

Bat Conservation Trust

# Bat News

Issue 108 Autumn/Winter 2015

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## Bats from the Land of Lemurs

Madagascar's bat diversity

## Bats in the Urban Jungle

A closer look at city bats

## Natural Insecticides

Bats as pest-controllers

## Welcome – From Julia Hanmer, Joint Chief Executive

It was good to see many of you at our National Bat Conference in September. I was impressed once again with the great mix of talks, particularly all the cutting edge science and technology improving our understanding of bats. In the plenary sessions, Kate Jones introduced us to the power of citizen science and some really cool wildlife monitoring apps; and in the second plenary Gareth Jones gave an overview of 30 years of bat conservation by the Bristol BatLab in 30 minutes, including an impressive roll call of the 39 BatLab PhD students. It's amazing how our knowledge of bats has increased thanks to new techniques such as DNA analysis. In the 1990s we knew of 925 bat species but now there are over 1,300 species described. We also heard about some exciting new discoveries. Erik Korsten and Eric Jansen tracked down common pipistrelles swarming in large numbers and then hibernating in large concrete urban buildings in the Netherlands. And some encouraging news – I was pleased to hear from Claire Wordley that wildlife friendly coffee makes a difference for bats – shaded coffee plantations are almost as good as natural forests for bats in India. Good to see new researchers making the most of the latest techniques including Alison Fairbrass at UCL who is investigating whether green roofs and buildings work for biodiversity by monitoring the urban soundscape. Next year's conference will take place from the 2nd to 4th of September at the University of York; do make a note of these dates in your diary.

In this issue of *Bat News* you can learn more about the bats of Madagascar from Paul Racey (page 6), as well as urban pipistrelles from Paul Lintott (page 8). Many congratulations to Paul Lintott for winning the 2015 Vincent Weir Award for

his thesis and published work on how bats respond to urbanisation. Paul's findings on how common and soprano pipistrelles are affected by urbanisation will help inform urban landscape management and the need to maintain pockets of "bat friendly" habitats in our cities. Huge congratulations as well to Arthur Rivett for winning the Pete Guest Award for his inspiring 30 years of dedicated volunteering for bat conservation. Arthur helped set up Suffolk Bat Group, was it's first Chairman and is still actively involved in everything from bat detector and hibernation surveys to advice for landowners on managing their trees and woodlands for bats.

Jan Collins gives an update on the new and highly anticipated 3rd edition of the *Bat Survey Guidelines* (page 13). This will bring together the latest best practice principles and techniques for carrying out bat surveys. The OnePoll survey (page 10) provides an insight into the state of knowledge about bats in society at large. We obviously still have a lot of work to do in engaging and educating even more people into the wonder of bats.

*Julia Hanmer*

**Julia Hanmer**  
Joint Chief Executive



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# C

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Bat Conservation Trust

National Bat Conference



2-4 September 2016, University of York

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Bookings will open for the conference on 4th January 2016.

[www.bats.org.uk/conference](http://www.bats.org.uk/conference)



Daniel Hargreaves holding the Nathusius' pipistrelle that travelled an estimated 1,458km. This bat was ringed in Latvia on the 20th of August 2015 and re-caught at Rye Harbour (East Sussex) on the 10th of October as part of the National Nathusius' pipistrelle project. A truly astonishing journey in just 50 days for a tiny bat which is no bigger than your thumb.

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Bat Conservation Trust



### Our Supporters

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# Spotlight on Bat Groups

Engaging members of the public is an important aspect to the work of most bat groups. In this edition of Bat News we look at just a few examples of the different ways bat groups go about winning people over to bats and their conservation.

## Good PR for Bats is Also Good for Bat Groups

*David Worley, of Gloucestershire Bat Group, writes in recognition of the wonderful community work carried out by members of the Group.*

As Secretary of the Gloucestershire Bat Group, I am receiving an increasing number of requests from members of the public which seem to fall outside the remit of our traditional 'Walks and Talks' programme or the Voluntary Bat Roost Visitor (VBRV) scheme. These include appeals from people who have bats they would like to know more about, households who want to 'road test' a bat detector before buying one and enthusiastic youngsters who would love to have a visit from a real bat person. A quick email from our 'Walks and Talks' Officer to the membership invariably secures a willing volunteer who is then given the necessary contact details and the task of arranging a visit.

One of our members visited a family whose cat was bringing home 'bats with rings on' after a night on the tiles. It turned out to be a night in the quarries and one of the bats was indeed a ringed greater horseshoe. The issue was resolved by advising the owners to keep their cat in at night. Since then our volunteer has gained permission to monitor the quarries and now, three years on, has recorded 11 lesser horseshoes and a greater horseshoe bat hibernating there.



Whiskered bats are just one of the species members of Gloucestershire Bat Group have given advice about.

Recently, a lady reported that she had found a dead bat on her doorstep and asked if we could identify it. She added that due to the smell she had put it in her fridge (we hoped in a suitable container!). In this instance our volunteer identified the specimen as a whiskered bat. He then lent the lady his bat detector for a week so that she could listen to the bats in her garden. The result was great PR for bats and a generous donation to the Bat Group.

Increasingly, we are being asked about which bat box to buy and where to place them. Whilst not offering a formal 'advice' service we do have knowledgeable members who are willing to visit people to discuss their needs and offer an informed view.

Sometimes the request comes from an organisation; perhaps a youth group wanting to develop a small plot of wasteland into a wildlife habitat or a community group trying to establish their 'Biodiversity' credentials by recording the bats on their allotments or open spaces.

