# **National Report on Bat Conservation in Greece**

# 2006-2010

# A. General information

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# **B.** Bats of Greece

# 1. Summary of information about species occurring in Greece

The following tables summarize the known distribution of bats in the 13 Regions of Greece (Hanák et al., 2001<sup>1</sup>; Legakis and Maragou, 2009<sup>2</sup>). Approximate estimations of population sizes of some cave dwelling species are available only from specific areas in Eastern Macedonia – Thrace (Papadatou et al. 2009<sup>3</sup> and from Crete (Benda et al., 2001<sup>4</sup>).

	Rhinolophus blasii	Rhinolophus euryale	Rhinolophus ferrumequinum	Rhinolophus hipposideros	Rhinolophus mehelyi
Eastern Macedonia – Thrace	√/?	√/?	Widespread ✓/?	√/?	√/?
Central Macedonia	√/?	√/?	√/?	√/?	√/?
Western Macedonia	√/?	√/?	√/?	√/?	
Epiros	√/?		√/?	√/?	
Thessaly		√/?	√/?	<b>√</b> /?	
Sterea Ellada	√/?		√/?	<b>√</b> /?	
Western Greece	√/?	√/?	√/?	√/?	√/?
Attiki			√/?	√/?	√/?
Ionian Islands		√/?	√/?	√/?	
Peloponnese	√/?	√/?	√/?	√/?	
North Aegean	√/?	√/?	√/?	√/?	√/?
South Aegean	√/?	√/?	√/?	√/?	√/?
Crete <sup>4</sup>	Widespread, 16 summer roosts >400 /?		Widespread, 20 summer roosts >1000/?	Widespread, 10 summer roosts >200/?	

	Barbastella barbastellus	Eptesicus bottae	Eptesicus serotinus	Hypsugo savii	Myotis alcathoe	Myotis aurascens
Eastern Macedonia – Thrace	√/?		<b>√</b> /?	√/?	√/?	√/?
Central Macedonia	√/?		√/?	√/?	√/?	√/?
Western Macedonia	√/?		√/?	√/?		√/?
Epiros			√/?	√/?	√/?	
Thessaly			√/?	√/?	√/?	
Sterea Ellada	√/?		√/?	√/?	√/?	
Western Greece			√/?	√/?		√/?
Attiki			√/?	√/?		√/?
Ionian Islands			√/?	√/?		

Peloponnese			√/?	
North Aegean	√/?	√/?	√/?	
South Aegean	√/?	√/?	√/?	
Crete <sup>4</sup>		<b>√</b> /?	Widespread ✓/?	√/?

Explanations:
✓= occurring, but no estimate of population size
?= population trend unclear/unknown

	Myotis bechsteinii	Myotis blythii	Myotis capaccinii	Myotis daubentonii	Myotis emarginatus	Myotis myotis
Eastern Macedonia - Thrace <sup>3</sup>	√/?	Widespread ✓/?	4 known summer roosts ~ 3000	√/?	√/?	√/?
Central Macedonia	√/?	√/?	√/?	√/?	√/?	√/?
Western Macedonia	√/?	√/?	√/?	√/?	√/?	√/?
Epiros	√/?	√/?		√/?	√/?	√/?
Thessaly	√/?	√/?	√/?		√/?	√/?
Sterea Ellada	√/?	√/?			√/?	√/?
Western Greece		√/?	√/?		√/?	√/?
Attiki		√/?			√/?	√/?
Ionian Islands		√/?			√/?	√/?
Peloponnese	√/?	√/?	√/?		√/?	√/?
North Aegean		<b>√</b> /?	√/?		√/?	√/?
South Aegean		√/?			√/?	
Crete <sup>4</sup>		Widespread, 14 summer roosts >2400/?	5 summer roosts >80/?		10 summer roosts >450/?	

