



**Bella Vista Bluebird Society  
Season Kick-off Meeting 2023**

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Butch Tetzlaff



The  
Bluebird  
Shed

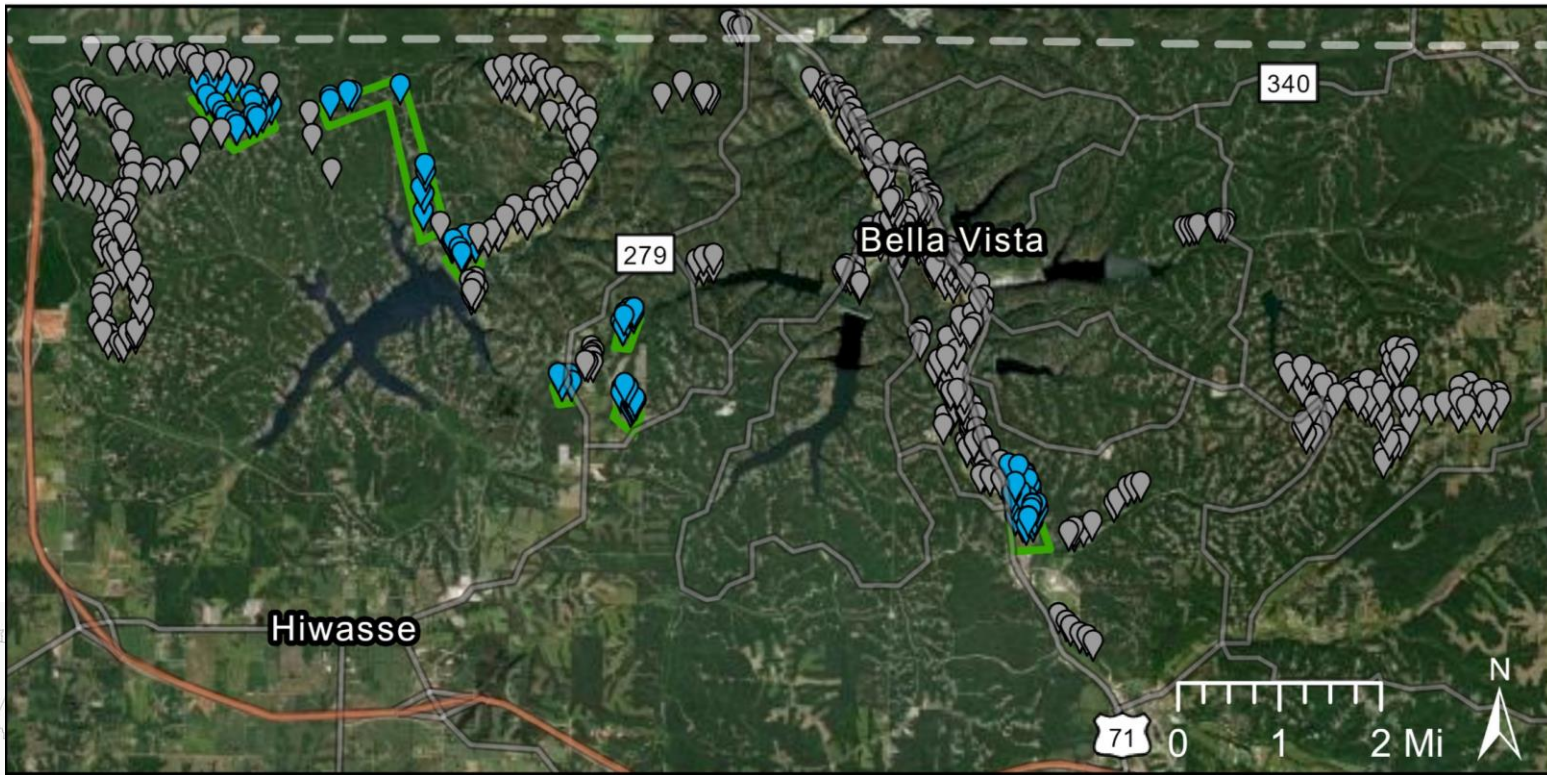
Photo by Flip Putthoff

Sue Gustafson



Photo by Flip Putthoff





- Berksdale Golf Course (fairways 5, 6, 7)
- Bella Vista Memorial Garden Cemetery
- Loch Lomond Dog Park
- Branchwood Recreation Center
- St. Bernard Catholic Church
- Presbyterian Church
- Glasgow Car Trail (boxes 1-10)

103 boxes total



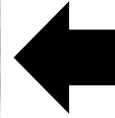
HY = hatch year, aka juvenile

### Research objectives:

1. Calculate **recruitment** into the local population
2. Study **winter roosting behavior** of adults and non-dispersing HYs
3. Determine what factors influence **box occupancy and productivity**



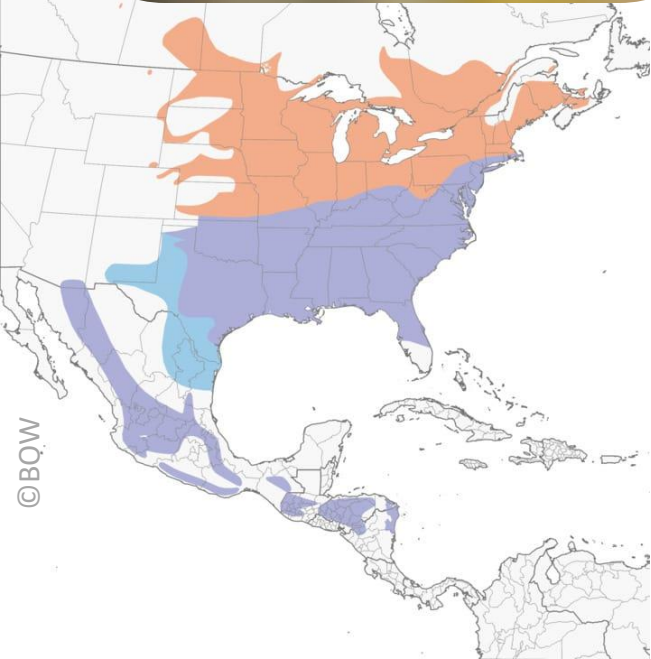
Photo by Quin Warsaw



Here we're asking, what proportion of the fledglings we help produce end up being breeders in following years?

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Male nestling

This objective requires knowing who is who and tracking them year to year. To do this, we band nestlings and then search for them in subsequent years. Color bands allow us to tell individuals apart without having to recapture any birds. We also take body measurements to get a sense of nestling condition and sex the nestlings (by plumage) to understand sex ratio.



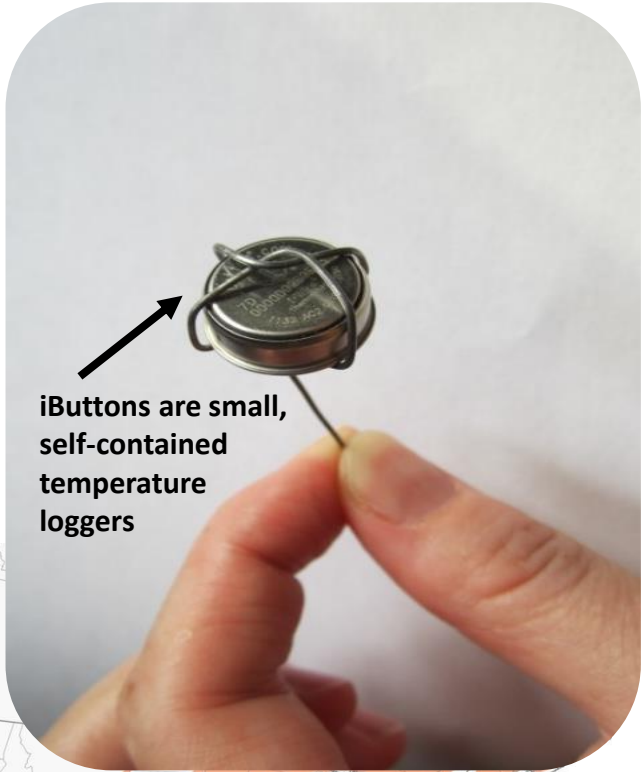
Female nestling



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iButtons are small, self-contained temperature loggers



We put one inside the nest box



And one outside the next box

Inside temperature – outside temperature = temperature difference between ambient temp and box temp

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# Predicted effects of EABL on winter nest box temps

