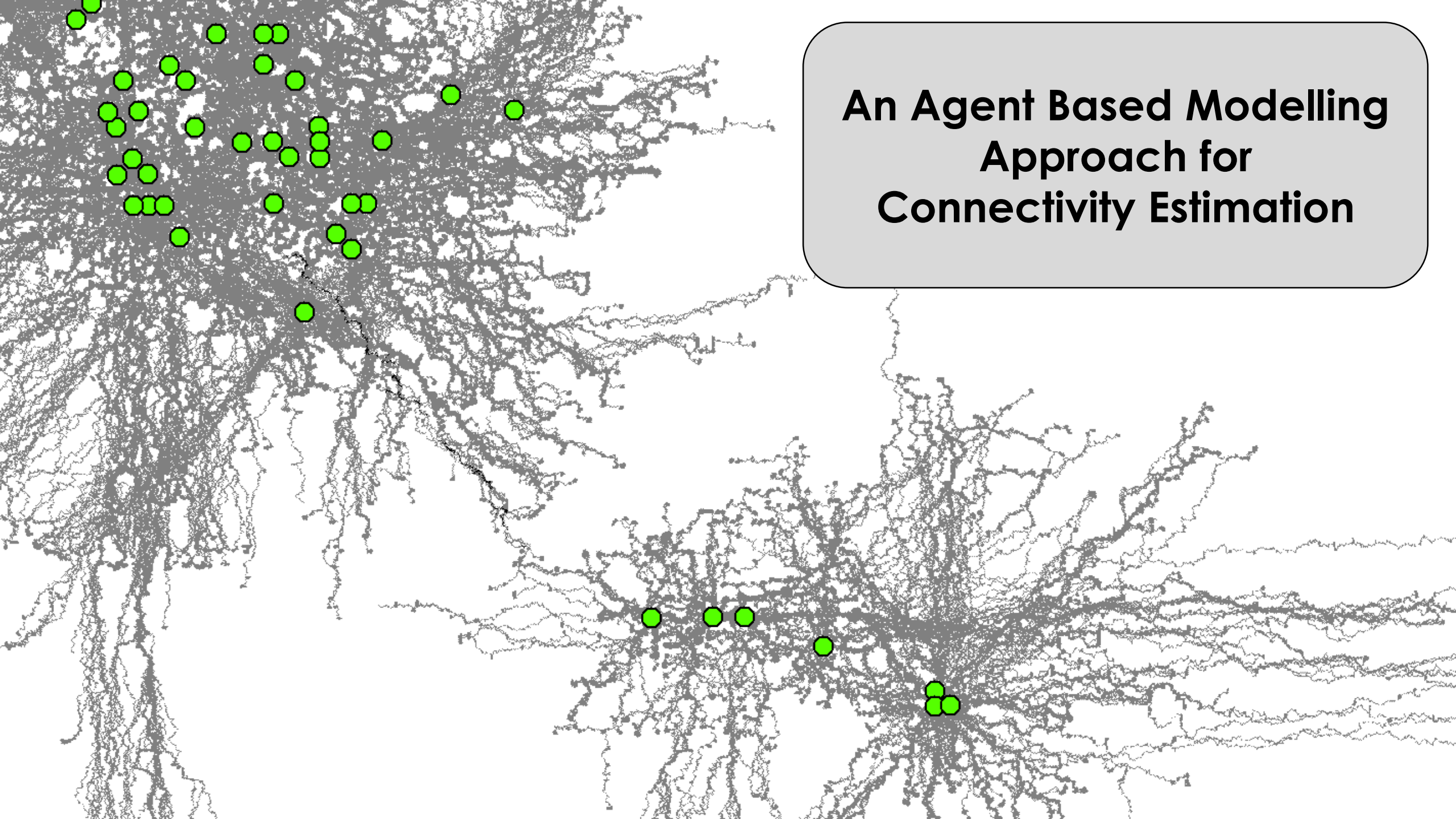
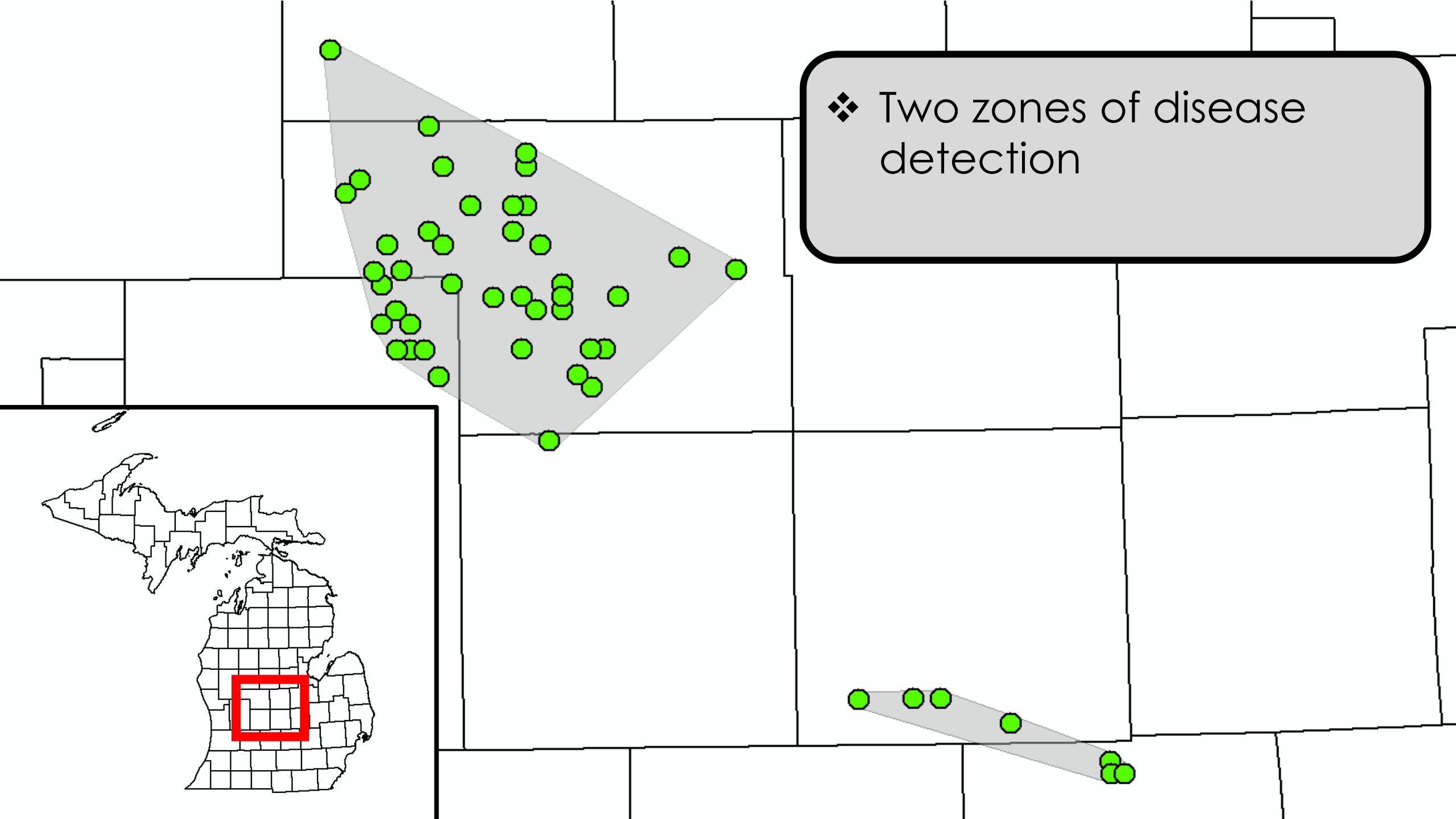
