

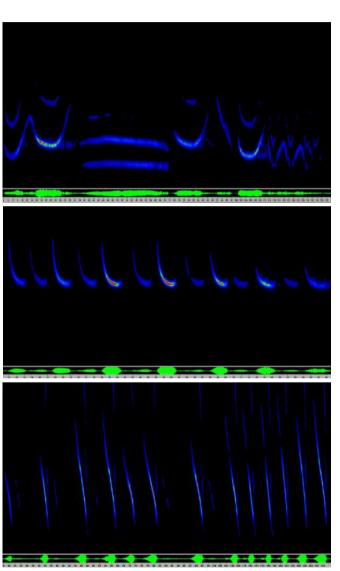


Bats, Bush-crickets and the future of acoustic monitoring Stuart Newson

Recent technological and other advances

- Potential to collect and analyse large volumes of acoustic data
- To provide a robust and representative assessment of species
- Main limitation, cost of equipment





Bat Monitoring Centres

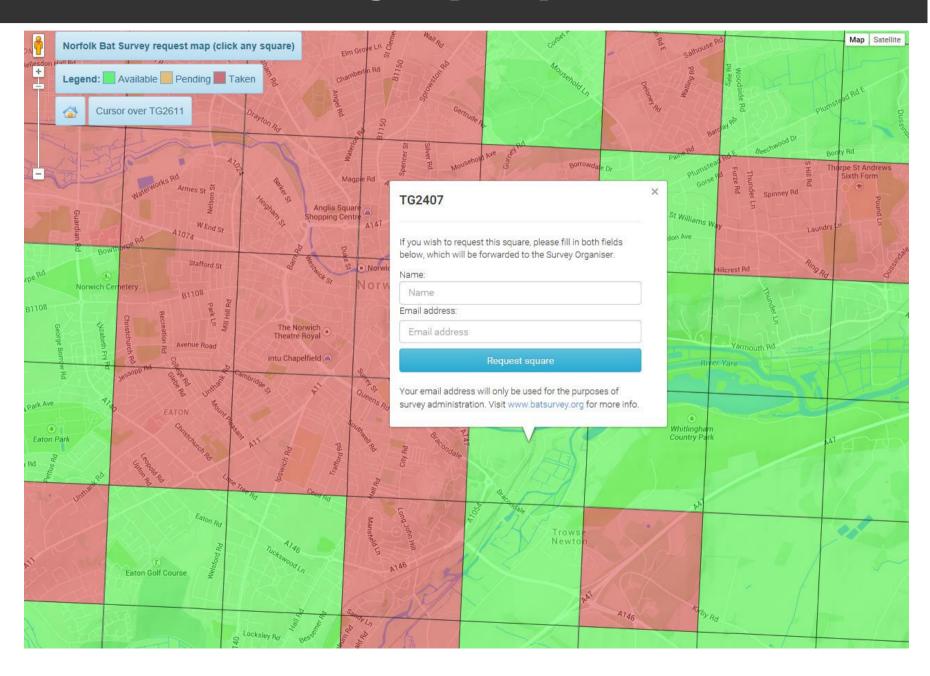




Bat Monitoring Centres



Sign-up map



Booking system

Contact details:

Caister Library

Beach Road

Caister

NR30 5EX

Phone: 01493 720594

Website: http://www.norfolk.gov.uk/Leisure and cult...

Opening Hours:

Monday: 10:30-13:00, 14:00-17:00 Tuesday: 10:30-13:00, 14:00-17:00 Thursday: 10:30-13:00, 14:00-17:00 Friday: 10:30-13:00, 14:00-19:00

Saturday: 09:30-12:30

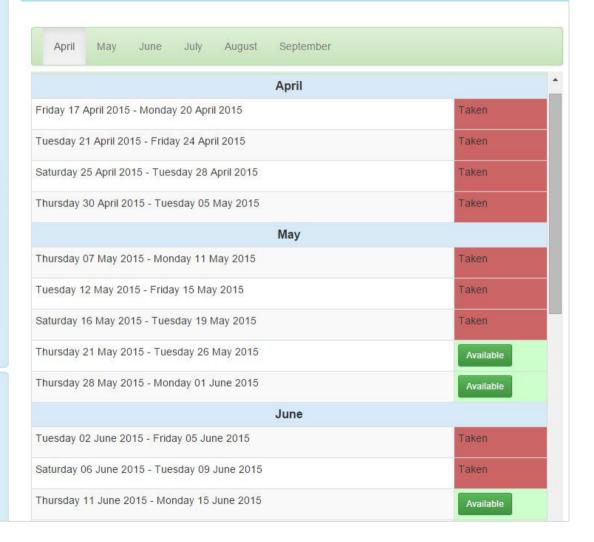
Bat Centre Locations:



