



EUROBATS National Implementation Report

In the Resolution 7.4, the 7th Meeting of Parties to EUROBATS decided to adopt a new format for the National

Implementation Reports and instructed the Secretariat to make this new format available for online completion in time for MoP8.

Present format of national reports was carefully revised by the relevant Intersessional Working Group during the 20th Meeting of the Advisory Committee (2015) in order to include the Resolutions of MoP7 and is now available on the CMS Family Online Reporting System (ORS).

Please visit the Support Centre page in case of any questions regarding the Online Reporting System. The link is available in the bottom left corner.

A. General Information

Name of your country

> Portugal

Period covered by this report

> May 2014 - May 2018

Is your country a party to EUROBATS Agreement?

Yes

Competent authority

Title, address, phone, fax, e-mail and other contact details

> Mainland Portugal: Instituto da Conservação da Natureza e das Florestas (ICNF), Av. da República 16-16B, 1050-191 Lisboa, Portugal, +351213507900, icnf@icnf.pt

Azores Autonomous Region: Direção Regional do Ambiente, Direção de Serviços de Conservação da Natureza e Sensibilização Ambiental, Edifício Matos Souto, Piedade, 9930 - 210 Lajes do Pico

Madeira Autonomous Region: Instituto das Florestas e Conservação da Natureza (IFCN), Caminho do Meio, Quinta do Bom Sucesso, 9064-512 Santa Maria Maior, Funchal, Portugal, + 351291211200, ifcn@madeira-gov.pt

Personal details of administrative focal point (s)

> Mainland Portugal: Dr Luísa Rodrigues, ICNF, Av. da República 16-16B, 1050-191 Lisboa, Portugal, +351213507900 (ext 51433), luisa.rodrigues@icnf.pt

Azores Autonomous Region: Mr Emanuel Veríssimo, Direção Regional do Ambiente, Edifício Matos Souto, Piedade, 9930 - 210 Lajes do Pico

Madeira Autonomous Region: Mr Duarte Nuno Ornelas Barreto, IFCN, Caminho do Meio, Bom Sucesso, 9064-512 Santa Maria Maior, Funchal, Portugal, duartebarreto@gov-madeira.pt

Please give details of designated scientific focal points

> Mainland Portugal: Dr Luísa Rodrigues, ICNF, Av. da República 16-16B, 1050-191 Lisboa, Portugal, +351213507900 (ext 51433), luisa.rodrigues@icnf.pt

Azores Autonomous Region: Mrs Carla Silva, Direção Regional do Ambiente, Edifício Matos Souto, Piedade, 9930 - 210 Lajes do Pico

Madeira Autonomous Region: Mr Sérgio Bruno Marques Teixeira, Madeira Fauna & Flora, Centro Comercial Centromar, loja 9, 9004-516 Funchal, Portugal, +351960384 243, gest@madeira-fauna-flora.com

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Madeira Autonomous Region: Sérgio Teixeira (compiler), José Jesus, Ricardo Rocha

B. Status of bat species within the territory

Please assess a national status ONLY for those bat species from the Annex 1 to EUROBATS Agreement that were recorded in your country

Rhinolophus euryale Blasius, 1853

Status of the species occurrence

Resident

Overall national trend

Indeterminate

Status in the National Red List (when it exists)

CR, Critically Endangered

Year of assessment

> 2005

Has the status been reported under the Article 17 of the Habitat Directive or for the Emerald network (non-EU countries)?

Yes

Year of report

> 2007-2012

Conservation status per biogeographical region

FV = favourable; U1 = unfavourable-inadequate; U2 = unfavourable-bad); XX = unknown.

NO = doesn't occur in the region

	F V	U1	U2	X X	N O
Alpine	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Atlantic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Boreal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Continental	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Macaronesian	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Mediterranean	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Arctic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Black Sea	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Pannonian	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Steppic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Anatolian	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Rhinolophus ferrumequinum (Schreber, 1774)

Status of the species occurrence

Resident

Overall national trend

Stable

Status in the National Red List (when it exists)

VU, Vulnerable

Year of assessment

> 2005

Has the status been reported under the Article 17 of the Habitat Directive or for the Emerald network (non-EU countries)?

Yes

Year of report

> 2007-2012

Conservation status per biogeographical region

FV = favourable; U1 = unfavourable-inadequate; U2 = unfavourable-bad); XX = unknown.

NO = doesn't occur in the region

	F V	U1	U2	X X	N O
Alpine	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Atlantic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Boreal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Continental	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Macaronesian	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Mediterranean	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Arctic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Black Sea	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Pannonian	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Steppic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Anatolian	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Rhinolophus hipposideros (Bechstein, 1800)

Status of the species occurrence

Resident

Overall national trend

Indeterminate

Status in the National Red List (when it exists)

VU, Vulnerable

Year of assessment

> 2005

Has the status been reported under the Article 17 of the Habitat Directive or for the Emerald network (non-EU countries)?

Yes

Year of report

> 2007-2012

Conservation status per biogeographical region

FV = favourable; U1 = unfavourable-inadequate; U2 = unfavourable-bad); XX = unknown.

NO = doesn't occur in the region

	F V	U1	U2	X X	N O
Alpine	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Atlantic	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Boreal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Continental	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Macaronesian	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Mediterranean	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Arctic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Black Sea	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Pannonian	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Steppic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Anatolian	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Rhinolophus mehelyi Matschie, 1901

Status of the species occurrence

Resident

Overall national trend

Indeterminate

Status in the National Red List (when it exists)

CR, Critically Endangered

Year of assessment

> 2005

Has the status been reported under the Article 17 of the Habitat Directive or for the Emerald network (non-EU countries)?

Yes

Year of report

> 2007-2012

Conservation status per biogeographical region

FV = favourable; U1 = unfavourable-inadequate; U2 = unfavourable-bad); XX = unknown.

NO = doesn't occur in the region

	F V	U1	U2	X X	N O
Alpine	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Atlantic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Boreal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Continental	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Macaronesian	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Mediterranean	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Arctic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Black Sea	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Pannonian	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Steppic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Anatolian	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Barbastella barbastellus (Schreber, 1774)

Status of the species occurrence

Resident

Overall national trend

Not studied

Status in the National Red List (when it exists)

DD, Data Deficient

Year of assessment

> 2005

Has the status been reported under the Article 17 of the Habitat Directive or for the Emerald network (non-EU countries)?

Yes

Year of report

> 2007-2012

Conservation status per biogeographical region

FV = favourable; U1 = unfavourable-inadequate; U2 = unfavourable-bad); XX = unknown.
NO = doesn't occur in the region

	F V	U1	U2	X X	N O
Alpine	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Atlantic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Boreal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Continental	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Macaronesian	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Mediterranean	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Arctic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Black Sea	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Pannonian	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Steppic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Anatolian	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Eptesicus isabellinus (Temminck, 1840)

Status of the species occurrence

Resident

Overall national trend

Not studied

Status in the National Red List (when it exists)

Other

Other categories

National Red List Status details

> The status in the National Red List was not evaluated because its presence was confirmed after 2005.

Has the status been reported under the Article 17 of the Habitat Directive or for the Emerald network (non-EU countries)?

Other

Please, specify

> At the time of the last report, this species had not yet been accepted by the EU.

Eptesicus serotinus (Schreber, 1774)

Status of the species occurrence

Resident

Overall national trend

Not studied

Status in the National Red List (when it exists)

LC, Least Concern

Year of assessment

> 2005

Has the status been reported under the Article 17 of the Habitat Directive or for the Emerald network (non-EU countries)?

Yes

Year of report

> 2007-2012

Conservation status per biogeographical region

FV = favourable; U1 = unfavourable-inadequate; U2 = unfavourable-bad); XX = unknown.
NO = doesn't occur in the region

	F V	U1	U2	X X	N O
Alpine	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Atlantic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Boreal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Continental	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Macaronesian	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Mediterranean	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Arctic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Black Sea	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Pannonian	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Steppic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Anatolian	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Hypsugo savii (Bonaparte, 1837)

Status of the species occurrence

Resident

Overall national trend

Not studied

Status in the National Red List (when it exists)

DD, Data Deficient

Year of assessment

> 2005

Has the status been reported under the Article 17 of the Habitat Directive or for the Emerald network (non-

EU countries)?

Yes

Year of report

> 2007-2012

Conservation status per biogeographical region

FV = favourable; U1 = unfavourable-inadequate; U2 = unfavourable-bad); XX = unknown.
NO = doesn't occur in the region

	F V	U1	U2	X X	N O
Alpine	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Atlantic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Boreal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Continental	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Macaronesian	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Mediterranean	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Arctic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Black Sea	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Pannonian	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Steppic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Anatolian	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Myotis bechsteinii (Kuhl, 1817)

Status of the species occurrence

Resident

Overall national trend

Not studied

Status in the National Red List (when it exists)

EN, Endangered

Year of assessment

> 2005

Has the status been reported under the Article 17 of the Habitat Directive or for the Emerald network (non-EU countries)?

Yes

Year of report

> 2007-2012

Conservation status per biogeographical region

FV = favourable; U1 = unfavourable-inadequate; U2 = unfavourable-bad); XX = unknown.
NO = doesn't occur in the region

	F V	U1	U2	X X	N O
Alpine	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Atlantic	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Boreal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Continental	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Macaronesian	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Mediterranean	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Arctic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Black Sea	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Pannonian	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Steppic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Anatolian	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Myotis blythii (Tomes, 1857)

Status of the species occurrence

Resident

Overall national trend

Negative

Status in the National Red List (when it exists)

CR, Critically Endangered

Year of assessment

> 2005

Has the status been reported under the Article 17 of the Habitat Directive or for the Emerald network (non-EU countries)?

Yes

Year of report

> 2007-2012

Conservation status per biogeographical region

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	F V	U1	U2	X X	N O
Alpine	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Atlantic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Boreal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Continental	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Macaronesian	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Mediterranean	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Arctic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Black Sea	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Pannonian	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Steppic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Anatolian	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Myotis daubentonii (Kuhl, 1817)

Status of the species occurrence

Resident

Overall national trend

Not studied

Status in the National Red List (when it exists)

LC, Least Concern

Year of assessment

> 2005

Has the status been reported under the Article 17 of the Habitat Directive or for the Emerald network (non-EU countries)?

Yes

Year of report

> 2007-2012

Conservation status per biogeographical region

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	F V	U1	U2	X X	N O
Alpine	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Atlantic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Boreal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Continental	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Macaronesian	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Mediterranean	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Arctic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Black Sea	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Pannonian	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Steppic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Anatolian	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Myotis emarginatus (Geoffroy, 1806)

Status of the species occurrence

Resident

Overall national trend

Not studied

Status in the National Red List (when it exists)

DD, Data Deficient

Year of assessment

> 2005

Has the status been reported under the Article 17 of the Habitat Directive or for the Emerald network (non-EU countries)?

Yes

Year of report

> 2007-2012

Conservation status per biogeographical region

FV = favourable; U1 = unfavourable-inadequate; U2 = unfavourable-bad); XX = unknown.

NO = doesn't occur in the region

	F V	U1	U2	X X	N O
Alpine	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Atlantic	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Boreal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Continental	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Macaronesian	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Mediterranean	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Arctic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Black Sea	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Pannonian	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Steppic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Anatolian	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Myotis escalerae Cabrera, 1904

Status of the species occurrence

Resident

General comments

Comments

Add specific comments, if required

> After the publication of the Portuguese Red Data Book, the presence of *Myotis escalerae* (replacing *M. nattereri*) was confirmed in mainland; all information regarding *M. nattereri* was transposed to *M. escalerae*. EU did not accept yet this species, so *M. escalerae* was reported as *M. nattereri*.

Overall national trend

Not studied

Status in the National Red List (when it exists)

VU, Vulnerable

Year of assessment

> 2005

Has the status been reported under the Article 17 of the Habitat Directive or for the Emerald network (non-EU countries)?

Yes

Year of report

> 2007-2012

Conservation status per biogeographical region

FV = favourable; U1 = unfavourable-inadequate; U2 = unfavourable-bad); XX = unknown.
NO = doesn't occur in the region

	F V	U1	U2	X X	N O
Alpine	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Atlantic	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Boreal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Continental	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Macaronesian	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Mediterranean	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Arctic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Black Sea	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Pannonian	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Steppic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Anatolian	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Myotis myotis (Borkhausen, 1797)

Status of the species occurrence

Resident

Overall national trend

Stable

Status in the National Red List (when it exists)

VU, Vulnerable

Year of assessment

> 2005

Has the status been reported under the Article 17 of the Habitat Directive or for the Emerald network (non-EU countries)?

Yes

Year of report

> 2007-2012

Conservation status per biogeographical region

FV = favourable; U1 = unfavourable-inadequate; U2 = unfavourable-bad); XX = unknown.

NO = doesn't occur in the region

	F V	U1	U2	X X	N O
Alpine	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Atlantic	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Boreal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Continental	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Macaronesian	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Mediterranean	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Arctic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Black Sea	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Pannonian	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Steppic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Anatolian	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Myotis mystacinus (Kuhl, 1817)

Status of the species occurrence

Resident

Overall national trend

Not studied

Status in the National Red List (when it exists)

DD, Data Deficient

Year of assessment

> 2005

Has the status been reported under the Article 17 of the Habitat Directive or for the Emerald network (non-EU countries)?

Yes

Year of report

> 2007-2012

Conservation status per biogeographical region

FV = favourable; U1 = unfavourable-inadequate; U2 = unfavourable-bad); XX = unknown.
NO = doesn't occur in the region

	F V	U1	U2	X X	N O
Alpine	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Atlantic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Boreal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Continental	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Macaronesian	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Mediterranean	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Arctic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Black Sea	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Pannonian	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Steppic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Anatolian	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Nyctalus azoreum (Thomas, 1901)

Status of the species occurrence

Resident

General comments

Comments

Add specific comments, if required

> Endemic to the Azores Archipelago.

Overall national trend

Not studied

Status in the National Red List (when it exists)

CR, Critically Endangered

Year of assessment

> 2005

Has the status been reported under the Article 17 of the Habitat Directive or for the Emerald network (non-EU countries)?

Yes

Year of report
> 2007-2012

Conservation status per biogeographical region

FV = favourable; U1 = unfavourable-inadequate; U2 = unfavourable-bad); XX = unknown.
NO = doesn't occur in the region

	F V	U1	U2	X X	N O
Alpine	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Atlantic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Boreal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Continental	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Macaronesian	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Mediterranean	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Arctic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Black Sea	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Pannonian	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Steppic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Anatolian	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Nyctalus lasiopterus (Schreber, 1780)

Status of the species occurrence

Resident

Overall national trend

Not studied

Status in the National Red List (when it exists)

DD, Data Deficient

Year of assessment

> 2005

Has the status been reported under the Article 17 of the Habitat Directive or for the Emerald network (non-EU countries)?

Yes

Year of report

> 2007-2012

Conservation status per biogeographical region

FV = favourable; U1 = unfavourable-inadequate; U2 = unfavourable-bad); XX = unknown.
NO = doesn't occur in the region

	F V	U1	U2	X X	N O
Alpine	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Atlantic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Boreal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Continental	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Macaronesian	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Mediterranean	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Arctic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Black Sea	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Pannonian	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Steppic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Anatolian	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Nyctalus leisleri (Kuhl, 1817)

Status of the species occurrence

Resident

General comments

Comments

Add specific comments, if required

> Mainland Portugal: Data deficient. Trend not studied.

Madeira Autonomous Region: Critically endangered. The resident endemic subspecies *Nyctalus leisleri verrucosus* has been assessed regionally in 2002 for the Portuguese Vertebrates red book as critically endangered. Monitoring made in 2014, 2015 and 2016 on sites assessed in 2002 showed Leisler's population has declines in most feeding areas and colonies that were previously assessed. Main cause of decline are large suburban and forest fires. Status of Critically Endangered should be maintained. Negative trend.

Year of assessment

> 2005

Has the status been reported under the Article 17 of the Habitat Directive or for the Emerald network (non-EU countries)?

Yes

Year of report

> 2007-2012

Conservation status per biogeographical region

FV = favourable; U1 = unfavourable-inadequate; U2 = unfavourable-bad); XX = unknown.