	Myotis mystacinus	Myotis nattereri	Nyctalus lasiopterus	Nyctalus leisleri	Nyctalus noctula
Eastern Macedonia - Thrace	√/?	√/?	√/?	Widespread ✓/?	√/?
Central Macedonia	√/?		√/?	√/?	√/?
Western Macedonia	√/?	√/?	√/?	√/?	√/?
Epiros	√/?	√/?	√/?	√/?	√/?
Thessaly	√/?	√/?	√/?	√/?	√/?
Sterea Ellada	√/?	√/?	√/?	√/?	√/?
Western Greece				√/?	
Attiki				√/?	
Ionian Islands	√/?	√/?			
Peloponnese	√/?	√/?		<b>√</b> /?	√/?
North Aegean					
South Aegean					
Crete <sup>4</sup>				Rare, only regional <b>/?</b>	

Explanations:
✓= occurring, but no estimate of population size
?= population trend unclear unknown

	Pipistrellus hanaki	Pipistrellus kuhlii	Pipistrellus nathusii	Pipistrellus pipistrellus	Pipistrellus pygmaeus	Plecotus auritus
Eastern Macedonia - Thrace		√/?	√/?	√/?	√/?	
Central Macedonia		Widespread ✓/?	√/?	√/?	√/?	
Western Macedonia		√/?	√/?	√/?	√/?	√/?
Epiros		√/?	√/?	√/?	√/?	√/?
Thessaly		√/?	√/?	√/?	√/?	√/?
Sterea Ellada		√/?		√/?	√/?	√/?
Western Greece		Widespread ✓/?	√/?	√/?	√/?	√/?
Attiki		√/?		√/?		
Ionian Islands		Widespread ✓/?				
Peloponnese		Widespread ✓/?				
North Aegean		√/?	√/?		√/?	
South Aegean		√/?			√/?	
Crete <sup>4</sup>	Widespread ✓/?	Widespread & abundant/?	Migratory /?			

	Plecotus austriacus	Plecotus kolombatovici	Plecotus macrobullaris	Vespertilio murinus	Miniopterus schreibersii	Tadarida teniotis
Eastern Macedonia - Thrace			<b>√</b> /?	√/?	Widespread ✓/?	<b>√/?</b>
Central Macedonia	√/?				√/?	√/?
Western Macedonia	√/?		√/?	<b>√/?</b>	√/?	<b>√/?</b>
Epiros		√/?	√/?	√/?	√/?	√/?
Thessaly	√/?	√/?	√/?	√/?	√/?	√/?
Sterea Ellada	√/?	√/?	√/?	√/?	√/?	√/?
Western Greece					<b>√</b> /?	√/?
Attiki					<b>√</b> /?	√/?
Ionian Islands		√/?			√/?	√/?
Peloponnese		<b>√</b> /?			<b>√</b> /?	√/?
North Aegean		√/?			√/?	√/?
South Aegean		√/?			√/?	√/?
Crete <sup>4</sup>		√/?	√/?		Widespread, 10 summer roosts >1500/?	Widespread ✓/?

#### **Explanations:**

- ✓= occurring, but no estimate of population size
- ? = population trend unclear unknown
- Hanak V., Benda P., Ruedi E., Horacek I. and Sofianidou T. 2001. Bats (Mammalia: Chiroptera) of the Eastern Mediterranean. Part 2. New records and review of distribution of bats in Greece. Acta Soc. Zool. Bohem. 65: 279-346.
- Legakis A. and Maragou P. (Editors). 2009. The Red Book of the Threatened Animals of Greece (To Kokkino Vivlio ton Apeiloumenon Zoon tis Elladas). Hellenic Zoological Society, Athens. 528 pp. (in Greek).
- Papadatou E., R.K. Butlin, R. Pradel, J.D. Altringham. 2009. Sex-specific roost movements and population dynamics of the vulnerable long-fingered bat, *Myotis capaccinii*. Biological Conservation 142, 280-289
- Benda P., Georgiakakis P., Dietz C., Hanák V., Galanaki K., Markantonatou V., Chudárková A., Hulva P. & Horáček I. 2008. Bats (Mammalia: Chiroptera) of the Eastern Mediterranean and Middle East. Part 7. The bat fauna of Crete, Greece. Acta Soc. Zool. Bohem. 72: 105–190.