Other Bat Centres:

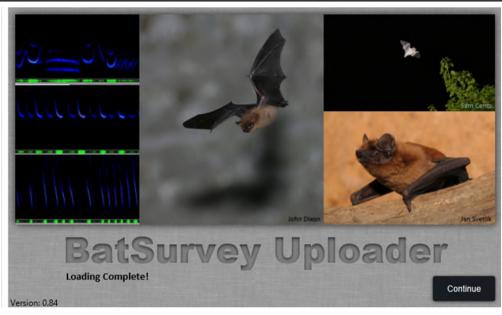
- Q Attleborough library
- Q Aylsham library
- Q Brandon Country Park
- Q British Trust for Ornithology, Thetford
- Q Dereham library
- Q Dinosaur Adventure, Lenwade
- Q Gaywood library
- Q Hethersett library
- Q Long Stratton library

Instructions: Please click on the date slot you would like to book the bat detector for, complete the contact details form and the system will email the Survey Organiser at the BTO with your request. A typical slot is 4 days (3 nights of recording / returning the detector on the fourth day), but may be longer depending on the opening hours of the centre holding the detector. If you have any problems please contact norfolkbatsurvey@gmail.com.



Software for direct upload of recordings





BatSurvey Uploader

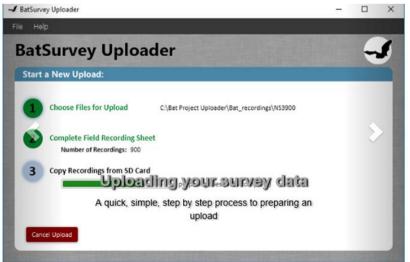
New for this survey season, you can now submit your bat survey recording files to the Bat Survey for analysis by uploading them directly using our new upload management app.

The application allows you to prepare an upload on your PC, complete a Field Recording Sheet with the details of your survey, and copy the acoustic recordings directly from the bat detector's memory card.

Once you have started an upload, you can use the app to view it's progress, and pause/resume it as needed.



For assistance with using the app, or to view answers to common questions, please see our Online Help pages.



Feedback



Bat Survey results for TG1022 from 3 survey nights

Below you can find a summary of the main findings from your bat survey visits. Further information for individual visits can be found on the following pages.

The total number of recordings per night:



Bat species detected:

Our provisional analysis of the recordings detected the following species. The numbers relate to the number of bat passes rather than the number of individual bats.

Species	Total number of passes (all nights)	
Barbastelle	3	
Brown long-eared bat	14	
Common pipistrelle	428	
Daubenton's bat	4	
Natterer's bat	16	
Noctule	5	
Serotine	16	
Soprano pipistrelle	158	

Below are details of recordings that could not be assigned with confidence to a single species.

Species	Total number of passes (all nights)	
Leisler's bat or Noctule	3	
Myotis species	6 53	
Pipistrelle species		

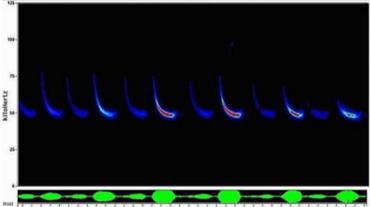
Note: Pipistrelle species = this refers to a recording of a bat in the genus *Pipistrellus* that cannot be identified to species. In the UK, possible species include Common Pipistrelle, Soprano Pipistrelle and Nathusius' Pipistrelle. Myotis species = this refers to a recording of a bat in the genus *Myotis* that cannot be identified with confidence to species. In the UK this includes Natherer's, Daubenton's, Whiskered, Brandt's, Alcathoe bat and Bechstein's

Common pipistrelle—peak frequency about 45 kHz

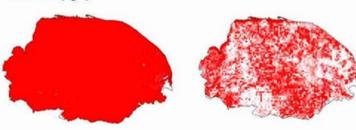


The Common Pipistrelle is the most common and widespread of British bat species. They appear fast and jerky in flight as they dodge about pursuing small insects which the bats catch and eat on the wing. A single Common Pipistrelle can consume up to 3,000 insects in a night.

