

Bat Conservation Trust
National Bat Conference



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Conference abstracts 2009

UK Bat Conservation: past, present and future

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No abstract

Differences in bat activity in relation to bat detector height: implications for bat surveys at proposed windfarm sites

Jan Collins, University of Bristol and RSK Carter Ecology; JCollins@rskcarterecological.co.uk

We recorded bat activity simultaneously at ground level and 30m height using Anabat II bat detectors and Anabat ZCAIM recording units mounted on masts at seven sites of varying habitat type in eastern England. At the lower detectors 6194 passes were recorded; 90.02% of calls were from *Pipistrellus*; 6.91% were from *Nyctalus/Eptesicus*; 1.70% were *Myotis/Plecotus*; 0.13% were *Barbastellus* and 1.24% could not be determined to species. At the higher detectors 484 passes were recorded from *Pipistrellus* (65.08%) and *Nyctalus/Eptesicus* (34.09%) and 0.83% were not determined to species. Total bat passes and the number of *Pipistrellus* passes were significantly higher on the lower detectors compared with the upper detectors. The difference between numbers of passes of *Nyctalus/Eptesicus* at the upper and lower detectors was not significant, although proportionally more passes of these species were recorded at height. No extra species groups were recorded at height than were recorded at ground level except at one site where closed canopy broadleaved woodland surrounded the mast. Here, *Nyctalus/Eptesicus* species were recorded only at height. Overall, 28% of *Nyctalus/Eptesicus* passes and 5% of *Pipistrellus* passes were recorded exclusively at height, and not at ground level. Assessing bat activity levels from ground level detectors only can therefore be misleading, particularly when surveying high-flying species that are most likely to be at risk from wind turbine developments.

Through forest and over fell: revealing the spatial ecology of bats in the Lake District

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Many bat populations are threatened by a decline in abundance and diversity due to landscape change and fragmentation. Effective conservation requires an understanding of how complex environments are used by bats. Data on bat distribution, abundance and diversity are being collected from acoustic surveys and capture in a grid of thirty 1 km² sites across the southern Lake District, a physically and biologically rich landscape. The relationships between bat activity and environmental characteristics are being modelled on different spatial scales using GIS-based statistical approaches. Data collection and analysis are ongoing, but initial results reveal a rich bat community with high levels of activity, a high abundance of *Myotis* bats and some surprising behaviour.

Some results from a LIFE NATURE Programme in France for the study and conservation of three cave-dwelling bat species

Melanie Nemoz & Marie-Jo Dubourg-Savage, Société Française pour l'Etude et la Protection des Mammifères & Groupe Chiroptères Midi-Pyrénées; melanie.nemoz@espaces-naturels.fr

A LIFE-Nature programme was conducted in the South of France in order to preserve the populations of three cave-dwelling bat species: *Rhinolophus euryale*, *Myotis capaccinii* and *Miniopterus*

schreibersii (LIFE04NAT/FR/000080). From 2004 to 2008 13 partners collaborated (i) to create communication tools, (ii) to protect a network of 26 bat roosts and (iii) to study the diet and the habitats used by the three species. Radiotracking of pregnant or lactating females in six areas allowed us to identify and map hunting habitats and to study individual and colony home ranges of the three species. These results were analysed in order to elaborate management recommendations, which were compiled in a handbook. Some results are presented here.

Opportunities for enhancement in construction

David Mason, Skanska; david.mason@skanska.co.uk

During this short talk I aim to explore the issues faced with bats and construction. For years the construction industry has been associated with environmental damage. Insensitive planning, design and delivery has led to well documented impacts on local bat populations. However, the need for change is now recognised with increasing effort being made to mitigate the impacts of construction.

By outlining how the industry works and the roles of its key players I hope to demonstrate how, with the right input and understanding opportunities for ecological enhancement, can be developed to the benefit of bat populations.

