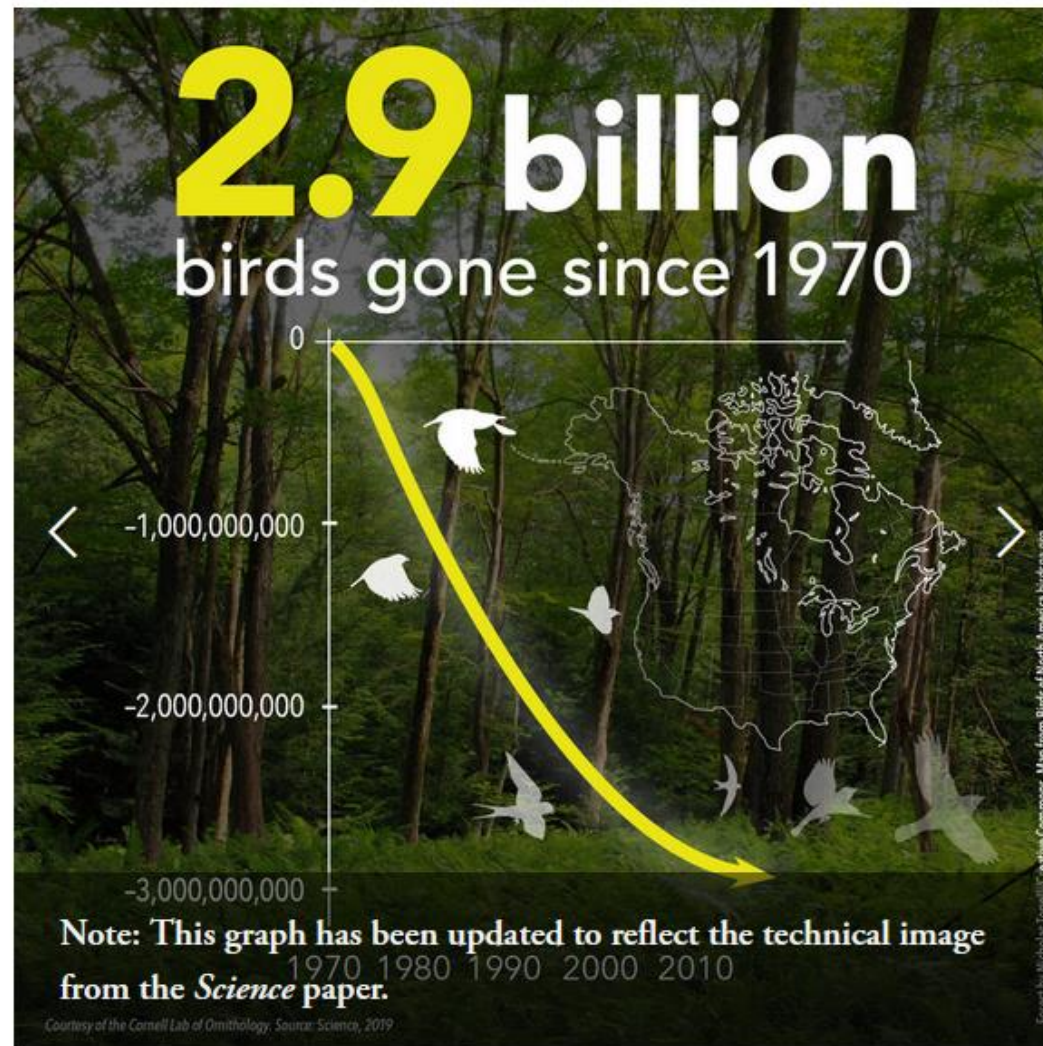




Adaptive silviculture practices and Breeding Songbirds in the Northeast

David Farris, Madeline Boyd, Rachel Cliché,
Leighlan Prout, Alexej Sirén, Noah Wilson, Toni Lyn Morelli

How are
birds doing?



