

**AGREEMENT ON THE CONSERVATION OF
POPULATIONS OF EUROPEAN BATS**
Report on implementation of the Agreement in Portugal
- 2006 / 5 MoP -

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A. General Information

- ♦ *Name of Party:* Portugal
- ♦ *Date of Report:* 18 May 2006
- ♦ *Period Covered:* June 2003 to February 2006
- ♦ *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).

The revision of the Portuguese Red Data Book, using the new criteria of IUCN, was recently published (Cabral MJ (coord.), Almeida J, Almeida PR, Dellinger T, Ferrand de Almeida N, Oliveira ME, Palmeirim JM, Queiroz AI, Rogado L & Santos-Reis M (eds). 2005. *Livro Vermelho dos Vertebrados de Portugal*. Instituto da Conservação da Natureza. Lisboa. 660pp.). *Pipistrellus nathusii* was not evaluated in the continent because its presence was reported in 1910 but there are no recent observations for this species.

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.
 Trends were calculated only for species with status other than Least Concern.
 Data published in the Portuguese Red Data Book (Cabral *et al*, 2005).

Species	Status	Apparent Trend
<i>Rhinolophus ferrumequinum</i>	Vulnerable	Indetermined
<i>R. hipposideros</i>	Vulnerable	Indetermined
<i>R. euryale</i>	Critically Endangered	Declining
<i>R. mehelyi</i>	Critically Endangered	Severe declining
<i>Myotis mystacinus</i>	Data Deficient	Unknown
<i>M. emarginatus</i>	Data Deficient	Indetermined
<i>M. nattereri</i>	Vulnerable	Seems to be increasing
<i>M. bechsteinii</i>	Endangered	Unknown
<i>M. myotis</i>	Vulnerable	Declining
<i>M. blythii</i>	Critically Endangered	Severe declining

<i>M. daubentonii</i>	Least Concern	
<i>Pipistrellus pipistrellus</i>	Least Concern	
<i>P. kuhli</i>	Least Concern	
<i>P. pygmaeus</i>	Least Concern	
<i>Hypsugo savii</i>	Data Deficient	Unknown
<i>Nyctalus leisleri</i>	Data Deficient	Unknown
<i>N. noctula</i>	Data Deficient	Unknown
<i>N. lasiopterus</i>	Data Deficient	Unknown
<i>Eptesicus serotinus</i>	Least Concern	
<i>Barbastella barbastella</i>	Data Deficient	Unknown
<i>Plecotus auritus</i>	Data Deficient	Unknown
<i>P. austriacus</i>	Least Concern	
<i>Miniopterus schreibersii</i>	Vulnerable	Stable
<i>Tadarida teniotis</i>	Data Deficient	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.

There are also many known roosts in buildings, cliffs, bridges and recently a few trees used by bats were identified.

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 sometimes 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 changed, 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. Clearing of riparian vegetation is still a common practice.

Pesticides

Pesticides probably affect bats, but there is no data on the subject.

Traffic injuries

In particular low-flight bat species can be killed by cars. There are a few records of several species (*R. ferrumequinum*, *R. hipposideros*, *P. kuhli*, *P. pipistrellus* or *P. pygmaeus*, *P. austriacus*, *B. barbastellus*) that were found dead in roads, but there are no quantitative data on this subject.

Wind-turbines

In particular high-flight species can be killed by wind turbines. There are some records of several species (*H. savii*, *N. leisleri*, *P. pipistrellus* or *P. pygmaeus*, *M. daubentonii*) that were found dead in wind farms, but there are no quantitative data yet on this subject.

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” (www.icn.pt) contains a database called SIPNAT (“Sistema de Informação do Património Natural”) that includes information of all bat species that occur in Portugal.

The web site of “Instituto da Conservação da Natureza” also contains a plan (“Plano Sectorial da Rede Natura 2000”) that comprehends cartography and conservation and management measures of Portuguese SCI’s. The plan includes information on natural values included in the annex II of Habitats Directive and data on the species present in the Portuguese SCI’s (covering species included in annexes II and IV).

