

Bat Box Project

Introduction

The Woodland bat species in Jersey are a bit of a mystery. Little is known of the bats roosting in our local trees which are considered relatively immature having mostly been felled during the occupation. The Jersey Bat Group/Collett Trust for Endangered Species believe that the age of the tree is less important than previously thought and that we do have bats roosting and breeding in some of our woods in Jersey. We would like to investigate this hypothesis further by discovering and identifying the species that are found in our woods as part of a wider Woodland Bat project.

As a tool to expand our knowledge of woodland bat species we are proposing to erect bat boxes in the various island woods during the winter of 2014/15. The idea of compensating for the loss of bat roosts in forests by the erection of artificial boxes is more than 100 years old (*Meschede & Heller 2000*) and one that has been used successfully in many British and European projects.

Another hypothesis that we will be testing regards bat species v height of box. Several surveys have results of *Nyctalus noctula* preferring boxes at higher levels whereas *Plecotus auritus* and *Myotis nattereri* seemingly prefer boxes at lower levels (*Vincent Wildlife Trust batbox database*) - We plan to test this hypothesis as we have the latter two species in the island and echolocation recordings have indicated that we also have the former.

The boxes will be monitored for occupation by volunteers using non-invasive methods during the spring and summer months. This is a long-term project which will last for at least 5 years during which time we plan to use other investigative tools to monitor our woodland species, such as other types of box, camera traps.

Aims

1. Expand local knowledge of the status, distribution, ecology and population trends of woodland bat species through the monitoring of these supplementary roosts. (*Island Action plan objectives & targets 4.2*)
2. To provide additional roosts for woodland bat species and therefore encourage conditions which would lead to an increase in bat populations (*Island Action plan objectives & targets 4.3*)
3. To test the hypothesis that certain species of bat prefer boxes placed higher on the tree and others prefer lower positions.

Methodology

The Jersey Bat Group in conjunction with the Collett Trust for Endangered Species will put up 50 bat boxes in island woods during the winter of 2014/15. The National Trust for Jersey and Jersey Water have given permission for boxes to be placed in their woods and we have asked the States Department of the Environment for permission to use their woods.

- 1) Boxes will be placed in the following woods (subject to permission from Environment dept.): St Peter's Valley, Hamptonne, Val de la Mare, Waterworks, La Hague and St Catherine's Woods,

although there may be others that can be considered. We have had success in all of these woods with echolocation.

The deployment method will be completely non-invasive. We will be using a version of the Kent Bat box which is recommended by the BCT and has had good results (*D. Fellman, Bat boxes at Priory country Park*) This is easy to construct and will have a lifespan of around 5-10 years using standard untreated timber. The advantages of this box include 1) it is self-cleaning due to design, 2) easy to construct (personal experience), 3) Proven use by bat species (*Lisa Worledge*) 4) it enables simple collection of droppings using a shelf underneath. 5) Birds cannot nest in it, 6) The two channel construction allows different species of bat to occupy it. 6) One can visually see if the box is occupied

Disadvantages include 1) Whilst having good results they are predominantly occupied by Pipistrelle species 2) They are unlikely to last for more than 10 years 3) As one cannot open them up to inspect the occupants, it may be difficult to identify the species without droppings.



- 2) Boxes will be erected during the winter at a height of between 2.5-4m with a clear flight line as recommended by the BCT and up to 2 boxes per tree as feasible. One box or two boxes per wood will be positioned at a height of 6m above ground level. This is to encourage bats that prefer higher roosts. The others will all be below 4m for health and safety reasons and ease of monitoring.



- 3) Box orientation was not considered a significant factor in neither the *Dodds/Billston project* nor the *Vincent Wildlife Trust batbox database* and, as our boxes will be mainly under the canopy, this should not have much effect on temperature.
- 4) Various species of trees will be used for this project including predominantly *Quercus spp*, *Alnus spp*, *Acer spp*, *Fagus spp*, *Abies spp* and *Picea spp*. Advice has been sought from Jersey Trees for Life.

Trees will be chosen that have trunks with diameters of >40cm for ease of securing (personal experience).

- 5) Boxes will be placed in shaded, stable, non-intervention woodland with closed canopy above and natural or lapsed coppice underneath (*Finemere study- Dobbs 2008, Phillips 2009, Billston 2011*). This is to ensure that temperature variation is kept to a minimum (to reduce variables) and that they are not obvious to the general public (possible vandalism or complaints). In certain woods we may struggle to find natural or lapsed coppice undergrowth but will try to reduce this variable as much as is possible.
- 6) Where feasible boxes will be located on trees in a line running parallel to the edge of the woodland, for example this will be relatively simple at Val de la Mare, St Peter's Valley and Hamptonne. Bats frequently hunt along line features and also this will make monitoring easier. We also do not wish the boxes to be too obvious to the general public.
- 7) Approximately 1.5 m directly underneath each box we will erect a shelf of 15cm in width for collection of any droppings at a height that can be seen visually or with a long-handled mirror.



- 8) Each box position will have its co-ordinates taken and a map will be created.
- 9) Fixings will be made with aluminium alloy which can be cut through without damaging chainsaws should the tree fall and need to be cut up. Each box will have 3 small flexible brackets attached to allow for the curvature of the tree, two at the top and one at the bottom.



- 10) These boxes will be checked once per month between April and October by myself and members of the Bat Group by observing any droppings on the shelf below. Other evidence of occupation includes visual examination from below, urine splattering, echolocation and visual monitoring of emergence. We will build up a data base of droppings and with the aid of DNA analysis expect to identify the occupying species. The shelf will be cleaned of any droppings after each monitoring session. We also plan to utilize one or more Infra-Red camera traps (the Collett Trust has been using Reconyx camera traps since 2009 with good results).
- 11) We do not plan to disturb the boxes in any way although we envisage having the appropriate authority to do this in the near future so we can trial other types of bat box that are for example not self-cleaning.
- 12) It is not envisaged that these boxes will be rapidly occupied and it is likely that some will never be occupied. After 5 years (May 2020) if a box has not been used we will remove it.