Source: Rosenberg et al. 2019

Background

- Adaptive silviculture practices are being developed to help forests adapt to climate change (Nagal et al 2017)
- Past management techniques created more of a homogenous forest type
- While the goal is for forest to be more robust for climate change, there is a need to make sure that the ecological function of the habitat is intact (D'Amato & Palik 2021)
- There is no universal approach to managing the forest habitats



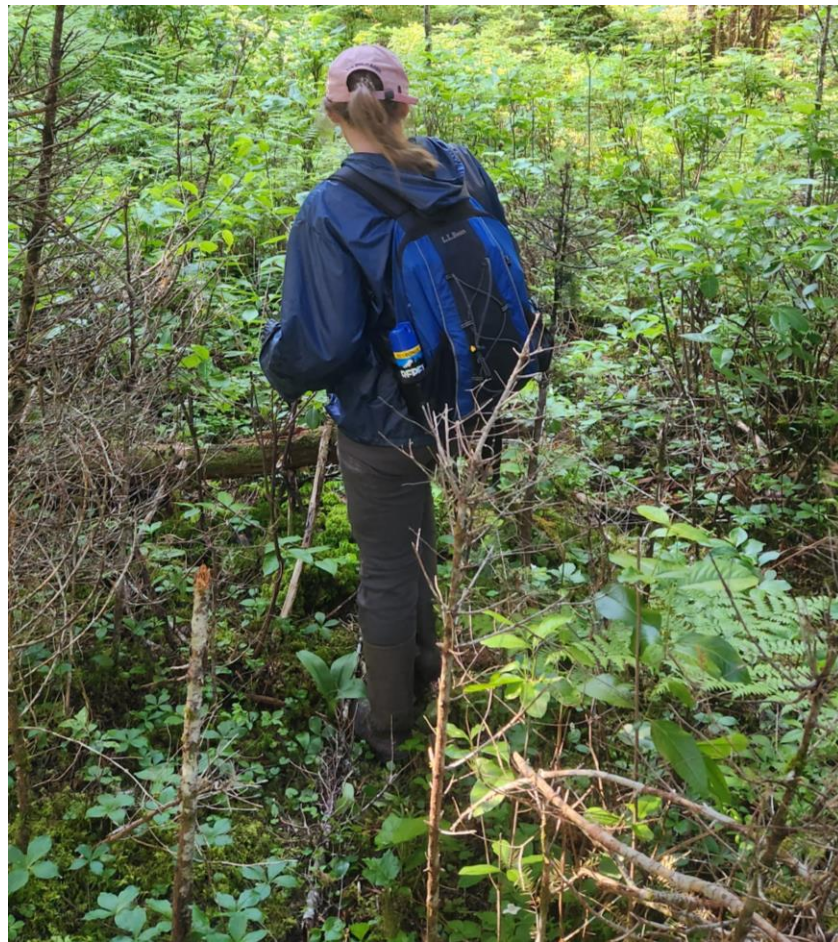
Adaptive Silviculture

- In NE US adaptive silviculture practices used to increase complexity and resiliency to climate change
- In the Northeast this could include forest thinning or selective logging (Rogers et al 2022)

