A study of bat activity at Avon Meadows, Pershore, Worcestershire, 2015.
An overview of findings.

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Summary
A qualitative bat survey was carried out in October 2016 on the Avon Meadows Community Wetland in Pershore. Seven species of bat were recorded:

Daubenton's Bat *Myotis daubentonii*
Natterer's Bat *Myotis nattereri*
Noctule *Nyctalus noctula*
Common Pipistrelle *Pipistrellus pipistrellus*
Soprano Pipistrelle *Pipistrellus pygmaeus*
Nathusius' Pipistrelle *Pipistrellus nathusii*
Brown Long-eared Bat *Plecotus auritus*

It is clear from these results that the area is an important foraging area for bats.

Introduction
The Avon Meadows Community Wetland and Local Nature Reserve in Pershore, Worcestershire was established in 2008. It covers 24 hectares of land set between the River Avon to the east and the market town of Pershore to the south and west and comprises a mix of lowland wet grassland, reedbed, open water, scrub and a network of a drainage ditches. The Piddle Brook, lined with mature Crack Willow *Salix fragilis*, Ash *Fraxinus excelsior* and scrub, forms part of the eastern boundary of the site, entering the site to the north and joining the River Avon to the east.

While bat activity had been informally recorded across the site in the past, no formal study targeted at identifying species presence over a period of time has been undertaken; therefore this short study is aimed to provide more detailed information on the species using the site for the purposes of foraging or dispersal from nearby roosts.

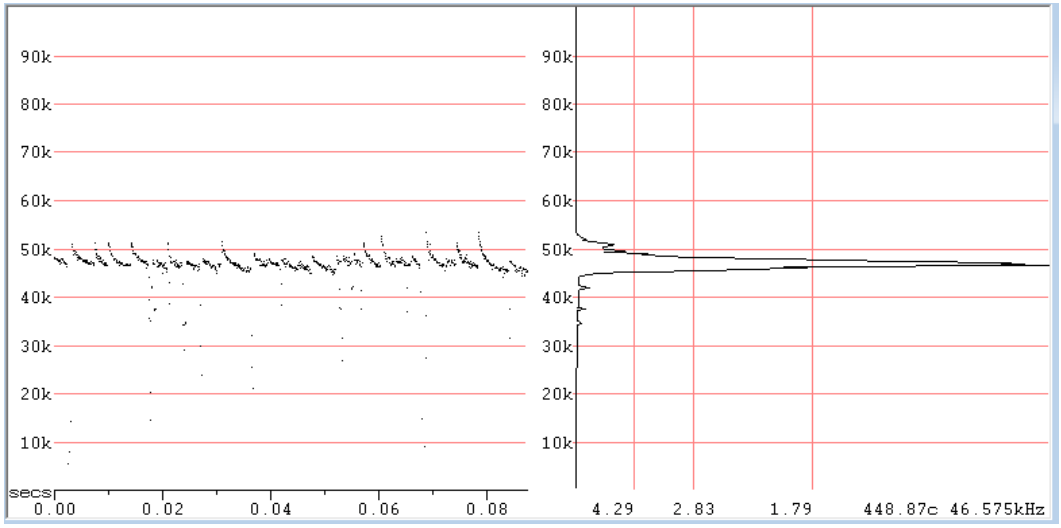
Methods
The study was carried out using an Anabat Express detector which is an automated static bat detector that records bat calls in a zero crossing format onto an SD card. The detector, which has an inbuilt GPS receiver, was set to switch on and activate recording mode from 30 minutes before sunset to 30 minutes after sunrise. The Anabat Express was placed in two locations, set high up in mature trees, along the Piddle Brook between 13th and 26th October 2015. The detector was placed in Location 1 (SO95450 46738) between 13th-20th October and in Location 2 (SO95468 46541) between 20th and 26th October. Although October is generally considered to be late in the bat active season, unusually warm weather for this time of year meant that conditions were suitable for bats to still be active. Over this two-week period sunset times ranged from 18.18 BST to 16.53 GMT and sunrise times ranged from 07.31 BST to 06.53 GMT.

Bat calls were analysed and identified using Analook software with split screens showing 'slope', 'cycles' and 'measures' details of the calls and with the aid of Russ 2012.

