

AGREEMENT ON THE CONSERVATION OF POPULATIONS OF EUROPEAN BATS

Report on implementation of the Agreement in Portugal

- 2003 / 4 MoP -

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A. General Information

- ♦ *Name of Party:* Portugal
- ♦ *Date of Report:* 17 June 2003
- ♦ *Period Covered:* April 2000 until May 2003
- ♦ *Competent Authority:* Instituto da Conservação da Natureza

B. Status of Bats Within the Territory of the Party

1. Summary details of Resident Species

24 species are known in Continental Portugal (Table 1). *Myotis mystacinus* does not have any status in this table, because when the Portuguese Red Data Book was prepared its presence in the country was still not confirmed. However, in 1994 we found one breeding colony in the North of Portugal and some individuals have been caught in mist-nets. The presence of *Pipistrellus nathusii* in the continent was reported in 1910, but there are no recent reports for this species. *Pipistrellus pygmaeus* does not have any status in this table, because when the Portuguese Red Data Book was prepared its presence in the country was not known.

The revision of the Portuguese Red Data Book, using the new criteria of IUCN, is in course.

2. Status and Trends

Table 1 shows the status and the apparent population trends of the species known in Continental Portugal.

Table 1 - Status and apparent population trends of the species known in Continental Portugal. Data published in the Portuguese Red Data Book (1990).

Species	Status	Apparent Trend
<i>Rhinolophus ferrumequinum</i>	Endangered	Declining
<i>R. hipposideros</i>	Endangered	Declining
<i>R. euryale</i>	Endangered	Declining
<i>R. mehelyi</i>	Endangered	Declining
<i>Myotis mystacinus</i>		
<i>M. emarginatus</i>	Endangered	probably declining
<i>M. nattereri</i>	Endangered	Declining
<i>M. bechsteinii</i>	Endangered	probably declining
<i>M. myotis</i>	Endangered	Declining
<i>M. blythii</i>	Endangered	Declining
<i>M. daubentonii</i>	Not threatened	
<i>Pipistrellus pipistrellus</i>	Not threatened	
<i>P. nathusii</i> (?)		
<i>P. kuhli</i>	Not threatened	
<i>P. pygmaeus</i>		
<i>Hypsugo savii</i>	Insufficiently known	Unknown
<i>Nyctalus leisleri</i>	Vulnerable	Unknown
<i>N. noctula</i>	Indeterminate	Unknown
<i>N. lasiopterus</i>	Indeterminate	Unknown
<i>Eptesicus serotinus</i>	Not threatened	
<i>Barbastella barbastella</i>	Indeterminate	Unknown
<i>Plecotus auritus</i>	Indeterminate	Unknown
<i>P. austriacus</i>	Not threatened	
<i>Miniopterus schreibersii</i>	Vulnerable	Declining
<i>Tadarida teniotis</i>	Rare	Unknown

3. Habitats and Roost Sites

In Portugal there are many habitats that can be used by bats. We have extensive limestone zones, with many caves, that are used by cave-dwelling species both in the winter and during the breeding season. In the last decades, with the declining of the mining activities, new potential roosts became available and are now occupied.

4. Threats

The major threats that occur in Portugal are:

- Disturbance

In the last years there has been an increase in the number of people involved in outdoor activities, including caving, and we often find signs of the recent presence of visitors inside the caves. The disturbance is particularly bad during the hibernation and breeding seasons. In some caves we even found signs of fires and shotgun cartridges.

- Roost destruction

Shepherds often blocked the entrance of vertical caves to keep their animals from falling in them. There are no data on the numbers of holes closed for this reason, but the practice does not seem to continue. In accordance with Portuguese law the entrances of inactive mine galleries are often closed with walls, but mines abandoned a long time ago have open entrances. Efforts are being made to avoid the blocking of the entrances of the galleries used by bats, by the mining authorities.

- Loss of feeding areas

Portugal's landscape is changing, due to the integration in EU. The traditional land use practices (low intensity grazing, large areas of holm oak "montados", and little use of pesticides) were overall, better for the bats. The newest CAP encourages a declining in pesticides use, so it may have halted this negative trend (but there are no data on this issue).

Clearing of riparian vegetation is still a common practice.

- Pesticides

Some forbidden pesticides may be still in use.

5. Data Collection, analysis, interpretation and dissemination

All activities related with data collection, analysis, interpretation and dissemination are done by "Instituto da Conservação da Natureza" in collaboration with "Faculdade de Ciências de Lisboa".

