus*-winter roost	1 F	B. CORDES

Brandenburg:

Status: Distribution not yet precisely known; presumably, occurs throughout the entire state and is not rare. To date, three well-populated maternity roosts have been discovered (TF, UM and OHV districts); all are in solitary farms. The presence of a maternity roost colony is suspected in one bat-box site (OPR district). To date, no overwintering bats have been found.

Threats: Presumably, the species is at risk from building renovation.

Hesse:

Reliable summer sightings of the newly discovered Soprano pipistrelle have been made in the rural districts Werra-Meißner, Gießen and Groß-Gerau. For years, one maternity roost colony has been in existence behind the exterior facade of a forest-ranger house in the Kühkopf European Nature Reserve.

Lower Saxony:

The species has been sighted in several areas of Lower Saxony.

Saxony:

Two maternity roosts (north of Dresden and in the pond landscape of the Upper Lusatian area), with up to 115 animals; additional sightings in the Rödergebiet area and in the Leipzig floodplain forest; no assessments of population size and trends are currently possible.

Saxony-Anhalt:

Although no systematic searches for the Soprano pipistrelle have yet been carried out, the bat has been sighted in the Elbe River valley near Burg.

Schleswig-Holstein:

Because the species has been only recently described, few occurrences of the Soprano pipistrelle have been reliably documented. Sightings have been reported from the Segeberg, Herzogtum-Lauenburg, Plön, Schleswig-Flensburg and Rendsburg-Eckernförde districts.

Apparently, this species' maternity roosts are concentrated in the eastern part of the state. Reports of maternity roosts have thus far been received only from the districts Rendsburg-Eckernförde (Westensee), Plön, Stormarn, Schleswig-Flensburg, Segeberg and Lübeck. The largest known maternity roost, which is located in Malente, harbours some 500 Soprano pipistrelles.

Status, threats: The available body of data is very limited and cannot support any relevant conclusions. The main threat is probably roost destruction.

1.18 *Pipistrellus nathusii*, Nathusius' bat

Baden-Württemberg:

Nathusius' bat is sighted mainly during fall and spring migration periods, in the riparian meadows along the Rhine and in other riparian areas throughout the state. Considerably fewer bats are sighted in the summer, and those that are sighted are almost all males. No instances of reproduction have been documented.

Bavaria:

Estimated population size: No reliable figures available (see Tab. 14). Most of the sightings made since 1995 are still considered to be relevant today. In 2000 and 2001, the existence of a documented maternity roost colony was documented, the first such colony seen in many years. Prior to this sighting, only one maternity roost colony had been found, by ISSEL et al. (1978), and one instance of reproduction (other than a colony) – as evidenced by a juvenile bat in the Aischgrund area – had been documented. The newly sighted colony occupies a crack between fascia on a building near Lake Chiemsee (ZAHN et al. 2002) and comprises 200 adult animals.

Status: Current instances of reproduction have been documented, and the bat still occurs regularly in Bavaria as a transit guest and winter guest.

Threats: Forest-management measures, along with water-body maintenance and traffic-safety measures, are potential threats, in light of the species' dependence on tree hollows near water and in forests.

Table 14: Sightings of Nathusius' bat in Bavaria since 1995 (not including individual sightings outside of roosts).

Period	Winter roosts	Summer roosts	Documented instances of reproduction	Of these, maternity colonies
since 1995 or the winter of 1994/1995	17	68	1	1

Brandenburg:

Status: Apparently, the species is unevenly distributed in Brandenburg – it tends to be most common in some northern areas. Presumably, the population is stable at present. In September/October, the entire local population migrates to winter roosts to the south-west – to milder areas no further away than southern France. Migrations of over 1,000 km have repeatedly been documented. The bats return in April/May. Bats from the Baltic and Poland migrate through Brandenburg. A few of these bats attempt to overwinter in the state (in large cities, which are milder in the winter?). At least in summer, *P. nathusii* is very much a forest bat, and it roosts in tree hollows and bat boxes. Its hunting biotopes including forests, forest periphery and water bodies.

Threats: In the past, the species was threatened by use of chemical pesticides in forests. *Pipistrellus nathusii* may now also be considerably threatened by wind turbines.

Lower Saxony:

There is no recent information about the population size. However, the conservation status as reflected by the current red list category will be revised.

Saxony:

To date, only a few documented instances of reproduction (1957, females in a whiskered-bat colony; 1999, a still flightless juvenile in a bat box) in the Upper Lusatian area; transit guests and mating roosts regularly found in lower and middle elevations; a few documented instances of overwintering individuals (for example, in an old oak in a Dresden park).

Saxony-Anhalt:

Instances of reproduction have been documented in the Elbe River valley, downriver from Dessau. The species also reproduces in the "Mildeniederung" and "Landgraben-Dumme-Niederung" lowland areas. In Saxony-Anhalt, the species' central-European reproduction distribution limit seems to run between Dessau and Salzwedel (B. OHLENDORF et al. 2002).

Schleswig-Holstein:

Summer: Nathusius' bat has been sighted in all parts of the state. Maternity colonies have been found in the Plön and Herzogtum-Lauenburg districts, in boxes and, less often, buildings. To date, only one maternity roost has been found in a tree hollow, in Bad Segeberg. Mating roosts have been discovered in the districts Segeberg, Plön, Ostholstein, Lübeck and Rendsburg-Eckernförde.

Winter: Little winter data has been gathered for this species. Individuals have been sighted only in the Herzogtum-Lauenburg district (bat boxes), in Kiel (buildings) and in Segeberg (Kalkberg cave, Groß Rönnau, Bornhöved). In mid-November 2002, a single Nathusius' bat was found, in Bad Segeberg, that a homeowner had inadvertently brought into his house along with fireplace logs from the garden. Significantly, a number of finds of single bats have occurred in recent years. Most of these finds involved males and most, like the bat in Bad Segeberg, were made in piles of firewood. Since such finds are still quite rare, it must be presumed, in light of the paucity of data gathered overall, that Schleswig-Holstein's Nathusius' bats leave the state in the winter.

Status, threats: Most of the Nathusius' bat roosts found have been found in the eastern and south-eastern parts of Schleswig-Holstein. The situation with regard to maternity and mating roosts is unclear in the rest of the state. As to the winter population, its roost requirements suggest that

researchers will have to continue to depend on chance finds. Winter finds of Nathusius' bats on buildings and in wood piles have been regularly reported in recent years.

1.19 *Pipistrellus kuhlii*, Kuhl's pipistrelle

Baden-Württemberg:

Only a few sightings of Kuhl's pipistrelle have been made in Baden-Württemberg (including finds of still-flightless juveniles), and existing sightings have all been made in the southern part of the state (especially in the Konstanz area). Future studies will focus on the extent to which the species has been expanding its range and is establishing populations in Baden-Württemberg, as well as on the existing and potential threats to Kuhl's pipistrelle.

Bavaria:

Status: The species now occurs regularly in Augsburg and Munich; presumably, it is also found in other parts of southern Bavaria. In 2002, the first instance of a maternity roost colony was documented, in the centre of Augsburg (Tab. 15). Instances of reproduction have also been documented in recent years in Dachau and Munich.

Population trend: Positive, did not enter Bavaria until the 1990s.

Threats: To date, no recognisable threats.

1.20 *Vespertilio murinus*, Parti-coloured bat

Baden-Württemberg:

Individual Parti-coloured bats, including an occasional juvenile bat, are sighted throughout the entire year, and groups of males are sighted in the summer. No indications of any maternity roosts have been obtained, however. The Parti-coloured bat prefers building roosts.

Bavaria:

Estimated population size: No reliable figures available; since 1995, a total of six instances of reproduction throughout Bavaria have been documented (see Tab. 16). The bat's colonies comprise 10 to 50 animals. Most of the summer roosts sighted are male roosts. Since 1985, a total of 19 male colonies, containing at least 50 bats, have been discovered. For eight of these, data has been collected during the period 1999 to 2002. Most of the other summer roost sightings (Tab. 16) involve male roosts with fewer than 50 bats.

Status: By far the largest percentage of sightings are sightings of individual bats. Since 1985, a total of 119 such sightings have been made during summer months (April to October) and 82 have been made during winter months (November to March). While most colonies have been found in eastern and southern Bavaria, individuals are found throughout all of Bavaria. Winter roosts, which are seldom found, are usually occupied by single bats and are usually located in cracks in subterranean walls or on historic buildings. Bats often fly into buildings during the winter months; this indicates the presence of winter roosts cities, on buildings.

Population trend: It is not possible at present to assess the bat's population trends.

Threats: The species roosts in cracks in buildings and thus is at the mercy of building residents/owners. Two of the few known maternity roosts in Bavaria were destroyed in the early 1990s (renovation and demolition). The continually used roost of one of these colonies was rediscovered telemetrically, in a neighbouring community, during a conservation project carried out by the lower-level nature conservation authority of the Neustadt/Waldnaab district.

Table 15: Sightings of Kuhl's pipistrelle in Bavaria.

Date	Place	Status	Number, sex, age	Source/remark
8.10.1996	Munich; Microbiol. Inst., Univ. Vet. Clinic	Single individual	1 M	MESCHEDE et al. (1998)
19.2.1999	Munich-Bogenhausen; Cosimabad	Single individual	1 M	H. HOFFMANN, A. MESCHEDE
15.1.2001	Munich; near Nymphenburg castle	Single individual	1 M	H. HOFFMANN, A. ZAHN
16.7.2001	Munich-Ramersdorf; elementary school near the church	Single dead bat	1 M, adult	M. KISTLER, A. ZAHN
26.7.2001	Munich-Untergiesing; near Isar River	Documented instance of reproduction	1 F, juv., flightless	M. KISTLER & R. WEID; first documented instance of reproduction in Bavaria
June/July 2002	Augsburg-Oberhausen; shutter box of a multi-storey apartment building	Nursery	6–16	C. LIEGL & F. SEIDLER; first maternity roost in Bavaria
6.8.2002	Karlsfeld (DAH)		2 F, juv., able to fly	M. KISTLER; flew into an apartment
16.8.2002	Munich; interior court on Klenzestraße	Documented instance of reproduction	1 M, juv., still a weak flyer	D. RUPP
23.8.2002	Augsburg; Rathaus	Single individual,	1 F, adult	C. LIEGL; flew into an office
11.2.2003	Munich-Haidhausen; near Isar River and Maximilianeum	Winter roost	6 F	M. KISTLER & A. ZAHN; roost in a wall space under an inside wooden ledge in a stairway (4th floor); found during renovation; together with a pair of Nathusius' bats

Table 16: Sightings of the Parti-coloured bat in Bavaria since 1995 or 2000 (not including individual sightings outside of roosts).

Period	Winter roosts	Summer roosts	Documented instances of reproduction	Of these, maternity colonies
since 1995 or the winter of 1994/1995	1	46	6	3
since 2000 or the winter of 1999/2000	0	21	3	1

Brandenburg:

Status: Very rare species. Most sightings involve individuals in cities. To date, a number of additional individual sightings have been made, in various parts of the state. These sightings prove that the species is more widely distributed than was previously thought. Previously, only one maternity roost had been sighted, in an attic west of the city of Brandenburg, and all other sightings were of individuals. A juvenile bat sighted in Prenzlau indicates the presence of an additional reproduction site. At least one other maternity roost colony has now been documented, in the Dahme-Spreewald district. One male roost is known in the same area. Initial analyses of the bats' food indicates that they tend to hunt above water bodies. Remote finds of two bats banded in the maternity roost in the

Dahme-Spreewald rural district have now been reported. Both of them were found in Hamburg, thereby indicating that the bats – surprisingly enough – migrated in a north-westerly direction.

Threats: The bats are highly at risk from renovation, since their maternity roosts and interim roosts are found only in and on buildings.

Lower Saxony:

Individuals are infrequently sighted. Sightings have been growing more regular, however, presumably as a result of better understanding of the species. The species is sighted on tall buildings, especially in the fall. No fundamentally new findings about the species have been obtained, however.

Saxony:

Nursery roost in Plauen (first documented instance of reproduction in Saxony); frequent individual sightings in late summer and fall (in/on buildings), especially in large cities; a few documented instances of overwintering, especially in rock crevices in the "Sächsische Schweiz" region.

Saxony-Anhalt:

The species has been sighted especially in the city of Magdeburg. No roosts have yet been found, however. One bat found in the city of Magdeburg, and then cared for in the Magdeburg zoo, was found in the Bonn region a short time later.

Schleswig-Holstein:

Summer: Since 1985, a number of sightings of individual Parti-coloured bats have been reported in Schleswig-Holstein (Plön, Rendsburg-Eckernförde, Pinneberg, Ostholstein and Lübeck districts). In 1999, following numerous individual sightings, and the discovery, in 1998, of a building roost in Lübeck/Stockelsdorf, the presence of a maternity roost colony was confirmed – the first ever confirmed in Schleswig-Holstein. Unfortunately, the roost was destroyed later via renovation (2000). No confirmed sightings of the Parti-coloured bat were made in the following years. In late summer 2002, a juvenile male was found in the same street in which the maternity roost had been destroyed in 2000. This indicates that a maternity roost colony probably still exists in the immediate vicinity. Unfortunately, the young bat was not found until August, which means that the search for the "new" maternity roost cannot begin until 2003. In August 2002 in Lübeck, two additional sightings of individual juvenile parti-coloured bats were made (one male and one female).

Winter: In spring 2002, a Parti-coloured bat from the Kiel area was brought to Dr. PETER BORKENHAGEN.

Status, threats: It currently seems that while the Parti-coloured bat is very rare in Schleswig-Holstein, there are additional, unknown reproduction sites of this species.

1.21 *Plecotus auritus,* Brown long-eared bat

Berlin:

Brown long-eared bats are found in nearly all inspected winter roosts. This is due especially to the bats' ability to find and occupy new roosts very quickly; Brown long-eared bats are among the first species to occupy newly established (i.e. by human beings) winter roosts. In winter 2001/2002, a total of 160 Brown long-eared bats were counted in 22 roosts (in 2000/2001, 149 individuals were counted in21 roosts). The most important roosts include the Tegel water works (45 individuals), Friedrichshagen (35 individuals) and, presumably, Fort Hahneberg. In the summer, the species is regularly sighted only in Berlin's forests. The population seems stable at present.

Bavaria:

Estimated population size: No reliable figures available; since 1995 202 instances of reproduction have been documented throughout Bavaria (see Tab. 17). Most of the sightings since 1995 are still considered to be relevant today. The Brown long-eared bat is the bat species with the widest winter distribution in Bavaria and the species most often sighted in the winter in Bavaria.

Status: No change since the last National Report. The Brown long-eared bat settles in both towns and forests (including all types of forests). Where large numbers of bat boxes are available, it also settles in conifer monocultures – for example, in those of the Heidecker and Röthenbacher forests (RH district) – in densities of between three and nearly seven animals per 100 ha.

Population trend: No change since the last National Report.

Threats: The Brown long-eared bat is currently considered not endangered. In forests, it is strongly dependent on bat-box roosts, however.

Table 17: Sightings of Brown long-eared bats in Bavaria since 1995 or 2000 (not including individual sightings outside of roosts).

Period	Winter roosts	Summer roosts	Documented instances of reproduction	Of these, maternity colonies
since 1995 or the winter of 1994/1995	865	163	202	175
since 2000 or the winter of 1999/2000	480	26	49	43

Brandenburg:

Status: One of the most common bat species in Brandenburg. Presumably, its population is stable at present. *P. auritus* settles in towns, park-like landscapes and closed forests. The bats hunt above water bodies. Nursery roosts of the species have been found in and on buildings, in both towns and solitary farms, and in tree hollows and bat boxes. Winter roosts usually contain only a few individuals. The bats choose a wide range of different types of sights for their winter roosts, including house cellars, well shafts, attics, stalls, bunkers, tunnels, etc..

Threats: The species is at risk as a result of its use of man-made structures for its summer and winter roosts.

Lower Saxony:

The species occurs regularly. Its population size has apparently not changed – i.e. its numbers cannot be estimated. A growing body of evidence indicates that no Brown long-eared bats are found in forest areas in which Bechstein's bat regularly occurs. This brings up the question of whether the two species are competitors in any way.

Saxony:

Frequent sightings of maternity roosts, throughout a spectrum of elevations ranging from lowlands to mountains; threatened by renovation of buildings (especially roof renovations and remodeling of attic spaces), overwinters predominantly in mine shafts and cellars, population ± stable.

Schleswig-Holstein:

Summer: Summer sightings have been reported from almost all parts of the state. On the other hand, significantly fewer sightings have been reported from the northern and western parts of the state than from the central and eastern parts. Whereas sightings in the former group of areas have usually been individual sightings, in the districts Rendsburg-Eckernförde, Plön, Ostholstein, Lübeck, Steinburg, Segeberg and Herzogtum-Lauenburg maternity roosts of *P. auritus* have also been found – almost always in bat boxes. And yet Brown long-eared bats are not found in every bat-box site and forest. For example, in 2002 no Brown long-eared bats were sighted in bat-box sites, some of which are very large, in the following forest areas: Illoer Forst, Sehestedt, Schleswig Forst, Schuby Forst and Rehberger Forst. To date, few maternity roosts have been found in buildings.

Winter: A total 38 winter roosts of the Brown long-eared bat have been sighted in Schleswig-Holstein; these are distributed throughout the districts Flensburg, Schleswig-Flensburg, Rendsburg-Eckernförde,

Dithmarschen, Kiel, Plön, Segeberg, Ostholstein, Lübeck, Steinburg and Herzogtum-Lauenburg. As expected, since this species is considered to be one of the first to occupy potentially suited underground spaces, the numbers of individuals counted in these roosts were rather low. A total of 10 or more (max. of 15) individuals were counted, in a single daily inspection, only in an air-raid shelter in Kiel, an ice cellar in Mönchneversdorf (OH), a roost in Großhansdorf (OD) and a roost in Büchen (RZ).

Status, threats: The Brown long-eared bat is one of the more frequently documented bat species in Schleswig-Holstein. Nonetheless, the status of the species is still uncertain in some parts of the state. This is especially the case in the western parts of the state. Additional research is required in these areas, especially in cases involving protection of summer roosts on buildings (and in tree hollows), roosts about which very little is known to date.

1.22 *Plecotus austriacus*, Grey long-eared bat

Baden-Württemberg:

Only a few reproducing colonies of the Grey long-eared bat have been discovered. To date, the populations of the species, which declined drastically from the 1950s to 1970s, have not yet recovered noticeably. Since the species is found primarily in building roosts at lower (and thus more densely populated) elevations, threats of roost loss persist and have not diminished.

Bavaria:

Estimated population size: No reliable figures available; since 1995, a total of 45 instances of reproduction have been documented throughout Bavaria (see Tab. 18). Most of the sightings since 1995 are still considered to be relevant today. The colonies are small; the largest maternity roost in Bavaria comprised 40 maternity-colony animals.

Status: No change since the last National Report.

Population trend: There are no indications of any negative population development; on the other hand, the species is not monitored regularly.

Threats: As a result of its strong dependence on buildings, in both summer and winter months, the Grey long-eared bat is especially sensitive to human interventions, whether use-related disturbances or usage changes.

Table 18: Sightings of the Grey long-eared bat in Bavaria since 1995 or 2000 (not including individual sightings outside of roosts).

Period	Winter roosts	Summer roosts	Documented instances of reproduction	Of these, maternity colonies
since 1995 or the winter of 1994/1995	164	36	45	73
since 2000 or the winter of 1999/2000	79	6	10	10

Brandenburg:

Status: P. austriacus reaches the boundary of its range in Brandenburg, north of Berlin. Within its range, it is widely distributed, with apparently stable (still?) populations at present. The species is warmth-loving, and in Brandenburg it has been sighted almost exclusively in settled areas. Its roosts are located in attics and churches and on buildings (for example, behind wall coverings and window shutters). Its winter roosts usually contain only a few animals, usually in combination with *P. auritus*. The species prefers to hunt in well-structured cultural landscapes, as well as in settled areas and their periphery.

Threats: The species is particularly endangered as a result of its dependence on man-made structures.

Lower Saxony:

Regular, although relatively rare, sightings of this species are still reported. Evidence of a maternity roost has been found in the form of a single dead juvenile bat. The population size is still unknown but presumed unchanged. Populations of the species are found only in southern Lower Saxony.

Saxony:

Maternity colonies have been found especially in lowland areas; threats from renovation; at present, no documented instances of overwintering in mountain areas; population trends cannot be assessed at present.

1.23 *Barbastella barbastellus*, Barbastelle bat

Baden-Württemberg:

Increasing numbers of overwintering Barbastelle bats have been found in recent years, as well as increasing numbers of hunting animals of the species. No maternity roosts have been found, however.

Bavaria:

Estimated population size: > 1,000 (winter population only).