The Bat Group has the appropriate insurance to cover the erection and monitoring of the boxes and we have written a risk assessment on the project.

Discussion

This is a long-term project which involves the commitment of the Collett Trust and the Jersey Bat Group to regularly monitor the boxes. In theory it should provide new roosts for bats which are probably needed due to the modernising of our houses which generally exclude bats. It should also improve the encounter rates for individual bats leading to more robust population data and further study *opportunities* (*A comparison of different bat box types by bat occupancy in deciduous woodland, Buckinghamshire* by M. Dodds Y H. Bilston). There is also a likelihood that we may discover previously unrecorded species due to our proximity with France and the rest of Europe.

Around three quarters of British Bats roost in trees (*BCT*) and we believe that at least some of these bats will utilise our bat boxes. Although woodland specialist bats such as Barbastelle and Bechsteins Bat are probably unlikely to exist here, as our woods are relatively small, those that forage in woodland habitats

including *Pipistrellus* spp, *Myotis* spp, (Natterer's, Brandts, Whiskered, Daubentons), Leislars, Noctules and Brown Long-eared (*Chris Scott/John Altringham*) could be found here in our woods. Natural roosts are probably limited in our relatively young Jersey trees therefore we do not believe that the boxes will interfere with natural roost usage. The bats have a choice and will in any case move roost on a regular basis due to disturbance, build up of parasites, change in microclimate, or for other reasons unknown. *Siemers & Swift (2005)* have demonstrated that different sensory ecology, prey selection and hunting strategies minimise competition between sympatric bat species therefore we do not expect utilization of the boxes to add to competition amongst species.

During the AEWC Ltd trapping survey in St Catherine's woods we caught 2 juvenile Natterers in the same trap. This leads one to the probability that they were breeding nearby.

Variables in the bat box project will be kept to a minimum e.g. temperature due to boxes being located under the canopy, box design, clusters (normally 2 boxes per tree when viable), position within the woodland, altitude of site (irrelevant in Jersey). However there will be some variables including the site and species of tree onto which we attach the box. These last two are considered nested variables which have significance when using a statistical program such as ANOVA. Species of tree is unlikely to make much difference as British tree roosting species do not make the features in the trees in which they roost – they search out features such as Woodpecker holes (*Nyctalus noctula*) or Hazard beams (*Plecotus auritus*) *H. Andrews – Bat tree habitat key*. Likewise site variables are not going to be great in a small island such as Jersey.

The variable that we wish to test is the height of the box above ground level. Several surveys suggest that two of our larger bats – *Nyctalus noctula* and *Nyctalus leisleri* prefer higher roosts. The former often uses Woodpecker holes which are usually created high on the tree in the UK. We therefore plan to place one or two boxes in each site at a height of 6m. The rest of the boxes will be placed between 2.5 – 4m in height.

Regular monitoring in the winter months is not considered necessary due to greatly reduced chances of occupancy (*Vincent Wildlife Trust batbox database summary of major results states 'Occupancy rates showed a clear winter trough with less than 2% in February rising to 10% in Aug/Sept'*). Most bats need a roost with a stable cool winter temperature such as a bunker or underground tunnel in the winter months whilst they are in torpor.

It is presumed that bats will be used as indicator organisms in woodlands in some way in the future. Member states of the Eurobats agreement decided that resolution no. 4.4 during the 4th meeting of the parties in Sofia in 2003 that the Eurobats advisory committee should instigate the investigation, and, if appropriate, the development of the use of bats as indicators for sustainable forestry and biodiversity in certain habitats in Europe. It would be useful therefore to start woodland surveys of forest bat fauna sooner rather than later with an aim to improving the population's status by appropriate conservation measures. (*P. Boye/M Dietz - Development of good practice guidelines for woodland management for bats*)

We plan to use other types of box in the future e.g. some of the Schwegler woodcrete models which have proved to be popular amongst some species of bat. They are larger than the Kent boxes and could be used as maternity roosts. These boxes have the disadvantage of not being self-cleaning and therefore would need a licenced bat worker to open them for bat count/ID and for cleaning. They are also expensive and our funds do not run to this extra cost currently.

The Bat Group is a rapidly growing group of enthusiasts who are channelling their energies into advancement including licences for roost visits and survey licences. We hold monthly meetings and are a

registered charity. We also hold several Bat Walks for the general public each year which are proving to be very popular. This is an excellent opportunity to educate people about our local bats and get children interested.

The Collett Trust for Endangered Species is a Jersey registered non-profit organisation that was formed in 2008 and is for the conservation of species, in particular those considered endangered. Although most of our operations are conducted in NE Argentina, including two bat projects, we wish to devote some of our energies in Jersey to help further various environmental projects here.

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References

Matthew Dodds/Hannah Bilston A comparison of different bat box designs by bat occupancy in deciduous woodland, Buckinghamshire.

Denise Foster – The importance of bat box monitoring

Simon Poulton – An analysis of the usage of batboxes in England, Wales and Ireland

Vincent Wildlife Trust

P. Boye/M. Dietz – Development of good practice guidelines for woodland management of bats

Bat Conservation Trust

H Andrews – Bat Tree Habitat Key

Daniel Fellman – Bat boxes at Priory Country Park

Appendices

Tree Requirements for volunteers

Survey form

Risk assessment

Map of Jersey Woods