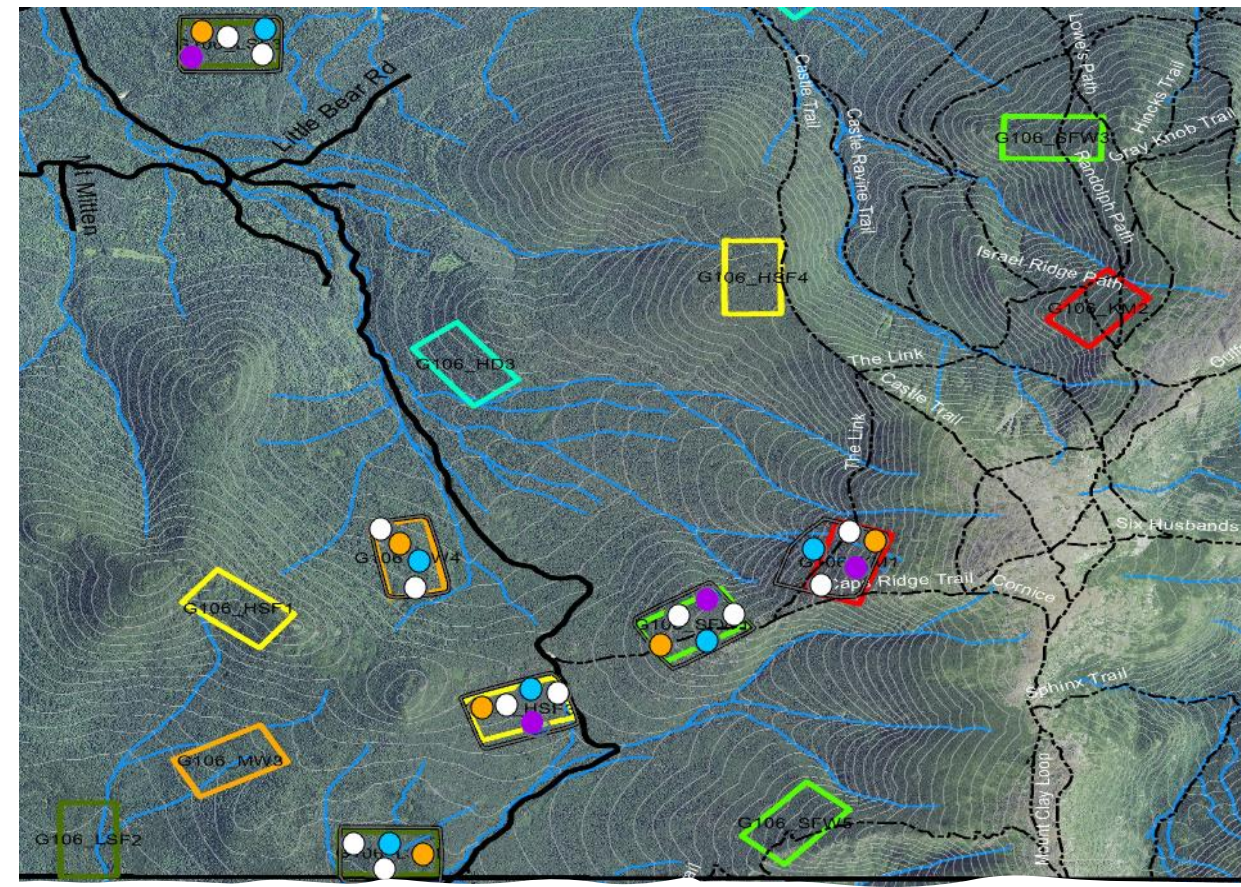
