

The Lifewatch sensor network for bat detection

Bat migrations: boosting our knowledge from
almost zero to beyond the simple basics

A brief introduction to bats

- World's only true flying mammals
- Anno 2021: +1430 species
- Order Chiroptera
- Recently: some families reclassified
- Two suborders: Pteropodiformes or Yinpterochiroptera + Vespertilioniformes or Yangochiroptera
- Diets: nectar, pollen, fruits, insects, scorpions, spiders, frogs, fish, birds, blood,...
- Extreme longevity
- Outstanding Immune system



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+50 species (and counting)



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Most species sedentary (varying patterns of dispersion)



Migratory bat species in Europe

Known:

Nathusius's Pipistrelle Bat (*Pipistrellus Nathusii*)

Parti-coloured Bat (*Vespertilio murinus*)

Leisler's Bat (*Nyctalus leisleri*)

Noctule Bat (*Nyctalus noctula*)

Suspected:

Greater noctule (*Nyctalus lasiopterus*)

Soprano Pipistrelle Bat (*Pipistrellus pygmaeus*)

Schreibers's Bent-winged Bat (*Miniopterus schreibersii*)

So how do they look like?...



Bram Conings ©

Nathusius's Pipistrelle Bat

Ruige dwergvleermuis

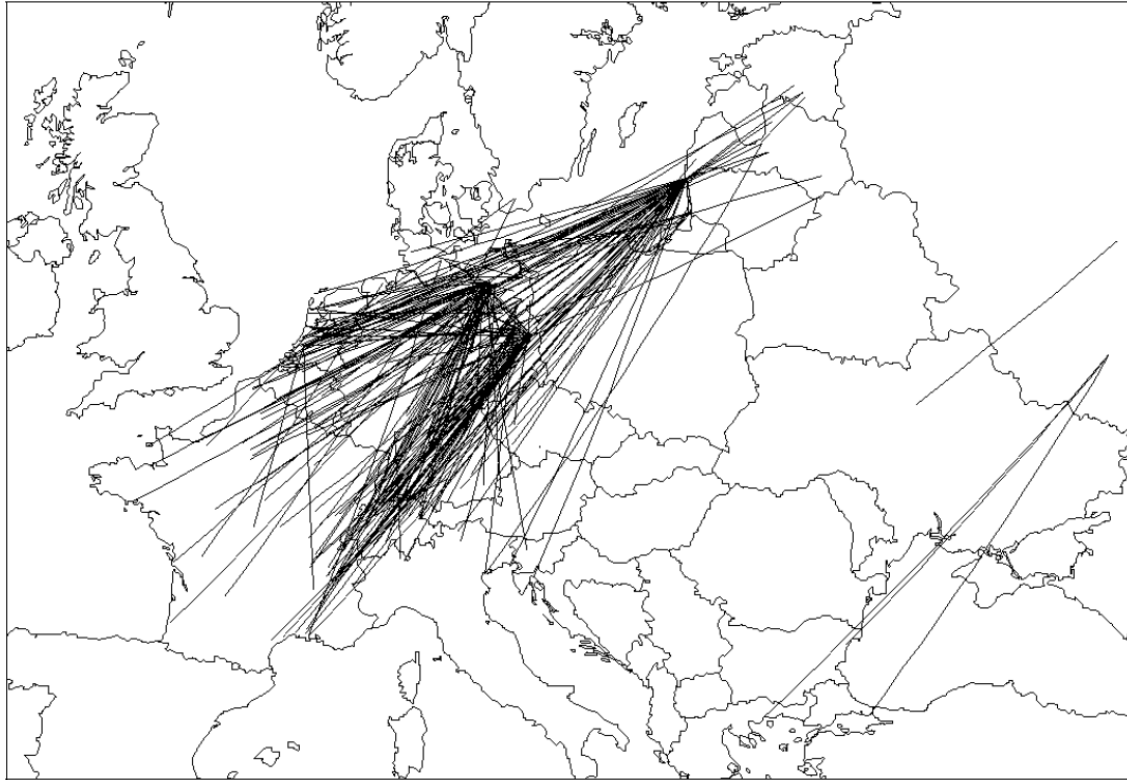


Fig. 24. Documented long-distance movements of *Pipistrellus nathusii* in Europe (n=307).

