

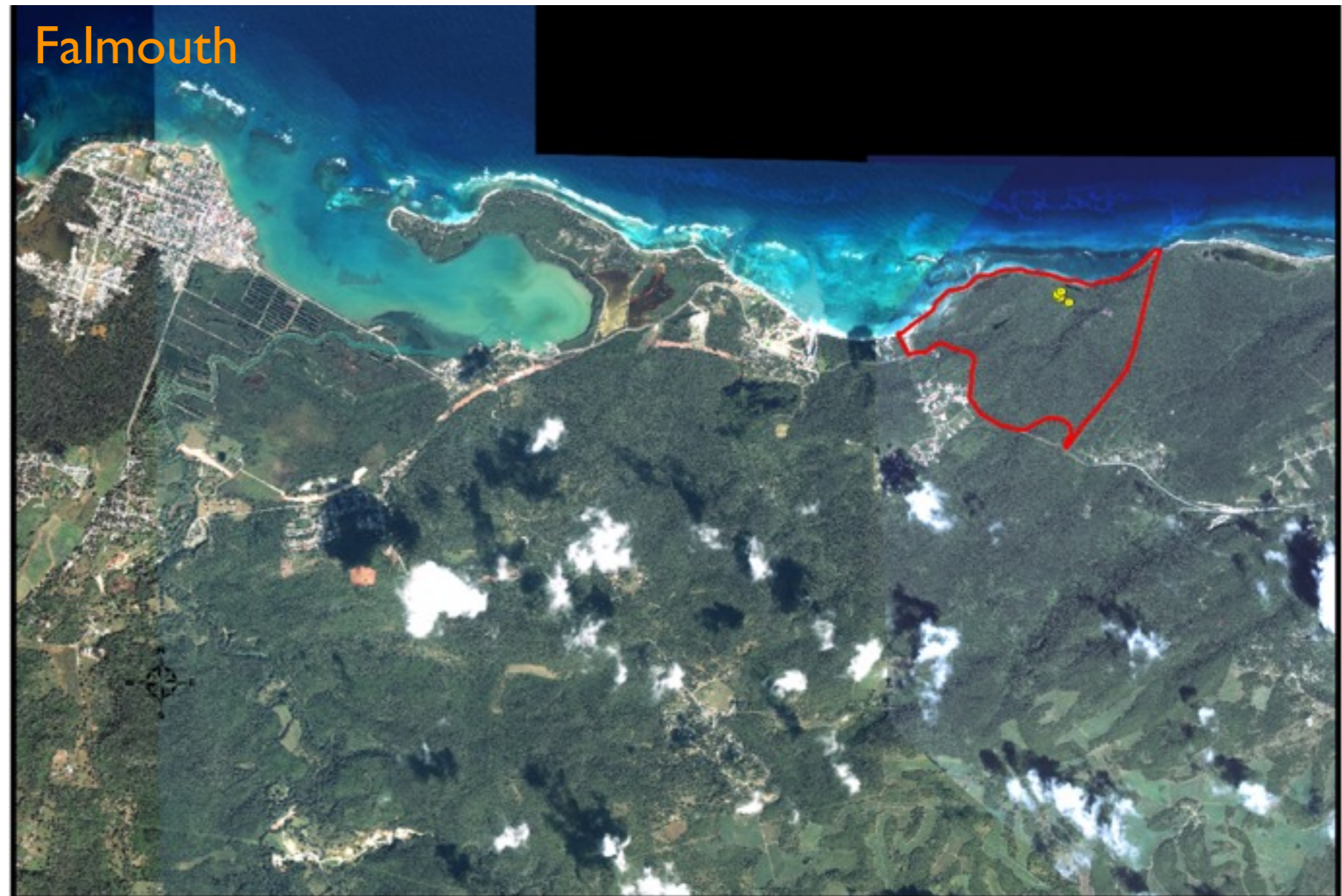
WILDLIFE SURVEY TECHNIQUES

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3. Case Study: Surveys at Coral Spring–Mountain Spring Protected Area