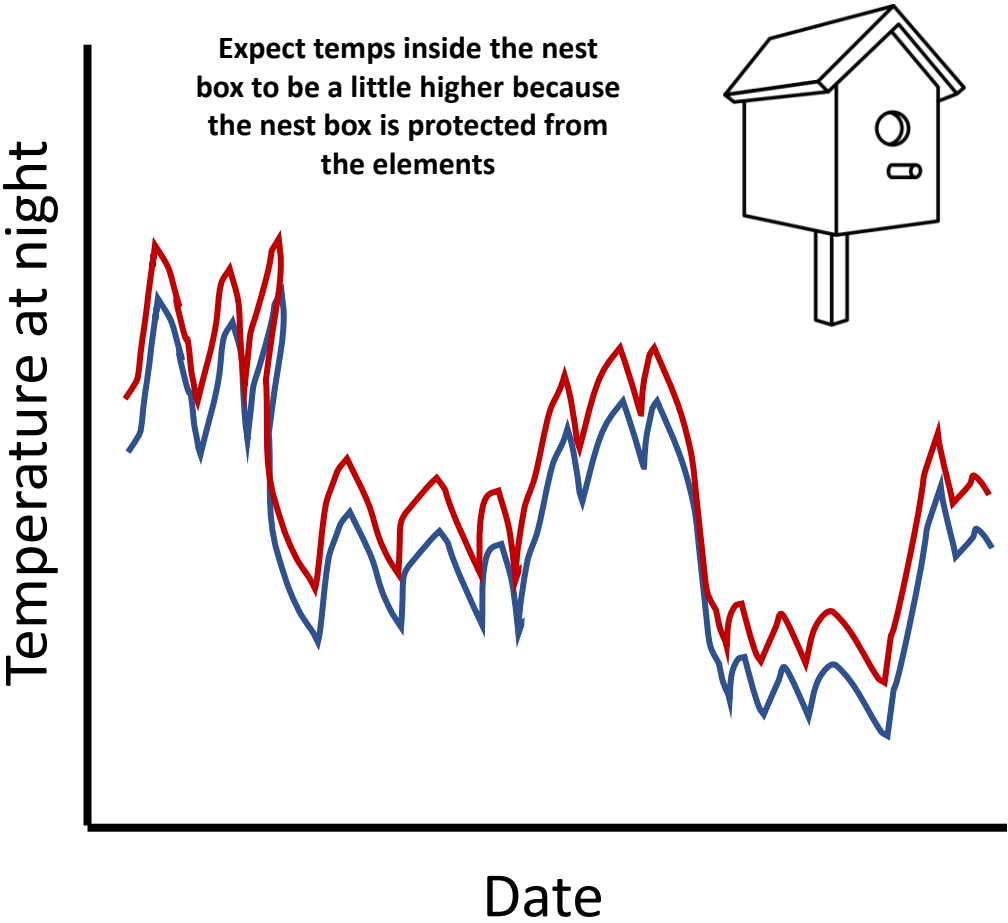


Temperature inside box

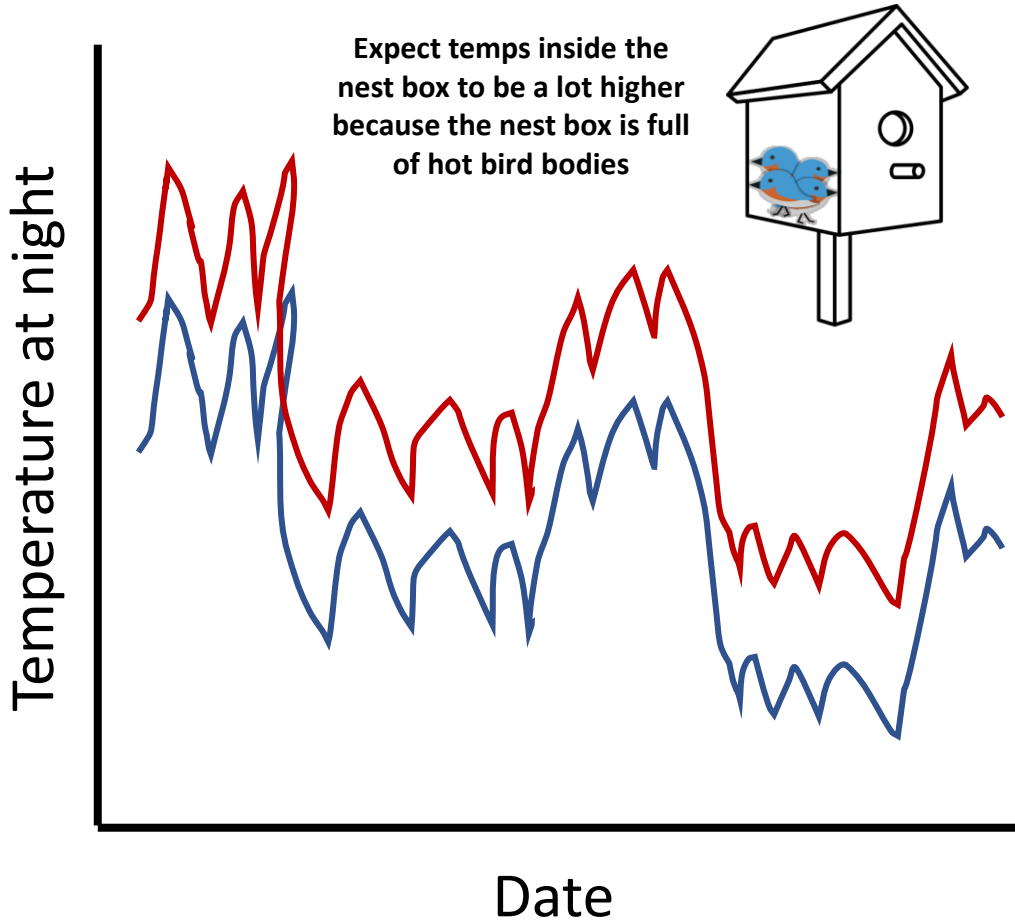


Ambient temperature outside box

### Expectations if no EABL roosting in box

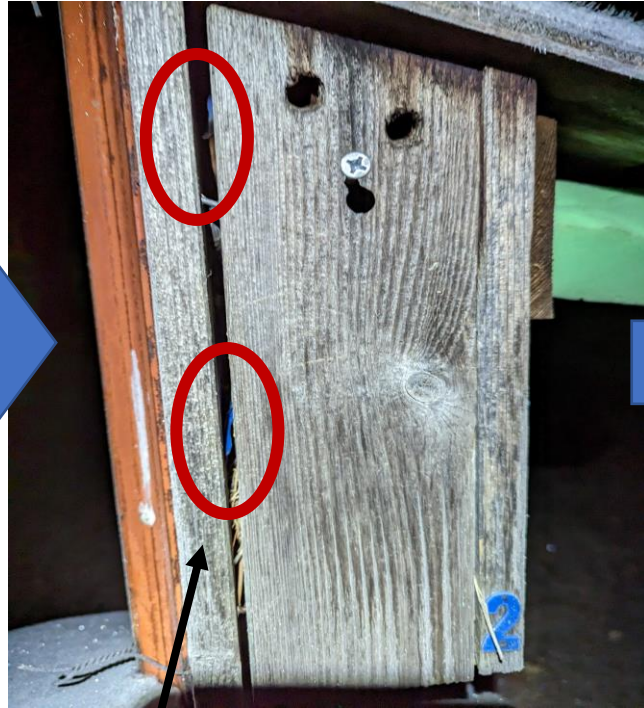


### Expectations if many EABL roosting in box

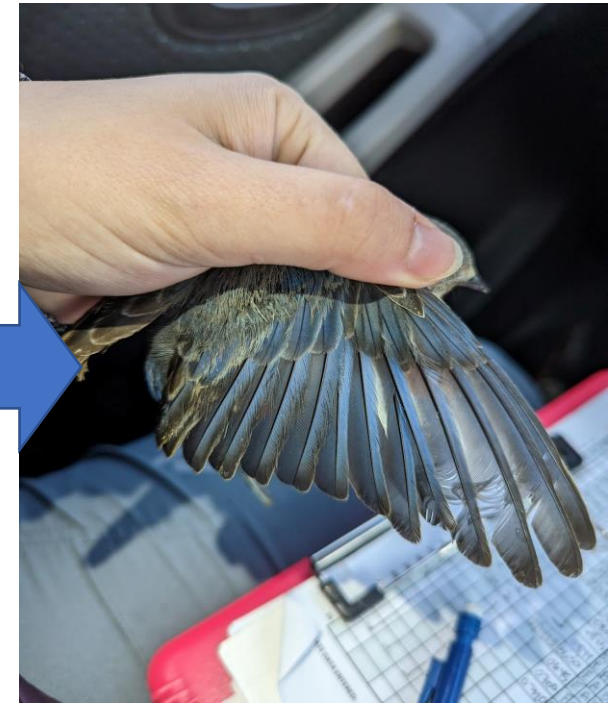




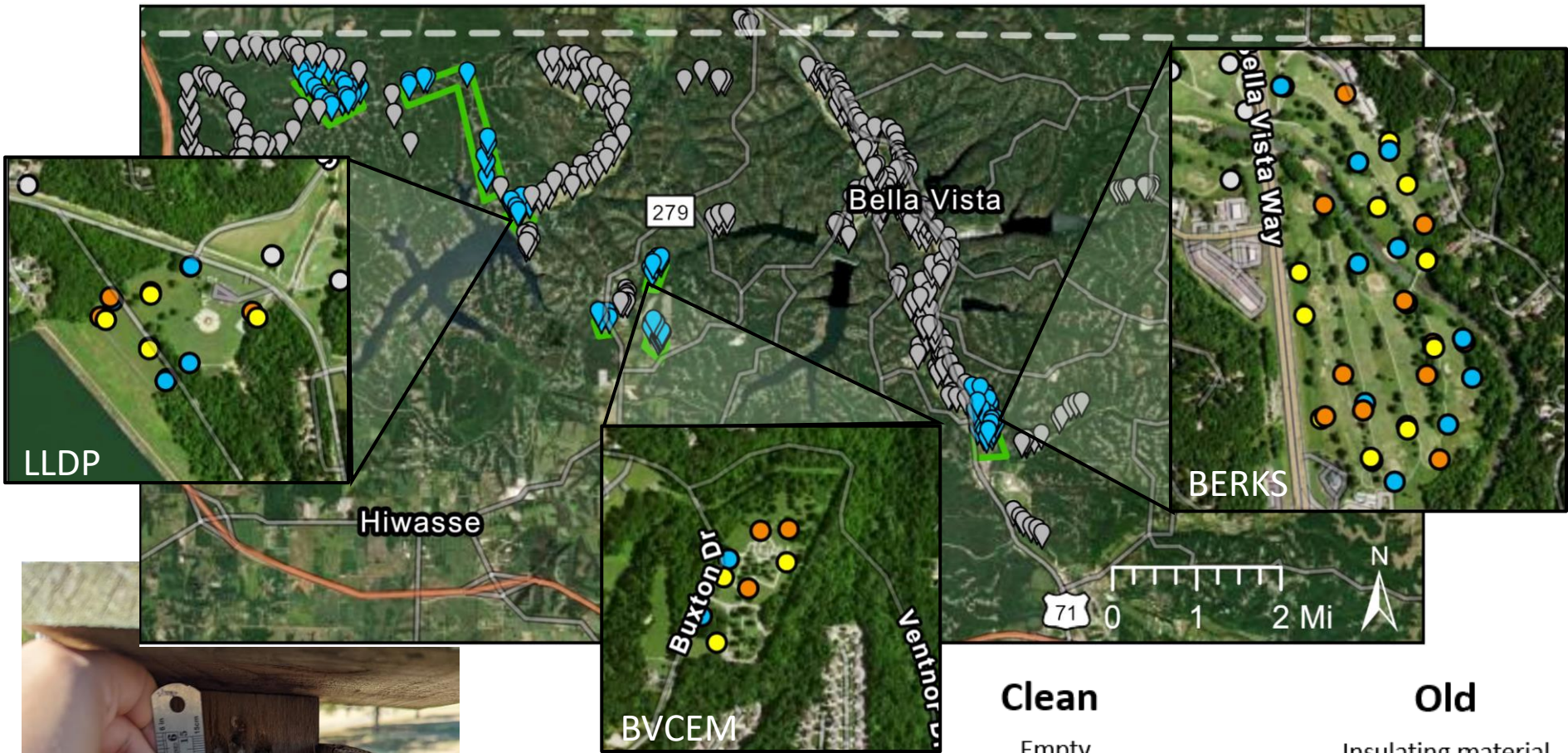
In addition to monitoring overnight box usage with temperature probes (which is an indirect measure of usage), we also go out before sunrise to check if anyone is in the box (a direct measure of usage). To do this, we plug the box hole and very carefully peek in the door. If there are bluebirds in the box, we take them out for banding, measuring, and sampling, and then put them back. It all takes only a few minutes.



I see a bluebird!