Status: Since 2000, seven new maternity roosts have been discovered, and two instances of reproduction have been indirectly documented. All in all, a total of 21 maternity roosts have been found since 1985, of which 15 have been recently reconfirmed. In addition, six instances of reproduction outside of roosts have been documented (Tab. 19, 20). One maternity roost in the KU district that was discovered in 2000 was destroyed through construction (outside of the maternity roost period). In 2001, another colony – presumably, the same as the first – was sighted in the same place. A particularly significant find was made in May 2002: a colony was discovered in a flat box in the Gramschatz Forest, an extensive beech-oak forest near Würzburg. This colony, whose continuing existence was confirmed in 2003, is the only known maternity roost in a forest area.

Additional sightings, from 2001 to 2003, of Barbastelle bats in northern Bavarian deciduous forests (Guttenberg Forest south of Würzburg, Bayerischer Wald National Park, Ebrach Forest [BA district], Frankenhöhe [NEA district]) presumably indicate that the species is more common than was previously assumed. Careful follow-up searches of barns in the Kulmbach area, in 2001 and 2002, led to the discovery of four colonies and several summer roosts of single animals. The roosts are located behind overlapping boards and are relatively easy to spot as a result of the light colour of the wood in the entry slits.

The Barbastelle bat is still sighted regularly in northern Bavarian winter roosts; in certain areas, it is sighted frequently: in the Rhön-Grabfeld district, for example, it was the most common species in winter roosts, after the Greater mouse-eared bat, in the past two winters.

Population trend: Summer roosts: No change since the last National Report. Winter roosts: Trends in permanently monitored winter roosts have been predominantly positive (Tab. 21). In the last three winters, the population in the Bodenmais mine shaft reached 579, 553 and 523 animals; in the Angerloch area in the Alps (GAP district), it reached 21 bats in 2001/2002 and 22 bats in 2002/2003. No monitoring was carried out in this area in 2000/2001. Additional important roosts are listed in Table 21.

Table 19: Sightings of the Barbastelle bat in Bavaria since 1995 or 2000 (not including individual sightings outside of roosts).

Period	Winter roosts	Summer roosts	Documented instances of reproduction	Of these, maternity colonies
since 1995 or the winter of 1994/1995	217	14	23	15
since 2000 or the winter of 1999/2000	109	9	18	15

Table 20: Instances of reproduction of the barbastelle bat in Bavaria 2000-2002, which were reported during the period covered by this report.

Place	District	Date	Number	Roost	Source
Documented instances of maternity roosts					
Vagen	RO	5.6.2000	6	Wooden sheathing, apartment building	A. ZAHN
Katschenreuth 1 (Grünbaum)	KU	14.7.2001	20	Wooden sheathing, apartment building	F. MATT & C. STEMMER
Katschenreuth 2	KU	9.7.2002	18	Board wall, 2 barns	C. STEMMER
Böbing-Kirnberg	WM	22.8.2001	42	Window shutters, apartment building	Coord. southern Bavaria
Gramschatzer Wald	WÜ	13.5.2002	40-50	Flat box, deciduous forest	G. KERTH
Dörnhof	KU	15.6.2002	28	Board wall, barn	C. STEMMER
Katzenlohe near Thurnau	KU	30.7.2002	12	Board wall, barn	C. STEMMER
Documented instances of reproduction					
Prechhausen	DEG	18.6.2001	2	Lactating females (traffic victim and net capture)	S. MORGENROTH
Surheim	BGL	18.5.2001	1	Pregnant female	G. REITER & T. HÜTTMEIER

Threats: The Barbastelle bat is still considered highly endangered. In former times, it was probably found throughout the state, but now there are large gaps in its range, especially in central Bavaria and the northern part of southern Bavaria (for example, Swabia). The largest threat is considered to be a lack of natural roosts in forests, i.e. of old and dying trees with bark roosts (cf. also 1.5 Bechstein's bat). The Barbastelle bat seems to be more susceptible than other species to road traffic. Since 1989, a total of 12 individuals have been found along roads in Bavaria, a number that represents 13 % of all known traffic victims since 1950 (n = 93). Only the Brown long-eared bat has a higher corresponding statistic: 17 victims.

Table 21: The most important winter roosts of *Barbastella barbastellus* in forts, castles and tunnels in Bavaria; censuses as of 1995/96; n.i. = not inspected.

Place (city or district)	1995/ 1996	1996/ 1997	1997/ 1998	1998/ 1999	1999/ 2000	2000/ 2001	2001/ 2002	2002/ 2003
Fort Marienberg (Würzburg)	19	18	n.i.	n.i.	n.i.	> 10	17	n.i.
Schönrain ruin (MSP)	12	15	8	n.i.	3	n.i.	22	33
Plassenburg (Kulmbach)	n.i.	29	n.i.	n.i.	n.i.	7	22	26
Fort Rosenberg (Kronach)	18	24	14	20	10	7	8	18
Salzburg ruin (NES)	7	8	8	5	4	5	8	11
Huflar castle (NES)	17	18	4	6	9	14	20	17
Lichtenburg (NES)	5	7	6	3	1	4	4	9
Veste Coburg	n.i.	12	12	n.i.	9	10	9	9
Stein a. d. Traun (castle; TS)	n.i.	n.i.	5	5	6	1	1	1
Tunnel 1 (northern Bavaria)	12	15	10	3	5	19	49	45

Place (city or district)	1995/ 1996	1996/ 1997	1997/ 1998	1998/ 1999	1999/ 2000	2000/ 2001	2001/ 2002	2002/ 2003
Tunnel 2 (northern Bavaria)	5	9	2	6	1	10	9	6
Tunnel 3 (southern Bavaria)	3	n.i.	n.i.	4	6	6	5	3
Tunnel 4 (southern Bavaria)	n.i.	n.i.	n.i.	3	9	9	25	18

Brandenburg:

Status: To date, nearly all districts have reported individual winter sightings. The sightings from the Prignitz, Ostprignitz-Ruppin, Oberhavel and Uckermark areas are the northernmost sightings throughout the bat's range. The significant numbers of overwintering bats within the species' areas of densest concentration, in the Teltow-Fläming district – with up to 150 bats in the Merzdorf bunker complex alone – indicate that the population has been increasing slightly. Maternity colonies have been sighted only in the south-eastern part of Brandenburg. Recently, additional maternity roosts have been sighted, and now at least 5 maternity roosts are thought to exist. It is difficult to determine the exact number of maternity roosts involved, since the bats often move between roosts, especially roosts in trees. In general, the bats locate their roosts mainly behind loose bark on standing dead trees, but they also settle on buildings and in tree hollows. Winter roosts usually contain just a few bats, and the bats normally do not enter winter roosts until the onset of severe frost. More winter roosts have been found in southern Brandenburg than in the northern part of the state. To date, little evidence has been found in Brandenburg to support any conclusions regarding relationships between summer and winter roosts. There is some evidence that females hibernate in the immediate vicinity (no more than 20 km away) of their maternity roosts. Males migrate up to 70 km to reach their winter roosts. Observation of roosts in buildings in the Spreewald area has confirmed earlier observations indicating that the bats often change roosts and, as we know from other studies, also do so during maternity periods. The species hunts most often in structurally rich coniferous and mixed forests, although it also hunts along forest periphery, rural avenues and shoreline trees.

Threats: Apparently, the most important roosts are located in standing dead trees, and thus forest management represents a threat.

Hesse:

While the Barbastelle bat was considered nearly extinct in Hesse in the early 1990s, since 1994 a steady stream of sightings have been made in winter roosts in the Upper Lahntal. In 1998, a maternity roost colony was discovered in the same area, a colony that proved to be among the largest maternity roosts known in Germany.

Lower Saxony:

The species' population size, like the sizes of all bat populations, is very difficult to determine. Since only a few groups have been documented in Lower Saxony, only an approximation can be given for this species. A total of 13 bats were sighted in two winter roosts and in front of a cave (during swarming). Other individuals have been counted along a flight path, bringing the total number of bats sighted to about 15. The species is also found in the summer in Lower Saxony, and it seems to occur most frequently in the south-eastern parts of the state. On the Thuringian side of the border, at about the same latitude, there may be a larger Barbastelle population that corresponds with that in Lower Saxony. In summer 2001, attempts were made to capture and telemetrically detect the bats, but all of these efforts failed.

Saxony:

Occurs most frequently in foothills of central German uplands (Mittelgebirge). Maternity colonies, with 10-30 adult+juv., are found on buildings and in bat boxes (forest areas in western Saxony). Winter roosts are found in discharge tunnels of railway embankments, mine shafts, decommissioned mines and cellars, and some are endangered by renovation (repair of crumbling stone walls). The population seems to be stable at present. In the past, a considerable decline was documented, especially in the eastern part of Saxony. Substitute roosts on buildings need to be provided.

Saxony-Anhalt:

In long-term monitoring carried out since 2002, in connection with designation of the "Karstlandschaft Südharz" Biosphere Reserve, important populations have been found in the Karst area. To date, no instances of reproduction have yet been documented, although data have been collected during swarming phases and in winter roosts.

2. General population situation and trends

2.1 Population trends

Bavaria:

During the reporting period, no negative population trends were reported, for any species, that would exceed populations' natural fluctuations. Data for nine species, as well as for the group consisting of the two "whiskered" species (Whiskered bat and Brandt's bat), are collected by the winter-roost monitoring programme of the co-ordination offices for bat conservation (see Fig. 5). These random-sample counts are extensive enough to support conclusions regarding winter-roost population trends for species other than the Grey long-eared bat, Bechstein's bat, Serotine bat and Northern bat, of which only a few individuals are encountered in roosts each year. Since winter 1985/86, when regular, wide-area counts began, positive trends have been seen for Daubenton's bat, the Greater mouse-eared bat, Brown long-eared bat, Natterer's bat and the "whiskered" species (probably primarily the Whiskered bat), although some considerable annual fluctuations have occurred, primarily as a result of weather (fewer individuals are sighted in roosts during warm weather than during cold weather). The Barbastelle bat population seems to be constant, at least in the winter roosts (Fig. 12).

Monitoring of summer roosts of the Lesser horseshoe bat, Greater mouse-eared bat and Geoffroy's bat, which covers much higher numbers of individuals, shows that trends for these species are constant or positive. The same results have been obtained for the small population of the Greater horseshoe bat (see Fig. 1-3 and 8). These positive results have been achieved partly through effective monitoring of the roosts of the aforementioned species, a policy which has included regular (at least annual) contacts to the administrators, owners or residents of the buildings in question, aimed at cultivating awareness about the bat colonies' protection needs. Such contacts play a lesser role in connection with winter roosts, especially the many beer cellars, mine shafts and caves where such roosts are located. Many of these sites are open to the public, although the most important (most populous) roosts, such as the Barbastelle bat roosts listed in Table 21, are normally protected: either through public-access restrictions (buildings) or through gates or grills.

In all likelihood, the positive population trends for most species are also a result of global warming.

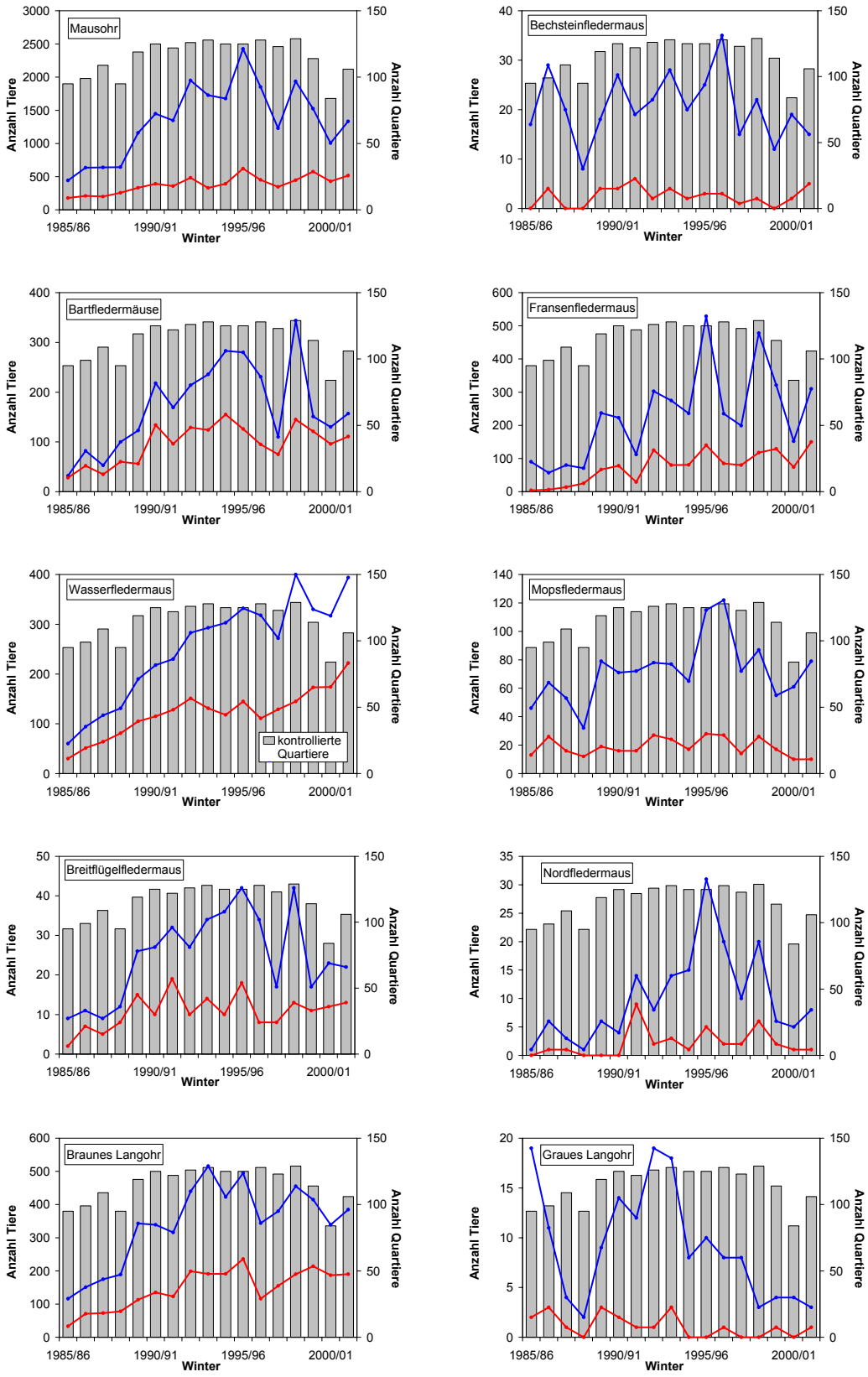
Brandenburg:

Formulation of development aims for the bat species listed in Annex II of the EU Habitat Directive has made possible positive long-term development of bat populations.

Hesse:

The increase in numbers of bat sightings in Hesse is more the result of increased mapping and improved detection methods than of measurable population changes. Only for the Greater mouse-eared bat, a well-counted and long-monitored species (monitored for years; counted in both maternity roosts and winter roosts), can any population stabilisation or recovery be documented. The most important reasons for the success with this species include systematic, effective roost protection and – perhaps – an improvement of the bat’s food base as forest management has become more semi-natural.

Figure 12: Population development of ten species in underground winter roosts since 1985/86; upper line: populations in roosts inspected at least 13 times (n = 131); lower line: populations in annually inspected roosts (n = 28). The large Bodenmais roost was not included in data for the Barbastelle bat. [Anzahl Tiere = number of bats; Anzahl Quartiere = number of roosts; kontrollierte Quartiere = inspected roosts; species in rows of two, from top to bottom: Greater mouse-eared bat, Bechstein's bat, Brandt's bat and Whiskered bat, Natterer's bat, Daubenton's bat, Barbastelle, Serotine, Northern bat, Brown long-eared bat, Grey long-eared bat.]



Lower Saxony:

In recent years, the general population situation seems to have improved slightly, in light of some growth in sizes of maternity roosts and of relative increases in numbers of sightings of rare species. For example, numbers of Greater mouse-eared bats in maternity roosts have either stabilised or increased slightly. Furthermore, maternity roosts of the Pipistrelle bat have not decreased in size. Numbers of sightings of the Barbastelle bat have slowly increased in recent years. This species remains extremely rare in Lower Saxony, however.

The general conditions for forest-dwelling and forest-hunting species have improved noticeably – at least in state forests – as a result of the more ecologically compatible forest management introduced several years ago. Structural diversity is increasing in many areas – for example, more old trees with hollows are now left standing, and stands are rejuvenated via growth of naturally seeded, locally native tree species.

Authorities have issued stricter regulations governing the ecological compatibility of pesticides; presumably, such regulations have also helped improve conditions for bat species. Furthermore, the summers of recent years, which have been especially warm during periods in which bats rear their young, have probably also contributed to the current improvements.

No studies attempting to confirm the above-mentioned potential reasons for the positive trends in Lower Saxony have been carried out.

Saxony:

From the middle of the last century until the early 1980s, Saxony's native bat species experienced drastic population declines. Most of these been only inadequately documented, however.

Currently, efforts to document population trends for individual species, or trends for selected roosts, have run up against considerable obstacles (problems in methods, lack of knowledge, shortages of finances and staff). As a result, the only available data is that gathered for selected species (especially the Greater mouse-eared bat and the Lesser horseshoe bat) in the context of roost surveys. The Lesser horseshoe bat continues to experience a positive population trend. On the other hand, if current, intensive conservation efforts were discontinued (for example, the roost-care system in place), the Lesser horseshoe bat populations would be in danger of extinction, since the bat's growing numbers have been concentrated in fewer and fewer summer roosts.

Although population trends for different colonies of the Greater mouse-eared bat differ considerably (threats, roost changes), the trend has been positive overall since the early 1980s.

Saxony-Anhalt:

During the period under review, the size of the bat population in Saxony-Anhalt has hardly changed. The numbers of sightings of Bechstein's bat, Pond bat and Natterer's bat have increased noticeably.

2.2 Red List

Bavaria:

The ongoing update of the Red List of threatened mammals is expected to appear by the end of 2003. The current-endangerment assessments made within the sections for specific species are in keeping with the new classifications.

Hesse:

The Red List of 1995 still applies.

Lower Saxony:

A new Red List of threatened mammals is being prepared in Lower Saxony; publications is scheduled for 2003 or 2004. In this edition, many bat species may be moved to lower endangerment categories.

Saxony:

The existing Red List of Vertebrates (1999) has not been revised.

Table 22: Status of bats in the current Red Lists of some Länder. BE = Berlin, BW = Baden-Württemberg, BY = Bavaria, NI = Lower Saxony, SH = Schleswig-Holstein, SN = Saxony, ST = Saxony-Anhalt, TH = Thuringia. In other Bundesländer there is no change in the Red Lists of threatened bats (compare BOYE et al. 1999).

0 = extinct; 1 = critically endangered, 2 = endangered, 3 = vulnerable, D = data deficient, G = probably threatened, but status unknown, R = extremely rare or geographically restricted, V = near threatened, 4R = risk because of decline, I and II = threatened migratory species, l.c. = not threatened, least concern, - = not regular occurrence in the Bundesland.

Species	BE	BW	BY	NI	SH	SN	ST	TH
Rhinolophus ferrumequinum	-	1	1	-	-	0	0	0
Rhinolophus hipposideros	-	0	1	-	-	1	1	1
Myotis myotis	1	2	3	2	1	2	1	3
Myotis bechsteinii	4	2	2	2	2	R	1	2
Myotis emarginatus	-	R	1	-	-	-	-	-
Myotis nattereri	2	2	2	2	3	2	2	3
Myotis mystacinus	1	3	3	2	G	2	1	3
Myotis brandtii	1	1	2	2	2	2	2	2
Myotis daubentonii	3	3	4R	3	l.c.	l.c.	3	l.c.
Myotis dasycneme	D	-	-	2	2	R	R	R
Nyctalus noctula	3	I	3	2	l.c.	3	3	2
Nyctalus leisleri	4	2	2	1	2	R	2	2
Eptesicus serotinus	3	2	2	2	V	3	2	2
Eptesicus nilssonii	D	2	3	2	-	2	2	2
Pipistrellus pipistrellus	3	3	4R	3	D	V	2	3
Pipistrellus pygmaeus	D	G	D	D	D	D	G	G
Pipistrellus kuhlii	-	D	D	-	-	-	-	-
Pipistrellus nathusii	3	I	II	2	3	R	2	G
Hypsugo savii	-	-	0	-	-	-	-	-
Vespertilio murinus	4	I	2	1	2	R	R	G
Plecotus auritus	2	3	4R	2	3	V	2	l.c.
Plecotus austriacus	1	1	2	2	-	2	2	2
Barbastella barbastellus	0	1	1	1	-	1	1	2
Miniopterus schreibersii	-	0	-	-	-	-	-	-

Saxony-Anhalt:

Saxony-Anhalt's Red Lists have now been revised, for the first time in ten years. Work for the revision has been completed, and the new edition will be printed this year.

Table 22 presents a comparison of the new classifications and those of the previous, still-valid list. Saxony-Anhalt's relevant new Red List reflects the current population situation for bats.

Schleswig-Holstein:

Thanks to the work of the Working Group for Bat Conservation (AGF) in Schleswig-Holstein, and to numerous studies carried out in the context of expert assessment, knowledge about the situation of bat populations in Schleswig-Holstein has grown considerably over the past decade.

