

Some observations about swarming behaviour in bats

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From experiences running trapping surveys at various Wiltshire swarming sites, with ongoing ring data for a range of species, and occasional observations at other swarming sites in Scotland & elsewhere.

**NB – this talk presents some preliminary observations.
For any further details or enquiries, contact us via BCT or Wilts Bat Group.**

swarming site catchments can be very large

- ring recaptures
- radio-tracking

- implies internal landscape map and cultural transmission of traditional routes and features (roosts, foraging, crossing points, etc),
- and consequent large-scale conservation needs to support catchment-scale populations.

... each ... site ... swarming population of several thousand bats.

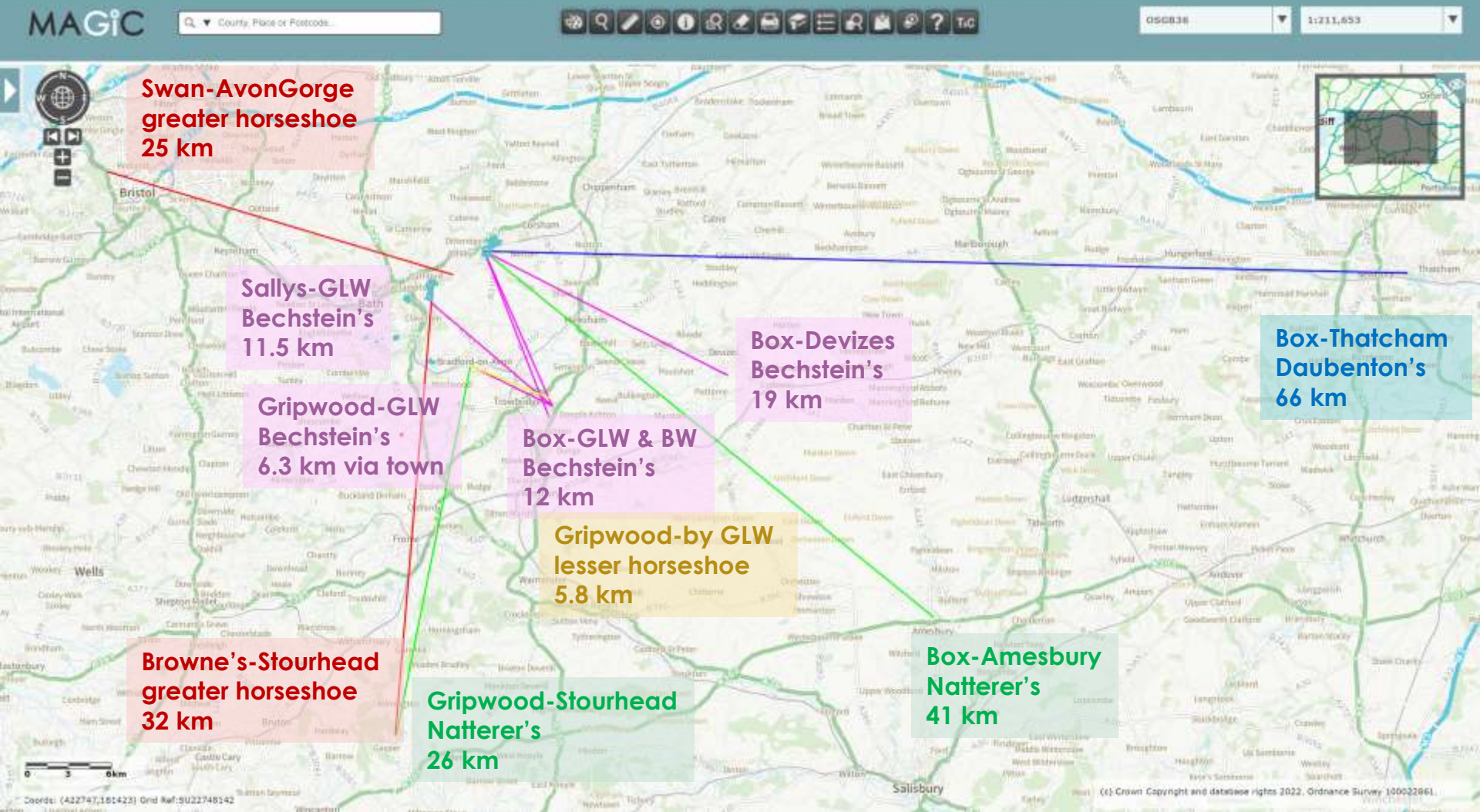
high fidelity shown to single underground sites

high fidelity + large numbers + large catchment = conservation imperative.

identification and protection of as yet unidentified swarming/hibernation sites should be a priority in bat conservation.