NO = doesn't occur in the region

	F V	U1	U2	X X	N O
Alpine	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Atlantic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Boreal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Continental	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Macaronesian	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Mediterranean	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Arctic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Black Sea	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Pannonian	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Steppic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Anatolian	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Nyctalus noctula (Schreber, 1774)

Status of the species occurrence

Occasional

General comments

Comments

Add specific comments, if required

> The rarity and distribution in Spain, the few records registered in mainland Portugal, and the migratory behaviour of this species, don't allow the determination of its distribution and type of occurrence; the presence may be occasional or seasonal.

The species was included in the 2007-2012's DH report but the conservation status was not assessed.

Overall national trend

Not studied

Status in the National Red List (when it exists)

DD, Data Deficient

Year of assessment

> 2005

Has the status been reported under the Article 17 of the Habitat Directive or for the Emerald network (non-EU countries)?

Yes

Year of report

> 2007-2012

Conservation status per biogeographical region

FV = favourable; U1 = unfavourable-inadequate; U2 = unfavourable-bad); XX = unknown.
NO = doesn't occur in the region

	F V	U1	U2	X X	N O
Alpine	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Atlantic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Boreal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Continental	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Macaronesian	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Mediterranean	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Arctic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Black Sea	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Pannonian	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Steppic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Anatolian	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Pipistrellus kuhlii (Kuhl, 1817)

Status of the species occurrence

Resident

General comments

Comments

Add specific comments, if required

> Mainland Portugal: Least concern. Trend not studied.

Madeira Autonomous Region: First bats were found in 2008, but an uncommon species when compared with

others on the Island of Madeira. This species wasn't specifically evaluated hence there isn't enough data to determine its trends.

Overall national trend

Not studied

Year of assessment

> 2005

Has the status been reported under the Article 17 of the Habitat Directive or for the Emerald network (non-EU countries)?

Yes

Year of report

> 2007-2012

Conservation status per biogeographical region

FV = favourable; U1 = unfavourable-inadequate; U2 = unfavourable-bad); XX = unknown.
NO = doesn't occur in the region

	F V	U1	U2	X X	N O
Alpine	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Atlantic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Boreal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Continental	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Macaronesian	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Mediterranean	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Arctic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Black Sea	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Pannonian	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Steppic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Anatolian	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Pipistrellus maderensis (Dobson, 1878)

Status of the species occurrence

Resident

General comments

Comments

Add specific comments, if required

> Madeira Autonomous Region: This endemic species has been assessed regionally in 2002 for the Portuguese Vertebrates red book as critically endangered. Due to the massive forest fires in 2010, 2012 and 2016 most known colonies were destroyed. Monitoring made in 2014, 2015 and 2016 on sites accessed in 2002 showed that there were strong or absolute population decline. Some feeding areas were burned and are no used presently. Status should be maintained. Negative trend.

Overall national trend

Not studied

Status in the National Red List (when it exists)

CR, Critically Endangered

Year of assessment

> 2005

Has the status been reported under the Article 17 of the Habitat Directive or for the Emerald network (non-EU countries)?

Yes

Year of report

> 2007-2012

Conservation status per biogeographical region

FV = favourable; U1 = unfavourable-inadequate; U2 = unfavourable-bad); XX = unknown.

NO = doesn't occur in the region

	F V	U1	U2	X X	N O
Alpine	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Atlantic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Boreal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Continental	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Macaronesian	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Mediterranean	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Arctic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Black Sea	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Pannonian	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Steppic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Anatolian	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Pipistrellus pipistrellus (Schreber, 1774)

Status of the species occurrence

Resident

Overall national trend

Not studied

Status in the National Red List (when it exists)

LC, Least Concern

Year of assessment

> 2005

Has the status been reported under the Article 17 of the Habitat Directive or for the Emerald network (non-EU countries)?

Yes

Year of report

> 2007-2012

Conservation status per biogeographical region

FV = favourable; U1 = unfavourable-inadequate; U2 = unfavourable-bad); XX = unknown.

NO = doesn't occur in the region

	F V	U1	U2	X X	N O
Alpine	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Atlantic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Boreal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Continental	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Macaronesian	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Mediterranean	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Arctic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Black Sea	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Pannonian	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Steppic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Anatolian	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Pipistrellus pygmaeus (Leach, 1825)

Status of the species occurrence

Resident

Overall national trend

Not studied

Status in the National Red List (when it exists)

LC, Least Concern

Year of assessment

> 2005

Has the status been reported under the Article 17 of the Habitat Directive or for the Emerald network (non-EU countries)?

Yes

Year of report

> 2007-2012

Conservation status per biogeographical region

FV = favourable; U1 = unfavourable-inadequate; U2 = unfavourable-bad); XX = unknown.

NO = doesn't occur in the region

	F V	U1	U2	X X	N O
Alpine	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Atlantic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Boreal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Continental	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Macaronesian	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Mediterranean	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Arctic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Black Sea	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Pannonian	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Steppic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Anatolian	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Plecotus auritus (Linnaeus, 1758)

Status of the species occurrence

Resident

Overall national trend

Not studied

Status in the National Red List (when it exists)

DD, Data Deficient

Year of assessment

> 2005

Has the status been reported under the Article 17 of the Habitat Directive or for the Emerald network (non-EU countries)?

Yes

Year of report

> 2007-2012

Conservation status per biogeographical region

FV = favourable; U1 = unfavourable-inadequate; U2 = unfavourable-bad); XX = unknown.
NO = doesn't occur in the region

	F V	U1	U2	X X	N O
Alpine	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Atlantic	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Boreal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Continental	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Macaronesian	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Mediterranean	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Arctic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Black Sea	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Pannonian	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Steppic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Anatolian	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Plecotus austriacus (Fischer, 1829)

Status of the species occurrence

Resident

General comments

Comments

Add specific comments, if required

> Mainland Portugal: Least concern. Trend not studied.

Madeira Autonomous Region: Critically endangered. Since it been assessed regionally in 2002 for the Portuguese Vertebrates red book as critically endangered, only one new area has been identified, but no new roosts have

been found. Areas used during the assessment, including a large colony with about 40 bats are now abandoned or destroyed and no bats were found. Therefore known sites have shown a steep decline in population. Trend not studied.

Year of assessment

> 2005

Has the status been reported under the Article 17 of the Habitat Directive or for the Emerald network (non-EU countries)?

Yes

Year of report

> 2007-2012

Conservation status per biogeographical region

FV = favourable; U1 = unfavourable-inadequate; U2 = unfavourable-bad); XX = unknown.

NO = doesn't occur in the region

	F V	U1	U2	X X	N O
Alpine	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Atlantic	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Boreal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Continental	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Macaronesian	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Mediterranean	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Arctic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Black Sea	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Pannonian	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Steppic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Anatolian	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Miniopterus schreibersii (Kuhl, 1817)

Status of the species occurrence

Resident

Overall national trend

Stable

Status in the National Red List (when it exists)

VU, Vulnerable

Year of assessment

> 2005

Has the status been reported under the Article 17 of the Habitat Directive or for the Emerald network (non-EU countries)?

Yes

Year of report

> 2007-2012

Conservation status per biogeographical region

FV = favourable; U1 = unfavourable-inadequate; U2 = unfavourable-bad); XX = unknown.

NO = doesn't occur in the region

	F V	U1	U2	X X	N O
Alpine	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Atlantic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Boreal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Continental	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Macaronesian	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Mediterranean	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Arctic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Black Sea	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Pannonian	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Steppic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Anatolian	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Tadarida teniotis (Rafinesque, 1814)

Status of the species occurrence

Resident

Overall national trend

Not studied

Status in the National Red List (when it exists)

DD, Data Deficient

Year of assessment

> 2005

Has the status been reported under the Article 17 of the Habitat Directive or for the Emerald network (non-EU countries)?

Yes

Year of report

> 2007-2012

Conservation status per biogeographical region

FV = favourable; U1 = unfavourable-inadequate; U2 = unfavourable-bad); XX = unknown.

NO = doesn't occur in the region

	F V	U1	U2	X X	N O
Alpine	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Atlantic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Boreal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Continental	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Macaronesian	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Mediterranean	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Arctic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Black Sea	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Pannonian	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Steppic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Anatolian	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

C. Measures taken to implement Article III of the Agreement

Does the national legislation protect all bat species?

Yes

Please, give details of the legislation which is protecting bats

> - Bonn Convention applied nationally through Decreto n.º 103/80, published on October 11th of 1980
> - Bern Convention applied nationally through Decreto n.º 95/81, published on July 23rd and updated and regulated by Decreto-Lei n.º 316/89, published on September 22nd of 1989
- Habitats Directive transposed to National law under Decreto-Lei n.º 140/99, published on April 24th of 1999, and later republished under Decreto-Lei n.º 49/2005, of February 24th of 2005 and altered by Decreto-Lei n.º 156-A/2013, published on November 8th of 2013. Adapted by Madeira Autonomous Region Parliament on March 2nd of 2006 through DLR n.º 5/2006/M
- EUROBATS - Agreement on the Conservation of Populations of European Bats, applied to National Law through Decreto n.º 31/95, published on August 18th of 1995 and later altered by Decreto 5/2014, published on January 29th of 2014.

Azores Autonomous Region: The Azorean regional legal framework of nature conservation and biodiversity was published by the Regional Legislative Decree No. 15/2012/A, of April 2nd. This document transposes the Habitat Directive, Bonn Convention, Bern Convention and EUROBATS.

Madeira Autonomous Region: The management and land use plans for the Sites of Community Importance (SCI) which include protection of all wildlife including bats, were published by Madeira Autonomous Region government under the following resolutions:

- Resolução n.º 1292/2009, de 2 de outubro – aprova o Plano de Ordenamento e Gestão das ilhas Selvagens (POGIS); Management of SCI Ilhas Selvagens, Savage Islands
- Resolução n.º 1293/2009, de 2 de outubro – aprova o Plano de Ordenamento e Gestão das ilhas Desertas (POGID); Management of SCI Ilhas Desertas, Desertas Islands
- Resolução n.º 1294/2009, de 2 de outubro – aprova o Plano de Ordenamento e Gestão da Ponta de São Lourenço (POGSL); Management of SCI Ponta de São Lourenço, Madeira Island
- Resolução n.º 1411/2009, de 19 de novembro – aprova o Plano de Ordenamento e Gestão do Maciço Montanhoso Central da ilha da Madeira (POGMMC); Management of SCI Maciço Montanhoso Central, Madeira Island
- Resolução n.º 1412/2009, de 19 de novembro – aprova o Plano de Ordenamento e Gestão da Laurissilva da Madeira (POGLM); Management of SCI Laurissilva da Madeira, Madeira Island
- Declaration of Rectification n.º 13/2009, of November 27th of 2009 - publishing the annexes relative to the resolutions n.º 1411/2009 and 1412/2009, of November 19th of 2009
- Despacho n.º 69/2009, de 24 de Junho - aprova o Programa de Medidas de Gestão de Conservação do Sítio de Importância Comunitária (SIC) do Pico Branco – Porto Santo. Management of SCI of Pico Branco, Porto Santo Island
- Despacho n.º 70/2009, de 24 de Junho - aprova o Programa de Medidas de Gestão de Conservação do Sítio de Importância Comunitária (SIC) do Ilhéu da Viúva. Management of SCI of Ilhéu da Viúva, Madeira Island.
- Despacho n.º 71/2009, de 24 de Junho - aprova o Programa de Medidas de Gestão de Conservação do Sítio de Importância Comunitária (SIC) das Achadas da Cruz. Management of SCI of Achadas da Cruz, Madeira Island.
- Despacho n.º 72/2009, de 24 de Junho - aprova o Programa de Medidas de Gestão de Conservação do Sítio de Importância Comunitária (SIC) dos Moledos. Management of SCI of Moledos, Madeira Island.
- Despacho n.º 73/2009, de 24 de Junho - aprova o Programa de Medidas de Gestão de Conservação do Sítio de Importância Comunitária (SIC) do Pináculo. Management of SCI of Pináculo, Madeira Island.

Comments

> Madeira Autonomous Region: Considering its recent inclusion on the EUROBATS Agreement and administrative changes within biodiversity and forestry conservation hindered the implementation of Article III time-wise, but all measures are planned or ongoing within the capabilities of local authorities.

1. Guidelines for the issue of permits for the capture and study of captured wild bats

Does the system of permits or licenses for the capture of bats exist in your country?

Yes

Comments (optional)

> Mainland Portugal: 48 permits regarding capture/handling/sampling/ringing were issued

Azores Autonomous Region: 1 permit regarding capture/handling was issued, for biometric data and photographic purposes.

Madeira Autonomous Region: Any scientific and conservation work dealing with wild species, including bats requires a permit/license from the IFCN. First licenses to capture bats were given in 2002. No new licenses to capture bats were emitted between 2014 and 2018.

System of permits or licences to keep bats for educational or animal welfare purposes

In place

Comments

> Mainland Portugal: 2 permits regarding keeping disabled bats were issued

Azores Autonomous Region: No permit for keeping bats was issued.

In Madeira Autonomous Region bats are kept in captivity exclusively for short periods of time for research purposes. If possible, injured bats are fed and released on the point where they were found. In case the bat deceases and release is not possible, all specimens are sent to local museums or university to be preserved and studied. So far, mostly due to the low number of specimens studied, no disabled bats were found so far.

System of permits or licences for sampling, ringing, killing of bats for scientific studies

Exists

Comments (optional)

> Mainland Portugal: No permit regarding killing was issued

Azores Autonomous Region: No permit regarding killing was issued

Madeira Autonomous Region: Permits or licences are limited to sampling. So far no permits were submitted for ringing. Bat killing for scientific purposes is not allowed, hence no permits with this aim exist. In Madeira Autonomous Region no permits to kill bats were emitted.

2. Identified and protected sites which are important to the conservation of bats

Click "expand" to see the questions!

Resolution 5.7. Guidelines for the protection of overground roosts, with particular reference to roosts in buildings of cultural heritage importance

2.4. List of national important overground roosts (including legal/physical protection status)

Doesn't exist

Comments

> Mainland Portugal: There is a list of known important roosts (over and underground) annually updated by ICNF taking into consideration the results of the monitoring programme, but it doesn't include information on physical protection.

Madeira Autonomous Region: The list of overground sites is not updated since most known overground roosts have been destroyed by the massive fires of 2010, 2012 and 2016 or destruction/improvement of buildings and landscape changes. Hence it is urgent to assess and update the list of overground roosts.

2.5. National guidelines for custodians of historical buildings on the protection of bat roosts have been developed

No

2.6. Summary report on interactions between the relevant cultural and natural heritage agencies (attach a file or provide a description)

> Mainland Portugal: When important roosts are located in built heritage, owners/administrators are contacted in order to inform about the existence of the roost and to conciliate the presence of the bats and the use of the space.

Azores Autonomous Region: No interactions have been undertaken between cultural and natural heritage agencies in regard to bat roosts.

In Madeira Archipelago there aren't any cultural agencies focusing on bats and their roosts. This role is exclusively attributed to natural heritage agencies.

Other activities carried out under this resolution (optional)

> Mainland Portugal:

The construction of the Baixo-Sabor dam by Energias de Portugal in Natura 2000 areas was authorized with several compensatory measures included in the project. One measure was the rehabilitation of 4 traditional dovecotes.

Compensatory measures for Foz Tua dam include 4 bat boxes (Texas Bat-Abode) were installed under bridges, and 100 bat boxes (Schwegler 2F and 2FN) were placed in forest areas surrounding reservoir. Another compensation measure for the construction of the Foz Tua Dam was the creation of the Regional Natural Park of the Tua Valley. Within the conservation and sustainable development projects of the Park, the first to be implemented was the agricultural and forest pest control by bats. Fifty wooden poles, with two bat boxes each (in a total of 100) (Schwegler 2F and 2FN), were placed in vineyards, olive tree orchards or cork oak woods of volunteer landowners. This took place in February of 2017, with the first bat being recorded in May, and the occupancy rate rising rapidly throughout the year, reaching 80% by September with four different species, *Pipistrellus pipistrellus*, *P. kuhlii*, *P. pygmaeus* and *Nyctalus leisleri*, when the guano sample period ended. The sampling has resumed in April of 2018, with a lower occupancy after hibernation, but is currently at 60%, with several boxes having colonies of *Pipistrellus* spp up to 35 individuals and some with pups, providing a positive outlook on the future of the project.