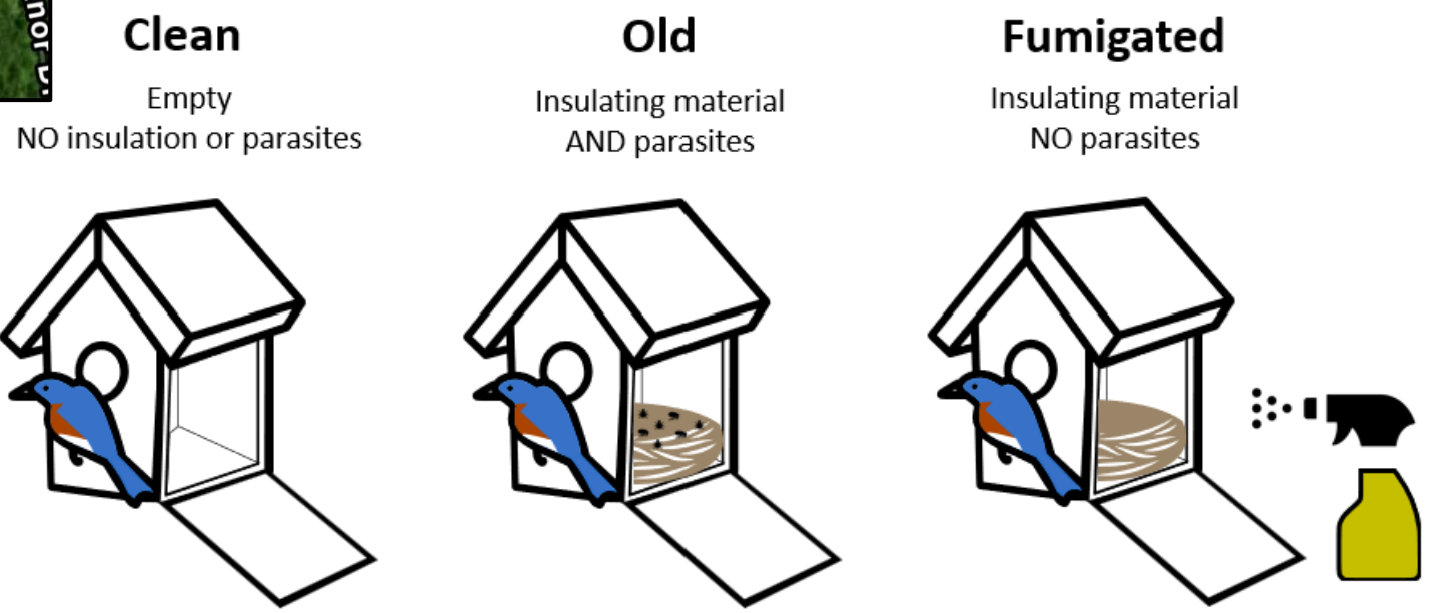






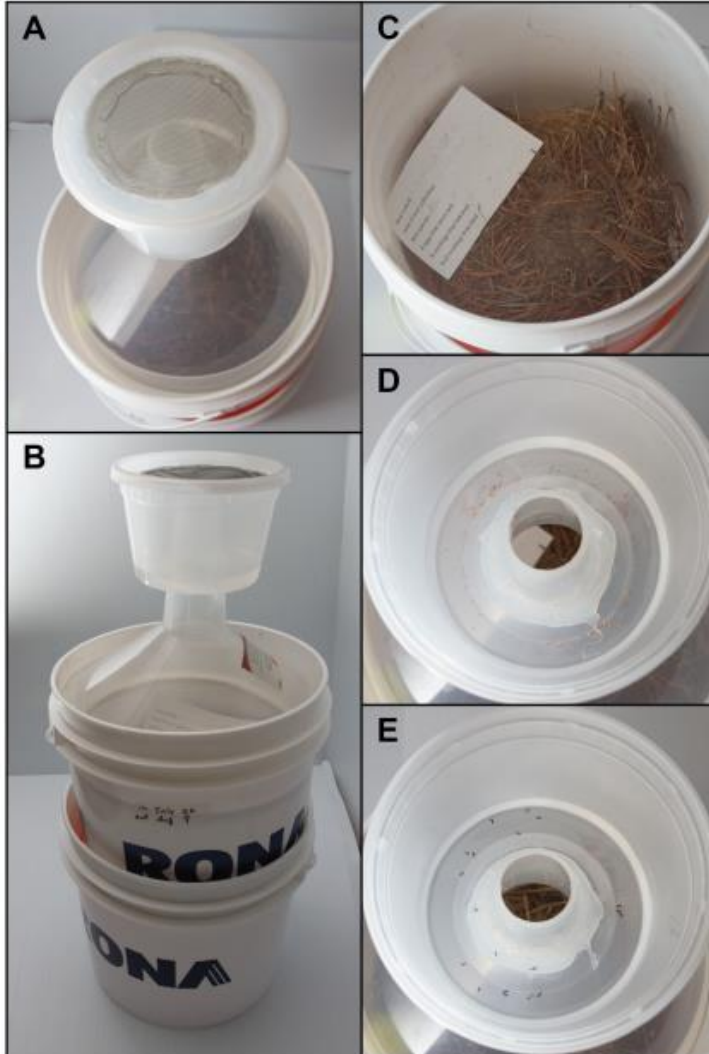
**Nest Treatments**

- Control
- Fumigated
- Old

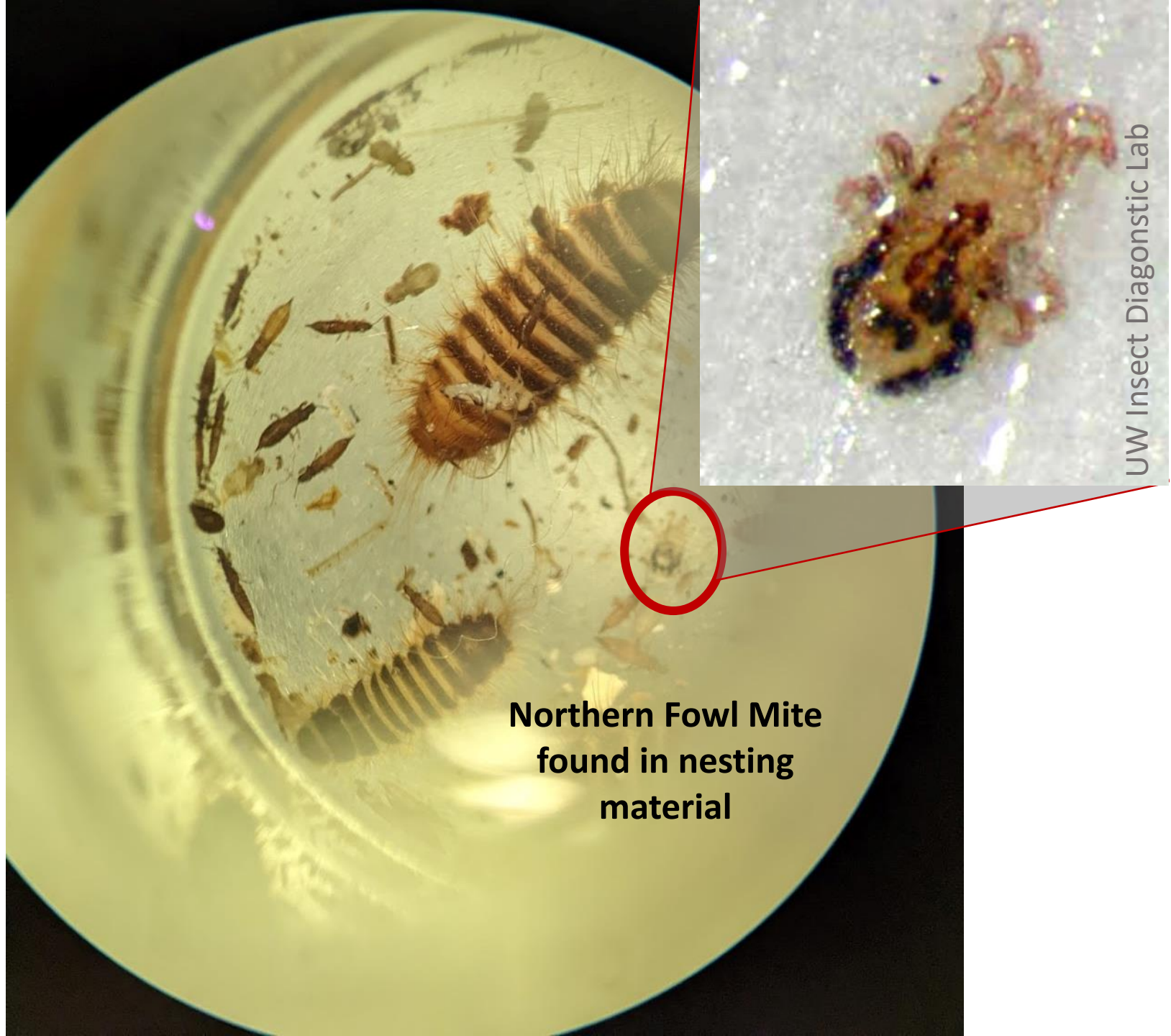




# Berlese funnel set up for extracting nest parasites



Levesque-Beaudin 2022





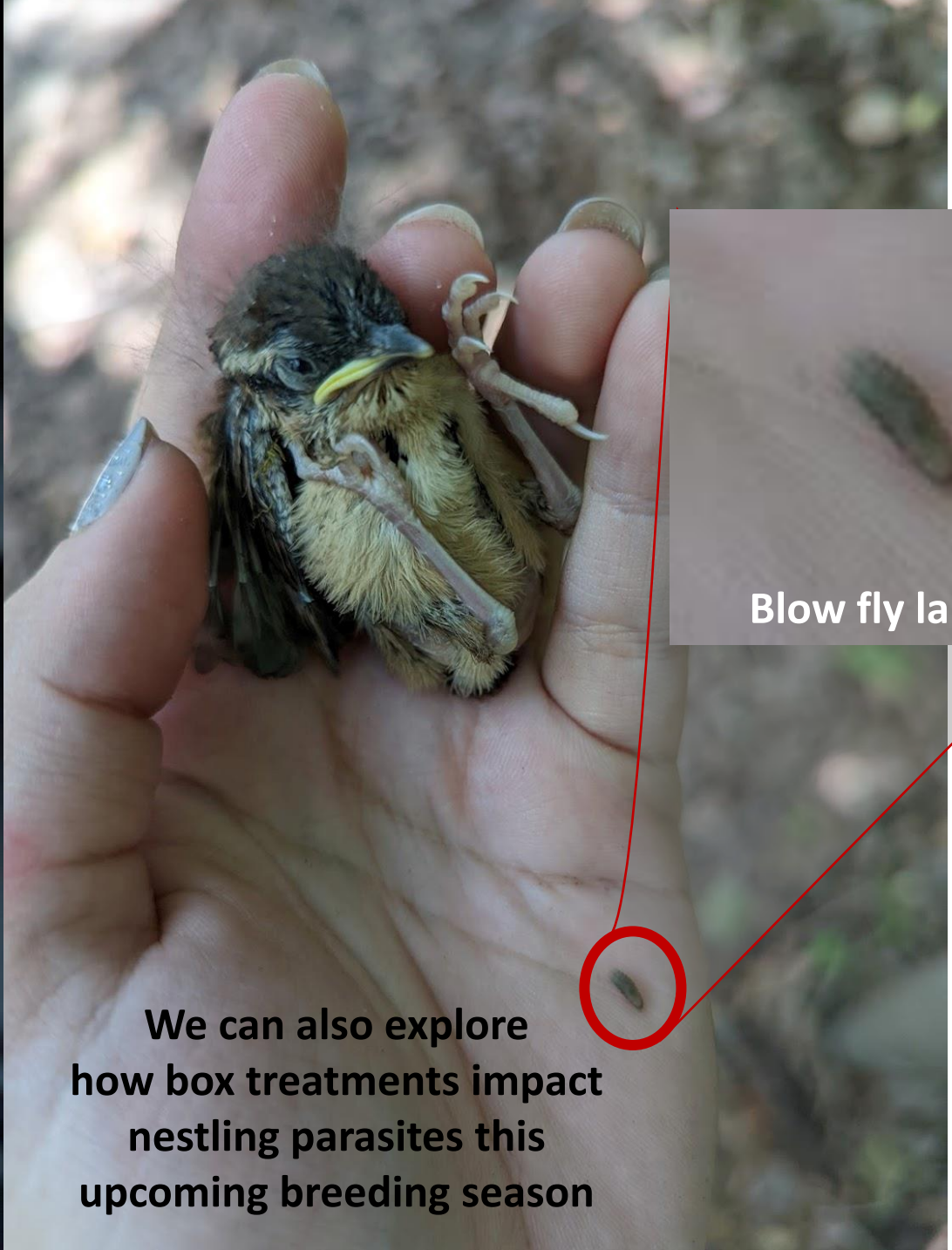
**Method for  
quantifying feather  
mites on adult birds**







**Other feather mites found  
this field season**



**Blow fly larva**

**We can also explore  
how box treatments impact  