Glover & Altringham (2008) Cave selection and use by swarming bat species

Swarming some ring re-trap locations



Swarming catchment ring recap examples

Maximum tracked range from the swarming site
26.7 km for *M. daubentonii* [n=24] - blue dash
24.8 km for *M. nattereri* [n=35] - green dash
Parsons & Jones 2003.

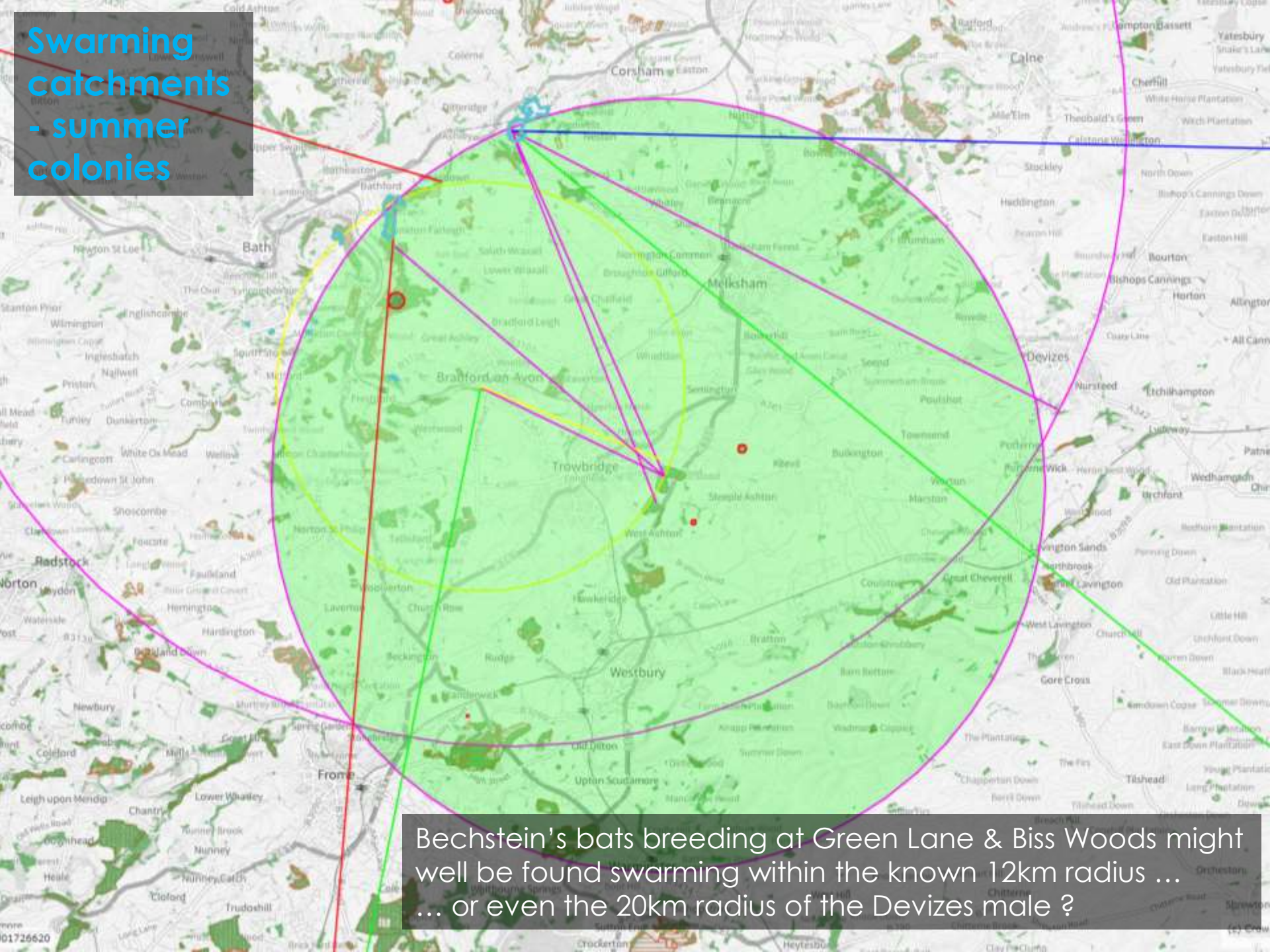
greater horseshoe
32 km
3217 km²

Daubenton's
66 km
42992 km²

Natterer's
41 km
5281 km²

M. nattereri, Yorkshire:
catchment area of **at least 60 km radius**.
average 310–400 bats visit the cave each night
Rivers, Butlin & Altringham (2006).