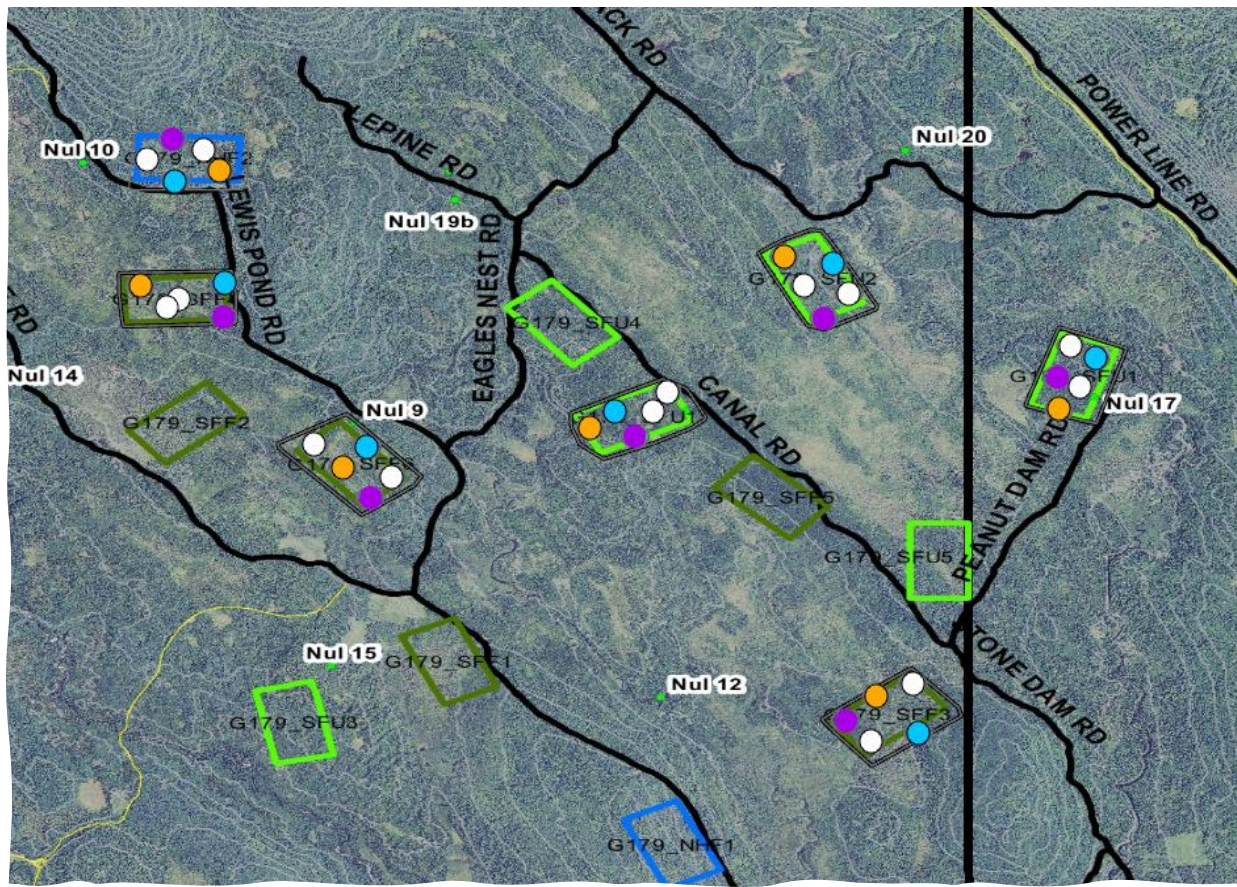
Main Questions

