



**An Introduction To
The Bats of
Cyprus**

**1st Edition
December 2006**

Authors: Neil E Middleton & Haris Nicolaou

Contents

Description	Page
Contact Details	2
Introduction	3
Conservation Challenges	4
An Overview Of The Species Present	6
Species Descriptions	7
A Simple Identification Key	23
Acknowledgements	24
Further Reading	25

Front Cover Picture: *Rousettus aegyptiacus* (Egyptian fruit bat) © Haris Nicolaou, 2006

Unless otherwise shown, all pictures within this booklet are © Haris Nicolaou, 2006

This booklet has been published by ECHOES Ecology Ltd and is currently available free of charge as a download from www.echoesecology.co.uk

Copyright © Echoes Ecology Ltd, 2006

Contact Details

This booklet will be updated as new information comes to light. We welcome any thoughts or records that will allow us to reflect a more accurate picture.

Any queries relating to this publication or the details within should in the first instance be sent by email to:

Neil Middleton

Echoes Ecology Ltd
25 Killin Drive
Polmont
Scotland
UK
FK2 0QQ

Email: neil.middleton@echoesecology.co.uk

Website: www.echoesecology.co.uk

Any details regarding bat records or issues relating to bats within Cyprus should in the first instance be referred to:

Haris Nicolaou BSc (Hons)

Cyprus Forestry Department
Parks & Environment Sector
Ministry of Agriculture, Natural Resources and Environment
Louki Akrita, 1414
Nicosia
Cyprus

Tel (Office): 00357 22805532

Fax (Office): 00357 22805508

Email: nicolaouharis@cytanet.com.cy

Website: www.moa.gov.cy/forest

Introduction

Inspired by the reaction of delegates to the first 'Bats In Cyprus' seminar (Nicosia, November 2006) this booklet is designed to introduce, to those interested in studying or learning about bats in Cyprus, all of the bat species we currently believe to be present. In addition we seek to give a brief overview of the conservation challenges faced by bat species on the island.

With at least 14 species, the island of Cyprus is an excellent place to find and study bats. Numerous habitats exist enabling the island to support this rich diversity of these fascinating flying mammals of the night. However one of the things that makes Cyprus so special is that it is the only member country of the European Union which has Egyptian fruit bats (*Rousettus aegyptiacus*). These bats are themselves unique, in that they are members of the only fruit bat genus which echolocate, something they need to do in order to find their way around the dark caves in which they roost during daylight.

At this stage there is still much to learn about bats in general and Cyprus bats in particular. As such we do not intend for this booklet to be a definitive field guide, but more of an appetiser to encourage potential bat workers living on, or visiting, the island to find out more about Cyprus bats. In doing so we would ask that you pass any records on to the Cyprus Forestry Department (see 'Contact Details' section). This will help us to gain a far more detailed picture of the status of the islands natural heritage and protect important roosting locations and habitat.

Conservation Challenges

In many cultures bats have numerous myths and misunderstandings pertaining to their behaviours (see Table 1). This results in their persecution and the destruction of their roosting locations. Much of the knowledge which exists within the mainstream of our society is indeed falsely based. Bats have many attributes and perform roles which are important to the maintenance of a healthy environment and in addition, make our own lives more bearable.

Table 1: Some myths about insect eating bats in Europe

Myth	Truth
Bats are blind	Bats are able to see perfectly well and in addition they can find their way through the darkness using their own sophisticated sonar system we call echolocation
Bats get caught in peoples hair	This is extremely unlikely to happen. If a bat is flying close to your head it is likely that it is helping you by eating insects that are swarming around you
Bats make nests	Bats do not build nests or create holes etc. They purely use what is already there
Vampire bats occur in Europe	Only 3 species of blood sucking vampire bats exist worldwide. They all occur in South America and are more likely to take blood from livestock or poultry than humans
Bats are evil	Bats are sophisticated mammals that operate during darkness, eating insects (e.g. mosquitoes). In many parts of the world (e.g. China) bats are seen as being symbols of good luck and fortune

Table 2 shows the main conservation challenges facing bats in Cyprus.

Table 2: Conservation challenges faced by bats in Cyprus

Threat	Reason
Loss of habitat	Land development
Loss of insect food	Use of pesticides and insecticides
Loss of roosts	Disturbance & destruction by people
Hunting & Persecution	In the main relating to fruit bats being illegally and unnecessarily slaughtered by local communities

We are often asked what benefits bats bring to our environment. Like most things within the natural world, bats have an extremely important role to play and they contribute greatly to a healthy, naturally balanced environment as described below in Table 3.