A new Red List of threatened mammals in Schleswig-Holstein was published in April 2001 (see Tab. 22). Overall, the situation for bats, compared to assessments in the last Red List (1990), has apparently improved – thanks, in part, to efforts of bat conservationists. A total of 8 species (Bechstein's bat, Natterer's bat, Brandt's bat, Daubenton's bat, Serotine, Parti-coloured bat, Nathusius' bat, Noctule) have been moved to a lower category. Knowledge about the population status of some species is still incomplete, however; for example, the Whiskered bat is listed in category G (assumed threatened, but status unknown), and Pipistrelle bat and Soprano pipistrelle are listed in category D (data deficient).

3. Habitats and roost sites

Since 1996, efforts to protect bat roosts in settled areas have been tested and refined in the framework of the development project (E+E) "Creation of a roost network for building-dwelling bat species by protecting existing roosts and adding new roosts in and on buildings". The final report for this project, which describes experience gained in efforts to raise public awareness and presents examples of creation of new roosts, has been published by the Federal Agency for Nature Conservation (BfN):

DIETZ, M. & M. WEBER (2002): Von Fledermäusen und Menschen [Of bats and men]. Bonn, 196 S.

Berlin:

General information about discovered roosts and foraging habitats in Berlin is provided in Table 23 (does not include species for which only individuals have been sighted).

Hesse:

In the framework of special studies, summer roosts of Natterer's bats were discovered in both buildings and tree hollows. The colonies live hidden away in cracks and pivot holes of old roof timbers; in some cases, colonies are found under house sheathings and in hollow blocks. A special characteristic of this species is that it occupies cow stalls, usually roosting in ceiling cracks or behind window or door lintels. If Natterer's bats can be observed hunting flies in a stall early in the evening, their roost – usually very difficult to find – is probably in the immediate vicinity. The Barbastelle bat's maternity roost in Hesse is located behind the slate sheathing of an estate building badly in need of renovation. In the summer, this maternity colony ranges over an area of up to 200 km². When hunting, the animals prefer forest land to open areas. The bats' hunting grounds, in Hesse's Lahntal area, exhibit a great variety of different types of forest. Clearly, Barbastelle bats prefer areas with few towns and roads.

Table 23: Roost types and foragung habitats of bats in Berlin.

Species	**Summer roosts (M = maternity roost, O = other roosts)**	**Winter roosts**	**Regular foraging habitats**
Myotis mystacinus	M: bat boxes and bird nesting boxes (individual sighting)		
Myotis nattereri	O: bat boxes and bird nesting boxes (only males)	Damp to wet cellars and mine shafts	Forests
Myotis myotis	O: bat boxes and bird nesting boxes	Damp cellars and mine shafts	Forests
Myotis daubentonii	O: buildings, in cracks and crevices; M: tree hollows, vaults	Damp to wet cellars	Forests, landscape parks, water bodies
Pipistrellus pipistrellus	M and O: buildings, in cracks and crevices	Dry cellars and mine shafts, cracks and crevices in buildings	Cities, residential zones, villa quarters, village structures, parks, gardens, cemeteries
Pipistrellus nathusii	O: bat boxes and bird nesting boxes	Cracks and crevices in buildings, tree hollows (individual sightings)	Forests, water bodies
Nyctalus noctula	M: tree hollows; O: tree hollows, bat boxes and bird nesting boxes	Tree hollows, cracks and crevices in buildings	Forests, water bodies
Eptesicus serotinus	M: cracks and crevices in buildings	Dry cellars and mine shafts, cracks and crevices	Cities, residential zones, villa quarters, village structures

Species	Summer roosts (M = maternity roost, O = other roosts)	Winter roosts	Regular foraging habitats
Vespertilio murinus		Cracks and crevices in buildings (individual sightings)	
Plecotus auritus	M: buildings, cracks and crevices, bat boxes and bird nesting boxes, tree hollows	Dry to damp cellars and mine shafts, cracks and crevices in buildings	Parks, gardens, cemeteries, forests
Plecotus austriacus		Cracks and crevices in buildings, dry cellars	

3.1 Roost sites

Bavaria:

Bridges: During the period under review, a number of bat roosts were renovated in an exemplary manner. One example affected a colony of Greater mouse-eared bats living in abutments of the A3 autobahn's bridge over the Main River near Bettingen (MSP district, see Tab. 1). The work, which lasted from 1998-2000, was expertly directed by northern Bavaria's autobahn administration and spared the bats to the greatest possible extent. While the colony's population did decrease somewhat, it has been recovering ever since the work was completed. In another positive example involving a bridge renovation, work was carried out on the pillars of a bridge near (Lower Bavaria) that serves as an interim roost for Barbastelle and Daubenton's bats. As part of this project, new approaches were created for the bats.

Former mess hall in the Murnauer Moos area: In July 2001, a large maternity roost of Whiskered bats was discovered in a building belonging to the operation in the Murnauer Moos quarry, in the GAP district. The maternity roost colony contained some 90 animals. The building was slated for demolition that same year, when the quarry's operating license was to expire and all buildings would have to be removed from the nature conservation area. A study was then set up at short notice, by the local rural district office and the State Institute for Environmental Protection (LfU), to explore the bats' roosting behaviour. A number of the colony's bats were telemetered and the colony's behaviour was observed. The study found that the building with fascia on its eastern and western sides, and with window shutters on its south side, was the most important roost for the colony. Furthermore, the building was found to harbour a small colony of Greater mouse-eared bats (15 animals), a colony of male Pipistrelle bats (ca. 20 animals) and, at least temporarily, some Brown long-eared bats. Since the demolition could not be halted, a part of the building, with one of the fascia, was saved, because it was one of the most important roosts for the *M. mystacinus* colony. Additional crack and crevice roosts (wooden sheathing) were also added. In spring 2002, Whiskered bats were again sighted at the site.

Renovation: Many other examples, in addition to the above, could be cited in which bat-colony roosts in or on buildings were renovated in accordance with requirements of nature conservation authorities and under the supervision of co-ordination offices for bat conservation. Such measures have primarily affected Greater mouse-eared bat-maternity roosts, although measures have also been carried out in roosts of the Northern bat (facade roosts), of the Noctule (facades), of the Serotine and of the Grey long-eared bat.

Fumigation: Each year, numerous cases of planned fumigations of church interiors, for protection against anobium woodworms, are reported to co-ordination offices for bat conservation (in southern Bavaria 87 cases in 2000, 102 cases in 2001; in northern Bavaria 31 cases in 2000, 25 cases in 2001, 66 cases in 2002 and [as of 4 June 2003] 25 cases in 2003). Normally, such notification is provided by the companies carrying out the work. About 70 % of all churches involved are known to harbour bats – usually, individual bats in their summer roosts. Where the fumigation is to affect the entire interior, and is to be carried out during the summer, efforts are made to postpone it until the fall – especially when colonies are known to be present near the roof's framework. When the work cannot be

postponed, special care is taken to seal off the area being fumigated, and fume-removal equipment is installed in roof areas.

Brandenburg:

During the period under review, additional winter roosts were placed under long-term protection and were improved:

- Optimisation of the bunker complex near Hassleben, in the Uckermark area. This winter roost, which was formerly used only irregularly, contained some 230 overwintering bats in the winter of 2001/2002.
- Optimisation of the Markendorf ice cellar, via addition of the necessary frost protection. This has stabilised the population at around 50 animals.
- Optimisation of several bunker systems in the Frankfurt/Oder district.
- Optimisation of 2 small bunkers in the OPR district, via expansion of the available structures. In each case, the number of bats using the roost doubled (to 24 and 46 overwintering animals).
- Restoration of an ice cellar ("Julianenhof") in the Märkisch-Oderland district as a bat winter roost.
- The state is working to obtain permanent protection for the state's largest known winter roost "Ostquell brewery", Frankfurt/Oder. The roost is also the largest known winter roost of the Greater mouse-eared bat and has been notified as a Natura 2000 site.
- The state has intensified its efforts to convert many former military facilities into bat roosts.

Lower Saxony:

In 2001, a telemetric study in East Frisia discovered four roosts of the Pond bat: two male roosts and two maternity roosts. One male roost (some 2 animals) and one maternity roost (8-10 animals) are located in a building (single-family home). In the second maternity roost, 49 bats were counted, and 10 bats were counted in the second male roost.

In light of the increasing numbers of nursing and pregnant Daubenton's bat females being captured in East Frisia, that region may be assumed to harbour maternity roosts of the species. To date, such colonies have been very rarely discovered in Lower Saxony.

In 2000, another maternity roost colony of Greater mouse-eared bats, containing 8-10 bats, was discovered south-west of Bremen, at the edge of the species' range in Lower Saxony.

Also in 2000, another winter roost of the Barbastelle bat was discovered, in a bunker south-east of Brunswick (1 bat); in addition, evidence for a Barbastelle bat winter roost was obtained at the southern edge of the Harz mountains (net capture in front of a cave).

In 2001, an important winter roost of the Noctule bat, estimated to contain over 300 bats, was discovered in an autobahn bridge on the border to North Rhine-Westphalia.

Another maternity roost of the Northern bat was confirmed in about 1999 in the Harz region.

Saxony:

In a winter roost in the eastern Erzgebirge mountains, different methods of estimating population size were compared (sight inspections in the winter roost, photo-electric counting, capture-recapture method, net captures in front of the roost). The methods were found to differ, considerably in some cases, in their population estimates and even in the spectrum of species they identified. Sight inspections counted Daubenton's and Natterer's bats very inadequately and registered only about 10 % of all bats present.

In a conservation project in Saxony's largest maternity roost colony of Greater mouse-eared bats, the Saxony Association for Bat Research and Conservation (SVF) carried out a long-term programme in which it monitored bat behaviour using infrared cameras (and incorporated resulting images in its work to enhance public awareness – for example, in its Internet presence). In the same colony, the German Nature Conservation Association (NABU) monitored bat activity with IR beam splitters.

Saxony-Anhalt:

Designation of the Natura 2000 site "Stollensystem Büchenberg" near Elbingerode/Harz (Code: FFH4230301) placed a decommissioned mine, with about 3 km of tunnels, under protection. In addition to passageways, the mine has large open areas with clearances ranging from 10 to 50 m, and it has countless cracks and crevices. A number of shafts and tunnels leading into the mine provide good ventilation to mine structures at a depth of about 60 m within the mountain. Only a fraction of the actual number of bats present have been counted. Presumably, large swarms gather on the plateaux of the central Harz mountains, and along the mountains' northern periphery, at an elevation of 500 m above sea level. Whiskered bats and Brandt's bats are likely to be the most important species. The area's northern-Harz location indicates that the area draws bats from throughout a large region to the north. Initial remote finds have provided evidence for this assumption.

Censuses during the last few winters recorded up to 233 bats, representing seven different species. The data gathered in the winter of 2002/2003 proved an exception. Censuses turned up only about half of the bats counted in previous years. The reason for the decrease is that every 10 years a safety check of the tunnel floodgate in the "Zillierbachtalstollen", the mine's drainage tunnel, has to be carried out. In the process, the floodgate's stability is checked from the inside of the mine. Following the check, the floodgate is normally closed again, and the mine is flooded. This was not carried out in 2002/2003. With an elevation differential of 150 m, the empty mine was highly exposed to the elements. Long stretches near the entrance were frozen, including stretches near the light shafts, and thus about 50 % of all known roost areas were unoccupied. The percentage of Greater mouse-eared bats stayed about the same, however (Fig. 13). In 2002, the mine entrance was covered with a steel grid. From the perspective of bat conservation, the mine should be reflooded to reduce its exposure to the elements and prevent freezing in the winter. The mine can be expected to be quickly re-occupied once it has been flooded.

The "Galgenberg bei Freyburg" tunnel system in the Natura 2000 site "Neue Göhle und Trockenrasen nördlich Freyburg" (Code: FFH4736302) is Saxony-Anhalt's most important rock roost for the Lesser horseshoe bat (Fig. 14). Ever since the tunnel system was closed with a double grid cover, in the winter of 1994/1995, the number of hibernating individuals has increased from 30 to a maximum of 89. Since the winter of 1999/2000, some 40 % of the labyrinthine system is no longer entered and inspected, since horizontally layered, laminated ("Wellenkalk"-type) limestone has been crumbling rapidly from the ceiling. As a result, an unknown number of individuals have not been counted since the winter of 1999/2000. In spite of the limited access to the system, in the winter of 2001/2002 a total of 89 individuals were still counted. In January 2003, a cave-in from the surface occurred. With night-time temperatures ranging from -10 °C to -15 °C, large parts of the tunnel system quickly froze. The cave-in crater was then quickly filled with straw and covered with a tarp. This permitted the restoration of the same microclimatic conditions that had prevailed in the cave prior to the cave-in. Most of the Lesser horseshoe bats roosting in the cave had already left the cave at this point, however; only 38 individuals were then counted. In the long term, the main Galgenberg tunnel will be lost, since the mountain is becoming increasingly unstable. It would be unfeasible to attempt to stabilise the area.

The Natura 2000 site "Alter Stolberg und Heimkehle im Südharz" (Code: FFH4431302), which contains the "Heimkehle" cave, is Saxony-Anhalt's most important rock roost. In a long-term monitoring programme underway since 18 February 2002 along the Thuringia / Saxony-Anhalt state border, bats have been captured (using a bat net) in the middle of the cave and marked on a weekly basis. The studies are being carried out by Saxony-Anhalt's bat-reference centre (Referenzstelle Fledermäuse) and by Working Party for Bat Conservation in Saxony-Anhalt (AK Fledermäuse Saxony-Anhalt e.V.). Representatives of ten of the total of 13 species documented in the cave have been captured. The cave has nationally significant populations of the Barbastelle bat, Bechstein's bat and Greater mouse-eared bat. The population of overwintering bats is estimated to number at least 1,000 individuals. The captures, which are carried out once per week – and twice per week during the month of April – registered a total of 565 individuals (Fig.15).

The "Heimkehle" long-term monitoring programme is exploring a number of different questions. For example, when a laser system was put into operation in the "Großer Dom" formation, potential Greater mouse-eared bat roosts remained unoccupied. Every time the laser system was taken out of operation, during flooding, Greater mouse-eared bats spontaneously appeared. The bats tend to occupy the roosts for several days and weeks. Consequently, it seems clear that operation of the laser is keeping the bats from permanently occupying the "Großer Dom" cave section (Fig. 16).

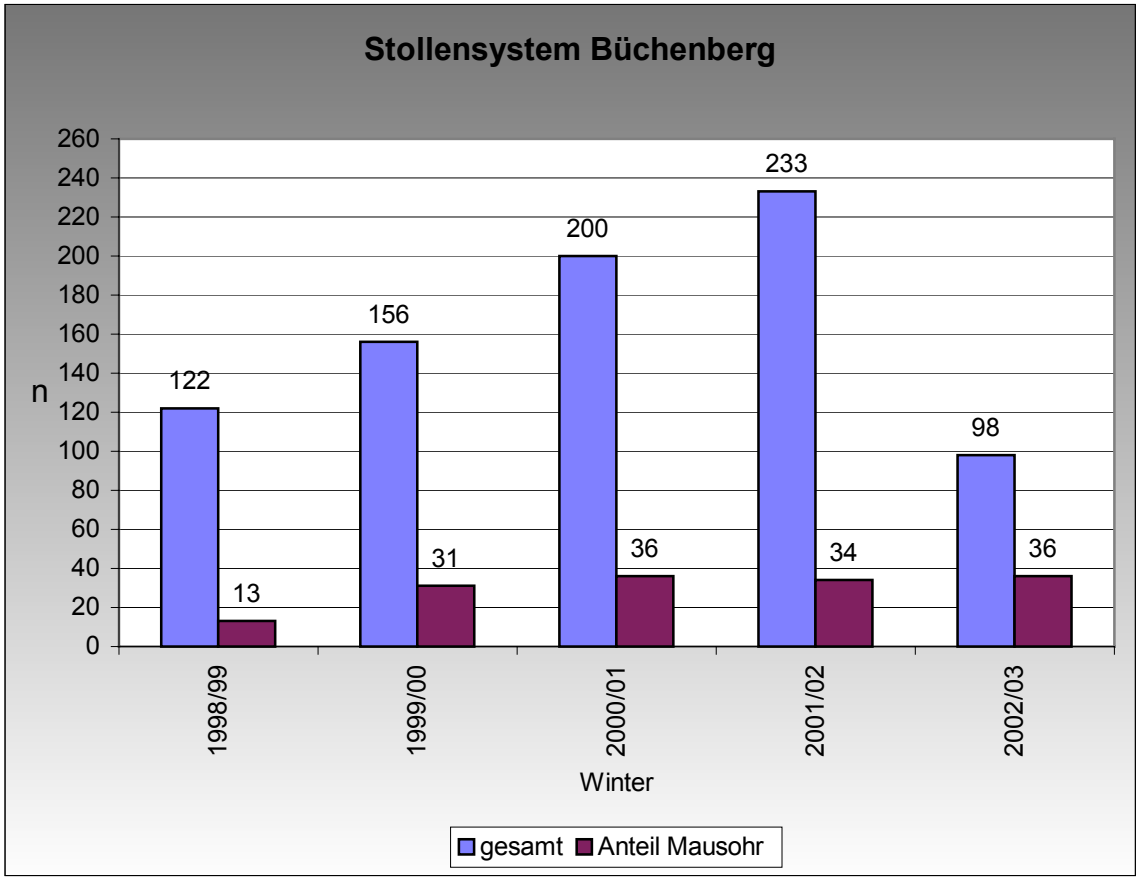


Figure 13: Bats, particularly Greater mouse-eared bats (*Myotis myotis*), in the roost site „Stollensystem Büchenberg", Elbingerode/Harz mountains, Saxony-Anhalt. Microclimatic changes frightened the bats away. [gesamt = all bat species; Anteil Mausohr = Greater mouse-eared bats]

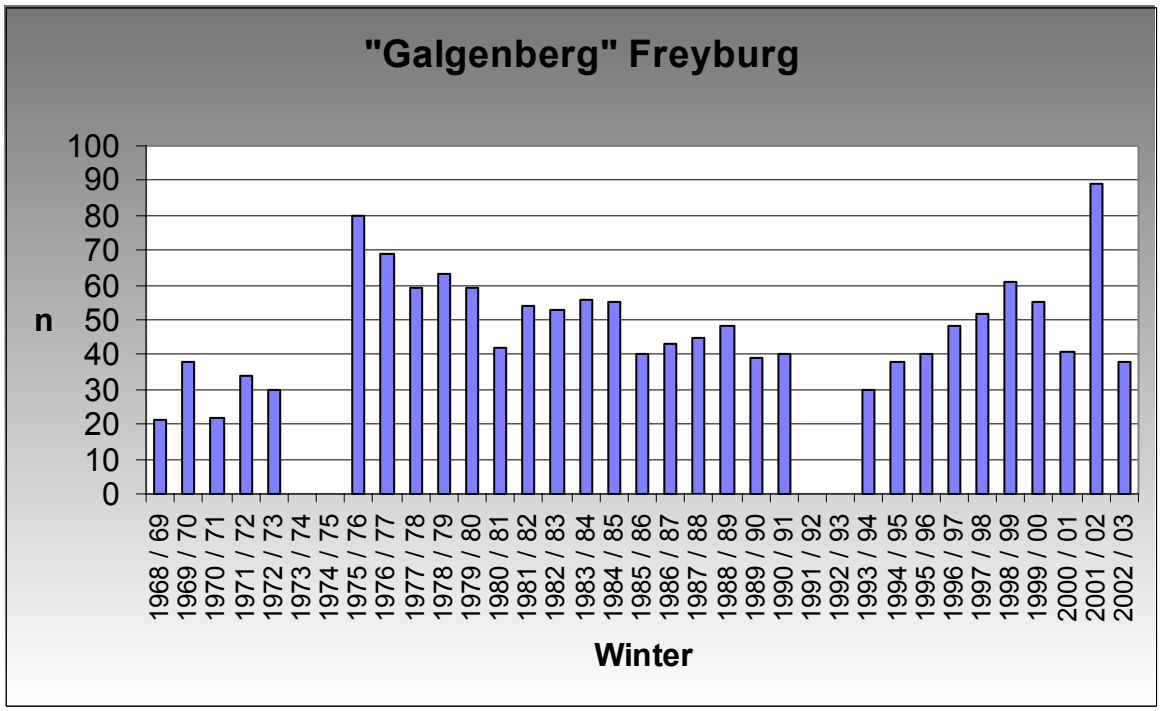


Figure 14: Numbers of Lesser horseshoe bats (*Rhinolophus hipposideros*) in the roost site "Galgenberg" near Feyburg/Unstrut, Saxony-Anhalt.

