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Ecology of Bats (British & Irish Species) An Overview



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1

Today's Topics?

- Species & Distribution
- Seasonal Life Cycle
- Roosting behaviour
- Foraging behaviour / Use of Habitat
- Echolocation
- Mating behaviour
- Hibernation
- Q&A



2

What is a Bat?

(In Our Part of the World)

- Mammals
- Give birth to live young
- Capable of true flight
- Active at night
- During daytime – in day roost
- Our species echolocate to navigate & forage
- Hibernate during winter months




















3

Species

- c.50 Species of land mammal (UK & Ireland)
- *34 Species of small mammal,
**18 (53%) of which are bats
- *Total population estimated at 175.5M
- **Total bat population = 10.3M (6%)

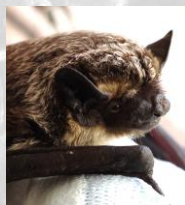


4

| Family | Genus | Species | Status | Distribution |
|---|---|---|--------------------------|----------------------|
| Rhinolophidae (Horseshoe Spp) | <i>Rhinolophus</i> |  Greater horseshoe | Resident | SW Eng, S Wales |
| | |  Lesser horseshoe | Resident | W Ire, SW Eng, Wales |
| Vespertilionidae (Vesper Spp) | <i>Pipistrellus</i> |  Common pipistrelle | Resident | GB, NI & Ireland |
| | |  Soprano pipistrelle | Resident/ Passage | GB, NI & Ireland |
| | |  Nathusius' pipistrelle | Resident/ Passage | GB, NI & Ireland |
| | <i>Myotis</i> |  Daubenton's bat | Resident | GB, NI & Ireland |
| | |  Natterer's bat | Resident | GB, NI & Ireland |
| | |  Whiskered bat | Resident | GB, NI & Ireland |
| | |  Brandt's bat | Resident | England & Wales |
| | <i>Plecotus</i> |  Bechstein's bat | Resident | S England & S Wales |
| | |  Alcathoe Bat | Resident | England |
| | <i>Plecotus</i> |  Brown long-eared bat | Resident | GB, NI & Ireland |
|  Grey long-eared bat | | Resident | S England & S Wales | |
| <i>Myotis</i> |  Noctule | Resident | Scotland, England, Wales | |
| |  Leisler's bat | Resident | GB, NI & Ireland | |
| <i>Eptesicus</i> |  Serotine | Resident | S England & S Wales | |
| <i>Barbastella</i> |  Barbastelle | Resident | S England & Wales | |

5

| Others | Genus | Species |
|---------------------------------|---------------------|----------------------------|
| Vagrants, Passage Or Unknown | <i>Pipistrellus</i> | Kuhl's pipistrelle |
| | <i>Myotis</i> | Greater mouse-eared bat |
| | | Pond bat Geoffroy's bat |
| | <i>Eptesicus</i> | Northern bat |
| <i>Vesperugo</i> | Parti-coloured bat | |



6

Foraging Behaviour & Use of Habitat

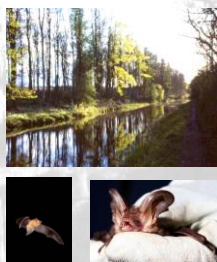
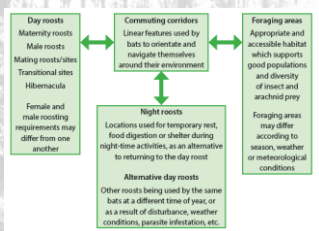


Figure taken from "Social Calls of the Bats of Britain & Ireland" (Middleton, Ford & French, 2014)

10

Linear Features

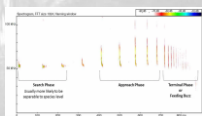
- Act as reference points in the dark
- Help to connect roosts with feeding areas
- Smaller bats = ~extremely important
- Removal = ~isolation/fragmentation
- Sheltered flyways
- Protection from predators
- Provide foraging opportunities



11

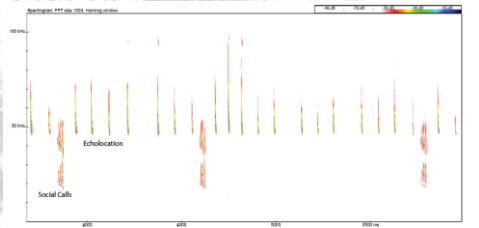
Echolocation

- *The analysis by an animal of the echoes of its own emitted sound waves* John D Altringham, Bats Biology and Behaviour
- Micro-bats (old currency!) to navigate & forage (some cases!)
- Sound travels at constant speed (340ms)
- Bat is listening for how long it takes for sound to come back relative to when it was emitted
- An 'adaptable tool' (It's NOT bird song!)
- Feeding Buzz = very fast echolocation
- Social Calls are nothing to do with echolocating = Communication



12

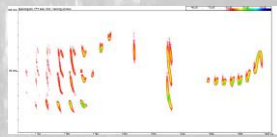
Echolocation & Social Calls Examples



13

Mating Behaviour

- Usually late summer through into autumn
- May also occur over winter & during spring
- Territorial behaviour can be evident
- *Pipistrellus/Nyctalus* – territorial – advertisement calls can be heard
- Purpose of these advertisement calls – twofold
- *Myotis* – swarming



14

Mating Behaviour

| Female ecology | Male strategy* | Description | Examples of species applicable |
|---|---------------------------|---|---|
| Mating strategies are driven by the female behaviours and the size and stability or lack of stability of the female range | Resource defence polygyny | Males defend territory, through which females pass, or which females are anticipated to visit | <i>Soprono phibetula</i> <i>Hidousia opaciorata</i> <i>Noctula</i> Greater horseshoe bat |
| | Female defence polygyny | Males are present with females within a stable, small setting during late summer or autumn, and defend access to these females from other males | Grey long-eared bat† |
| | Promiscuity | Swarming activity whereby large groups of bats are present at the same location and engage in mating. No fixed male territories | <i>Myotis</i> spp. Brown long-eared bat |
| | | Males are present with females within a relatively small location during late summer/early autumn and mate as/when an opportunity arises | <i>Myotis</i> spp. Brown long-eared bat |

- Mating - late summer/autumn
- Delayed fertilisation – store sperm & ovulate in spring
- Nursery roosts May - Aug
- Single pup born Jun - Aug
- At birth pup weighs 20-30% adult mass
- Weaning at 45-65 days



* As well as the strategies discussed above, many bat species are thought to adopt a selection of differing approaches independent upon the season, and a number of species have also demonstrated what would appear to be opportunistic behaviour (e.g. during hibernation).

Table taken from 'Social Calls of the Bats of Britain & Ireland' (Mason, Ford & French, 2018)

15

Hibernation

- Hibernation –Oct – –Mar
- Lack of food in winter
- Survive on stored fat
- Need constant temp and high humidity
- Body temp drops to just above ambient temp
- Can take half an hour to arouse from deep torpor
- 'Classic' & 'Non-Classic' roosting sites



16

Reference Material

- *Bats of Britain & Europe* (Dietz & Kiefer, 2016)
- *British Bats* (Altringham, 2003)
- *British Bat Calls – A Guide to Species Identification* (Russ, 2012)
- *Social Calls of The Bats of Britain & Ireland* (Middleton, Froud & French, 2014)
- *Ecology & Conservation of Bats in Villages and Towns* (Simon, Hüttenbügel & Smit-Viergutz, 2004)



17

Thanks For Attending Today



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18



19