Table 3: The benefits that bats bring to our environment

Fruit eating bats (Cyprus: 1 species)	Pollination of tree/plant species as they travel between feeding areas
	Regeneration of new tree/plant stock through dispersal of seeds through their droppings
	Control of insect pests, such as Mediterranean Fruit Fly, as a result of eating the over-ripe fruit in which the larvae of these pests are present and the adult insects feed
	Tend to concentrate their efforts on over-ripe fruit which would fall to the ground and rot, thus reducing waste and excessive build up of pest insects and fungi in rotting fruit
Insect eating bats (Cyprus: 13 species)	One pipistrelle bat can eat up to 3,000 insects in a single evening. A colony of 200 can eat almost 110 million insects in a single year.
	A natural controller of insect populations without the need or expense of chemicals that cause damage to the environment
	Control of insect numbers without the labour costs associated with controlling these by man-made methods

Legal Protection

All bat species in Cyprus are legally protected at all times. It is an offence to, amongst other things, intentionally, deliberately or recklessly kill, injure, capture or take a bat. In addition it is also an offence to damage, destroy or obstruct access to any structure or place that a bat uses for shelter or protection (i.e. all bat roosts are protected at all times regardless of whether bats are present or not).

An Overview Of The Species Present

There are over 1000 species of bat worldwide, representing well in excess of 20% of all known mammals. Bats are the only mammals capable of active flight and belong to the order Chiroptera. Table 4 (below) shows the species we believe are present in Cyprus.

Table 4: Bat species present on Cyprus

Sub-order	Family	Genus	Species		
Mega-Chiroptera	<i>Pteropodidae</i> (Old World fruit bats)	<i>Rousettus</i>	<i>R. aegyptiacus</i> (Egyptian fruit bat)		
Micro-Chiroptera	<i>Rhinolophidae</i> (Horseshoe bats)	<i>Rhinolophus</i>	<i>R. hipposideros</i> (Lesser horseshoe)		
			<i>R. ferrumequinum</i> (Greater horseshoe)		
			<i>R. blasii</i> (Blasius's horseshoe)		
			* <i>R. mehelyi</i> (Mehely's horseshoe)		
			<i>R. euryale</i> (Mediterranean horseshoe)		
	<i>Vespertilionidae</i> (Vesper bats)	<i>Myotis</i>		<i>M. capaccinii</i> (Long-fingered bat)	
				<i>M. nattereri</i> (Natterer's bat)	
				* <i>M. myotis</i> (Greater mouse-eared bat)	
				<i>M. blythi</i> (Lesser mouse-eared bat)	
			<i>Nyctalus</i>		<i>N. noctula</i> (Noctule)
			<i>Eptesicus</i>		<i>E. serotinus</i> (Serotine)
		<i>Pipistrellus</i>			<i>P. kuhli</i> (Kuhl's pipistrelle)
					<i>P. savii</i> (Savi's pipistrelle)
					* <i>P. pipistrellus</i> (Common pipistrelle)
			<i>Plecotus</i>		<i>P. austriacus</i> (Grey long-eared bat)
			<i>Miniopterus</i>		<i>M. schreibersi</i> (Schreiber's bat)
			<i>Molossidae</i> (Free-tailed bats)	<i>Tadarida</i>	* <i>T. teniotis</i> (European free-tailed bat)
* Shaded Boxes: Status unclear as no recently confirmed records exist					

Species Descriptions

This section aims to provide an overview of each of the species we believe to be present on Cyprus based on recent observations and data. The template we have used for each species is self explanatory and as far as possible we have included pictures.

All behaviours and measurements provided are typical for the species concerned, but the reader should be aware that differences to typical can occur. These descriptions are designed to give the reader a good overview of the species in question, as opposed to being a thorough account. For considerably more detail on any particular species or aspect of bat behaviour we would refer you to the 'Further Reading' section at the end of this booklet.

It is also worth stressing that bat echolocation is a complex subject, often relating almost as much to where a bat is and what it is doing, than what it is. As such please treat the echolocation descriptions as being approximately typical for the particular species described, present in its typical habitat and typical distance from clutter.

The following species have not been included within our species descriptions until such time as we are able to verify their status on the island. However these bats may be mentioned within the context of the text, for example, where confusion may occur with other species that are known to live in Cyprus:

Myotis myotis

Pipistrellus pipistrellus

Rhinolophus mehelyi

If anyone is aware of any confirmed records for these species or any others that we may have missed we would more than welcome hearing about these for inclusion in future editions.

