



BatMapper

Investigating effects of landscape and climate on roosting bats using citizen science

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BatMapper

Background

- Past research focused on foraging bats or very localised roost studies.
- Temperature and humidity of roosts are important to bats (Kunz, 1973)
- Microclimatic variability can lead to low roost fidelity.
- Changing climates and landscapes.



Photo by Jens Rydell
(<http://www.fladdermus.net>)



BatMapper

- Tricky to locate bat roosts
 - Extensive surveys
 - Prior knowledge
- Artportalen: alternative data source
- Public knowledge is high





BatMapper.org

- Citizen science website to record bat roost locations
 - Engage public in reporting bats
 - Gather more precise information
 - To enable site selection
 - To enable public involvement in surveying bats

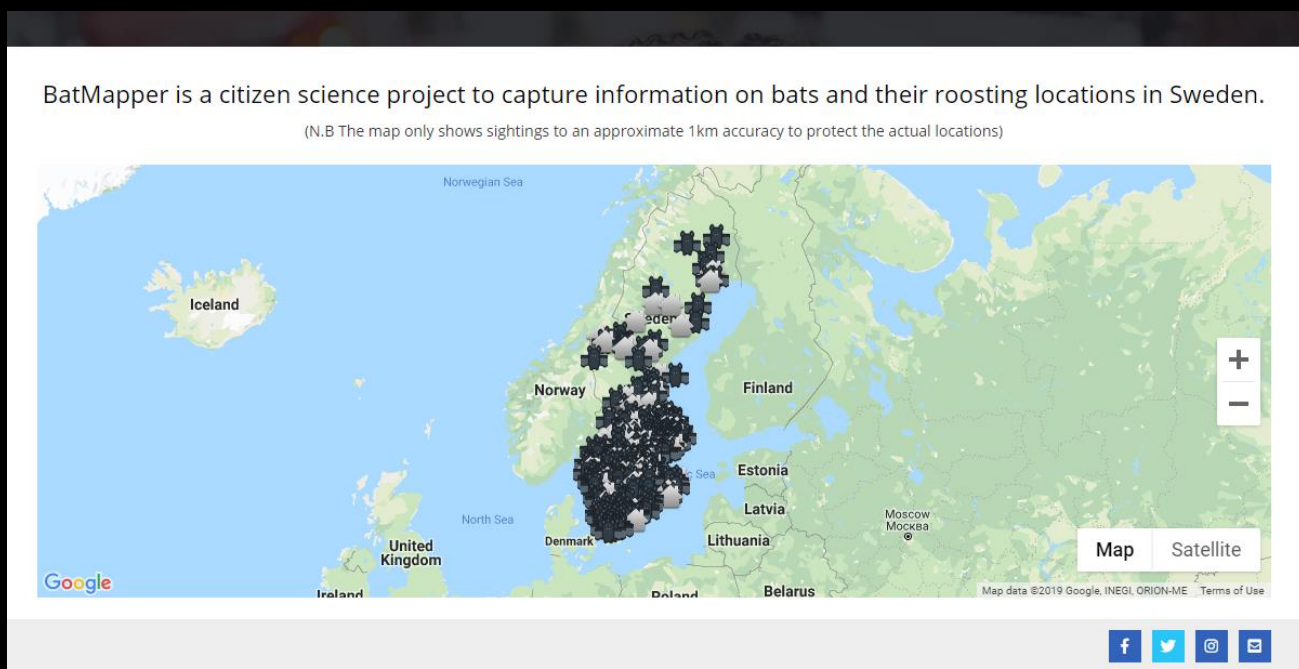


Photo by Jens Rydell
(<http://www.fladdermus.net>)



BatMapper.org

- Launched in July 2019
- >1000 registered users
- C. 200 bat roosts
- C. 800 bat sightings
- Fieldwork 2021-22



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BatMapper



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BatMapper

Research project:

- **Assessing the drivers of roost occupancy and foraging activity of *Eptesicus nilssonii* along a climatic gradient in Sweden using a citizen science approach?**





BatMapper

Background:

- *E. nilssonii* most common Swedish bat species (nordfladdermus)
- Population predicted to move north with climate change
- Declined dramatically in last 30 years
 - Possibly due to changes in street lighting
 - But probably also due to landscape and climate change
- Roosts mainly in houses
- Has slightly different ecology in north vs south Sweden
- Very limited research from northern populations

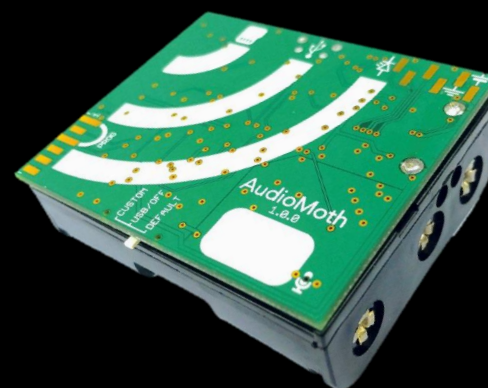




BatMapper

How:

- Estimate roost occupancy with the help of citizen scientists.
- Dataloggers will also measure microclimate within and outside the roosts.
- Install automatic bat detectors in surrounding foraging habitats.
- Collect bat droppings from every roost.





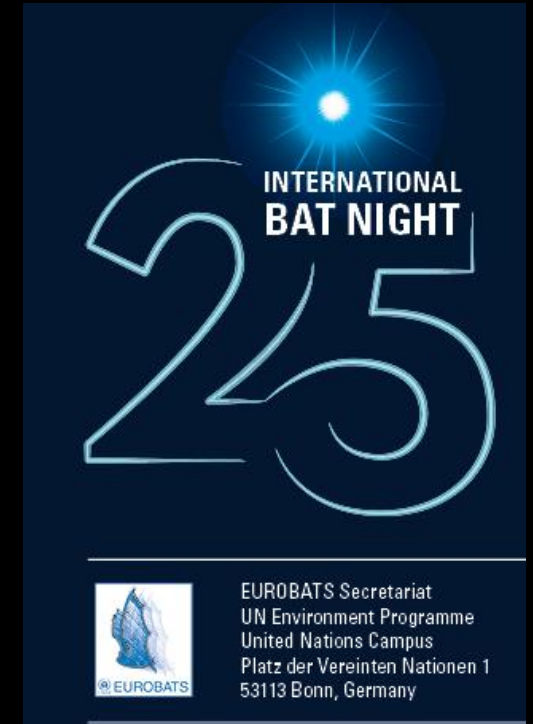
BatMapper

- How can you help?
 - Report any bat sightings on BatMapper
 - Report any known/suspected bat roosts on BatMapper.
 - Volunteer to help count bats.



Tips for beginners

- Become a member of a bat group
 - Fladdermöss i Sverige Facebook Group
 - BatLife Sweden (www.batlife-sweden.se)
- Do a guided bat walk
 - International Bat Night: Tovetorp 28th August
 - BatLife Sweden
- Websites:
 - www.chiroptera.se
 - www.fladdermus.net
 - www.bats.org.uk
 - www.eurobats.org
- Take a course
 - BatLife Sweden
 - Bat Conservation Trust (www.bats.org.uk)
- Buy a bat detector



Tips: How to look for bats

Bat detectors

- Heterodyne (cheapest and simplest)
 - It adds a frequency onto the bat's frequency to make it audible
 - Tricky to identify some species
 - Can only listen to one frequency (miss bats)
 - Can't use calls on bat software
 - E.g. Magneta Bat 5
- Frequency Division
 - Divides the frequency (usually by 10) to make it audible.
 - Detects all frequencies simultaneously.
 - Can use bat software to analyse calls.
 - E.g. Pettersson D-230



Tips: How to look for bats

Bat detectors

- Time Expansion
 - digitally record approx. 1 second of call and replay it usually ten times slower.
 - during playing back it becomes "deaf" to any bats flying past.
 - Calls can be analysed in software
 - E.g. **Pettersson D-240X Bat Detector**
- Full spectrum
 - All frequencies recorded simultaneously
 - Calls can be analysed in software
 - Active (Pettersson M500 or Echo Meter Touch)
 - Passive (Audio Moth, Song Meter SM4BAT, Pettersson D500x),