nestling parasites this  
upcoming breeding season**



## 2022-2023 Monitoring Data

**6/28** days (21%)

**12** boxes  
(5 on 12/23/22)

**3.25** avg # indiv./roost

**9** indiv. in largest roost



**25** unique individuals  
(17 prev. banded in  
breeding season)

59% in birth box

35% in adjacent box

### Research objectives:

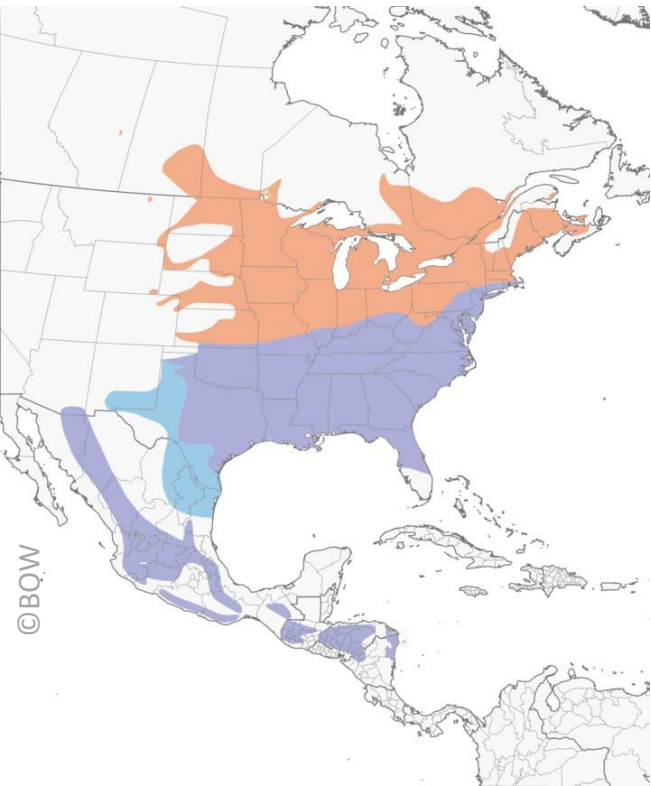
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## 2022-2023 Monitoring Data