Carving up the landscape: bats, roads and mitigation

John Altringham, IICB, Faculty of Biological Sciences, University of Leeds;
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Roads have profound effects on the landscape. A major road causes habitat loss and fragmentation, chemical, noise and light pollution, unknown levels of collision mortality, and contributes to climate change. There appears to be little political will for a reduction in road network expansion programmes. We should therefore be taking a rigorous, evidenced-based approach to studying the effects of roads and mitigation practices on bats and their habitats. I will summarise current knowledge on the ecological effects of roads on bats and the benefits or otherwise of mitigation practices, and address the question - can mitigation against the effects of roads be improved?

Doppler returns and detectability of wind turbines from the bat's perspective

Chloe Long, Loughborough University; C.V.Long@lboro.ac.uk

While the harnessing of wind energy has been developing rapidly over the last few decades, recently concern has been escalating over the impact of wind turbine installations on wildlife, particularly flying animals such as birds and bats which are at risk of colliding directly with turbine blades. Investigating bat-turbine interactions presents a unique problem since it is not clear how the echolocation pulses they produce to navigate could be interacting with the moving rotor blades. Here we approach the issue from several different angles, firstly by identifying which physical parameters of turbine models could increase the likelihood that a bat's echolocation pulses may be reflected from moving blades, and secondly by determining exactly how their emitted sound pulses are interacting with and being modified by turbine rotors, in attempts to understand what may be being perceived by the bat.

Bats, pads and ZEDs: Bats & birds, roosts and low to zero energy developments

Brian Murphy, Green Spec, BrianSpecMan@aol.com

The Habitats Regulations and Code for Sustainable Homes have complimentary and conflicting requirements; the average architect, development controller and constructor need definitive guidance through them to safe solutions.

For the first time the bat world and the construction industry has come together to find common ground, to do some future gazing into methods of construction that will survive the next few decades and find ways to accommodate bats and birds without compromising the performance of future buildings.

The future technical guide *Biodiversity for Low and Zero Carbon Buildings* will do just that for both bat and bird species for which buildings are important, such as swifts, swallows, house martins, house sparrow, starlings, barn owls and peregrine falcons.

This presentation will give an insight into the process of analysis of existing information, look at the critique of available products, materials and reveal discussions about appropriate format for the potential readers.

Flying forwards

Julia Hanmer, BCT; jhanmer@bats.org.uk

As BCT's new Chief Executive I feel incredibly fortunate to be working with the unique UK volunteer network, as well as the consultants, academics, BCT staff and Trustees and others with a shared passion for bats. The strength of this fabulous "bat world" puts us in a hugely powerful position to make a difference for bats. I'm both encouraged and excited by the new approaches that have been piloted this year as part of the BCT Review, including the first BCT Regional Conferences in England and Partner Group trials. It's a privilege and with great pleasure that I'll be giving you an update on how we envisage these approaches becoming integral to our work at BCT in future years. I strongly believe that working in partnership is the key to flying forwards to secure the future of bats in a changing world and will outline our plans to work with you, to place bats at the heart of the evolving Biodiversity Action Plan process, the landscape approach, sustainable development and community involvement in conservation.

Assessing bat activity at the Hollywood Tower Estate, South Gloucestershire

Rob Bacon, Gloucestershire Bat Group, robacon@hotmail.com

In February 2007 I was awarded a funded internship grant by the Peoples Trust for Endangered Species. I had proposed to assess the bat activity at the Hollywood Towers Estate, a site owned by Bristol Zoo Gardens, which in the future will be developed into the National Wildlife Conservation Park.

The primary focus of the project was to conduct an automated activity survey to compare species activity levels across the site during the course of the summer. Additional aims of the project were to identify bat roosts on the site and in the surrounding area with analysis of the faecal composition of droppings found in these roosts.

Having no prior knowledge of bats or the methods deployed for surveying them this project was a huge learning experience for me and along with my findings I will be discussing the unexpected issues I encountered during the course of the project.

What to do if you suspect a bat crime

Ian Guildford, Countryside Council for Wales; I.Guildford@ccw.gov.uk

Don't panic! Seriously what I hope to outline is a simple procedure that anyone, who suspects a crime against bats is taking place, can follow. All species of bats are protected by criminal law within the UK and therefore it is the responsibility of the police to deal with such matters; unfortunately we are not always trained or equipped with the necessary understanding or experience to deal with it in isolation and this is where, quite often, you become very important to us.