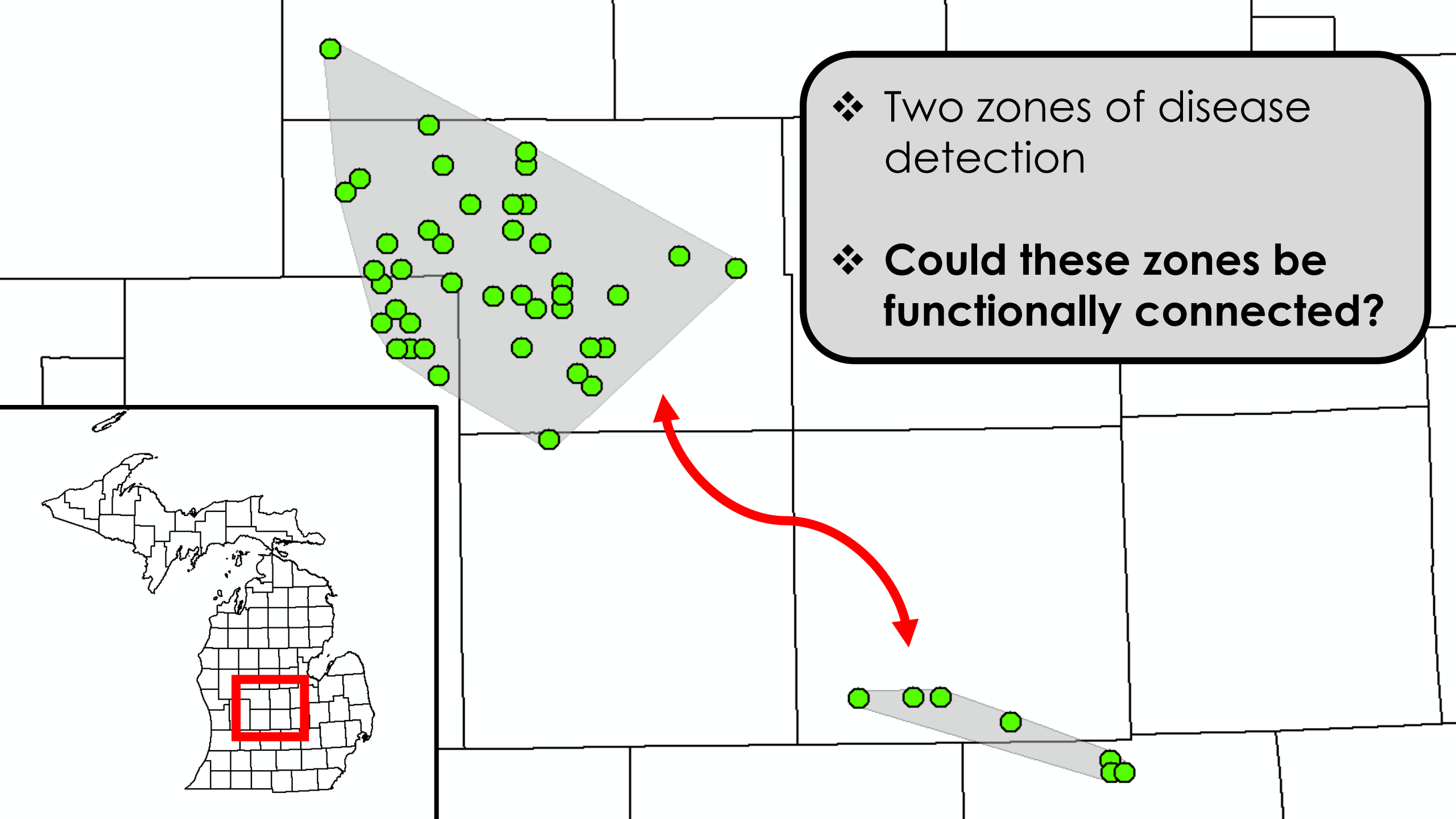
An Agent Based Modelling Approach for Connectivity Estimation