Photo credit: Amy Lewis



Maps of predicted distribution (left) and activity as a measure of relative abundance (right)

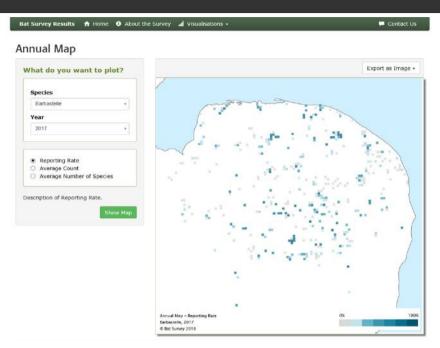


Taken from Newson et al. (2015) and derived from data collected by volunteers through the Norfolk Bat Survey (www.batsurvey.org)

Online results pages

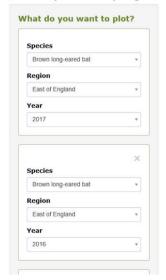


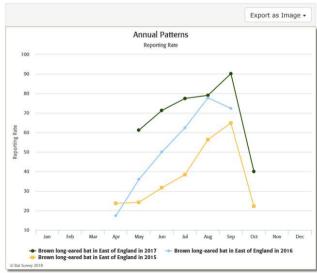
Export as Image +



Region Norfolk Year 2015 Total count of recordings (or bat cable) Count as a proportion of the total Total number of sites as a proportion of the total Total number of sites as a proportion of the total Total number of sites Number of Sites as a proportion of the total Total number of Sites Show Graph

Annual patterns by region





Habitat preference recorded by region

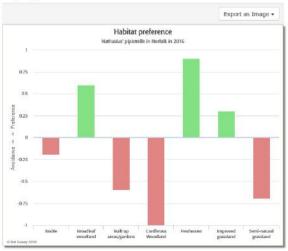
Bat Survey Results A Home 6 About the Survey .al Visualisations -

Bat Survey Results 🍵 Home 0 About the Survey 🚜 Visualisations •

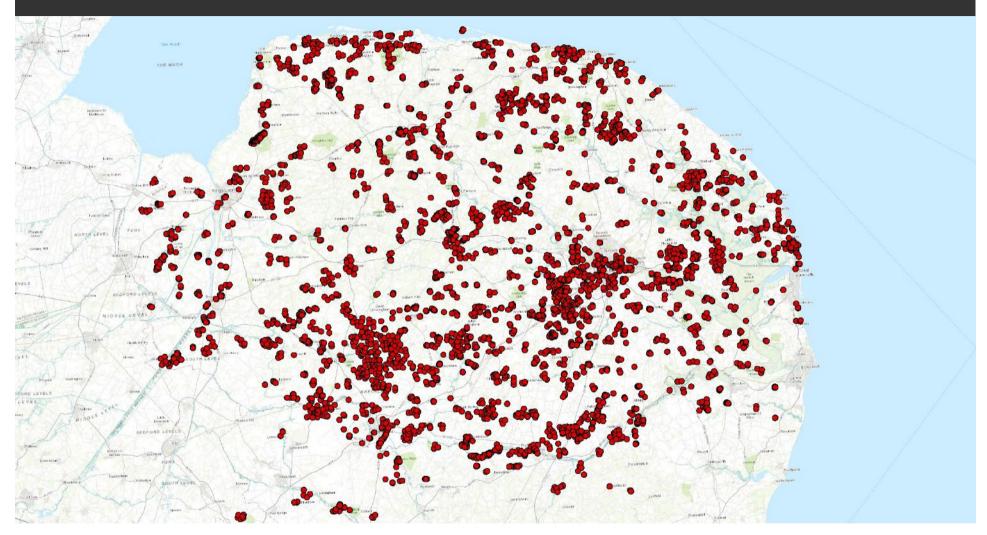
Bat species recorded by region

What do you want to plot?





