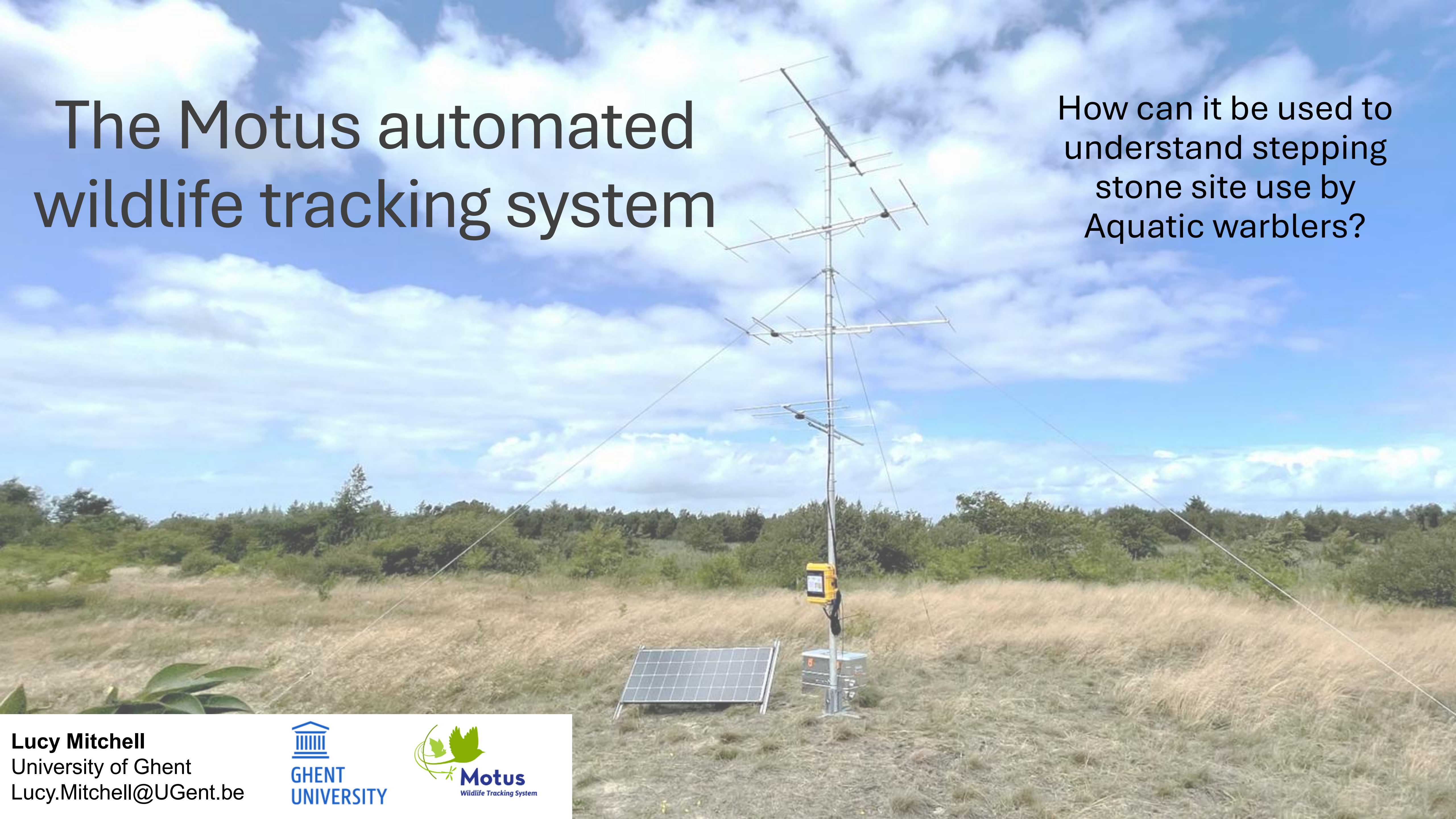
The Motus automated wildlife tracking system

How can it be used to understand stepping stone site use by Aquatic warblers?