***Rousettus aegyptiacus* (Egyptian fruit bat)**

General Overview

This bat is the largest species present in Europe and the only Old World fruit bat that occurs within the EU. It travels long distances from its roosts to forage on fruit. It is easily identified due to its size, shape of head, large eyes and behaviour.

Identification Features

Dorsal colour: Dark brownish grey
Ventral colour: Paler shade of dorsal colour
Forearm: 83 - 106mm
Wingspan: Up to 610mm
Weight: 100 - 170g
Tragus: Absent

Foraging habitat: Fruit trees and plantations

Roosts: Caves

Emergence from roost: After sunset

Feeding strategy: Feeds upon fruit bearing trees and plants

Flight: Slow and birdlike

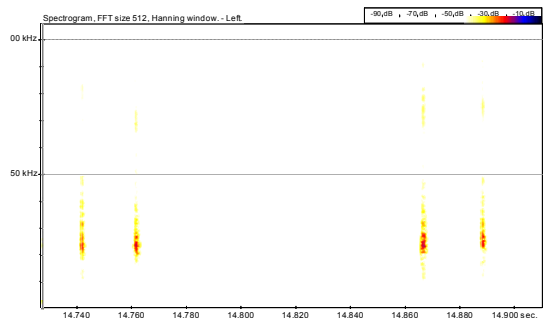


Echolocation

A member of the only genus of Old World fruit bats that echolocate

Call structure:
Frequency modulated, sweeping from c.60 - c.10kHz

Call duration: 2 - 5ms



***Rhinolophus hipposideros* (Lesser horseshoe)**

General Overview

The smallest of the horseshoe species present in Europe. Unmistakeable, due to its size and rounded upper connecting process of noseleaf.

Identification Features

Hair base: Light grey
Dorsal colour: Brownish
Ventral colour: Light grey
Forearm: 34 - 42mm
Wingspan: 200 - 254mm
Weight: 5.5 - 9.0g
Tragus: Absent

Foraging habitat: Open woodland, parkland, gardens. Areas of limestone

Roosts: Caves, tunnels, buildings (summer) and other man-made structures

Emergence from roost: Sunset +30min

Feeding strategy: Gleaner, hawkler, ground feeder

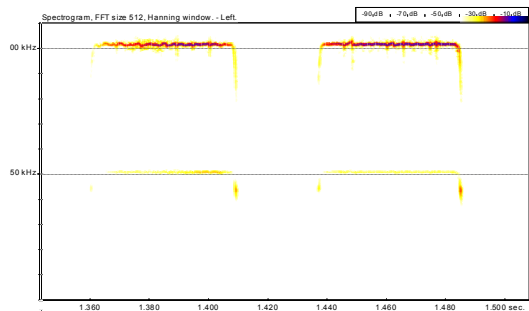
Flight: Fast and agile



Echolocation

Call structure: Constant frequency component of call at 105 - 112kHz

Call duration: 25 - 40ms



***Rhinolophus ferrumequinum* (Greater horseshoe)**

General Overview

The largest of the horseshoe species present in Europe. Unmistakeable in the area due to its size and blunt upper connecting process of noseleaf.

Identification Features

Hair base: Dark grey

Dorsal colour: Smokey grey, tinged red

Ventral colour: Grey white/yellow white

Forearm: 54 - 61mm

Wingspan: 350 - 400mm

Weight: 17 - 34g

Tragus: Absent

Foraging habitat: Sheltered woodland, parkland, scrubland and pastureland. Often near water. Areas of limestone

Roosts: Caves, tunnels, buildings and other man-made structures

Emergence from roost: Sunset +30min

Feeding strategy: Perched feeder, hawkler, ground feeder, gleaner

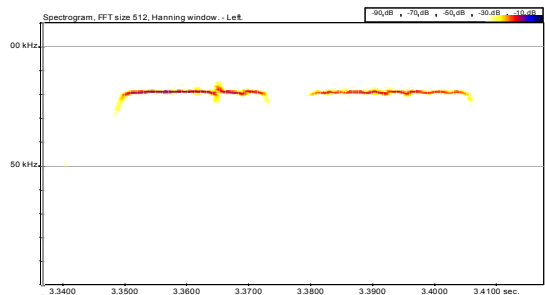
Flight: Butterflylike, periodic short glides



Echolocation

Call structure: Constant frequency component of call at 79 - 83kHz

Call duration: 30 - 60ms



***Rhinolophus blasii* (Blasius's horseshoe)**

General Overview

A medium sized horseshoe bat. Upper connecting process of noseleaf is straight and longer than the lower connecting process. Identification assisted when comparison between the length of 1st and 2nd phalanges of the fourth finger is made.