From experienced bat workers to ordinary members of the public what I hope to try and outline is a simple process of what to do when you suspect a crime against bats is taking place. This will include observing and recording through to the often tricky process of reporting the matter.

BCT's scientific projects and partnerships

Karen Haysom, Bat Conservation Trust; khaysom@bats.org.uk

To implement effective conservation activities, BCT relies on evidence derived from applied scientific studies. BCT's portfolio of research and monitoring projects has recently expanded, and several new projects began in 2009. Work includes evaluating alternative uses of NBMP data, piloting new species' surveys, and applied research studies founded on NBMP survey approaches. BCT has begun its first work on climate change as a member of the BICCO-Net consortium. It is also a partner in a major new project in Wales that is assessing the impact of the higher level agri-environment scheme Tir Gofal on a range of species including bats. In collaboration with university partners, several new PhD studentships have been established including autecological studies on rare species and work on the properties of breathable membranes and their potential interaction with bats. This paper presents an overview of BCT's current scientific work, including an introduction to several new projects.

The post release monitoring of hand-reared pipistrelle bats - the benefits of pre-release training

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Very little is known about the post-release survival of hand-reared pipistrelle bats. Previous work (Kelly, *et al*, 2008) investigated the survival of 12 pipistrelle bats hand-reared and released under three different protocols: i) Standard pre-release flight training and over-wintering (N = 5); ii) Prolonged pre-release flight training, but with limited space (N = 2) and iii) Prolonged pre-release flight training in large flight cage (N = 5).

Of the five bats reared under the first protocol, four were recovered grounded within 48 hours and the signal from the fifth bat lost on day two, either due to tag failure or from the bat flying out of the study area. Both bats in the second group flew strongly on the night of release but on the second and third nights only one bat emerged and flew briefly. In contrast bats from the third group were tracked for between 5 and 10 nights (11 –14 days from activation of the transmitters) indicating that they were able to survive independently following release.

These preliminary results suggest that post-release survival depends on extensive pre-release conditioning in a large flight cage, and we have continued to investigate this by tracking a further 10 bats in 2007. These bats were tracked for between two and 11 nights. We conclude that pre-flight training as offered in the bat flight cage at Stapeley Grange is essential before releasing these hand-reared bats into the wild.

Observations on *Myotis* bats in barns

John Drewett, John Drewett Ecology; johndrewett@btinternet.com

This presentation will review observations made at a number of Natterer's bat roosts and a whiskered bat roost in the north of England during survey work. In particular, the talk will highlight types of behaviour that once looked for can be useful when trying to locate roosts, the type of roost locations used, and the habitat surrounding those roost sites studied.

Lessons learnt from the Dundee City Bat Project

Anne Youngman, BCT; ayoungman@bats.org.uk

The Dundee City Bat project ran over the summer of 2007. The aims of the project were to;

- increase awareness of bats in Dundee,
- involve volunteers in survey,
- gather data for the local records centre,
- identify bat hotspots.

Dundee was chosen because funding from SITA (landfill) was available.

27 volunteers were involved in surveying the city in a patchwork of 1km squares. In addition two car surveys were carried out. Of the 57 x 1km squares within the city only nine squares had no survey.

The biggest problem encountered was the exceptionally poor summer. Despite this feedback from volunteers was very positive. The project led to the formation of the Dundee City bat group. The results of the survey are held by the local records centre and copies of the final report were sent to local planning offices, reference library and Scottish Natural Heritage.

Groups wishing to undertake a similar project should note that the report contains advice, costings and equipment lists which may be helpful. Copies are available from the BCT website.

What do we know about the smallest mammal in the world, *Craseonycteris thonglongyai*?