(a) Birds

(b) Bats



WILDLIFE SURVEY TECHNIQUES

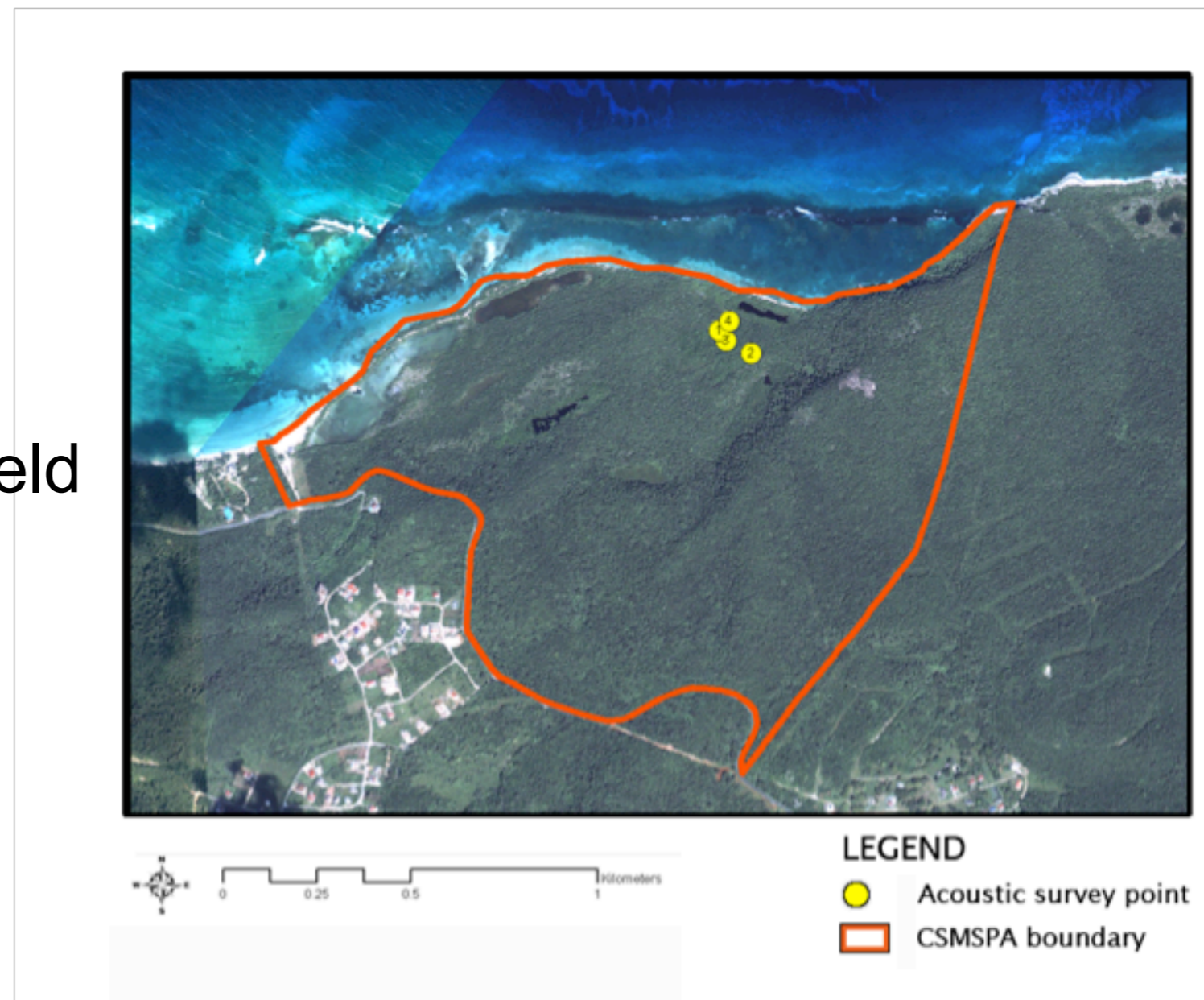
Acoustic Bat Surveys in CSMSPA

Reasons for surveying:

(A) It's fun to deploy bat detectors in an area not previously surveyed for bats

(B) Complemented a demonstration of avian bird survey techniques during a field workshop for UTech students

(C) Overlapped spatially with avian mist-netting and point count surveys conducted by WRC 2008-09



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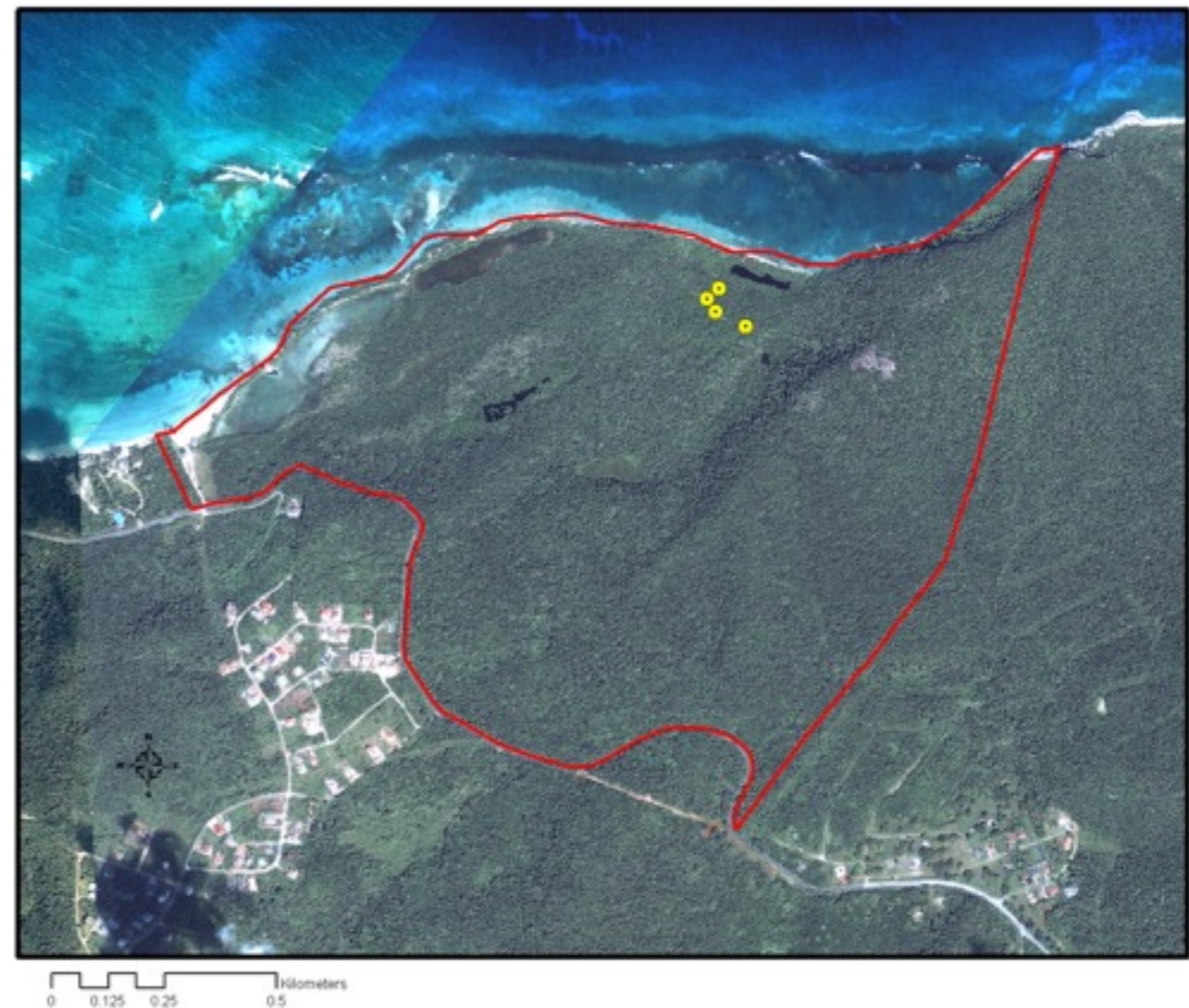
Deployed 4 ultrasonic bat detectors in the woodland