Identification Features

Hair base: Nearly white

Dorsal colour: Grey brown with a pinkish tinge

Ventral colour: Nearly white with a yellow tinge

Forearm: 45 - 48mm

1st Phalanx, 4th Finger: 7.6 - 9.2mm

2nd Phalanx, 4th Finger: 14 - 17mm (equal or less than double the length of 1st phalanx)

Wingspan: c.280mm

Weight: 12 - 15g

Tragus: Absent

Foraging habitat: Open woodland and shrubland. Areas of limestone

Roosts: Caves

Emergence from roost: After sunset

Feeding strategy: Hawker, perch feeder, probably also gleans

Flight: Slow fluttering and agile

Echolocation

Call structure: Constant frequency component of call at 93 - 98kHz

Call duration: 40 - 50ms

***Rhinolophus euryale* (Mediterranean horseshoe)**

General Overview

A medium sized horseshoe bat. Upper connecting process of noseleaf is pointed and curves downward slightly (longer than lower connecting process). Identification assisted when comparison of the length of 1st and 2nd phalanges of the fourth finger is made.

Identification Features

Hair base: Light grey

Dorsal colour: Grey brown with a pinkish tinge

Ventral colour: Nearly white with a yellow tinge

Forearm: 43 - 51mm

1st Phalanx, 4th Finger: 6.6 - 8.5mm

2nd Phalanx, 4th Finger: 16.4 - 19.1mm (more than double the length of 1st phalanx)

Wingspan: 300 - 320mm

Weight: 9 - 15g

Tragus: Absent

Foraging habitat: Open woodland and shrubland. Areas of limestone

Roosts: Caves

Emergence from roost: Sunset +30mins

Feeding strategy: Hawker, perch feeder, probably also gleans

Flight: Slow fluttering and agile

Echolocation

Call structure: Constant frequency component of call at 102 - 107kHz

Call duration: 20 - 30ms

***Myotis capaccinii* (Long-fingered bat)**

General Overview

This is a medium sized bat, with large bristled feet and a tail membrane partially covered with dark, downy hair. Nostrils are protruding more than other similar species. It tends to be found in woodland and scrub areas near water.

Identification Features

Hair base: Dark grey

Dorsal colour: Light smokey grey, with tinge of yellow

Ventral colour: Light grey

Forearm: 38 - 44mm

Wingspan: 230 - 260mm

Weight: 6 - 15g

Tragus: Pointed, $\frac{1}{2}$ length of ear

Calcar: Straight, extending to $\frac{1}{3}$ length of tail membrane

Foraging habitat: Woodland and riparian. Areas of limestone

Roosts: Caves

Emergence from roost: Sunset +40mins

Feeding strategy: Hawker, Skimmer

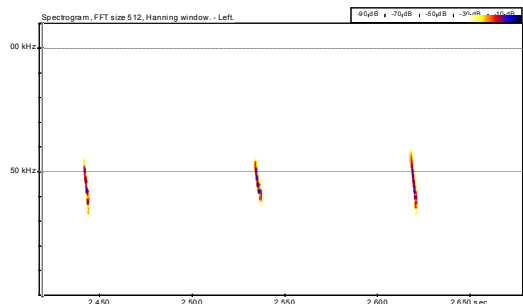
Flight: Low and two dimensional, often over water

Echolocation

Call structure: Frequency modulated call sweeping from 70 - 25kHz

Frequency of max energy: 40 - 45kHz

Call duration: 4 - 5ms



***Myotis nattereri* (Natterer's bat)**

General Overview

Medium sized, with relatively long ears and a long lancet shaped tragus. Tail membrane is lined with stiff bristles. It is often found in woodland areas with associated wetland habitat.