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 that was transferred to national legislation, such as Bern Convention, Bonn Convention, and Habitats Directive.

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

The survey of the underground roosts is already quite complete. The actual list of Portuguese SCI’s (approved for Atlantic region and under approval for Mediterranean region) includes the majority of underground important roosts.

The roosts of the remaining species are still poorly known.

8. Consideration given to habitats which are important to bats

In Portugal the landscape is not managed specifically to protect bat-feeding habitats. However, since most of the main known roosts are inside SCI’s, some planning/management and regulatory rules will protect directly or indirectly feeding habitats (as well as roosts). Under the implementation of environmental impact assessment regulation there are also compensation and minimization measures, as well as monitoring, specifically for bats feeding habitats (and also roosts).

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

7th and 8th Bat Nights were organised by the Museum of Natural History of Porto (respectively on 26th July 2003 and 17th July 2004). The events were organised in a park in the centre of the town. During the afternoon, a few dozens of children participated in several activities. After dusk, there were talks about conservation and walks in the park with bat detectors.

9th Bat Night was organised by “Câmara Municipal de Montemor-o-Novo” (Local Authority) during one week in September 2005. 489 students from 21 schools participated in several activities. 100 persons participated in evening walks with bat detectors, preceded by talks. One of the schools that took part in the events is currently developing a project on bats.

Included in a project on geology, organized by “Ciência Viva”, on 24th September 2005 40 persons attend an event consisting on a walk through abandoned mining area; at sunset a demonstration of ultra-sound detectors took place during bat emergence from the mine.

Fifteen talks about bat conservation were done in schools, universities and general public.

Several talks and two workshops about bat conservation and ecology were presented in Conferences.

Three field trips with students from a university were organised.

Several articles about bats were published in magazines and newspapers.

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 was built, paid by the promotor. The new roost is already occupied and is being monitored.

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

- a) 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. An evaluation of the evolution along the years was published. Funded by "Instituto da Conservação da Natureza".

- b) 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".
- c) Fencing of underground roosts. One cave was protected. Funded by "Câmara Municipal de Alcanena".
- d) 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 has an observatory, where visitors can observe the bats inside the cave using infrared cameras. Co-funded by "Structural Funds for Environment" and Local Authority ("Câmara Municipal de Alcanena").
The Centre will have an interactive exhibition about bats. The exhibition is almost finished.
- e) 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. 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 results were not conclusive. Some bats were sent to a Spanish laboratory; a positive reaction to Herpesviridae was found.
- f) The impact of parasitism on the condition of bat hosts. Parasites can have a profound affect on their hosts, influencing their immune responses, energy budgets, behaviour and physical condition. Although bats harbour a wide range of ectoparasites, their effects on bat's condition have not been well documented. The purpose of this PhD is to gain information about the effects of parasitism on bats, using *Miniopterus schreibersii* and its specific ectoparasites as model species. It was recently studied i) the seasonal variation of ectoparasitic loads on about 1000 bats, and ii) the relation of these loads with the condition of bats in different periods of their yearly cycle. So far, findings show that some ectoparasitic species have their life cycle synchronized with

that of its host, and that these loads have the potential to significantly affect host condition in certain period of its yearly cycle. Funded by “Foundation for Science and Technology”.