There are some databases prepared by "Instituto da Conservação da Natureza" and "Faculdade de Ciências de Lisboa": (a) Bat observations (based on bibliography, information and fieldwork), (b) Underground roosts monitoring programme, and (c) Banding (captures and recaptures).

The web site of "Instituto da Conservação da Natureza" includes a database called SIPNAT (Natural Patrimony Information System) that includes information of all bat species.

C. Measures Taken to Implement Article III of the Agreement

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

Portuguese law protects all bat species since 1967. They are also covered by international legislation, such as Bern Convention, Bonn Convention, and Habitats Directive.

The legislation of protection of caves and mines that harbour important bat populations has not been approved yet.

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

The survey of the underground roosts is already quite complete.

The roosts of the remaining species are still poorly known, although there has been an effort to locate important roosts of non cave-dwelling bats in protected areas (Section C.12.d).

The actual list of Portuguese SAC's includes the majority of underground important roosts.

8. Consideration given to habitats which are important to bats

Research about feeding habitat use by bats in Portugal has been going on, using radio-tracking (Section C.12.c). There are already good data for *Myotis myotis* and some data for *Rhinolophus mehelyi* and *Miniopterus schreibersii*.

Nowhere in Portugal is the landscape managed specifically to protect bat-feeding habitats. However, since some of the main roosts known are inside natural parks it is hoped that the general rules to protect the landscapes in these areas will, in general, also benefit bats.

Some areas of the selected Sites of Community Importance also included feeding habitats.

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

Bat Night 2000 was organised in two phases: (i) 5 June – A ceremony to close a project with schools organised by a NGO took place, with the presence of the Minister of Environment. 80 schools participated in this project. (ii) 22 and 23 September – Several activities were organised in Lisbon's Castle. It included an exhibition and a circuit with 7 stops, each of them with games concerning bats. Around 500 children participated in this circuit. The event was visited by the Secretary of State of Territory Planning and Nature Conservation.

Bat Night 2001 was organised by the Museum of Natural History of Porto, on 22nd September. The event was organised in a garden in the centre of the town. Some posters with several informations were placed in the garden and were left in exhibition for 2 months. There was a talk about conservation and a walk in the garden with bat detectors. During 2 months, several hundreds of children participated in several activities related to bat conservation.

Bat Night 2002 was organised by the Museum of Natural History of Porto, on 29th September. The event was organised in a park in the centre of the town. During the afternoon, a few hundreds of children participated in several activities. After dusk, there was a talk about conservation and a walk

in the park with bat detectors. There was also an exhibition of materials produced by schools and a slide projection; these materials were left in exhibition for 3 months.

Three talks about bat ecology were presented in the 12th International Bat Research Conference.

Four talks about bat ecology were presented in the 9th European Bat Research Symposium.

Ten talks about bat conservation, one workshop about field methodologies and three ateliers with educational activities were done in Portuguese Conferences.

Three projects on Bat Conservation organised by NGO's were done. They included talks, ateliers and field excursions with teachers.

As a mitigation measure of the construction of a big dam in Southern Portugal, an educational program was developed in 32 schools of the region, reaching a total of 1960 students between 7 and 12 years old. Pre- and post-session inquiries allowed evaluating the success of the program in terms of acquired knowledge. The results showed statistically significant improvement.

Five field trips with students from primary schools and universities were organised.

Four TV documentaries were produced.

35 articles about bats were published in magazines and newspapers.

An article about the use of technology in the study of bats was published in Sony's catalogue.

A book about bat conservation in the Southern part of Portugal was published; it includes a story and several activities for children (5-10 years old).

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

This point has not been implemented yet.

11. Additional action undertaken to safeguard populations of bats

The destruction of a building that harbours *Tadarida teniotis* is being followed; an artificial roost will be built. The promoter will pay the roost.

In result of the construction of a big reservoir in southern Portugal, several measures were taken to safeguard the populations of bats in that area: (1) 100 bat-boxes (model adapted from the BCI's nursery house) were mounted, before the cut down of all the forested areas and the consequent destruction of bat roosts in trees. The first bat-box was colonised 4 months after, soon after the winter. The number of bats and colonised bat-boxes is still increasing. (2) Due to the partial flooding of one major underground roost, some measures were taken to consolidate its structure. Together with the continuous recording of temperature and humidity inside the roost the colony is being regularly monitored.

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

a) Control of the vegetation in the entrances of some roosts. There has been an effort to cut the vegetation in the entrances of some roosts, which sometimes become blocked.

Funded by "Instituto da Conservação da Natureza".