While careful to avoid contentious issues or planning matters, there are still many opportunities for bat groups to develop closer links with their local community. Interestingly, as our

members carry the conservation message into the community I sense a growing feeling of purpose and fulfilment within the Bat Group. Good PR for bats is, it seems, also good for bat groups.

## Banners for Bats

*BCT has a small support fund for bat groups and applications are regularly made for public engagement activities. Sean Hanna explains how the Kent Bat Group put a recent award to good use.*

Following a successful application to the Bat Group Partner Support Fund, Kent Bat Group purchased two all weather banner displays based upon the Bat Conservation Trust's 'Amazing Bats' display. We hoped that these would provide a useful addition to our display boards at bigger events we attend to raise awareness and promote bat conservation, along with being a stand alone display which we could use at smaller events across the county.

The banners have been well used since we have had them and been very effective in engaging people and drawing attention to the work of the Bat Group. At the recent

Kent Garden Show, one person commented how good the banner looked and how engaging and interesting the short snippets of information were on the banner. The silhouettes of bats are a particularly useful way of engaging people when trying to help them identify the bats which they see flying around their property.

So far the banners have been used at events with the Kent Wildlife Trust, Kent Agricultural Society, Caring for God's Acre, Kent Garden Show, Bredhurst Woodland Fayre, Bioblitz at Oare Gunpowder Works, Sevenoaks Festival of Wildlife and the Sandwich Bay Bird Observatory Annual Fair. We promoted the new banners in our Bat Group Newsletter, acknowledging the Partner Support Fund, and hope this will help encourage more of our members to help with events allowing us to reach a wider audience.



One of the new Kent Bat Group banners in use at a Caring for God's Acre event at Bokesbourne Church this summer.

## EchoLocation Location

*Surveying for bats is a great way for people to become involved with bat conservation. Michael Walker, of Nottinghamshire Bat Group, explains how more people are being encouraged to find out what bats are in their area as part of a Heritage Lottery Funded project in the county.*



Nottinghamshire Bat Group began a project in June 2015 to record the distribution of bats in as much of the county as possible over a three year period. We were successful with our application to the Heritage Lottery Fund and were awarded £67,300 for the project which we have called 'EchoLocation Location'. Much of the funding will be used for equipment including a range of bat detectors, trapping and radio tracking equipment and display banners and leaflets to help spread the message of bat conservation around the county. One of the most important aspects of the project is public engagement and getting people involved who have perhaps never even thought about going out after dark to look for bats. The project will fund bat detector training workshops for beginners and courses for those who want to develop their skills in bat call analysis to help with the major task of going through all of the data generated from our surveys. We also have funding for DNA analysis of bat droppings and will be using this to identify species which would be impossible to confirm with just a bat detector.

In the first four months of the project the response from the public has been tremendous with people keen to have a detector in their garden to find out which species visit them every night. We will be working with local groups in all parts of the county but especially in areas where we know little about the bats that live there. At the end of the project we will produce a distribution atlas and a report on the project which will be an important baseline for future bat conservation work in Nottinghamshire.

Regular updates on the project are posted on our new website at <http://nottsbatgroup.org.uk/echolocation-location/>



People were drawn to the NBG stand this summer by the weird looking giant harp!

© Michael Walker

## Downton Moot Annual Bat Walk

*Bat walks are staple activities of many bat groups and here Jan Freeborn, of the former Five Rivers Bat Group, describes an event run annually with the National Trust.*

The annual bat walk at Downton Moot was a great success again this year, with around 20 people attending the event on Saturday 23rd May. Arranged by Susan Barnhurst Davies on behalf of the Moot Trust, and led by Jan Freeborn from the Five Rivers Bat Group and Michelle



One of the Downton Moot soprano pipistrelles.

Brown from the National Trust, the group met at 8:30pm at the main gates to the Moot. Jan welcomed the group, which consisted of a variety of local residents and interested parties, from children to adults, from couples to individuals, all hoping to catch a glimpse of these fascinating creatures of the night. Jan introduced the event and gave an insightful talk about the 18 species of bat found in the UK and details of the species that have been encountered at the former 12th Century fortified earthworks and site of an early 18th Century pleasure grounds. Now a landscaped garden, the Moot provided a stunning backdrop to listen to and explore the captivating world of bats.

The evening sprang to life with the emergence of soprano pipistrelles and common pipistrelles foraging along the tree lines and hunting along the site's border with the River Avon; a credit to the sensitive site management which creates a valuable haven for both wildlife and people. These were joined by Daubenton's bats which could be seen swooping and diving over the pond in an amazing display of white bellies flashing over lily pads as they caught small insects from the water surface in the dark.

The event generated another year of bat records which will contribute to the knowledge of bats at the Moot and help to inform management plans to ensure these wonderful creatures remain valued Moot residents for the future.

# The Bats of Madagascar

The island nation of Madagascar is famous for its wildlife, including unique species of animals and plants found nowhere else in the world. In this article **Prof. Paul Racey** explains why the bats of the island are so special and in need of further study and protection.

No other country in the world has experienced a 40% increase in the number of bat species described over a period of 15 years. In the 1995 bat volume of *Faune de Madagascar*, Peterson and his colleagues listed 27 species, 60% of which were endemic. Fifteen years later, in his 2011 monograph on the Bats of Madagascar, Goodman listed 43 species in eight families, with an endemism rate of 73%. These additions have been largely due to Goodman himself, a taxonomist with the Field Museum in Chicago who is based permanently in Madagascar. He continues to describe new species, so that the current total is 47 and is likely to rise further. Although this increase in knowledge of the diversity of Madagascar's bats has been exciting, with a few exceptions our knowledge of their ecology has not kept pace.