Identification Features

Hair base: Dark grey

Dorsal colour: Grey, tinged brown

Ventral colour: Light whitish grey

Forearm: 36 - 44mm

Wingspan: 245 - 280mm

Weight: 5 - 12g

Tragus: Long, lancet, $> \frac{1}{2}$ length of ear

Calcar: S shape, $\frac{1}{2}$ length of tail membrane

Foraging habitat: Woodland, parkland, riparian

Roosts: Buildings, trees and other man-made structures. Caves and tunnels (winter)

Emergence from roost: Sunset +60mins

Feeding strategy: Hawker, Gleaner

Flight: Low and manoeuvrable

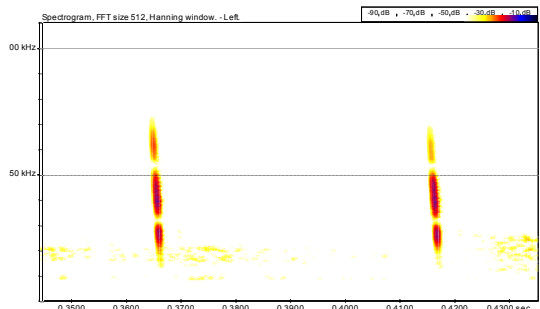


Echolocation

Call structure: Frequency modulated sweeping from 80- 20kHz

Frequency of max energy: 45 - 50kHz

Call duration: 2 - 4ms



***Myotis blythi* (Lesser mouse-eared bat)**

General Overview

This bat is very similar, but smaller, than *Myotis myotis* (Greater mouse-eared) which may also occur in Cyprus. Batworkers on the island should bear this in mind if examining what would appear to be a large specimen of *Myotis blythi*.

Identification Features

Hair base: Dark grey

Dorsal colour: Grey with a brown tinge

Ventral colour: Greyish white

Forearm: 52 - 61mm

Wingspan: 380 - 400mm

Weight: 15 - 28g

Tragus: Lancet shaped reaching almost $\frac{1}{2}$ length of ear

Calcar: Almost $\frac{1}{2}$ length of tail membrane

Foraging habitat: Fairly open woodland, parkland, urban. Areas of limestone

Roosts: Warm caves, attics (summer) and tunnels

Emergence from roost: Sunset +60mins

Feeding strategy: Hawker, Ground Feeder

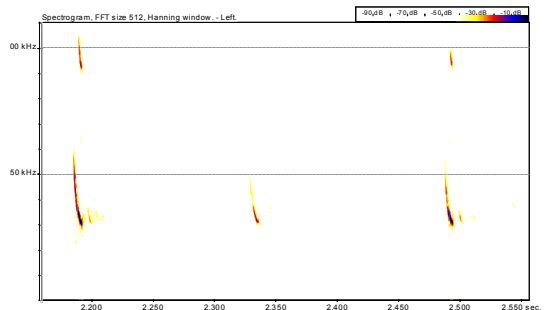
Flight: Slow and regular

Echolocation

Call structure: Frequency modulated sweeping from 40 - 25kHz

Frequency max energy:
31kHz

Call duration: 5 - 9ms



***Nyctalus noctula* (Noctule)**

General Overview

This is a large bat often seen hunting at or before sunset high above ground level (up to 70m). It is found feeding above woodland, parkland and wetlands.

Identification Features

Dorsal colour: Reddish brown
Ventral colour: Dull brown
Forearm: 48 - 58mm
Wingspan: 320 - 420mm
Weight: 19 - 40g
Tragus: Mushroom shaped
Calcar: Almost $\frac{1}{2}$ length of tail membrane with post-calcarial lobe

Foraging habitat: Woodland, parks and riparian

Roosts: Trees and buildings. Sometimes caves/tunnels (winter)

Emergence from roost: Sunset

Feeding strategy: Hawker

Flight: Fast, high and straight, with swoops as it descends upon prey

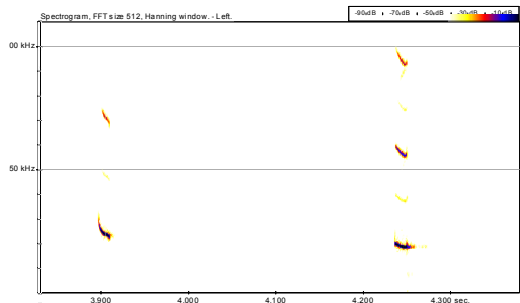


Echolocation

Call structure: Shallow frequency modulated with tail -
25 - 18kHz (open habitat)
35 - 25kHz (edge habitat)

Frequency max energy:
18 - 25kHz

Call duration: 25ms (open habitat) / 6ms (edge habitat)



***Eptesicus serotinus* (Serotine)**

General Overview

This is a large bat generally associated with roosting in buildings. It is usually quite easily identified due to its size, tragus shape and dark facial features.