Survey coverage



- 1,745 1-km squares surveyed (30% of Norfolk) 2013-2017
- 7,246 complete nights of recording
- > 1.7 million bat recordings

Community and participant involvement

- Project is working with a new volunteers largely non-bat specialists
- Broad range of communities and individuals including:

Schools

Local businesses

Farming community

Wildlife groups

Reserve managers

Families

Students

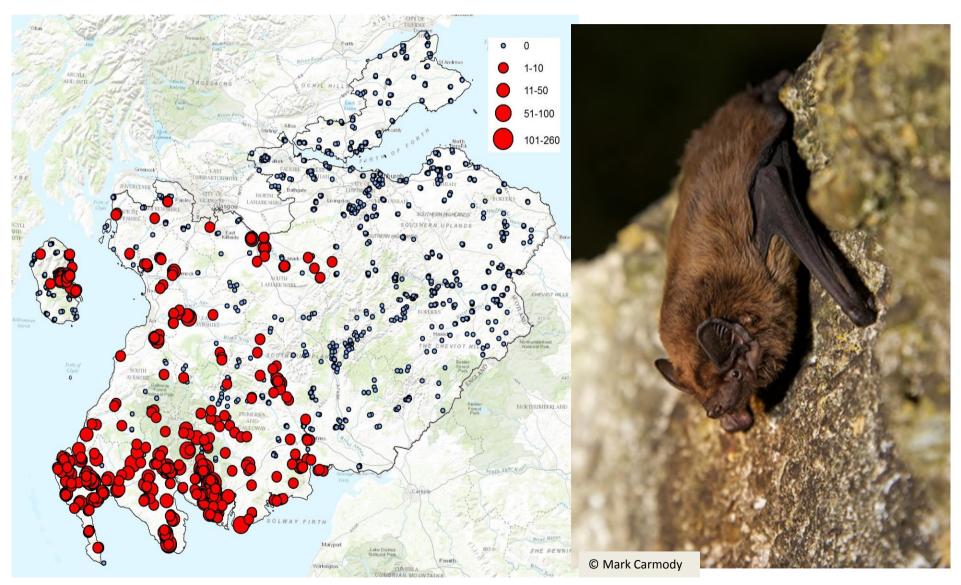


Summary of 'bat' recordings

Species	Recordings (2013-17)	
Common pipistrelle	958,245	
Soprano pipistrelle	541,796	
Noctule	30,742	
Daubenton's	30,519	3
Serotine	12,415	
Brown long-eared bat	10,752	
Natterer's	9,617	
Barbastelle	9,126	
Nathusius' pipistrelle	6,426	
Leisler's	1,913	
Whiskered / Brandt's	603	
Bat recordings (not assigned to species)	40,503	
Biological non-bat (e.g. bush-cricket)	> 900,000	