Lucy Mitchell
University of Ghent
Lucy.Mitchell@UGent.be

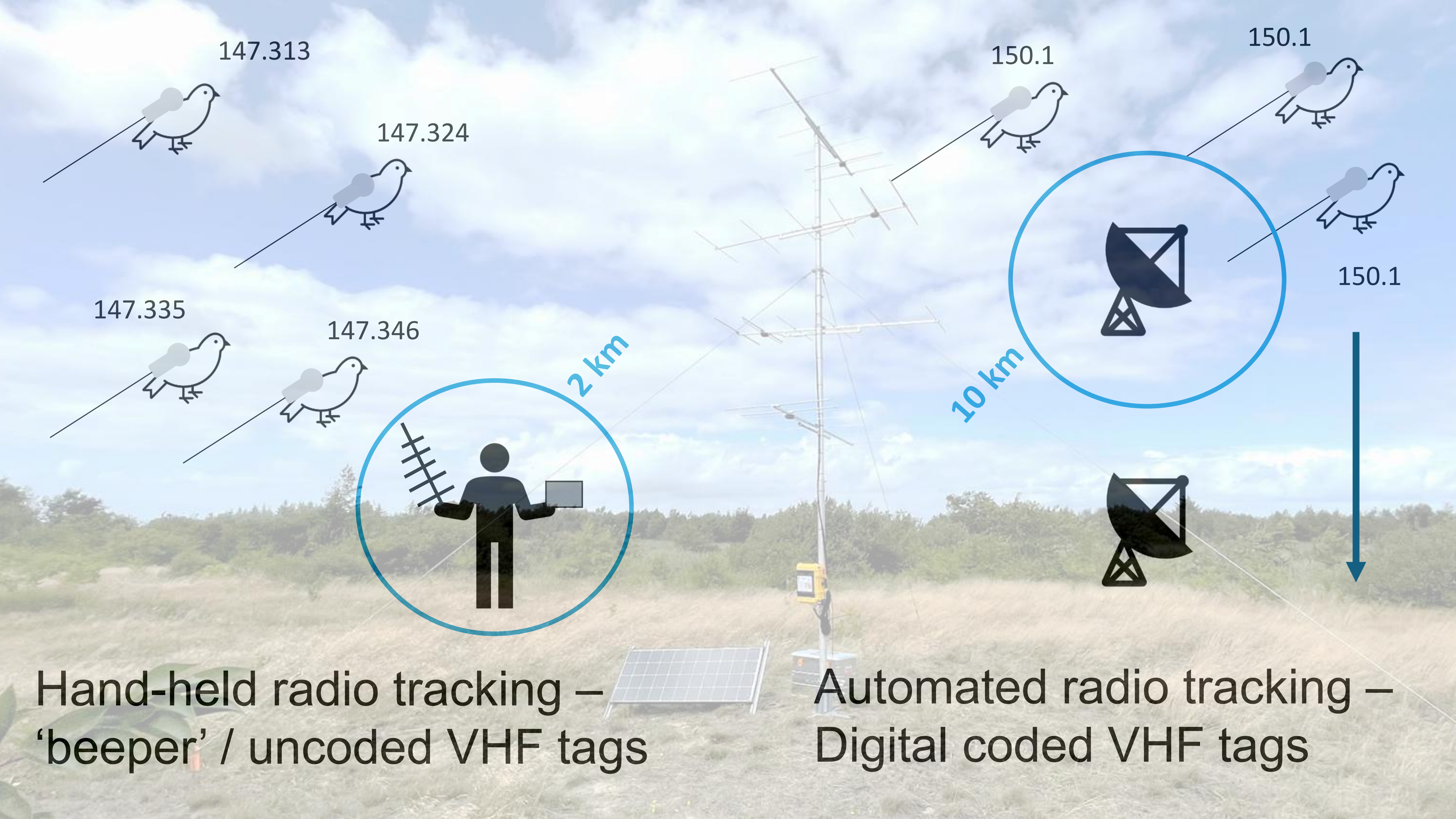
GHENT UNIVERSITY

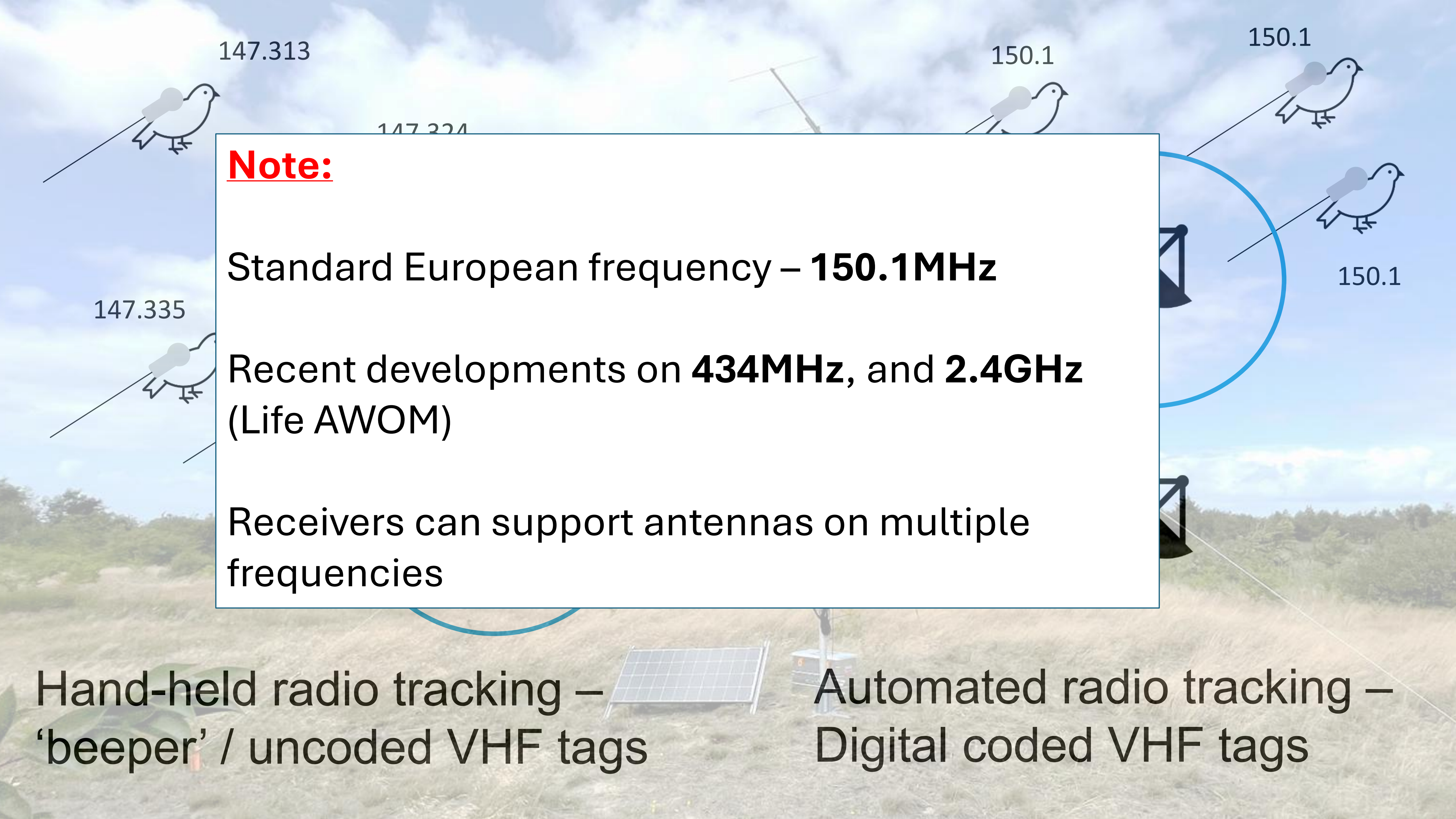
Motus
Wildlife Tracking System

The problem

- Small bird species ✅
- Dispersal movements @ landscape scale ✅

Collaborative automated radio telemetry uses **coordinated arrays of automated stations** that are **all monitoring the same frequency** to detect tagged animals over broader spatial scales and maximize the use of equipment operated by many researchers that traditionally may have not had the opportunity to collaborate.


147.313
147.324
147.335
147.346
2 km
150.1
150.1
150.1
10 km
Hand-held radio tracking –
'beeper' / uncoded VHF tags
Automated radio tracking –
Digital coded VHF tags



Note:

Standard European frequency – **150.1MHz**

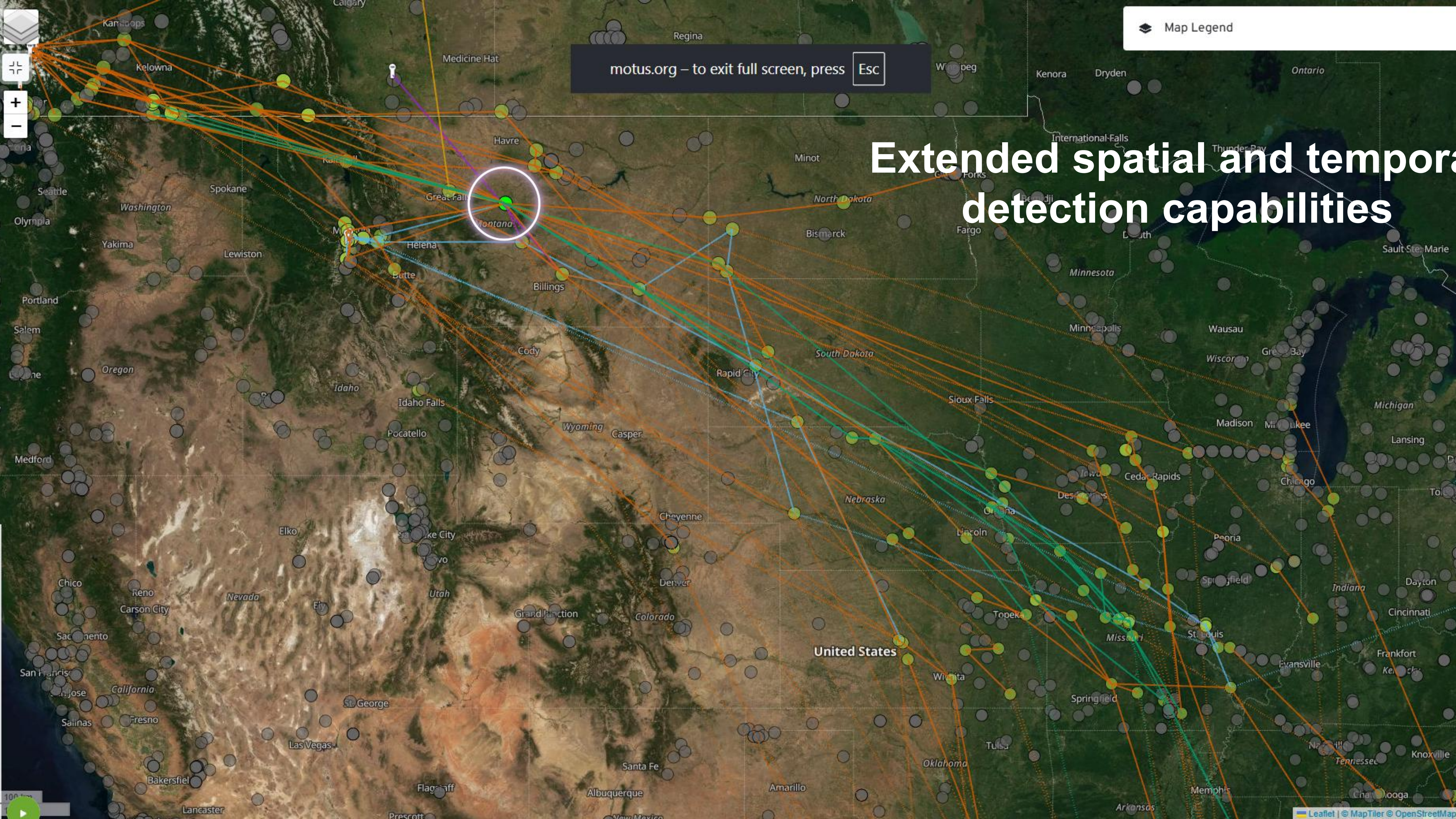
Recent developments on **434MHz**, and **2.4GHz** (Life AWOM)

Receivers can support antennas on multiple frequencies

Hand-held radio tracking – ‘beeper’ / uncoded VHF tags

Automated radio tracking – Digital coded VHF tags

Extended spatial and tempora detection capabilities



Other key features

Size
- <0.5g / 10mm long

Spatial resolution

- Receivers can detect ~10km on 150.1MHz; less on 434MHz and 2.4Ghz
- site-level data rather than broad regional data (= **geolocators**).

Temporal resolution

- Min ~1s = fine scale / short-term movements
- 10-30s to increase = more suitable for long distance migration.

Data transfer

- No need to recapture bird to retrieve data.