4 microhabitats:

- closed canopy woodland
- woodland with agave
- interior black mangrove
- woodland - *Thespesia* interface

14-15th November 2012

16-17th January 2013



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Equipment:

- Four Wildlife Acoustics SM2-BAT 384 kHz detectors with SMX-US omni-directional microphones
- Microphone height: 2.5 m above ground (mounted on aluminum pole used to hold mist nets [nets remained furled overnight, only used the next morning to catch birds])
- Maximum detection range of microphones is about 30m: therefore surveyed ca. 2,800 sq. m; < 0.2% of CSMSPA's 165 hectares

Sampling / Recording Protocols

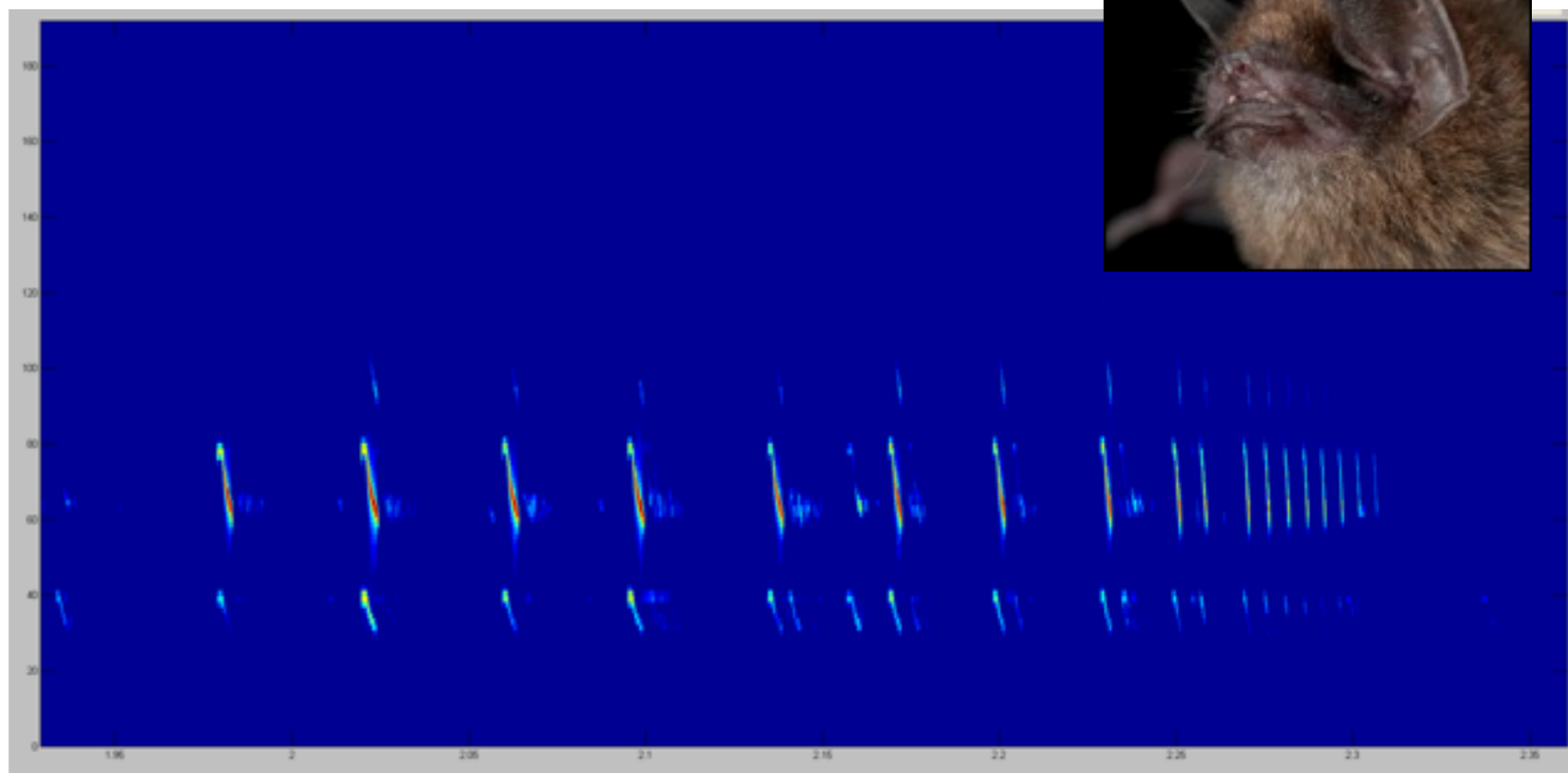
- Sampling Rate: 384 kHz
- Start time: 30 minutes before sunset
- Stop time: 30 minutes after sunrise
- Record 1 minute, pause 1 minute (50% of night recorded)
- Files saved as 0WAC-compressed, converted to WAV for review