Scaling up: Southern Scotland Bat Survey





Newson et al. (2017). Biological Conservation

British Bat Survey



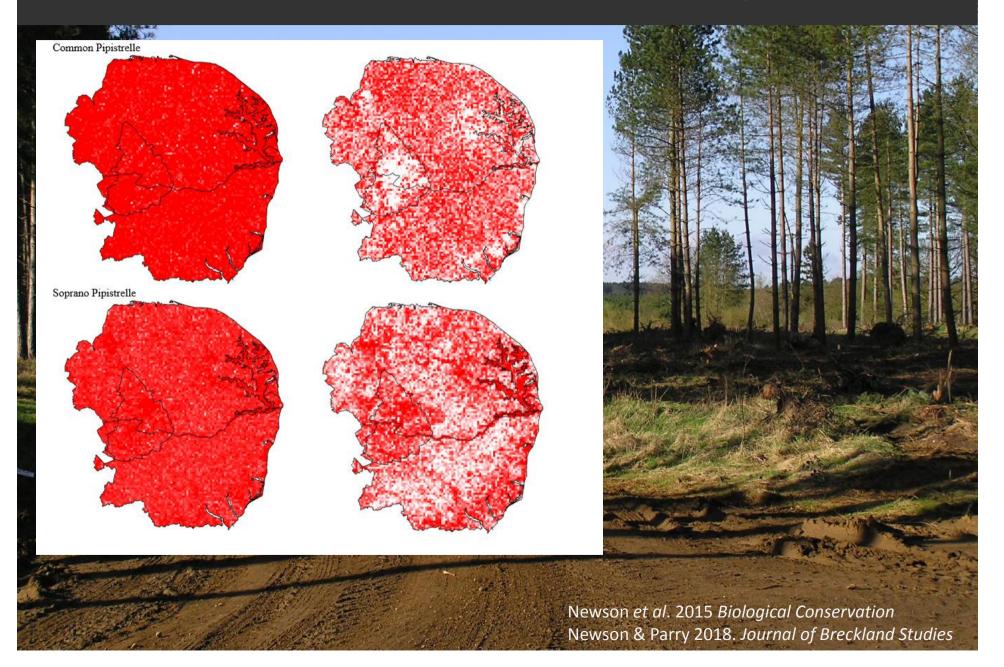
British Bat Survey

Welcome Taking Part in the Pilot About Research Contact

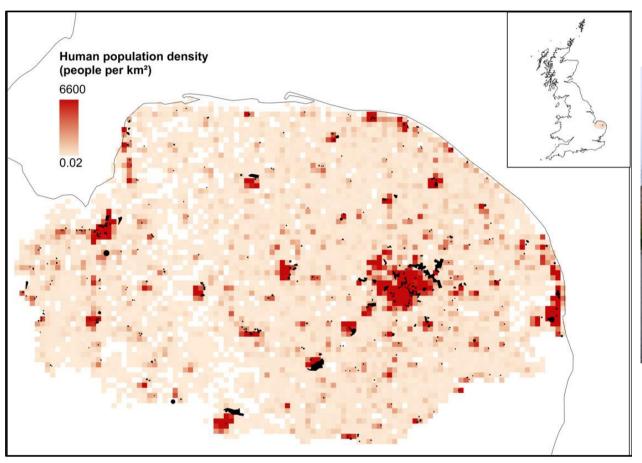


Welcome to the NERC-funded British Bat Survey project. Here you can find information on the project, who we are, and how to take part in the British Bat Survey Pilot Project.

Predicted occurrence (left) and activity (right)



Projected impact of planned housing on bats





• > 66,000 new houses, with a footprint of 27.1 km²

Projected impact of planned housing on bats

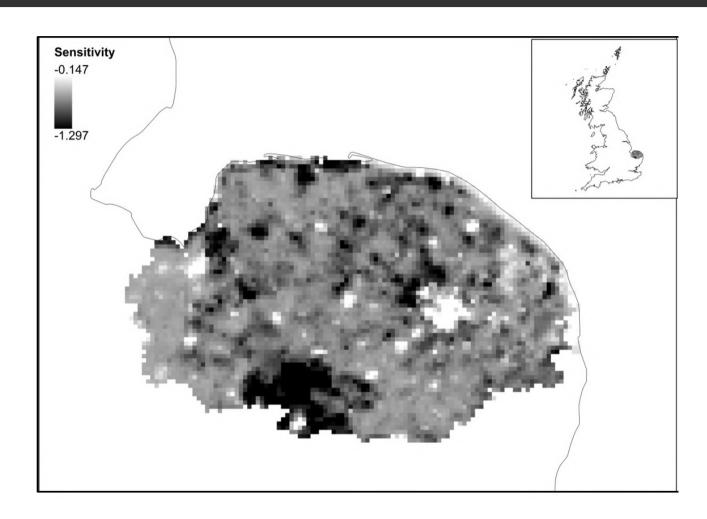


- Planned housing likely to negatively impact on bats
- Largest impact in preferred habitats (e.g. Thetford forest area)

Spatial variation in bat sensitivity to development

Sensitive areas determined by

- High probability of occurrence
- Many species
- Species' avoidance of urban areas

