Developing a cost-effective technique to estimate wolf abundance in Michigan

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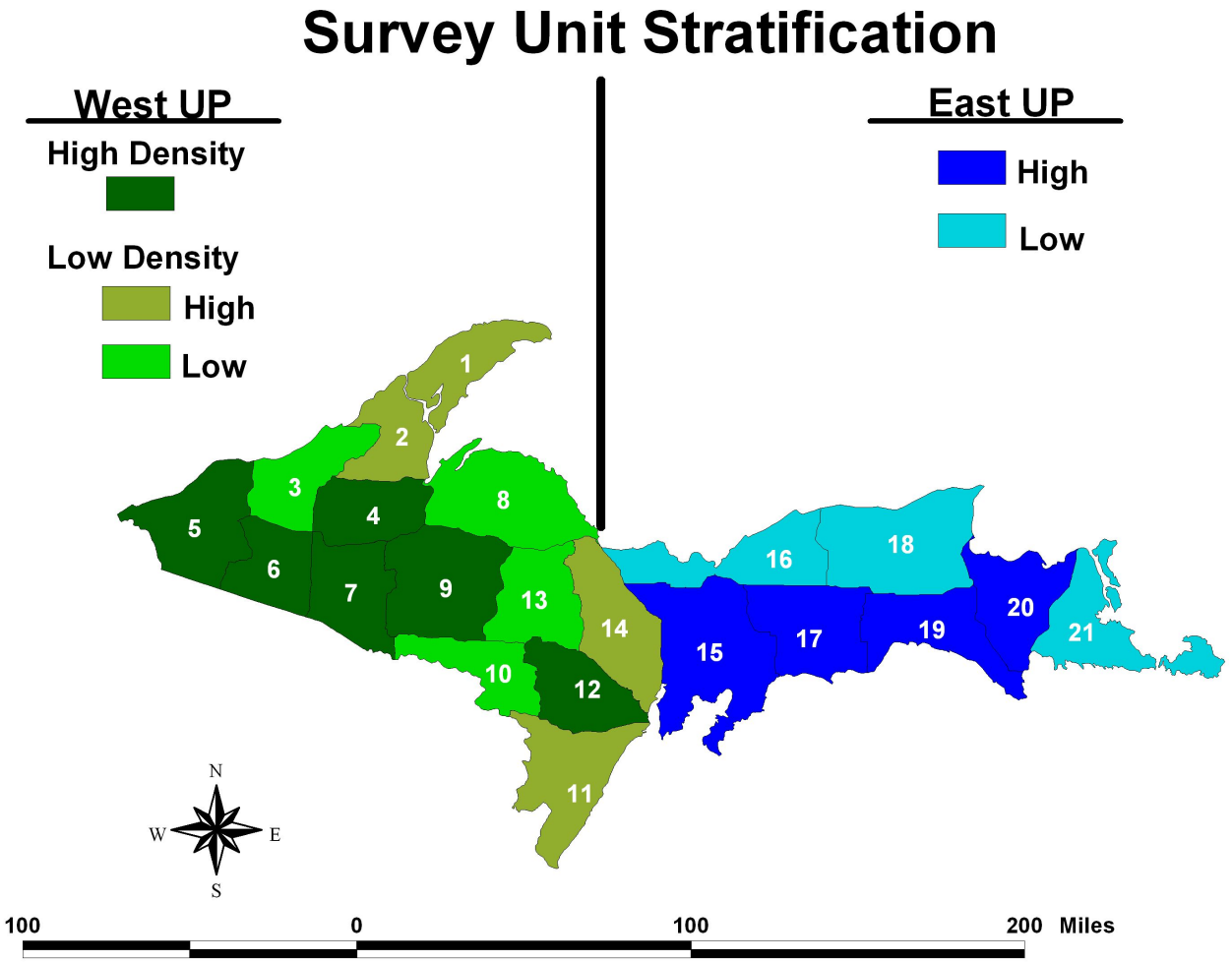
Minimum Count: Wolf Population Index

- Why during winter?
  - High pack cohesion
  - Relatively easy detection
- Track Surveys
  - 60% of UP biennially
  - Travel by truck or snowmobile
  - Intensive & extensive search for wolf tracks and sign