Mobile receivers

Building mounted

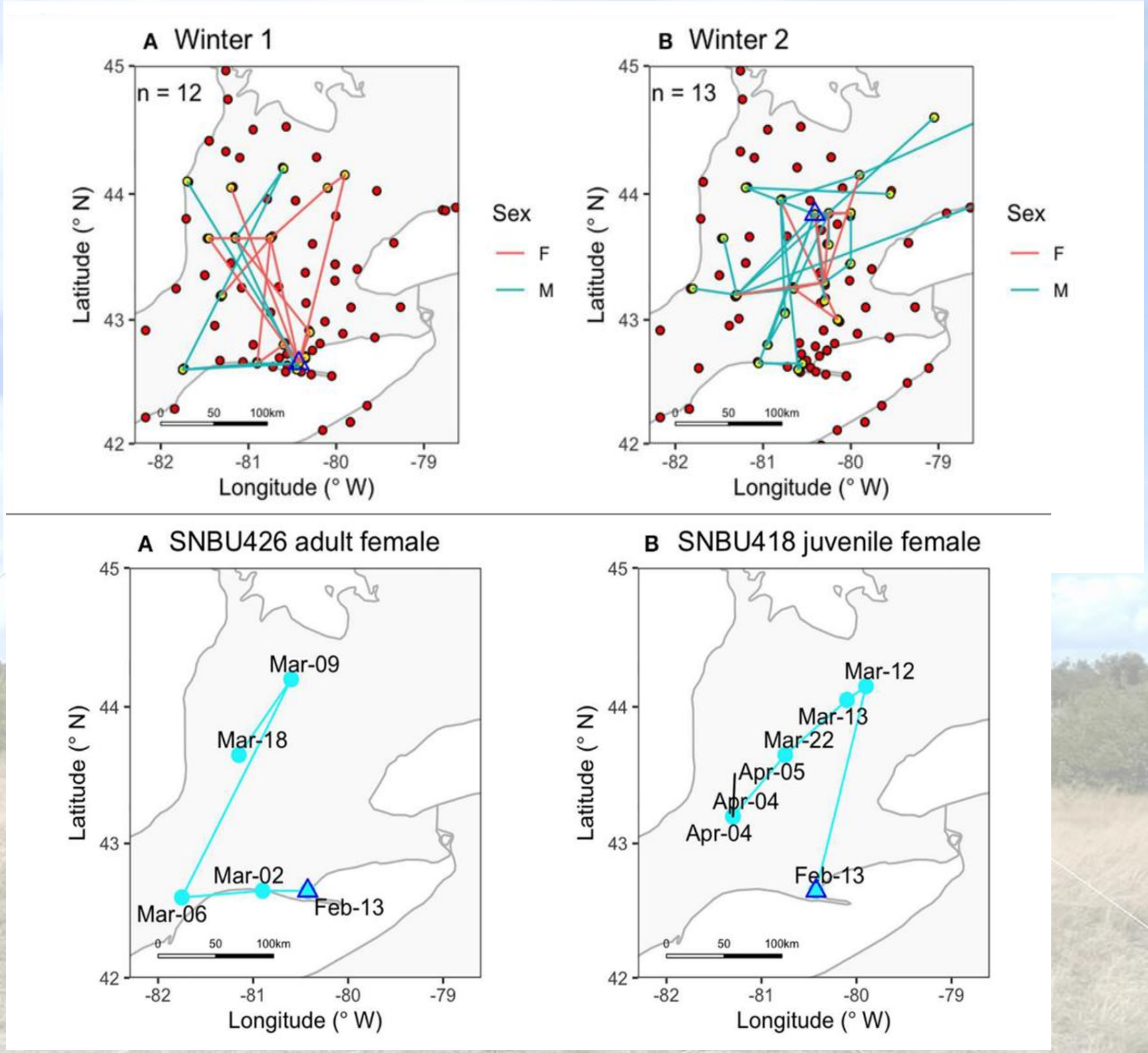
What does a Motus receiver look like?

Feasibility of installation vs cost vs requirements

Reconstruction of flight direction
+ activity pattern

Exciting Motus outputs!