The Alqueva Multi-purpose Undertaking (EFMA) is based on the Alqueva dam, which creates the largest strategic water reserve in Europe, the Alqueva reservoir. As compensation for the construction of the Alqueva dam in 2015 and 2016, EDIA has installed 60 new bat boxes of three different models (Schwegler 2FN and 3FN, and handmade boxes using old tiles). Bat box monitoring indicates low occupation; in 2016 only 29 bat boxes were in use. *Pipistrellus* spp has the high percentage of occupation. Not used boxes will be relocated to other suitable areas.

The overground roosts occupied by important colonies of species with cave-dwelling habits (*R. ferrumequinum* and *R. hipposideros*) are being monitored.

Resolution 7.6. Guidelines for the protection and management of important underground habitats for bats

Updated counts of bats at each listed site are submitted to the Secretariat

No

2.1. List of important underground sites

2.1. List of important underground sites for bats and measures of their protection (including Natura 2000, Emerald or other status) was submitted to EUROBATS

Yes

When the latest update was submitted?

> Mainland Portugal: 2014 (information until 2012)

Comments

> Azores Autonomous Region: An Inventory of the Azorean Speleological Heritage has been done, and none of the caves is referred as bat roost (<http://www.speleoazores.com/patrimonio.php>).

Madeira Autonomous Region: Although several underground sites such as lava tubes, hollow lava flows and basalt column crevices are plentiful on Madeira Island only a few have been assessed. The sampled sites are a small fraction of possible underground sites in Madeira Archipelago, which are mostly inaccessible due to the Island's topographic relief. Bats have been reported to leave lava tubes at dusk on Madeira Island and also a few people have reported caves filled with bats years ago, although none was found so far.

2.2. Management of important underground sites for bats is in accordance with EUROBATS Publication n°2

Yes

Comments

> Mainland Portugal: Yes

Madeira Autonomous Region: No. Underground sites are still not updated or evaluated. List should be updated. Once the list is updated and important underground sites are found, management of these sites will follow the established recommendations made by EUROBATS publication n° 2.

2.3. Other relevant activities for the protection of underground habitats

> Mainland Portugal:

Compensation measures of the Baixo-Sabor dam included the protection of seven bat roosts in the nearby Site of Community Importance "Minas de St. Adrião". One roost is an important hibernating roost for dozens of bats belonging to three species and another one is an important maternity roost for hundreds of bats of two species. The other roosts shelter small numbers of bats of several species. These roosts are very accessible and some of them are natural caves, a rare habitat in the region. Human disturbance could play an important role in roosts occupancy. In 2016, the entrance of all 7 roosts was fenced to prevent people from going in. During the construction of Alqueva dam some underground roosts were destroyed. With the intent to minimize this negative impact, EDIA constructed two artificial underground roosts, which are classified as National Important roosts due to their occupancy. Financed by the POCTEP Program (Spain-Portugal Cooperation), EDIA has fenced these two roosts and another important roost near Alandroal in January 2016. Monitoring showed that fences improved roosts conditions for bat populations, especially in the roost Moura III where the numbers had increased exponentially.

Barrocal Site PTCO049 (Natura 2000 Network) includes two local Protected Areas (Local Protected Landscape Rocha da Pena and Local Protected Landscape Fonte Benémola). The Municipality of Loulé, managing entity of these Protected Areas, fenced 3 caves occupied mainly by *Miniopterus schreibersii* and *Myotis blythii* in 2014. Fences were financed by the Regional Operational Program of the Algarve. In 2018 and in a joint effort between several entities (Municipality of Loulé, Institute of Nature Conservation and Forestry, Portuguese Federation of Speleology, Geonauta Association and Association of Underground Studies and Environmental Protection), it is planned to monitor roosts in all seasons.

Foz Tua dam construction works started in 2011, reservoir filling was concluded in 2017 and exploitation phase has recently begun (2018). Under the environmental and post assessment process negative impacts for the bats were identified, namely foraging areas and roosts (including deactivated railway tunnels used as maternities). Compensatory measures include shrub removal at the entrances of 15 mines, 6 bat-friendly gates and 1 fence. An experimental measure to improve a tunnel roost for bats in a deactivated ancient railway section (construction of an attic to functioning as a bat shelter) was undertaken. The attic was constructed in 2016, on named Remisquedo Tunnel, belonging to the ancient Mirandela-Bragança railway deactivated.

Closure of inactive mine galleries for security reasons have used methods compatible with the continuation of their use by bats (galleries colonized by important bat colonies are being closed leaving at least 30cm in top, galleries used by some bats are being closed by bat-friendly gates with doors (to allow monitoring) and galleries not used by bats are being closed by walls with large respiration holes 15x40cm (this will allow a future colonization but not their monitoring). Vertical shafts are being protected with concrete slabs with large respiration holes 15x40cm.

A close collaboration with the Portuguese Geocaching Association has allowed that caches placed in important roosts have been managed taking the bats into consideration.

The time-table regarding the seasons when caves should not be visited due the presence of important bat colonies was updated and an explanatory text about the criteria was prepared. It is presented in the website of "Federação Portuguesa de Espeleologia" (<http://www.fpe-espeleo.org/index.php/component/content/article?id=30:abrigos-de>).

Azores Autonomous Region: A proposal of Regional Legislative Decree is being discussed presently in the Azores Regional Government for protection of the caves listed in the Inventory of the Azorean Speleological Heritage.

3.Consideration given to habitats which are important to bats

Click "expand" to see the questions!

Resolution 7.7. Bat conservation and sustainable forest management

National guidance has been developed based on the principles in the EUROBATS Bats and Forestry leaflet

No

Examples of best practice for forest management are submitted to the Secretariat

No

If no, provide explanations or give links to available examples

> Azores Autonomous Region: No available examples specifically regarding bats in forest management are known. But there are several measures of ecosystem protection that also safeguard the bats, such as: when the Government Forest Authorities perform the pre-operation evaluations and resource control surveys, there is an item that has to do with the existence of "long-lived and cavernous trees" and with the need to safeguard their permanence in places where forest management operations are being carried out, as they are elements of the forest ecosystem that constitute hotspots of biodiversity.

Research in forest management that is sustainable for bats (attach file or provide links)

> Mainland Portugal: See Point 8 (papers and projects).

Madeira Autonomous Region: Studies are being made to find out which laurel forests (Laurissilva) species are the most suited as bat roosts. Because most forests on the island are relatively young, not many pristine old forest patches exist, therefore suitable forests for bats are not common. Pristine old suitable patches are mostly inaccessible or are Natura 2000 protected areas.

Other activities carried out under this resolution (optional)

> Mainland Portugal:

Two schemes of sustainable forest management certification - Programme for the Endorsement of Forest Certification (PEFC) and Forest Stewardship Council (FSC) - started to be applied in Portugal in 2005 and certified area has been increasing, surpassing 250,000 (march 2018) and 400,000 ha (May 2018) respectively. These schemes include the identification of protected/threatened natural values and its protection, emphasizing the integration of a specific indicator on the conservation of long-lived and cavernous trees, especially important for forest bats, as well as the monitoring of the actions. FSC includes a specific attribute on critical areas of seasonal use, taking into account particularly important areas during the breeding season or the availability of food that provide in certain seasons.

Guidelines for the elaboration of forestry projects in classified areas for nature conservation were prepared in 2011. The purpose of this document is to assist owners, project designers and machine operators in the development of forestry projects and implementation of forest operations, in view of its compatibility with conservation of natural values. Issues such as new afforestation, brush clearing and the use of barbed wire are covered in this document. Above a certain area (which varies by region of the country) privately owned forests has to present a Forest Management Plan (FMP). When the forest holding overlaps with a classified area for nature conservation the FMP must include a Biodiversity Management Program whose aim is to ensure the compatibility and contribution of the interventions proposed in FMP to the conservation of protected habitats and species - including bats - whose favorable conservation status relies upon forest management.

A Best Practice Guide has been developed for SCI Monfurado and Cabrela, with the aim of supporting land owners to preserve protected habitats and species. This guide has subsequently been adapted for all SCI in Alentejo region, in order to support producers in their decisions to apply for assistance related to the biodiversity conservation components of Community funds. The document contains a specific form of good practice for "Maintenance and conservation of bat shelters", which should be applied in conjunction with measures on food habitats, including in particular the "mosaic promotion", "Installation / improvement of access to water points "and" Cleaning and maintenance of riparian galleries ". http://www.drapal.min-agricultura.pt/drapal/images/servicos/Apoio_Zonal/ITI/GUIAO_BOAS_PRATICAS_GESTAO_MATOS_1.pdf. Mainland Portugal's rural development program includes roosts protecting compliance. The applicants who commit voluntarily to agri-environmental and forest-environmental schemes, in Nature 2000 areas, must not disturb or destroy the existing roosts. Non-productive investment support for maintaining traditional buildings like watermills, traditional corrals and other old buildings used for roosting, as well as funding for correcting field fences are also available.

Support is available for investments in forests which enhance the public amenity value of forest and wooded land. Funding forest investment plans targeted to woodland management promoting adaptation to natural conditions, protecting biodiversity and features like hedgerows, scattered bushes, indirectly protects bats habitat.

An intervention plan for one SCI (Intervention Plan for the rural space of the SCI of Monfurado, <http://www.cm-montemornovo.pt/pmot/PIER/Relatorio.pdf>) has already come into force. In this management plan several conservation priority areas were defined and mapped, based on their value to bats, particularly forest bats.

Strict forest habitats and tree preservation measures were implemented within these areas: preservation of riparian woodland, preservation of montado areas, limits to livestock density, promotion of ground cover diversity, fire control, restriction to the use of barbed wire, and the preservation of drinking water sources. Management plans are currently being developed for some SCI which will obviously include specific conservation measures for this group, in particular in SCI containing roosts of national importance.

Azores Autonomous Region: There is a process of Forest Management System Certified by the FSC® initiative since 2014, in the Forest Perimeter and Regional Forests of the Island of São Miguel (corresponding to the public forest managed on this Island). In this process, bat monitoring is being done with acoustic surveys.

Madeira Autonomous Region: So far forestry management has not been coupled with bat ecology. Forests management plans such as Laurissilva forests did not include bats, although these forests are crucial for bats on the Island, chiefly the macaronesian endemic madeira pipistrelle *Pipistrellus maderensis*.

Resolution 7.8. Conservation and management of critical feeding areas, core areas around colonies and commuting routes

Awareness of the importance of critical feeding areas, core areas around known colonies and commuting routes for bats exists

Yes

Give details of activities devoted to raising awareness

> Azores Autonomous Region: The Nature Rangers speak to the farmers and local populations to raise awareness about the areas that are used by bats, and about what to do when they encounter bats and bat colonies.

Measures to take bats into account in land use and planning decisions

Yes

Measures, if yes

Describe these measures, please

> Mainland Portugal: Bat foraging habitats are generally considered when large development projects are planned near important bat roosts or when within a Natura 2000 site. In these cases and when bat foraging habitats are known in the area specific mitigation and mitigation measures are applied; otherwise general good practices like preserving or recovering waterbodies, waterlines, riverine vegetation and native woods are recommended.

Azores Autonomous Region: These measures are not specific for bats, but the Natura 2000 Network Sectorial Plan is an instrument in land use planning that all public authorities have to take into account in their planning and management decisions.

Madeira Autonomous Region: No.

Research and monitoring to improve understanding of the use of landscape by bats are ongoing

Yes

research, if yes

Please, specify or give referencies to studies

> Mainland Portugal: See Point 8 (papers and projects).

Azores Autonomous Region: The Nature Conservation Services of the Regional Government of the Azores continue to carry out annually the acoustic monitoring of bat species, covering several types of landscape types.

Madeira Autonomous Region: Sérgio Teixeira is collecting data for his PhD, mainly to find important feeding areas, commuting routes and roosts. Some areas are identified, but funding would be fundamental to increase the sampling effort.

National guidelines, drawing on the general guidance published in EUROBATS Publication have been developed

No

Other activities carried out under this resolution (optional)

> Mainland Portugal:

A good example of mitigation measures supported by the scientific knowledge are the ones taking place in the area planned to be irrigated with the water of the large Alqueva reservoir. The area surrounds two major underground bat roosts and a good knowledge of the foraging behaviour of the three most abundant species allowed the implementation of some measures, namely: (a) In 2017 EDIA started to monitor bats activity on Caliços-Machados irrigation area and in a control area, in the range of Moura I roost. Changes in land use are expected after 2018, and it is intended to follow its potential impact to the bat communities. In 2017,

Pipistrellus kuhlii was the specie with more activity, but Miniopterus schreibersii also registered high activity in both areas. Fewer records were registered for other important species such as Rhinolophus ferrumequinum, R. mehelyi/euryale and Myotis myotis/blythii. (b) A new irrigation area is currently under analysis - Moura / Sto Amador - and the reduction of parts of this area is under analysis justified by its use by foraging bats. Measures that aim to reducing habitat homogeneity and the use of phytochemicals were also included. As compensation for the construction of the Foz Tua Dam, native forest areas and riparian habitats benefit or restoring actions have been promoted.

Compensation measures of the Baixo-Sabor dam also included some habitat interventions not specifically designed for bats but still benefit for them. 68 ha of riparian vegetation and 220 ha of woodland vegetation were planted and 14 ponds and 8 weir were constructed. Several species of bats were detected feeding in these areas although trees are still very small. Pipistrellus species were the most common.

Madeira Autonomous Region: So far critical feeding areas, core areas around colonies and commuting routes are still being assessed. Of the critical feeding areas found and not destroyed by the fires, some are located in unprotected areas, but most areas are located within Natura 2000 SCI's and nearby areas. The guidelines for the assessment and monitoring of bats within Natura 2000 areas is being discussed.

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

Click "expand" to see the questions!

4.1. International Bat Night. Give details for each year: number of events and number of people participated

> Mainland Portugal: More than 60 events with more than 6000 participants (details in file MainlandPortugalSensibilization).

Azores Autonomous Region: No events were promoted for the International Bat Night.

Madeira Autonomous Region: International Bat Night was organized by Madeira Fauna & Flora, a local ecotourism company that organizes Bat watching activities to raise awareness and monitor bats. Although Bat nights were organized several times, within the period of this report was only organized in September 2014 (about 30 participants).

4.2. Details of other important activities which are worth to mention (educational centres, etc.)

> Mainland Portugal:

Alviela Ciência Viva Science Centre ("Carsoscópio"). The Centre is located in the proximities of one of the country's most important maternity roosts and holds an interactive exhibit totally dedicated to bats - The Quiroptário (<http://www.alviela.cienciaviva.pt/home/>). This interactive exhibition shows in an attractive and unique way the importance of these animals in ecosystems and also the need of their conservation, by giving to the nearly 20 000 annual visitors an opportunity to actively participate in acquiring knowledge by exploiting interactive - exhibits. This Ciência Viva Science Centre also includes a Cave Bat Observatory composed by 4 infrared cameras placed in the inside of the cave which allows users to follow live, 24 hours per day the bat colony that uses this cave as a maternity roost. This observatory aims to support scientific research and is devoted to the appreciation and awareness for the conservation of Chiroptera, it allows to observe in a natural shelter, 12 bats species and develop behavioral studies to determine the seasonal occupation of the roost, determine when the births occur and the period that goes from the birth to the weaning and first flights of the pups, describe roosting behaviour and the interaction among species that use the roost. In 2014/2015 the Alviela Ciência Viva Science Centre carried out the project "As saudades que eu tinha da minha alegre casinha" for the older students of Agrupamento de Escolas de Alcanena (60 participants). The aim of this project was the awareness of the school community for the importance of bats in ecosystems and the need for their conservation, and it included a challenge for the construction and decoration of bats boxes. About a dozen works were exhibited in the Library of the High School of Alcanena and later in the Roque Gameiro Museum (Minde). In 2017/2018 the Alviela Ciência Viva Science Centre carried out the project "Quiroptário fora de portas", financed by POSEUR, which had the main aim to develop information regarding the awareness in bat conservation targeted to the school and youth community. It includes (a) a website (www.conhecemosmorcegos.pt) where scientific information is available in various formats (informative texts, videos, multimedia and teaching materials), (b) an interactive exhibit "Morcegos às claras" (exhibited in 15 schools, 3 Environmental Interpretation Centers, 4 Science Centers, receiving more than 50000 visitors), (c) a children's book "Vida de Morcego" (2000 books were printed and distributed free of charge to younger students all over the country), and (d) scientific research camps for high school students, involving the active participation of these students in field work sessions with researchers (140 participants).