# 2 General population situation and trends

# 2.1 Population trends

There's no information regarding the population trends of any species in Greece.

## 2.2 Red List

The table below provides the classification of species in the "Red Book of Endangered Animals of Greece"<sup>1</sup>, according to the IUCN criteria (ver 3.1). Assessment was based mainly on the known distribution of species.

Species	Conservation status
Rhinolophus blasii	NT
Rhinolophus euryale	NT
Rhinolophus ferrumequinum	LC
Rhinolophus hipposideros	LC
Rhinolophus mehelyi	VU
Barbastella barbastellus	EN
Eptesicus bottae	EN
Eptesicus serotinus	LC
Hypsugo savii	LC
Myotis alcathoe	DD
Myotis aurascens	DD
Myotis bechsteinii	NT
Myotis blythii	LC
Myotis capaccinii	NT
Myotis daubentonii	VU
Myotis emarginatus	NT
Myotis myotis	NT
Myotis mystacinus	DD
Myotis nattereri	NT
Nyctalus lasiopterus	VU
Nyctalus leisleri	LC
Nyctalus noctula	DD
Pipistrellus hanaki	VU
Pipistrellus kuhlii	LC
Pipistrellus nathusii	DD
Pipistrellus pipistrellus	DD
Pipistrellus pygmaeus	DD
Plecotus auritus	VU
Plecotus austriacus	DD
Plecotus kolombatovici	DD
Plecotus macrobullaris	VU
Vespertilio murinus	DD
Miniopterus schreibersii	NT
Tadarida teniotis	LC

# **Explanations:**

DD = Data deficient

EN = Endangered

LC = Least concern

NT = Near threatened

VU = Vulnerable

Legakis A. and Maragou P. (Editors). 2009. The Red Book of the Threatened Animals of Greece (To Kokkino Vivlio ton Apeiloumenon Zoon tis Elladas). Hellenic Zoological Society, Athens. 528 pp. (in Greek).

#### 3 Habitats and roosts

#### 3.1 Roosts

In general, there is a lack of knowledge with regards to the use of roosts by bats in Greece, a country particularly rich in limestone caves in particular. Specific information comes from certain areas:

- On Crete several tens of caves and mines provide shelter to bats, mainly for Rhinolophus blasii, Rhinolophus ferrumequinum, Rhinolophus hipposideros, Miniopterus schreibersii, Myotis blythii, Myotis capaccinii and Myotis emarginatus. Maternity colonies of Rhinolophus ferrumequinum and Rhinolophus hipposideros can be found also in buildings. Additionally, two small colonies of Pipistrellus kuhlii have been located in the outer walls of buildings. Fourty nine roosts house more than 10 individuals (three Hibernacula, 22 Nurseries, 22 transition roosts and 15 winter roosts with active bats). Only 3 caves (in western, central and eastern Crete) provide shelter to more than 1000 bats.
- A number of underground roosts (~ 8) were studied in the Greek part of Thrace, within and in the vicinity of the National Park of Dadia-Lefkimi-Soufli, north-eastern Greece prior to 2006. Some of them were shortly visited in 2006 and 2007. These roosts host important breeding and/or male populations mainly from *Rhinolophus ferrumequinum*, *Rhinolophus mehelyi*, *Rhinolophus blasii*, *Rhinolophus euryale*, *Miniopterus schreibersii*, *Myotis myotis*, *Myotis blythii*, *Myotis capaccinii*. They also serve as important roosts of bats in transit between their summer roosts and their hibernacula. Species in transit are mainly the same as those breeding at these sites, but in addition, important populations of *Myotis emarginatus* in transit are found in spring.
- Within the framework of a relatively recent collaboration between a Greek NGO (the Society of the Protection of Prespa, SPP), a French NGO (Groupe Mammalogique Breton, GMB) and Greek researchers/bat workers, roosts of bat species occurring in the National Park of Prespa in northwestern Greece are currently being studied.
- A few tens of bat roosts have been found in the past decades in the rest of the country. This
  information has mainly come from irregular visits from foreign researchers and cavers, but also
  within the framework of environmental studies in protected areas or areas proposed for protection
  from 2006 onwards. However, these roosts have not been systematically studied and specific
  information on their use in space and time is lacking.
- There have not been organized monitoring schemes for bat roosts in Greece so far (but see section 15.1 below). On some cases, regional, local and national authorities were called to take action against actions with negative impacts on bat populations.