- Insights into small hard to track species
- Landscape scale – unknown behaviours
- cumulative distances of 738 km
- Males tracked for longer and further than females / juveniles



Received: 2 June 2020 | Accepted: 2 December 2020

DOI: 10.1002/ece3.7235

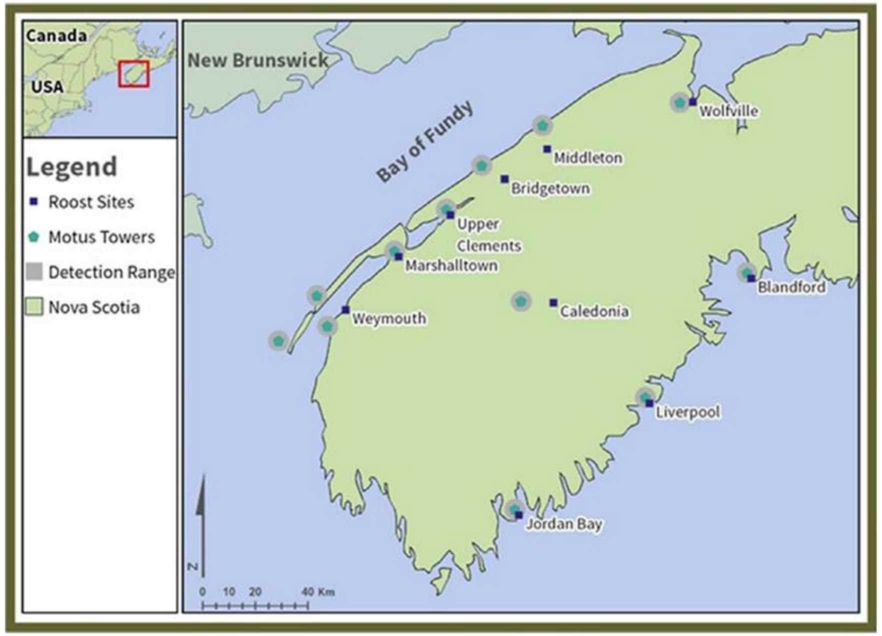
ORIGINAL RESEARCH

Ecology and Evolution Open Access WILEY

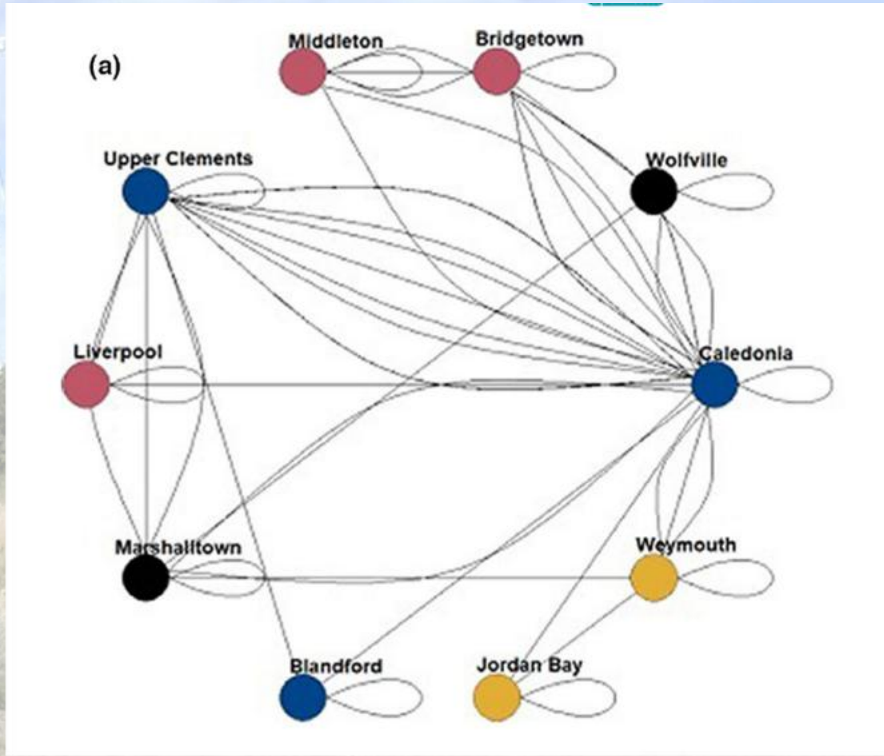
Roost sites of chimney swift (*Chaetura pelagica*) form large-scale spatial networks