There have been several projects on the feeding ecology, diet and conservation biology of the three endemic fruit bat species, starting with Emma Long's study on *Pteropus rufus* roosting in the private tourist reserve of Berenty in the south east. This small

area of gallery forest is surrounded by 30,000 hectares of sisal, so it's just as well that the bats are avid consumers of sisal nectar and pollen! In 1998, the first of a series of Darwin Initiative grants to Aberdeen University involved a survey of *Pteropus* roosts on the island which revealed that many historic roosts had been lost due to overhunting and disturbance. We estimated that there were 300,000 *P. rufus* on the island and concluded that the rate of hunting was unsustainable. We came across a roadside eatery which claimed to serve 30 *P. rufus* a day and we found 30 live bats in two paniers in a back room. This extrapolates to 10,000 bats a year. The largest roost we counted consisted of 5,000 bats so clearly this species is under pressure.

Along with *P. rufus*, Madagascar's other two fruit bat species, *Eidolon dupreanum* and *Rousettus madagascariensis* are sometimes persecuted for eating marketable fruit. Radosoa Andrianaivoarivelo has shown that *R. madagascariensis* actually prefers native or introduced fruits of no commercial value to marketable species.

Feeding on the latter is what happens in many parts of the old world tropics when forests are felled and bats are deprived of the fruits with which they evolved. Madagascar has lost most of its natural forests since records began and much of what is left is located in protected areas.

These bats also perform important ecological services. Using GIS telemetry, Ryszard Oleksy has revealed the long distances travelled by foraging *P. rufus* and hence their capacity for seed dispersal over a wide area, and Daudet Andriafidison has shown that *E. dupreanum* pollinates endemic baobabs.

It's not just fruit bats that are eaten. Recent taxonomic revision has revealed that *Hipposideros commersoni*, one of the largest hipposiderids, until recently thought to occur also in Africa, is a Malagasy endemic. It roosts in caves in the west of the country and in trees in littoral forests in the east. In the south west in times of food shortage, it is swatted as it emerges from sink holes and is eaten in large numbers as 'starvation food'.

The endemic family Myzopodidae was originally thought to consist of one species – the sucker-footed bat *Myzopoda aurita*. This is the most distinctive bat on which I have worked, with large ears, an overhung jaw and pads on its ankles and wrists. Although originally termed suckers, Dan Riskin has shown that these pads work by wet adhesion and enable the bat to roost head up in the semi-unfurled leaves of the traveller's tree *Ravenala madagascariensis*. Up to fifty bats roost in a single tubular leaf but must move on when it unfurls. In a seven year study of *M. aurita* in a coffee research station in south east Madagascar, my colleague Mahefatiaina Ralisata and I caught over 300 new individuals. All were males, making this the most remarkable sexual segregation reported in any mammal. Because juvenile males arrive in our study area every year, we know females can't be far away, and other researchers have caught occasional individuals in the surrounding area. A new species of *Myzopoda* was recently described in western Madagascar by Steven Goodman who named it *M. schliemanni*.



*Hipposideros commersoni*



© Paul Racey

▲ *Pteropus rufus* at roost

▼ *Hipposideros commersoni*



© MaYoa

It also roosts in vegetation, in the dead leaves of *Bismarkia* palms but is not sexually segregated.

The legacy of our Darwin Initiative grants is an NGO – Madagascar Voakajy ([www.madagasikara-voakajy.org](http://www.madagasikara-voakajy.org)) which means Madagascar Conserved and which continues to undertake conservation initiatives for bats. In terms of staff, it has grown to a similar size as BCT in the ten years of its existence. Steven Goodman has also established an NGO – Vahatra ([www.vahatra.mg](http://www.vahatra.mg)) which works on a wide range of mammals, including bats, and birds.

Despite being one of the world's poorest countries, Madagascar remains a great wildlife tourist destination. In addition to *P. rufus* roosting in Berenty, there are bat caves in Ankarana in the north and Bemaraha in the west ([www.bradtguides.com](http://www.bradtguides.com)). And if the bats prove elusive, there are always the lemurs...



*Pteropus rufus*

© Paul Racey

# Stressed in the City: Using the NBMP to understand the response of bats to urbanisation

Paul Lintott, winner of the 2015 Vincent Weir Scientific Award, has been researching the bats found in our towns and cities, looking at how habitat differences impact on the species present. Paul's work has important findings for bat conservation in our increasingly urbanised world.

By 2050 it is projected that two-thirds of the global population will be living within urban areas which will lead to environment problems including habitat loss, higher pollution levels, and an increasing frequency of human-wildlife conflict; all of which can impact upon our flora and fauna. Therefore as part of a PhD supervised by Kirsty Park and Nils Bunnefeld at the University of Stirling I have been examining how wildlife behaviour and habitat preferences are modified by the urban landscape so that effective conservation strategies can be designed.