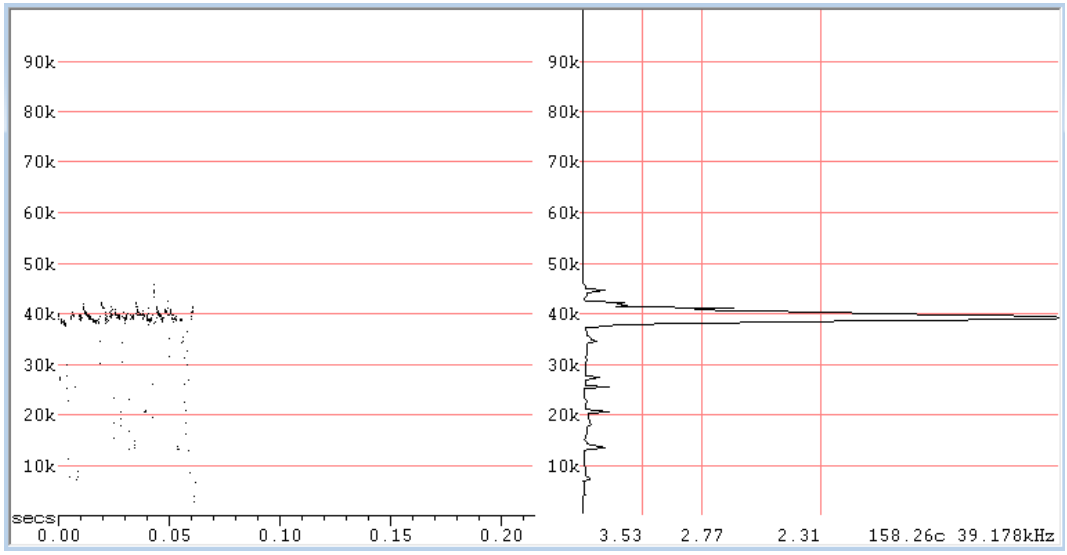
Discussion
Over the two-week period over 600 bat calls were recorded, proving that there was no shortage of bats at this late stage in the season! A total of seven species were positively identified. These included three passes by a Nathusius Pipistrelle *Pipistrellus nathusii* (a first for Avon Meadows) on 13th October at 18.52 and 18.53 (within 40 minutes of sunset). The Nathusius Pipistrelle is a rare but fairly widespread species, which is known to be associated with waterbodies and, being a migratory species, is commonly encountered in the autumn.

There were numerous records of Common Pipistrelle *Pipistrellus pipistrellus* and Soprano Pipistrelle *Pipistrellus pygmaeus*, including social calls from Soprano Pipistrelle. The timings of the records suggest that a roost site was located close by, with Soprano Pipistrelle calls (including social calls) being recorded eight minutes after sunset and Common Pipistrelle calls commencing 15 minutes after sunset. Daubenton's Bat *Myotis daubentonii* was recorded regularly and, as with Soprano Pipistrelle, social calls were recorded. Natterer's Bat *Myotis natterei* was a regular, Brown Long-eared Bat *Plecotus auritus* was recorded on a few occasions and there were a couple of passes by a Noctule *Nyctula noctula*. A lot of the calls were from Myotis species (a group of bats that include Natterer's Bat, Whiskered Bat *Myotis mystacinus*, Brandt's Bat *Myotis brandtii*, Daubenton's Bat and Bechstein's Bat *Myotis bechsteinii*). While, it was not possible to distinguish the species of many of the *Myotis* calls, likely due to the cluttered environment (nearby trees and overhanging vegetation) of the location in which the calls were recorded, it is clear from the number of unidentified Myotis calls that there was the potential for Whiskered/Brandt's and/or Bechstein's to be present.

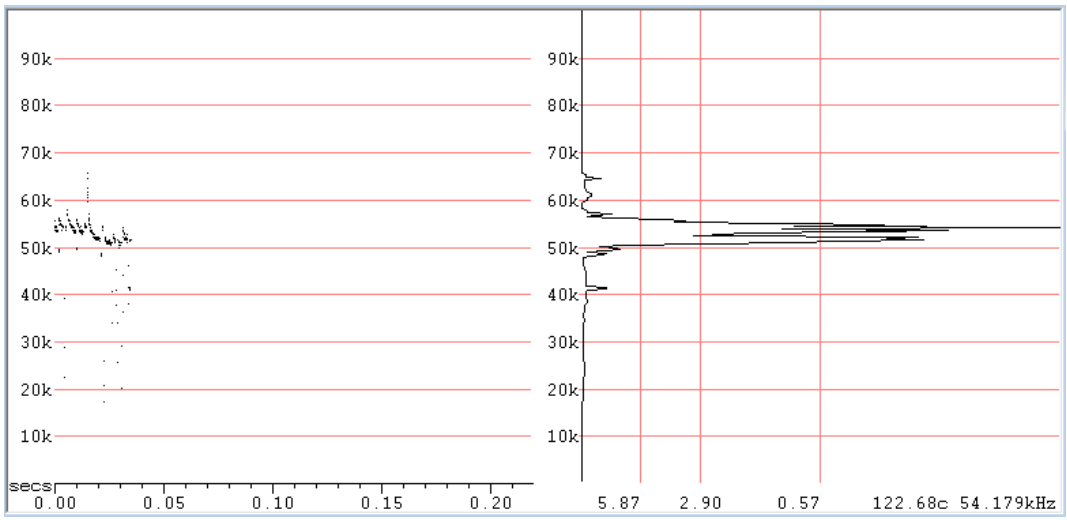
This short study, conducted towards the end of the bat active season, suggests that Avon Meadows provides suitable and valuable foraging resources for bats. The corridor formed by the Piddle Brook is used regularly by foraging and commuting bats and it is hoped that this type of survey can be extended to other parts of the site and throughout the bat active season in order to gain a better understanding of how bats utilise the site.