Hutterer e.a., 2005



Leisler's Bat Bosvleermuis

(Very similar to the
Noctule Bat
Rosse vleermuis)



Parti-coloured bat
Tweekleurige vleermuis



How to map or monitor Bat migrations?

- Visually, by night: by definition virtually impossible
- By night, using NIR, IR or heat camera's: identification virtually imp.
- Visually, daytime: checking roosts, such as batboxes (picture); not all species use batboxes (Pip. Nathusii does!)
- Hydrogen isotopes in fur samples: low geographical accuracy
- Radar: still highly experimental in bat research
- Banding: labour intensive, (very) little resightings
- GPS-trackers (active): still too heavy (rule: <5% body mass)
- GPS-loggers (passive): have been used, attachment to the bat is tricky, (very) low chance to recapture the bat
- Radiotracking: battery lifespan of the transmitters (<0,5g) rather short
- Acoustics: bats may fly too high or not even use sonar



Checking batboxes in the Zwin area, september 2021

This is where Lifewatch comes in!

- Radiotracking: the MOTUS receivers network (Canada).
- Since 2017, a team of Wageningen University & Research (WUR) has captured, radiotagged and released +1000 bats in the Netherlands.



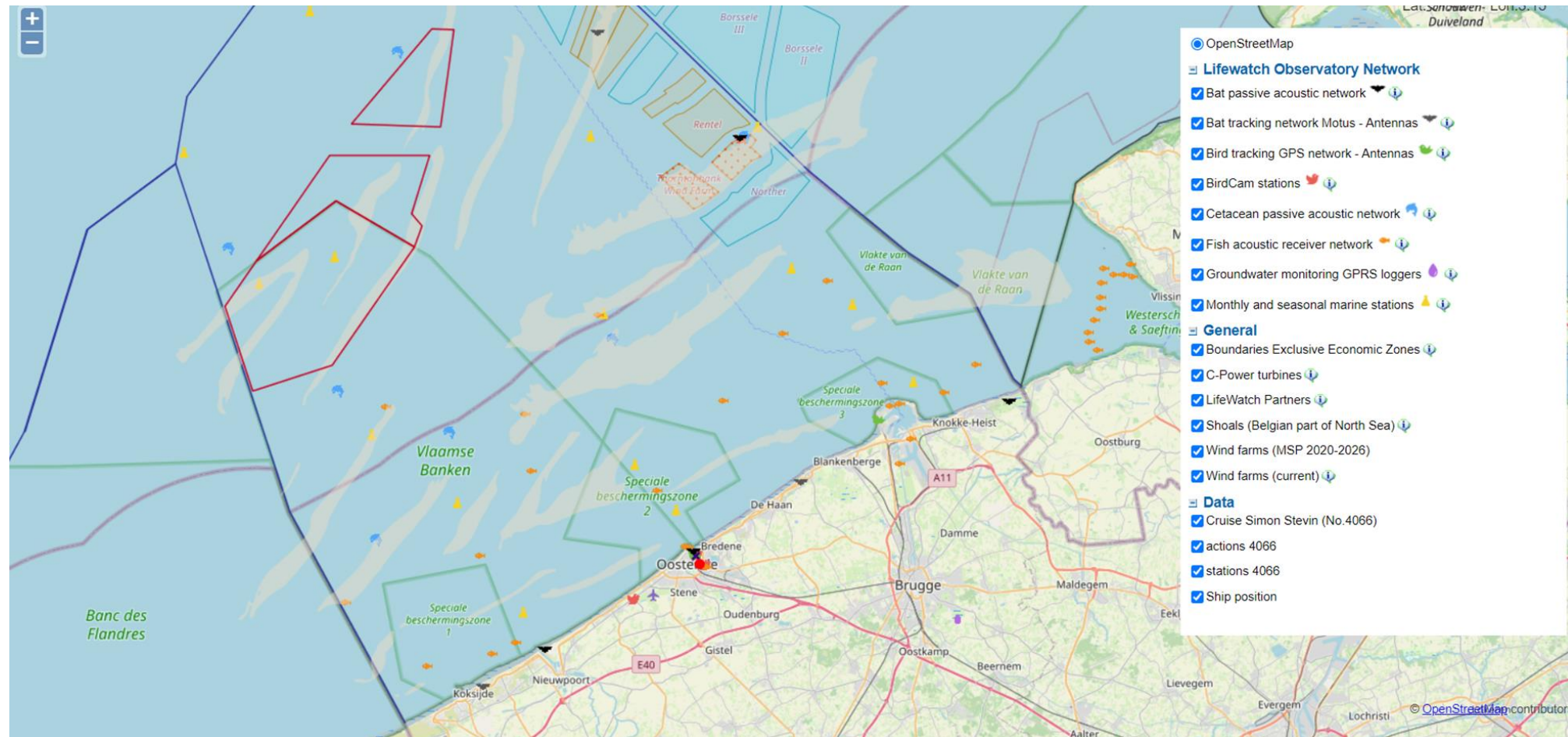
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- Radiotracking: the MOTUS receivers network