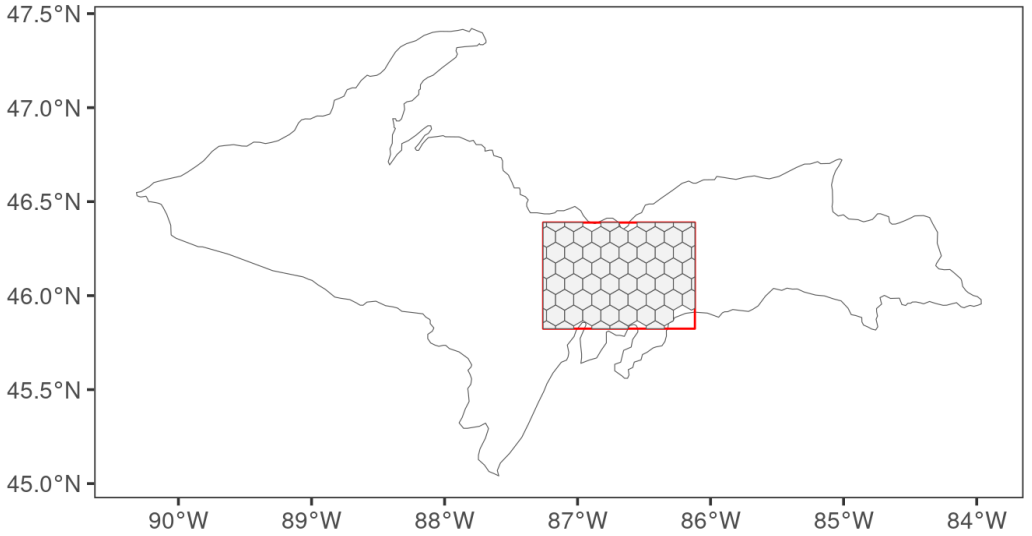
Background/Need for Wolf Abundance Project

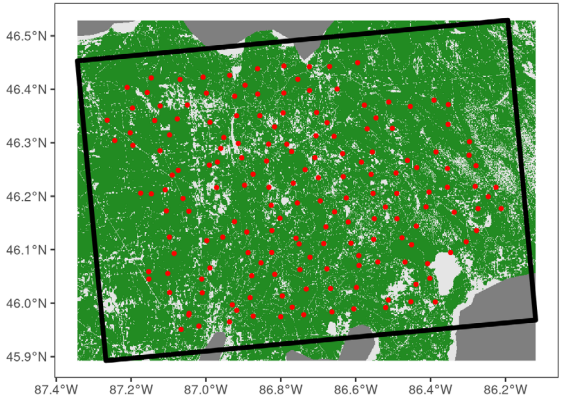
- Current minimum count requires significant effort to provide index of abundance
  - As wolf density has increased more time is needed to discern adjacent packs
  - Does not account for imperfect detection
  - Does not provide an abundance estimate with confidence intervals

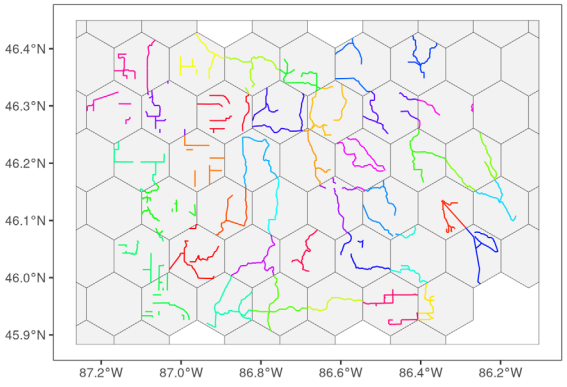
- Proposed wolf abundance project to research alternatives to estimate wolf abundance (2022-2027)
    - Increase precision
    - Decrease cost

2022 Pilot Surveys

- Feasibility study
- Pilot of 40 cells
  - 100 km^2 (~62 mi^2)
- 2 Surveys
  - A. Camera Survey
    - 200 cameras; 1 camera / 20 km^2 (~12.5 mi^2)
  - B. Occupancy track survey
    - 756 miles; average 19 miles/cell