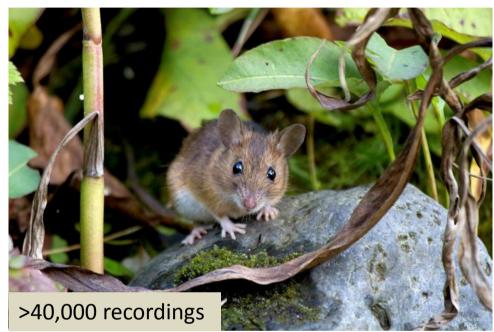


Mitigation

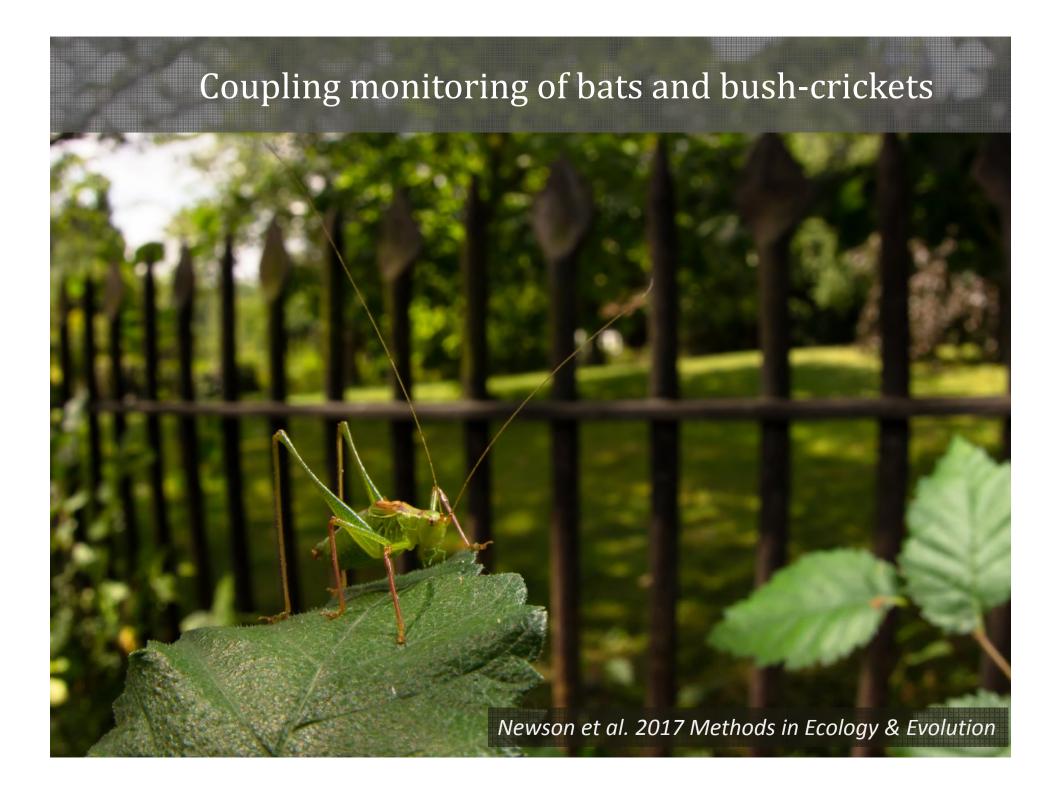
Guide housing allocations towards areas and habitats of least impact

Incidental recording of other species groups



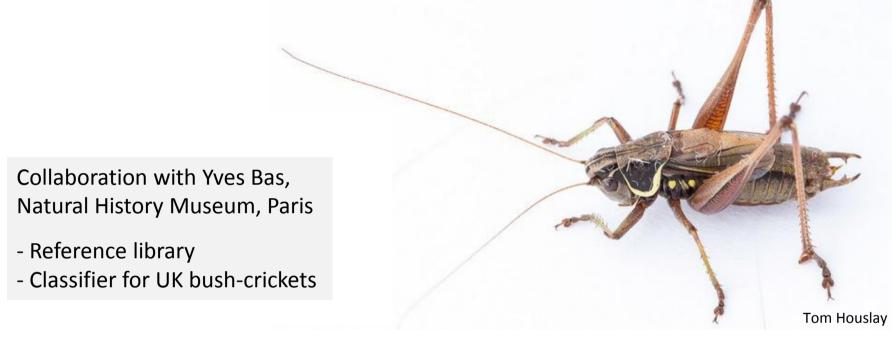


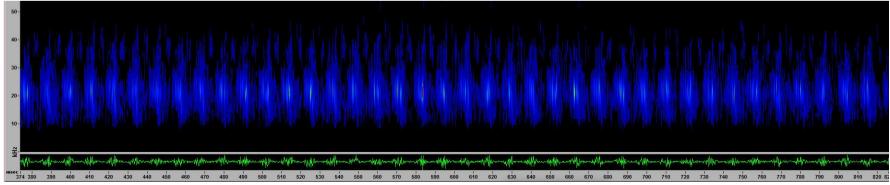




Coupling monitoring of bats and Orthoptera







Dersingham Bog NNR



- Intensive recording of bush-crickets over the day and night
- Potential relocation of Large Marsh Grasshopper and Bog Bush Cricket