- b) Monitoring programme of cave-dwelling species. A monitoring programme of the cave-dwelling species is in progress since 1987. This programme involves the estimation of bat numbers present in the most important wintering and parturition roosts. The surveys are carried out annually in most of the roosts.

Funded by "Instituto da Conservação da Natureza".

- c) Identification of the most important feeding areas of some cave-dwelling species.

The foraging behaviour and habitat selection in *Myotis myotis*, *Miniopterus schreibersii* and *Rhinolophus mehelyi* were studied in Spring 2000 and 2002 in a dry area of Southern Portugal, mostly covered by Mediterranean scrub, stone oak woodlands, olive grooves and cereal steppe. The main objectives of this study are related to acquiring the information necessary for managing the areas around the roost. This includes: 1) To identify the feeding habitats of these species in this areas; 2) To identify the extent of the foraging range of the colony, that is, to identify the area that may be subjected to special management in order to sustain the colony. As a secondary objective we were also interested in studying other aspects of the foraging behaviour.

Several animals were marked with small radio tags. In Spring 2000 bats were followed mostly by triangulation from fixed and mobile antennas, placed in the highest points of the landscape. All the towers had double antennas and used a precision system, which allows the bearings to have an error of less than 2 degrees. With the fixed antennas and car mounted antenna in most directions it was possible to obtain accurate location up to 10 Km, but in certain circumstances up to more than 20 Km. In Spring 2002 bats were followed on a first night by plane, in order to identify the location of feeding-areas, and afterwards by triangulation from two mobile antennas. Both towers had double antennas and used a precision system, which allows the bearings to have an error of less than 2 degrees.

All the locations of the animals were incorporated in a Geographic Information System and plotted over digital aerial photographs for interpretation.

Until now it was possible to follow the night 20 *M. myotis*, 6 *M. schreibersii* and 10 *R. mehelyi*. Some of this data has not yet been processed and the results presented are still preliminary and incomplete, and refer exclusively to *M. myotis*.

Time of emergence: All the animals left the roost just before complete darkness throughout the study season. However, the time of return to the roost varied considerably among individuals and between nights.

Foraging areas: All the animals used fixed foraging areas where they returned most nights. Usually each animal used only one area, but often they could use two or even three areas. **Distance:** It was possible to identify 23 foraging areas, located up to 19 Km from the roost.

The great majority of males forage within a radius of 10 Km from the roost. However, the females in general seem to forage further away. **Area:** In the cases so far analysed each foraging area usually covers about 200 ha (90% point – Minimum convex polygon). However this value is still based on a small number of foraging areas and it may change once we analyse most of our data.

Speed: Comparing the speed of progression during the foraging period with the movements

between roost and feeding areas we found a huge difference. While in the first case it took place quite slowly, most often between 2 and 4 Km per hour, in the second case it reaches up to 40 Km per hour. This was possible because the animals usually flew directly and without stops. **Foraging habitats**: We still have not analysed most of our data and so we can not present a quantitative analysis of habitat selection. What seems quite clear is that foraging animals use most main habitats in the study area.

Funded by "Instituto da Conservação da Natureza" and "Faculdade de Ciências de Lisboa".

- d) **Inventory of bat fauna in Natural Parks**. Natural parks are the areas where land use practices are more closely monitored and where there are better chances of doing habitat management to improve the quality of habitats for bats. Therefore, in some of these protected areas, a study is being carried out to identify the habitats that are most used by bats during their feeding flights. The data are being collected with bat detectors, along transects that include the most important habitats of each park.

Funded by "Instituto da Conservação da Natureza".

- e) **Development of bat-boxes for Mediterranean areas**. The purpose of this study was to develop a bat-box with the suitable characteristics to be successfully occupied by bats in the Mediterranean region. These bat-boxes have to have a wide range of internal temperatures, optimal internal temperatures for bats and keep long periods of time within these conditions. The thermal characteristics and some architectural variables of a bat-box model were studied, namely the bat-box colour (white, grey, black and "wood" colour), roof colour (white and black), roof size, ventilation openings size, existence of a lateral ventilation and existence of a "double-roof". The results showed that bat-boxes painted with dark colours, such as black or grey, achieved higher temperatures and the widest range of internal temperature. The dark bat-boxes have the disadvantage of reaching high temperatures that might be excessive for bats. On the other hand, bat-boxes with a "double-roof" or with a white roof in a grey box achieved the lowest temperatures, maintaining a wide range of internal temperatures. Our data supports the idea that a medium-grey bat-box is suitable for most of the Mediterranean area. In hotter regions the bat-boxes which seem to be the more appropriate are the ones with a bigger roof or with a white roof in a grey box. In this way we can avoid excessive temperatures inside. In the colder regions grey bat-boxes with black roof or completely black bat-boxes seemed to be more appropriate. These ones can absorb more sun radiation, increasing the heat inside. Bat-boxes thermal conditions are still under study. Now we are testing new architectural variables and the influence of geographic orientation.