Over the past five years we have studied the activity and abundance of various bat species using acoustic and trapping surveys within fragmented urban woodlands, along urban waterways and within urban gardens across the UK. We found that female soprano pipistrelles show greater selectivity in foraging locations within urban woodland in comparison to males, both locally and at a wider landscape scale; there was a lower probability of finding females within woodlands which were poorly

connected, highly cluttered with vegetation, had a high woodland edge to interior ratio and fewer mature trees. These results have important implications for our understanding of how to manage areas for breeding females and highlight the need to supplement acoustic monitoring, which cannot differentiate between the sexes, with trapping data. We also found that the extent of urbanisation up to 3km away from a waterway can negatively affect how bats use urban rivers and canals. Our results indicate that the removal of invasive plant species and retaining vegetated river and canal banks will benefit a variety of bat species.



Retaining vegetation along river and canal banks will benefit a variety of bat species.

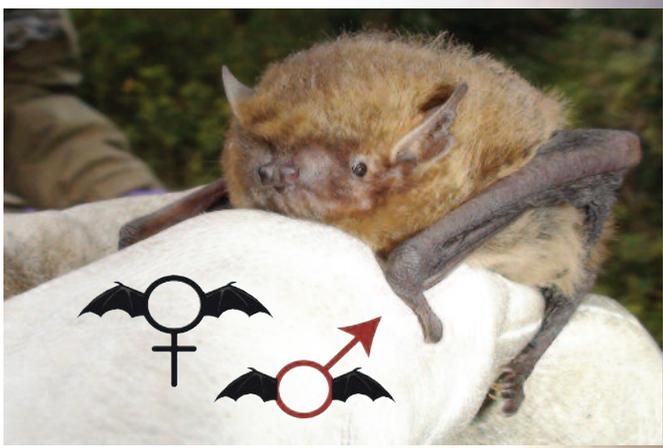
However, one of the most exciting projects has involved using data from the BCT's National Bat Monitoring Programme (NBMP) to assess how two of the UK's commonest bat species, the common and soprano pipistrelle, respond differently to urbanisation. We used the records collected by BCT's volunteers during the annual NBMP field survey conducted on two evenings in July to assess how the relative activity levels of pipistrelle bats within a transect were influenced by the surrounding landscape.

The relative prevalence of *Pipistrellus pygmaeus* compared to *P. pipistrellus* was greater in urban landscapes with a higher density of rivers and lakes, whereas *P. pipistrellus* were more frequently detected in landscapes comprising a high proportion of green space (e.g. parklands). Although *P. pipistrellus* is thought to be well adapted to the urban landscape, we found a strong negative response to urbanisation at a relatively local scale (1km), whilst *P. pygmaeus* was detected more regularly in wooded urban landscapes containing freshwater. Although the populations of both

pipistrelle species are thought to have stabilised following historical declines, probably as a consequence of increased legal protection, raised awareness of bat conservation, and changes in climate, our results indicate that increasing urbanisation is likely to have a negative effect on both pipistrelle species.

The conservation needs of common species are frequently overlooked given their abundance and widespread distribution. Conservation management is frequently focused on efforts to increase the abundance of rare species, often through the establishment, restoration and maintenance of protected areas.





© Daniel Hargreaves

Paul's research found that female soprano pipistrelles are more particular in their selection of urban woodlands than males.

It is rarely possible to create protected areas for wildlife within cities given the pressure on managing green space for recreational activities and public enjoyment. However, promotion and support of wider scale conservation strategies (e.g. re-greening and incorporation of bat-friendly habitat in urban gardens, reducing light pollution along riparian zones to ensure greater connectivity within the urban landscape) will be beneficial for common species. Such efforts to improve green space across the urban matrix will not only benefit common species but ensure a higher percentage of urban residents will have access to high quality green space and so increase wildlife spotting opportunities. Encounters with wildlife can strongly influence attitudes towards conservation, therefore ensuring that common species survive within cities is key as a way to inform, educate and inspire the public about both the diverse range of wildlife in their backyard and also wider conservation issues.

Although it is easy to be blasé about pipistrelles given their relative abundance throughout the UK history has taught us that common species can rapidly be driven to extinction through human activities. The passenger pigeon was once the most abundant bird in North America in the 19th Century, living together in flocks so large that one in Ontario was described as being 1 mile wide and 300 mile long containing in excess of 3.5 billion birds, yet it was extinct by the early 20th Century. Although this fate is unlikely to befall either the soprano or common pipistrelle, one of the key messages from my research is that even common bat species are negatively affected by urbanisation and much greater attention should be paid to securing their future. This quote by Dennis Murphy at Stanford University (1988) seems an apt message to finish on:

*“Our urban centres can be viewed as bellwethers of our global environmental fate. Our success at meeting the challenges of protecting biological diversity in urban areas is a good measure of our commitment to protect functioning ecosystems worldwide. If we cannot act as responsible stewards in our own backyards, the long-term prospects for biological diversity in the rest of this planet are grim indeed”.*



The quality and composition of urban habitats is critical in determining the species to be found in our towns and cities.

© Pixabay.com



# Why isn't everyone batty about bats?

As readers of *Bat News*, it is fairly safe to assume that the majority of you are interested in bats. However, as I recently discovered, the UK public's opinions on bats are often negative and misguided. Using the online research company, OnePoll, I surveyed 1,000 adults across the UK. As far as I'm aware, this is the first time this type of research has been carried out. The majority of existing perception surveys surrounding bats targeted people who are members of wildlife groups, leading to possible bias and misconstruing the true perceptions of the general public. I conducted this study to raise public awareness of bats, and so that the bat community can identify how to promote positive opinions on bats.

I found that four out of five people liked bats, with the North East and London coming out as the regions where bats are liked least. Sadly, I also found that bats are the third least favourite UK land mammal, with rats and mice taking the top two spots. One possible reason for this is diminished awareness in cities where people are less likely to interact with wildlife. I then asked respondents who reported they didn't like bats to elaborate on their reasons.