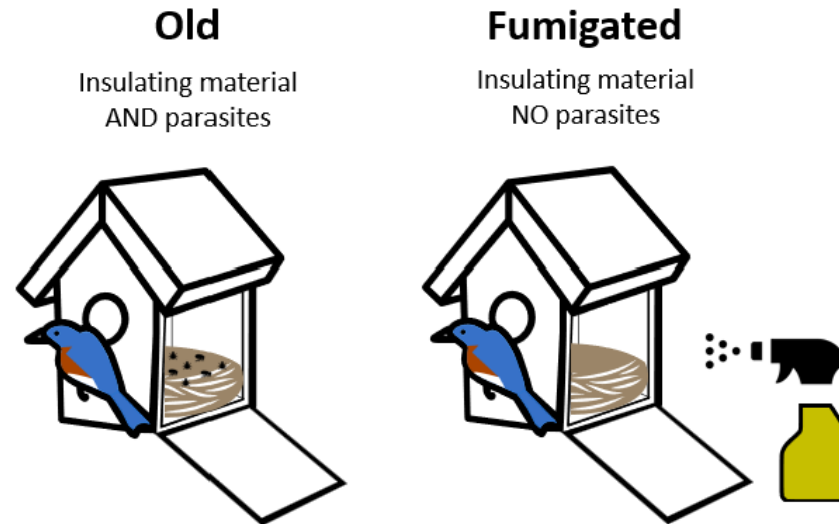
19.2° F avg. low temp

-3° F min low temp

24° F max low temp



100% of roosting birds were found in boxes w/ nesting material



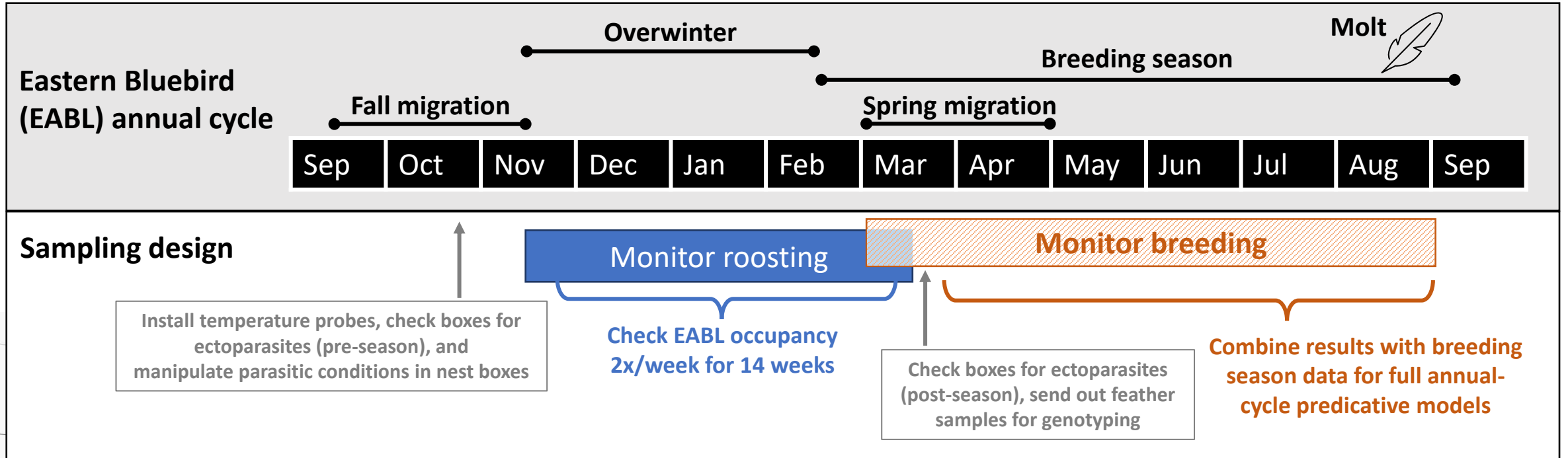
50/50 split between 'Fumigated' and 'Old' treatments

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# Full annual-cycle research plan



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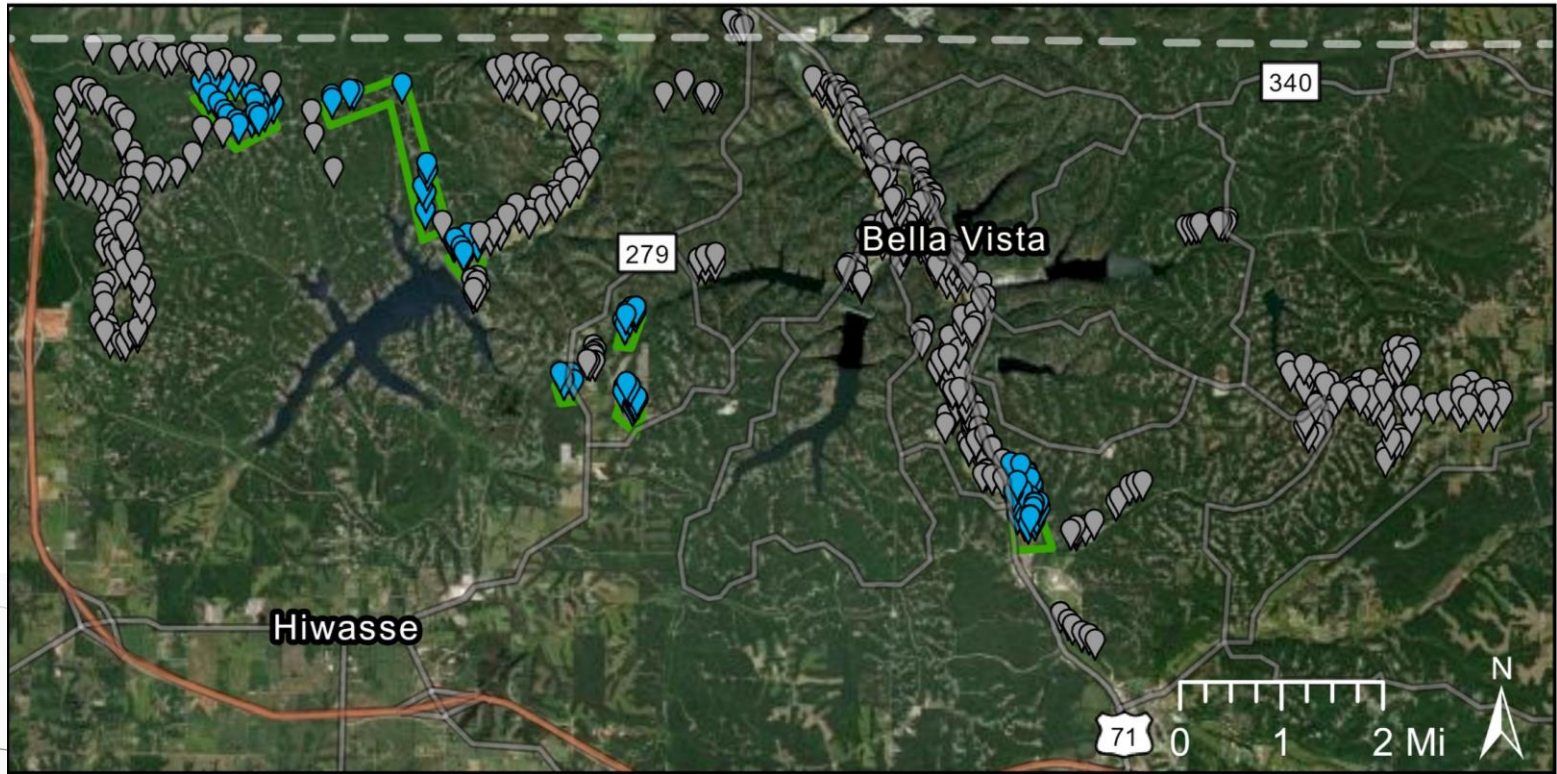
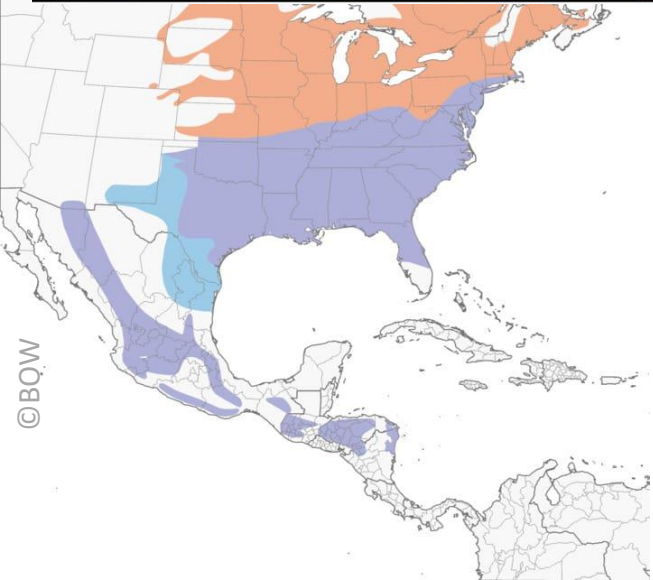