Identification Features

Hair base: Dark brown

Dorsal colour: Light brown

Ventral colour: Lighter shade of dorsal

Face & ears: very dark

Forearm: 48 - 55mm

Wingspan: 320 - 380mm

Weight: 15 - 35g

Tragus: Fingerlike up to $\frac{1}{3}$ length of ear

Calcar: Up to $\frac{1}{2}$ length of tail membrane with post-calcarial lobe

Tail Tip: 4 - 7mm free from membrane

Foraging habitat: Pasture, open woodland edge, parkland, sub-urban

Roosts: Buildings

Emergence from roost: Sunset +15mins

Feeding strategy: Hawker

Flight: Manoeuvrable, slow flapping with steep dives

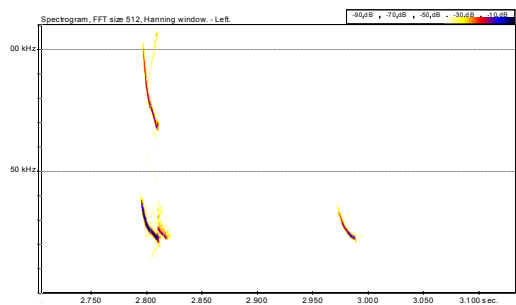


Echolocation

Call structure: Frequency modulated ending with a tail, sweeping from 50 - 23kHz

Frequency max energy:
25 - 30kHz

Call duration: 13 - 20ms



***Pipistrellus kuhli* (Kuhl's pipistrelle)**

General Overview

The areas most regularly occurring bat and often encountered in towns and villages. It is the bat that we are most likely to encounter on the island.

Identification Features

Hair base: Dark brown

Dorsal colour: Brown/yellow brown

Ventral colour: Light grey

Face & ears: Dark to blackish brown

Forearm: 31 - 37mm

Wingspan: 210 - 230mm

Weight: 5 - 10g

Tragus: Short and rounded

Calcar: Short with post-calcarial lobe

Wing Membrane: A white stripe usually occurring along edge of wing membrane between 5th finger and foot

Foraging habitat: Semi-urban, parkland, woodland edge, near or above water

Roosts: Buildings, man-made structures

Emergence from roost: Sunset +40mins

Feeding strategy: Hawker

Flight: Fast, agile, unpredictable

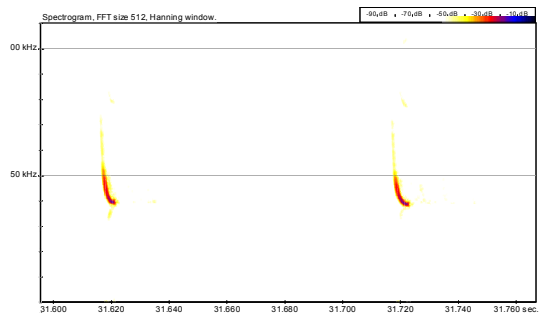


Echolocation

Call structure: Frequency modulated ending with a tail, typically sweeping from 70 - 39kHz

Frequency max energy:
35 - 42kHz

Call duration: 4 - 8ms



***Pipistrellus savii* (Savi's pipistrelle)**

General Overview

A small bat with relatively long fur, often found in mountain valleys and alpine areas. However also associated with coastline habitat on islands. Its ears appear broader and more rounded when compared to other *Pipistrellus* spp.

Identification Features

Hair base: Dark brown, almost black
Dorsal colour: Yellow brown/dark brown
Ventral colour: Yellow white/grey white
Face & ears: Dark brown/black
Forearm: 30 - 37mm
Wingspan: 220 - 230mm
Weight: 5 - 10g
Tragus: Short and broad
Calcar: Short with post calcarial lobe
Tail Tip: 3 - 5mm free from membrane

Foraging habitat: Mountain valleys and alpine pastures. Also associated with coastline. More often seen feeding higher above ground level than other *Pipistrellus* spp

Roosts: Crevices, cliffs, caves, buildings and other man-made structures

Emergence from roost: Sunset +20mins

Feeding strategy: Hawker

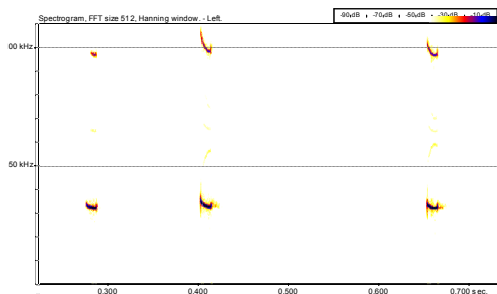
Flight: Compared to other *Pipistrellus* spp. more direct and not as fast

Echolocation

Call structure: Shallow frequency modulated call, with a long, almost constant frequency tail. Typically sweeping from 55 - 33kHz

Frequency max energy:
33-36kHz

Call duration: 5 - 14ms



***Plecotus austriacus* (Grey long-eared bat)**

General Overview

A medium sized bat and the only one known to be present in the area with long ears. Generally found in semi-urban habitat, open woodland and sheltered valleys.