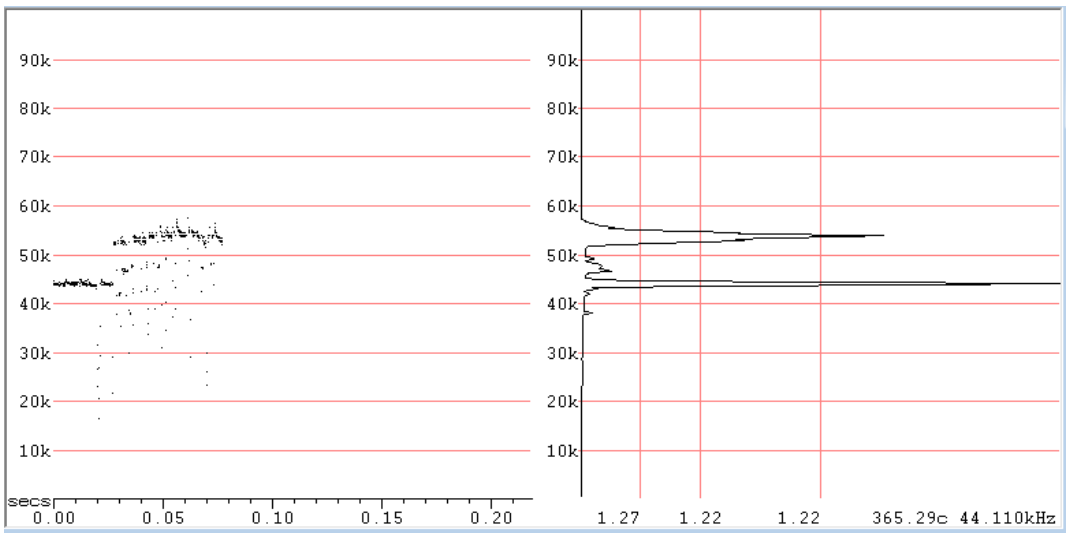
01. Sonogram viewed in Analook showing a Common Pipistrelle call with the peak frequency around 45kHz.



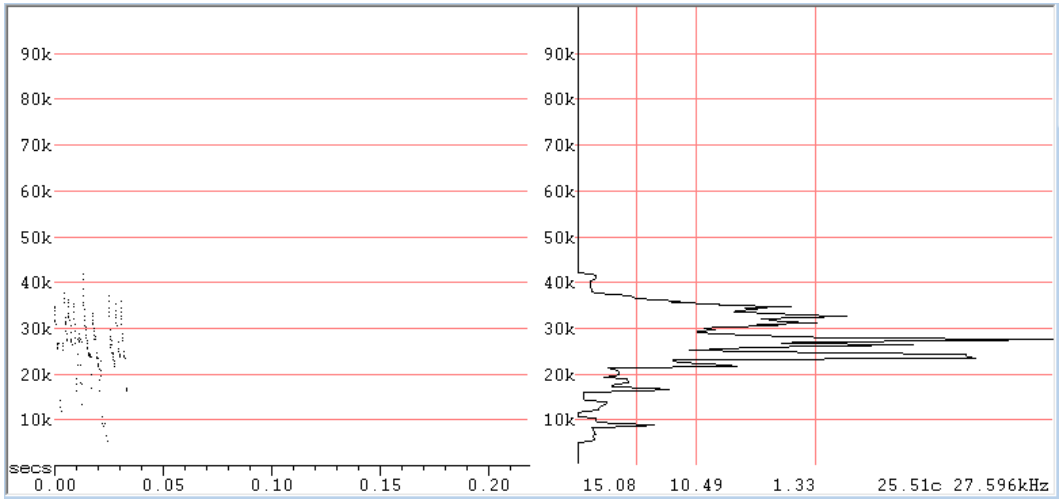
02. Sonogram viewed in Analook showing Nathusius Pipistrelle call showing a peak frequency of 39 kHz.