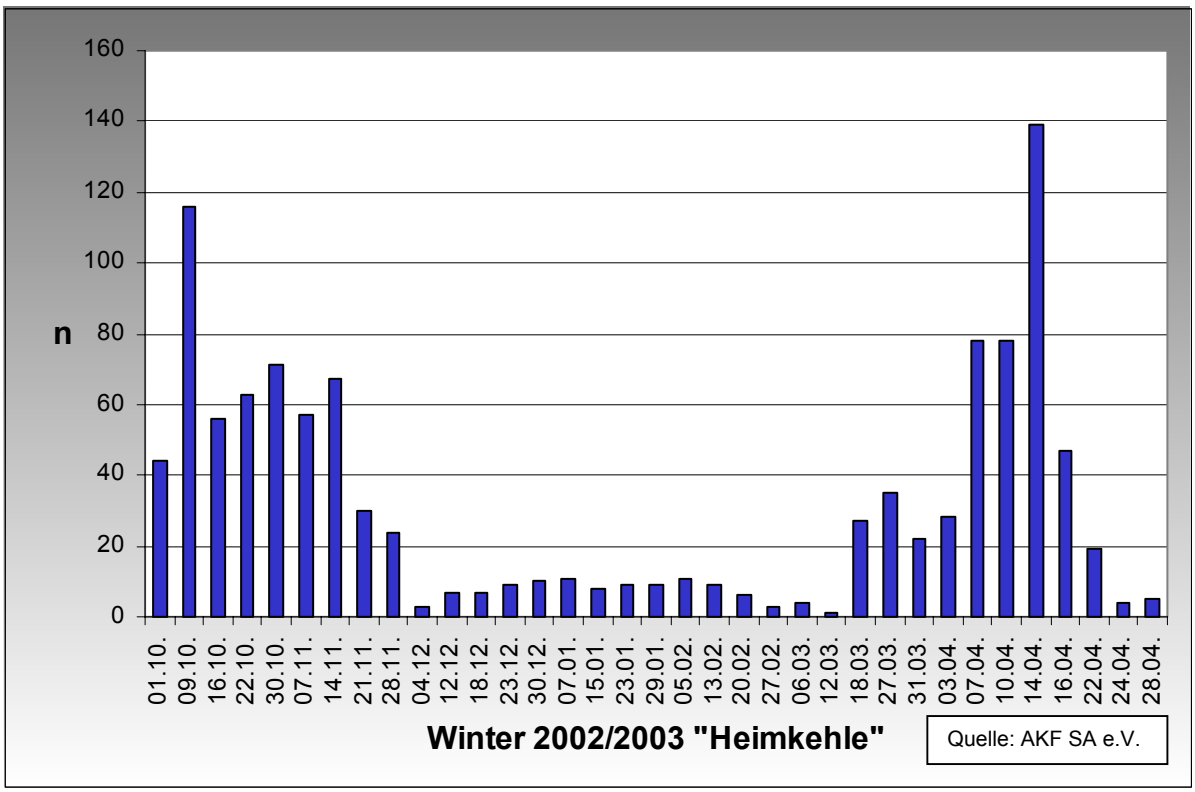


Figure 15: Number of bats entering the rock roost „Heimkehle“, Saxony-Anhalt, from the beginning until the end of the winter 2002/2003.

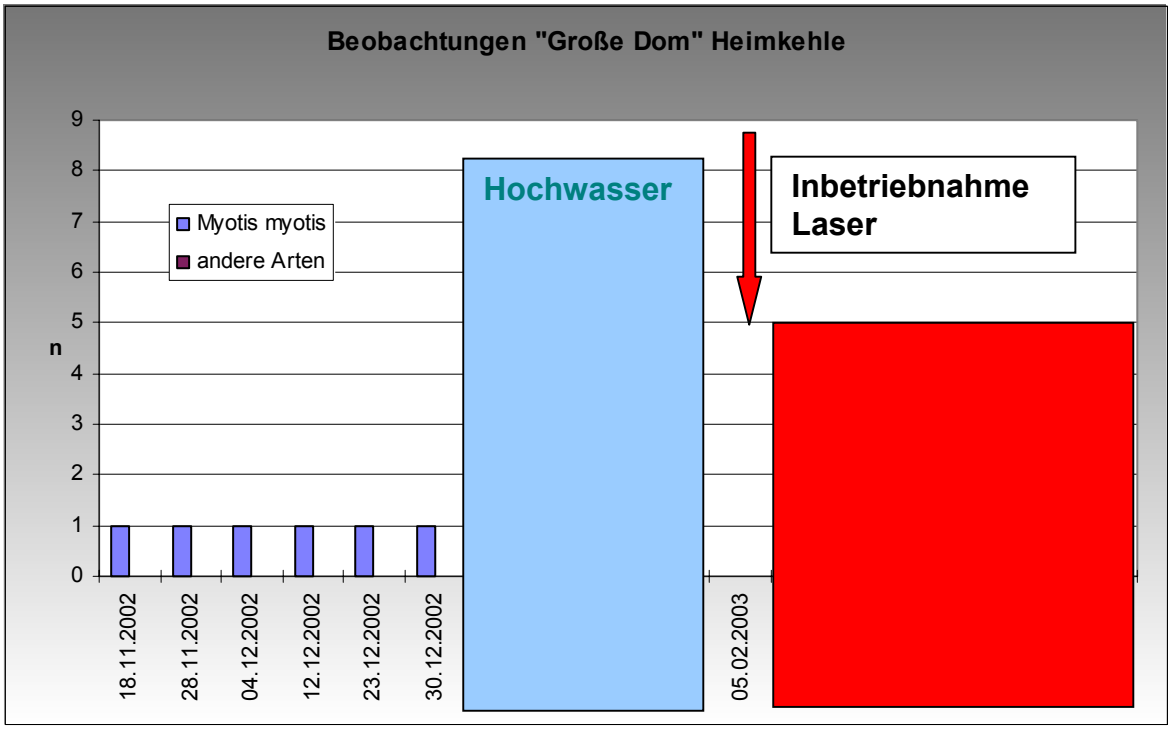


Figure 16: Impact of the laser show in the „Great Dome“ of the roost site „Heimkehle“, Saxony-Anhalt: First block – bats occupy roosts, partly for a longer time (no laser at work); second block – bats change or leave their places because of the laser show. High columns = *Myotis myotis*, lower columns = other bats species. [Hochwasser = high level water; Inbetriebnahme Laser (arrow) = laser starts its work.]

Schleswig-Holstein:

- *Winter roost at Jägerslust* (very high protection priority, important, protection status assured):

The passageway system at Jägerslust consists of a former military refuelling system dating from World War II. While the complex once contained many bunkers and passageways, much of it was destroyed by Allied blasting, and thus only parts of the system are now accessible. About two thirds of the still-accessible portion of the complex is located under the grounds of the military's explosive ordnance clearance services. An inspection of the grounds revealed that the area still contains numerous remains of military facilities. The existence of additional underground rooms is still uncertain – the available information is contradictory and inconclusive – and thus additional, as yet unknown, bat roosts may exist.

The complex has been closed with a grid and clearly marked as a bat winter roost. These protective measures are considered thorough and adequate; they prevent entry of unauthorised persons. A cave-in in the rear part of the complex has openings to the outside, although these are too small for people to pass through. These openings play a central role in ventilating the complex, and they need to be protected. In particular, those parts of the complex that were burned out some time ago (the exact date of the fire cannot be determined) contain numerous cracks and crevices in which bats can overwinter. At present, this roost, in terms of the numbers of different species it harbours, and of its overall species composition, is the second-most important underground bat winter roost yet found in Schleswig-Holstein. Studies of the roost carried out in 2002 have proven its great significance for bat conservation. The only other winter roost in Schleswig-Holstein to harbour a comparable number of species is the Kalkberghöhle cave in Bad Segeberg. The complex also harbours the second-largest overwintering population of Brandt's bat (Myotis brandtii) found in Schleswig-Holstein. Furthermore, in 2002 an overwintering whiskered bat (*Myotis mystacinus)* was sighted in it. Net captures carried out during swarming periods have provided clear evidence of the roost's great significance. The initiated population counts need to be continued.

Table 24: Current counts in the "Jägerslust" winter roost, from 2002 and 2003. The winter-population figures are based on manual counts.

M.das. = Pond bat (*Myotis dasycneme*); *M.dau.* = Daubenton´s bat (*M. daubentonii*); *M.nat.* = Natterer´s bat (*M. nattereri*); *M.bra.* = Brandt´s bat (*M. brandtii*); *M.mys*. = Whiskered bat (*M. mystacinus*); *M.bec.* = Bechstein´s bat (*M. bechsteinii*); *P.aur.* = Brown long-eared bat (*Plecotus auritus*); *P.pip.* = Pipistrelle bat (*Pipistrellus pipistrellus*).

Date	*M.das.*	*M.dau.*	*M.nat.*	*M.bra.*	*M.mys.*	*M.bec.*	*P.aur.*	*P.pip.*	Total	Remarks
2.2.2002	5	125	1	5	1		(2)*		137	* two weeks earlier at the entrance
3.9.2002	4	11	-	3	-		1	1	20	captures by nets
13.9.2002	3	20	2	-	-	1	2		28	captures by nets
22.1.2003	6	163	3	8	-		1		181	

- *Schleswig-Schützenkoppel wintering roost* (No. 95 on the list of important underground bat habitats in Germany, protection priority very high, important, protection status assured):

A former brewery cellar in the Schützenkoppel facility in Schleswig, which was converted into an air-raid bunker during World War II. The former "Schleswiger Brauhaus GmbH" was closed in 1923. The underground, vaulted, yellow-brick cellars are still intact today (S.A. LÜTGERT 2000). The brewery cellar is a large, multi-room complex, with a number of rooms of hall-like proportions. The complex has hardly been used since the end of World War II, and this has made it possible for bats to occupy it. In addition, bats are drawn to the facility, in spite of its inner-city location, because of the park-like grounds above the facility, and because of the facility's location within the old town centre of Schleswig, which has many structurally diverse gardens and open areas.

The site is one of the five most important winter roosts in Schleswig-Holstein. It is also the largest winter roost north of the North and Baltic Sea Canal. Its large numbers of overwintering Natterer's bats *(Myotis nattereri)* are particularly significant. The group of species found in it is as expected for a winter roost in a young-moraine landscape in Schleswig's surrounding areas, which are rich in water bodies and forests, although no evidence of the Brown long-eared bat *(Plecotus auritus)* has yet been found. The roost may also be well-suited as a winter roost for other species of the *Myotis* family. No relevant evidence has yet been produced, however.

Table 25: Surveys of the Schleswig winter roost, 1998- 2003. The winter-population figures are based on manual counts. Abbreviations as in Tab. 24.

Date	*M.dau.*	*M.nat.*	Total	Remarks
11.1.1998	31	42	73 (+3)	
31.1.1999	84	58	142 (+6)	Provisional assessment
22.1.2000	92	44	136 (+1)	
21.1.2001	72	47	119 (+12)	
20.1.2002	118	82	200 (+4)	
25.1.2003	151	115	266 (+2)	Largest population figure

3.2 Foraging habitats

Lower Saxony:

The foraging habitats and flight routes of female Greater mouse-eared bats of various colonies were explored in telemetric studies carried out in 2000 and 2002. In the heavily forested Weserbergland area, the bats flew to foraging areas up to 16 km distant from their roosts. In each of the nights in which they were monitored, the bats acted very "conservatively", always using the same hunting grounds (1-2) and flying directly to the grounds without any interruption. The hunting grounds consisted of typical beech forest or mixed beech forest, with medium-age trees, and largely without any underbrush ("hall" forests). In the lower Weser River area, which has few forests and is fragmented by settlements, the bats visited many small hunting grounds per night, and they often switched areas. Here, the bats sought out areas with forest and shrubbery, with little undergrowth, and with widely spaced trees. In addition, the bats spent considerable amounts of time in areas that, by virtue of their vegetation structure, are unlikely to be suited for near-ground hunting. In this case, the bats travelled no further than about 10 km away from their roosts.

In 2001, the approach paths and hunting grounds of Pond bats were studied telemetrically (to a limited extent). The Pond bats were found to orientate primarily by means of water bodies, which they used as landmarks. They did not use the same routes every night. One lactating female covered distances ranging between 23 and 34 km. In transit, the bats were found to reach speeds of up to 40 km per hour. The bats were also found to use a considerable number of different foraging habitats, many of which were quite distant from the roost. They did not seem to spend much time within foraging areas, however.

4. Threats

The reasons behind the current threats to bats in Germany are being studied in the framework of a research and development project that is being funded by the Federal Environment Ministry. The project "Analysis of the reasons for threats to planning-relevant animal groups in Germany, complementing Red Lists of endangered animals" is running from 2002 to 2004, under the scientific

direction of the Federal Agency for Nature Conservation (BfN). This project is focussed on animal species found on Germany's Red List of threatened animals, a group that includes almost all bat species.

Bavaria:

No major changes since the last National Report. Attention is also called to the assessments for individual species, as presented in Section 1.

The main threats to summer roosts, and the pertinent reasons, are considered to be as follows:

- (Unintentional) destruction or damaging of roosts in buildings,
- A lack of co-ordination and care in renovation of buildings with roosts of colonies,
- A lack of suitable roosts that the various species can use to form roost networks (in forests/parks: natural cracks in trees, sufficiently densely spaced tree hollows; in towns and villages: a lack of cracks/crevices and accessible attics that bats can use to form networks.

With regard to winter roosts:

- Disturbances of roosts of particularly endangered species (Greater horseshoe bat, Lesser horseshoe bat, Barbastelle bat) or of particularly heavily populated roosts. Illegal spelunking during winter months causes disturbances of both kinds;
- A lack of co-ordination in connection with renovation of historic buildings with significant bat populations (see Tab. 21).

Berlin:

The threat factors listed in the first National Report (December 1995) persist. Issues in connection with renovation of old buildings and concrete-slab apartment buildings (Plattenbauten), especially in the eastern part of Berlin, are especially important. It must be assumed that bat roosts on buildings are being lost – certainly unintentionally – through renovation.

Winter roosts are regularly inspected. Some vandalism occurs (such as forced-open doors), and relevant damage is normally quickly repaired.

Hesse:

Most native bats face a wide range of different threats. For the EU Habitat Directive Annex II species that reproduce in Hesse, the problems include the following:

Myotis myotis: Because female Greater mouse-eared bats are strongly dependent on individual summer roosts, in attics, that bats have used for decades, renovation of a single buildings – if not co-ordinated with conservationists – can affect large numbers of bats. Structural changes in forests that serve as bats' hunting habitats, including man-made changes (such as "under-canopy" planting), can affect bat species negatively. Where forest management affects population sizes and diversity of beetles (for example, planting of pine monocultures, use of pesticides), it also affects the quality of hunting habitats of Greater mouse-eared bats. Furthermore, the importance of tree hollows as interim roosts in forests has been underestimated for a long time. Finally, because Greater mouse-eared bats are often easily visible in their winter roosts, they are more likely than other species to suffer intentional damage at the hands of people.

Myotis bechsteinii: The main threat to this species is widespread conversion of richly structured deciduous and mixed deciduous forests, with sufficient numbers of tree hollows, into conifer monocultures and typical commercial age-class forests. Other threats include the destruction of fruit-tree meadows along the edges of forests; habitat loss via extensive land clearing; and habitat fragmentation via construction of wide roads.

Barbastella barbastellus: This bat's winter roosts are threatened by usage changes and by inadequate protection against disturbances. The bat is also threatened by forest management changes in its hunting grounds and by construction of roads and towns.

Lower Saxony:

The obvious, continuing threats in recent years have included rapidly increasing landscape fragmentation and a very high rate of land use. Residential and commercial developments are expanding throughout the entire state, at frightening speed, and destroying bat habitats and, often, flight paths in the process.

Colonies of building-dwelling species continue to be endangered by renovation of roost buildings.

A trend toward "styled" home gardens is a constantly growing threat to town-dwelling species. Gardens are often filled with conifers and non-native ground cover that significantly diminish insect fauna. Clearly enough, in northern German fruit-growing regions in lowland areas, Serotine bat colonies have been responding to such changes in the insect world by shrinking and even disappearing.

Saxony:

The factors that obviously are having a negative impact on population development include roost loss, via an enormous increase in building renovation; demolition of buildings; "exaggerated tree care and cutting" (traffic-safety obligations); closure/usage of underground spaces; intolerance/vandalism; and habitat changes, and loss of bats' food base, via land use (commercial and residential developments, traffic infrastructure) and intensive agriculture (large-scale farming, pesticides, etc.).

Recent findings indicate that wind farms pose a considerable threat to bats. In a survey of dead birds and bats commissioned by the State Environmental Office in Bautzen (StUFA), daily inspections carried out in one wind farm between 18 July and 10 October 2002 found 34 dead bats (Noctule bat, Nathusius' bat, Parti-coloured bat, Pipistrelle bat, Leisler’s bat).

Saxony-Anhalt:

Bat species that live in and on buildings are increasingly endangered as a result of major changes made in structures in recent years. Such changes include building renovations and modernisations and demolition of empty concrete-slab apartment buildings (Plattenbauten). In a number of cases, bats were saved as demolition was in progress. Construction measures not subject to permits are often carried out without prior inspection by nature conservation experts.

Nature conservation experts are being consulted more frequently in connection with monument-preservation projects (churches, castles, etc.), however.

Since 1990, an estimated 90 % of all window shutters in Saxony-Anhalt have been replaced with rolling shutters. This has not been without consequences for the Barbastelle bat, Whiskered bat, Brandt's bat and Serotine bat.

In forests, older stands of trees are increasingly being used more intensively. As a result, forests' percentages of older trees are decreasing. This, in turn, is reducing densities of available roosts in trees (cracks, hollows, openings at the bases of branches, under-bark roosts), a development that is likely to affect the Barbastelle bat and Leisler’s bat directly.

For reasons of traffic safety, trees along avenues are often cut or completely replaced. Such measures have eliminated a number of known tree hollow roosts of the Noctule bat and Daubenton's bat in the north-eastern part of Saxony-Anhalt.

Schleswig-Holstein:

In the past two years, no special new threats to bats – in addition to known threats found nation-wide – have appeared in Schleswig-Holstein.

5. Data collection

During the period under review, the Federal Agency for Nature Conservation (BfN) has taken the initiative for establishment of a bat-monitoring programme. Basic ideas relevant to this programme were developed in various efforts, including the research and development project (F+E) "Model for an overall concept for monitoring of animal-species populations, illustrated with the example of avian

fauna". The resulting consequences for bat monitoring were presented by the Federal Agency for Nature Conservation at a workshop held by the advisory body in accordance with Article III.5 of the EUROBATS Agreement in May 2001 (cf. Chapter 10). From 22 to 25 April 2002, the Federal Agency for Nature Conservation, in co-operation with the Community for Bat Conservation and Research in Thuringia [Interessengemeinschaft Fledermausschutz und –forschung in Thüringen e.V.], carried out a workshop on the Isle of Vilm, near Rügen, on "Steps toward nation-wide monitoring of bat populations" ["Schritte zu einem bundesweiten Fledermaus-Bestandsmonitoring"]. This workshop highlighted the fact that special co-ordination offices for bat conservation are needed, in all Länder, to collect and evaluate bat data and combine it in keeping with nation-wide standards. The relevant developments, events and decisions are presented in:

> BUNDESAMT FÜR NATURSCHUTZ (ed.) (2003): Grundlagen für die Entwicklung eines Monitorings der Fledermäuse in Deutschland. [Foundations for development of a bat-monitoring programme in Germany.] BfN-Skripten 73, Bonn, 142 S.

Bavaria:

In connection with work on the Bavarian bat atlas (which will be published in 2004), all of the bat data in the "species-protection mapping" [Artenschutzkartierung – ASK] database of the then Bavarian State Institute for Environmental Protection (LfU) were extracted, reviewed and managed within a separate database. These data will soon be re-integrated with the ASK. At present, the bat database lists some 14,700 localities and over 52,000 records. Data for this database are collected and entered by the co-ordination offices for bat conservation for northern and southern Bavaria. They are also collected by volunteer bat conservationists and in the framework of commissioned work or scientific studies.

State-wide bat monitoring is carried out by the co-ordination offices for bat conservation, under commission to the LfU. This effort covers colonies of the Lesser and Greater horseshoe bats, Greater mouse-eared bat, Geoffroy's bat and Barbastelle bat, as well as a selection of winter roosts (see Fig. 12), including the most important winter roosts (for example Tab. 21).

Berlin:

As part of Berlin's species conservation programme for bats, and under commission to the highest-level nature conservation authority of the state of Berlin, population data are regularly collected from winter roosts. Bat-box sites in forests are inspected by volunteer bat conservationists (for example, members of the German Nature Conservation Association (NABU)) and, at larger intervals, within the framework of the species conservation programme.

Hesse:

To date, data have been collected primarily by volunteer staff of the Working Group for Bat Conservation in Hesse (AGFH). Some additional data has been obtained in the framework of intervention planning carried out by specialised planning bureaux. Currently, a project is being prepared in which Hesse's Services Centre for Agriculture, Horticulture and Nature Conservation (HDLGN), in co-operation with the AGFH, will strive to collect and evaluate all relevant data available state-wide. In addition, a considerable amount of data has also been collected via work for university theses and in other research projects.