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Review of recordings

- All files reviewed by Susan Koenig using CallViewer v18
- No filters or auto-detection was used
- Each detector took approx. 3 hours to review (total 24 hrs for both sessions)
- Species identified with reference to WRC's Call Library of Jamaican Bats and from recordings of Cuban species
- Nightly Activity Index generated from the "number of passes" per species per hour
- Feeding activity of insectivores counted by presence of terminal phase "buzzes"



SURVEY RESULTS

Species	No. of "bat passes" Nov-2012	No. of "bat passes" Jan 2013	Feeding Guild	Roost Ecology	Preferred Habitat
<i>Pteronotus parnellii</i>	6	6	Insectivore	Cave	Cluttered forest
<i>Pteronotus macleayi</i>	232	215	Insectivore	Cave	Top of canopy; edge forest
<i>Pteronotus quadridens</i>	11	32	Insectivore	Cave	Top of canopy; edge forest
<i>Mormoops blainvillei</i>	12	50	Insectivore	Cave	Top of canopy; edge forest
<i>Noctilio leporinus</i>	3	0	Piscivore	Cave	River
CHMI or GLSO*	28	37	*	Cave	*
<i>Erophylla sezekorni</i>	3	0	Nectarivore	Cave	Forest
<i>Artibeus flavescens</i>	10	1	Frugivore	Tree; opportunistic cave	Forest, mixed agriculture
<i>Artibeus jamaicensis</i>	1	3	Frugivore	Cave	Forest, agriculture, gardens
<i>Tadarida brasiliensis</i>	58	125	Insectivore	Cave; building	Open space
Possible <i>Nyctinomops</i>	1	-	Insectivore	Cave; building	Open space
Unidentified insectivore	2	72	Insectivore	-	-
Unidentified	-	12	-	-	-

* Acoustic call signatures of *Chilonatalus micropus* (3-gram insectivore) and *Glossophaga soricina* (10-gram nectarivore) are difficult to distinguish on sonograms.

Nearest roost caves for the majority of species detected are Windsor Great Cave (northern Cockpit Country; 14 km as the crow flies) and Green Grotto / Runaway Bay Caves (22 km)