## 3.2 Hunting biotopes

Only some specific information comes from certain species and areas of Greece from systematic studies:

- The foraging ecology of *Myotis capaccinii* was studied in NE Greece (Evros prefecture) with radio-tracking of lactating females<sup>1</sup>. The bats commuted primarily along valleys and foraged over rivers and lakes. Studied bats appeared to be faithful to specific locations on subsequent nights and even successive years. Bats feeding in the vicinity of the roosts were primarily juveniles. The most striking finding from this study was that lactating *M. capaccinii* were prepared to commute at least 26 km to forage, although there appeared to be suitable foraging habitat on their commuting routes, much closer than their preferred foraging sites.
- Research conducted in Crete in 2008 and 2009 revealed the foraging habitat preferences of Cretan bats, including the newly described *Pipistrellus hanaki*<sup>2</sup>. Wetlands (rivers with calm water and ponds) and oak forests support the greatest abundance and the highest number of species, while villages and shrublands appear to be the least important habitat types. Most of the activity of P. hanaki was recorded in oak forests, while forested rivers and chestnut groves are also very important for the species.
- Within the framework of the collaboration between SPP, GMB and Greek bat researchers, information is currently being collected on the use of hunting areas in the National Park of Prespa using captures and echolocation call recordings.
- Davy et al. (2007)<sup>3</sup> found important bat use for foraging of pine woodland and traditional olive groves on the island of Zakynthos in the Ionian Sea, western Greece, in contrast to other studies.

Papadatou E. 2006. Ecology and conservation of the long-fingered bat Myotis capaccinii in the National Park of Dadia-Lefkimi-Soufli, Greece. PhD thesis. Institute of Integrative and Comparative Biology, University of Leeds.

Georgiakakis P. 2009. Geographical and elevational distribution, acoustic identification and ecology of Cretan bats (Geogriafiki kai ypsometriki katanomi, akoustikos prosdiorismos kai oikologia ton chiropteron tis Kritis). PhD thesis. Biology Department, University of Crete. (in Greek with English abstracts). viii + 275 pp. (in Greek).

Davy CM, Russo D, Fenton MB. 2007. Use of native woodlands and traditional olive groves by foraging bats on a Mediterranean island: consequences for conservation. Journal of Zoology 273:397-405

#### 4 Threats

- A major threat for cave-dwelling bat species in Greece is the exploitation of caves as a tourist attraction. A characteristic example is the planned exploitation of Polyphimos Cave near Maronia village in the north-east of Greece: the cave hosts several thousand bats from at least 9 species throughout the year, including all 5 European Rhinolophus species! Although the cave has been designated as a "Natura 2000" site, no management measures exist and despite the lack of management, the local community is willing to proceed with the exploitation of the cave. In general, uncontrolled visits by tourists and visitors at caves are also an important threat for bat populations, especially given the fact that many bat species in Greece form maternity colonies inside caves. Use of caves to store waste material or by shepherds cause disturbance or damage to bat roosts.
- Fires destructing both foraging habitat and tree-roosts
- Uncontrolled use of pesticides and insecticides
- · Development of intensive agriculture
- Renovation of old houses not considering bat roosts (in particular roosts of *Rhinolophus hipposideros* in the north of Greece)
- Road construction. Although specific quantitative data are lacking, some indications have been given by particular areas where roads have been constructed near important underground roosts.
- Wind-farms: a law recently voted by the Greek state to speed up the construction of wind-farms on
  every single corner of Greece, including strictly protected areas, mountains and forests, is a major
  threat for many bat populations, given that it takes of NO consideration of bats, despite the effort of
  more than 170 NGOs that tried to change the law before being voted. No guidelines for the
  protection of bats are being considered and EIAs for wind-farms do not consider bats.
- Lack of protection of bats in practice: bats are rarely considered in EIAs and other environmental studies in general.