- Comparing two different types of management, how are the bird communities affected?
- What environmental factors predict bird occupancy in the Northeast?





Methods



Study Sites

- Nulhegan Basin (VT)-> US Fish and Wildlife Service
 - active logging (climate adaptative management)
- Mount Jefferson (NH)-> White Mountain National Forest, US Forest Service
 - no active logging for at least a century

Estimating Bird Diversity

- Camera Traps (year-round)
- Audio Recorders (months)
- Point Counts (season)



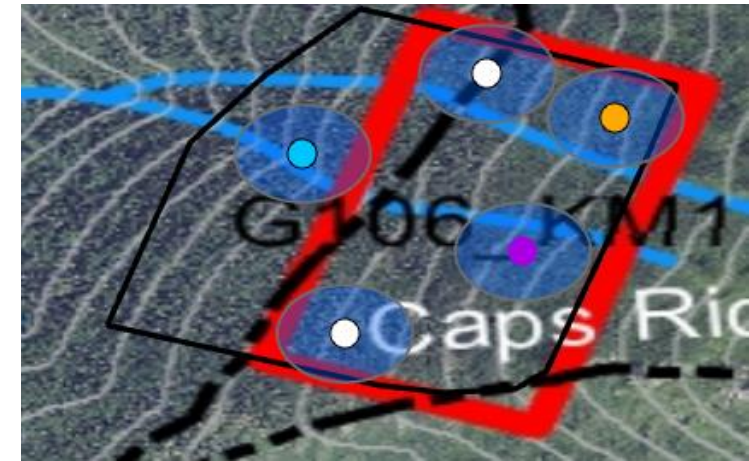


Camera Traps

- Recording stills of wildlife
- Left up year-round
- SiMPL-cam
- Three per plot

Audio Recorders

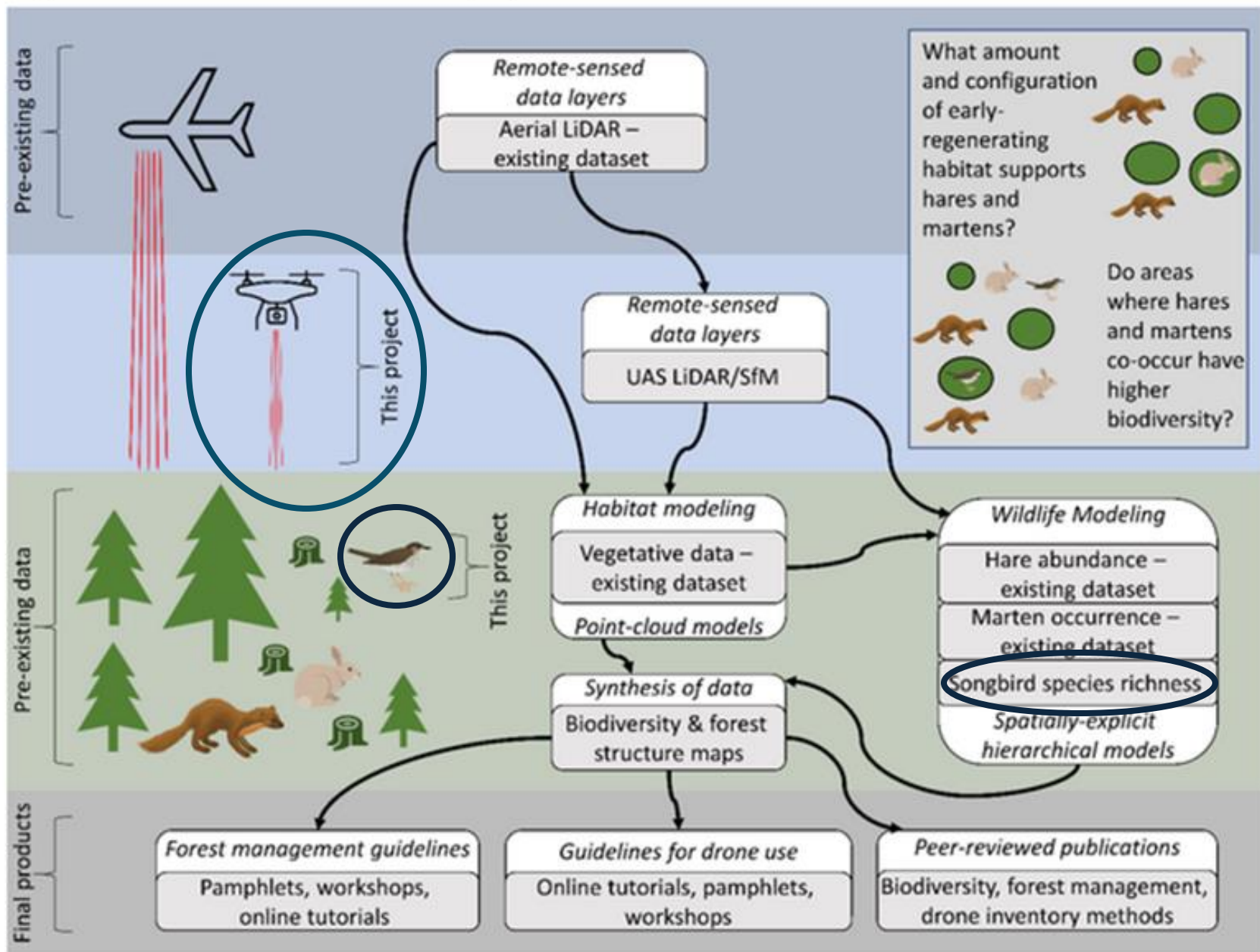
- Placed around late Spring & retrieved in the Fall
- Placement was based on the camera traps
- Using two different types
- Used extended boundaries available through LiDar