Mormoops blainvillei

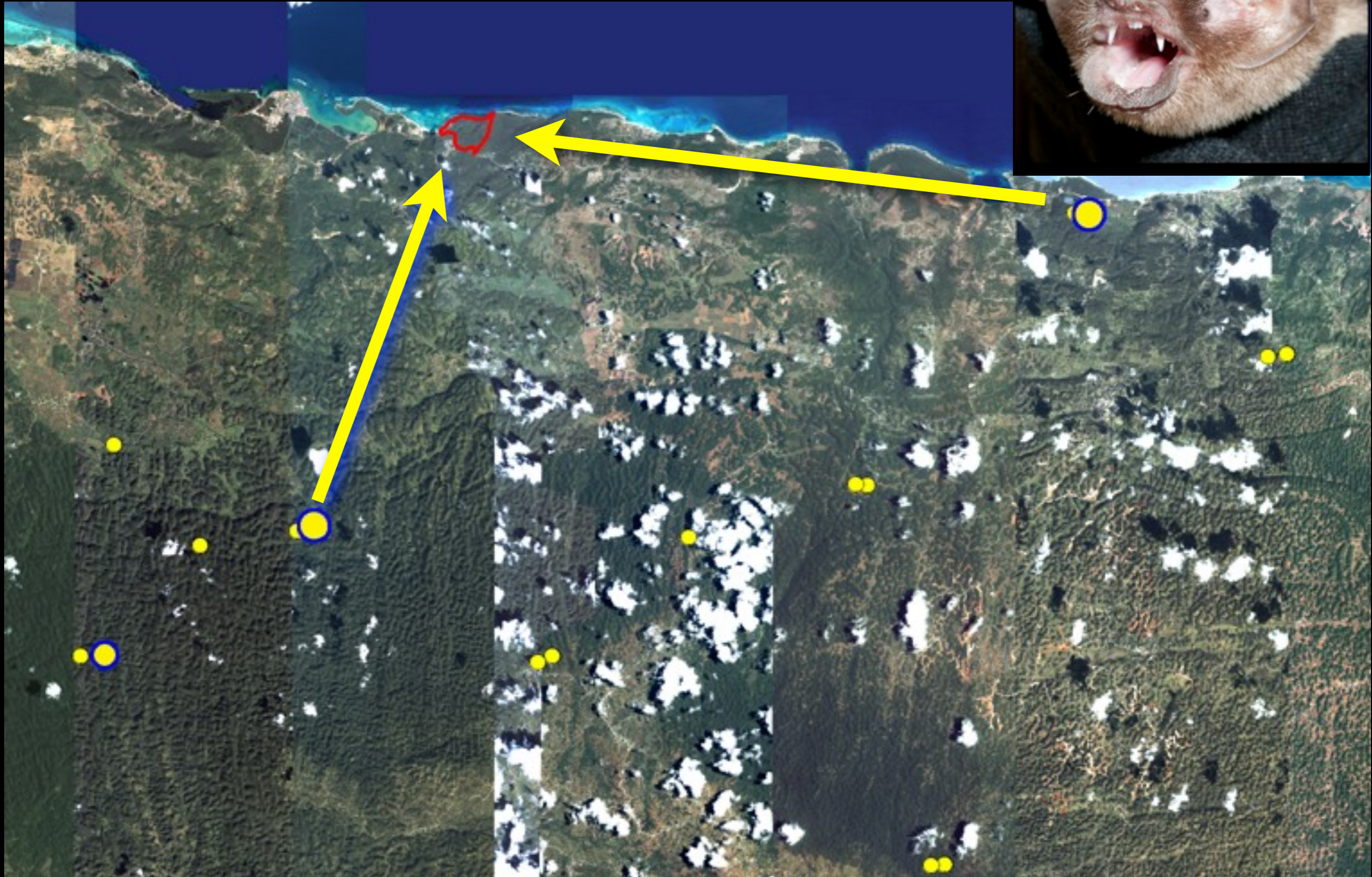
1st Time of Detection at CSMSPA
corresponds to travel time from
Windsor or Runaway Bay