This is where Lifewatch comes in!

- 3 onshore and 1 offshore MOTUS receivers are now part of the Lifewatch infrastructure
- Onshore: Knokke (Zwin nature reserve), De Haan (dunes), Koksijde (dunes)



<https://motus.org/data/track?tagDeploymentId=31901>

Show detections in: [a table](#) | [a timeline](#) | [a map](#)



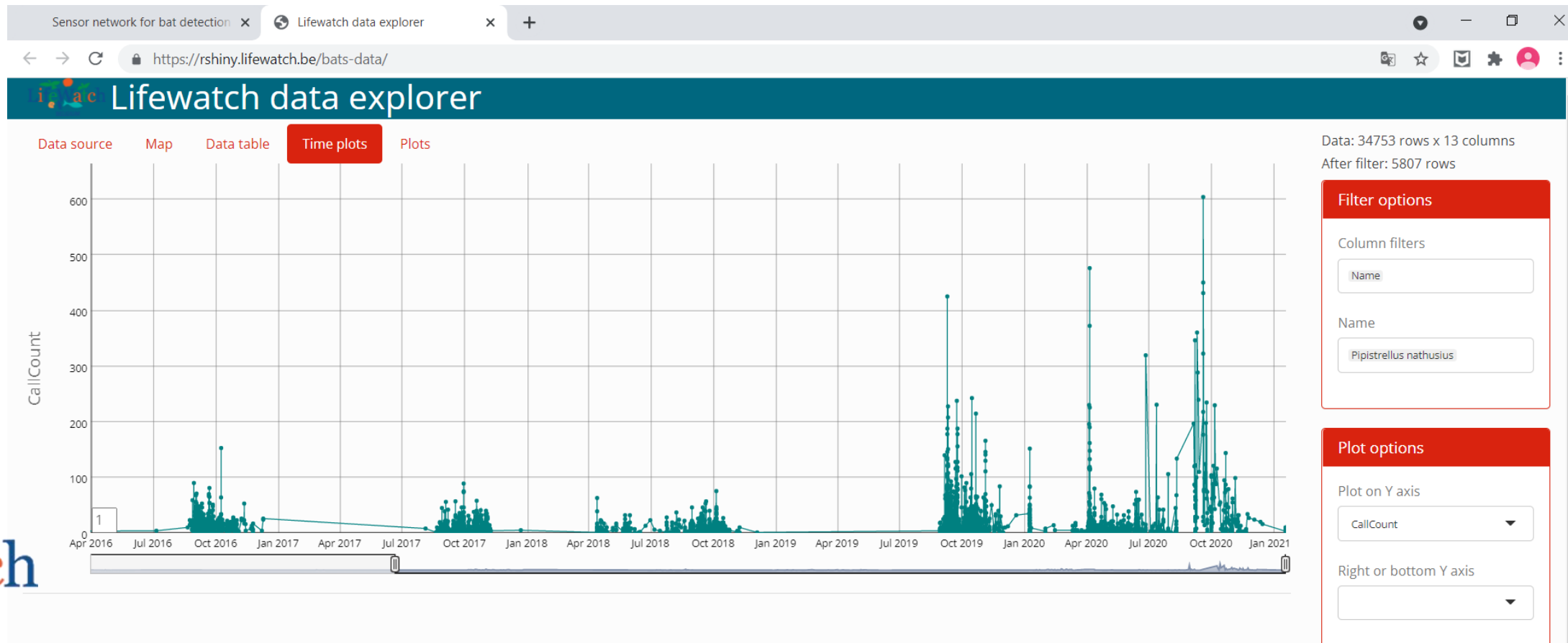
This is where Lifewatch comes in!