Species found around Tovetorp

Forest species

Brandts fladdermus (*Myotis brandtii*)

- relatively common forest species

Mustaschfladdermus (*Myotis mystacinus*)

- forests, parks, pastures, meadows

Fransfladdermus (*Myotis nattereri*)

- forest, open woodland, parks, near water

Vattenfladdermus (*Myotis daubentonii*)

- forest and water

Brunlångörad fladdermus (*Plecotus auratus*)

- Openings in forests, parks and gardens



Species found around Tovetorp

Interface species

Nordfladdermus (*Eptesicus nilssonii*)

--agricultural, villa areas, parks, forests

Dvärgpipistrell (*Pipistrellus pygmaeus*)

- forests, gardens, parks

Gråskimlig fladdermus (*Vespertilio murinus*)

-agricultural areas, forest

-autumn: cities

Open Species

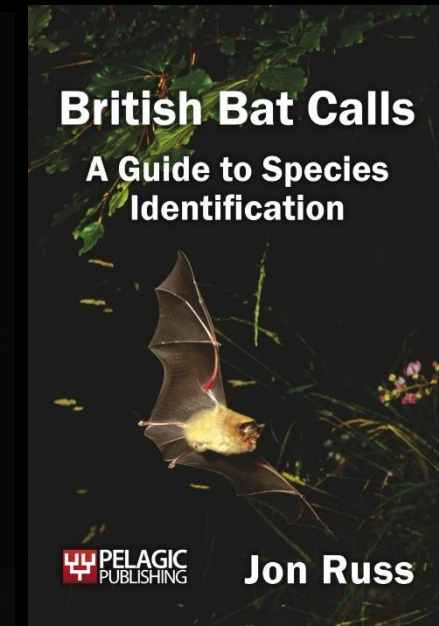
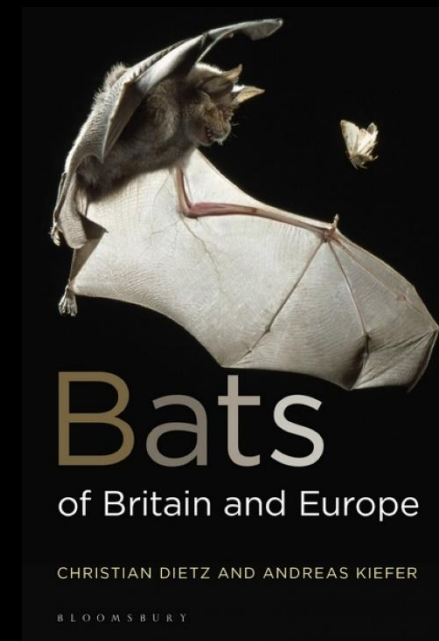
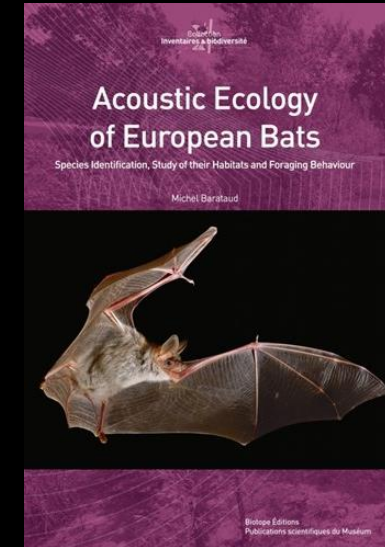
Storfladdermus (*Nyctalus noctula*)

-agricultural areas with lakes



Books

- **Fladdermöss - i en värld av ekon (Eklöf & Rydell)**
- **Bats of Britain and Europe (Dietz & Kiefer)**
- **British Bat Calls A Guide to Species Identification (Russ)**
- **Acoustic Ecology of European Bats (Barataud)**



Thanks for listening