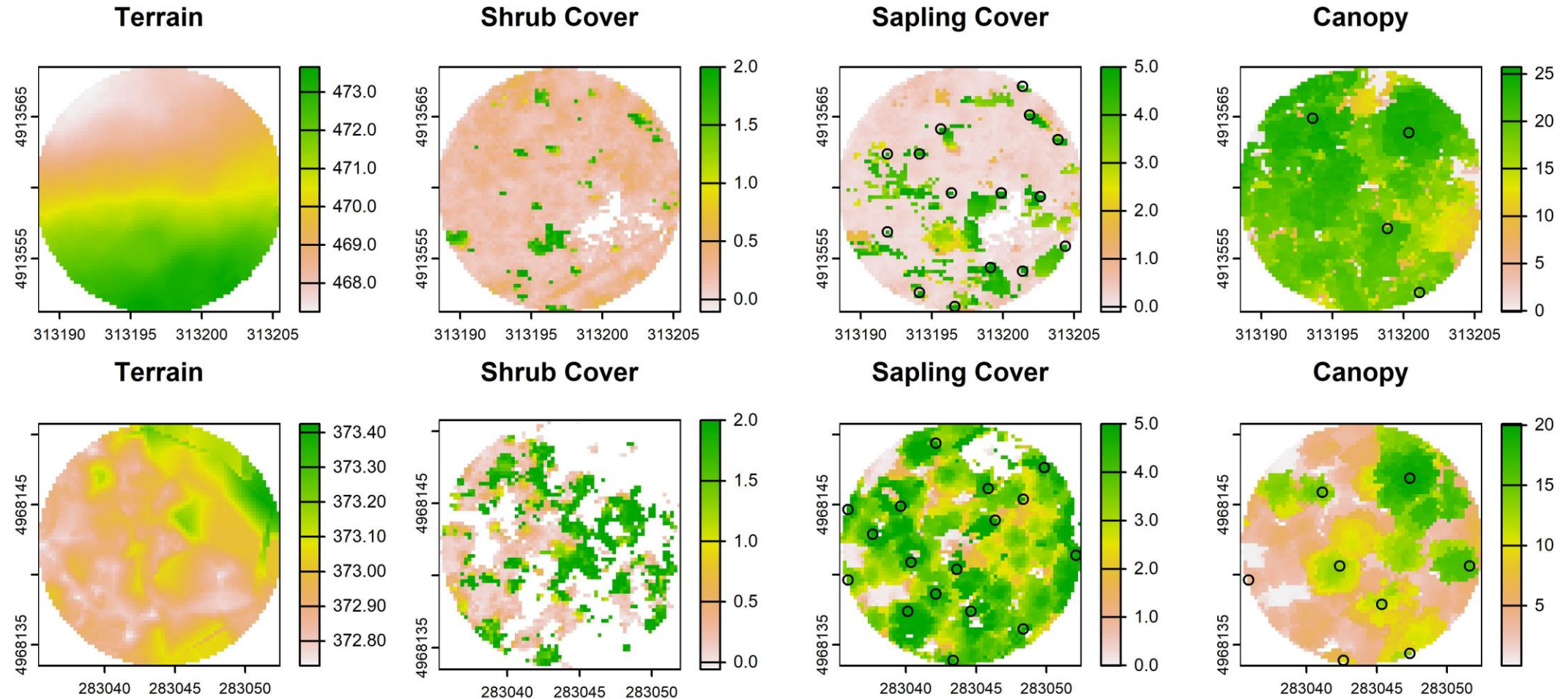
Point Counts

- Late May to July in 2023 and 2024
- 12 min. point counts split into 3 min sections
- Each site was surveyed three times