Funded by "Instituto da Conservação da Natureza".

- f) **Habitat use by *Tadarida teniotis***. Associated with the following of the destruction of a building that harbours a colony of this species (Section C.11) some individuals were followed by means of radio-tracking. The feeding-range of the colony was estimated on 35 Km, and the preferred habitats in this range were determined. Other important aspects like the use of the building during the night and the use of alternative roosts were evaluated.

Funded by the promotor.

- g) Fencing of underground roosts. One mine (very disturbed) was fenced.
Funded by "Structural Funds for Environment".
- h) Creation of an Interpretation Centre in a Natural Park. An Interpretation Centre was built in the "Natural Park of Serras de Aire and Candeeiros", near a cave that harbours parturition colonies of several species. The Centre will have an observatory, where visitors can observe the bats inside the cave using infrared cameras.
Funded by "Structural Funds for Environment".
- i) Identification of the causes of the unusual mortality observed in *Miniopterus schreibersii*. In Summer 2002 several hundreds of juveniles of *Miniopterus schreibersii* were found dead. Four juveniles were analysed in the UK, for bacteriology and histopathology. This analysis was paid by DEFRA. The laboratory investigations add weight to the opinion, based on macroscopical findings that the animals did not die as a result of an infectious disease. However, one should take into consideration that these were young of the year, which could have starved after their mothers died or deserted the roost. Five juveniles were analysed in Portugal, but the data are not available yet.

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

No action was carried out about this item.

D. Functioning of the Agreement

14. Co-operation with other Range States

Luísa Rodrigues participates in a commission to give advice to a Spanish project about roosts conservation.

Luísa Rodrigues participated in the scientific committee of the 9th European Bat Research Symposium, organised in France.

The Spanish Society for the Study of Bats organised a meeting with Spanish authorities and representatives of France and Portugal to discuss the unusual mortality observed in *Miniopterus schreibersii* in the three countries (Section C.12.i).

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

Resolution 2.1 - Consistent Monitoring Methodologies

In Portugal, since 1987 we have been monitoring cave-dwelling species (Section C.12.b). We monitor both maternity and hibernation roosts. We try to monitor every year all the underground roosts considered to be of National importance (around 30 each season) and some buildings that harbour important colonies of "cave-dwelling species" such as *R. ferrumequinum* and *R. hipposideros*.

We always make observations inside the roosts, counting the individuals or estimating the area of the colonies (visually and with photographs). We use the methods described for *Myotis myotis/blythii* and *Miniopterus schreibersii* in the resolution approved in 2MoP.

We believe that these methods can be successfully applied to *R. euryale*, *R. mehelyi*, *M. myotis*, *M. blythii* and *M. schreibersii*, that are very faithful to their roosts and hang from the ceiling, making the observations very reliable.

In the case of *R. ferrumequinum* and *R. hipposideros*, we have more problems since they use many roosts to breed, in small numbers. Even during the winter, when there are expected to use only underground sites, they are not so philopatric as the other species.

In the case of *M. nattereri* and *M. emarginatus*, although we only know maternity colonies in underground roosts, since normally they use hidden places (especially *M. nattereri*) very often we can not observe the colonies. In many roosts we only know that there is a maternity colony inside because we catch juveniles flying at the entrance.

Resolution 2.4 – Transboundary Programme: Habitat Proposals

Since underground habitats are particularly important in Portugal, a special attention has been given to them. In the National Conservation Plan of Cave-dwelling Bats (1992), information about the most important roosts is available. A database of all roosts was prepared.

Resolution 2.5 – Geographical Scope of the Agreement

A study of migratory patterns of some cave-dwelling species (*Miniopterus schreibersii*, *Myotis myotis* and *Myotis blythii*) is being conducted in a few roosts.

Resolutions 2.7 and 3.3 – Format of National Reports

The reports have been prepared accordingly to the new formats.

Resolutions 2.8 and 3.8 – On the implementation of the conservation and management plan

An effort to implement the Article III of the Agreement has being taken, as presented in this Report.

Resolution 3.5 – International Year of the Bat

ICN made an effort to increase the activities of public awareness (see Section C9). A sticker with the logo prepared by the Secretariat was produced and was circulated in ICN's mailing.

Resolution 3.7 – Amendment of the Agreement

This point has not been implemented yet.

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