Lousal Ciência Viva Science Centre. The Centre was built near an abandoned mine which includes a gallery colonized by a maternity colony. The exhibition includes an interactive module on bats, containing short documentaries, 2D games and quizzes. Its main objective is to introduce several aspects of bat biology and ecology to the general public, and particularly to school communities, and to encourage an understanding of these animals, and their important role in nature. Funded by "Agência Ciência Viva" and "Fundação Frédéric Velge".

EDIA prepared 2 documentaries: one regarding the artificial roost Alqueva (<https://www.youtube.com/watch?v=6v0cTx24wbo>) and one on monitoring of bat-boxes (<https://www.youtube.com/watch?v=JX2ogqsNTqM>).

A documentary on study and conservation of bats was produced. It is expected to show the film on TV and later make it available online. An effort to prepare an English version is ongoing.

A blog about Portuguese Wildlife fauna exists (<http://umdiadecampo.blogspot.com/>). It is a space of divulgation (biology, ecology, distribution and status conservation) and public opinion. It divulgates and gives an important contribution to the knowledge of the Portuguese wildlife heritage, with a particular interest in bats.

A facebook group to divulgate publications, curiosities and activities exists (<http://www.facebook.com/groups/chiroptera.pt/>).

Azores Autonomous Region: The educational services of the Azores Island Natural Parks promote every year in their school program ("School Park") several activities related to bats (some of the titles are "the Azorean Bat goes to your school"; "the forgetful bat"; "hands that fly"; "bats in the Botanical Garden"). In 2014/15 for 1233 students; in 2015/16 for 1077; in 2016/17 for 984 students; and in 2017/18 for 572 students so far (details in file AzoresAutonomousRegionEnvironmentalEducation). A few bat walks were organized, in the summer of 2014 in São Miguel Island and in 2016 in Terceira Island, to general public and in partnership with local

municipalities. The educational sessions, both for schoolchildren and for the general population, discuss the species present in the Azores archipelago, their ecological characteristics and their role in the Azorean insular ecosystems, their threats, their legal protection and how the population should behave in relation to these species, especially in situations of cohabitation and exclusion of bats in buildings. Azorean schools and families are encouraged to build bat shelters and demonstration actions are carried out to build artificial houses suitable for these species. One interview to the Director of Nature Conservation Services and EUROBATS focal point in the Azores, Eng. Veríssimo, was published in 2016 in a Azorean newspaper, speaking about the importance of bats and the work being done by the Azores Government to monitor these species. The workshop given by Dr. Ana Rainho in 2012 for the Nature Rangers of the Azores Island Natural Parks was repeated in 2016. In November 2017 the São Miguel Island Natural Park gave a lecture about the Azorean Bat, in the Conference “XII Jornadas pela Conservação do Priolo”, organized by the NGO SPEA.

Madeira Autonomous Region: Several awareness articles have been in local newspapers and magazines. A book funded by local Government about the archipelago's vertebrates was published. Public radio and television conducted interviews to local bat researchers, as well as European Researchers' Nights. Frequently inquiries about bats and information about their importance to control pests and help farmers are made in rural areas. Madeira Fauna & Flora is organizing groups of volunteers within the several municipalities of the inhabited Islands of Madeira and Porto Santo to monitor bat activity within their boundaries throughout the whole year. Training and Heterodine bat detectors are being provided by Madeira Fauna & Flora as well as monitoring count sheets.

4.3. Information on training and awareness raising for forest managers and workers, farmers, road workers, stakeholders involved in insulation of buildings, etc.

> Mainland Portugal:

Pest control agencies were contacted in order to explain that bats cannot be harmed during their operations. A workshop on Bat-boxes and Bat identification (basic notions) for EDIA's technicians who monitor bat-boxes and biologists who were accompanying the constructions near Alqueva Dam (15 participants) was given in July 2015 by Luísa Rodrigues. Details on monitoring of bat-boxes were presented.

A training course on Bat Conservation for teachers and students (400 participants) was given by Carlos Pedro Diogo Santos and Luzia Sousa in May 2016 in collaboration with FAPAS. It included bat identification session, construction of bat-boxes in the school context, instructions for placement bat-boxes and motivating students to follow up and monitor them, and a show open to the public with theater, songs and poems alluding to bats. A course on bats (“The bat, prince Quiro”) for teachers was given in January, February and March 2017 (35 participants) by Virgínia Duro in collaboration with FAPAS. It included a talk on “bats from our cities”, several workshops “Construction of shelters”, “Tile Painting”, “Terracotta Costume Jewelry” and a guided visit to the Center of Ciência Viva do Alviela. Aspects related to the operationalization of contents in the context of the classroom were also discussed.

A workshop on bats (basic notions) for general public was given in April 2017 by Vanessa Mata in collaboration with ATN (NGO). Mist nets were set at dusk to try to capture some individuals and a bat detector was used to “listen” to bat activity. A nocturnal informal chat with the participants was kept under a starry sky and over the medieval bridge of the “Calçada de Alpajares” in Ribeira do Mosteiro, a quite picturesque area of northeastern Portugal. A general overview of bats was given, including myths, diversity, ecology, behavior, role as ecosystem services providers, as well as sampling and monitoring techniques.

A workshop on Bats and caves (basic notions) for Portuguese Speleological Federation cavers (level III students) (6 participants) was given in April 2017 by Pedro Alves. It was split in three parts: (1) General overview of the bat world, including myths, diversity, ecology and behavior. Most common conservation issues (special attention to cave-dwelling species) and the importance of bats in the ecosystems and human economy, in international and National contexts. (2) Brief description of National cave-dwelling species. Brief description of National Monitoring program of cave-dwelling species. (3) Bat constraints to caving. How cavers should behave and what data to collect, when bats are found in caves.

A workshop on Bat identification for general public (27 participants) was given in October 2017 by Francisco Amorim and Virgínia Duro. It was split in three parts: (1) General overview of the bat world, including diversity, ecology and behaviour. Most common conservation issues and the important role of bats in the ecosystems, in international and National contexts. Most common techniques on bats studies. (2) Morphological characters used to identify bats, including ways to assess sex, reproductive status and age. Main features that allow to identify families, genus and species occurring in Portugal. (3) Night walk to introduce various aspects of echolocation and species identification through their vocalizations.

A workshop on Bat and Insects for families (40 participants) was given in November and December 2017 by Virgínia Duro. In this workshop it was explored the relationship between bats and insects and the importance that bats present to ecosystems.

A workshop on Bat and Bat-boxes for elementary school teachers (7 participants) was given in February 2018 by Virgínia Duro. It was split in three parts: (1) General overview of the bat world, including diversity, ecology and behaviour. Most common conservation issues and the important role of bats in the ecosystems, in international and National contexts. (2) Morphological characters used to identify bats and main features that allow to identify families, genus and species occurring in Portugal. (3) Construction of bat-boxes in the school context, instructions for placement bat-boxes and motivating students to follow up and monitor them.

A training course on Bat Conservation for teachers (15 participants) was given by Maria João Silva and Pedro

Alves in April 2018. It was split in three parts: (1) General overview of the bat world, including diversity, ecology, behavior and the important role of bats in the ecosystems. (2) Presentation of the project "Quiroptário fora de portas" (objectives, pedagogical contents and pedagogical resources for teachers), accomplishment of several hands on activities based on the pedagogical resources available in the portal of the project and discussion of strategies to be applied in the exploration of the programmatic contents associated to these themes. (3) Night walk to observe bats and species identification through their vocalizations. This activity was developed with the support of city hall of Arouca and the Arouca Geopark. A workshop on Bat identification for University Volunteer Association (4 participants) was given in May 2018 by Virgínia Duro. It was split in three parts: (1) General overview of the bat world, including diversity, ecology and behaviour. Most common conservation issues and the important role of bats in the ecosystems, in international and National contexts. Most common techniques on bats studies. (2) Morphological characters used to identify bats, including ways to assess sex, reproductive status and age. Main features that allow to identify families, genus and species occurring in Portugal. (3) Night walk to introduce various aspects of echolocation and species identification through their vocalizations. A training course on Bat Conservation for teachers and students (200 participants) was given by Virgínia Duro in May 2018, in Lousada. It included bat identification session, construction of bat-boxes in the school context, instructions for placement bat-boxes and motivating students to follow up and monitor them, and a show open to the public with theater, songs and poems alluding to bats. A workshop on field technics and Bat identification was given in May by Francisco Amorim and Vanessa Mata, as part of "Biodiversidade 100 por censo" ("Biodiversity 100 per census"), organized by ALDEIA (NGO) (35 participants). It was split in two parts: (1) Introduction to field technics, including bat recording with automatic stations and handled bat detectors, and mist netting covering different aspects on how to handle bats and which features to measure. (2) Introduction to species identification, including morphological and acoustic identification. Azores Autonomous Region: No specific training was organized for these audiences. Madeira Autonomous Region: This necessity has been identified and local authority on Nature conservation (IFCN) and it is considering to provide training to local forestry police. In relation to farmers, the biology department of the University of Madeira is starting a project to educate farmers to the importance of bats to farmland and pest control.

Resolution 4.11. Recognising the important role of NGOs in bat conservation

4.4. Details of NGOs participating in /contributing to bat protection and most valuable activities that have the potential to substantially improve transboundary cooperation and mutual assistance

> Mainland Portugal:

Born in 1997 to explore study and protect Sicó-Alvaiázere Karst Massif, Grupo Protecção Sicó (GPS) is a regional NGO (since 2012) that has an important role on studying and protecting bats and bats roost, from this and other karst regions. GPS is an active member of the national programme to monitor cave-dwelling species, with more than 100 visits in the last 4 years at several roosts. It also promotes several bat nights and other bat related lectures, and regularly helps bat researchers in their field work. (GPS.SICO@GMAIL.COM) FAPAS is a non-governmental, non-profit organization created in 1990 by people with long experience in the field of nature conservation, which is dedicated to the promotion of actions aimed at the protection and recovery of wild fauna and flora. It has promoted several Nature Conservation projects, such as the reforestation of burned areas in Gerês, Côa and Serra da Estrela, the intervention in areas such as our land in the Peneda-Gerês National Park, in our land inserted in the Reserve of the Faia Brava (Côa valley), in the Ciba Orchid Reserve, Sicó / Alvaiázere, in the colony of São Vicente kennels, Beja, or multiple interventions to recover dune vegetation, often using voluntary work. In addition to the dynamization of conservation projects and the monitoring of major national themes, training was, from the outset, a strong commitment, achieved through the publication of field guides and other educational materials, with a strong interaction with schools, with the promotion of accredited training for primary and secondary school teachers, as well as organizing congresses, seminars, lectures and field trips. It also promotes several bat nights and other lectures related to bats. (fapas@fapas.pt)

Azores Autonomous Region: The Azorean group of the National NGO "Quercus" worked in 2017 in the production of a leaflet about the Azorean Bat, but it was not yet released to the public. The Azorean group of the National NGO "Sociedade Portuguesa para o Estudo das Aves" (known as SPEA), through the project LIFE Terras do Priolo (2013 until 2019) promotes the protection of all resident species in the native forest in Nordeste, São Miguel Island, and has a specific reference to the protection of the Azorean Bat in their permanent exhibition at the Environmental Centre (Centro Ambiental do Priolo).

Madeira Autonomous Region: Although Madeira Fauna & Flora is a private company and not an NGO, it runs a bat monitoring scheme using volunteer students and tourists and is also organizing groups of volunteers to monitor bat activity and conduct inquiries to find new or unknown colonies. This company is providing free training and bat detectors to volunteers. (info@madeira-fauna-flora.com)

5. Additional actions undertaken to safeguard populations of bats

Click "expand" to see the questions!

Resolution 2.2. Consistent monitoring methodologies

5.1. Implementation of EUROBATS guidelines published in EUROBATS Publication n°5 to ensure consistency and information exchange between Parties and Range States

Yes

Please give details

> Mainland Portugal: Yes. Since 1987 there has been a programme to monitor cave-dwelling species. Maternity and hibernation underground roosts considered being of National importance and some buildings that harbour important colonies of "cave-dwelling species" such as *R. ferrumequinum* and *R. hipposideros* are monitored, in a total of around 50 places each season. Observations inside the roosts are done, counting the individuals or estimating the area of the colonies (visually and with photographs), using the methods described for *M. myotis/blythii* and *M. schreibersii* in Resolution 2.2 and recommended by EUROBATS Publication Series n° 5. These methods can be successfully applied to *R. euryale*, *R. mehelyi*, *M. myotis*, *M. blythii* and *M. schreibersii*, which 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*, there are 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 other species. In the case of *M. escaleraei* and *M. emarginatus*, although most maternity colonies are known in underground roosts, since normally they use hidden places (especially *M. escaleraei*), very often they are not observable inside. Often, only the capture of flying juveniles enables the identification of maternity sites.

Azores Autonomous Region: Monitoring of bat populations is conducted by the Environmental Authorities with ultrasound detectors, every summer since 2012.

Madeira Autonomous Region: Because Madeira Archipelago and the other macaronesian archipelagos were out of the geographical range of the agreement, EUROBATS guidelines were not used. After the entry in the agreement, no monitoring actions were executed by Local Focal point or nature conservation authorities. In the future, monitoring of Natura 2000 areas will consider EUROBATS guidelines for monitoring and data collection.

Resolution 5.4. Monitoring bats across Europe

5.11. Involvement in a long-term pan-European surveillance to provide trend data

Yes

Involvement details

Please, give details of involvement

> Mainland Portugal: Yes. Participation in the project "Streamlining European Biodiversity Indicators (SEBI): Development of a prototype indicator of European bat population trends", providing hibernation data; the output was the paper by Van der Meij et al. (2015; see Point 8 - papers and projects). Currently, data on monitoring is being updated in order to update the indicator.

Azores Autonomous Region: No.

Madeira Autonomous Region: No.

Awareness-raising of the importance of underground sites

Yes

Collaboration and information exchange with other Parties and range states on surveillance and monitoring activities

Yes

Please provide details

> Mainland Portugal: Cooperation with Spain regarding the share of information about recaptured bats is being carried out.

5.14. Monitoring bats in accordance with EUROBATS Publication n°5

Yes

5.15. Capacity building of bat workers and surveyors to support the undertaking of bat surveillance projects

Exists

Other activities under Resolution 5.4.

> Azores Autonomous Region: Since the first course in 2012, the Environmental Authorities organized a second course in 2016, about monitoring with ultrasound detectors, for the Nature Rangers that work in the Azores Natural Island Parks.

Madeira Autonomous Region: No awareness-raising, no collaboration and information exchange, no monitoring bats in accordance to Publ. 5, no capacity building.

Resolution 6.6. Guidelines for the prevention, detection and control of lethal fungal infections in bats

5.17. Surveillance for the presence of fungal infections

Yes

Please provide details

> Mainland Portugal: Relevant information on fungal infection in bats has been forwarded to investigators, technicians doing field work and speleologists. Particular care is being taken regarding the identification of signs of potential fungal infection in bats during field work. Regarding research, see Point 8 (papers and projects).

Azores Autonomous Region: No.

Madeira Autonomous Region: No.

Resolution 6.13. Bats as indicators for biodiversity

5.19. Does your country support a development of national, regional and pan-European biodiversity indicators for appropriate target audiences, using bat data

No

5.20. Bat data is incorporated within high profile national multi-taxa indicators

No

5.22. Cooperation platforms that facilitate the required data exchange

Don't exist

Resolution 7.5. Wind turbines and bat populations

5.2. Raising awareness on the impact of turbines on bats and the existence of some unsuitable habitats or sites for construction

Yes

If yes, how?

> Mainland Portugal: Using a mailing list (promoters, companies in charge of monitoring programs, bat experts, environmental authorities), information on the impacts that some wind farms may have on bat populations has been circulated (including papers, EUROBATS guidelines, IWG on WT's reports).

Azores Autonomous Region: No.

Madeira Autonomous Region: Information was provided to main wind turbine investors about their effects on local fauna including bats. Therefore wind turbine farms were built on the areas less prone to cause damage on local bat populations.

5.3. Pre-construction impact assessments, if possible, undertaken by suitably experienced bat experts

Yes

Please, give details

> Mainland Portugal: Since authorities evaluate impact assessments, poor quality reports (done by non-experienced persons) are revised and sometimes refused. This procedure has increased the quality of the field work and reports.