Photo by Quin Warsaw



### Research objectives:

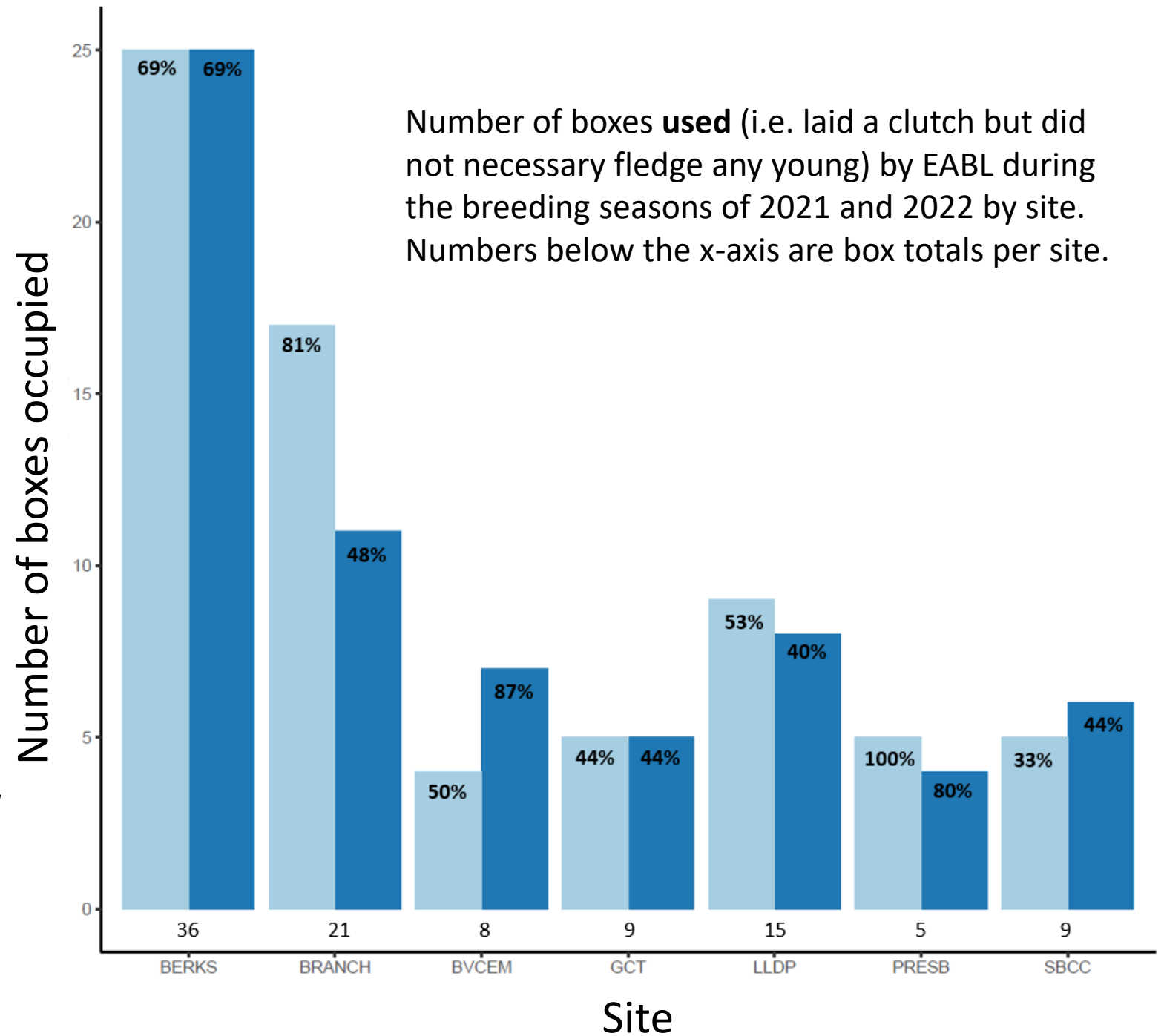
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# EABL box occupancy

2021 2022

BERKS: Berksdale East  
BRANCH: Branchwood  
BVCEM: Bella Vista Memorial Cemetery  
GCT: Glasgow Car Trail #s 1-10  
LLDP: Loch Lomond dog park  
PRESB: Presbyterian Church  
SBCC: St Bernard Catholic Church



# Variables measured at each box (3 spatial scales)

We plan to model how different variables influence **occupancy** and ask whether the pattern is consistent across **sites, seasons** (i.e. breeding vs overwintering occupancy), and **years**

## 1. Nest box

- Paired (Y/N)
- Weathering code (0-6)
- Baffle type (cone, column)
- Predator guard (Y/N) and length
- Locking mech (nail, screw)
- Entrance type (slot, hole)
- Entrance size
- **Entrance orientation**
- Distance from ground to baffle top
- Distance from box entrance to ground

- Internal area of box
- Reproductive legacy of box
- Occupancy legacy of box

## 2. Microhabitat

- Canopy cover (hit/miss every 5 m along 25 m transect at 3 heights)
- For each quadrant (NE, SE, SW, NW)
  - Nearest tree type
  - Distance to nearest tree
  - Diameter breast height of nearest tree
  - Lowest branch height of nearest tree

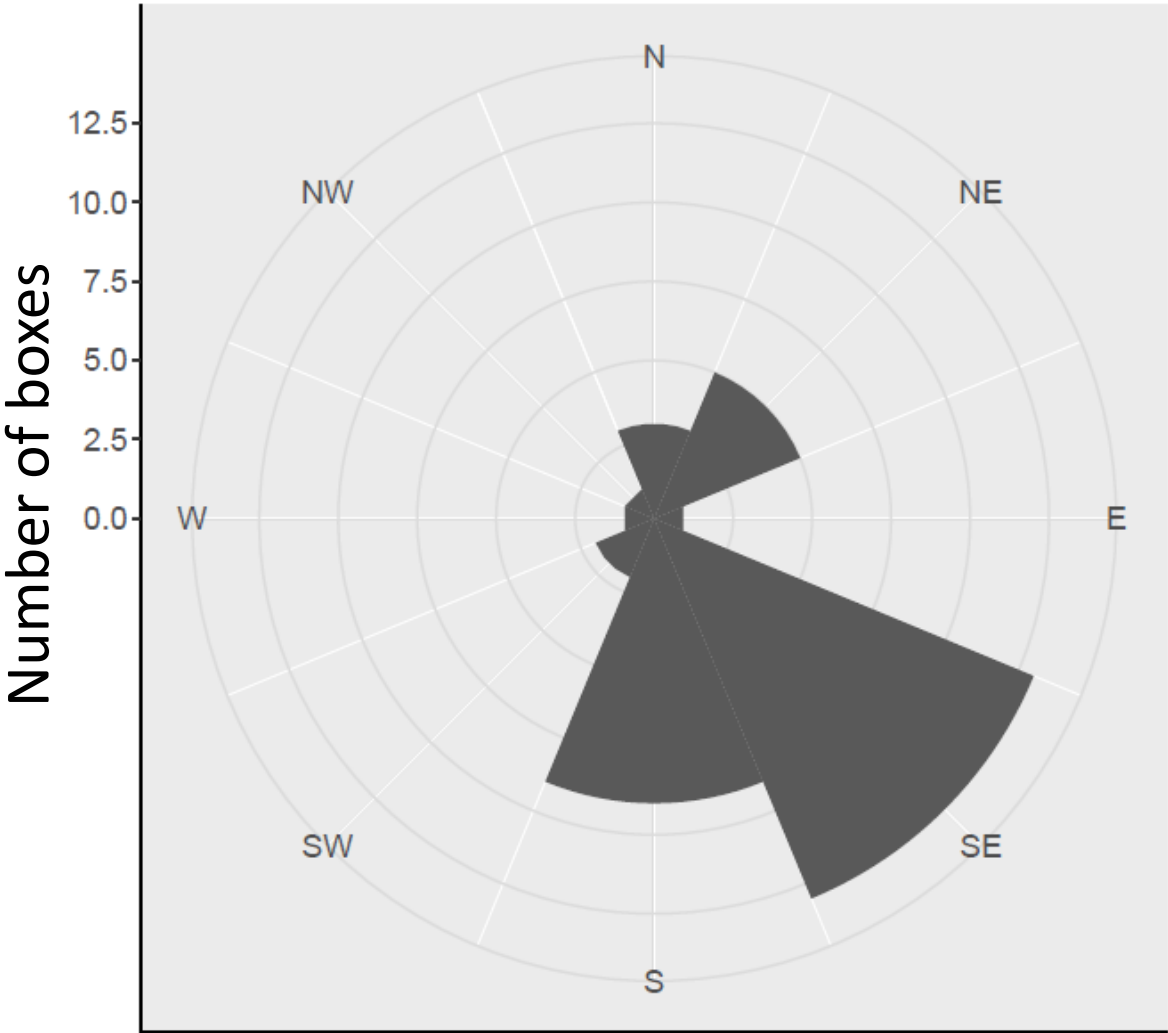
## 3. Landscape

- Nearest structure type and distance
- Distance to nearest non-road surface
- Distance to forested edge
- **Openness**
- Site size
- Development index (?)
- Soundscape (?)