Forest Structure-LiDAR data





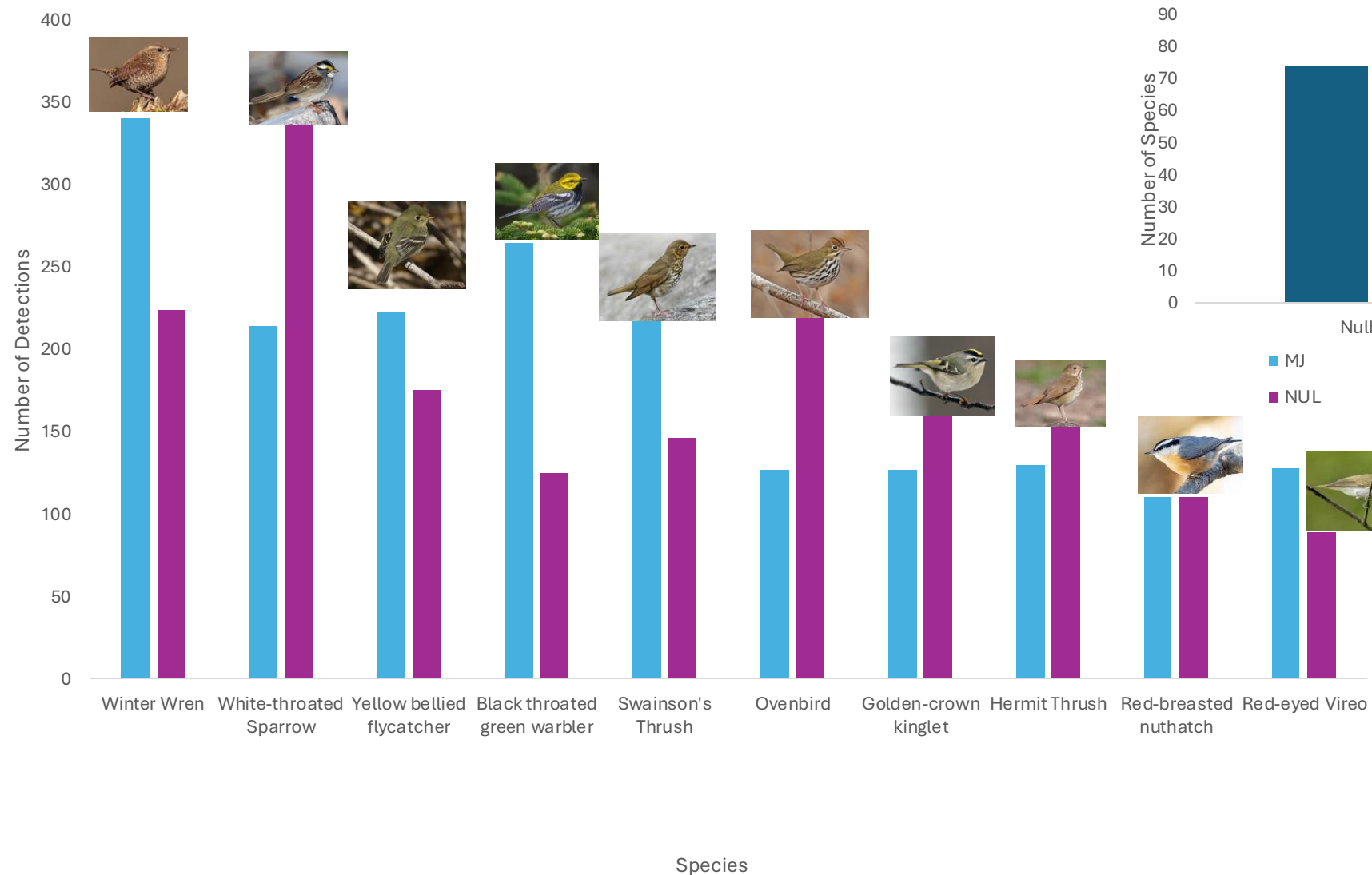
Occupancy Modeling

- We used a species occupancy model that included our forest structure predictors and observer predictors
- Forest structure: sapling cover, shrub cover, and canopy openness
- Observer: who, distance, noise, wind, visit, weather
- Done in R using the unmarked package