Identification

Hair base: Dark grey/black
Dorsal colour: Brownish grey
Ventral colour: Light grey
Forearm: 37 - 44mm
Wingspan: 255 - 300mm
Weight: 7 - 13g
Tragus: >5.5 wide
Calcar: c.½ length of tail membrane

Foraging habitat: Parkland, open woodland, sheltered valleys

Roosts: Buildings, man-made structures (summer), caves/tunnels (winter)

Emergence from roost:
Sunset +50mins

Feeding strategy: Hawker, gleaner

Flight: Will hover whilst gleaning

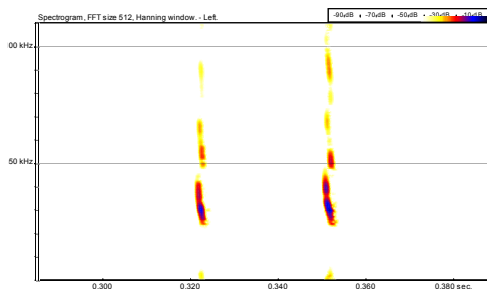


Echolocation

Call structure: A very weak frequency modulated call typically sweeping from 60 - 35kHz. A lower frequency call may be used in more open habitat

Frequency max energy:
40kHz

Call duration: 2 - 6ms



Miniopterus schreibersi (Schreiber's bat)

General Overview

A medium sized species, with a short muzzle and a distinctively humped forehead. Hair on head is short and upright, and ears are triangular in shape. Can form extremely large roosts.

Identification Features

Dorsal colour: Grey brown
Ventral colour: Lighter than dorsal
Forearm: 45 - 48mm
Wingspan: 305 - 340mm
Weight: 9 - 16g
Tragus: Short and rounded
Calcar: $\frac{1}{3}$ to $\frac{1}{2}$ length of tail membrane

Foraging habitat: Mountain valleys, meadows and pasture

Roosts: Caves and tunnels

Emergence from roost: Early after sunset

Feeding strategy: Hawker

Flight: Fast and swallow-like

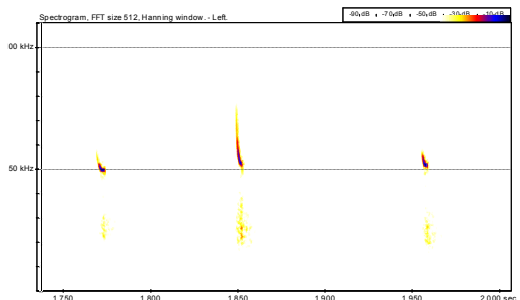


Echolocation

Call structure: Frequency modulated ending with a tail. Sweeping from 70 - 50kHz

Frequency max energy: 51kHz

Call duration: 5 - 8ms



***Tadarida teniotis* (European free-tailed bat)**

General Overview

A large bat, which is unmistakable in Europe. Its status on Cyprus is still unclear. Ears protrude forward over eyes and face. Has a tail that extends freely between $\frac{1}{3}$ and $\frac{1}{2}$ beyond its tail membrane.

Identification Features

Dorsal colour: Blackish grey

Ventral colour: Lighter than back

Face & ears: Blackish grey

Forearm: 57 - 64mm

Wingspan: Up to 410mm

Weight: 25 - 50g

Tail Tip: >14mm, extending well beyond tail membrane

Foraging habitat: Mountain passes, river valleys, coastal, above towns and villages

Roosts: Cliffs, mountains, gorges, high man-made structures

Emergence from roost: Late after sunset

Feeding strategy: Hawker

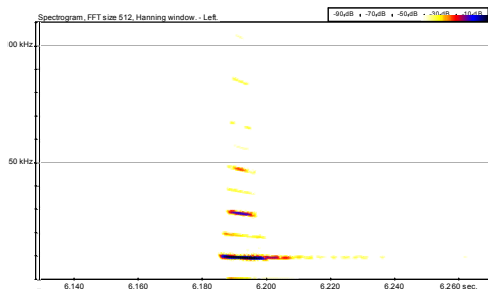
Flight: High, fast and purposeful in open air space