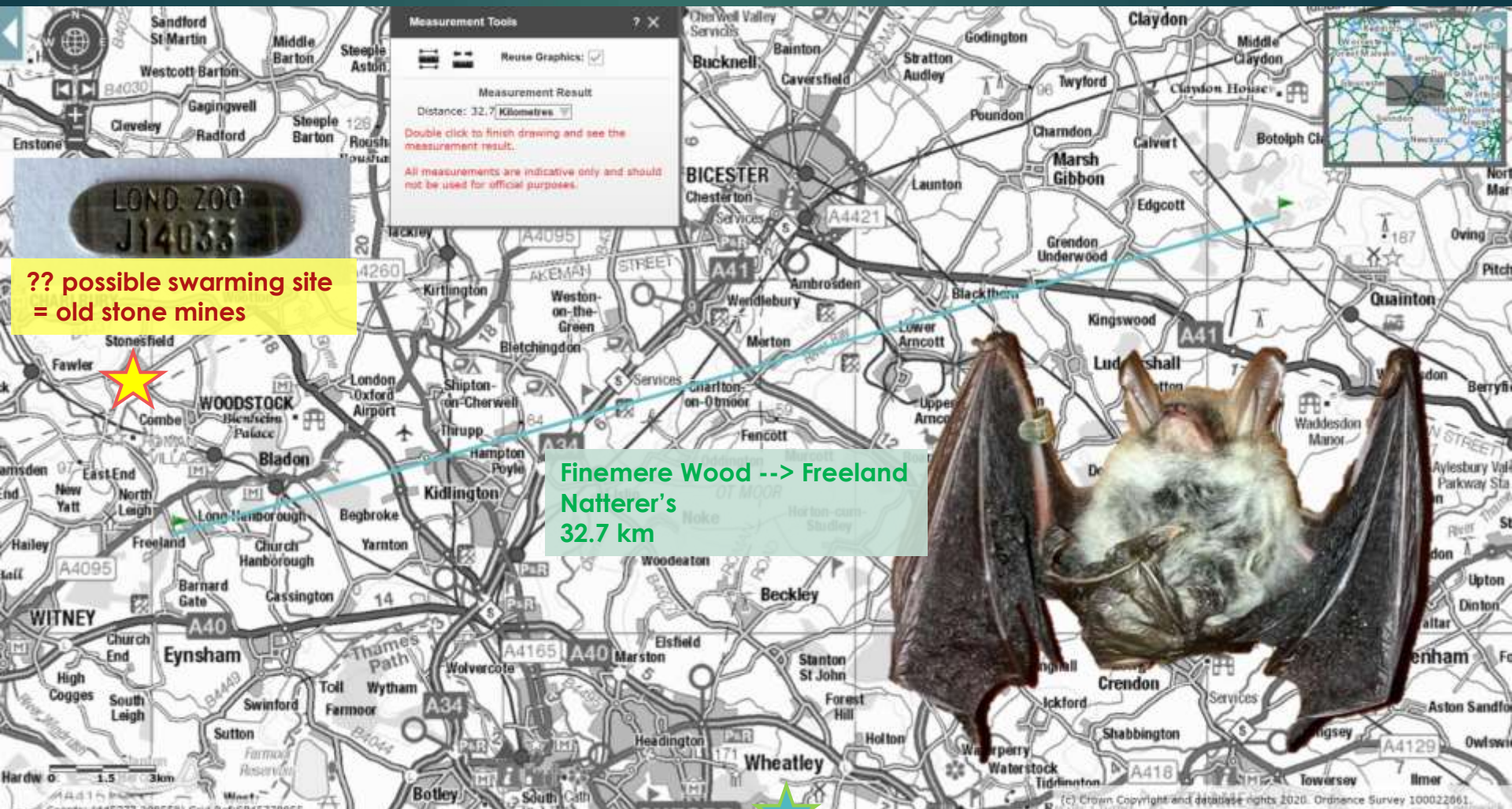
Swarming catchments - summer colonies



Bechstein's bats breeding at Green Lane & Biss Woods might well be found swarming within the known 12km radius ...
... or even the 20km radius of the Devizes male ?