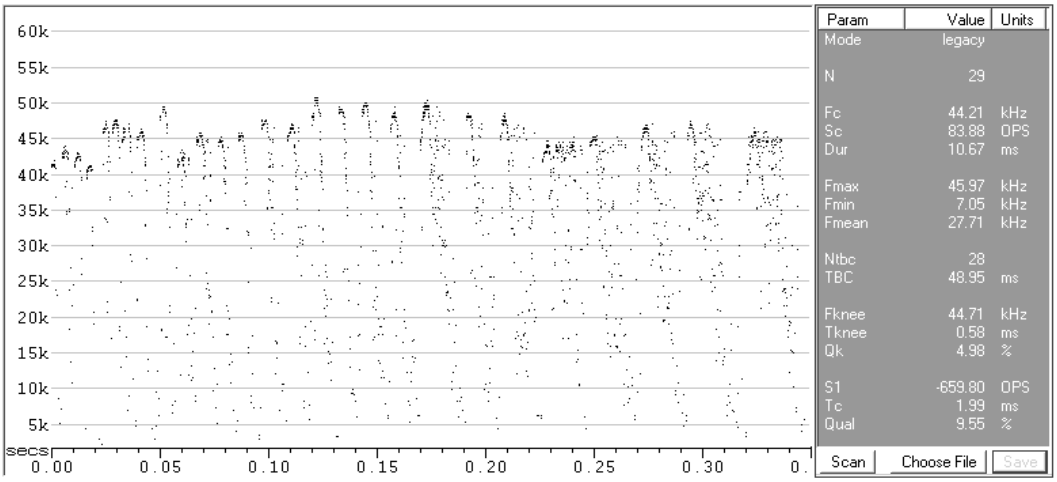
03. Sonogram viewed in Analook showing Soprano Pipistrelle call showing a peak frequency of around 55 kHz.



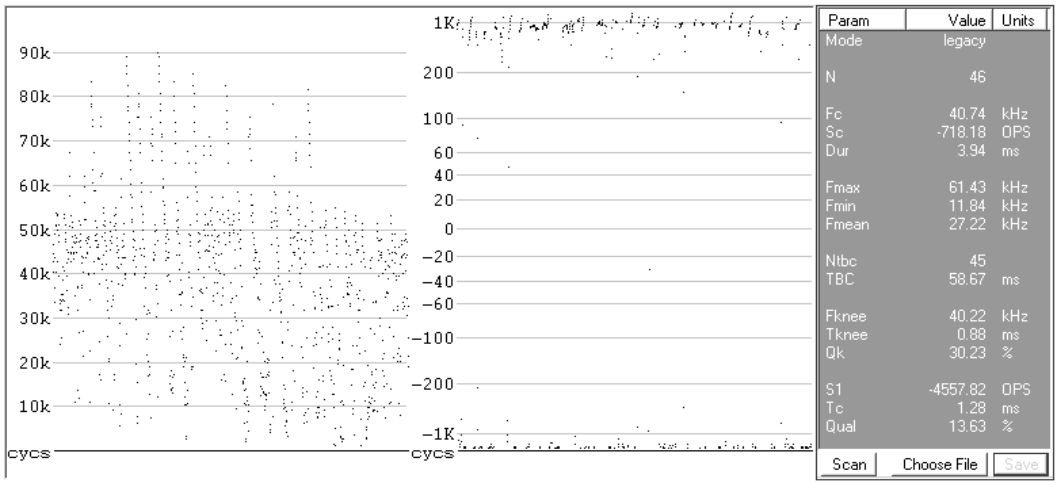
04. Sonogram viewed in Analook showing Common Pipistrelle and Soprano Pipistrelle calls together.



05. Sonogram viewed in Analook showing Brown Long-eared Bat call with a fundamental or first harmonic with a peak frequency of around 25 kHz and a second harmonic with a peak frequency of around 35 kHz.



06. Sonogram viewed in Analook showing the social call of a Daubenton's Bat, a call typically recorded during autumn swarming activity or while flying over open water.



07. Sonogram viewed in Analook showing Natterer's Bat call, with a split screen showing 'slope' (a measure of how vertical or horizontal a call sonogram appears, measured in octaves per second) and 'measures'. Natterer's Bat characteristically have calls that extend over a wide range of frequencies, therefore showing in Analook as having a 'high' slope (starting at a high frequency and descending very rapidly to a low frequency).

References

Russ, J. 2012. *British Bat Calls. A Guide to Species Identification.* Pelagic Publishing.

Acknowledgements

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