Echolocation

Call structure: Near constant frequency tail occurring between 15 - 11kHz. This bats echolocation calls can be far carrying and audible to humans

Frequency max energy:
11 - 13kHz

Call duration: 10 - 14 ms



A Simple Identification Key

Forearm (mm)	Tragus or Noseleaf	PCL	Other Key Features	Species
83 - 106	Neither	No		<i>R. aegyptiacus</i>
57 - 64	Neither	No	Ear shape 14mm+ free tail	<i>T. teniotis</i>
54 - 61	Short/blunt UCP Noseleaf	No		<i>R. ferrumequinum</i>
52 - 61	Lancet shaped Tragus	No		<i>M. blythi</i> *
48 - 58	Mushroom shaped Tragus	Yes	Very short free tip to tail	<i>N. noctula</i>
48 - 55	Finger shaped Tragus	Yes	Free tail of 4 - 7mm	<i>E. serotinus</i>
45 - 48	Short blunt Tragus	No	Shape of head P2 of F3, 3Xs P1	<i>M. schreibersi</i>
45 - 48	Pointed UCP Noseleaf	No	P2, F4 is = or less than double length of P1,F4	<i>R. blasii</i> **
43 - 51	Pointed UCP Noseleaf	No	P2, F4 is > than double length of P1,F4	<i>R. euryale</i> **
38 - 44	Pointed Tragus ½ length of ear	No	Straight Calcar < ½ length of tail membrane which is partially covered with hair	<i>M. capaccinii</i>
37 - 44	Pointed Tragus >5.5mm wide	No	Very long ears joined at base	<i>P. austriacus</i>
36 - 44	Lancet shaped Tragus >½ length of ear	No	S-shaped Calcar > ½ length of tail membrane	<i>M. nattereri</i>
34 - 42	Short/blunt UCP Noseleaf	No		<i>R. hipposideros</i>
31 - 37	Short blunt Tragus	Yes	White trailing edge to wing membrane Dentition 1 st UI with single point. 2 nd UI very small – not obvious	<i>P. kuhli</i> ***
30 - 37	Short blunt Tragus	Yes	Dentition 1 st UI with 2 points. 2 nd UI obvious Free tail tip 3 -5mm	<i>P. savii</i> ***

Key:

* If forearm > 55mm consider *M. myotis*

** If forearm > 48mm consider *R. mehelyi*

*** If unable to confirm ID consider *P. pipistrellus*

F - Finger

P - Phalanx

PCL - Post calcarial lobe

UCP - Upper connecting process

UI - upper incisor

Acknowledgements

We would like to take this opportunity to acknowledge the help and support of the following people in producing this booklet:

Kyriakos Kyriacou (ARC/Kivotos, Animal Responsibility Cyprus)

Patricia Radnor (ARC/Kivotos, Animal Responsibility Cyprus)

All sonograms produced using Batsound V3.0, Pettersson Elektronik AB, Sweden.

Further Reading

Barataud, M. (1996). The World Of Bats (including 'The Inaudible World' CD). Sittelle, France.

Boye, P., Pott-Dorfer, B., Dorfer, K. & Demetropoulos, A. (1990). New records of bats (Chiroptera) from Cyprus and notes on their biology. *Myotis*, Vol 28, pp93-100.

Dietz, C. & von Helvesen, O. (2004). Illustrated Identification Key To The Bats of Europe. Tuebingen & Erlangen, Germany.

Dietz, C. (2005). Illustrated Identification Key To The Bats of Egypt. Tuebingen & Erlangen, Germany.

Hadjisterkotis, E. (2006). The destruction and conservation of the Egyptian Fruit bat *Rousettus aegyptiacus* in Cyprus: a historic review. *Eur J Wildl Res*, DOI 10.1007/s10344-006-0041-7

Makin, D. & Mendelssohn, H. (1985). Insectivorous Bats Victims of Israeli Campaign. *Bat Conservation International, Bats Vol 2, No4:1-4*

Richarz, K. & Limbrunner, A. (1993). The World of Bats. T.F.H. Publications. ISBN 0-86622-540-4

Schober, W. & Grimmberger, E. (1997). The Bats of Europe & North America. T.F.H Publications. ISBN 0-7938-0490-6

Tupinier, Y. (1996). European Bats: Their World of Sound. Sittelle, France.

Tuttle, M. D. (1984). Fruit Bats Exonerated. *Bat Conservation International, Bats Vol 1, No2:1*