❖ Two zones of disease detection


❖ Two zones of disease detection
❖ Could these zones be functionally connected?

Dispersals as Gateways

- Simulate dispersals from CWD detection points
- Track the times deer reach opposite disease zone
- Index of connectivity between zones

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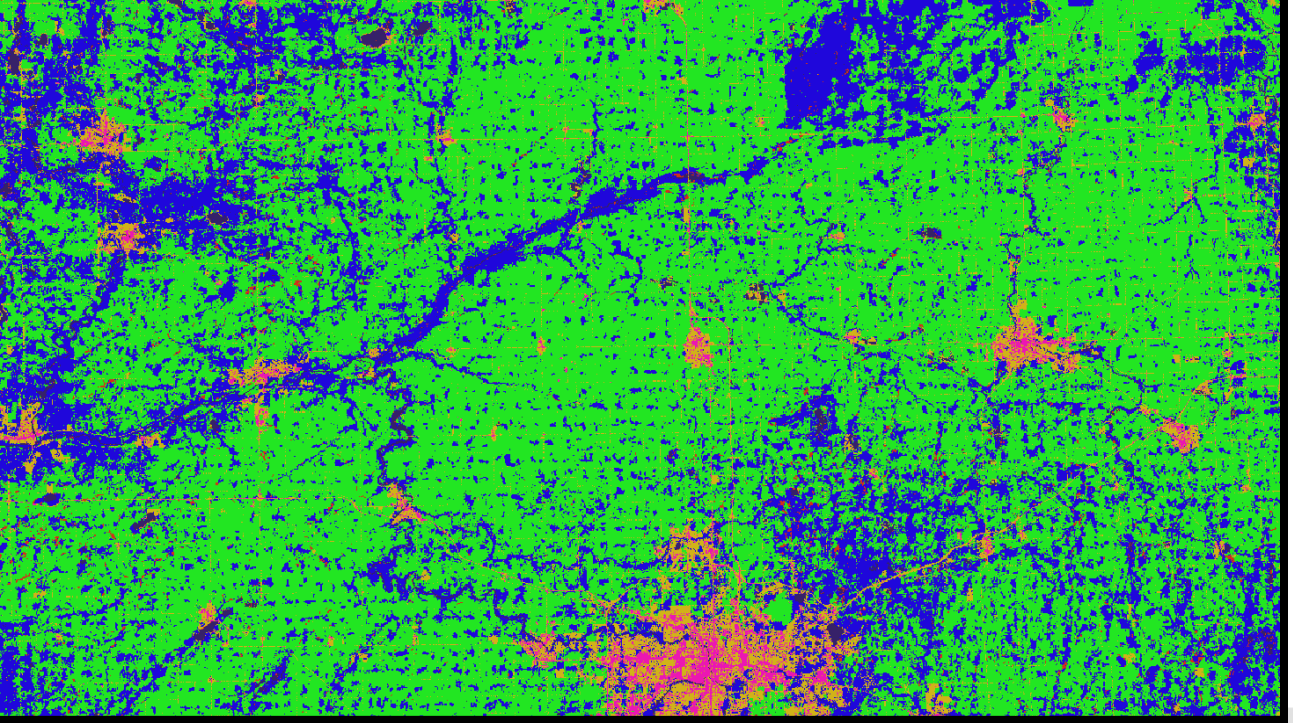
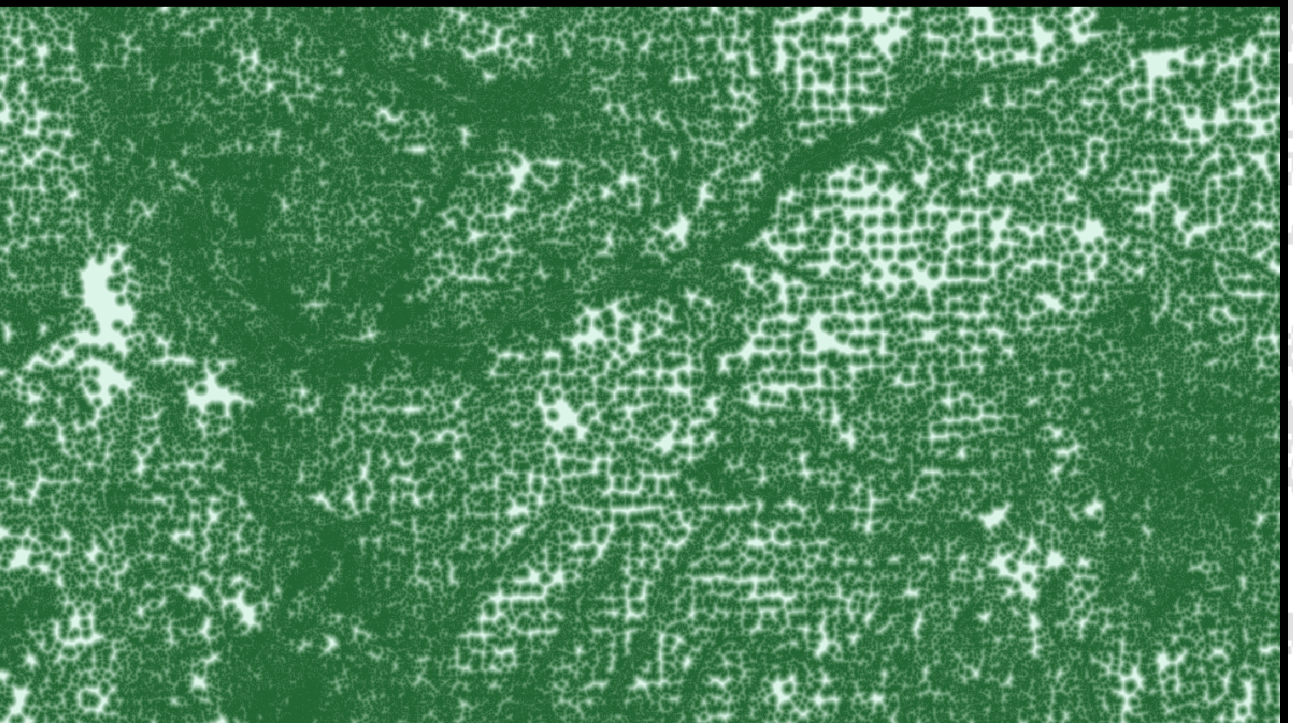
Agents