Swarming catchment ring recap

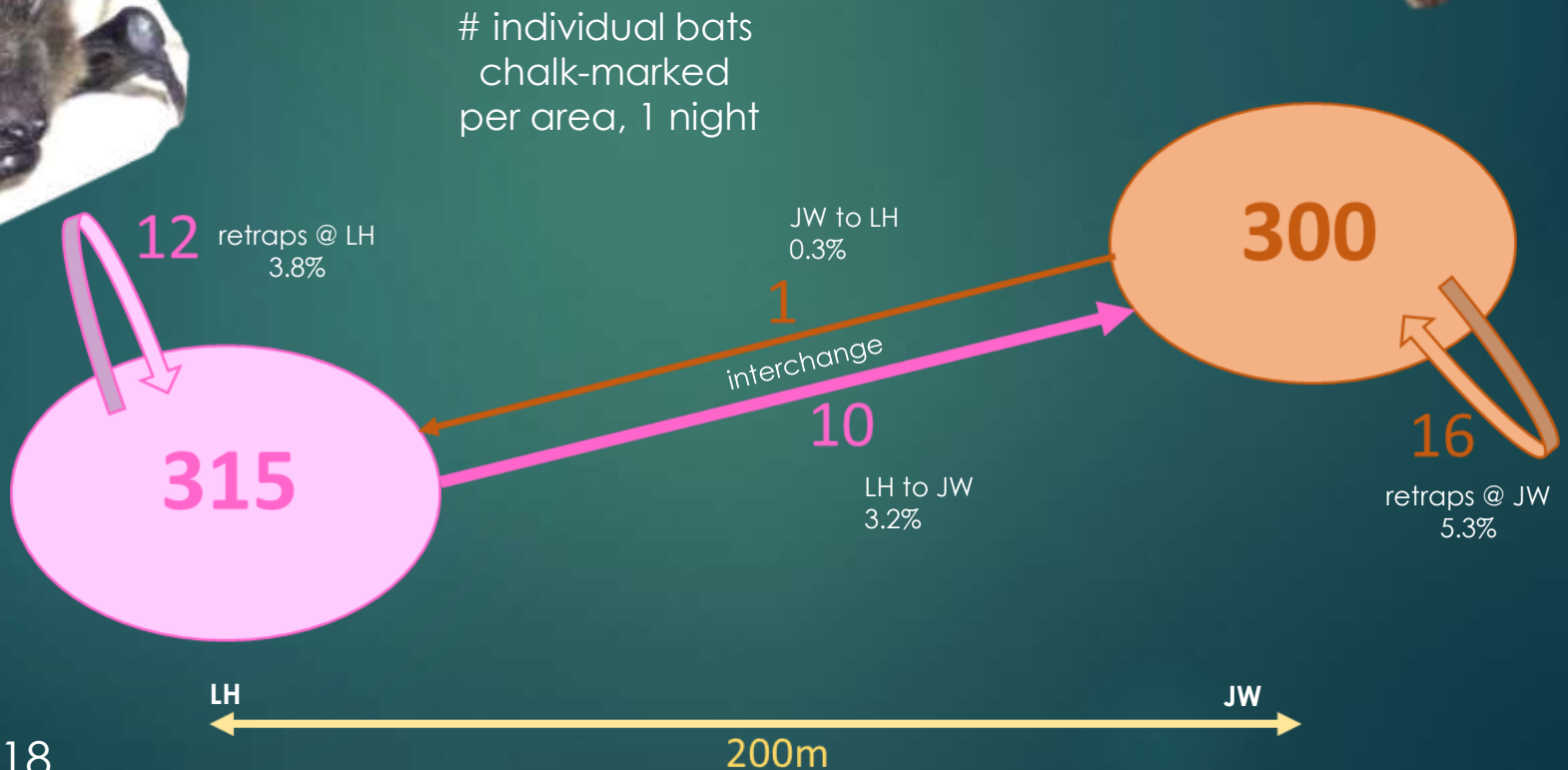
Unknown swarming site



interchange between swarming areas is low (high fidelity)

- Chalk-marking

implies that different swarming locations are not interchangeable



interchange between swarming areas is low



M. nattereri, Yorkshire:

Trapping at 2 sites on same night, 3 times, only 1 between-sites recap.

Rivers, Butlin & Altringham (2006).



325m

1 0.5%
interchange



Data graphic: Dani Linton

Browne's Folly
21st Sept 2019

very few *Myotis* ring recaptures between sites

- ringing

Bats ringed at JW and retrapped at JW in 2016-19:
33 individuals retrapped, on 79 occasions;



Bats ringed at JW and retrapped at LH in 2016-19:
24 individuals retrapped, on 38 occasions.

in yellow shapes:
Since 2016, trapping has also
taken place at adjacent
section of Box, Lady Hamilton's.

Why conduct autumn surveys as an alternative to winter surveys?

- More complete species inventory;
- Can estimate bat population sizes;
- Cause less disturbance;

Rivers, Butlin & Altringham (2006).

swarming is a 3-D behaviour

- thermal cameras

in & out, up & down, canopy to floor
... both at underground entrances, and away

1. Lady Hamilton's, Box stone mines SAC

Bath
Dani Linton, Keith Cohen

2. Cults lime mines, partially blocked entrances

Keith Cohen,
Fife

Swarming is 3-D

Lady Hamilton's, Box stone mines SAC
Bath
Keith Cohen



● REC 6:12

thermal video:

Showing activity away from any entrance, but with swarming, chasing bats, flying fast, far up through canopy and down low and around, using the full height and diversity of the landscape here.