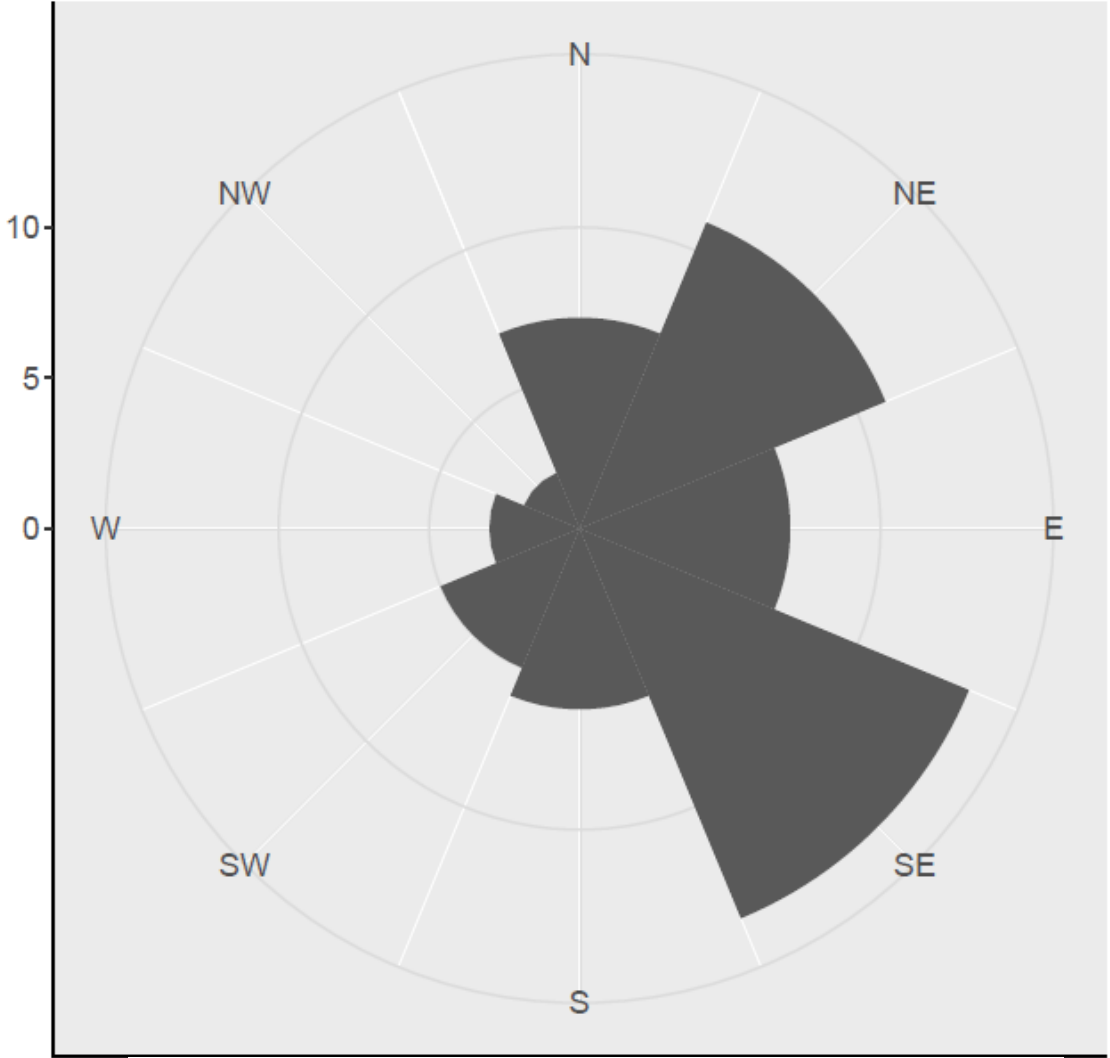


# Did entrance orientation affect box occupancy in 2021?

Preliminary data: These two figures look pretty similar, so orientation probably not that important in predicting occupancy



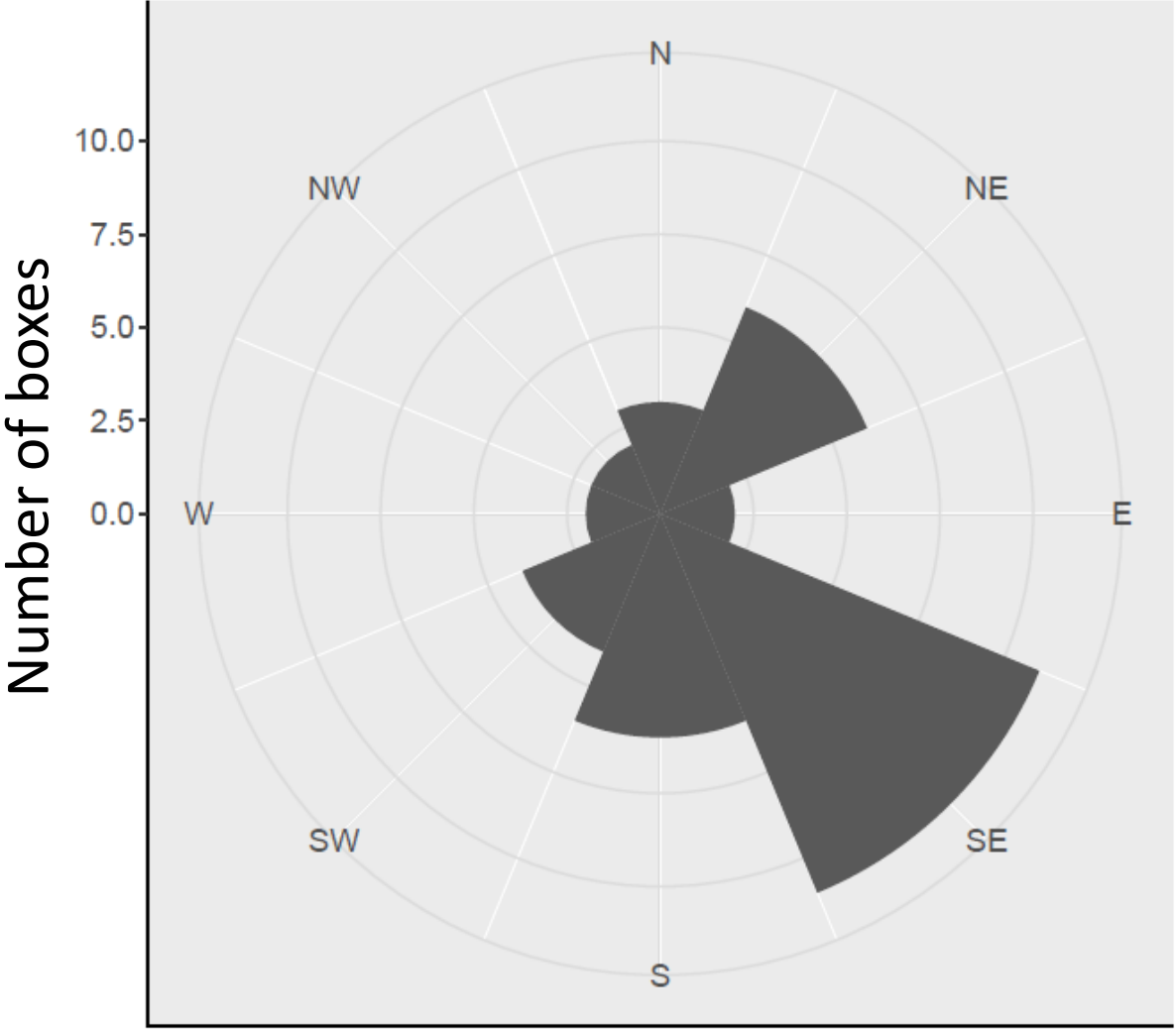
Orientation of boxes **not used** by EABL