Lower Saxony:

Since about 1979, the nature conservation authority in Lower Saxony's State Ecology Agency (NLÖ) has gathered and collected bat data (in an electronic database) in the framework of Lower Saxony's programme for collecting species data [Tierartenerfassungsprogramm]. In addition, volunteer "regional bat helpers" [Fledermausregionalbetreuer], appointed by the Agency in co-operation with district governments, have been collecting data (systematically, in part) on species, roosts, hunting grounds, flight routes, threats to certain roosts and habitats, etc., and have been reporting the data to the Agency. Bat data gathered through landscape-planning studies also enters into the authority's database, as do data from studies commissioned by the Agency, by other research institutions and by national parks.

Regional bat helpers have been carrying out bat surveys – long-term surveys, in some cases – in areas such as entire districts. For years, such surveys have monitored species such as the Greater mouse-eared bat, Northern bat and Pipistrelle bat, even if the monitoring standards have varied somewhat. For several years, the Agency has monitored the Greater mouse-eared bat and Barbastelle bat, and in 2003 this project is being harmonised with recently published official monitoring guidelines (issued with regard to the Greater mouse-eared bat). Similar monitoring is to be carried out for the Pond bat and, to a limited extent (due to methodological problems), for Bechstein's bat. The management responsibility for all monitoring projects lies with the nature conservation authority.

Furthermore, many volunteer bat conservationists have collected bat-population data oriented to specific flight paths and hunting grounds. No suitable software for entering this data into databases has yet been made available, however.

Saxony:

The tasks of caring for existing bat roosts, and of searching for new bat roosts, are carried out primarily by volunteer bat conservationists of the German Nature Conservation Association (NABU; Saxony state chapter) and/or of the Saxony Association for Bat Research and Conservation (SVF). These tasks are supported by nature conservation authorities and, in part, are integrated with the authorities' nature conservation services.

Current population and threat data for selected species (Greater mouse-eared bat, Barbastelle bat, Bechstein's bat, Lesser horseshoe bat), and for selected important bat roosts, is collected by the State Agency for the Environment and Geology (LfUG) in the framework of a conservation programme for threatened animal species. The sizes of maternity roosts of the Lesser horseshoe bat have been recorded since the early 1970s, for example. Regular inspections of certain roosts of the Greater mouse eared bat and Barbastelle bat have been organised in the framework of the support programme for endangered animal species. In addition, selected winter roosts are regularly inspected (1-2 times per season). NABU and SVF also keep additional records on bat populations.

As part of the tasks of a new bat-banding centre for the five Eastern German Länder, and on the basis of bilateral agreements with partner institutions in the Länder, the LfUG maintains a database on bat banding and recovery.

Saxony-Anhalt:

Bat data are collected mainly by the Working Group for Bat Conservation in Saxony-Anhalt [AK Fledermäuse Saxony-Anhalt e.V.] and by Saxony-Anhalt's bat-reference centre. Both institutions maintain and manage databases. Saxony-Anhalt uses the WINART PC-programme state-wide.

Schleswig-Holstein:

- All bat data collected in Schleswig-Holstein are centrally stored in the state's centre for bat conservation and research, in Bad Segeberg, and entered, with the WINART PC-programme, into TK 25,000 maps. The programme has been specially adapted to bat-data requirements.
- Net captures are carried out systematically, at selected locations in Schleswig-Holstein, by the state's centre for bat conservation and research and by volunteers from the working party on bat conservation. The Pond bat (*Myotis dasycneme*) and Bechstein's bat (*Myotis bechsteinii*) have been defined as the key species for this effort. In addition, where other bats are found that are rare and endangered in Schleswig-Holstein (including the Parti-coloured bat, Brandt's bat and Whiskered bat), attempts are made to collect additional relevant data by means of net captures in the immediate vicinity of the record localities. In coming years, increasing use is to be made of combined techniques, using both net captures and telemetry, in finding maternity roosts.
- In Schleswig-Holstein, five important underground winter roosts are automatically monitored with the help of photo-electric (beam-splitter) systems. The roosts involved are the Segeberg Kalkberg cave, Mönchneversdorf ice cellar, Krusenkoppel air-raid bunker in Kiel, an air-raid bunker in Eckernförde and an ice cellar in Schleswig. In mid-2003, a winter roost on the Levensau viaduct will also be equipped with a photo-electric monitoring system. Manual winter counts, in addition to automatic counts, are also carried out in the above-mentioned roosts.

- In addition, HILDEGARD DIETERICH, CARSTEN HARRJE and KARL KUGELSCHAFTER collect data on the Noctule bat. For this work, they both use automatic photo-electric counting systems and carry out banding.

C. Measures taken to implement Article III of the Agreement

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

In 2002, the German Bundestag (Parliament) amended Germany's nature-conservation and landscape-management laws and passed a modernised Federal Nature Conservation Act [Bundesnaturschutz-gesetz]. These actions left existing provisions on species protection – and, thus, on bat conservation – largely unchanged.

Berlin:

In keeping with nationally standardised regulations, permission for visiting bats' roosts, and for capturing bats for scientific purposes, is issued only to persons with suitable expertise. Exemptions from prohibitions against destroying roosts, which are seldom issued – for example, in connection with building renovations – always include requirements to provide replacements for destroyed roosts.

In February 2001, the nature conservation authority intervened to stop shooting of movie scenes in an important bat roost, due to the disturbance the production was causing for the bats. The movie company's application for a temporary restraining order was rejected (Decision of Berlin Administrative Court (VG Berlin), Az. VG ER-S1/01).

Saxony:

The legal basis for preventing the capturing, keeping and killing of bats is provided by the Federal Nature Conservation Act and by Saxony's Nature Conservation Act. Additional legal provisions for bat conservation entered into force during the period under review.

Saxony-Anhalt:

Saxony-Anhalt's Nature Conservation Act contains no special provisions on bat conservation. As a result, federal and European laws provide the basis for bat conservation in the state (Federal Nature Conservation Act, Federal Species Conservation Ordinance, EU Habitat Directive). In addition, the new, amended version of the state's nature conservation act, which is currently undergoing the parliamentary procedure, will not contain any provisions oriented especially to bats. On the other hand, it will contain regulations that will make it possible to provide temporary protection for certain areas (both within and outside of settled areas) as "off-limits areas" ("Schongebiet"). Furthermore, both natural and artificial caves are subject to laws on habitat protection.

On 11 January 2001, the federal administrative court (BVerwG) overturned a ruling of the Higher Administrative Court of the state of Saxony-Anhalt of 15 April 1999 (Az. A 2 S 363/97; Az. A 4 K 520/96 – Magdeburg Administrative Court [VG]) with regard to development of vacant lots filled with trees and shrubs (Az. 4 C 6.00). A lower authority had revoked a building permit on the grounds that the planned construction would entail the destruction of trees and shrubs that provided food and nesting space for birds, and hunting habitats for bats; the federal court found that the lower authority had acted impermissibly in revoking a building permit issued for construction on an open lot in a contiguously developed section of the community.

7. Sites identified and protected which are important to the conservation of bats

Bavaria:

- Natura 2000 sites:

Overall, the state's Natura 2000 sites cover about 5.9 % of the state's territory. About 60 % of the sites' total area is forested, and two-thirds of these forests are state-owned. The criteria applied, as part of

transposition of the FFH Directive in Bavaria, to reporting of bat roosts and habitats, and to the site proposals, were described in the last National Report. As of 1 January 2003, Bavaria's Natura 2000 site notification includes 167 small bat habitats, including buildings that serve as roosts for horseshoe bats (one building per colony), Geoffroy's bat (eight colonies) and the greater mouse-eared bat (111 colonies), and including the most important winter roosts (49 individual roosts or roost complexes). In some cases, a roost contains colonies of several different species; as a rule, each proposed site contains several colonies. The larger proposed sites contain numerous additional winter roosts – for example, caves.

These roosts include about 75% of all known maternity-colony animals of the greater mouse-eared bat and over 80% of female Geoffroy's bats. They also include over 75% of the known overwintering population of the barbastelle bat.

For Bechstein's bat, specific forest areas with known maternity-colony groups were included in the Natura 2000 sites (currently 15, including large sites, usually with several maternity-colony groups). Only in exceptions are the bat colonies' foraging habitats precisely known – for example, those of the Greater horseshoe bat or of the Lesser horseshoe bat colony on the Herren Island in Lake Chiemsee. With regard to the Greater mouse-eared bat, the site proposal takes account of the fact that deciduous forests, the bat's preferred hunting grounds, are adequately protected via inclusion in large Natura 2000 sites – especially in areas with high bat-population densities. As a result, significant portions of the hunting grounds of many populous colonies have been included in the Natura 2000 site notification – for example, forests in areas such as Spessart and Rhön, Mainfränkische Platten, Hassbergen, Steigerwald, Fränkische Alb and Swabian Alb. The large forests in these regions include additional important habitats of Bechstein's bat (and, in part, of the Barbastelle bat). Due to a lack of relevant findings, it was not possible to identify special hunting grounds for Geoffroy's bat and the Barbastelle bat.

- National parks, natural forest reserves:

The core zones of the two national parks, and the 156 natural forest reserves in state forests (Art. 18 (3) Bavarian Forest Act [BayWaldG]), are closed to all uses. This policy ensures that these forests can develop naturally and, as a result, that natural roosts can develop. It also ensures that forests have the necessary dynamics to be able to create new roosts. Overall, the natural forest reserves cover an area of 6,680 ha (as of 1 January 2003), which corresponds to 0.82 % of state forest areas and 0.25 % of the forested area in Bavaria. Since their average size is only 43 ha, only in combination with surrounding forests do they provide sufficiently large habitats for bat populations.

Berlin:

Bat winter roosts are regularly inspected for intactness. Gradually, existing roosts are being improved through incorporation of additional hiding places for bats and through improvement of microclimatic conditions.

Table 26 lists the most important underground roosts with respect to bat conservation. The roosts were selected in accordance with the criteria developed by the advisory body in accordance with Article III.5 of the EUROBATS Agreement. The three criteria are as follows:

- Criterion I – Many individuals: roosts in which over 19 bats, including all observed bat species, have been counted on at least one inspection date.
- Criterion A – Species diversity: roosts in which more than four bat species have been counted on at least one inspection date.
- Criterion S – Rare species highlighted by international agreements: roosts, in which at least 20 *Myotis myotis* (Greater mouse-eared bat) were counted on at least one inspection date (the other species listed in the catalogue of criteria did not occur, or did not occur in the required numbers).

Table 26: Important underground habitats for bats in Berlin.

Object name	**Object type**	**Criteria**			**Species / maximum population** (since 1991) Counted visible individuals, or estimate of the total population using the capture-recapture method (CMR)
		I	**A**	**S**	
Spandau Citadel	Fort	x	x	x	*M. nattereri* 348, CMR 8,000; *M. daubentonii* 171, CMR 3,000; *M. myotis* 59; *P. auritus* 12; *P. pipistrellus* 16; *E. serotinus* 6; *M. mystacinus/ brandtii* 1
Fichtebergbunker	Bunker	x	x	x	*M. nattereri* 70; *M. daubentonii* 30 (1992/93); *M. myotis* 25; *M. mystacinus* 1; *P. auritus* 1
Wasserwerk Friedrichshagen	Underground sand-filter system (2/3 of which has been decommissioned)	x	x	x	*M. nattereri* 137; *M. daubentonii* 68; *M. myotis* 40; *P. auritus* 46; *M. bechsteinii* 1; *P. pipistrellus* 1
Fort Hahneberg	Fort	x	x		*M. nattereri* 64; *M. daubentonii* 91; *M. myotis* 9; *P. austriacus* 2; *P. pipistrellus* 11; *M. bechsteinii* 1
Eiskeller Dahlem	Former ice cellar	x			*M. nattereri* 20; *M. daubentonii* 17; *M. myotis* 1; *P. auritus* 1
Bunker am Rupenhorn	Bunker, roof shingles, cable conduits	x			*M. nattereri* 19; *M. daubentonii* 4; *M. myotis* 3; *P. auritus* 4
Keller Forstamt Grunewald	Small earth cellar; jointed wall	x			*M. nattereri* 16; *M. myotis* 9; *P. auritus* 9
Keller "Bürgerablage"	Small earth cellar; jointed wall	x			*M. nattereri* 19; *M. daubentonii* 2; *M. myotis* 1; *P. auritus* 4
Keller Insel Scharfenberg	Root cellar, extensive use; jointed wall	x			*M. nattereri* 21; *M. daubentonii* 9; *M. myotis* 1; *P. auritus* 16
Kreuzbergdenkmal	Base of the Viktoria monument on Kreuzberg	x			*M. nattereri* 10, 100 estimated; *M. daubentonii* 5; *P. auritus* 1; *E. serotinus* 1; *P. pipistrellus* 1
S-Bahn-Bogen Dianastraße	Storage cellar / bridge	x			*P. pipistrellus* several hundred
Wasserturm Volkspark Jungfernheide	Cellar, jointed masonry wall and chiselled-out joints	x			*M. nattereri* 25; *M. myotis* 1; *P. auritus* 5
Keller Waldkranken-haus Spandau	Large storage cellar, extensively used	x			*M. nattereri* 25; *M. daubentonii* 5; *M. myotis* 1; *P. auritus* 5; *M. bechsteinii* 1
Sprengplatz-Bunker Spandauer Forst J 39	Shelter on blasting grounds	x			*M. nattereri* 27; *M. daubentonii* 2; *M. myotis* 1; *P. auritus* 10

Brandenburg:

Final set-aside of notified Natura 2000 sites, including important sites with regard to bat conservation, has still not been completed in Brandenburg. A final implementation of the EU Habitat Directive is significant with regard to bat conservation.

Currently, a 3rd group of site proposals for the EU Habitat Directive is being prepared. It will take account of important maternity roosts (especially of *Myotis myotis*) and of winter roosts (especially of *Myotis myotis, Myotis bechsteinii* and *Barbastella barbastellus),* and it will include foraging areas.

Hesse:

Hesse has numerous protected areas that are of special significance for bats. Currently, no comprehensive list of all protected areas of significance with regard to bat conservation is available, however. Such a list will be prepared following completion of the Natura 2000 site network and will be appended to the next report as applicable.

Lower Saxony:

In addition to designation of Natura 2000 sites, for reasons of bat conservation, a number of roosts and roost areas have been optimised for bats. Most of these measures have involved optimisation of bunkers or bunker areas primarily with a view to their use by bats as winter roosts. And such measures have been carried out throughout the state. The sites have not been set aside as protected areas for bats.

Saxony:

Proposals for proposed Sites of Community Interest (pSCI) have been prepared on the basis of information available from the State Agency for the Environment and Geology (LfUG) and of special documents prepared by the German Nature Conservation Association (NABU) (Tab. 27). In the process, separate bat roosts were listed as point objects, where the relevant bat populations did not occur within large-area pSCI.

In Saxony, a total of five separate bat roosts have been designated; in these, a total of 52 objects have been combined. The objects are distributed as follows throughout the five planning regions: north-western Saxony - 6, Upper Elbe Valley/eastern Erzgebirge mountains - 20, Chemnitz/Erzgebirge - 8, Upper Lusatia/Lower Silesia - 13 and south-western Saxony - 5.

An additional 37 pSCI were designated due to their populations of Greater mouse-eared bat, Lesser horseshoe bat, Bechstein's bat and Barbastelle bat or due to sightings of these species in them (even if, in the latter case, the areas had been proposed for other reasons).

Saxony-Anhalt:

Saxony-Anhalt's bat reference centre and the state's environmental protection agency in Halle, acting on behalf of the Ministry for Agriculture and Environment, have proposed protected sites, for additional notification, for the EU Habitat Directive Annex II bat species. The relevant draft, which remains to be approved by the state cabinet, proposes 22 sites for the Greater mouse-eared bat, 10 for Bechstein's bat, 10 for the Barbastelle bat, 5 for the Lesser horseshoe bat and 2 for the Pond bat.

Schleswig-Holstein:

In the framework of Natura 2000 site notification, in January 2000 four sites were notified with regard to bat conservation (Tab. 28).

Table 27: pSCI with bat populations in Saxony. *M.bec = Myotis bechsteinii, M.myo = Myotis myotis, B.bar = Barbastella barbastellus, R.hip = Rhinolophus hipposideros*.

No.	pSCI designation	*M.bec*	*M.myo*	*B.bar*	*R.hip*
001E	Nationalpark Sächsische Schweiz	x	x	x	
002E	Mittleres Zwickauer Muldetal		x	x	
020E	Striegistäler und Aschbachtal		x		
027E	Niederspreer Teichgebiet und Kleine Heide Hähnichen			x	
030E	Basalt- und Phonolithkuppen der östlichen Oberlausitz	x			
033E	Elbtalhänge zwischen Loschwitz und Bonnewitz		x		x
034E	Elbtal zwischen Schöna und Mühlberg	x	x	x	x
037E	Täler von Vereinigter und Wilder Weißeritz	x	x	x	x
043E	Müglitztal		x		x
052E	Laubwaldgebiete zwischen Brandis und Grimma		x	x	
054E	Stöckigt und Streitwald		x	x	
116	Täler um Weißenberg		x		
125	Spannteich Knappenrode			x	
143	Rödertal oberhalb Medingen		x		
147	Separate Fledermausquartiere und –habitate in der Lausitz		x	x	
154	Moritzburger Teiche und Wälder		x	x	
166	Lachsbach- und Sebnitztal		x		
168	Linkselbische Täler zwischen Dresden und Meißen		x	x	x
170	Großholz Schleinitz			x	
171	Triebischtäler	x	x	x	x

No.	pSCI designation	*M.bec*	*M.myo*	*B.bar*	*R.hip*
181	Bahrebachtal		x		x
182	Gottleubatal und angrenzende Laubwälder		x		x
184	Bielatal				x
185	Tafelberge und Felsreviere der linkselbischen Sächsischen Schweiz		x		x
189	Separate Fledermausquartier im Großraum Dresden		x	x	x
196	Presseler Heidewald und Moorgebiet			x	
207	Dolomitgebiet Ostrau und Jahnatal		x	x	
218	Elsteraue südlich Zwenkau		x		
224	Oberholz und Störmthaler Wiesen		x	x	
229	Prießnitz		x	x	
230	Wyhraaue und Frohburger Streitwald		x		
235	Erlbach- und Auenbachtal bei Colditz		x	x	
237	Muldentäler oberhalb des Zusammenflusses		x		
238	s Zschopautal		x	x	
239	Separate Fledermausquartier in Mittel- und Nordwestsachsen		x	x	
240	Pastholz Langenleuba	x	x		
252	Oberes Freiberger Muldetal		x	x	
260	Kalkwerk Lengefeld		x		
272	Separate Fledermausquartiere im Raum Chemnitz und Freiberg	x	x	x	
276	Kalkbrüche im Wildenfelser Zwischengebirge			x	
277	Muldetal bei Aue			x	
296	Nordwestvogtländische Teiche und Moor Oberlinda	x	x		
307	Separate Fledermausquartiere u. –habitate Vogtland/Westerzgebirge		x	x	

Table 28: Natura 2000 sites for bats in Schleswig-Holstein.

Nr.	Site	Bat species
2027-302	Segeberg cave	Bechstein´s bat
2027-303	Forest at the Ihlsee	Bechstein´s bat
1929-301	Wahlsdorf Forest	Bechstein´s bat
1924-301	Forests in the Aukrug area	Bechstein´s bat

8. Consideration given to habitats which are important to bats

Bavaria:

- Management plans for Natura 2000 sites:

In 2001, the state's environmental and state-forest administration began preparing the first management plans for Natura 2000 sites that also include bat populations: a site with a population of the Greater horseshoe bat in the Upper Palatinate, and site 7036-302 "Hienheimer Wald with Ludwigshain and Hangkante Altmühltal" (KEH district, Bavarian state forest administration 2001, GULDER et al. 2002). In the latter area, only a single group of Bechstein's bat had been known, but bat box inspections during a survey found two maternity-colony groups (63 bats in a total of 110 inspected boxes in September 2001). The population's condition was evaluated as "A", or outstanding.

To date, management plans for about 115 Natura 2000 sites are either being prepared or are already completed. The sites include several special bat areas and numerous forests with bat populations. In the Natura 2000 sites 6025-301 and 6225-301 ("Gramschatzer Wald" and "Irtenberger und Guttenberger Wald", WÜ district), in which the Barbastelle bat was recently sighted for the first time, telemetric studies will be carried out, as part of management planning, to determine bats' roost requirements and their activity radii.

- Contractual nature conservation programme (VNP) in forests:

A VNP option for support of habitat or species conservation measures carried out by owners of private forests was introduced in 2002 and will be applied as of 2003/2004. This incentive scheme's most significant aspect with regard to bat conservation is its support for measures to protect caves and "habitat trees" and to promote planting of deciduous trees.

Berlin:

Significant parts of bats' foraging habitats have been set aside as landscape conservation or nature conservation areas or have been notified as Natura 2000 sites. Notification of additional Natura 2000 sites that are significant for bats is being prepared.