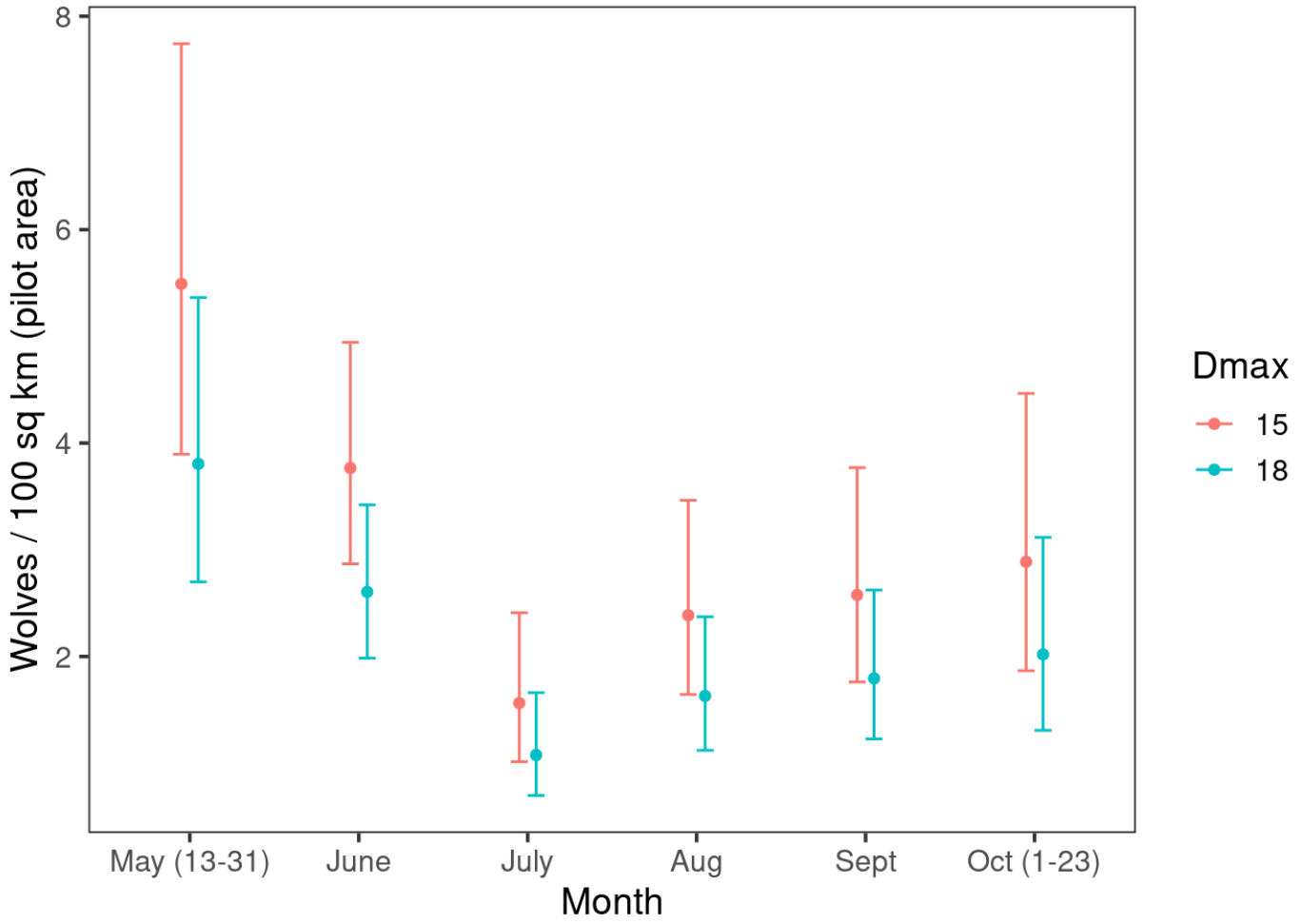


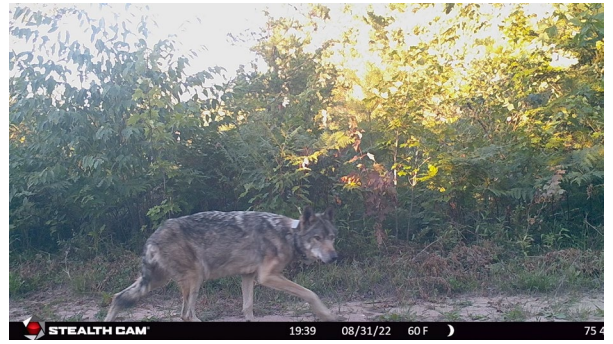




2022 Pilot Camera Survey

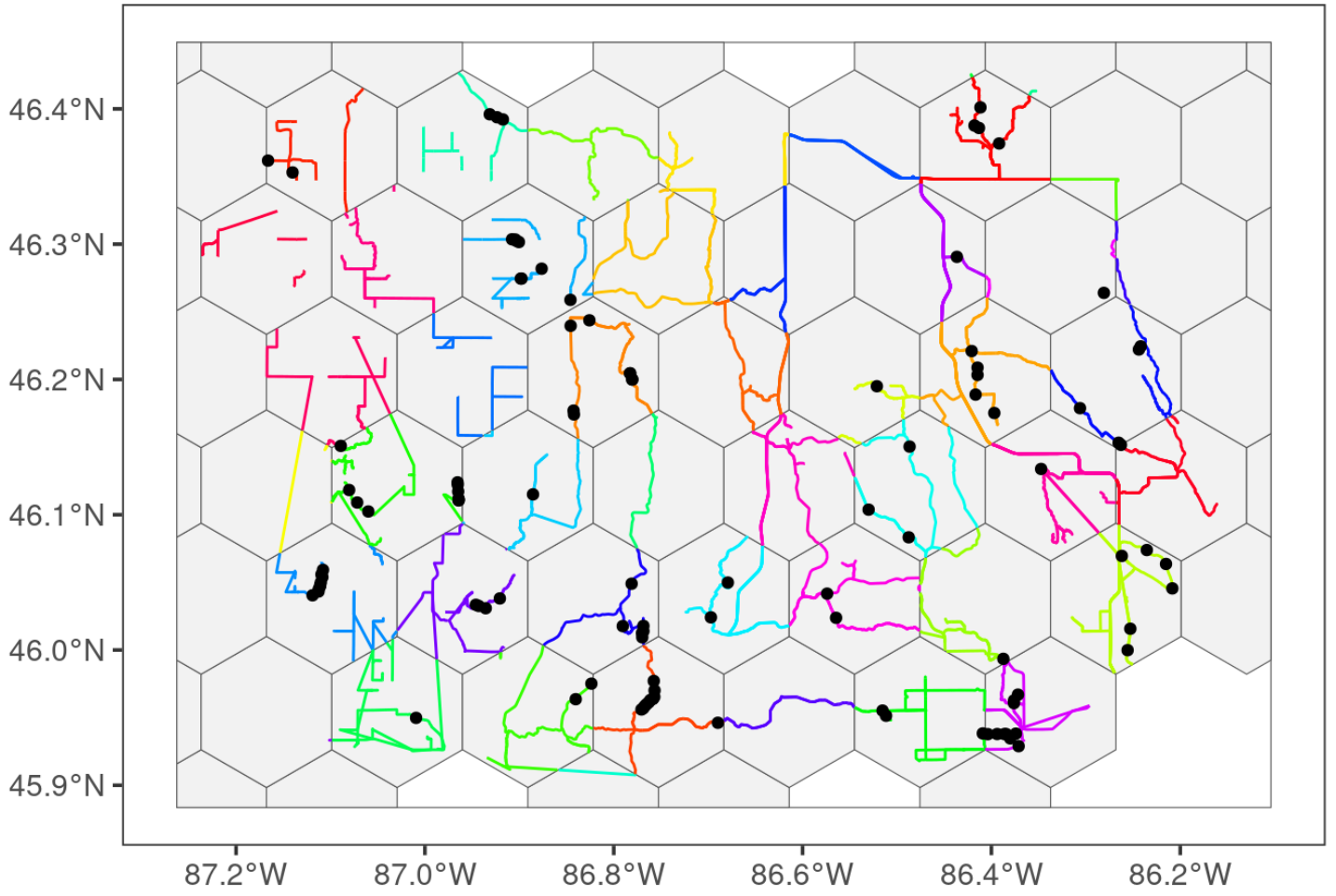
- 171 cameras detected 1,490 unique observations
- Detection probability likely driven by species life history
- Need to deploy cameras year-round for direct comparison to track surveys
- Need to assess detection year-round to select period of greatest precision for estimate