Swarming is 3-D *'towering bats', Lady Hamilton's, Box stone mines SAC*

Keith Cohen



1.4x



03 45



● REC 2:34

thermal video:

The location we call Bailey's, what we think is an old adit entrance but now with no internal connectivity – and yet still showing some swarming activity.

Swarming is 3-D *'Bailey's' (closed adit), Box stone mines SAC*

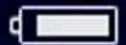
Keith Cohen



1.4x



03 20



Swarming is 3-D

*Cults Hill lime mines
Fife, Scotland
Keith Cohen*



photos. Keith Cohen

● RFC 4:29



thermal video:
Looking into an adit entrance, showing busy multi-directional
chasing in and out, up and down, round and round.

Swarming is 3-D *Cults Hill limestone mines, Fife*

Keith Cohen



1.4x



00:03





thermal video:
c.20m top to bottom of view, so larger view around landscape
surrounding adit. Fast and diverse movements at the
'Dangerous Mine' entrance.



even small access points can be swarming sites –

1. old cellar hibernation & swarming site

*Ruud Kaal,
Nieuw Milligen, Holland*

2. Cults lime mines, partially blocked entrances

*Keith Cohen,
Fife*

even small access points / internal spaces can be swarming sites –

1. Ruud Kaal's cellar hibernation & swarming site,
Nieuw Milligen, Holland



maximum of 90 bats hibernating in 2015

3 *Myotis* species, *M.natt*, *M.dau*, *M.bech*, + *P.auritus*

even small access points / internal spaces can be swarming sites –

1. Ruud Kaal's cellar hibernation & swarming site, Nieuw Milligen, Holland



approx. 30cm x 10cm

cellar void c. 2m tall, 2.5 x 3m floor; 15m³.