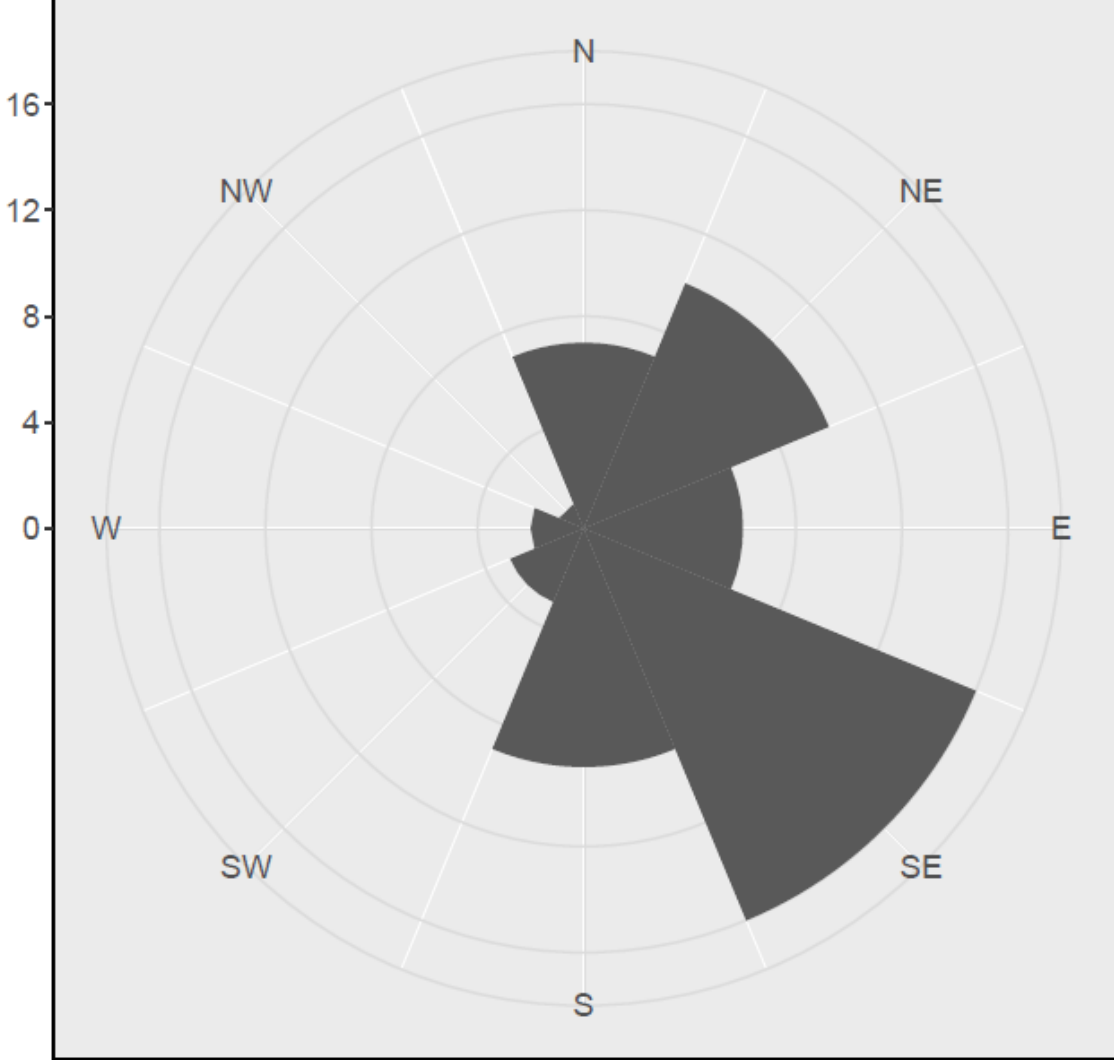
Orientation of boxes **used** by EABL

# Did entrance orientation affect box occupancy in 2022?

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Orientation of boxes **not used** by EABL



Orientation of boxes **used** by EABL



# Landscape openness

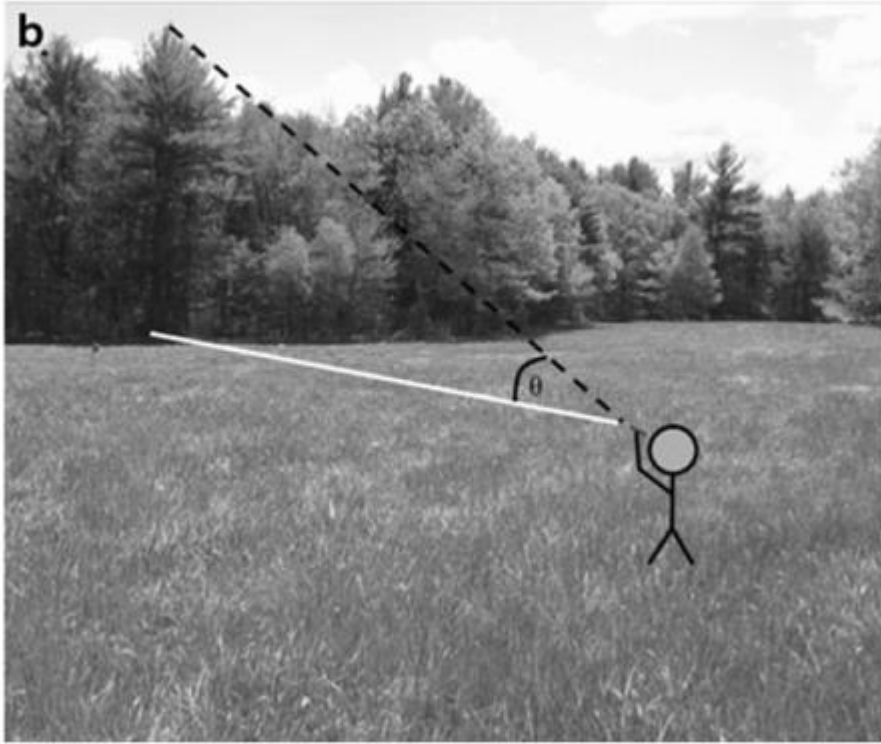


Image source: Keyel et al. 2012. Testing the role of patch openness as a causal mechanism for apparent area sensitivity in a grassland specialist. *Oecologia* 169:407-418.

0 = minimal openness  
1 = maximal openness

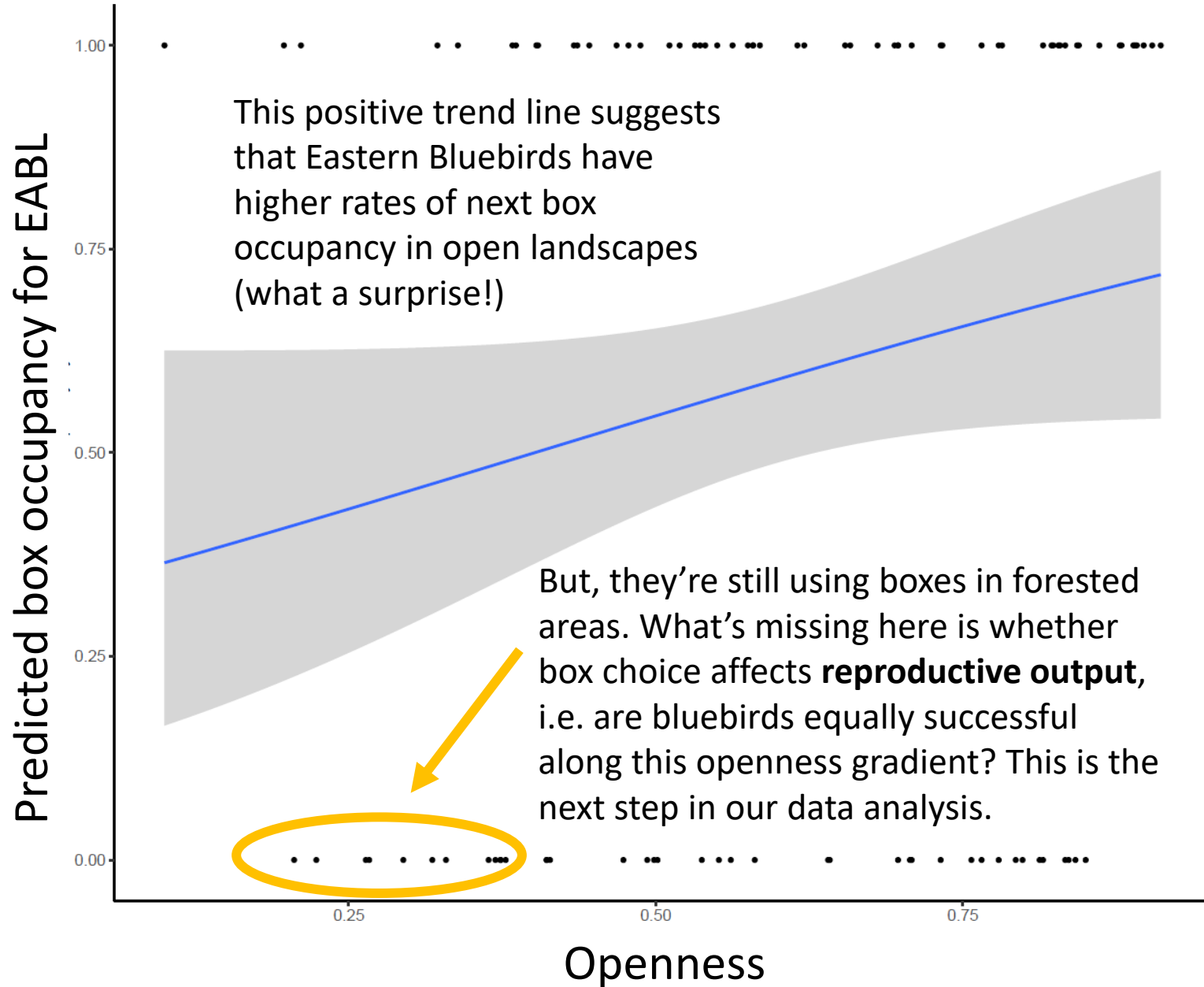




Photo by Quin Warsaw

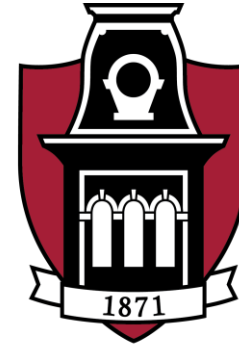
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# Thank you!

- Butch Tetzlaff
- Sue Gustafson
- Laura Claggett
- Brennan Waters



UNIVERSITY OF  
ARKANSAS