- Yearling male deer
  - Unique ID
  - Location
  - Stochastic Start Point
  - Preferred Direction
  - Memory of previous 1 km travel





Environment

- Raster representation
- Landscape features
  - Land Cover Type
  - Distance to forest

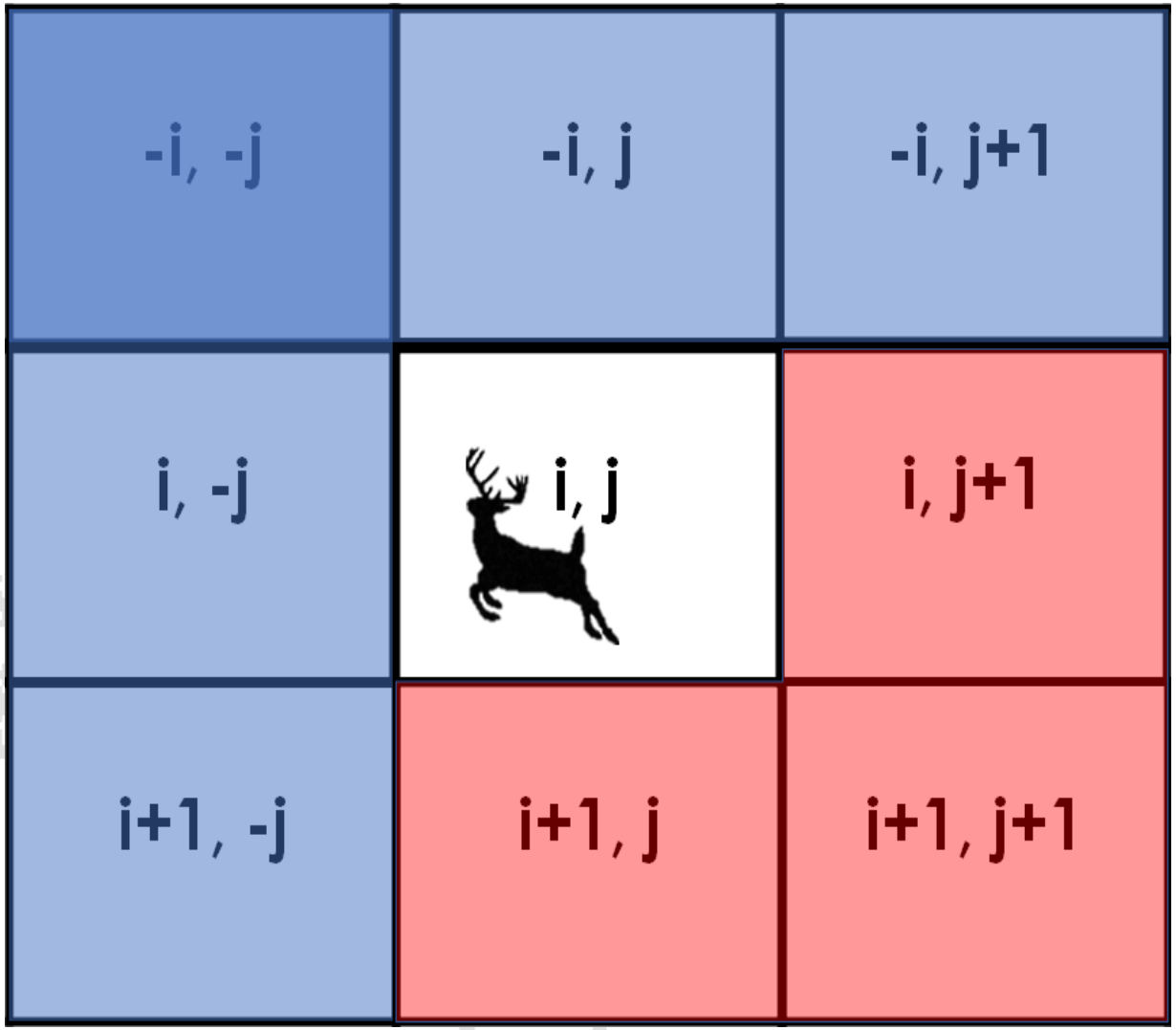
Movement

- Raster based movement rules
- Deer can move to any nearest neighbor

-i, -j	-i, j	-i, j+1
i, -j	 i, j	i, j+1
i+1, -j	i+1, j	i+1, j+1

Movement

- Raster based movement rules
- Deer can move to any nearest neighbor
- **Directionally biased**