The top reason was fear; 60% of young adults (18-24) who don't like bats accounted for this because they are scared, whilst only 36% of respondents aged 25-34 gave this reason. This suggests that young adults are less aware of bats; education is required from a young age to prevent irrational fear and the accumulation of misconceptions. Other reasons given for disliking bats included that they are unattractive (these people clearly haven't seen a bat before!), and that they are 'flying rats' – a common misconception.

I gave respondents the opportunity to give their written opinions on bats, and the results were extremely varied. Some were very encouraging: 'Amazing', 'Fascinating', 'Misunderstood', 'Essential to British wildlife', whilst others were less so: 'Dark avenging creatures of the night', 'Disgusting', 'Disease ridden rodents', 'Vampires'. These conflicting opinions reflect the fact that we still have a

lot of work to do in order to educate more people, something we can all help with.

I then delved deeper into the misconceptions surrounding bats, and found that 25% of people didn't know whether or not bats fly into people's hair, even though UK bats employ sophisticated echolocation, making this highly unlikely to occur. Some people also considered bats to be 'vermin', despite the various benefits they provide us with such as insect pest control. Furthermore, almost four in 10 people that took part in the survey believe that UK bats are blind. Bat diversity is also largely unknown, with 62% of people believing that there are fewer than 100 species worldwide – there are actually over 1,300!

A crucial part of bat conservation is the legislation to protect bats. While seven out of 10 people are aware that bats are protected, this is lower in younger age groups. Worryingly, of young adults surveyed aged 18-24, 53% are unaware that UK bats are protected, making it illegal to capture, disturb or destroy their roosts. Furthermore, only 63% of UK adults surveyed are aware that renovating, converting, or demolishing buildings could adversely affect bat populations – this could directly affect bat crime occurrences. It is vital that awareness is improved, in order to sustain our bat populations dwelling within buildings.

Although awareness is increasing (in particular across social media), this research shows that the public is vulnerable to forming negative opinions on bats, largely based on misinformation or misconceptions. By continually educating the public from a young age, I believe that we can make

more people appreciate just how wonderful and useful bats are. The value of bats to the public is undeniable (e.g. it's estimated that they contribute over \$1 billion/year to corn production alone through insect pest control), so more people should join us and become batty about bats!

Want to know more? Contact me: [charlotte.chivers@onepoll.com](mailto:charlotte.chivers@onepoll.com)



# Bats as Pest-Controllers

Insects are major agricultural pests of crops in many parts of the world, but until recently the role of bats as pest-controllers has been underestimated. For some years American farmers have shown an interest in attracting bats to their land, installing artificial roosts such as bat boxes, reducing the need for pesticides and the development of pesticide resistance. A review of the literature on bats and insect control by Riccucci & Lanza (*Vespertilio* 17, 2014) indicates the service of insectivorous bats is now being investigated more fully.

Rice is a staple to almost half the world's population, so sustainable rice production is critical to global food security. The world rice crop is attacked by more than 800 species of insect and in regions where the majority of rice production is concentrated over-use of pesticides is an issue. Monserrat *et al* (*Mammalian Biology* 2015) working in a wetland area in NE Iberia, found soprano pipistrelles *Pipistrellus pygmaeus* control rice borer moth infestations for at least two of the moth's peak activity periods, when most damage is done. Pest levels declined when bat boxes were taken up by pipistrelles. In Thailand, seeking effective control of pests of rice such as the white-backed plant hopper, Wanger *et al.* (*Biological Conservation* 2014) used data on the wrinkle-lipped bat *Tadarida plicata* to quantify the value of bio-control by bats. They demonstrated that bat population declines are likely to affect food security of local people most severely, translating into food availability. For hunger mitigation, sustainable and local food production, especially in the developing world, they recommend that conservation management efforts should target important and often common bat species, and suggest rice farmers consider establishing bat roosting boxes.

In *Ecology Letters* 2013 Maas *et al* describe an experiment in which they manipulated access of birds and bats to cacao agroforestry in Indonesia. They collected continuous data to investigate the effects of diurnal and nocturnal predators on fruit development, fruit yield and leaf herbivory, the first study of bird and bat exclusions from a paleotropical system. The number of leaf-eating insects increased in the day exclusions, whereas mainly night-active insects increased in the night exclusions. Results provided new arguments for wildlife-friendly management of agroecosystems, not only

important for sustaining rural livelihoods, but also for the potential conservation of endangered species.

Corn is an essential crop for farmers, and is grown on more than 150 million hectares worldwide. *Proceedings of PNAS* 2015 reported on Maine & Boyles' two year investigation of the value of bats in combatting corn crop pests in the USA. Netted enclosures keeping bats outside and away from corn showed that bats exert sufficient pressure on pests to suppress larval densities and damage. In addition, the bats also indirectly suppressed the presence of pest-associated fungus and a toxic compound produced by the fungus. Bats face a variety of threats globally, but their relevance as predators

replacement to the harsh chemicals often used to ward off pests.

The impact of bats as predators of insects in macadamia agro-ecosystems, where stink bugs are major pests, was subject of a study by Taylor *et al* (*South African Macadamia Association Yearbook* 2013). They examined faecal pellets of bats collected from macadamia orchards in the Levubu Valley, South Africa. Preliminary results revealed that the droppings of five species of bat foraging and roosting in plantations contained DNA from the green vegetable stink bug, providing unequivocal evidence for predation by bats. Brown *et al* (*Crop protection* 2014) investigated crop pests eaten by bats on two certified organic pecan orchards in



© Organization for Bat Conservation

Bats are most likely keeping the European Grapevine Moth under control at Esporão vineyard, Portugal.

of insects in ubiquitous corn-dominated landscapes underlines the economic and ecological importance of conserving biodiversity.