Sébastien Puechmaille, University College Dublin; s.puechmaille@gmail.com

The Craseonycteridae, the most recent mammalian family to be described, has only one representative, *Craseonycteris thonglongyai*. This cave-roosting insectivorous bat species is well known to be the smallest mammal in the world. However its distribution, status, biology and ecology are poorly known. For nearly 20 years after its discovery, the species was still only known to be in a few caves in Kanchanaburi Province, Thailand. In 2001, surveys in Myanmar revealed the existence of a second population in the Mon and Kayin States, increasing our knowledge of the distribution and population size of this endangered species. Interestingly, the Myanmar and Thai populations exhibit a 8-10 kHz difference in echolocation call peak frequency, raising important questions about the possible presence of cryptic species.

Between 1997 and 2008, 181 caves were surveyed for the presence of *Craseonycteris* in Thailand and Myanmar. Colony size was estimated by diverse methods, including direct counts inside the cave, photographic counts and emergence counts. These data were then used and extrapolated to estimate the total population size for *Craseonycteris* over its entire range. During field surveys, echolocation calls and genetic data were also gathered from the entire distribution of the species.

The census population size obtained was 6,487 in Thailand and 3,770 in Myanmar for the caves surveyed. We then estimated the total population size of the Thai *Craseonycteris* to ca. 45,000 individuals whereas more data would be needed to reliably estimate the size of the Myanmar population. The largest *Craseonycteris* colony discovered to date is in Myanmar with over 2,000 individuals. Genetic data show a very clear isolation between the Thai and Myanmar populations suggesting they might be different species.

The increases in distribution and population size coupled with the new genetic findings suggest that the conservation status of *Craseonycteris thonglongyai* has to be revisited.

Echoes from insects: what bats get back

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Echolocation calls of bats span the upper sonic to the lower ultrasonic band, from around 10 kHz to just over 200 kHz. At the upper end, they are limited by atmospheric attenuation, which can absorb over 10 dB of sound intensity for every meter travelled by the echolocation call. At the lower frequency end, the amount of energy reflected by an object reduces as the object becomes smaller than the wavelength of the sound. These two factors interact in a complex way to determine what frequency the bat should use to detect a certain size of object. The traditional view has been that in order to detect small objects at maximum range, the bat should use high frequencies. By investigating the reflections from real insects in the laboratory, we demonstrate that the situation is much more complicated than this, and that insects do not behave in the same way as simple acoustic models.

The utility of speech recognition technology for the classification of acoustic signals: bats are not birds

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Most vocalisations of animals have evolved to convey information on the identity of the calling individual. A significant proportion of this information stems from resonance patterns created by the vocal tract. The echolocation calls of bats have evolved under different selection pressures – not to identify the caller to conspecifics but to locate objects in 3-dimensional space. However, it is possible that vocal tract resonance patterns exist in the calls. Here we provide results from a study that used cepstral coefficients to identify 15 US species of bat from their echolocation calls. Cepstral coefficients encode resonance patterns and are the basis of many human speech recognition systems. The data set included 11 species from the genus *Myotis*, commonly considered the most difficult to identify acoustically. The performance of the cepstral-based bat classifier was poor (mean correct ID rate 55%) compared with one trained using traditional spectral and temporal call parameters (mean correct ID rate 82%). Splitting the bats into geographic regions increased the identification rate. This work shows that information derived from vocal tract resonance patterns is not useful for identification. However, traditional parameters, coupled with an ensemble-based classifier, are very good.

Food for thought: the barbastelle and a molecular approach to diet analysis

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Understanding an animal's dietary requirements is an important element in the effective conservation of all predatory species. For insectivorous bats, information on diet has traditionally been gained through the microscopic visual identification of prey fragments that remain within faecal samples. Despite the usefulness of such techniques they frequently incur bias against heavily digested soft-bodied prey and are limited in the level to which many prey items can be identified taxonomically. To overcome these problems we developed a novel molecular-based technique, utilising heavily fragmented prey DNA remaining within bat faeces to reduce bias and enable the identification of insect prey items to species-level. This study aimed to significantly improve our understanding of the diet of the barbastelle, a moth-specialist species for which little information has been gained through traditional microscopic analysis techniques.