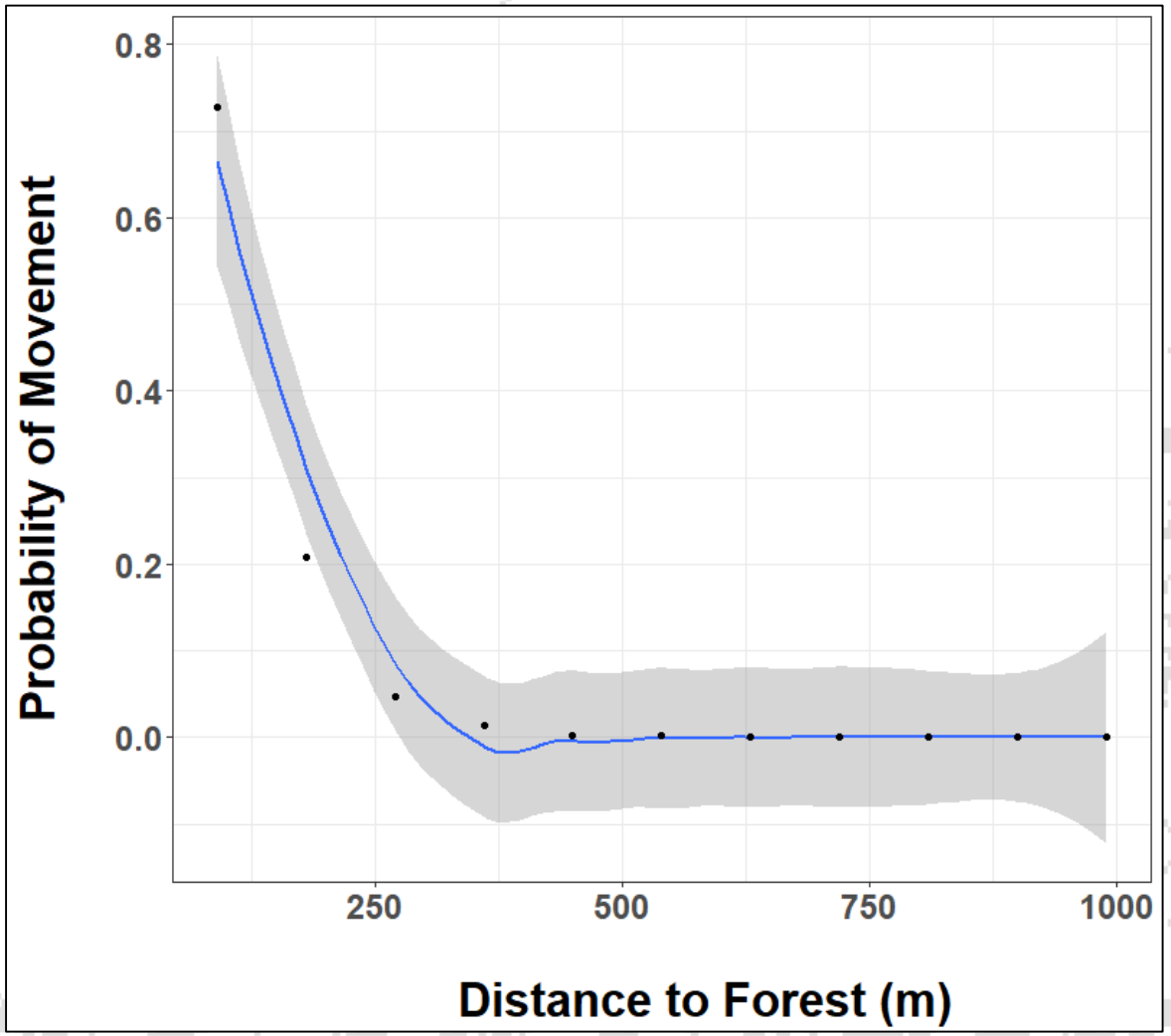
Cell Suitability

Land Cover

- Discrete probability of movement by cover type