Azores Autonomous Region: The construction of wind power for electricity production is subject to Environmental Impact Assessment, depending on their size and location, according to the Legal regime of impact assessment and environmental licensing, by the Regional Legislative Decree N^o. 30/2010/A of November 15th, specifically in the Annex II.

Madeira Autonomous Region: Within the period covered by this report, all pre-construction impact assessments were conducted by experts hired by companies specialized on biodiversity monitoring and assessments. All bat experts of the companies that undertook these assessment actions collected data using bat detectors, recorded bat echolocation calls and made sound analysis using specific software. Reports with collected data on the assessments were published as required by national law. In these reports, name of experts and data analysis methodology is provided as well as main conclusions on bat use of the habitats within the assessed area prior to construction.

5.4. National guidelines were developed following Eurobats Pub. No. 6

Yes

Please, attach a file or or provide a link

> Mainland Portugal: <http://www2.icnf.pt/portal/pn/biodiversidade/patrinatur/resource/docs/Mam/morc/2018-03-19-recomendacoes-parques-eolicos-out2017.pdf>

National guidelines are implemented

Yes

Please, provide implementation details

> Mainland Portugal: Guidelines for consideration of bats in monitoring programs of wind turbines projects (first version prepared in 2004) were updated with some aspects referred in EUROBATS Publication Series nº 6. The draft proposal was discussed with promoters, companies in charge of monitoring programs, bat experts and environmental authorities, and is online

(<http://www.icnf.pt/portal/naturaclas/patrinatur/resource/docs/Mam/morc/morc-recom-p-eolic>).

Recommendations are followed in most projects, inside and outside classified areas.

Azores Autonomous Region: No National guidelines developed accordingly to Publ 6.

Madeira Autonomous Region: No National guidelines developed accordingly to Publ 6.

5.5. Investigations and research for mitigating bat mortality have been undertaken

Yes

Please, list references, attach reports and articles

> Mainland Portugal: See Point 8 (papers and projects).

Azores Autonomous Region: No investigations and research.

Madeira Autonomous Region: No investigations and research. Despite the large increase of wind turbines, most parks have implemented monitoring of bat activity around wind turbines and search for dead specimens. A global assessment should be made on existing parks and research on areas of potential new parks should be made at least a whole year before construction.

5.6. Additional information on research on the impact of wind turbines on bat populations

List new references, attach reports or articles

> Mainland Portugal: See Point 8 (papers and projects)

Madeira Autonomous Region: Despite the large increase of wind turbines, most parks have implemented monitoring of bat activity around wind turbines and search for dead specimens. A global assessment should be made on existing parks and research on areas of potential new parks should be made at least a whole year before construction.

5.7. Post-construction monitoring, if possible, is undertaken by suitably experienced bat experts

If yes, give details

Yes

> Mainland Portugal: See 5.3.

Azores Autonomous Region: Post-construction monitoring is obligatory when the pre-construction impact assessments detect important bat use of the area. There is a recent example, not of a Wind Power Plant, but of a Geothermal Power Plant constructed in Terceira Island, where bat monitoring is being done as postconstruction monitoring, by the Research group on Applied Ecology of the University of the Azores.

Madeira Autonomous Region: Typically, companies that assess habitat use on pre-construction also continue to do so during construction and post-construction stages. Several have used experienced bat experts that monitor, record and analyze bat echolocation sounds using bat detectors and specific sound analysis software, assessing the use of the area given by bats after the construction. Data and reports allow comparability between the different stages of the wind farm undertaking.

5.8. Raw data from environmental impact assessment and post-construction monitoring is available for independent scientific analysis

No

5.9. Blade feathering, higher cut-in wind speeds and shutting down turbines are used to reduce or avoid bat mortality

Yes

Please, provide details

> Mainland Portugal: Due to close locations regarding important underground roosts, two projects were authorized with cut-in speed increased. A project including 7 turbines, one located 158 m from one important

hibernating roost (around 4000 *Miniopterus schreibersii* and 150 *R. ferrumequinum*), was authorized with cut-in speed increased to 5 m/s in October, November, December, March and April. A project including 4 turbines located less than 7 km from the most important underground roost known in mainland, occupied all over year by many thousands of bats of several species, was authorized with cut-in speed increased to 3.3 m/s.
Azores Autonomous Region: No mitigation measures.
Madeira Autonomous Region: No mitigation measures.

Other activities carried out under Resolution 7.5 (optional)

> Madeira Autonomous Region: Recommendation was made for monitoring companies to identify the experts, equipment, recordings and data analysis software used during each monitoring campaign. Additional recommendations were made that all data collected during monitoring made on wind turbines has to be submitted to local EUROBATS Focal point.

Comments (optional)

> Mainland Portugal: Although raw data is not available, all reports are available (some online).
Madeira Autonomous Region: Traditionally, because in mainland areas bats hibernate during winter, monitoring plans used in mainland are also applied to Madeira archipelago and monitoring is made every trimester, every semester or once per year. However due to the archipelago mild climate, bats are active throughout the year and hence in Madeira archipelago wind turbine monitoring should be made at least 6 months per year or during the whole year in areas with higher activity.

Resolution 7.9. Impact of roads and other traffic infrastructures on bats

5.23. Bats are taken into account during the planning, construction and operation of roads and other infrastructure projects

Yes

Please give details or attach a file with description

> Mainland Portugal: Yes. A characterization of the bat fauna is required in Environmental Assessments. If important roosts exist or are found close to the infrastructure projects, a monitoring programme is required.
Azores Autonomous Region: Not specifically bats, but biodiversity in general is evaluated in Environmental Impact Assessment, which is mandatory.
Madeira Autonomous Region: No.

5.24 Pre-construction strategic and environmental impacts assessment procedures are mandatory

Are mandatory

5.25. Post-construction monitoring

Required occasionally

5.26. Raw data from environmental impact assessment and post-construction monitoring is available for independent scientific analysis

No

5.27. Research into the impact of new and, where appropriate, existing roads and other infrastructure on bats and into the effectiveness of mitigation measures

Yes

Please list references, attach documents or provide links

> Mainland Portugal: See Point 8 (papers and projects).
Azores Autonomous Region: No.
Madeira Autonomous Region: No.

5.28. National guidelines are developed

No

Comments (optional)

> Mainland Portugal: Although raw data is not available, all reports are available (some online).

Resolution 7.10. Bat Rescue and Rehabilitation

5.29. Animal rescue and rehabilitation systems are effective in the country

Yes

5.30. Collaboration between bat rehabilitators and scientists

Exists

Provide examples of collaboration

> Mainland Portugal: When bat rehabilitators receive animals, generally communicate to ICNF and keep in touch. A file with details of injured bats is regularly updated.

Azores Autonomous Region: The wildlife rehabilitation Centres will contact scientists and the Environmental Authorities in case of any bat being delivered at the Centres. This already occurs frequently with birds, but no bat rehabilitation cases occurred so far in the Azores.

Madeira Autonomous Region: No effective system and no collaboration.

5.31. Bat rehabilitators contribute their data to a national database

Yes

Please provide information about this database

> Mainland Portugal: Details on the location of injured bats is sent to ICNF, in order to be included in the database of bats observations.

Resolution 7.11. Bats and building insulation

5.34. Impacts on bats are included in the environmental assessment of insulation programs

Yes

Other activities carried out under Resolution 7.11 (optional)

> Mainland Portugal: Very few situations regarding conflicts with bats are known. When it was impossible to maintain the bats, a licence to exclude them before sealing the entrances was provided. Situations are generally followed by rangers or accredited professionals.

Azores Autonomous Region: Impacts on bats are included in the environmental assessment of insulation programs. Very few situations regarding conflicts with bats are known. Situations are generally followed by rangers to make sure that no bats are harmed.

Comments (optional)

> Mainland Portugal: There is no official program, but insulation of buildings is common. There are no regulation or national guidelines regarding the need of surveys prior to insulation of a building.

Madeira Autonomous Region: No conflicts between insulation regulations and bat conservation. Because Madeira Islands have a mild climate, most buildings are not insulated, therefore insulation is not a problem for bat populations.

Resolution 7.12. Priority species for autecological studies

Rhinolophus blasii Peters, 1866

Some studies have been conducted (are ongoing) for this species in the country

No

Eptesicus isabellinus (Temminck, 1840)

Some studies have been conducted (are ongoing) for this species in the country

Yes

Studies on:

	Winter roosts	Summer roosts	Swarming sites	Migration	Spatial and habitat use	Foraging behaviour	Diet
Yes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
No	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Please add below or attach a list of references

> Mainland Portugal: See Point 8 (papers and projects).

Myotis escalerae Cabrera, 1904

Some studies have been conducted (are ongoing) for this species in the country

Yes

Studies on:

	Winter roosts	Summer roosts	Swarming sites	Migration	Spatial and habitat use	Foraging behaviour	Diet
Yes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
No	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Please add below or attach a list of references
 > Mainland Portugal: See Point 8 (papers and projects).

Nyctalus azoreum (Thomas, 1901)

Some studies have been conducted (are ongoing) for this species in the country
 Yes

Studies on:

	Winter roosts	Summer roosts	Swarming sites	Migration	Spatial and habitat use	Foraging behaviour	Diet
Yes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
No	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Please add below or attach a list of references
 > Azores Autonomous Region: Not published yet.

Nyctalus lasiopterus (Schreber, 1780)

Some studies have been conducted (are ongoing) for this species in the country
 Yes

Studies on:

	Winter roosts	Summer roosts	Swarming sites	Migration	Spatial and habitat use	Foraging behaviour	Diet
Yes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
No	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Please add below or attach a list of references
 > Mainland Portugal: See Point 8 (papers and projects).

Pipistrellus hanaki Hulva & Benda, 2004

Some studies have been conducted (are ongoing) for this species in the country
 No

Pipistrellus maderensis (Dobson, 1878)

Some studies have been conducted (are ongoing) for this species in the country
 Yes

Studies on:

	Winter roosts	Summer roosts	Swarming sites	Migration	Spatial and habitat use	Foraging behaviour	Diet
Yes	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
No	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Please add below or attach a list of references
 > Azores Autonomous Region: Data on spatial and habitat use, not published yet.
 Madeira Autonomous Region: Data on foraging behaviour, spatial and habitat use, swarming sites, summer roosts and winter roosts are being collected for a PhD Thesis, but still not published.

Plecotus kolombatovici Dulic, 1980

Some studies have been conducted (are ongoing) for this species in the country

No

Plecotus sardus Mucedda, Kiefer, Pidinchedda & Veith, 2002

Some studies have been conducted (are ongoing) for this species in the country

No

Plecotus teneriffae Barrett-Hamilton, 1907

Some studies have been conducted (are ongoing) for this species in the country

No

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

Click "expand" to see the questions!

Resolution 2.3. Transboundary programme: species proposals

6.1. Inclusion of *Myotis dasycneme* and *Pipistrellus nathusii* in transboundary cooperation

No

Comments (optional)

> Species not present in Portugal

Resolution 2.4. Transboundary programme: habitat proposals

6.2. National research on underground sites has been undertaken since the last reporting

Yes

Please list references

> Mainland Portugal: See point 8 (papers and projects).

Azores Autonomous Region: No.

Madeira Autonomous Region: No.

6.3. National research on bats in forests

Yes

Please list references

> Mainland Portugal: See point 8 (papers and projects).

Azores Autonomous Region: No.

Madeira Autonomous Region: No.

Resolution 5.2. Bat rabies in Europe

6.5. National bat rabies surveillance network

No

6.6. Vaccination against rabies is compulsory

No

6.7. Details of the institution(s) in charge of recording of all test results and their submission to the World Health Organisation

> Mainland Portugal: Direcção Geral de Alimentação e Veterinária (Campo Grande 50, 1700-093 Lisboa, Portugal, +351213239500, dirgeral@dgav.pt)

Azores Autonomous Region: Direcção Regional da Agricultura (Vinha Brava - Posto Santo, 9701-861 Angra do Heroísmo; Terceira, Açores; +351292404200; info.drag@azores.gov.pt)

6.8. Other activities carried out under this resolution (optional)

> Mainland Portugal: A passive surveillance is being carried out. Samples were collected in different geographical points of the territory. All samples tested negative by RT-PCR for classical rabies and rabies-related bat lyssaviruses: 10 brain (dead *M. daubentonii*), 419 oral swabs (*M. schreibersii*, *M. bechsteinii*, *M. blythii*, *M. daubentonii*, *M. escaleraei*, *M. myotis*, *P. pygmaeus*, *R. euryale*, *R. ferrumequinum*, *R. hipposideros*, *R. mehelyi*), 32 guano (*M. schreibersii*, *M. blythii*, *M. daubentonii*, *M. myotis*, *R. euryale*, *R. ferrumequinum*, *R. hipposideros*, *R. mehelyi*) (details in file MainlandPortugalRabies). All bat workers are advised to handle bats in the expectation that they may have rabies and are encouraged to get rabies vaccinations and to use gloves.

Resolution 6.5. Guidelines on ethics for research and field work practices

6.9. National Code of Practice that addresses the context and legitimacy of acquisition, due diligence, long-term care, documentation, relevance and institutional aims

Doesn't exist

6.10. Other activities carried out under this resolution (optional)

> Mainland Portugal: This Resolution was divulged among investigators from Universities and Natural History Museums and technicians who are doing field work.

Resolution 6.8. Monitoring of daily and seasonal movements of bats

Please select a species for which a research in daily/seasonal movements has been conducted from the list

Rhinolophus hipposideros (Bechstein, 1800)

New data on daily movements was obtained

Yes

Please attach a list of references

> Mainland Portugal: Non published data.

New data on seasonal movements was obtained

Yes

Please attach a list of references

> Mainland Portugal: Non published data.

Myotis blythii (Tomes, 1857)

New data on daily movements was obtained

No

New data on seasonal movements was obtained

Yes

Please attach a list of references

> Mainland Portugal: Non published data.

Comments (optional)

> Mainland Portugal: Banding is being done accordingly to Resolution 4.6.

Myotis myotis (Borkhausen, 1797)

New data on daily movements was obtained

No

New data on seasonal movements was obtained

Yes

Please attach a list of references

> Mainland Portugal: Non published data.

Comments (optional)

> Mainland Portugal: Banding is being done accordingly to Resolution 4.6.

Miniopterus schreibersii (Kuhl, 1817)

New data on daily movements was obtained

No

New data on seasonal movements was obtained

Yes

Please attach a list of references

> Mainland Portugal: Non published data.

Comments (optional)

> Mainland Portugal: Banding is being done accordingly to Resolution 4.6.

Tadarida teniotis (Rafinesque, 1814)

New data on daily movements was obtained

Yes

Please attach a list of references

> Mainland Portugal: Non published data.

New data on seasonal movements was obtained

Yes

Please attach a list of references

> Mainland Portugal: Non published data.

7. 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

Click "expand" to see the questions!

Resolution 4.5. Guidelines for the use of remedial timber treatment

7.1. Small projects to provide basic data to allow an assessment of the potential impact of industry on bat populations

No

7.2. Raising awareness of product users is taking place

No

7.3. Legislation on products which have any adverse effects on bats

Doesn't exist

Comments (optional)

> Mainland Portugal: Remedial Timber Treatment is not commonly used in mainland Portugal.

Resolution 6.15. Impact on bat populations of the use of antiparasitic drugs for livestock

7.4. Efficient non-chemical methods to control livestock parasites and use of products of least toxicity to non-target species implemented

Yes

Please give details

> Mainland Portugal: Antiparasitics are veterinary medicinal products. A medicinal product is any substance, or combination of substances, presented as possessing curative or preventive properties for diseases in animals or their symptoms, or which may be used or administered to the animal for the purpose of establishing a medical-veterinary diagnosis or, pharmacological, immunological or metabolic action, to restore, correct or modify physiological functions. The active substances can be: (i) human, such as human blood and products derived from human blood; (ii) animal, such as micro-organisms, whole animals, portions of organs, animal secretions, toxins, substances obtained by extraction, blood products; (iii) vegetable, such as micro-organisms, plants, parts of plants, vegetable secretions, substances obtained by extraction; (iv) chemistry, as well as elements, natural chemical materials and processing and synthetic chemicals. Law Decree nº 148/2008 of 29 July, as amended by Law Decree nº 314/2009 of 28 October, provides for the authorization of herbal veterinary medicinal products including a simplified authorization when several criteria are met. However there aren't any herbal veterinary medicinal products authorized in Portugal due to lack of submissions by the companies. Biocidal products are classified into 22 biocidal product-types, grouped in four main areas. PT (product type) 19 are Repellents and attractants, used to control harmful organisms (invertebrates such as fleas, vertebrates such as birds, fish, rodents), by repelling or attracting, including those that are used for human or veterinary hygiene either directly on the skin or indirectly in the environment of humans or animals. There are some PT 19 Repellents and attractants from herbal origin authorized.