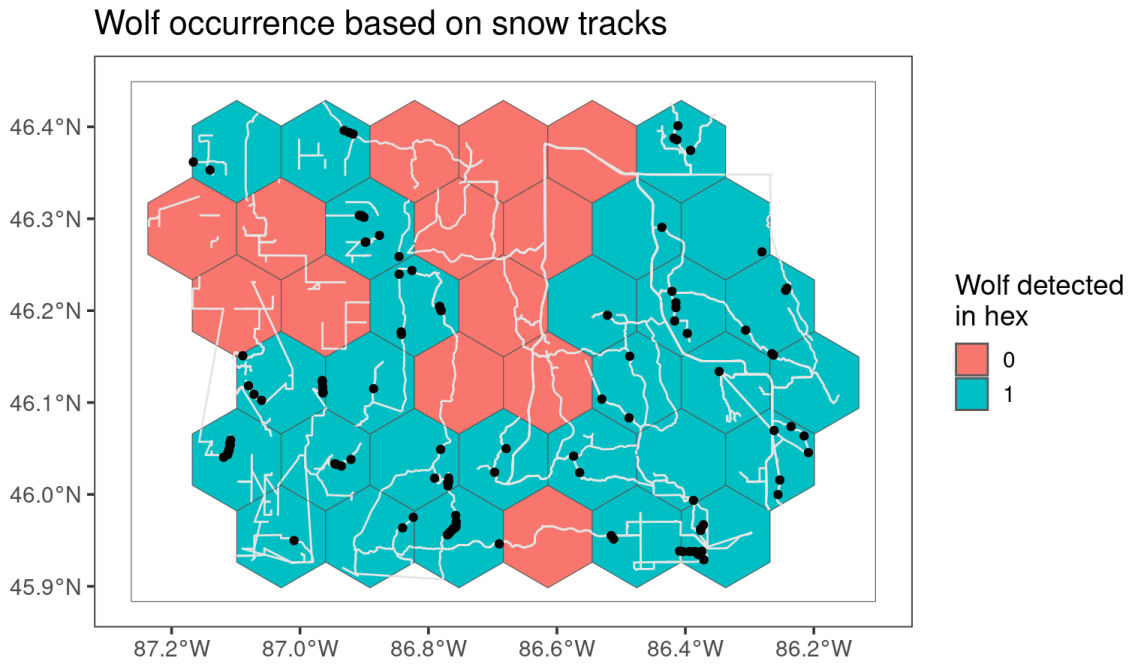
2022-2023 Pilot Snow Track Survey

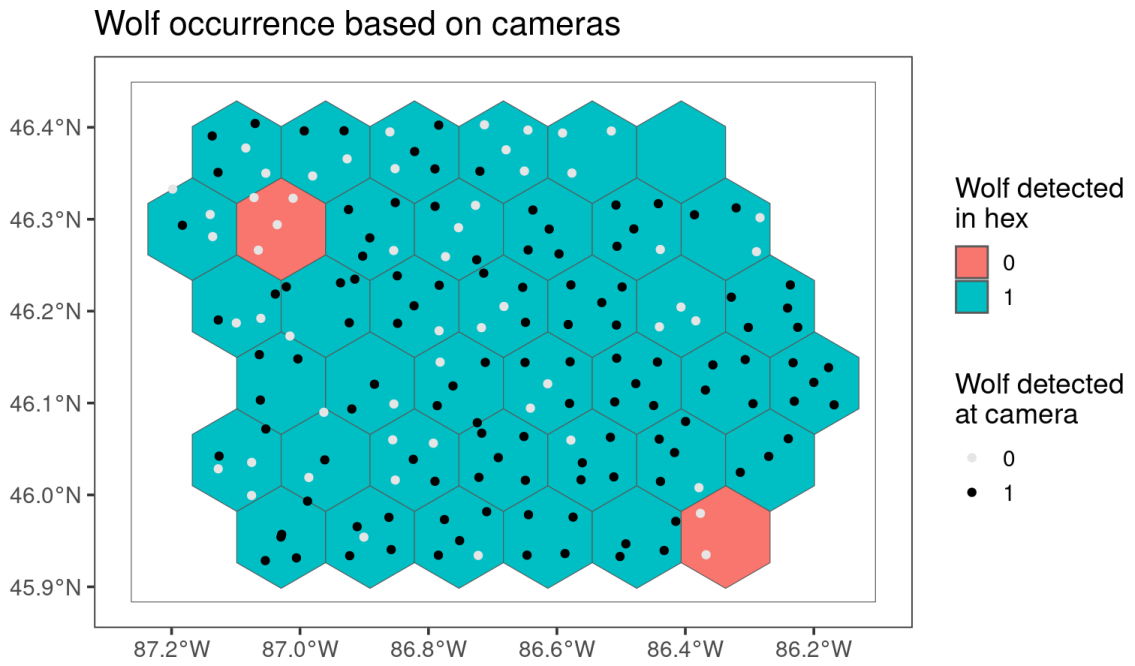
- 2,268 miles driven
- 119 observations of wolf tracks
- Challenges in scaling up survey
  - Time consuming
  - Low detection
  - Weather dependent



2022 Pilot Surveys: Lessons Learned