Courtney E. le Roux | Joseph J. Nocera

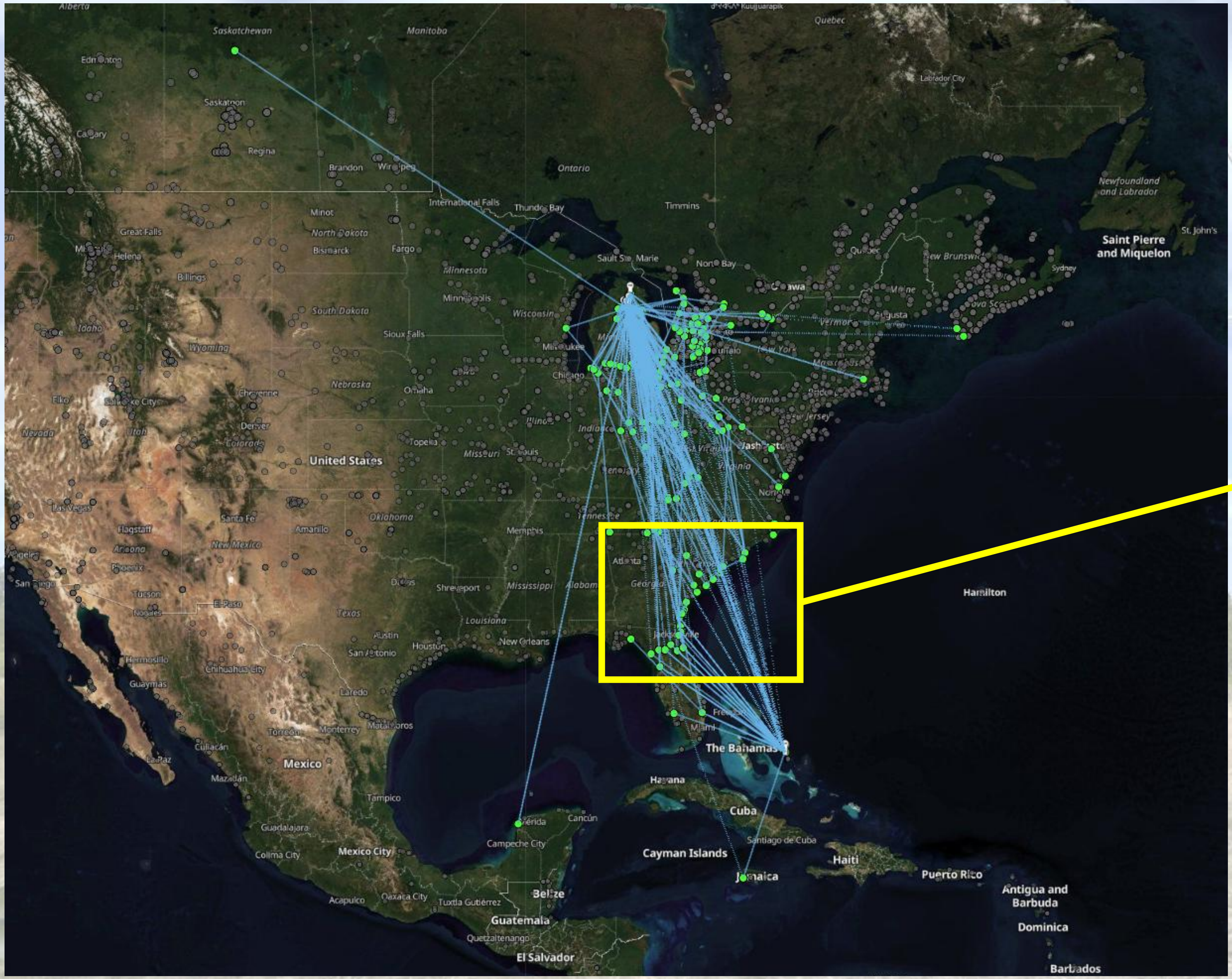
FIGURE 1 Location of active Motus automated telemetry towers, their detection ranges (Taylor et al., 2017), and chimney swift (*Chaetura pelagica*) roosting sites throughout southern Nova Scotia, Canada, as of September 2019



- **Social Network Analysis (SNA)** – quantify links between roosts and importance of specific sites for conservation.



Survival and mortality



Stopover site identification

Cooper, N.W., Yanco, S.W., Rushing, C.S., Sillett, T.S. and Marra, P.P., 2024.. *Current Biology*, *34*(21), pp.5097-5103.

Questions

Where to site the receivers?
How many birds to tag?

Practicalities – who will maintain/ how will you get data?

Get in touch:

Lucy.Mitchell@ugent.be
@lucyjmitchell.bsky.social