Azores Autonomous Region: There is animal production in the Azores with alternative therapies. Their use is still residual but the number of organic producers in the region is increasing. There are already producers of meat certified in Organic Production Mode in the islands of Faial and São Jorge, and in Terceira there are dairy farms in conversion to Organic Production Mode. In São Miguel there is also a project under study for the production of organic milk. In these cases, the European Regulations of biological production are followed: COUNCIL REGULATION (EC) Nº 834/2007 of 28th June 2007 and COMMISSION REGULATION (EC) Nº 889/2008 of 5th September 2008.

Madeira Autonomous Region: No.

7.5. Research on the use of antiparasitic drugs

Yes

Please list references

> Mainland Portugal: According to Law Decree nº 148/2008 of 29 July, as amended by Law Decree nº 314/2009 of 28 October, the technical-scientific evaluation of veterinary medicinal products is intended to guarantee the quality, Safety and efficacy of medicinal products placed on the market on the basis of strict technical and scientific criteria, applicable legislation and standards, in particular those published by Eudralex and in the European Medicines Agency (EMA). The evaluation is carried out by experts from the Pharmaceutical,

Preclinical, Clinical, Safety and Environmental Risk Assessment. Experts are responsible for assessing potential effects and, above all, risks to public and animal health and the environment. The environmental risk assessment of the veterinary medicinal product involves, as a first step, the estimation of the concentration of the active substance and its excipients in the environment and, depending on the results of this first approach, the assessment of its destination and effects on the trophic system. A summary of the characteristics of the medicinal product (SPC), which reflects all the conclusions of the evaluation, is agreed, with the inclusion of safety sentences, where applicable, in particular in the adverse reaction items (4.6); Special precautions for the disposal of unused veterinary medicinal product or waste materials derived from the use of such products (6.6), Special precautions for use (4.5), pharmacological (immunological) and 5.Pharmacological Properties <Environmental properties>.

Azores Autonomous Region: No.

Madeira Autonomous Region: No

7.6. Recommendations in Annex I to the Resolution 6.15 are adopted

Yes

7.7. Other activities carried out under this resolution

> Mainland Portugal: With regard to the recommendation of Resolution 6.5 - Impact on Bat populations of the use of antiparasitic drugs for livestock, in order to maintain an up-to-date list of approved veterinary medicinal products, where are included anti-parasites for farm animals, DGAV (General Directorate of Food and Veterinary) created the MEDVET platform. MEDVET it is a research platform that aims to make available to the user, data related to Veterinary Medicines, as well as the approved summary of the characteristics of the medicinal product (SPC) medvet@dgav.pt. The other recommendation of Resolution 6.5 - Impact on Bat populations of the use of antiparasitic drugs for livestock is the use of non-chemical treatments, in particular the use of herbal medicines. Regarding this recommendation, Law Decree nº 148/2008 of 29 July as amended by Law Decree nº 314/2009 of 28 October, in Article 87, provides the authorization of veterinary herbal medicinal products including a simplified authorization scheme provided, when several criteria are met.

Azores Autonomous Region: No.

Madeira Autonomous Region: No

8. Further important activities to share with other Parties and Range States

Give details or provide links

> Mainland Portugal: List of publications, including summaries for unpublished projects (file MainlandPortugalPublicationsProjects).

Madeira Autonomous Region: Although scarce, there were a few publications about bats between 2015 and 2018, as listed below:

Rocha R. 2015. Look what the cat dragged in: *Felis silvestris catus* as predators of insular bats and instance of predation on the endangered *Pipistrellus maderensis*. *Barbastella*, 8: 4 pp.

Teixeira, S. 2017. Relatório de Monitorização da Componente Quirópteros no Projecto de Ampliação do Aproveitamento Hidroeléctrico da Calheta - Fase Pré-Obra, Madeira Fauna & Flora, Funchal. 9 pp.

Date	Name (Local)	Participants	Monitor	Organization / Support
May 2014	Night predators	35	Maria João Silva	Centro Ciência Viva do Alviela
May 2014	Bat Night (Porto)	50	Luzia Sousa	AAOUP
June 2014	Mito e Realidade (Santa Maria da Feira)	30	Luzia Sousa	FAPAS
June 2014	Bat Night (Porto)	60	Luzia Sousa	EB 2/3 Paranhos
June-October 2014	Bats in the Castle (Lisboa)	240	Margarida Augusto, Mário Carmo, Paula Rosa	NATUGA
July-August 2014	Bat Night - Ciência Viva no Verão (Alcanena)	202	Maria João Silva	Centro Ciência Viva do Alviela
June 2014	MISTÉRIOS DA NOITE DE <u>COIMBRA</u> Workshop de identificação e conservação de morcegos	35	Milene Matos	Living Place - Animação Turística
July 2014	Workshop de identificação e conservação de morcegos (Parque do Buçaquinho, Ovar)	25	Milene Matos	Parque Buçaquinho; Câmara Municipal de Ovar
August 2014	Discovering the Bats of the Region of Barroso/Gerês (Montalegre)	15	Sergio Bruno Ribeiro	Biomater; Centro Ciência Viva Bragança; Agência Ciência Viva; Ecomuseu de Barroso; Município de Montalegre
August 2014	European Bat Night	18	Luzia Sousa	Museu de História Natural da U.Porto
August 2014	8 th Pombal Bat Night (Pombal)	36	Pedro Alves	Grupo Protecção Sicó; Plecotus
September 2014	Bat Night (Porto)	30	Luzia Sousa	FAPAS (Ciência Viva, Biologia no Verão)
September 2014	Os morcegos: porque são nossos amigos? (Canelas, Estarreja)	24	Milene Matos	União das Freguesias de Canelas e Fermelã
October 2014	Bat Night (Porto)	41	Luzia Sousa	Câmara Municipal do Porto
October 2014	Night of the creatures from the dark (Coimbra)	unk	Pedro Alves	Núcleo de Estudantes de Biologia, Associação Académica de Coimbra; Grupo Protecção Sicó; Plecotus
November 2014	Bat Night (Porto)	13	Luzia Sousa	Câmara Municipal do Porto
November 2014	Os morcegos: porque são nossos amigos? (Aveiro)	100	Milene Matos	Agrupamento de Escolas da Gafanha da Nazaré
June-October 2015	Bats in the Castle (Lisboa)	210	Margarida Augusto, Mário Carmo, Paula Rosa	NATUGA
May 2015	Workshop Identificação e Conservação de Morcegos (Vagos)	27	Milene Matos	Associação Charcos e Companhia
July-August 2015	Bat Night - Ciência Viva no Verão (Alcanena)	170	Maria João Silva	Centro Ciência Viva do Alviela
August 2015	9 th Pombal Bat Night (Pombal)	36	Pedro Alves	Grupo Protecção Sicó; Plecotus

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September 2015	3 rd Caldas da Rainha Bat Night (Caldas da Rainha)	80	Pedro Alves	Grupo Protecção Sικό; Direcção Regional de Cultura do Centro Museu José Malhoa; União das Freguesia das Caldas da Rainha – Nossa S ^a do Pópulo, Coto e São Gregório; Plecotus; Florista Aroma do Campo
September 2015	Bioblitz	>1000	Hugo Rebelo, Francisco Amorim, Helena Santos, Vanessa Mata	Serralves
April 2016	Bat Night - FAPAS/Centro Ciência Viva do Alviela (Alcanena)	70	Maria João Silva	FAPAS; Câmara Municipal de Alcanena; Centro Ciência Viva do Alviela
April 2016	Bat Night - SPECO (Alcanena)	10	Ana Rainho, M ^ª João Silva	cE3c/FCUL, Centro Ciência Viva do Alviela
May-September 2016	Bat Night - Ciência Viva no Verão (Alcanena)	378	Maria João Silva, Patricia Silva, Verónica Paiva	Centro Ciência Viva do Alviela
May 2016	Talk “De bestas a bestiais num bater de asas: Promover a conservação de morcegos através de ações informais de educação ambiental.” Conservation Day (Aveiro)	40	Milene Matos	Society for Conservation, Universidade de Aveiro
May 2016	International Biodiversity Day (Alcanena)	22	Maria João Silva	Centro Ciência Viva do Alviela, Charcos com vida
May 2016	Alte Bat Night (Loulé)	80	José Gabriel Mendes, Carlos Oliveira	Câmara Municipal de Loulé; Junta de freguesia de Alte; Quinta da Regaleira; Geonauta
June 2016	BioBlitz - Monsanto (Lisboa)	15	Ana Rainho, Jorge M. Palmeirim	Câmara Municipal Lisboa, cE3c/FCUL
June-October 2016	Bats in the Castle (Lisboa)	300	Bárbara Monteiro, Gonçalo Duarte, Paula Rosa	Biota
August 2016	10 th Pombal Bat Night (Pombal)	50	Pedro Alves	Grupo Protecção Sικό; Plecotus
September 2016	European Researchers’ Night (Alcanena)	unk	Pedro Alves, Francisco Amorim	Centro Ciência Viva do Alviela; Plecotus; CIBIO
September 2016	Bat Night (Lousada)	52	Milene Matos	Associação BioLiving; Câmara Municipal de Lousada
October 2016	Bat Night (Porto)	25	Luzia Sousa	Câmara Municipal do Porto
October 2016	Bat Night (Porto)	71	Luzia Sousa	Câmara Municipal do Porto

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October-November 2016	Night of the creatures from the dark (Albergaria-a-Velha, Alcanena, Aveiro, Braga, Cantanhede, Condeixa, Évora, Porto, Proença-a-Nova, Seixal, Verdizela)	400	Margarida Augusto, M ^a João Silva, Milene Matos, Nuno Pinto, Pedro Alves, Sílvia Barreiro, Vanessa Mata	Associação Charcos & Companhia; Associação BioLiving; Associação Portuguesa de Herpetologia; Associação Portuguesa de Educação Ambiental; Centro Ciência Viva do Alviela; Centro Ciência Viva da Floresta; Charcos com Vida; Centro Interdisciplinar de Investigação; Marinha e Ambiental, Universidade do Porto; Grupo Flamingo; Grupo Protecção Sicó; Plecotus; Santa Casa da Misericórdia de Aveiro; Sociedade Portuguesa de Vida Selvagem; Universidade de Évora
January 2017	The bat, prince Quiro (Porto)	35	Virgínia Duro	FAPAS; Museu Soares dos Reis
February 2017	Ação de sensibilização para professores – conservação de morcegos	24	Milene Matos	Associação BioLiving; FAPAS
April 2017	Bats in the Wild (Regoufe)	30	Pedro Alves	Associação Geoparque Arouca; Plecotus
May-August 2017	Bat Night - Ciência Viva no Verão (Alcanena)	432	Maria João Silva, Patricia Silva, Verónica Paiva	Centro Ciência Viva do Alviela
May 2017	Bats in the Wild (Leiria)	40	Pedro Alves	Centro de Interpretação Ambiental de Leiria; Plecotus
May 2017	Apolinario Bat Night (Porto)	37	Luzia Sousa; Luis Monteiro; Ana Luisa	Câmara Municipal do Porto
June-October 2017	Bats in the Castle (Lisboa)	300	Bárbara Monteiro, Gonçalo Duarte, Paula Rosa	Biota
June 2017	exhibit "Morcegos às Claras"_ opening (Lisboa)	80	Luisa Rodrigues, Paula Robalo	Centro Ciência Viva do Alviela; ICNF; Pavilhão do Conhecimento
June 2017	Tróia (Morçegário - overground replacement bat roost)	27	Hugo Rebelo	MARE-FCUL, Biodiversity4all, Troiaresort
July 2017	A night with bats (Alcácer do Sal)	14	Maria Conceição Conde	Alexandra Batista; Ian Warburton; ICNF
September 2017	Lousada Blitz	27	Nuno Pinto	Associação BioLiving; Câmara Municipal de Lousada
September 2017	Bats Night	35	Milene Matos	Associação BioLiving; Câmara Municipal de Lousada
September 2017	Bats in the neighborhood (Ramada)	10	Bárbara Monteiro, Paula Rosa	Biota
September 2017	BioBlitz Monsanto – European Night of Researchers (Lisboa)	50	Margarida Augusto	National Museum of Natural History and Science of the University of Lisbon
September 2017	4 th Caldas da Rainha Bat Night (Caldas da Rainha)	40	Pedro Alves	Direcção Regional de Cultura do Centro Museu José Malhoa; União das Freguesias das Caldas da Rainha – Nossa S ^a do Pópulo, Coto e São Gregório; Plecotus; Florista Aroma do Campo

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October 2017	Bats Gala 2017 (Alcanena)	111	Hugo Rebelo, Jorge Palmeirim, Denis Medinas	Centro Ciência Viva do Alviela
October-November 2017	Night of the creatures from the dark (Braga, Condeixa, Famalicão, Lousada, Proença-a-Nova, Vagos, Viça Real)	400	Luis Brás, Maria João Silva, Milene Matos, Pedro Alves, Nuno Garrido, Virgínia Duro	Associação BioLiving; Associação Charcos & Companhia; Câmara Municipal de Lousada; Câmara Municipal de Vila Nova de Famalicão – Parque da Devesa; Centro Ciência Viva da Floresta; Grupo Protecção Sicó; Plecotus; Sociedade Portuguesa de Vida Selvagem; NEPA-UTAD
April 2018	Bioblitz Serralves 2018 (Porto)	1000	Anabela Pereira, Virgínia Duro	Fundação Serralves
April 2018	Short Course: Birds and Bats of Portugal	12	Ana Rainho	cE3c/FCUL
April-May 2018	Bat Night - Ciência Viva no Verão (Alcanena)	179	Maria João Silva	Centro Ciência Viva do Alviela
May 2018	Bats in Monastery of Tibães (Tibães)	30	Virgínia Duro	International Museum Day, Monastery of Tibães, BioAventuras
May 2018	22º International Bat Night - FAPAS (Lousada)	100	Virgínia Duro	FAPAS
May 2018	Bioblitz Alviela (Alcanena)	20	Bruno Silva, Pedro Alves, Sílvia Barreiro	Câmara Municipal de Alcanena; Centro Ciência Viva do Alviela; Plecotus
May 2018	BioBlitz - Almada	40	Ana Rainho, Mário Carmo	Câmara Municipal de Almada