*The Smithsonian* August 2015 reports on a bat programme which began in 2011 in the Alentejo, a wine-producing region southeast of Lisbon. No bats previously lived on the property, probably due to the lack of shelter in the landscape. To attract bats the estate installed 20 wooden bat boxes amid its rows of grapes. There has since been a drop in the number of insects on its 1,235 acres of wine grapes. As of this August, the boxes house some 330 bats, including Kuhl's pipistrelle and Leisler's bat. As a winery striving to make its operations as sustainable as possible, the bats have become a reliable

the southern United States, studying DNA found in the guano of bats living in bat houses to document the consumption of pest moth species. This demonstrated that bats prey upon pecan crop pests, and is the first step in showing that bats are beneficial to pecan farmers and provides incentives for bat conservation. Documentation that bats roosting in bat houses in pecan orchards are consuming insect pests suggests that growers can encourage the natural pest control services of insectivorous bats through the installation of bat houses.

This small selection from a growing body of literature documenting investigations into the significant impact of bats as predators of agricultural pests is good news for agriculturalists and bat conservationists alike.

# Greater Mouse-Eared Bat

## *Myotis myotis*

Almost all UK records of the greater mouse-eared bat, the UK's largest bat and one of the largest European bats, are of bats in hibernation. Although widely distributed in Europe and well-studied there, occurring from the European Mediterranean coast to the southern Netherlands, the greater mouse-eared bat has perhaps never been well established in the British Isles, and has undergone a change in status here in recent years. Although it is often counted as our 18th species, without a known maternity colony in existence in the UK it is not recognised as one of our 17 breeding species.

A small hibernating population of probably not more than ten animals, discovered in Dorset in 1956, was extinct by 1980. The last hibernating population of c.30 bats, discovered in West Sussex in 1969, contained several females until 1985. However, these disappeared around the time that a nearby cottage was destroyed by fire, and as the females tend to form maternity colonies in attics they may have perished then. A single male was recorded hibernating in underground tunnels near Dover in 1987, but subsequent searches suggested this was a stray migrant. Numbers in the Sussex colony gradually declined to a lone 17 year-old male in 1990. However, in January 2001 an emaciated female was found within five miles of the last known colony, but she died shortly afterwards; from her worn teeth she was presumed to be quite old. Then in December 2002 a male, considered to have probably been born that year, was found and ringed in the West Sussex hibernation site used previously by the species. It was present at the same site in the following January and February 2003, and has been observed there every winter since. Efforts have been made to identify likely summer roost and foraging sites, but there have been no other winter or summer records.

## Social organisation and behaviour

**Summer:** In Central Europe maternity colonies dwell, with few exceptions, in large roof spaces, sometimes in huge numbers, while in the Mediterranean area caves are mostly used as maternity sites. Interchange between adjacent nursery colonies seems frequent. Males are solitary or in small groups. In autumn males usually lure one to five females to a roost site in tree holes, bridges or buildings for mating. The single young is born the following summer and starts to practice flying at 3-4 weeks. In Germany 95% of the females between four and 14 years of age are involved in reproduction; older animals no longer give birth annually.



Greater mouse-eared bats in a roost.

## Vital statistics

**Head and Body Length:** 65mm-80mm

**Forearm Length:** 57mm-450mm

**Wingspan:** 365mm-450mm

**Weight:** 24g-40g

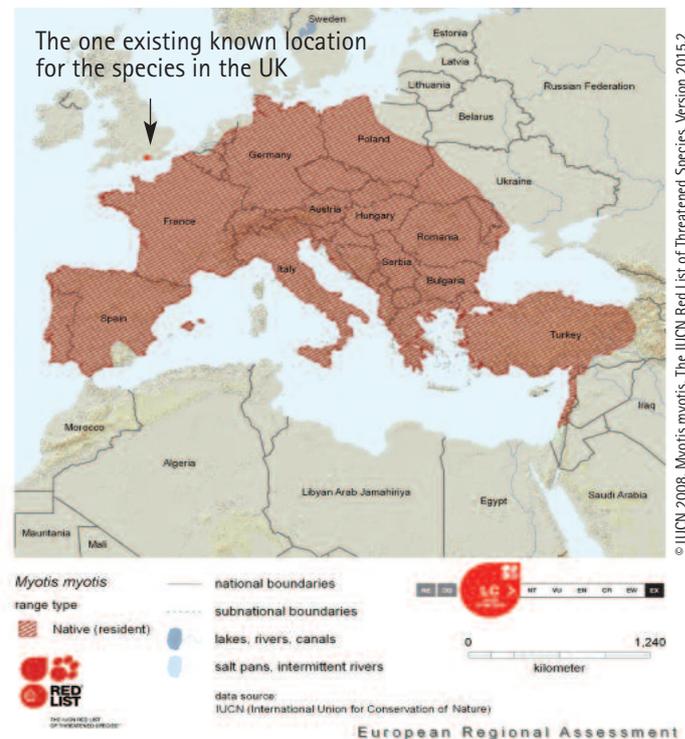
**Colour:** Dorsal fur a sandy colour contrasting strongly with the white fur underneath.