Brandenburg:

The state is supporting a EURONATUR project for development and optimisation of bat winter roosts in areas along the Polish border, including areas in Mecklenburg – West Pomerania, Brandenburg and Saxony. Preparatory work for this project has received key support from the state of Brandenburg. In 2002, as part of this project, Polish and German military engineers converted a bunker complex in Barnim, in northern Brandenburg, into a bat winter roost. The number of overwintering animals in the roost gives reason to expect the population to develop positively. In 2002, a work contract was awarded under which about 30 additional military properties were inspected for suitability as bat winter roosts. The effort identified a number of potentially valuable roosts. In addition, protection of a winter roost, of state-wide importance, in the Ostquell Brewery in Frankfurt (O.) was assured via the roost's acquisition by EURONATUR.

Hesse:

Relevant sites in Hesse include all forests in Hesse notified as Natura 2000 sites, along with the Kellerwald National Park, which is to be set aside at the end of 2003.

Lower Saxony:

A number of sites have been processed, also with regard to bats, in environmental impact assessments and Habitat Directive impact assessments. The scope of the present report does not permit mentioning all relevant specific measures carried out.

A castle located near Bodenwerder, in Holzminden district, houses northern Germany's largest maternity roost colony of Greater mouse-eared bats (>1,000 females). The castle's roof is now being renovated, and a plan to protect the colony has been prepared.

A bunker complex with forest, owned by the Federal Office for Regulation of Issues of Assets Ownership (Bundesamt zur Regelung offener Vermögensfragen), is being protected as a Barbastelle bat habitat (especially as a hibernation roost), also in connection with set-aside as a Natura 2000 site. The agreements relative to the habitat's protection were made long before the Natura 2000 selection procedure, however. In 2003, that procedure will enter its final phase, which will include a study on the current status of the Barbastelle bat.

Saxony:

Existing protected areas (Sächsische Schweiz National Park; Upper Lusatian pond and heath Biosphere Reserve, nature conservation areas and natural monuments) include important bat habitats. Furthermore, a large number of habitats that are also important for bats are protected pursuant to Art. 26 of Saxony's Nature Conservation Act. Pursuant to these provisions, potential roosts such as open rock formations, mine shafts of decommissioned mines, stands of old trees with large numbers of hollows and solitary trees with hollows are especially protected. In addition, the following habitat types are protected because of their special importance for bats: fenwoods, swamp forests and riparian

forests; ravine forests; traditional orchards with straw meadows; springs, semi-natural and unmodified sections of streams and rivers, oxbows of watercourses and small, semi-natural standing waters.

The planned route of the BAB17 motorway (Dresden-Prague) cuts through Saxony's most important area for Lesser horseshoe bat populations. The bat populations identified to date are being taken into account in relevant planning procedures. Very little additional supplementary or special data has been collected in this context, however. At present, the planned compensatory measures include construction of six "green bridges" (wildlife crossings).

No state-wide overview of special local measures to support bat conservation is currently available.

Schleswig-Holstein:

Notification of state-owned forests as FSC forests

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

From 2000-2002, the Federal Government supported the Berlin "Bat Festival". This two-day event at the Spandau Citadel, which has taken place every year on the weekend following the "European Bat Night", was conceived as the concluding highlight of the many official and volunteer activities carried out to promote bat conservation. The Federal Ministry for the Environment and the Federal Agency for Nature Conservation (BfN) also developed additional public-relations measures during the "International Year of the Bat" (cf. chapter 15.4).

The final report of the development project (E+E) "Creation of a roost network for building-dwelling bat species" (cf. chapter 3) contains tips and guidelines for efficient ways to raise public awareness regarding bat conservation. These tips and guidelines are the results of many events and projects carried out in the framework of the overall effort.

Bavaria:

In summer 2000, a bat brochure jointly produced by the State Institute for Environmental Protection (LfU) and the State Bird Conservation Association (Landesbund für Vogelschutz in Bayern e.V.) was completely revised and updated. In addition, a flyer was prepared in connection with the species conservation programme for the Lesser horseshoe bat in the Chiemgau area and then distributed to local communities, private persons and churches. And the co-ordination centres for bat conservation have also produced flyers on individual species, etc..

The two co-ordination centres for bat conservation for northern and southern Bavaria, and the state's nature conservation associations, place a high priority on raising public awareness. Each year, the co-ordination centres carry out over 20 presentations and excursions, over ten further-training events for volunteer bat conservationists, over five press conferences and events involving radio/TV and regular annual conferences for bat conservationists in southern and northern Bavaria.

Berlin:

The need for bat conservation is communicated via an exhibition, guided tours and press work carried out by official and volunteer nature conservationists. Among volunteer bat conservation organisations, the "Vespertilio e.V." association is especially worthy of mention. In 2000, 2001 and 2002, members of this association have helped to organise the "European Bat Festival" at the Spandau Citadel. This event, which has now been held for the sixth time in a row, is the central concluding event and highlight of the "European Bat Night", which comprises numerous campaigns and events in European cities. It offers a broad range of information, and has been attended by over 10,000 visitors each year.

Efforts to encourage creation of bat roosts on buildings are made within the "assistance programme for species that breed in buildings". In fall 2000, Berlin's senate department of urban development published a brochure entitled "Animals as neighbours – species protection on buildings" ("Tiere als Nachbarn – Artenschutz an Gebäuden"). This brochure provides a range of information and encourages the creation of bat roosts on buildings. It also assists readers in practical implementation by presenting sample designs for such roosts.

Brandenburg:

- Brandenburg's state environmental agency (LUA), in co-operation with the German Nature Conservation Association (NABU), supports activities relative to the annual “European Bat Night”.
- During the period under review, LUA carried out several training courses on bat conservation, including courses for government employees and architects.
- The state provided funding for the production of a 30-minute video on "Bat conservation in Brandenburg", which was completed in 2002 and is now available for use.
- In 2001, LUA and German Nature Conservation Association (NABU) jointly organised a nation-wide NABU bat conference in Prenzlau.

Hesse:

- Annual conference of Working Group for Bat Conservation in Hesse (AGFH) (with about 150 participants)
- Regional bat nights
- Bat excursions
- Video presentations – "A close look at a bat maternity roost"
- School projects
- Workshops for persons interested in bats and for special groups
- Media work (especially press work, as well as numerous radio presentations and a few TV presentations)
- Publication of an atlas, "Hesse's bats II”, 2002
- "Bat telephone", until 2002 at the Working Group on Wildlife Biology (AKW).

All of these activities have been carried out in the framework of the AGFH's work or of the now-completed project of the Federal Agency for Nature Conservation (BfN). In addition, probably several thousand citizens have been reached directly (without use of media "multipliers") in Hesse over the past three years.

Lower Saxony:

- Preparation of a new flyer on bats, by the state's nature conservation authority.
- Co-production of an information brochure especially for members of forest administrations: "Bat conservation in the forest".
- Support for lectures and exhibits offered by nature conservation groups and nature conservation institutions etc..
- Publication of newspaper articles on the topic of bats.
- Consultation of, and co-operation with, state forest administrations' officials responsible for nature conservation, with regard to practical, publicly perceived bat conservation.
- Holding of excursions.

Saxony:

During the period under review, one of the emphases of bat conservation in Saxony was on raising public awareness. In June 2001, Saxony's State Nature and Environment Foundation (Landesstiftung Natur und Umwelt) launched a "bat, come to my home" ("Fledermaus, komm ins Haus") campaign, inspired by Thuringia's "bat-friendly" campaign. The campaign, which was prepared with the help of volunteer bat conservationists, Saxony's Ministry for the Environment and Agriculture (SMUL) and Saxony's State Agency for the Environment and Geology (LfUG), presents simple ways to protect bat roosts and create new ones. It also extends thanks to building owners and residents for bat-

conservation efforts, and issues plaques to make such efforts visible to the public. As of the end of 2002, a total of 243 plaques had been issued to 186 applicants. In relevant events, a total of some 2,900 participants learned about native bats and ways to protect them.

The campaign is being supported with a range of advertising and informational materials, along with a travelling exhibit and an art and story-writing contest.

In 2001, the LfUG published the brochures "Saxony's bats need friends" ("Sachsens Fledermäuse brauchen Freunde") and "Design of bat roosts" ("Gestaltung von Fledermausquartieren"), in a series on "materials for nature conservation and landscape management" (Materialien zu Naturschutz and Landschaftspflege).

In addition, conferences and workshops on practical aspects of bat conservation and research (such as roost protection and creation, the EU Habitat Directive and bats, call analysis) were held by Saxony's state chapter of the German Nature Conservation Association (NABU) and by Saxony's association for bat research and conservation (Sächsischer Verband für Fledermausforschung und –schutz e.V.), in part with support from the nature conservation academy. Lectures and public excursions on bats – also in connection with the "European Bat Night" – have acquired a certain tradition.

Saxony-Anhalt:

Between 2000 and 2003, three central events and eight regional events were held in connection with the "European Bat Night". A total of 16 public lectures and 22 excursions were offered. The Working Group for Bat Conservation (AK Fledermäuse) organised six lecture events (conferences, workshops). In the districts of Salzwedel, Stendal, Ohre and Burgenland, make-work schemes to benefit bats were organised. Numerous guided tours using detectors were offered, and these generated considerable public interest. Training events were carried out for experts on wood preservation and structural conservation. Flyers and bat-information sheets were distributed in the "Karstlandschaft Südharz" biosphere reserve. Bat conservation plays a central role in the "Karstlandschaft Südharz" Biosphere Reserve in connection with cave protection.

An international workshop on Leisler's bat (*Nyctalus leisleri*) was carried out in 2000 in Saxony-Anhalt (WENDT et al. 2000).

Schleswig-Holstein:

- Since 2000, an annual bat night has been held in Bad Segeberg on the last weekend in August, which coincides with the "European Bat Night". This event will be held for the fourth time in 2003. The bat night, actually a large all-day event, is NABU's official main event for the "European Bat Night". It is held around the Segeberger Kalkberg area and directly at the Segeberg cave, and it makes use of the open-air theatre of the Karl May festival. The bat night offers a great deal of variety and is thus aimed at families and persons interested in nature. In 2002, over 5,000 visitors – primarily families with children – enjoyed the bat night. As a result, this event, along with Berlin's bat night in Spandau, is the largest event of its kind in Germany. An important aspect of the event is that it is carried out jointly by many authorities and organisations that play an important role in bat conservation. These sponsors include: NABU Schleswig-Holstein, the Working Group for Bat Conservation and Research (Arbeitsgruppe Fledermausschutz und –forschung [AGF]), the EUROBATS Secretariat, Schleswig-Holstein's State Ministry for Environment, Nature and Forests, the Segeberg district, the city of Bad Segeberg, Kalkberg GmbH and Beiersdorf Innovation Werbeagentur (advertising agency). It should also be noted that even though the bat night in Bad Segeberg is a major event, with stands, games, tours, etc., it does not violate the sensitive Segeberg cave area, since it is conducted in an exemplary manner that is compatible with nature conservation requirements.
- In mid-August of each year, the Working Group on Bat Conservation and Research (AGF) carries out the Levensau bat night. This event, for which the main organisational responsibility lies with CARSTEN HARRJE, is an evening event focussed on observing swarming of the Noctule bat at the Levensau viaduct. It also presents information on bat biology and conservation. Each year, the Levensau bat night draws several hundred visitors.
- In May 2002, "bat walks" were inaugurated in Bad Segeberg. The bat walks, a project of the city of Bad Segeberg and of the state of Schleswig-Holstein, are a total of eight different routes

through the city that call visitors' attention to bats and the threats they face. The walks show visitors environmental wonders in fascinating, playful and fun ways, and they offer tips and ideas for bat conservation at home. The tours provide information about native bat species, and about related nature conservation issues, by taking visitors to places where secretive bats live. They are suited for adults and children alike.

- In October 2002, Kiel, the state capital, published a 20-page brochure entitled "The bats of the Levensauer Hochbrücke". This clearly written, well-illustrated publication describes the importance of the Levensau viaduct as a bat winter roost. It also discusses the biology and ecology of Noctule bats, and it presents information about the threats to the bat and about the legal protection the bat enjoys. Furthermore, it offers suggestions for ways that readers can become involved in bat conservation. The brochure is available from the following Web address: http://www.kiel.de/umwelt/download/bat.pdf.
- The Working Group on Bat Conservation and Research (AGF) has had an Internet presence since the end of 2001. This site provides information on a wide range of bat-related topics, including descriptions of native species, conservation measures, threats, the work of the AGF, opportunities to observe bats, etc., and its texts are accompanied by outstanding photographs of bats (taken by DIETMAR NILL). The site is intended as a jumping-off point for persons interested in bats. The AGF Website is part of Schleswig-Holstein's "Infonet-Umwelt" (environmental information network), in which it can be found under organisations, clubs and associations (Organisationen, Vereine und Verbände). The following Web address leads directly to the Website: http:// www.umwelt.schleswig-holstein.de/servlet/is/11401.
- In the Westensee lake area (near Kiel), AGF members are carrying out a publicly noted project. This effort, being carried out in co-operation with communities bordering on Westensee lake, is providing information about the bat species occurring in the area.
- Bat-oriented lectures are offered by the State Centre for Bat Conservation and Research (Landesstelle für Fledermausschutz und -forschung). Over the past two years, 21 NABU groups in Schleswig-Holstein (the state has a total of 44 such groups) have held slide shows on native bat species. These events have focussed on the ecological requirements of individual species, ways to protect certain species and, especially, on practical conservation measures.
- Schleswig-Holstein's Academy for Nature and Environment holds annual day-long workshops. The state chamber of commerce and the Katinger Watt nature centre also offer educational workshops.

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

During the period under review, the advisory body appointed by the Federal Government and the Länder, pursuant to Article III.5 of the Agreement, met as follows: on 25 September 2000 in Berlin, on 23 January 2001 in Bonn, on 3 September 2001 in Berlin, on 8 October 2002 in Bonn and on 19 July 2003 in Erfurt. The group's chairman has been JOHANNES SCHWARZ (Berlin). The topics of the group's meetings have included:

- Development of a bat-monitoring programme in Germany;
- Preparation of a list of important underground bat habitats;
- Activities relative to the International Year of the Bat;
- Improvement of the procedure for preparing National Reports for EUROBATS.

The advisory body held the workshop "Monitoring of bats in Germany", which took place on 20 May 2001 in Prenzlau (Brandenburg) in the framework of a conference of the German Nature Conservation Association's (NABU's) national working group on bat conservation.

As representative of the state of Berlin, Mr Johannes Schwarz has a seat on the German advisory body pursuant to Art. III 5. of the agreement; during the period under review, he served as the body's

chairman. During this period, the body met a total of five times. Deliberations at these meetings focussed on preparation of a list of the most important underground bat roosts, establishment of a bat-monitoring system in Germany, development of a nation-wide standard for Länder contributions to the national report for the bat agreement and on raising public awareness.

11. Additional action undertaken to safeguard populations of bats

Since 1999, the Federal Ministry for the Environment has promoted bat-roost conservation in eastern Germany in the following ways:

- An research and development project (F+E) entitled "Study of the suitability of former military bunkers, and other underground spaces, in the German-Polish-Czech border areas as bat roosts" (1999-2001);
- A development project (E+E) entitled "Optimisation of bat winter roosts in eastern Germany" (2002-2006).

Bavaria:

The research projects listed in table 29 were carried out during the period under review in the framework of diploma and state-examination theses submitted to the universities of Erlangen and Munich (TU and LMU):

Table 29: Research on ecology of native bats in Bavaria as of 1999 (state-examination and diploma theses with relevance to Bavarian bat fauna, along with mention of the most important methods applied).

B = ringing, BC = biochemical analysis, D = detector surveys, G = genetics, K = analysis of droppings, N = net captures, Q = roost inspections, R = call analyses, T = telemetry, Tr = transponders, V = observation of behaviour.

Author (Year)	Topic	Methods
RUFFERT (1999)	Bat-box-dwelling species in the Ebersberg Forest	Q
RUPP (1999)	Ectoparasites	
KAYIKCIOGLU (2002)	Hunting behaviour and food of the Lesser horseshoe bat	T, K, Q, V
HASELBACH (2003)	Hunting behaviour of the Greater mouse-eared bat	T
YITMEZ (2003)	Roost use and roosting requirements of bats living in cracks in buildings	Q, V
HOLLERIETH (2003)	Phenology and habitat selection of Nathusius' bat	N, Q, R, V

In 2001, efforts began to prepare "district reports on bat conservation" for individual districts. These reports summarise findings about bats in the relevant districts and cities, and they present concepts, in the form of lists of priorities, for implementation of the most important conservation measures. The aim of the effort is to support work of lower-level nature conservation authorities in the area of bat conservation, as well as to help concentrate resources on the most important needs.

Brandenburg:

- The activities regularly carried out over the past few years have been continued.
- The State Environmental Agency (LUA) issued a contract for study of the distribution and behaviour of the Barbastelle bat, Bechstein's bat and Pond bat.
- Measures have been carried out to protect valuable bat roosts, including maternity roosts of the Greater mouse-eared bat in Groß Behnitz, Gatow, and various bat winter roosts.

Hesse:

- Development project (E+E) of the Federal Agency for Nature Conservation (BfN) entitled "Creation of a roost network for building-dwelling bat species by protecting existing roosts and adding roosts in and on buildings" (Arbeitskreis Wildbiologie an der Justus-Liebig-Universität Gießen e.V. (Working Group on Wildlife Biology at the University of Giessen), in co-operation with Arbeitsgruppe Tierökologie der Philipps-Universität Marburg (Working Group on Animal Ecology at the University of Marburg); the project ran from 1996 to2002.
- Counting of Greater mouse-eared bat populations, with regard to the Natura 2000 site "Werra- und Wehretal", and with recommendations for long-term monitoring assessment under commission to Kassel's chief administrative official.
- Concept for counting and monitoring bats in Natura 2000 sites in the Gießen administrative district (DIETZ & SIMON [2003], under commission to the state of Hesse, represented by Gießen's chief administrative official).
- Counting of bat populations in Natura 2000 sites.

Lower Saxony:

Completed projects commissioned by the competent authority:

- Telemetric study of nursing females of two Greater mouse-eared bat colonies in the Weserbergland area (study of bats' usage of space, of bats' foraging habitats [including their structures] and of bats' contacts to other colonies; proposals for Natura 2000 site demarcation);
- Telemetric study of nursing female Greater mouse-eared bats of a colony in the lower Weser River area (usage of space, foraging habitats and their structure, contacts to other colonies);
- Telemetry study of nursing Pond bats, for location of roosts (roosts, space usage, identification of foraging habitats and their structure, contacts to other colonies);
- Study of populations of the 20 most important Greater mouse-eared bat maternity roosts in Lower Saxony (pursuant to monitoring), and study of threats to the bats and of other relevant parameters;
- Determination of the spectrum of bat species, and of their status, in the Bentheim forest, in the extreme south-western part of Lower Saxony, using detector methods and net captures;
- Studies of populations of the Barbastelle bat and Bechstein's bat in the southern Harz uplands, using net captures and detectors;
- Identification and protection of summer roosts of Daubenton's bat in the Duing forest area near Alfeld;
- Study to determine the actual bat population, and bat activity, in winter months in a cave with an extremely jagged interior ("Rothesteinhöhle") in the Holzminden area, using a two-way photo-electric barrier and activity-recording techniques;
- Additional studies and projects, approved by the authority from a scientific standpoint, have been carried out, and continue to be carried out, on a volunteer basis and in the framework of compensation for intervention, etc. The spectrum of such efforts includes:
    - Determination of migration routes of Noctule bats, in the framework of the forest bat project of the Federal Agency for Nature Conservation (BfN);
    - Determination of migration routes of Nathusius' bat (BfN forest project);
    - Counting of Barbastelle bats in the "Kampstüh" winter roost area near Lehre;
    - Studies of space usage by male Daubenton's bats in the Duing forest, a territory occupied by male Daubenton's bats;
    - Determination of the frequency of occurrence of Brandt's bat and Whiskered bat in winter roosts in Harz National Park;

- Determination of the spectrum of bat species in Harz National Park using detector and capture methods, and inspection of all National Park buildings for roosts, including forest-ranger residences and hunting cabins;
- Determination of the spectrum of bat species, and the status of the various species, in the Reiherbach Valley in the Solling area;
- Studies of space usage (telemetry) by the Northern bat, and of its prey-capture behaviour;
- Measures for setting up and securing winter roosts, and for repairing closures over winter roosts, are carried out on an ongoing basis.

In addition, regular consultations are held, and measures carried out, relative to protection of summer roosts (buildings, structures in the forest, trees with hollows).

Saxony:

A range of local support projects for creation of roosts. For example, in Borna, Leipzig and Dresden, extensive measures were carried out to protect roosts – via installation of bat blocks – as facade insulation was applied to concrete-slab buildings (Plattenbauten); in the Sächsische Schweiz rural district, grids were placed over winter roosts.