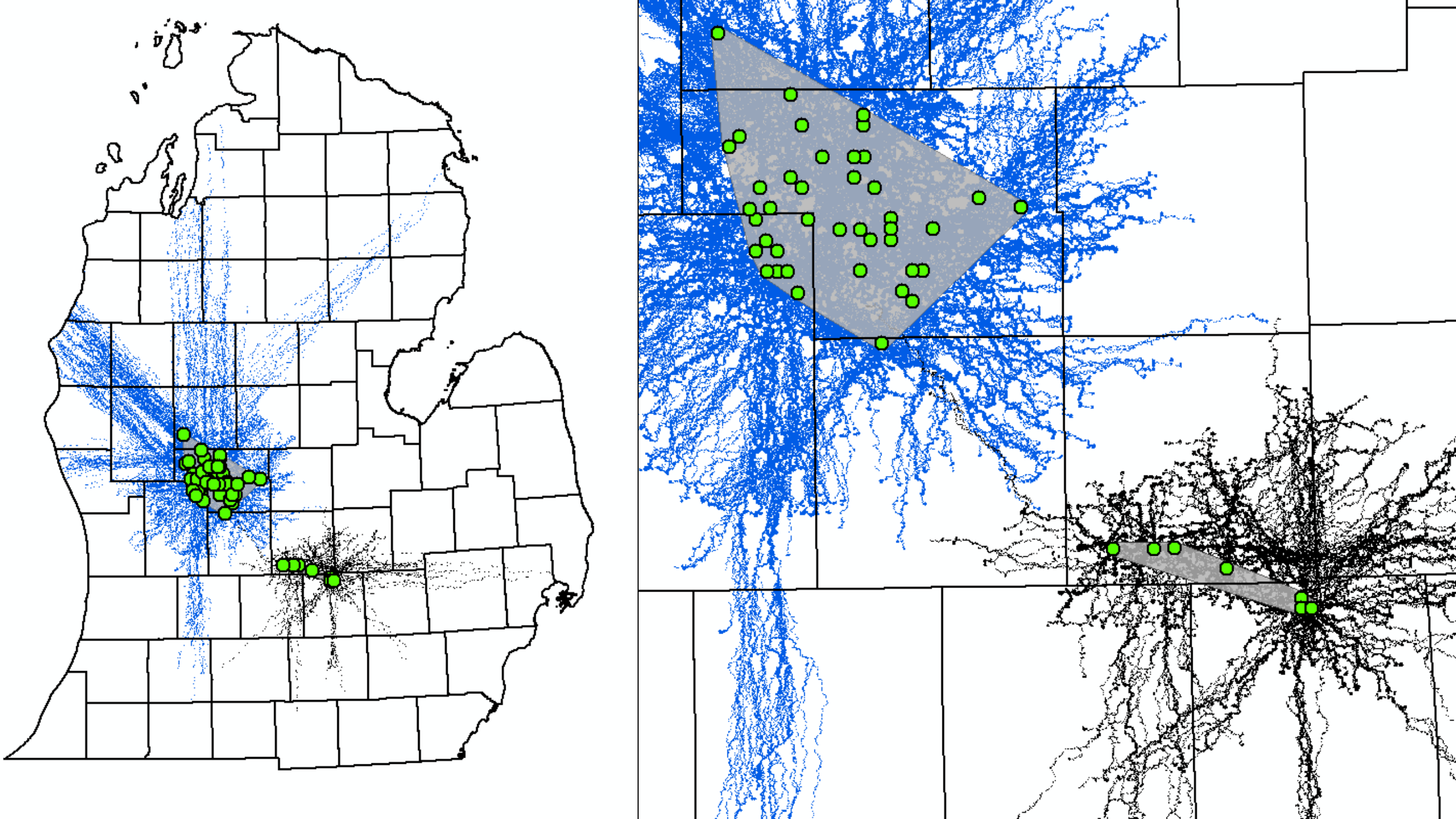
Forest	**1.0**
Agriculture	**0.8**
Emergent Wetland	**0.8**
Low Urban	**0.5**
High Urban	**0.15**
Open Water	**0.05**