- g) Bats in islands. During 2002 a preliminary study was made to evaluate the situation of bat species in the archipelagos of Madeira and Azores. Two species were confirmed in the Azores islands (*Pipistrellus maderensis* and *Nyctalus azoreum*). Three species were confirmed in the Madeira Island (*Pipistrellus maderensis*, *N. leisleri verrucosus* and *Plecotus austriacus*) and one in Porto Santo Island (*Pipistrellus maderensis*). Funded by "Instituto da Conservação da Natureza".
- h) On the presence of *P. pipistrellus* and *P. pygmaeus* in Portugal. Genetic and ultra-sound methodologies were used to identify individuals of this genus. The presence of both *P. pipistrellus* and *P. pygmaeus* was confirmed. Funded by "Instituto da Conservação da Natureza".
- i) Monitoring the impact of agriculture, forestry and live stocking activities on bat populations of Serra de Monfurado (proposed SCI), guidelines to the site management plan. (LIFE 03/NAT/P/000018). Bat activity has been monitored using bat detectors on 40 stations, which were visited monthly between March-October 2004 and March-September 2005. Four new species to the site were discovered: *Barbastella barbastellus*, *Nyctalus leisleri*, *Myotis nattereri* and *Myotis daubentonii*. Bat activity and species diversity will be related to farming practices on each station in order to identify which practices have lower impacts on bat populations. Bats were captured using mist nets with two aims: (i) complete the bat species inventory of Serra de Monfurado, and (ii) capture tree dwelling bats, mark these individuals with radio-tags and track them to their tree-roosts. A very rare and new species to the site was caught (*Myotis bechsteinii*); it also confirmed the presence of bat species previously inventoried using bat detectors (*N. leisleri*, *M. daubentonii*, *M. nattereri* and *B. barbastellus*). Using radio-tracking seven roosts of *Nyctalus leisleri* in trees were found; these are the first known in the country. Five roosts in underground galleries and buildings were also found (one harbouring 30 *Rhinolophus hipposideros* and another harbouring a small reproduction colony of 25 *Myotis myotis*). Co-funded by LIFE Nature, Local Authority (“Câmara Municipal de Montemor-o-Novo”) and “Instituto da Conservação da Natureza”.
- j) Ecology of the barbastelle bat, *Barbastella barbastellus*. The purpose of this PhD is to investigate the ecological characteristics of one of the least known and most threatened

species of tree-dwelling bats (*B. barbastellus*) and also consider other tree-dwelling species. This study will focus on developing habitat-suitability maps that highlight areas of likely occupancy by this bat. Subsequently, new trapping techniques will be tested in these areas to improve capture efficiency. From captured individuals a non-lethal biopsy punch will be collected for genetic analysis to characterize the population structure and species' evolutionary history. Individuals will be released and followed to their roosts by radio-tracking. Located roosts will be characterized, and tested for whether bats select roost trees. This research will try to identify patterns of resource utilization and demographic structure that can be used in effective conservation strategies for tree-dwelling bats. Funded by "Foundation for Science and Technology".

k) Publications

- Ramos Pereira, M.J., Rebelo, H., Rainho, A. & Palmeirim, J.M. 2002. Prey selection by *Myotis myotis* (Vespertilionidae) in a Mediterranean region. *Acta Chiropterologica*, 4(2): 183–193
- Rainho, A, J.T. Marques e J.M. Palmeirim. 2002. *Arquipélago dos Açores*. Pp. 8-28 In Os morcegos dos arquipélagos dos Açores e da Madeira: Um contributo para a sua conservação. Relatório Técnico Final. Centro de Biologia Ambiental / Instituto da Conservação da Natureza, Lisboa, 49 pp.
- Rainho, A e J.M. Palmeirim. 2002. *Arquipélago da Madeira*. Pp. 30-49 In Os morcegos dos arquipélagos dos Açores e da Madeira: Um contributo para a sua conservação. Relatório Técnico Final. Centro de Biologia Ambiental / Instituto da Conservação da Natureza, Lisboa, 49 pp.
- Salgueiro P., A. Rainho A. e J.M. Palmeirim. 2002. *Pipistrellus pipistrellus* e *P. pygmaeus* em Portugal. Relatório técnico final. Centro de Biologia Ambiental / Instituto da Conservação da Natureza.
- Rodrigues, L., H. Rebelo e J.M. Palmeirim. 2003. *Avaliação da tendência populacional de algumas espécies de morcegos cavernícolas*. Relatório técnico final. Centro de Biologia Ambiental / Instituto da Conservação da Natureza.
- Rodrigues, L., A. Zahn, A. Rainho, e J.M. Palmeirim. 2003. Contrasting the roosting behaviour and phenology of an insectivorous bat (*Myotis myotis*) in its southern and northern distribution ranges. *Mammalia*, 67(3): 321-335.
- Santos, C.P.N. 2003. *Ultrasound communication in the greater wax moth, Galleria mellonella*. Final Thesis. Biology Course. Universidade de Évora.