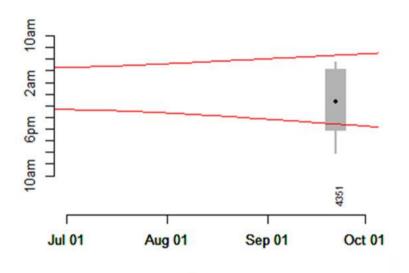




 To train local Schools and Dersingham Bog volunteer team to use bat detectors to carry out surveys in future years

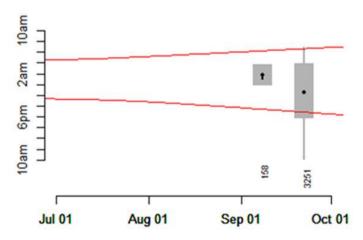
Detectors recording over the day and night

Dark bush-cricket





Speckled bush-cricket

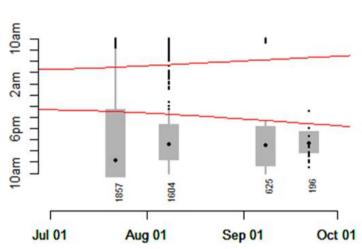




Newson et al. (2017). Methods in Ecology & Evolution

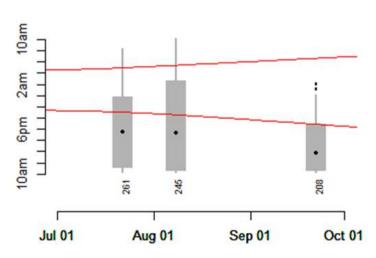
Detectors recording over the day and night