**Diet:** Mostly larger ground beetles, lepidopteran larvae, and orthopteroids and other ground dwelling

**Winter:** Though generally solitary they are also found in groups, sometimes of mixed species. In mainland Europe at the beginning of winter a preference for internal areas of caves has been observed, moving towards the entrance by spring. The few observations in the UK conform to this same pattern: most were found hanging in high exposed parts of tunnels.

## Habitat

In mainland Europe this species is usually found around human settlements, hunting in open lightly wooded country, along woodland edges, over pasture and adjoining cultivated areas. Flight is slow, heavy and generally straight; frequencies used for



Distribution in the UK and Europe.

echolocation lie between 22 and 86kHz, with most energy at 37kHz. They emerge late in the evening and hunt for several hours, gleaning much of their prey from the ground, locating them by listening for the noises produced by large beetles, spiders and centipedes.

## Conservation

Conservation measures in mainland Europe include protection of the maternity colonies and winter roosts, promotion of locally suitable hardwood forest populations, abandonment of pesticides in agriculture and forestry, and conservation of large non-fragmented habitats.

# Bat Surveys for Professional Ecologists – Good Practice Guidelines 3rd edition

The much anticipated 3rd edition of the Good Practice Guidelines is due out shortly. In this article **Jan Collins**, BCT's Head of Biodiversity, explains what had changed since the 2nd edition.

Over the last year we've been drafting the 3rd edition of the Bat Survey Guidelines with input from expert authors and a technical review by a board of 25 people representing the four UK Statutory Nature Conservation Organisations, a range of ecological consultants, the Association of Local Government Ecologists and a Local Planning Authority ecologist. The 3rd edition has also been shaped by the public consultation we carried out in 2013 and the multitude of phone calls and emails we have received about interpretation of the guidelines and how they are being applied, misused or not used in an industry context. This amounts to a lot of input and we would like to thank all of those involved.

We have changed the title to reflect the fact that the audience for the 3rd edition is primarily professional ecologists and we have restructured the document to improve the flow, using standard headings for the 'survey types' chapters, more cross-referencing and an index to improve accessibility.

The *Surveying Proposed Onshore Wind Turbine Developments* chapter has been removed because key UK research on bats and wind turbines has not yet been published. Chapter 10 of the 2nd edition will stand until new guidance is available for this type of work.

We have also removed the *Surveying Major Infrastructure Projects* chapter in favour of describing considerations for survey design that will apply to all types of projects. More emphasis is placed on proportionality and the need to apply expertise and ecological rational in designing surveys.

We have included a new framework to describe the potential low, medium or high suitability of habitat for roosting, commuting and foraging bats, with the terminology consistent across all three.

## Roost Surveys

We received lots of feedback about the tree surveys section of the 2nd edition and in response we have included a new chapter on tree surveys for bat roosts. This includes potential roost feature inspection surveys using climbing or other access equipment, which more effectively establish the nature of tree features to enable appropriate targeting of further survey work where necessary.

## Activity Surveys

A section on acoustic surveys at potential swarming sites is included in the *Bat Activity Surveys* chapter. As an emerging area we also acknowledge the recent findings reported at the National Bat Conference in 2015 relating to *Pipistrellus* bats swarming and hibernating in large urban buildings in the Netherlands.

## Advance Licence Bat Survey Techniques

The 3rd edition includes a new chapter on *Advance Licence Bat Survey Techniques*, primarily trapping and the use of radio telemetry in the context of professional bat survey work. Mist netting, harp trapping and the use of acoustic lures is becoming more common and is covered under the Natural England Class Licence scheme, which is why we have



© Patrick Smith

Brown long-eared bats in roof void.

included a chapter on these methods in the 3rd edition. Surveys for Bechstein's bat using mist nets and harp traps with acoustic lures are covered, along with some important considerations for the use of these invasive techniques.

## Data Analysis and Interpretation

The use of automated detectors has led to larger amounts of data being collected and therefore the 3rd edition includes more information on analysing this data using statistical techniques. Similarly, data collected during radio telemetry surveys needs to be analysed appropriately so methods for this are covered.

Practising ecologists have a wide range of experience and expertise. The guidelines should be used by professionals with sufficient expertise and integrity to be able to effectively apply their professional judgement. Guidelines cannot and should not be prescriptive due to the vast range of scenarios that occur. We hope that the 3rd edition strikes the right balance in this respect.

Our aim has been to produce a 3rd edition that builds on earlier editions and responds to comments received resulting in an easier to use, more consistent and updated edition based on professional experience and, where available and appropriate, the latest research.

You can pre-order the new edition of the guidelines from NHBS. They will also be available to download from the BCT website (as a free non-printable PDF).

# Scottish Hibernation Surveys

With the cooling weather, bats are starting to disappear from the night skies to go into hibernation in the UK. The National Bat Monitoring Programme hibernation surveys are our longest running, with data going back decades for some sites. **Charles Hearst** interviewed one of our volunteers, **John Haddow**, who has braved the winter conditions for years surveying bats in Scotland. One of his sites include Doune Castle, famous for having farm animals launched over its ramparts in 'Monty Python and the Holy Grail'.

**Q. What was your first introduction to bats?**

My first real introduction was helping Paul Racey to catch pipistrelles emerging from a house near Aberdeen. I was interested in catching live fleas from the bats, since at the time I was working on fleas. Paul Racey had only recently started working at Aberdeen University, and was finding out where there were bat roosts around the city. At that time, very little was known about bats in the area. The roost we caught at was later one of Susan Swift's study roosts for her PhD, where she established much basic information about our common bat species that up to then had not been investigated. I became much more interested in bats than fleas after that experience!