#### 5 Data collection

In his Doctoral thesis, P. Georgiakakis (2009)<sup>1</sup>, summarized all published knowledge on bats of the island of Crete, and new information that he collected from 2001 to 2009. In his thesis, he studied:

- 1. The distribution of species on the island with special emphasis on elevation.
- 2. Main roosts of bats
- 3. Habitat selection and winter activities of bats assessed by acoustic surveys All available information on Cretan bats has been registered in a digital database, hosted by the Natural History Museum of Crete (N.H.M.C., University of Crete).

In her Doctoral thesis, E. Papadatou (2006)<sup>2</sup>, studied the roosting and foraging ecology and population dynamics of *Myotis capaccinii*, but also collected information on all other species roosting with *M. capaccinii*, in the National Park of Dadia-Lefkimmi-Soufli, north-eastern Greece. In addition, she collected information on the distribution of other species found in the park. Results on the roosting ecology and population dynamics of *M. capaccinii* were published in scientific journals<sup>3,4</sup> and data on the distribution of all species found in the park were published in a book chapter<sup>5</sup>.

Data on roosts and foraging habitat use are currently being collected in the National Park of Prespa, north-western Greece (see section 3 above). Data are stored in a digital data base owned by the Society for the Protection of Prespa and as private data sets by researchers and bat workers participating in the project. Sparse data on roosts and habitat use have been collected from various other areas of Greece within the framework of environmental studies by Greek researchers (E. Papadatou & P. Georgiakakis) before but mainly from 2006 onwards or by foreign researchers, as mentioned above. There is currently an effort to collect all available data at least on bat species distribution throughout the territory of Greece in a common data base hosted by N.H.M.C.

Georgiakakis P. 2009. Geographical and elevational distribution, acoustic identification and ecology of Cretan bats (Geogriafiki kai ypsometriki katanomi, akoustikos prosdiorismos kai oikologia ton chiropteron tis Kritis). PhD thesis. Biology Department, University of Crete. (in Greek with English abstracts). viii + 275 pp. (in Greek).

<sup>2</sup> Papadatou E. 2006. Ecology and conservation of the long-fingered bat Myotis capaccinii in the National Park of Dadia-Lefkimi-Soufli, Greece. PhD thesis. Institute of Integrative and Comparative Biology, University of Leeds.

Papadatou, E., Butlin, R.K., Altringham, J.D., 2008. Seasonal roosting habits and population structure of the long-fingered bat Myotis capaccinii in Greece. Journal of Mammalogy 89;503–512

Papadatou E., R.K. Butlin, R. Pradel, J.D. Altringham. 2009. Sex-specific roost movements and population dynamics of the vulnerable long-fingered bat, *Myotis capaccinii*. Biological Conservation 142:280-289

Papadatou, E. 2010. Bats (Mammalia: Chiroptera): species diversity, distribution and abundance in the Dadia –Lefkimi- Soufli Forest National Park. *In:* Catsadorakis, G., Källander, H. (Eds.). The Dadia – Lefkimi – Soufli Forest National Park, Thrace, Greece: Biodiversity, Management and Conservation. WWF Greece, Athens.

# C. Measures relative to implementation of Article III of the Regional agreement

# 6 Legal measures for protection of bats, and enforcement of such measures

The bats of Greece are protected by the following laws:

- 1. Law 1650/86 (About the protection of the Environment, Article 18, par. 6 & Article 20, par. 1),
- 2. Law 2204/94 (Ratification of the Convention on Biological Diversity)
- 3. Law 1355/1983 (Ratification of the Bern Convention)
- 4. Law 2719/1999 (Ratification of the Bonn Convention) and the
- 5. Common ministerial decision 33318/3028/11-12-98 (Ratification of the Habitats Directive, 92/43/EEC).

However, the obligations set by these laws are rarely put into practice.