photos. Rutger Kaal

even small access points can be
swarming sites –

2. Cults Hill lime mines, partially
blocked entrances
Fife, Scotland

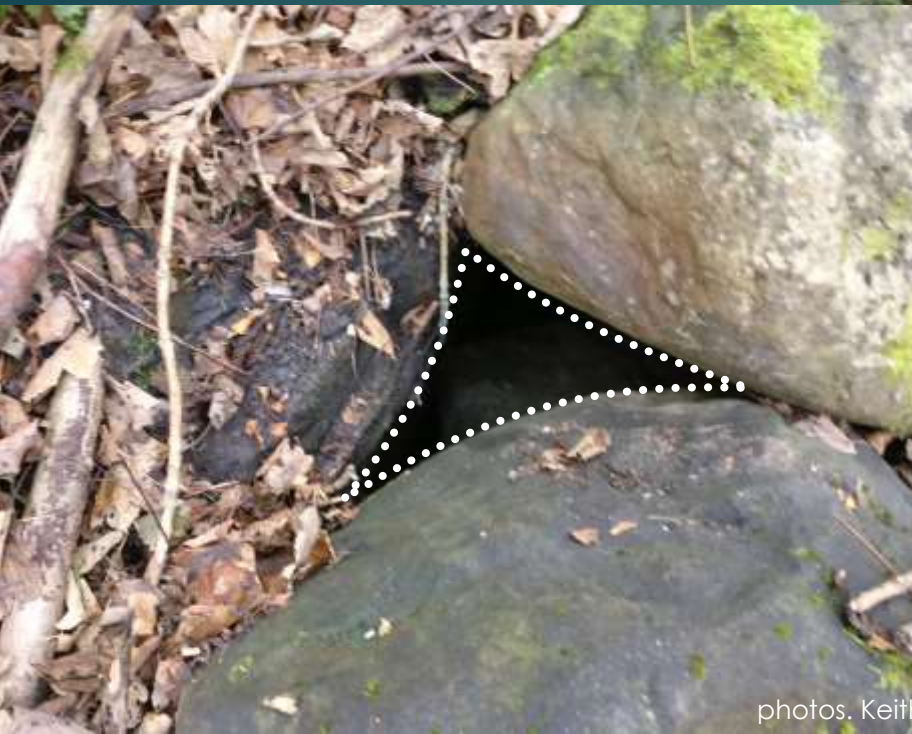
approx. 60cm x 20cm



even small access points can be
swarming sites –

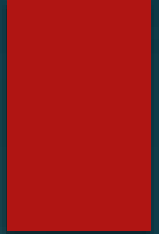
2. Cults Hill lime mines, partially
blocked entrances
Fife, Scotland

approx. 40cm x 30cm



older attempt to block, boulders, bats can pass

seasonal activity is not a fixed timing pattern



- trapping data v weather, juv data, breeding status data

Phenology of swarming varies with effects of weather on breeding

> a poor breeding year may result in early swarming, or

> a very good and early breeding year could also have a similar result (though maybe not as early ?)



Based on personal field observations, centred on the sites studied with Wiltshire Bat Group including Bath and Bradford-on-Avon Bats SAC (Box, etc) and related sites (e.g. Gripwood).

Also linked to population monitoring of summer Bechstein's bats by Trowbridge;

Additional field observations come from Fife, and North Bucks BG / Wytham Bat Project re one notable movement by a ringed Natterer's that was probably linked to swarming at an unconfirmed site.

Further observations come from Dani's curation and review of the historical swarming capture data for Wiltshire Bat Group sites.

Incidental other swarming observations come from experiences in Holland, Slovakia, Hungary.

Thanks to Wilts Bat Group members and others who have shared data and surveys, too many to name.