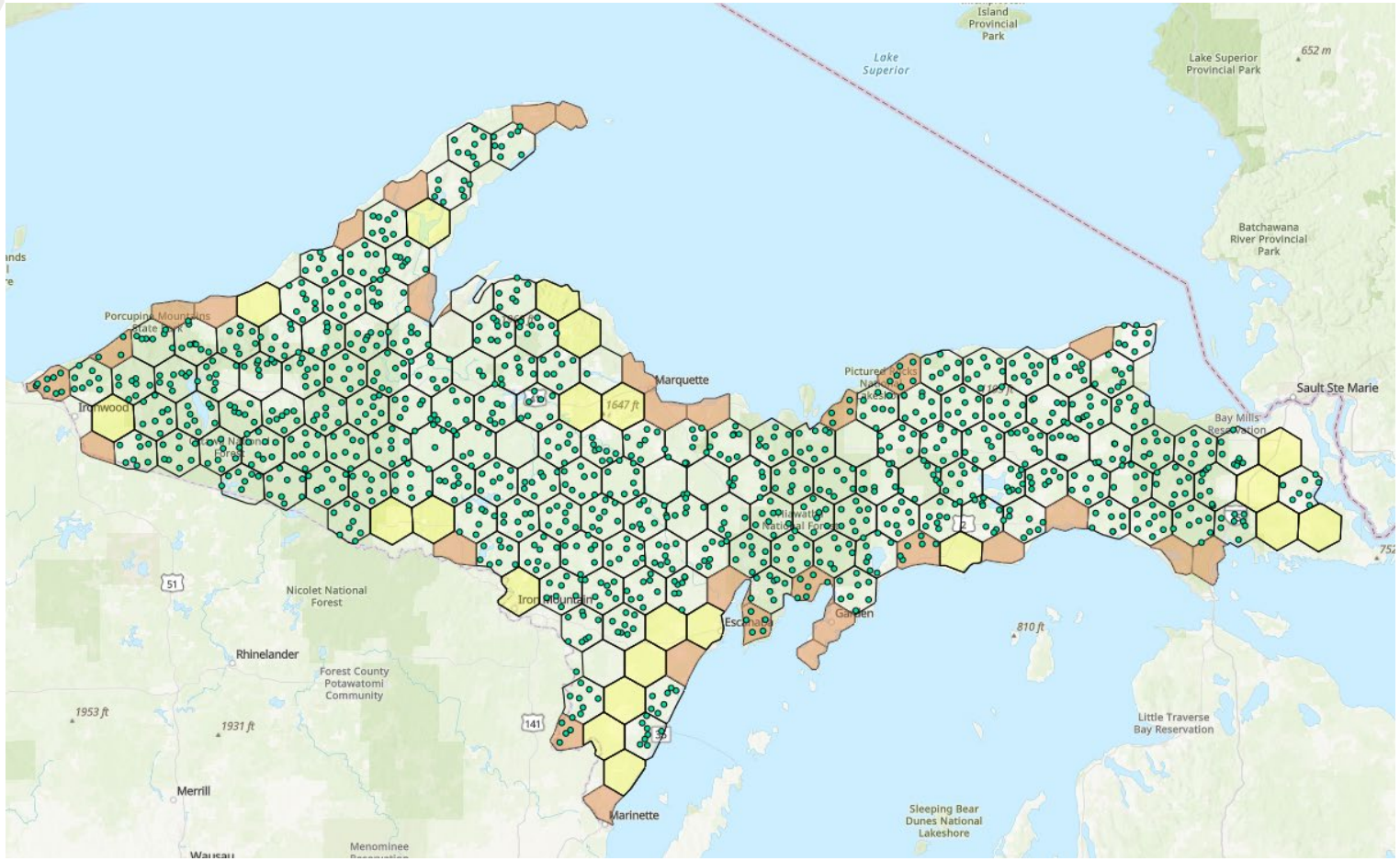
- Greater occupancy estimated from camera surveys
- 3 visits vs. 120 ‘visits’
  - 119 vs. 1,490 unique detections
- Not feasible to scale up occupancy-based track surveys
- Year-round camera surveys should provide good detection for comparison