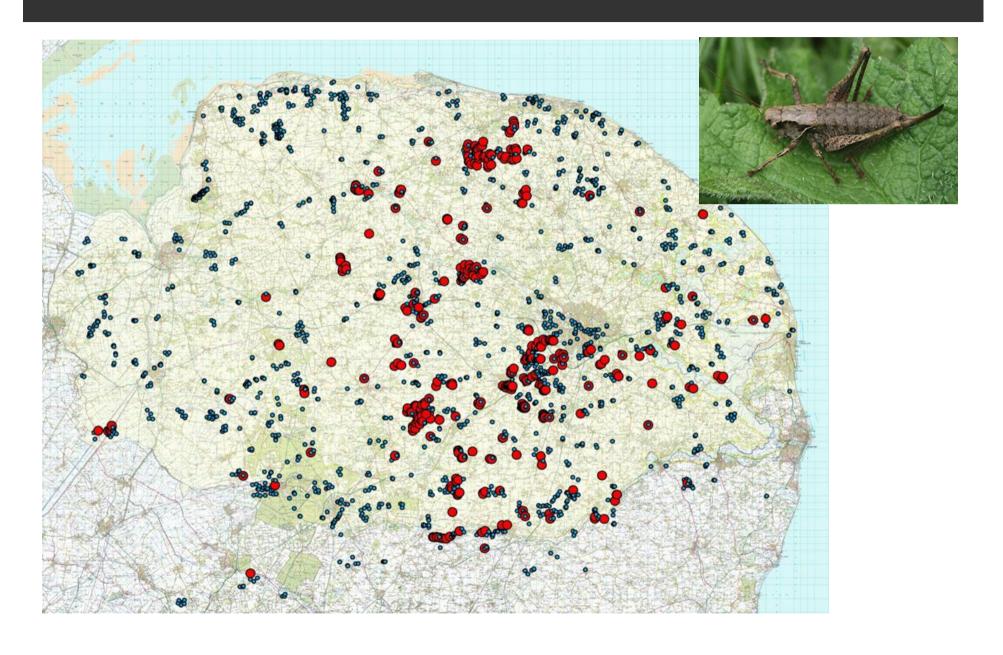
Roesel's bush-cricket



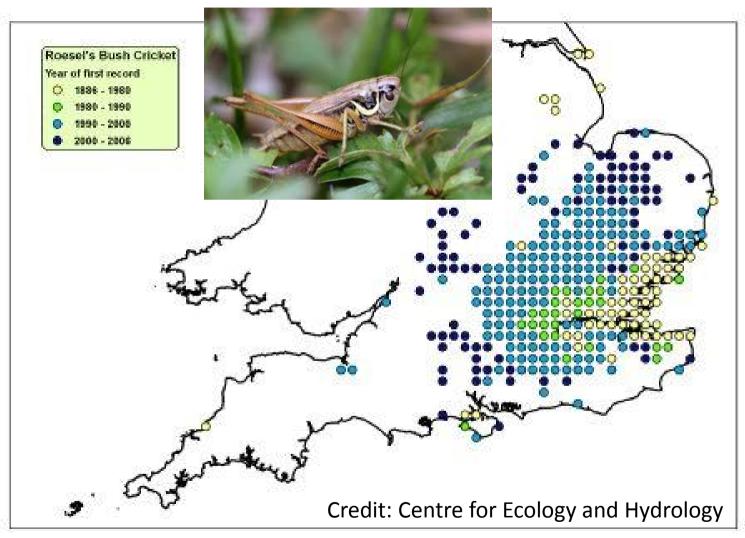


Newson et al. (2017). Methods in Ecology & Evolution

Dark Bush-cricket (42,132 recordings)

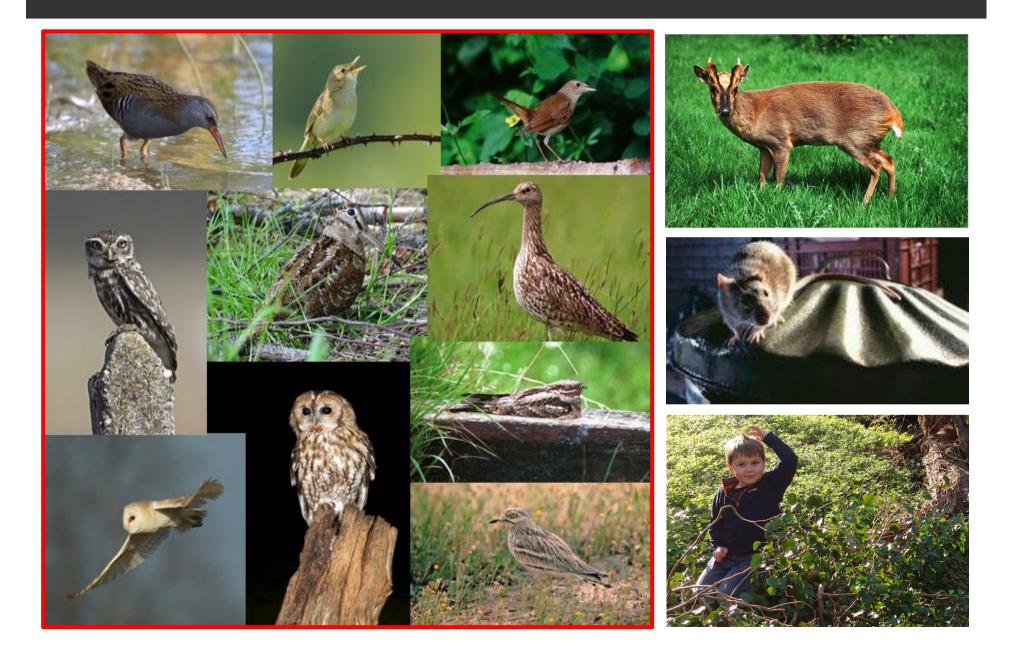


Potential for monitoring range change/colonisation



Grey Bush-Cricket and Large Conehead included in classifier as potential future colonists

Sound identification of nocturnal birds (and other stuff)



Sound identification of bumblebees





Low-cost acoustic / ultrasonic logger

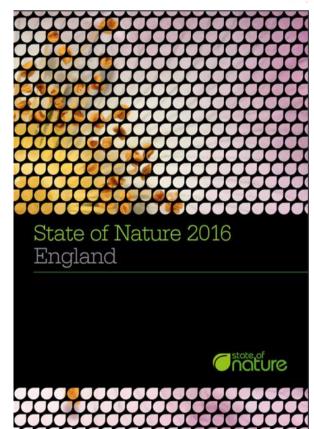


- AudioMoth <u>www.openacousticdevices.info/</u>
- NERC Innovation Fund Alex Rogers, Oxford University (UCL, BCT and BTO)
- Low-cost acoustic logger recording in full spectrum (about £40), configurable, recording up to 160 kHz).

Lessons learnt

BTO

- "Citizen Science"
 Interest and enthusiasm of the public
- Rapid and engaging feedback
- Robust data able to guide decision-making
- Take risks and find solutions as you go along
- Consider what more could be addressed
- Future technology



More information: www.batsurvey.org/publications

www.bto.org/research-data-services/publications/research-notes

Twitter @NewsonStuart