9.1 m / sec

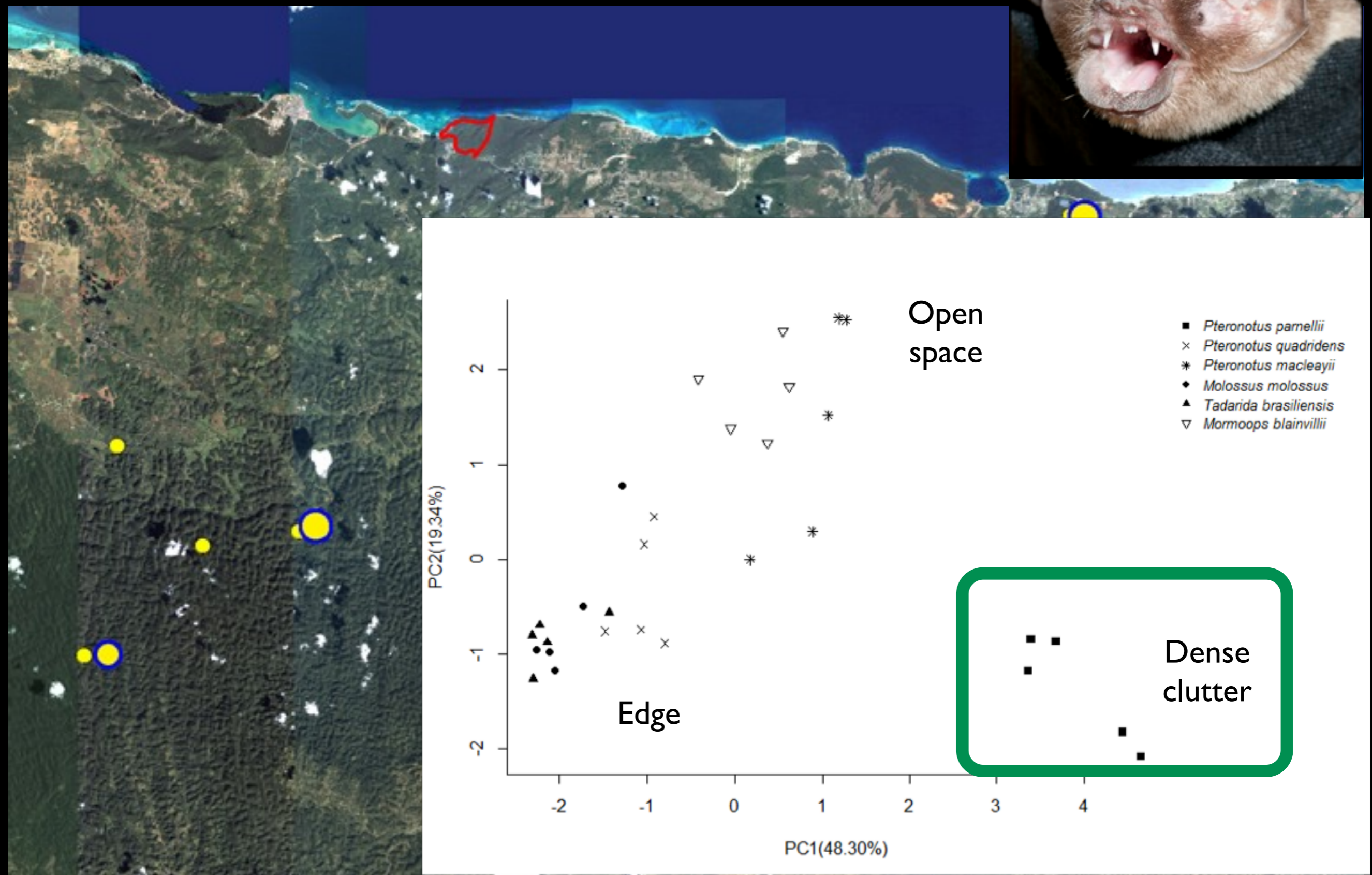
100 m in approx. 11 seconds



Importantly for *Pteronotus parnellii*, that distance isn't "straight as the crow flies"



Pteronotus parnellii requires densely cluttered forest for commuting to feeding areas and to hunt for food



Pteronotus parnellii



To get to CSMSPA, *Pteronotus parnellii* needs a forest corridor from its roosting cave all the way to and along the coast

Bat Survey Techniques

- I. Capture
 - a. Mist net
 - b. Harp trap
- II. Acoustic survey
- III. Radio-telemetry



To identify the *Pteronotus parnellii* forest flyway, we need to track their flight using radio telemetry





Funding for bat acoustic surveys

MACARTHUR

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