Date	Name of the activity	Participantes	Monitor	Organization / Support
January 2016	O morcego esquecido	20	Lubélio Mendonça	Parque Natural do Corvo
January 2017	Biodiversidade Açoriana	13	Marisa Hipólito	Parque Natural das Flores
February until April 2016	O Morcego dos Açores vai à tua escola!	266	Dina Dowling	Parque Natural do Faial
April 2017	Morcego-dos-Açores: Tímido e simpático!	17	Dina Dowling	Parque Natural do Faial
February and March 2018	Mãos que voam	248	Dina Dowling e Cristina Carvalho	Parque Natural do Faial
February and March 2018	O morcego no Jardim	40	João Bettencourt	Parque Natural do Faial
April 2016	Apresentação sobre Conservação da Natureza e o Morcego-dos-Açores	87	Tânia Santos e Helder Xavier	Parque Natural da Terceira
July 2016	Vem conhecer o morcego-dos-Açores	14	Tânia Santos	Parque Natural da Terceira
May 2014	Passeio Noturno com Audição da espécie Morcego-dos-Açores	15	Vigilantes da Natureza	Parque Natural de São Miguel
January until July 2015	O morcego esquecido	957	Rafaela Anjos, Daniela Câmara e Rita Melo	Parque Natural de São Miguel
December 2014 until June 2015	O Morcego-dos-Açores na tua escola	41	Rafaela Anjos, Daniela Câmara	Parque Natural de São Miguel
January 2015	Nyctalus azoreum - Conhecer para proteger!	132	Rafaela Anjos, Daniela Câmara e Vigilantes da Natureza	Parque Natural de São Miguel
December 2015	Apresentação sobre Conservação da Natureza e o Morcego-dos-Açores	7	Carolina Anjos	Restart – Inst. Criatividade Arte Novas Tecnologias
February, May, October and November 2016	O morcego esquecido	304	Carolina Anjos e Joana Borges	Parque Natural de São Miguel
February, May and October 2016	O morcego-dos-Açores na tua escola	79	Carolina Anjos e Joana Borges	Parque Natural de São Miguel
April 2016	Passa uma noite na boca do vulcão e conhece o morcego-dos-Açores	20	Rafaela Anjos, Joana Borges, Mafalda Veiros, Carla Ferreira, Susete Resendes, Ana Lúcia Vieira, Cristina Bento, D. Conceição e Patrícia Monteiro	Parque Natural de São Miguel
January until October 2017	O morcego "esquecido"!	814	Carolina Anjos e Joana Borges	Parque Natural de São Miguel
January and March 2017	O Morcego-dos-Açores na tua escola	140	Carolina Anjos e Joana Borges	Parque Natural de São Miguel
November 2017	XII Jornadas pela Conservação do Priolo	33	Carolina Anjos	Sociedade Portuguesa para o Estudo das Aves (SPEA)
January and March 2018	O morcego "esquecido"!	99	Carolina Anjos e Joana Borges	Parque Natural de São Miguel
November 2015 and February 2016	O morcego-dos-Açores na tua escola	96	Sofia Freitas	Parque Natural de Santa Maria
January, February and April 2016	Nicolau: Um morcego simpático	301	Sofia Freitas e Carla Briló	Parque Natural de Santa Maria
November 2017 and April 2018	Morcega-te!	95	Sofia Freitas	Parque Natural de Santa Maria

Species	Brain (dead specimens)	TOTAL	Oral swabs			TOTAL	Guano			TOTAL
	2016		2015	2016	2018		2015	2016	2018	
<i>Miniopterus schreibersii</i>			57	8	3	68	2	4	3	9
<i>Myotis bechsteinii</i>				1		1				0
<i>Myotis blythii</i>			2	11	19	32		1	1	2
<i>Myotis daubentonii</i>	10	10			5	5			1	1
<i>Myotis escaleraei</i>			16	10		26				0
<i>Myotis myotis</i>			21	19	41	81	1	2	2	5
<i>Pipistrellus pygmaeus</i>			1			1				0
<i>Rhinolophus euryale</i>			1	23	47	71		2	1	3
<i>Rhinolophus ferrumequinum</i>			2	29	19	50	1	2	2	5
<i>Rhinolophus hipposideros</i>				3	15	18			2	2
<i>Rhinolophus mehelyi</i>			3	12	51	66		2	3	5
Total	10	10	103	116	200	419	4	13	15	32

PUBLICATIONS

- Amorim, F., Mata, V. A., Beja, P., & Rebelo, H. 2015. Effects of a drought episode on the reproductive success of European free-tailed bats (*Tadarida teniotis*). *Mammalian Biology-Zeitschrift für Säugetierkunde*.
<http://www.sciencedirect.com/science/article/pii/S1616504715000075>
- Amorim F., I. Jorge, P. Beja & H. Rebelo. 2018. Following the water? Landscape-scale temporal changes in bat spatial distribution in relation to Mediterranean summer drought. *Ecology and Evolution*, 1–14.
<https://doi.org/10.1002/ece3.4119>
<https://onlinelibrary.wiley.com/doi/epdf/10.1002/ece3.4119>
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THESIS AND PROJECTS

- Barreiro S.P. 2016. *Saving trees for saving bats: tree-like features as key foraging habitats for insectivorous bats in intensively farmed agricultural lands*. Tese de Mestrado, Universidade de Évora
- [Land conversion for agricultural purposes and the intensification of management practices, are the major drivers of the global biodiversity decline. The loss of natural vegetation remnants and homogenization of agricultural landscapes have detrimental effects on many species, including bats. As they are important pest controllers, it is important to understand the mechanism underlying their persistence in agricultural landscapes. By comparing structural features of increasing complexity (open fields, single trees, tree lines and woodlands), in this MSc it was investigated the patterns of bat species richness, flight and feeding activities of the three main foraging guilds; and the potential effect of prey availability on these patterns; in a Mediterranean intensively managed agricultural landscape located in Tagus River flood plain (“Lezíria do Tejo”), Centre Portugal. Bats were surveyed by acoustic methods and arthropods by using light traps, during the summer of 2014. Overall 16197 bat passes and 3449 bat “feeding buzzes” were recorded and 3643 arthropods were collected. More than 85% of bat passes recorded belong to the edge foragers *Pipistrellus pipistrellus*, *P. pygmaeus* and *P. kuhlii*; and to the open-space foragers *Eptesicus serotinus* / *E. isabellinus* and *Nyctalus leisleri*. Results showed that open fields were significantly less bat rich and had lower levels of flight and feeding activities. Treed features were differently used by distinct bat guilds: open-space foragers were more abundant, and foraged preferentially above woodlands; edge foragers activities were higher in tree lines; and narrow-space foragers were more abundant near single trees. Differences on bat activities patterns were not driven by prey availability (measured as arthropods abundance), which was similar across structural feature complexity. It was concluded that the occurrence of different structural features within agricultural landscapes provide a variety of commuting and feeding habitats for bat species with different requirements, reinforcing the importance of landscape heterogeneity to bat occurrence and species richness in agricultural landscapes.]
- Costa A.S. (ongoing MSc) *The effect of landscape composition on bat activity and species richness in olive farms*. Universidade de Évora.
- [Bats are negatively affected by the intensification of agricultural practices. In Portugal, the intensification of olive groves has greatly increased in recent years and the impact on bat flight activity patterns and species richness is still scarcely known. Therefore, the main objectives of this dissertation are to determine bat flight activity patterns and species richness in olive groves under different degrees of intensification and to evaluate the effect of the surrounding landscape on these patterns.]

Faria S.S.A. 2014. *Caraterização da riqueza específica da comunidade de quirópteros no Campus da Universidade de Trás-os-Montes e Alto Douro*. Relatório Final de Estágio da Licenciatura em Biologia. UTAD.

[Bat community richness characterization in the campus of University of Trás-os-Montes e Alto Douro (UTAD campus): This Graduation Thesis main objective was to analyze the bat's diversity, socialization and the feeding areas in the different habitats that compose the UTAD campus. 378 acoustic records were recorded and analyzed, confirming the existence of at least 11 species (*Tadarida teniotis*, *Pipistrellus kuhlii*, *Pipistrellus pipistrellus*, *Pipistrellus pygmaeus*, *Miniopterus schreibersii*, *Nyctalus leisleri*, *Myotis daubentonii*, *Plecotus austriacus* or *Plecotus auritus*, *Eptesicus serotinus* or *Eptesicus isabellinus*, *Myotis myotis* or *Myotis blythii*, and *Nyctalus lasiopterus* or *Nyctalus noctula*) and a maximum potential of 14 species. The ANOVA variance tests results points to an increase in the bat's diversity according to the vegetative development state of the habitats. It also revealed that wet habitats are a prime hunting spot, while the gardens are the socialization hotspot. It was concluded that UTAD campus represent an excellent ecological niche for bats, proving to be a place of great importance for the conservation of this faunistic group in a regional context. Despite the high biodiversity associated with UTAD campus, it must be taken into account that this data is preliminary (gathered only during early spring) so further researches should include the whole annual cycle of bat's activity in order to accurately access the reference situation of bat diversity in UTAD campus.]

Faria S.S.A. 2017. *The influence of prey availability on the seasonal patterns of bat richness and activity in autochthonous deciduous forests*. Tese de Mestrado, Universidade de Trás-os-Montes e Alto Douro.

[Deciduous forests are known to hold a large quantity and species of arthropods. Despite this evidence, bats can exhibit severe seasonal variations in this type of forests, mainly induced by changes in the resources availability as well as several climatic conditions. Therefore, they must adjust their phenological conditions (post-hibernation, breeding and pre-hibernation seasons) according to the availability of trophic resources. In order to assess the potential influence of these factors on the seasonal patterns of bat activity, in this MSc two plots of deciduous forests were selected as representative autochthonous habitats, one dominated by sweet chestnut trees (*Castanea sativa* L.) and the other by English oaks (*Quercus robur* L.). The sampling design was based on the data collected through an automatic passive ultrasound detector (bat activity and richness), flight-intercept and pitfall traps (prey availability) and by monitoring the vegetative growth cycle (leaf development stages). Finally, the weather conditions were monitored through an automatic fixed weather station. The data collection (vegetation, arthropods, bats and weather) was performed with a fortnightly sampling periodicity between March and October in each type of forest. The bat data collection resulted in 1117 bats acoustic records and eleven species identified, being the *Pipistrellus* spp the genus with more bat passes recorded. Furthermore, two major social activity peaks were detected, one on March/April (post-hibernation season) and the other on September/October (pre-hibernation season). Additionally, the nocturnal bat activity was concentrated in the first half hour of the monitoring period. Regarding the arthropods variables (richness, abundance and biomass), the statistical analyses showed significant differences between trap types (aerial versus pitfall) and, as expected, between the vegetative variables (leaf area, leaf perimeter and Spad) of the two forest types. Three GLM models were performed in order to test the combination of all the above factors taking into consideration three phenological periods (post-hibernation, breeding and pre-hibernation seasons). In this context, although some significant explanatory variables were coincident in the three models, other variables had a different weight and significance between different phenological periods, as well as some explanatory variables with an unpredicted statistical result that could point to new lines of future research. Overall, the results are encouraging since they seem to demonstrate the reliability on capturing the relationships between some trophic attributes associated with the studied forests and the behavioural and ecological patterns of bat occurrence, habitat food resources availability and environmental prevailing conditions. Therefore, concerning the forest habitats management for bats, the maintenance of healthy oak forests seemed to play a significant conservation role, due to the fact that these habitats ensure a trophic niche available for bats until late autumn (pre-hibernation season).]

Farino A. (ongoing MSc) *Evaluation of the occupation of bat boxes for arboreal bats in the Alqueva and Pedrógão reservoirs*. Universidade de Évora.

[Bat boxes have been used for conservation and mitigation of bat roost destruction across the world. In the Alqueva and Pedrógão dams several thousand trees were cutted down before the flooding and one of the mitigation actions was to set up bat boxes to replace the bat roosts that were lost. Here we assessed the occupation of the bat boxes and the influence of their characteristics and landscape variables for the use by bats. We surveyed the 101 bat boxes in 2016 and 2017 and recorded the information such as color, model, orientation of the exit, etc. Landscape information was collected using GIS. We recorded an occupation of 11%, mainly by *Pipistrellus kuhlii* bats. Occupation probability – logistic model – was higher in areas with high proportion of montado or dehesa and with high values of water edge. Both landscape variables had higher influence in 5000m buffers. The results from this model were spatially extrapolated to the study area to provide information on the probability of occupation of new bat boxes.]

Fernandes M. 2017. *The influence of land use changes on the genetic structure of *Plecotus auritus begognae* populations*. Tese de Mestrado, Universidade do Porto.

[In order to understand the effects of climate change and habitat loss it is important to identify bioindicator taxa that show measurable responses to these changes. Particularly, insectivorous bats, show a strong dependence of forested habitats and are sensitive to a wide range of disturbances that also affect many other taxa (Jones et al., 2009). This research focused on *Plecotus auritus begognae*, a recently discovered lineage in the Iberian Peninsula, associated to forested environments. The Iberian Peninsula

has been considered an important reservoir of biodiversity. However, it has also been a target of climate and land-use change over the XXth century, leading to spatial changes in the landscape. The main goal was to evaluate through landscape genetics analyses the effect of historical land use changes on the population structure of *P. a. begognae*. Over 300 *Plecotus auritus begognae* samples were obtained from mist netting and roost trapping sessions in the Iberian Peninsula over the last decade. 23 autosomal microsatellite loci were analyzed and submitted to a number of genetic and statistical analyses, aiming towards the calculation of different genetic indices. This information was related to spatial environmental data, made available by historical maps and the HILDA (Historic Land Dynamics Assessment) model, and later facilitated the creation of friction layers, landscape genetic models (through Multiple Regression Distance Matrices) and species distribution models, in order to better understand the relation between the studied species and its environment. Results suggest that the overall forest area has increased in Iberia during the XXth century, while the forest extent during the earlier decades of the XXth century were strongly associated to the current *Plecotus* population structure. Also, older forests seem to provide a better habitat for this species, given its ecology, and therefore, it is more abundantly found in areas where older roosts can be found. This study highlights the need to include historical data when studying the current structuring of species populations and provides evidence that we should urge to preserve the existing ancient forests, as well as aid in their expansion, rather than promoting the development of new spurious forests that may not provide the necessary resources for the species survival.]

Jensen K.M. 2018. Interaction between ectoparasitic fungus and bat flies. Bachelor Thesis, University of Copenhagen.

[Bat flies (Nycteribiidae) of the order Diptera are highly specialized bloodsucking ectoparasites living on bats. The life cycle of the bat flies emphasizes their obligate relationship with their hosts as they spend almost their entire life on bats. Upon mating, the female bat fly carries the larva internally until the 3rd-instar stage. Only then will the female leave the bat to deposit the prepupa on the bat roost ceiling. The larva then forms a puparium and after 3-4 weeks the adult bat fly emerges and starts searching for a host bat to colonize. Some of these ectoparasitic bat flies themselves are infected with an ectoparasitic fungus of the genus *Arthrorhynchus* (Laboulbeniales). Ascospores of the fungi attach themselves to the cuticle of the bat fly and presumably develop a haustorium that penetrates tissue from where it extracts nutrition from the bat flies. This interaction converts the fungus into a hyperparasite. Both the parasite and hyperparasite are obligates and cannot live separate from their hosts. This peculiar case of hyperparasitism remains highly unknown. The studied bat flies were collected in caves of Portugal, in maternity and hibernation bat seasons, and in the autumn migration period. The most common species of cave-dwelling bats in Portugal is *Miniopterus schreibersii*, frequently parasitized by the bat fly species *Nycteribia schmidlii* and *Penicillidia conspicua*. There are no published records of bat fly-associated Laboulbeniales in Portugal. We have studied the prevalence of the Laboulbeniales of the genus *Arthrorhynchus* in natural populations of bat flies. Laboulbeniales infections were found on 10 of 428 screened bat flies (2.3%). Furthermore, we encountered the fungus species *Arthrorhynchus nycteribiae* as a new country record for Portugal. Lastly, we found evident penetration of the haustorium into the host tissue. This study extends the geographical range of the Laboulbeniales fungus and contributes to the understanding of this unique case of fungus-insect-vertebrate hyperparasitism interaction.]

Jorge I. 2014. *The effect of landscape dynamics on bat habitat use and community composition in a future reservoir area*. Tese de Mestrado, Universidade do Porto.

[Landscape alteration and fragmentation are among the main drivers of current biodiversity loss. The building of a large dam and its reservoir in the Sabor river may cause a huge impact on the landscape, flooding numerous habitats, transforming a diverse and complex landscape into a homogenous wide reservoir and causing irreversible damages to local species. Consequently, these changes can affect the permanence of bat species in this ecosystem. The results of this MsC showed that from the tested ecological variables, the area of water bodies, number of patches of closed areas and the mean slope are drivers of bat diversity in the study area. Also, besides the area of water bodies, small urban areas and native forests have positive effect on bat diversity, while arable lands have negative effect. On landscape structure, results showed that an intermediate level of number of patches (fragmentation) combined with patch richness of both closed and open areas influence positively bat species diversity. Taking these results into consideration, conservation measures on bat diversity can be designed for maintaining bat diversity in the Sabor valley.]

Marques F. 2016. *Using metabarcoding techniques to assess the winter diet of *Rhinolophus hipposideros**. Relatório de estágio. Licenciatura em Biologia. Faculdade de Ciências do Porto.

[Using metabarcoding techniques to assess the winter diet of *Rhinolophus hipposideros*: A recent study showed that Natterer's bats (*Myotis nattereri*) hibernation in Europe is irregular with frequent arousals for feeding during winter. Non-volant preys are consumed, raising questions on bat prey-detection system. In this study the winter dietary composition of Lesser horseshoe bat (*Rhinolophus hipposideros*) was analyzed, providing new data to conservation management as also as useful information to support questions about prey detection system. Dietary composition was obtained by Next generation sequencing using small barcode fragment of COI extracted from stool samples.]