Saxony-Anhalt:

- In the Ohre district, a total of 7 bunkers were set up for bats, and 400 bat boxes were hung.
- In 2001 in the Merseburg-Querfurt district, five important rock roosts were secured for the Lesser horseshoe bat and Barbastelle bat.
- In 2002 in the Merseburg-Querfurt district, measures were initiated for restoring a second reproducing roost of the Lesser horseshoe bat, located in Sankt Ullrich.
- In 2001 in the Burgenland district, the "Weinkeller Mariental", a roost of the Lesser horseshoe bat, was restored.
- In 2002 in Eckertsberga, in the Burgenland district, a cellar with 16 Lesser horseshoe bats was provisionally secured.
- In 2002, in the Wernigerode district, entry slits leading into the "Hermannshöhle", "Bielsteinhöhle" and "Kameruner Höhle" caves were moved or enlarged. This eliminated a number of predation traps (capture of bats by racoons, housecats, stone martens).
- In 2002, in the Wernigerode district, access to the Büchenberg tunnel system, in the Elbingerode area, was protected.
- In 2002, in the Sangerhausen district, the "Karstlandschaft Südharz" Biosphere Reserve secured two mine shafts.

Schleswig-Holstein:

- In spring 2002, two bat-entry towers in the Segeberg cave were repaired, with full financing from the state of Schleswig-Holstein. In addition, a ceiling feature near the cave exit that had proved disadvantageous for bats was reshaped. These measures served the primary purpose of protecting entering and exiting bats from housecats, which preyed on the bats in front of the cave. The measures – especially the complete redesign of the exit area – have been able to reduce bat losses to cats. Furthermore, the newly installed entry towers are larger, stronger and better made than the first-generation entry towers. They have also been equipped with photo-electric systems for monitoring the Segeberg cave bats. Since the towers are expected to last for at least 25-30 years, this protective measure is truly significant.
- In the last two years, a number of measures have been carried out in Schleswig-Holstein for protecting and conserving underground winter habitats. A network of helpers for caring for winter roosts is also in place. All winter roosts now have trained helpers who are active in the Working Group on Bat Conservation and Research (AGF).

- In Schleswig-Holstein, additional bat box sites were set up in several suitable forest areas. The sites are being used within the context of area-based population monitoring.
- In 2001, DOROTHEA BARRE and FLORIAN GLOZA presented the final report on the Westensee bat project. The multi-year project, an initiative of the Rendsburg-Eckernförde district group of the German Association for Environmental and Nature Protection (BUND), and supported by the lower-level nature conservation authority of the Rendsburg-Eckernförde district, has provided a wealth of new findings on populations, status and threats of/to bat species living in the Westensee area. (Detailed information gained through the project is presented in the relevant species descriptions.)
- The final report for the Neumünster bat project was also presented in 2001. This project, which ran for five years, was a co-operative effort of the BUND district group in Neumünster and of the city of Neumünster's nature and environment service (Fachdienst Natur und Umwelt). The project was extensive and provided new findings about populations of bat species in one of Schleswig-Holstein's largest cities. It also has identified areas in which protective measures need to be taken.
- In 2000, FLORIAN GLOZA completed a diploma thesis entitled "Population-genetic study of the Noctule bat (*Nyctalus noctula*) in Schleswig-Holstein". Relevant work was carried out at the Institute of Domestic Animal Research (Institut für Haustierkunde) at Christian Albrechts Universität zu Kiel (University of Kiel).
- Information has also been obtained on bat populations in the Segeberg cave. As noted in earlier reports, this information consists primarily of evaluations of photo-electric data. The relevant reports were prepared by KARL KUGELSCHAFTER (Gießen).
- In the village of Klein Nordsee, after a large maternity roost colony of the soprano pipistrelle (*Pipistrellus pygmaeus*), with over 300 individuals, threatened to become an intolerable smell nuisance, the existing roost was modified in an exemplary manner – even though the roost's importance as both a maternity roost and a winter roost presented a special challenge. With expert support from KARL-HEINZ ANDERSEN (AGF), a photo-electric counting system was used, beginning a full year before the actual work was to commence, to determine the time at which the work would disturb the roost the least. The work was then carried out the following year. Soon thereafter –in the same year in which the measures were completed – bats were found to be using the modified roost on the relevant building. An article about the entire project is currently being prepared for publication in the journal “Nyctalus”.

12. Recent and ongoing programmes relating to the conservation and management of bats

The Federal Agency for Nature Conservation (BfN), in co-operation with the relevant specialised Länder authorities, has established a working group that is preparing the basis for fulfilment of reporting obligation in the framework of the EU Habitat Directive. Bats were one of the first species groups that this working group deals with. In the coming months, recommendations for suitable, specific survey and assessment methods are to be developed and published, to provide nation-wide German standards for protecting and monitoring bat populations.

Bavaria:

No additional programmes beyond those already described in this report.

Berlin:

In the framework of the assistance programme for bat species run by Berlin's highest-level nature conservation authority, winter roosts in particular have been inspected with regard to population sizes and relevant protection. Authorities and building societies, and some private building owners, have been advised regarding bat conservation. Numerous artificial roosts on buildings were installed for building-dwelling bats – primarily the Pipistrelle bat (*Pipistrellus pipistrellus*).

Brandenburg:

Measures in addition to those described under section 11 include the following:

- The State Environmental Agency (LUA) plans to award a contract that will continue its successful efforts to provide long-term protection for former military facilities (especially bunkers), in the interests of bat conservation.
- The number of bat ringers working in the state of Brandenburg that are also members of the State Committee for Mammalian Research (Landesfachausschuß Säugetierkunde) of the German Nature Conservation Association (NABU) has grown to eleven. These persons are working on long-term studies (in some cases, lasting over 20 years!) that have provided important information relevant to conservation of specific species and are expected to yield more such information. The topics concerned include population structures of individual bat species, studies on the relationships between summer and winter roosts, loyalty to winter roosts, provision of potential roosting sites with the help of bat boxes, age-group structures of individual bat species, importance of different roost types, interrelationships between roosts of individual species, etc.. The projects are integrated within state-wide and international projects.
- Most of the large known winter roosts, and some of the summer roosts, are cared for by volunteer staff.
- Co-operation with the Federal Research Centre for Virus Diseases of Animals (located in Wusterhausen), for study of the rabies situation in bats, has been continued.

In spite of the efforts made in recent years to find existing and potential winter roosts, a large number of existing or potential roosts remain to be found, and thus a further contract for relevant work is planned. Additional winter roosts that the German-Polish-Czech bat project found to be important are now, in a follow-on project, being secured and optimised as necessary (EURONATUR). In addition, Brandenburg's state environmental agency, via the Zippelsförde Nature Conservation Station, prepared a state-wide overview of important bat winter roosts, to provide a basis for continuous monitoring of the roosts and their species.

In 2003, in a model monitoring project, an effort is commencing to survey the Greater mouse-eared bat *Myotis myotis*. The project is being carried out nation-wide, using standardised procedures, and is expected to provide the first relatively good picture of this species in Germany, a picture that will make it possible to assess the population and its development reliably.

A number of ringing programmes have been underway for some time – for decades, in some cases – with the help of volunteer bat ringers. These programmes have concentrated on the following topics:

- Population dynamics (reproduction, mortality, and other related issues),
- Roost use and roost loyalty,
- Roaming and migratory behaviour and
- Social behaviour.

A broad spectrum of species is being studied in the effort, whose greatest importance is seen in its long-term focus.

The Brandenburg state environmental agency's co-ordination centre for mammal conservation – the Zippelsförde Nature Conservation Station, in place since 1990 – has proven to be an especially valuable resource in connection with the need to monitor mammals listed in the EU Habitat Directive's Annexes, which include all bat species. Ultimately, it thus also supports effective bat conservation. The station efficiently mixes government authority, biological expertise and volunteer commitment.

Hesse:

The state of Hesse is planning to enter into a co-operation agreement with the Working Group for Bat Conservation in Hesse (AGFH) for data collection in connection with Natura 2000 site notifications, definition of conservation aims, monitoring, reporting obligations, etc..

Lower Saxony:

- Decree: Obligation to carry out measures to protect building-dwelling birds and bats on public buildings.
- Lower Saxony's animal-species survey programme: bat surveys.
- Financial support for establishment and repair of roosts throughout the state.
- The specialised authority regularly advises regional bat helpers.
- Monitoring of populations of Greater mouse-eared bat, Pond bat, Barbastelle bat, Bechstein's bat; see section 11.
- Banding programmes: Noctule bat, Nathusius' bat; see section 11.
- Co-operation with the WHO in Wusterhausen regarding bat rabies.
- Since 2001, entry of bat-roost data in a GIS.
- Regular workshops are to be offered on basic skills for capturing and ringing bats.

Saxony:

Volunteer and private nature conservationists regularly care for important bat roosts (relevant responsibilities are assigned in accordance with defined territories). Such care also includes assistance measures and population surveys.

The Nature Conservation Fund's campaign "bat, come to my home" ("Fledermaus komm ins Haus") popularises activities for the protection of building-dwelling bat species. The campaign is being continued.

Additional measures and activities devolve from the EU Habitat Directive and the reporting obligations it imposes. Saxony's state chapter of the German Nature Conservation Association (NABU; LV Saxony e.V.) has submitted an offer for monitoring of Greater mouse-eared bat and Lesser horseshoe bat populations.

Saxony's State Agency for the Environment and Geology (LfUG) serves as the bat-marking centre for the east German Länder. In 1999, LfUG entered into relevant agreements with the responsible state authorities of Mecklenburg-West Pomerania, Brandenburg, Thuringia and Saxony-Anhalt. At present, results of bat ringing carried out since 1964 are being evaluated.

Saxony-Anhalt:

As of 1 November 2001, Saxony-Anhalt's bat-reference centre has been in place in the "Karstlandschaft Südharz" Biosphere Reserve. This centre was established by decree.

Population-monitoring programmes – which Saxony-Anhalt's Working Group on Bats (AK Fledermäuse Saxony-Anhalt e.V.) has developed since 1995 – are being continued in co-operation with the reference centre. HOFMANN (2001) describes the efforts planned for Annex II species. The reference centre plans to make increasing use of telemetry and to study species such as the Lesser horseshoe bat, Barbastelle bat, Bechstein's bat and Northern bat. Most importantly, in selected parts of the state it will seek to find additional reproduction sites of the Lesser horseshoe bat.

Long-term studies in selected Harz mountain cave areas are being continued.

In the framework of planning for the A 14 motorway, basic bat data is being collected that will serve as the starting point for detailed telemetric studies. The aim is to provide scientific justification for use of multifunctional "green bridges" (wildlife crossings) in sensitive natural areas.

Schleswig-Holstein:

- In 2002, a full-time co-ordination centre for bat conservation in Schleswig-Holstein was created, in co-operation with Schleswig-Holstein's chapter of the German Nature Conservation Association (NABU) and the Working Group on Bat Conservation in Schleswig-Holstein (AGF). The centre's full-time staff person is employed by NABU Schleswig-Holstein, with financing under a contract with the environmental ministry. The co-ordination centre is located in Bad Segeberg.

- The co-ordination centre and AGF are carrying out a programme for monitoring all known winter roosts in Schleswig-Holstein.
- All known summer roosts are also regularly inspected by AGF.
- Bat species are also regularly monitored in various bat-box sites, spread throughout all of Schleswig-Holstein.

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

Berlin:

During the period under review, no harm to bats as a result of wood preservatives came to light.

Brandenburg:

Apart from dissemination of the updated list of bat-friendly wood preservatives, via TEUBNER et al. (1998): "Bat conservation in settled areas – tips for habitat and landscape management" ("Fledermausschutz im Siedlungsbereich – Hinweise zur Biotop- und Landschaftspflege") DVL, special issue 1998, no additional measures were carried out with regard to the impacts of pesticides and wood preservatives on bats.

Lower Saxony:

Efforts to raise public awareness: information provided by bat helpers; information to the press provided by the specialised authority; bat brochures, etc..

Saxony:

No additional measures were taken with regard to effects of pesticides and wood preservatives on bats. No recommendations are issued regarding "bat-friendly wood preservatives", since none of the available preservatives can be considered fully bat-safe.

No roosts have been found in attics (churches, residential and commercial buildings) that have been treated with wood preservatives – even in cases in which the preservatives were applied decades ago.

In 2001, a very high juvenile mortality rate was observed in a Greater mouse-eared bat maternity roost (alternate roost). This was probably the result of treatment of rafters with Hylotox (active ingredient is Lindan). In spring 2002, no access to the endangered roost was granted.

Saxony-Anhalt:

In 2002, the church in Nebra, in the Burgenland district, was ecologically upgraded. Large numbers of the Greater mouse-eared bat had died there in 1995. The church's rafters, which were saturated with wood preservative, were removed and the church was re-roofed.

D. Functioning of the Agreement

14. Co-operation with other Range States

The project "Training of bat-conservation experts in eastern and south-eastern European countries", which was carried out in 1999 and 2000, was continued in 2001 with funding from the Federal Ministry of the Environment. Under commission to the Federal Agency for Nature Conservation, Mr HERMAN LIMPENS (Eco Consult & Project Management, Wageningen) carried out additional training workshops, in Lithuania, Yugoslavia and Slovakia, on use of bat detectors.

As a contribution to the efforts of the EUROBATS Advisory Committee to document migrations of European bat populations, the Federal Agency for Nature Conservation, with funding from the Federal Ministry of the Environment, has commissioned the evaluation of data obtained in Germany via ringing of bats. The country's two bat ringing centres, located in Bonn and Dresden, are now preparing a joint report within the research and development project (F+E) "Bat migrations in central Europe".

Bavaria:

The southern Bavarian bat-affairs co-ordination centre (Koordinationsstelle für Fledermaus) and the Bavarian Academy for Nature Conservation, in Laufen, exchange information regularly with colleagues at the co-ordination centre for bat conservation of the Austrian state of Salzburg.

A trans-boundary project on "Surveys of bat roosts on buildings in Laufen (BGL rural district), Oberndorf (Salzburg) and surrounding areas" was carried out in 2002. This effort discovered a populous colony of Geoffroy's bat in Kirchanschöring, in the TS district (see Tab. 2).

Berlin:

Berlin's representative in the advisory body in accordance with Article III.5 of the EUROBATS Agreement took part, by virtue of his function as chairman of that body, in the 3rd Meeting of Parties to EUROBATS, held in July 2000 in Bristol (UK).

Brandenburg:

Continuation of the project for securing potential winter roosts is planned; EURONATUR has submitted a relevant application to the Federal Environment Ministry. The Länder Brandenburg, Saxony and Mecklenburg-West Pomerania will continue to represent the German side. The partner countries are still Poland and the Czech Republic. The project continues to be focussed on measures for roost protection, on scientific support for such work, on questions pertaining to biology of individual bat species and on bat conservation.

Hesse:

- Experts of the Working Group for Bat Conservation in Hesse (AGFH) participate in workshops and maintain contacts with foreign colleagues.
- KLAUS RICHARZ is involved in the IUCN/SSC Chiroptera Specialist Group and took part in the IUCN's "Global Status Survey and Conservation Action Plan Microchiropterean Bats" (2001).
- KLAUS RICHARZ participated in an international workshop on "Landscape fragmentation as an ecological factor", with a presentation on "impacts of roads on bats".

Lower Saxony:

Exchanges of information via contacts with internationally active experts.

Saxony:

To date, there has been no official co-operation with other member states of the EUROBATS Agreement. NABU's Saxony chapter has participated in an international project (involving Germany, Poland, Czech Republic) for protecting winter roosts in the Oder River area. It also participated in a trilateral conference (Poland, Czech Republic, Germany), on "Bats in the Sudety Mts.", held in July 2002 in Yelenia Gora. The co-operation is to be continued.

Saxony-Anhalt:

From 16 to 18 June 2000, a workshop on "The situation of Leisler's bat *Nyctalus leisleri* in Europe" was held in Harzgerode/Alexisbad. The participants in this event came from 13 European countries, predominantly eastern European countries. The publication for this workshop will appear in April 2004.

The publication for the workshop "The situation of the Barbastelle bat *Barbastella barbastellus* in Europe" appeared in May 2003.

Plans call for documenting the population development of horseshoe bats at 10-year intervals. In keeping with these plans, Saxony-Anhalt is preparing a first follow-up workshop, "The Situation of horseshoe bats in Europe", that will be held in 2006.

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

15.1 MOP 2 Resolution No. 2: Standardised methods of monitoring

Efforts to develop a nation-wide system for monitoring bat populations (cf. chapter 5) are oriented to the species and methods recommended by the EUROBATS Agreement. For the Greater mouse-eared bat (*Myotis myotis*), an agreement was reached calling for a nation-wide survey, using standardised methods and beginning with volunteer workers, in 2003 and 2004. Each year, this effort will seek to count all adult animals, in all suitable maternity roosts, from mid-May to mid-June (before the young are born). In each case, bats will be counted either during the day, in their roost, or in the evening as they leave the roost. In addition, each year juvenile bats (alive or dead) will be counted, in all suitable roosts, from the end of June until mid-July (before the young are able to fly). These animals will be counted either during the day, in the roost (especially where colonies are small) or at night, after the adults have left the roost. In cases in which roost and exit counts are especially difficult, bat counters will work in teams, in the interest of data quality. Wherever possible, counting after rainy nights will be avoided, since such conditions can prompt adults to remain in alternative roosts, away from the maternity roost.

To promote information exchange on monitoring of Greater mouse-eared bats, the Co-ordination Office for Bat Conservation in Thuringia (Koordinationsstelle für Fledermausschutz in Thüringen) and the Community for Bat Conservation and Research in Thuringia (Interessengemeinschaft Fledermausschutz und –forschung in Thüringen e.V.) have distributed a printed flyer and set up an Internet website: www.artenmonitoring.org.

The detector workshops in eastern and south-eastern Europe, which were financed by Germany (cf. chapter 14), have also supported international efforts in connection with monitoring programmes. Wherever possible, training has concentrated on detecting the bat species selected by the EUROBATS Advisory Committee.

Bavaria:

Rhinolophus hipposideros:

- Counting of colony sizes via roost inspections and counting of exiting bats in July.
- Counting of hibernating animals in winter roosts in January/February.

  Known colonies and winter roosts are surveyed once annually.

Myotis myotis:

- Counting of colony sizes (maternity-colony animals) via roost inspections during the period July to early August; for some roosts, exiting bats are also counted.
- Counting of hibernating animals in winter roosts, from mid-November to early March.

  About 90% of all colonies are visited once annually; some 200 of the known winter roosts with documented sightings of the species (> 900 since 1985) are visited annually.

Myotis bechsteinii:

- To date, almost no systematic monitoring of summer populations has been carried out. In some forest areas, bats in bat boxes are counted at irregular intervals. The only continuous long-term data available is the research data gathered in Ebrach forest (BA and SW districts) by GEORG SCHLAPP (includes ringing data) via inspections of several maternity-colony groups in bat boxes. Since about 1996, GERALD KERTH and his team have been studying Bechstein's bat in the Würzburg area and have been marking bats with transponders. Some of the data the team has gathered is useful within the context of monitoring of colonies.

- Winter-roost counts in the framework of long-term roost monitoring in Bavaria (see Fig. 12). These counts have turned up very few bats in winter roosts, however.

Eptesicus serotinus:

- To date, virtually no systematic monitoring of summer populations has been carried out. Census data for some colonies (in most cases, counts of exiting bats) is available for some years.
- Winter-roost counts, normally carried out in the framework of long-term roost monitoring in Bavaria (see Fig. 12). Very few bats are normally sighted in winter roosts, however.

Eptesicus nilssonii:

- To date, virtually no systematic monitoring of summer populations has been carried out. Census data for some colonies (in most cases, counts of exiting bats) is available for some years.
- Winter-roost counts, normally carried out in the framework of long-term roost monitoring in Bavaria (see Fig. 12). Very few bats are normally sighted in winter roosts, however.

Nyctalus noctula:

- A few roosts in southern Bavaria are monitored more or less regularly, with counting of exiting bats in the summer and at other times of the year, and with some roost censuses (Tab. 30).

The reasons for the inadequate monitoring of some species have to do with shortages of personnel and funding. The system of bat-colony roost helpers trained to carry out counts is still inadequately staffed, and the nature conservation authorities responsible for the monitoring are underfunded.

Table 30: Noctule bat counts (annual maxima) at important building roosts in southern Bavaria.