Peninsula-wide deployments

- July-October 2023
  - 159 cells with cameras
  - 1,230 cameras deployed
- Some cells excluded due to size/ownership
  - 22 partial cells
  - 21 cells mostly private ownership
- Currently collecting data from 1st annual deployment



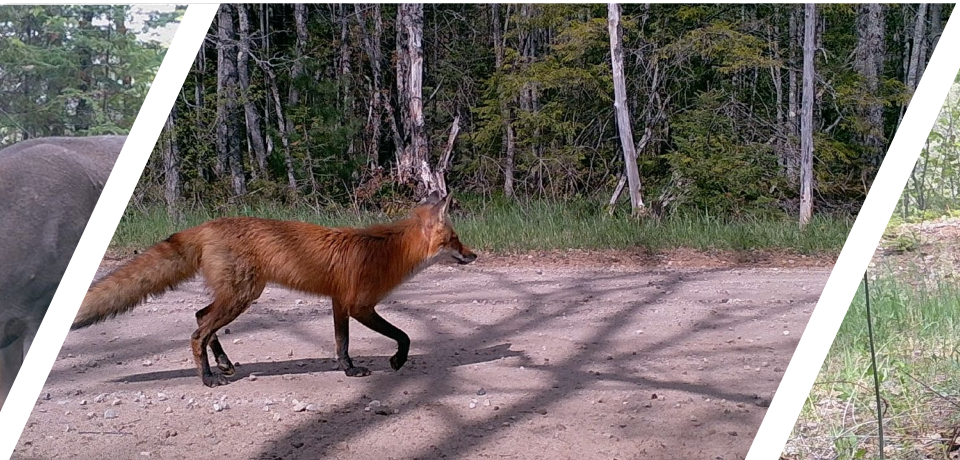
Wolf Abundance Project – Next steps

- 2024-2026
  - Cameras deployed in summer 2023, revisited in 2024, 2025, and 2026
  - Photo analysis using AI
  - Generate U.P. wide wolf abundance estimate
  - Annual reports available to public
  - Public facing website with interactive results
- 2027 and beyond
  - Final report to compare efficacy of wolf monitoring techniques
  - Potential to continue full camera deployment to monitor wolves



Potential monitoring strategy for other wildlife species

White-tailed deer, moose, bobcat, black bear, red fox, gray fox, coyote, turkey


Questions?