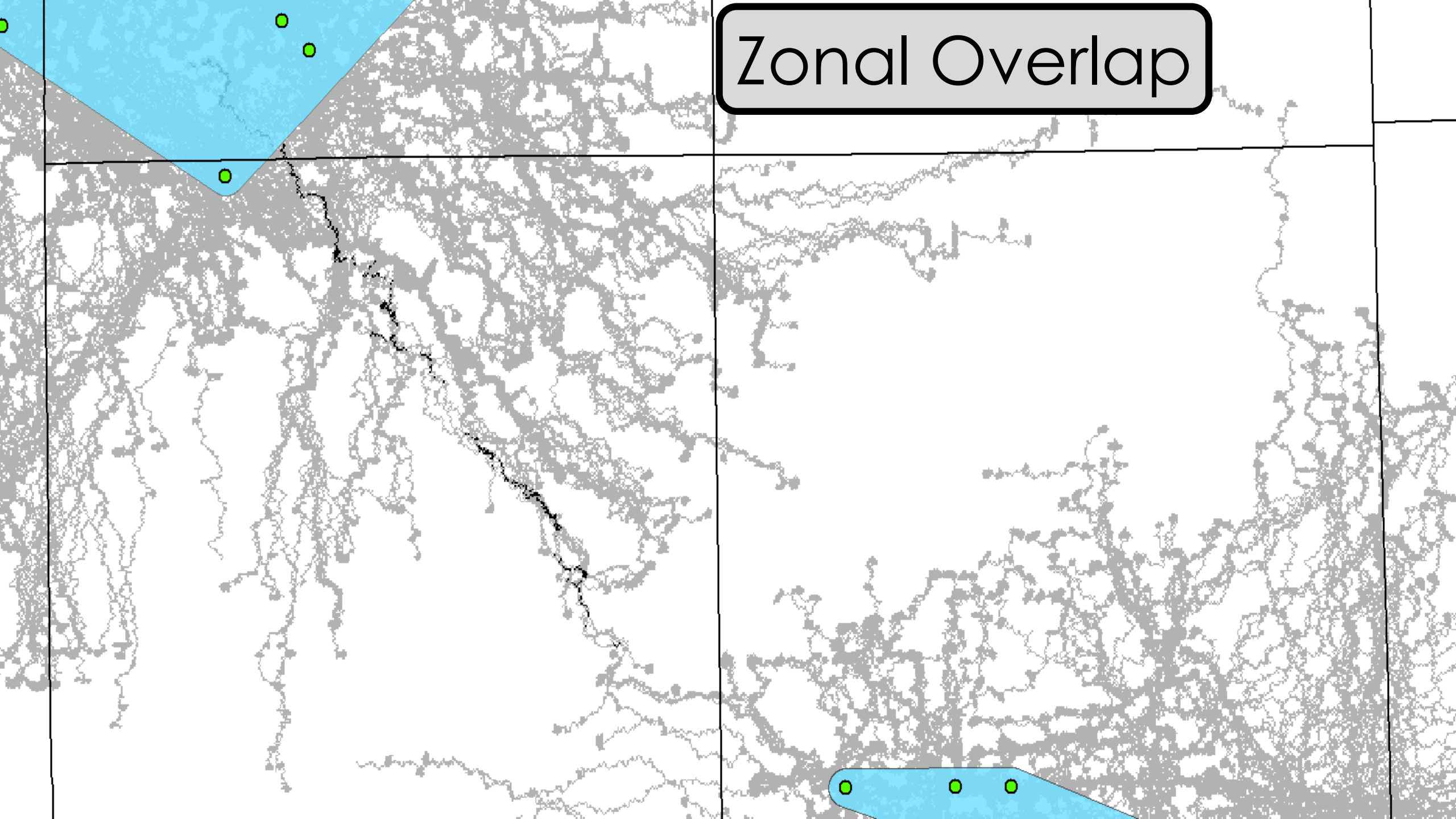
Cell Suitability

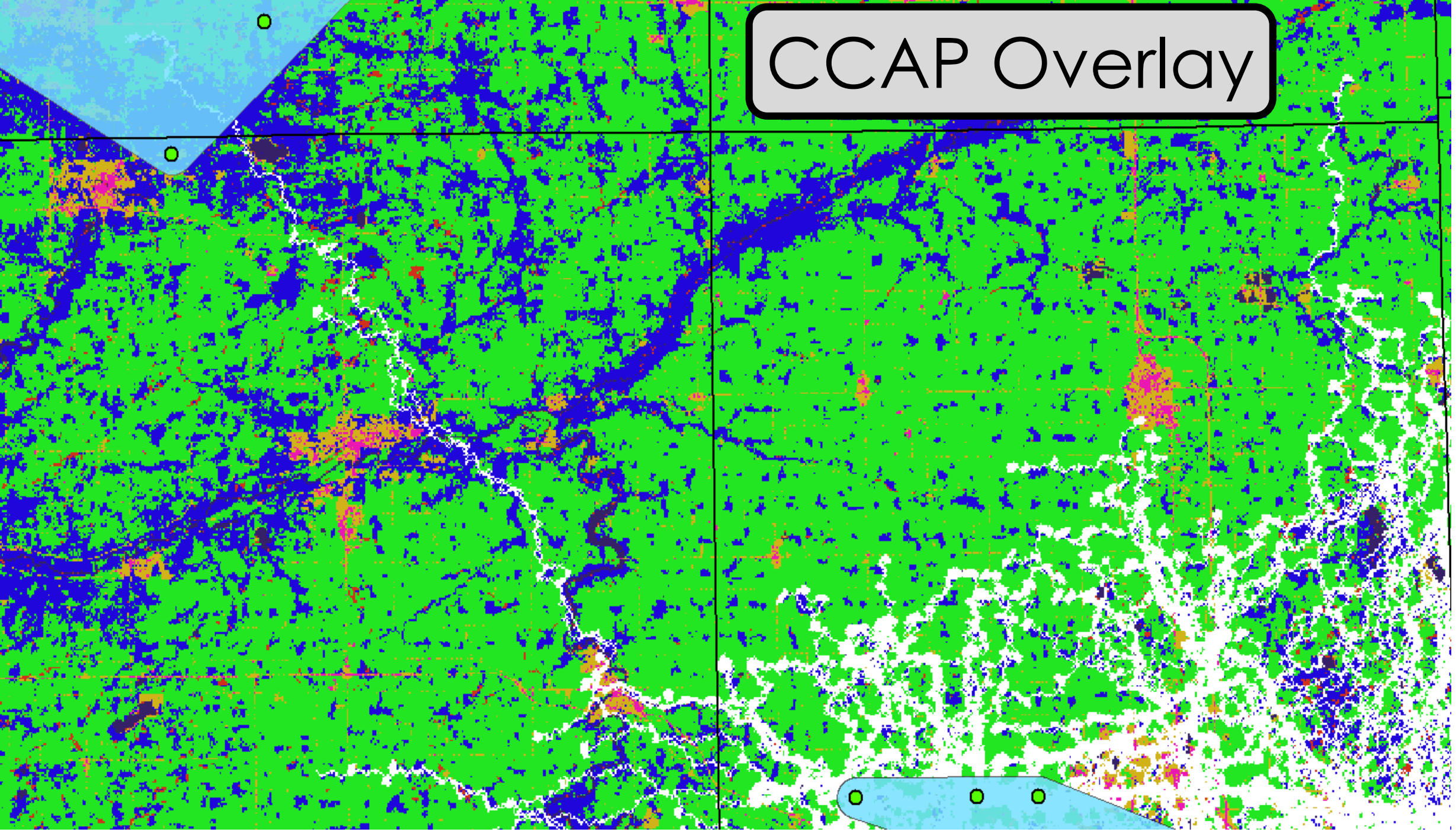


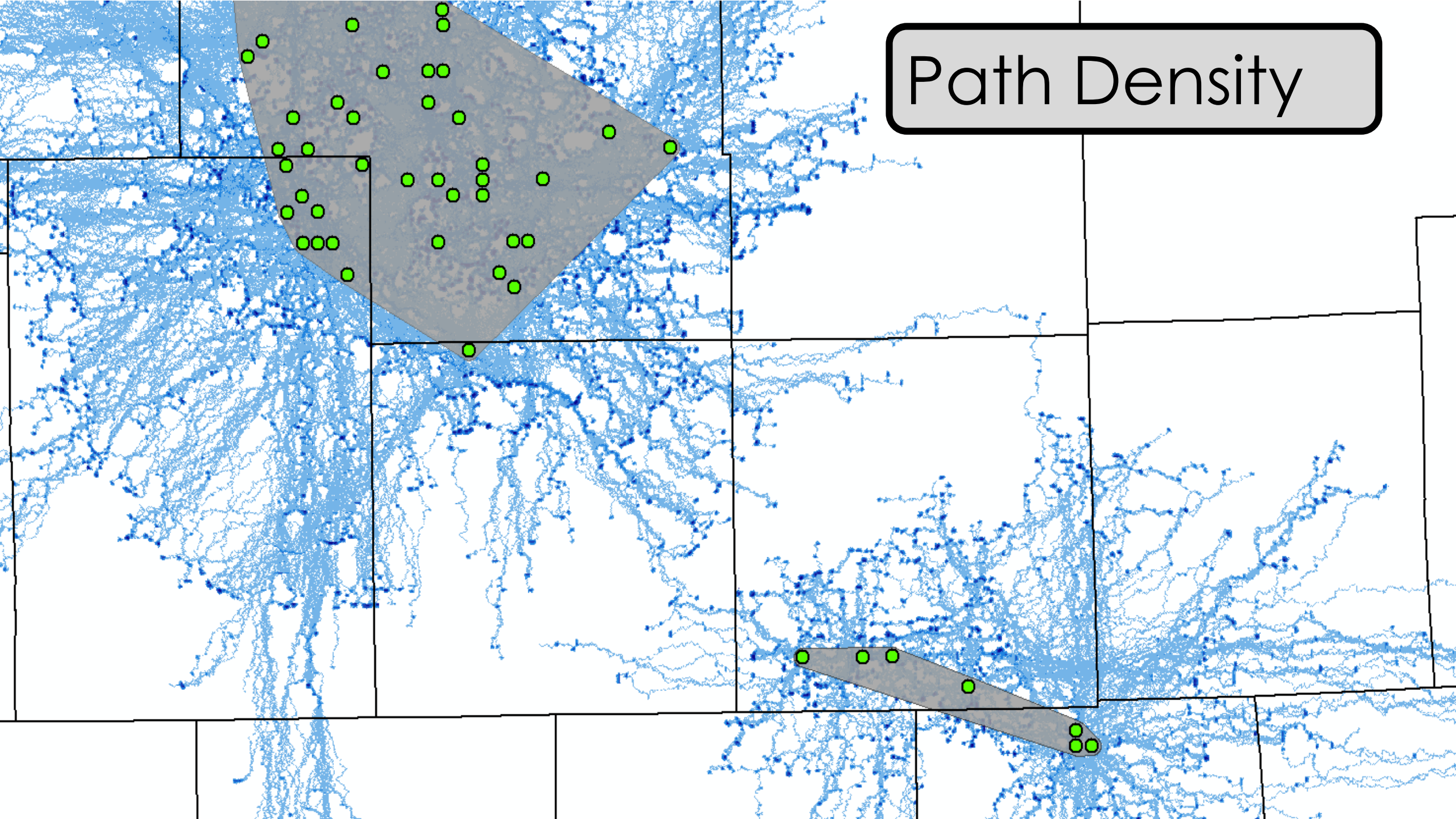
Distance to Forest

- Exponential Decay
- Modelled from NY movement data




Zonal Overlap


CCAP Overlay


Path Density

Future Directions

- Update to continuous movement
- Sensitivity analysis (IN PROGRESS)
- Simulate across entire study area
  - Identify corridors?