The counts were carried out and organised by: C. CHRISTOPH, L. CHRISTOPH, D. FRIEMEL, M. EHM, B. GROß, R. HARTKOPF, H. HOFFMANN, I. JANDL, B. KRAFT, M. KREDLER, D. LEIPPERT, S. MORGENROTH, A. REITMEIER, C. SCHACHENMEIER, F. SCHÄFFLER, T. SCHOTT, B. SCHWARK and A. ZAHN. Each count-row maximum is highlighted. Abbreviations: Sp = spring, Su = summer, F = fall, W = winter

Place, roost type	**Seasons; x = roost occupied**				**before 1995**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**
	Sp	**Su**	**F**	**W**									
Ingolstadt, Fischerheim	**X**	x	x	x		210	174	**327**	191	190		150	69
Bergheim (ND), Donau power station	**X**	x	x	x	80 (1987)		166	236	340	355	**590**	476	489
Bittenbrunn (ND), Donau power station	**X**	x	x		80 (1987)			237	426		431	157	**534**
Wasserburg (RO), apartment building	x	x	x					324	231	650	334	468	**770**
Mühldorf, tax authority building				**X**	100 (1994)	12	100	200	150	**500**	300	150	300
Waldkraiburg (MÜ), apartment building	**X**	x	x	x			130	118	354	**420**	214	183	416
München-Oberföhring, apartment builduing	x	x	**X**	x			120	150		67		60	**194**
Ismaning (M), apartment building	**X**	x	x			465	102	432		375			**606**
Rosenheim, apartment building	**X**	x	x		60 (1987), 110 (1991)		**150**	45		33	23		0

Place, roost type	Seasons; x = roost occupied				before 1995	1995	1996	1997	1998	1999	2000	2001	2002
	Sp	**Su**	**F**	**W**									
Kempten, apartment building	x	**X**	x	x				**360**		153	198	220	276
Höchstätt (DLG), Donau power station	**X**						90			150	**250**		
Altötting, church	**X**	x	x	x				107	91	79	81	**115**	35

Berlin:

The winter population of the Greater mouse-eared in the state of Berlin is regularly surveyed via winter-roost counts. No maternity roosts of this species are known in Berlin. The species Lesser horseshoe bat, Bechstein's bat and Northern bat either do not occur in Berlin or occur only as solitary bats, and thus no monitoring of these species is required. Due to organisational and financial constraints, no monitoring programmes have yet been commenced for the species Serotine bat and Noctule bat. In research carried out for a diploma thesis, a Serotine bat roost system was discovered telemetrically and described.

Hesse:

Of the species listed, in Hesse only the Greater mouse-eared bat is systematically surveyed and counted in accordance with largely standardised monitoring methods (this work is carried out by volunteer AGFH members). Programmes for systematic data collection, following preparatory studies (see section 11) are being developed.

Lower Saxony:

- *Rhinolophus hipposideros:* No monitoring, since the species is no longer native to Lower Saxony
- *Myotis myotis:* Since 1986, population counts have been carried out – either annually or at intervals of several years – in most of the maternity roosts and winter roosts in Lower Saxony. Since 2000, 18 of the most important greater mouse-eared bat maternity roosts have been monitored via counts at fixed dates within the maternity period, although no continuous records have been kept of finds of dead juveniles and adult bats. As of 2003, monitoring will be carried out in accordance with the criteria proposed by the Federal Agency for Nature Conservation (BfN).
- *Myotis bechsteinii:* Currently, only incomplete monitoring is carried out – in part, via the animal-species-survey programme. The monitoring consists of studies of basic population levels. Standardised monitoring is not (yet) feasible, due to the methodological difficulties and time or funding investments it involves.
- *Eptesicus serotinus:* Currently, only incomplete monitoring is carried out, via the animal-species-survey programme. Standardised monitoring is not (yet) feasible, due to the methodological difficulties and time or funding investments it involves.
- *Eptesicus nilssonii:* For years, the population of this species has been regularly surveyed and documented via the animal-species-survey programme. The methods used are largely in line with monitoring standards, with some exceptions. Efforts are being made to standardise counting periods and recording of finds of dead animals.
- *Nyctalus noctula:* Currently, only incomplete monitoring is carried out, via the animal-species-survey programme. The monitoring consists of studies of basic population levels. Standardised monitoring is not (yet) feasible, due to the methodological difficulties and time or funding investments it involves.

In general, for a number of the species listed, staffing and funding shortages hamper efforts to collect data systematically in keeping with nation-wide monitoring standards.

Saxony:

- *Rhinolophus hipposideros:* Synchronous roost inspections in mid-July; counts of both adults and juv.; data collection housed with Saxony's State Agency for the Environment and Geology (LfUG), in the framework of species support.
- *Myotis myotis:* Roost inspections in mid-July; counts of both adults and juv.; data collection housed with the LfUG, in the framework of species support.
- *Myotis bechsteinii:* Data collection housed with the LfUG, in the framework of species support.
- *Eptesicus serotinus, Eptesicus nilssonii* and *Nyctalus noctula:* All collected data, for all three species, with NABU and the Saxony Association for Bat Research and Conservation (SVF); a co-ordination centre will have to be established, if records are to be kept centrally and monitoring is to begin.

Saxony-Anhalt:

Since 1995, monitoring programmes have been carried out and expanded, in Saxony-Anhalt, in accordance with standardised criteria. The parameters listed in table 31are recorded in the process.

Table 31: Parameters covered by the monitoring programmes of the state of Saxony-Anhalt.

WQ = winter roost; RQ = reproducing roost; SQ = swarming roost; Z = counting date; B = counting of individuals in tree roost; K = counting of individuals in box; N = net captures, species identification; T = telemetry, search for roosts.

Species	WQ	RQ	SQ
R. hipposideros	Z January	Z + T May + July	N August
M. myotis	Z January	Z May + July	N August-September
M. bechsteinii	Z January	B, K, N +T May + July	N + K August-September
E. nilsonii	Z January	Z, N, T May + July	N July-September
E. serotinus		Z May + July	N July-September
N. noctula		B + K May + July	N + K August-September

Schleswig-Holstein:

- *Myotis myotis:* No summer finds (sightings, animals in hand) of the Greater mouse-eared bat have been made in Schleswig-Holstein since the mid-1980s. It is thus highly questionable whether the state has any summer population at all of Greater mouse-eared bats. All known underground winter roosts are checked in the winter, but apart from surveys of Segeberg cave (1 individual in the period 2000-2003), such efforts have failed to document any occurrences. A follow-up search for Greater mouse-eared bats is being carried out very selectively, on just a few days of the year (net captures in forests), in the southern part of Schleswig-Holstein.
- *Myotis bechsteinii:* The NABU State Office for Bat Conservation and Research, and the Working Group on Bat Conservation and Research (AGF), collect data on Bechstein's bats by inspecting existing bat-box sites in Schleswig-Holstein following the end of the maternity period. Furthermore, additional bat-box sites are being set up, in suitable forest areas, especially for Bechstein's bats. In addition, net captures, on four different capture dates, are carried out in likely forest habitats (carefully selected). In late summer and fall, during the swarming period, net captures are carried out in front of winter roosts. This method has shown that Bechstein's bats take part in so-called swarming, but do not winter at all of the hunting grounds they use. In the winter, all known underground winter habitats are checked for overwintering Bechstein's bats. Since the end of 2002, work has been underway on a publicity campaign for Bechstein's bat, entitled "Bechstein's bat project". In 2003, a poster and a sticker for this species will be issued.

- *Eptesicus serotinus:* Serotine bats are found mainly through follow-up searches with bat detectors and as a result of private citizens' calls to the NABU State Office for Bat Conservation and Research, the State's Nature and Environment Agency and AGF staff. Each year, during July, an effort is made to count bats leaving selected Serotine bat roosts. As a result of the species' wide distribution in the villages of Schleswig-Holstein, establishment of a monitoring programme has proved difficult; not all of the state's landscape areas have been thoroughly surveyed, and there is a shortage of volunteers who can care for specific areas. In the coming years, efforts to solve these problems will be intensified. In the winter of 2002/2003, a summer roost was found that is probably the longest-occupied summer roost in Schleswig-Holstein. The roost, located in a house near Schleswig, has been used annually by a maternity roost colony since 1933.
- *Nyctalus noctula:* With the help of various types of bat boxes, the Noctule bat is easy to find. For its maternity roosts, the bat exhibits a special preference for boxes with large interiors. Long-term studies in a number of bat-box sites, some of which are quite large (Rixdorfer Tannen, forest areas near Schleswig, etc.) have provided a good overview of the species' populations. Both boxes and trees that the bats use for hibernation are inspected annually.

  Various research projects have been carried out in the past few years, in keeping with the species' good distribution in the forests of Schleswig-Holstein. One roost that requires special treatment is the Levensau viaduct (it normally harbours about 5,000 Noctule bats during the winter). In 2002, CARSTEN HARRJE (AGF), working with support from the BINGO environmental lottery, began a project that includes efforts to raise public awareness (large signs with information) and research (installation of a new photo-electric system).

15.2 MOP 2 Resolution No. 3: Trans-boundary programmes, proposals relative to individual species

Collection of new findings on the Pond bat (*Myotis dasycneme*) and Nathusius' bat (*Pipistrellus nathusii*) has been continued in Germany. Findings of research on Nathusius' bat, funded by the Federal Environment Ministry, were published in a journal of the Federal Agency for Nature Conservation (BfN) (Schriftenreihe für Landschaftspflege und Naturschutz, No. 66 and No. 71) (cf. section 15.3).

Bavaria:

- *Myotis dasycneme:* Although historically reported sightings of the Pond bat in Bavaria have long been accepted, a critical review of old sightings of BRÜCKNER (1926) and KOLB (1950), carried out in connection with the new bat atlas, found no solid evidence of earlier populations of the species in Bavaria. BRÜCKNER, for example, provides no information on Daubenton's bat, and thus it seems very likely his sightings were plagued by some confusion. KOLB's sighting report includes neither commentary nor even a date. More recent indications of summer populations, obtained using bat detectors along the Main River area near Würzburg and at Walchensee lake (TÖL district), also seem unreliable. The Pond bat should thus be struck from Bavaria's list of fauna.
- *Pipistrellus nathusii:* The most important new find during the period under review was the discovery of a maternity colony south-east of Lake Chiemsee (see section 1.18).

Hesse:

A *Pipistrellus nathusii* female that was ringed in the fall in the Bergstraße rural district was found in northern Italy in the following spring. A bat that was ringed in the Rhine meadows (Rheinaue) near Mannheim, during the summer, was found in the Marburg castle in late summer.

Lower Saxony:

- *Myotis dasycneme:* To date, the above-mentioned telemetric studies have provided few new findings about migrations of the species. Since the species' roosts in Lower Saxony are also located near the Dutch border, it must be assumed that females with young cross this border to hunt. In 2003, a further telemetry study is being carried out along the border between Lower

Saxony and the Netherlands, and this study may well produce solid evidence of such trans-boundary hunting flights. As a result, it would be important to identify and protect any existing hunting habitats on the Netherlands side of the border.

- *Barbastella barbastellus:* The Barbastelle bat populations at the southern periphery of the Harz mountains – populations which were only discovered in recent years – show signs of having contact to populations in Thuringia or Saxony-Anhalt that are also relatively near the border. This could also apply to populations north-east of Braunschweig (Baienroder Holz near Lehre). Migrations across the Länder borders must be assumed. So far, attempted telemetry studies of the bats occurring in these areas of Lower Saxony in the summer have proved unsuccessful. Nonetheless, further efforts should be made to identify migratory routes across Länder boundaries.

Schleswig-Holstein:

In 2003, the Working Group on Bat Conservation and Research (AGF) is starting a special programme for identifying possible maternity roosts of the Pond bat. At present, no special programmes on Nathusius' bat are underway, and no new findings on this species have been gained recently.

15.3 MOP 2 Resolution No. 4: Trans-boundary programmes, proposals with regard to biotopes

A "list of the important underground bat habitats in Germany" has been prepared in co-operation with the Länder. This list comprises 122 "multi-species sites" and 170 "single-species sites" (August 2002). It is in harmony with internationally agreed specifications and has been integrated within the pan-European overview for the EUROBATS Agreement.

The topic of bat conservation and forestry has been studied by the EUROBATS Advisory Committee's "Intersessional Working Group on Bat Conservation and Forestry Practices", under German chairmanship. Findings of the research and development project (F+E) "Studies and recommendations relative to conservation of forest-dwelling bats" ("Untersuchungen und Empfehlungen zur Erhaltung der Fledermäuse in Wäldern"), which was funded by the Federal Ministry of the Environment, have provided an important basis for this work. These findings have been published by the Federal Agency for Nature Conservation (BfN):

MESCHEDE, A. & K.-G. HELLER (2000): Ökologie und Schutz von Fledermäusen in Wäldern. [Ecology and conservation of bats in forests.] Schriftenreihe für Landschaftspflege und Naturschutz 66, Bonn, 374 S.

MESCHEDE, A., K.-G. HELLER & P. BOYE (2002): Ökologie, Wanderungen und Genetik von Fledermäusen in Wäldern – Untersuchungen als Grundlage für den Fledermausschutz. [Ecology, migrations and genetics of bats in forests – studies providing a basis for bat conservation.] Schriftenreihe für Landschaftspflege und Naturschutz 71, Bonn, 288 S.

An English-language version of a brochure entitled "Fledermäuse im Wald" was also prepared in the framework of this project. This publication, "Bats in Forests", is also available in the Internet: www.lpv.de/fledermaus/index-fl.htm.

Bavaria:

See section 7.

Berlin:

With a view to protecting important underground habitats, during the period under review three roosts in buildings were notified as Natura 2000 sites: Spandau Citadel and former sand filter systems of the Berlin-Tegel and Friedrichshagen waterworks.

Hesse:

Several hundred of the some 2,000 known winter roosts in Hesse have been given lasting protection in the form of grate covers. Forests with importance for bats are being protected in the framework of notification of special protected areas pursuant to the EU Habitat Directive (see section 7).

Lower Saxony:

Since the early 1980s, important underground habitats (winter roosts) in Lower Saxony have been identified and protected (since 1986, this effort has been systematic). The roost protection provided normally consists of bat-friendly closures, installed by agreement – and often in co-operation – with building owners. Since 1990, in a systematic roost-protection campaign, the state (nature conservation and forest authorities) have invested over 50,000 € in such protection measures. The measures are carried out on an ongoing basis, as necessary. One decommissioned mining tunnel has been set aside as a monument, on the basis of its bat population. To date, forests have been protected only in connection with notification of Natura 2000 sites that are of great importance for bats.

Saxony-Anhalt:

All important underground habitats in Saxony-Anhalt have been protected, and a number of roosts have been optimised. The list of notified important underground habitats is to be updated every five years, an interval which is short enough to provide a clear view of trends. From the perspective of the state of Saxony-Anhalt, the list could well be expanded to include additional objects. A number of additional important objects are slated to be designated Natura 2000 sites and have already been secured.

Saxony:

The notified important underground bat habitats (all multi-species sites and all single-species sites >1 indiv.), and forest areas that, pursuant to current data, are important bat habitats, have been listed as pSCI (see section 7).

Schleswig-Holstein:

All notified underground habitats are covered by a winter-roost monitoring programme, and the roosts' condition is annually checked. In the framework of Natura 2000 site notification, the state of Schleswig-Holstein will notify other types of forest habitats that are important with regard to bat conservation.

15.4 MOP 3 Resolution No. 3.5: International Year of the Bat

The Federal Government published a 20-page brochure entitled "Aktuell: Fledermäuse schützen" ("Currently: protecting bats") to support the EUROBATS campaign in 2001. This brochure was very well-received and is now in press at its third edition. In addition, on the occasion of the International Year of the Bat, the Federal Agency for Nature Conservation distributed a calendar with photographs of bats and explanatory texts in German and English.

15.5 MOP 3 Resolution No. 3.7: Amendment of the Agreement

The amendments of the Agreement were ratified by Germany and entered into force on 13 April 2003.

References:

BAYER. STAATSFORSTVERWALTUNG (2001): Managementplan Hienheimer Wald. - München (Bayerischen Staatsministerium für Ernährung, Landwirtschaft und Forsten).

BRAUN, M. & HÄUSSLER, U. (1999): Funde der Zwergfledermaus-Zwillingsart *Pipistrellus pygmaeus* (Leach, 1825) in Nordbaden. - Carolinea 57: 111-120.

BRÜCKNER, A. (1926): Die Tierwelt des Coburger Landes. - Coburger Heimatkunde und Heimatgeschichte 3: 4-5.

DIETZ, M. & SIMON, M. (2003): Konzept zur Durchführung der Bestandserfassung und des Monitorings für Fledermäuse in FFH-Gebieten im Regierungsbezirk Gießen. – BfN-Skripten 73: 87-140.

DINGER, G. (2001): Winternachweise von Breitflügelfledermäusen (*Eptesicus serotinus*) in Kirchen. - Nyctalus (N.F.) 7: 614-616.

DOLCH, D., HAGENGUTH, A. & HOFMEISTER, U.(2001): Erster Nachweis einer Wochenstube der Teichfledermaus, *Myotis dasycneme* (Boie, 1825), in Brandenburg. - Nyctalus (N.F.) 7: 617-618.

GULDER, H.-J., MÜLLER-KRÖHLING, S. & FISCHER, M. (2002): Erster Managementplan in bayerischen Wäldern. - AFZ/Der Wald 3: 152-154.

HOFMANN, T. (2001): Mammalia (Säugetiere). - In: Die Tier- und Pflanzenarten nach Anhang II der Fauna-Flora-Habitatrichtlinie im Land Sachsen-Anhalt. Naturschutz im Land Sachsen-Anhalt 38: 78-94.

HOLZHAIDER, J., KRINER, E., RUDOLPH, B.-U. & ZAHN, A. (2002): Radio-tracking a Lesser horseshoe bat *(Rhinolophus hipposideros*) in Bavaria: an experiment to locate roosts and foraging sites. - Myotis 40: 47-54.

ISSEL, B. & ISSEL, W. (1960): Beringungsergebnisse an der Großen Hufeisennase *(Rhinolophus ferrumequinum* Schreb.) in Bayern. - Bonner zoologische Beiträge 11 (Sonderheft): 124-42.

ISSEL, B., ISSEL, W. & MASTALLER, M. (1977): Zur Verbreitung und Lebensweise der Fledermäuse in Bayern. - Myotis 15: 19-97.

KAYIKCIOGLU, A. (2002): Verhaltensökologische Untersuchungen an der Kleinen Hufeisennase (*Rhinolophus hipposideros*) – Quartiernutzung, Jagdverhalten und Nahrungsanalyse. - Diplomarbeit an der Universität München.

KIEFER, A. & VEITH, M. (2002): A new species of long-eared bat from Europe (Chiroptera: Vespertilionidae). – Myotis 39: 5-16.

KOLB, A. (1950): Beiträge zur Biologie einheimischer Fledermäuse. – Zoologische Jahrbücher, Abt. Systematik 78: 471-640 (547-572).

NICOLAI, B. & OHLENDORF, B. (1991): Unterscheidung von Zweifarbfledermaus, *Vespertilio murinus* L., 1758 und Nordfledermaus *Eptesicus nilssoni* (Keyserling & Blasius, 1839) nach Schädelmerkmalen. - Nyctalus (N.F.) 1: 25-46.

OHLENDORF, B. (2001a): Fledermäuse (Chiroptera). - In: Arten und Biotopschutzprogramm Sachsen-Anhalt, Landschaftsraum Elbe (Teil 2). - Berichte des Landesamtes für Umweltschutz Sachsen-Anhalt 3: 549-559.

OHLENDORF, B. (2001b): Quartiere der Nordfledermaus *Eptesicus nilssonii* im Harz. – Abhandlungen und Berichte aus dem Museum Heineanum Halberstadt 5: 125-133.

OHLENDORF, B. (2002): Quartierwechsel der Fransenfledermaus *Myotis nattereri* in Sachsen-Anhalt. - Nyctalus (N.F.) 8: 119-130.

OHLENDORF, B. & HECHT, B. (2000): Zum Eintritt der Geschlechtsreife der Weibchen und zur sozialen Streßbewältigung in interspezifischen Reproduktionsgesellschaften in einer Population der Große Bartfledermaus *Myotis brandtii* im Norden von Sachsen-Anhalt. Zeitschr. f . Säugetierkde.**65** (SH), 36-37.

OHLENDORF, B., BUSSE, P., LEUTHOLD, E., HECHT, B. & LEUPOLD, D. (2000): Reproduktion des Abendseglers *(Nyctalus noctula)* in Sachsen-Anhalt. - Nyctalus (N.F.) 7: 279-286.

OHLENDORF, B., HECHT, B., LEUPOLD, D., BUSSE, P., LEUTHOLD, E., BÄCKER, A. & KAHL, M. (2002): Zum Vorkommen der Rauhhautfledermaus *Pipistrellus nathusii* in Sachsen-Anhalt. - Nyctalus (N.F.) 8: 211-222.

OHLENDORF, L., OHLENDORF, B. & HECHT, B. (2002): Beobachtungen zur Ökologie der Großen Bartfledermaus (*Myotis brandtii*) in Sachsen-Anhalt. – Schriftenreihe für Landschaftspflege und Naturschutz 71: 69-80.

ZAHN, A., CHRISTOPH, C., CHRISTOPH, L., KREDLER, M., REITMEIER, A., REITMEIER, F., SCHACHENMEIER, C. & SCHOTT, T. (2000): Die Nutzung von Spaltenquartieren an Gebäuden durch Abendsegler (Nyctalus noctula) in Südostbayern. – Myotis 37: 61-76.

ZAHN, A., HARTL, B., HENATSCH, B., KEIL, A. & MARKA, S. (2002): Erstnachweis einer Wochenstube der Rauhhautfledermaus (*Pipistrellus nathusii*) in Bayern. – Nyctalus (N. F.) 8: 187-190.