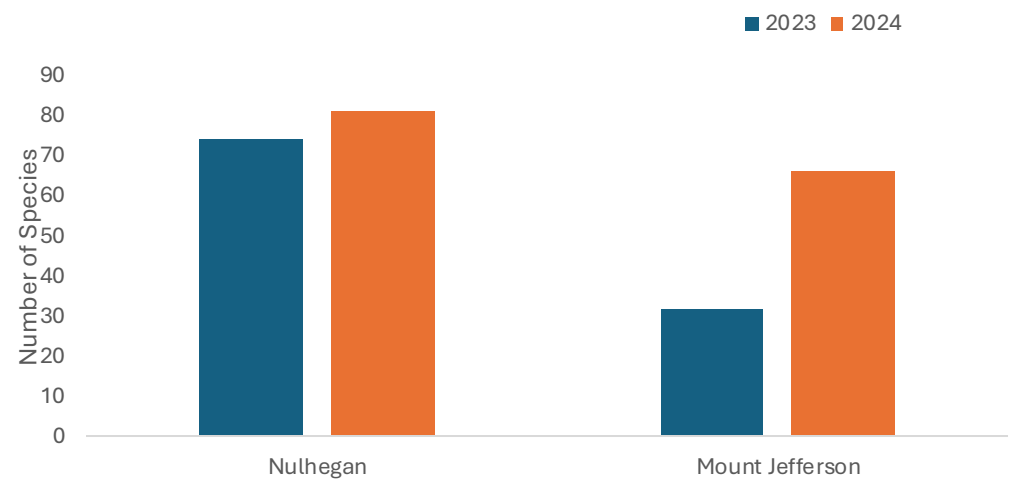


Results

Results (Point Counts)



Top Species



Total Species

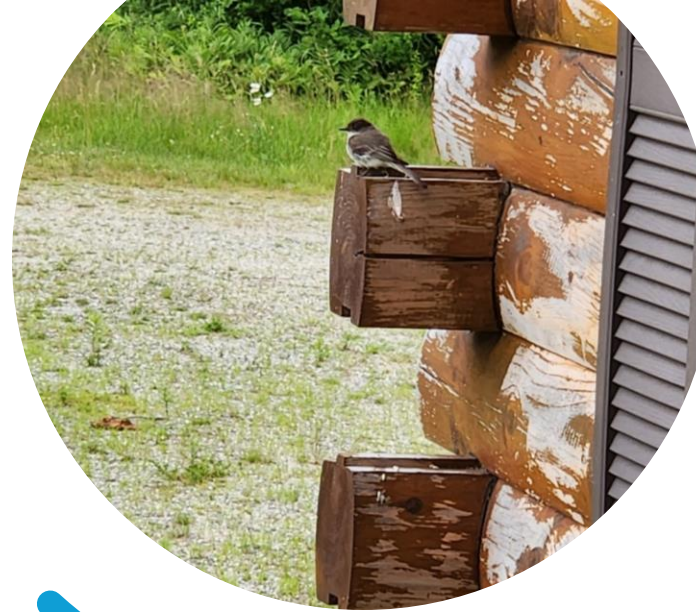
What did the Model find?

For the species occupancy model, none of the LiDar predictors were strongly associated with species occupancy, but there were negative trend associated with canopy closure while the other factors were positive

Detections variables were significant factors in detecting species

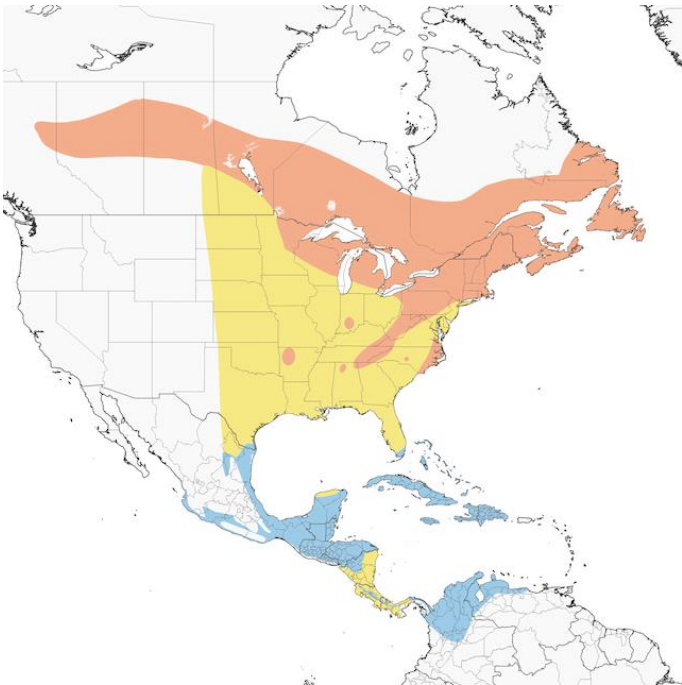
Future Directions:

- Can the SiMPL cams be used to survey bird diversity?
- Audio recorders (add to the point count surveys)
- Work with resource managers to incorporate bird diversity into forest management for climate adaptation



Looking forward...

Hoping to build an understanding of where certain habitats and avian species will be in the future to inform how we can focus management strategies



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Thank you