- Acoustic monitoring
- 3 onshore detectors, +/- year round
- Zwin nature reserve, Ostend @VLIZ, Nieuwpoort
- 1 offshore detector planned
- Species identification:
BatIdent (Ecoobs)



Acoustic monitoring

- The use of detectors is resulting in a XL dataset over the years, essential for mapping and modelling bat migrations, not only in Belgium, but also on a European scale
- For that purpose, the Lifewatch dataset may soon be integrated in a European database (coordination: MNHN, France)

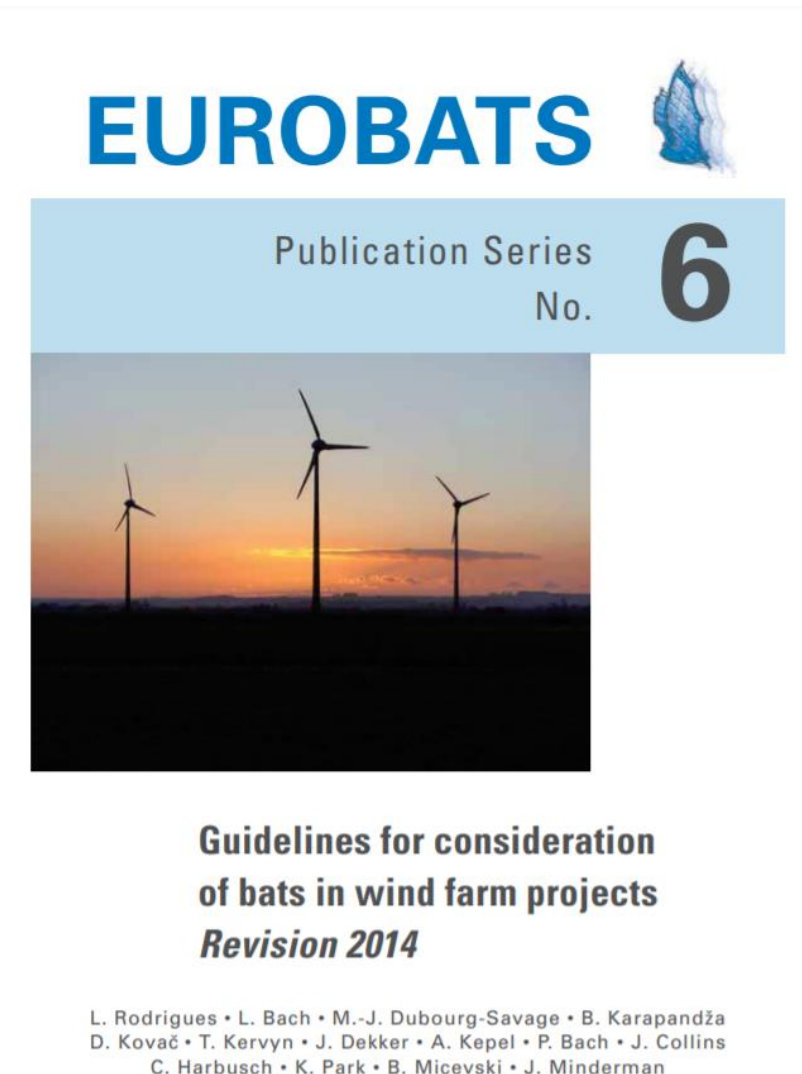


Conclusion

- Monitoring bat migrations remains a challenge
- The chapter of bat banding in Europe may be closing...
- Acoustic monitoring of bats in Belgium has been boosted by Lifewatch, this method will continue to improve in density and in quality.
- Radiotracking may soon be replaced by newer technologies

So what's the use of all this (expensive) research?

- Currently, many -and soon probably most- windturbines are temporarily being shut down at times when bat (&bird) activity is presumed to be high
- Using preset parameters inevitably results in a net loss in generated power
- Any research and/or technology further finetuning these parameters can reduce this net loss, in the long run not only saving more bats as well, but also €'s.



Conference 'Bat migrations along the North Sea'

@VLIZ, November 2019

Thank you!



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