**Q. Do hibernation surveys lend themselves to a certain type of personality?**

In Scotland, hibernation surveys require strong, dogged characters willing to struggle into hibernation sites that perhaps 50% of the time or more have no bats present!

**Q. What are the most challenging aspects of carrying out hibernation surveys?**

Sometimes it is difficult to get there in the winter. This year just getting to the Aberfoyle quarry site was hazardous, since it involves driving up a steep winding road that can be closed due to ice or snow. Our first attempt was cancelled because of the road conditions, and our second attempt was a close thing as there was heavy snow near the top of the road pass; we were about the last vehicles to get down before the road was closed.

**Q. What are the most rewarding aspects?**

Just finding bats! And better still finding more than one species.



Natterer's bat at Aberfoyle

**Q. What bats have you come across at this site?**

Doune Castle has up to 40 common and soprano pipistrelles hibernating in mortar gaps in the barrel-vaulted cellars, but some bats can be found in the same places at any time of year. Other bat species sometimes found roosting here at different times of the year are Daubenton's bat, Natterer's bat and the brown long-eared bat.



Daubenton's bat at Aberfoyle.



John Haddow (left) and the survey group make it to the Aberfoyle quarry.

**Q. What advice would you give to someone wishing to get involved in hibernation surveys?**

For Scotland, first try to get experience with batworkers in an area of the UK or other countries where there are more bats in hibernation.

**Q. What attracted you to survey at Doune Castle?**

Doune Castle is unusual as it is a reliable hibernation site for pipistrelles (both common and soprano), that, in spite of being the easiest bats to encounter in the summer, are the most difficult to find in winter.

**Q. Any other interesting wildlife sightings?**

The castle walls and roof are also used by roosting or nesting birds like swifts, jackdaws and the occasional owl. A custodian at the castle once watched a small bat, presumably a pipistrelle, flying round inside the walls in the middle of the day. It eventually landed high up on the stonework, and was immediately "pounced on" and eaten by a jackdaw, that must also have been watching it.

## Vincent Weir Award 2015

The Vincent Weir Scientific Award aims to recognise, reward and encourage research by young scientists that will aid in the conservation of bats. It also recognises the contribution that the late Hon. Vincent Weir has made to bat conservation over many years.

Paul Lintott (University of Stirling) is this year's winner of the award for the substantial contribution his research has made to our understanding of how bats respond to urbanisation at a range of spatial scales. (See page 8 for more details of Paul's research.)

In an attempt to increase the species diversity he was recording Paul spent one summer kayaking the waterways of Britain surveying the use of urban rivers and canals by bats. He managed to collect sufficient field data for a paper in the journal *Biological Conservation*.

Collectively, these papers have greatly added to our understanding of how two of our commonest bat species are negatively influenced by urbanisation and has practical relevance to the management of our urban landscapes, and the remaining pockets of "bat friendly" habitat contained within.

As well as the content, the judges were particularly impressed by the productivity of Paul's PhD thesis; it contains seven data chapters of which five chapters have already been published in the scientific literature.



Paul Lintott being presented with the 2015 Vincent Weir Scientific Award by BCT Trustee, Abigail Entwistle.

## Pete Guest Award 2015

The Pete Guest Award is given in memory of Pete Guest, an inspirational figure in the world of bat conservation for over 20 years. The award recognises people who have made an outstanding practical contribution to bat conservation. This year's award goes to Arthur Rivett.

Arthur has clocked more than 30 years of dedication to bat conservation- a massive achievement which continues to inspire newcomers to get involved. He helped set up Suffolk Bat Group back in 1984 and served as its first Chairman for the next 12 years. However the wider bat community may not know of his involvement in the discussions that led to the establishment of the Bat Conservation Trust when he was the Eastern Region Representative with Bat Groups of Britain. Thirty years later, Arthur is still on the Suffolk Bat Group committee, is active as a volunteer roost visitor as well as



Arthur Rivett, shown here having just received the 2015 Pete Guest Award, for his outstanding contribution to bat conservation.

being the Group's Trainer and supports anyone keen to train as a roost visitor or wanting experience for a survey licence. He has embraced the technology of bat detectors and computer sound analysis, and after group surveys writes up all the reports so that landowners get the best advice for managing their trees and woodlands for bats. He also masterminds the hibernation checks across the county and his experience in dealing with lots of batty situations over the years is like a library for others to borrow from.

## Bat Habitat Regulations Bill

On Thursday the 11th of June the Bat Habitats Regulation Bill, originally presented as a Private Members' Bill in the House of Commons by Mr Christopher Chope MP, was revived by Lord Cormack in the House of Lords and reintroduced into that House in July. The second reading of the Bill (in both Houses) is currently scheduled for the 16th of January 2016 and 6th of February respectively. Many of you rallied to the previous call to action and we are asking for your help once more since we believe this Bill to be detrimental to bat conservation.

## Habitats Directive Review

At the time of going to press, the issue of the potential review of the Habitats Directive continues to be of great concern despite the unprecedented response to the public consultation by the European Commission. The Habitats Directive has been the cornerstone of much of the protection that many species and habitats receive. Weakening the Directive would be disastrous for bat conservation as well as impacting negatively on many other species.

Please check our website or get in touch to receive updates on both of these issues, you can email us on [comms@bats.org.uk](mailto:comms@bats.org.uk)

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