Marques F. (ongoing MSC) *Evaluating the effectiveness of European protected areas preserving the diversity and connectivity of bat populations*. Faculdade de Ciências do Porto.

[The world is facing a mass biodiversity extinction due to climate change and other anthropogenic stressors. Species distribution and connectivity between populations play a key role in species resilience to extinction, but to our best knowledge the effectiveness of European protected areas on covering species connectivity has not been addressed. This master thesis will assess European bat

diversity using species distribution models which will allow to calculate connectivity among populations. Finally, gap analyses will be performed to evaluate how well European protected areas cover those ecological values, thus providing data to improve protected areas design.]

Milhinhas C. (ongoing MSC) *Factors influencing the bat community in vineyards: landscape characteristics, natural structures and management*. Universidade de Évora.

[Agricultural areas are increasing worldwide and the impacts of these structurally simple landscapes on biodiversity need to be assessed. Vineyards are one of the more simplified agricultural areas and we investigated the use of these ecosystems by bats and how management, and the presence of ecological structures (tree lines) and of important habitats (wetlands) influence the suitability of them for bats. We surveyed 26 vineyards using automatic bat recorders for 6 consecutive nights. Vineyard and landscape land use variables were measured using GIS of detailed maps. GLM models will allow us to design management strategies to improve the conservation of bat populations in these areas.]

Mina R.M.M. 2017. *Bioaccumulation of metals in bats: is there a potential risk?* Tese de Mestrado, Universidade de Coimbra.

[Given the conservation status of many bat species, and the need for large-scale studies, there is an increasing need for developing non-invasive tools to assess whether metal accumulation is one of the factors associated with the declining of the bat populations. Thus, the aim of this MSc was to validate the use of non-lethal samples to determine the bioaccumulation of metals in bats. For that, the concentration of 10 essential and non-essential metals (As, Cd, Co, Cr, Cu, Mn, Ni, Pb, Se and Zn) was measured in internal organs (bone, brain, heart and liver) and in external tissues (fur and wing membrane skin) collected from bat carcasses of four species (*Hypsugo savii*, *Nyctalus leisleri*, *Pipistrellus pipistrellus*, *Pipistrellus pygmaeus*) obtained in the scope of windfarms mortality searches. Correlations between metal concentrations in external tissues (non-lethal samples) and metal concentrations in internal organs (lethal samples) were established. The significance of the correlations was evaluated individually for each metal, and all the possible combinations between the tissues sampled were considered. In general, for the different metals analyzed, fur and wing membrane were the samples that showed the highest concentrations, while the bone was the tissue that presented the lowest concentrations. Few correlations were found between the metal concentrations in external tissues and the metal concentration in internal organs. However, all the biological samples showed similar response patterns in terms of metal accumulation, except the bone for some metals. In conclusion, fur and wing membrane demonstrated to be suitable biological matrices to evaluate metal exposure in bats, and may be useful to predict endogenous metal concentrations in these species.]

Oliveira, F.S.H. 2014. *Influência das albufeiras de pequenas barragens na actividade de quirópteros no Nordeste de Portugal*. Tese de Mestrado, Universidade do Minho.

[Influence of small dams in Chiroptera activity in northeastern Portugal: Freshwater streams and natural ponds are very attractive places for bats because they provide resources such as food, water and shelter. Freshwater systems have been profoundly changed by the construction of dams over the years and the influence of these structures on bat activity is poorly understood. This MSc aims at studying the effect of small river dams in the local bat communities and also at understanding if bat species benefit from these types of structures. This study was carried out in small water dams on 5 small streams of the Sabor river basin, located in the NE of Portugal. Four sampling points were selected on each stream: upstream of the dam (CM), downstream of the dam (CJ), on the reservoir next to the dam's wall (A1) and on the most upstream point of the reservoir (A2). A total of 20 sites were sampled, using an ANABAT SD2 to monitor bat activity and foraging activity, during a period of 3 hours after the sunset, during the summer of 2011. Each site was sampled three times. Results showed that total bat activity is significantly higher in reservoir sites (A sites) than in riverine sites (C sites) and the same was observed in relation to foraging activity. However, no statistically significant differences were found between homologue sites (i.e. A1 vs A2; CM vs CJ). Comparisons between bat activity using TtCI values showed that *Pipistrellus pipistrellus* is the dominant species out of the 15 different species/complex of species detected in the study area. The presence of small reservoirs in this region has a significant influence on the activity of bats. Therefore, in periods of drought, reservoirs can provide water and food for bat species in the region. However, these dams appear to primarily benefit the species belonging to the genus *Pipistrellus* and *Myotis daubentonii*, which are rapidly expanding in Europe. Even though riverine sites show lower bat activity and foraging activity, these sites are more balanced in terms of species activity. Furthermore, the greatest number of species with high conservation status was recorded in a riverine site located upstream of the reservoir. Therefore, riverine areas appear to be more important than reservoirs in terms of biodiversity and conservation of the local bat community].

Ribeiro C. 2016. *Atividade de quirópteros no inverno: Quais as condições climáticas que a determinam?* Relatório Final de Estágio. Licenciatura em Biologia. Universidade de Trás-os-Montes e Alto Douro.

[Winter activity of bats: Which climatic conditions determine their activity?: Most of bats that inhabit in temperate zones hibernate during the coldest season of the year, because of the scarcity of food resources, namely insects, that are not available due to low temperatures in these regions. However, the hibernation of bats is not a continuous metabolic process, once in particular situations with propitious conditions, some species break their hibernation state, namely to move within the hibernaculum, or to change to other hibernaculum, to feeding and/or physiological requirements, or due to perturbation. The main objective of this study was to characterize the activity of bats (typology, frequency, species) during the coldest period of the year (November, December, January, and February), and correlate with climatic conditions that could determine the break of the hibernation state. This study was done in UTAD Campus in two main habitat types of autochthonous deciduous forests, one dominated by semi-natural oaks (*Quercus robur*), and the other by chestnuts (*Castanea sativa*). The results showed that the activity during the period of study varied according

the species, in which the highest period of activity was in November, the lowest during December and February, and absent in January, being registered significant statistical differences on the activity between months. Generally, the response variables, namely number of detected passages (Npass), number of species (Nsp), and number of social calls (SC), were not indifferent to a set of climatic variables, such as relative humidity, temperature, precipitation, wind speed, precipitation accumulated within 48 hours preceding acoustic detection, moon light, and period when the detection was registered. The temperature proved to be the most influential variable on the activity of bats (Npass and SC) and species richness (Nsp), in both cases, in a positive and highly statistically significant way. Concluding, the pattern of bat activity during the period of hibernation could be strongly associated with the fluctuations of air temperature. Nonetheless, the prevailing conditions on previous days, about this variable and others, are still lesser studied under the hypothesis that sustains a non-instantaneous reaction of the Chiroptera to the variation of the environmental conditions. In the future, the studies carried out on this subject should look for the best possible determination on the periods of characterization to be considered for the climatic conditions, and thus obtain results that allow to better clarify what determines this intermittent behavior acquired evolutionarily by bats as a strategy of survival.]

Rodrigues A.F.P.N. 2014. *Medidas de minimização de impactes para a conservação de quirópteros: O caso da demolição de abrigos em estruturas edificadas no âmbito do aproveitamento hidroeléctrico do Baixo Sabor*. Relatório Final de Estágio. Licenciatura em Biologia. Universidade de Trás-os-Montes e Alto Douro.

Santos H.S.V. 2017. *Combining molecular analyses with predictive modelling to study the population history of Iberian cryptic bats: lessons from the past to better predict the future*. Tese de Doutoramento, Universidade do Porto.

[Due to the global trends in biodiversity loss, there is an increasing need in conservation biology for the development of methodologies to aid in the fast development of conservation management guidelines. This work focuses on combining methodologies from conservation and landscape genetics with predictive modelling and connectivity, to provide relevant insights on the ecological and molecular characteristics of bat cryptic species, while presenting significant outputs for conservation management. Using the Iberian Peninsula as a case study, this research firstly aimed at determining the distributions, as well as ecological and biogeographical affinities, of recently discovered bat cryptic species. These outputs revealed possible unsurveyed areas of species occurrence as well as the ecological relationships between species' niches and the contact zones within each cryptic complex. With a particular focus on the poorly-known cryptic lineage *Plecotus auritus begognae*, a population evolution study was also developed to clarify the evolutionary history and relationships between the Iberian *Plecotus* lineages. These results revealed a clear separation of all lineages within this genus, except between *Plecotus auritus auritus* and *Plecotus auritus begognae*, which were only differentiated by mitochondrial DNA and microsatellites, therefore suggesting a recent separation and supporting the subspecies status. Successful field campaigns were then conducted in the previously determined subspecies' area of occurrence, with the aim of filling the sampling gaps. Subsequently, a multi-disciplinary approach was developed, integrating landscape genetics' analyses with species distribution modelling and connectivity methodologies, to study the environmental drivers affecting the population structure and connectivity patterns of *P. a. begognae*. This subspecies showed no clear population structure within Iberia, with gene flow occurring throughout its range. The outputs of this study, however, not only demonstrated that this gene flow is dependent on the presence of forested and mountainous areas, but also identified the subspecies' distribution patches which are potentially at-risk of isolation. The large extents of mature forests in the North of the Iberian Peninsula seem to be preventing the fragmentation within this subspecies and, as such, conservation efforts directed to forest preservation in these areas are recommended. Finally, with the aim of evaluating the potential impacts of climate change in *P. a. begognae*'s populations, landscape genetics was integrated with climatic modelling. The results obtained showed a considerable contraction of *P. a. begognae*'s suitable area of occurrence for 2050 and even more severe for 2070. Most of the subspecies' distribution range will become unsuitable, forcing populations to shift their ranges into projected suitable and stable areas, mostly located in north-western Iberia. The most likely pathways for range shift and dispersal, and the climatic predictors most related to them were also determined. Predictions also revealed possible refuge areas, as some regions located within the western distribution of the subspecies seem to remain stable throughout the decades in climate change scenarios. Overall, the integration of different disciplines proved successful in providing relevant ecological and molecular information for *P. a. begognae*, as well as presenting spatially explicit outputs essential to prioritize conservation measures.]

Silva C.M.C. 2015. *Desenvolvimento de uma ferramenta baseada na modelação estocástico-dinâmica para a previsão da actividade de morcegos em zonas de montanha: contributos para a determinação do risco de mortalidade associado a parques eólicos*. Tese de Mestrado, Universidade de Trás-os-Montes e Alto Douro.

[**Development of a tool based on stochastic-dynamic modeling to bat activity forecasting at mountain areas: contributions for determination of bat mortality risk associated with wind farms:** Modeling tools are becoming an increasingly common practice for explaining and supporting decisions associated with ecological effects and environmental impact assessments. The Stochastic-dynamic methodology (StDM) is a tool specialised in predicting the response of ecological indicators, which can be used to mitigate and/or minimize ecological and environmental impacts. In this context, a StDM model was created in this MsC, including the multifactorial effect of meteorological conditions, land cover and geographical variables in predicting bat activity at mountain ridges of northwest Iberia, in order to assess bat mortality risk for ridges with wind farms. The StDM model was calibrated using correlative information collected during five years, namely acoustic detection of bats and environmental variables associated. Meteorological

variables (temperature, wind speed and moisture) had a preponderant influence, although other explanatory variables also were identified as significant in predicting bat activity. In fact, the proximity to agricultural areas, forested areas and ponds seem to promote the increase of bat activity in ridges. Conversely areas occupied by tall scrubs, low shrubs associated with rocks and distant areas of water lines are associated to a decrease in activity. The simulations demonstrate higher accuracy in predicting bat activity levels for more comprehensive and broader scales, such as bat activity during annual cycles or bat activity by ridge, discriminating periods and locations with different bat activity levels. In fine and detailed scales, such as bat activity by sampling point or bat activity by month, the error of prediction is higher. Nevertheless the model response to the scenarios imposed showed its capacity to detect differences between ridges considering the influence of several environmental variables on bat activity. The model also showed capacity to indicate the months and nights with meteorological conditions in which bat activity is superior. In general, the simulated bat activity is higher in warmer and less windy periods, which may obviously be associated with an increase of bat mortality risk in mountain ridges where wind farms are present. Our model indicates September as the period when bat activity is greater. The temporal overlap between highest values of predicted bat activity and bat mortality recorded in wind farms at Portugal, appears to corroborate proportional relationship between activity and mortality risk. The proposal presented in this thesis aims to contribute to improving, in an innovative way, the ability to anticipate, prevent and mitigate the possible consequences associated to wind farms installation, for ridges of northwest Iberia. The StDM model developed can be used as support tool to decide whether install or not install wind power projects for a specific location, but also could be used to improve the management of already installed wind farms, by increasing the start-up speed or even stop windmills at specific nights and locations associated to high bat activity levels.]

Silva J.M.R. 2017. *O efeito do hidroperíodo na actividade e diversidade dos morcegos: comparação entre charcos temporários mediterrânicos e charcos permanentes*. Tese de Mestrado, Universidade de Évora.

[The effect of hydroperiod in bat activity and diversity: comparison between mediterranean temporary ponds and permanent ponds: Several studies suggest that ponds are crucial to bats. According to the type of ponds and landscape, these habitats may provide different foraging opportunities for bats. The aim of this MSc was to test the influence of pond hydroperiod length on bats in both mediterranean temporary ponds and permanent ponds. 32 ponds were sampled (16 mediterranean temporary and 16 permanent) along the southwestern coast of Portugal during April to 16 May 2015 and in May 2016, and the activity and species richness were evaluated. The influence on bats of other variables such as water quality parameters, insect availability and landscape features were also assessed. Hydroperiod influenced species richness but not bat activity. Most species of conservation concern were recorded in permanent ponds. GLM models revealed a strong positive influence of arthropod biomass and urban area, and a negative influence from wind speed on bat activity, feeding buzz and species richness.]

Teixeira C.S.C. 2017. *Ocorrência de fungos patogénicos e oportunistas de morcegos cavernícolas e seus hibernáculos na região de Trás-os-Montes*. Tese de Mestrado, Universidade de Trás-os-Montes e Alto Douro.

[Occurrence of pathogenic and opportunistic fungus in cave-dwelling bats and underground roosts in the Trás-os-Montes region: *Pseudogymnoascus destructans* was isolated for the first time in Portugal in 2014 in the Trás-os-Montes region, justifying the importance of this work's objectives for the integrated assessment of the ecological relevance of bats, its conservation status, which is frequently unfavorable, and its role in the transmission and dispersion of pathogenic and saprophytic fungi in ecosystems. In this MSc a total of 74 specimens were collected directly from the wings and muzzles of bats, as well as 13 samples from their hibernation and breeding shelters (faeces, mine walls, tunnels and buildings in the Trás-os-Montes region). Sterile swabs (soaked in saline) were used for this purpose and were then used to inoculate appropriate culture media under asepsis conditions (examples: "Potato Dextrose Agar" and "Sabouraud Dextrose Agar"). In the present work, only filamentous fungi were target for taxonomic identification, through macroscopic and microscopic observation techniques of the colonies, from which the morphological identification of fungi was carried out at least until the genus level.]

Vieira R. 2016. *Determinação da dieta de morcegos em vinhas através de metabarcoding*. Relatório de estágio. Licenciatura em Biologia. Faculdade de Ciências do Porto.

[Bat diet assessment at vineyards through metabarcoding analysis: Recent studies indicate that insectivorous bats play a very important role in the regulation of insect pests in agricultural areas. These mammals feed daily on a high amount of biomass and their diet encompasses a wide variety of insect and other arthropod species. However, the impact of bats' diet on wine production is still unknown. The objective of this study was to investigate if insectivorous bats feed on potential pests of vines and what was their effect is in controlling these pests. The diet of these bats was analyzed through Next Generation sequencing techniques using a small barcode fragment of the COI gene. The results showed that these mammals feed on a large variety of species. However, no vine pest species were detected.

PUBLIC AWARENESS

Matos M. & F. Santos. 2017. O espantoso recordatório de factos adoráveis sobre os incríveis animais de Lousada. Câmara Municipal de Lousada.

Matos M. 2018. O Livro da Ciência. Câmara Municipal de Lousada.