# 7 Protected areas of special importance with regards to bat conservation

A few protected areas (mainly caves) are nominated solely for the protection of bats, e.g. the cave Polyphimos near Maronia village has been designated as a "Natura 2000" site. However, although these sites are legally protected, no management and no real protection measures have been put into practice. Bat species are referred in the data sheets of several pSCI's but the bat fauna in most of these areas is poorly studied and many more bat species and roosts remain unexplored.

# 8 Consideration given to habitats which are important to bats.

There has not been consideration to habitats important to bats in Greece so far.

# 9 Measures to raise public awareness about bat conservation

None so far, but there are plans for the near future (from 2011).

## 10 The body pursuant to Article III.5 of the Agreement

**NOT APPLICABLE** 

# 11 Additional measures for protection of bats

NONE

# 12 Existing and planned programmes for bat conservation

There is a single planned programme for the conservation of bats in the National Park of Prespa in north-western Greece.

#### 13. Activities relative to the impacts of pesticides and wood preservatives on bats

NONE

# D. Method of function of the Agreement

#### 14 International co-operation

Greek bat-workers are in collaboration with German researchers (University of Tubingen and Berlin Museum of Natural History). The basic aim of this collaboration is to enrich the knowledge on Greek bat fauna (bat inventories). Another aim is to assess the degree of genetic isolation of Greek bat populations (including Crete) with a potential impact to conservation. The collaboration between Greek bat researchers, SPP and GMB (see section 3 above) has also risen in the last few years. The aim of this collaboration is to produce the bat inventory for the National Park of Prespa, as well as the proposition of appropriate conservation measures in the near future. Finally, informal exchange of information on bat fauna has been taking place among Greek, Bulgarian and Turkish bat researchers in the region of Thrace, north-eastern Greece.

# 15 Measures for implementation of the resolutions of the Meeting of the Parties

# 15.1 MOP 2 Resolution No. 2: Consistent monitoring methodologies

So far, there have not been organized monitoring schemes for bat populations and roosts of Greece apart from the systematic studies of roosts within the frame of the theses by P. Georgiakakis (2009) and E. Papadatou (2006) (see above). However, during this summer 2010, the first official pilot monitoring methodology will be proposed for summer bat roosts in the Prespa area, north-western Greece, within the frame of a transboundary programme involving Greece, Albania and FYROM.

### 15.2 MOP 2 Resolution No. 3: transboundary programmes, proposals relevant to species

See section 15.1 above.

#### 15.3 MOP 2 Resolution No. 4: transboundary programmes, proposals relevant to biotopes

**NOT APPLICABLE** 

# 15.4 MOP 4 Resolution No. 4.3: Guidelines for the protection and management of important underground bat habitats

NONE

15.5 MOP 4 Resolution No. 4.4: Bat conservation and sustainable forest management

NONE

# 15.6 MOP 4 Resolution No. 4.6: Guidelines for the issue of permits for the capture and study of captured wild bats

According to the Greek legislation (Law 1650/86, About the protection of the Environment), for catching and possessing wild animals a permit from the Ministry of the Environment, Energy and Climate change (Directorate of Aesthetic Forests, Parks and Gaming) is required. No recent changes have been made regarding this topic.

# 15.7 MOP 4 Resolution No. 4.7: Wind turbines and bat populations

No guidelines for the study and the consideration of the impacts of wind turbines on bat populations as well as the protection of bats are being applied in Greece. EIAs do not consider bats. However, a recent monitoring scheme applied in north-eastern Greece studying the impact of wind turbines on birds has revealed major impacts on certain bat species. In total, 79 dead bats were found between August and November 2009, mainly belonging to *Nyctalus leisleri*, *Hypsugo savii*, *Pipistrellus pipistrellus* and *Pipistrellus nathusii*; other species found were *Nyctalus noctula*, *Myotis mystacinus*, *Vespertilio murinus* and *Pipistrellus pygmaeus*. Another 33 bats were collected between April and mid June 2010, but the species have not yet been identified. Monitoring will continue until August 2010. The results from this study will be used to put pressure on the Greek government to start considering the impacts of wind farms on bat populations in Greece.

15.8 MOP 4 Resolution 4.12: Priority species for autecological studies