- Rebelo, H. & A. Rainho. 2003. Acções de Conservação de Morcegos na Área de Regolfo de Alqueva + Pedrogão. Relatório técnico final. ICN.
- Lourenço, S.I. & J.M. Palmeirim. 2004. Influence of temperature in roost selection by *Pipistrellus pygmaeus* (Chiroptera): relevance for the design of bat boxes. *Biological Conservation*, 119: 237–243
- Marques, J.T., A. Rainho, M. Carapuço, P. Oliveira & J.M. Palmeirim. 2004. Foraging behaviour and habitat use by the European free-tailed bat *Tadarida teniotis*. *Acta Chiropterologica*, 6(1): 99–110.
- Salgueiro, P., M.M. Coelho, J.M. Palmeirim & M. Ruedi. 2004. Mitochondrial DNA variation and population structure of the island endemic Azorean bat (*Nyctalus azoreum*). *Molecular Ecology*, 13: 3357–3366.

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

Pest control agencies have been contacted, so that bats will not be harmed during their operations.

D. Functioning of the Agreement

14. Co-operation with other Range States

Luísa Rodrigues participated in a commission to give advice to a Spanish project about roosts conservation (“Estudio da Mina de la Ahumada”).

Cooperation with Spain concerning the recapture of banded bats is being carried out.

Luísa Rodrigues participated in six EUROBATS Intersessional Working Groups (IWG on Transboundary Programme – Habitats: Data Compilation, IWG on Geographical Scope of the Agreement, IWG on Review of Guidelines for the Issue of Permits for the Capture and Study of Captured Wild Bats, IWG on Producing Guidelines on Bat Monitoring Methods to Assess Population Trends at Different Levels, IWG on Autecological Studies for Priority Species, and IWG on Wind Turbines and Bat Populations, convening the last one.

Luísa Rodrigues participated in a workshop organised by DEFRA/BCT, held in London in April 2005, on the development of a pan-European strategy to monitor bat populations in underground sites across Europe.

Luísa Rodrigues participated in two meetings of the Ad-hoc Working Group on Wind Energy and Nature Conservation, organized by the European Commission (May 2005 and January 2006).

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

Resolution 2.2 - Consistent Monitoring Methodologies

In Portugal, since 1987 there has been a programme to monitor cave-dwelling species, coordinated by Instituto da Conservação da Natureza. 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 they are expected to use only underground sites, they are not as 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 cannot observe the colonies. Often, only the capture of flying juveniles enables the identification of breeding sites. Details of monitoring programme have been forwarded to the relevant IWG.

Roosts inventoried during local monitoring programmes established as minimization measures of projects subjected to Impact Studies (particularly wind farms) are monitored by promoters. If any underground roost of national importance is found, it is included in the programme running by Instituto da Conservação da Natureza.

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.

Details of the most important underground roosts have been forwarded to the relevant IWG.

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, 3.8 and 4.9 – 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 3.7 – Amendment of the Agreement

This point has not been implemented yet.

Resolution 4.3 – Guidelines for the Protection and Management of Important Underground Habitats

Portugal already sent information to the IWG. Several roosts were already protected with fences; other roosts should be protected.

Resolution 4.4 – Bat Conservation and Sustainable Forest Management

This point has not been implemented yet.

Resolution 4.5 – Guidelines for the Use of Remedial Timber Treatment

Remedial Timber Treatment is not commonly used in Portugal.

Resolution 4.6 – Guidelines for the Issue of Permits for the Capture and Study of captured wild Bats

New permits have been prepared taking into consideration these guidelines.

Resolution 4.7 – Wind Turbines and Bat Populations

Impact Studies of wind turbines projected for Portuguese SCI's have taken this resolution into account.