

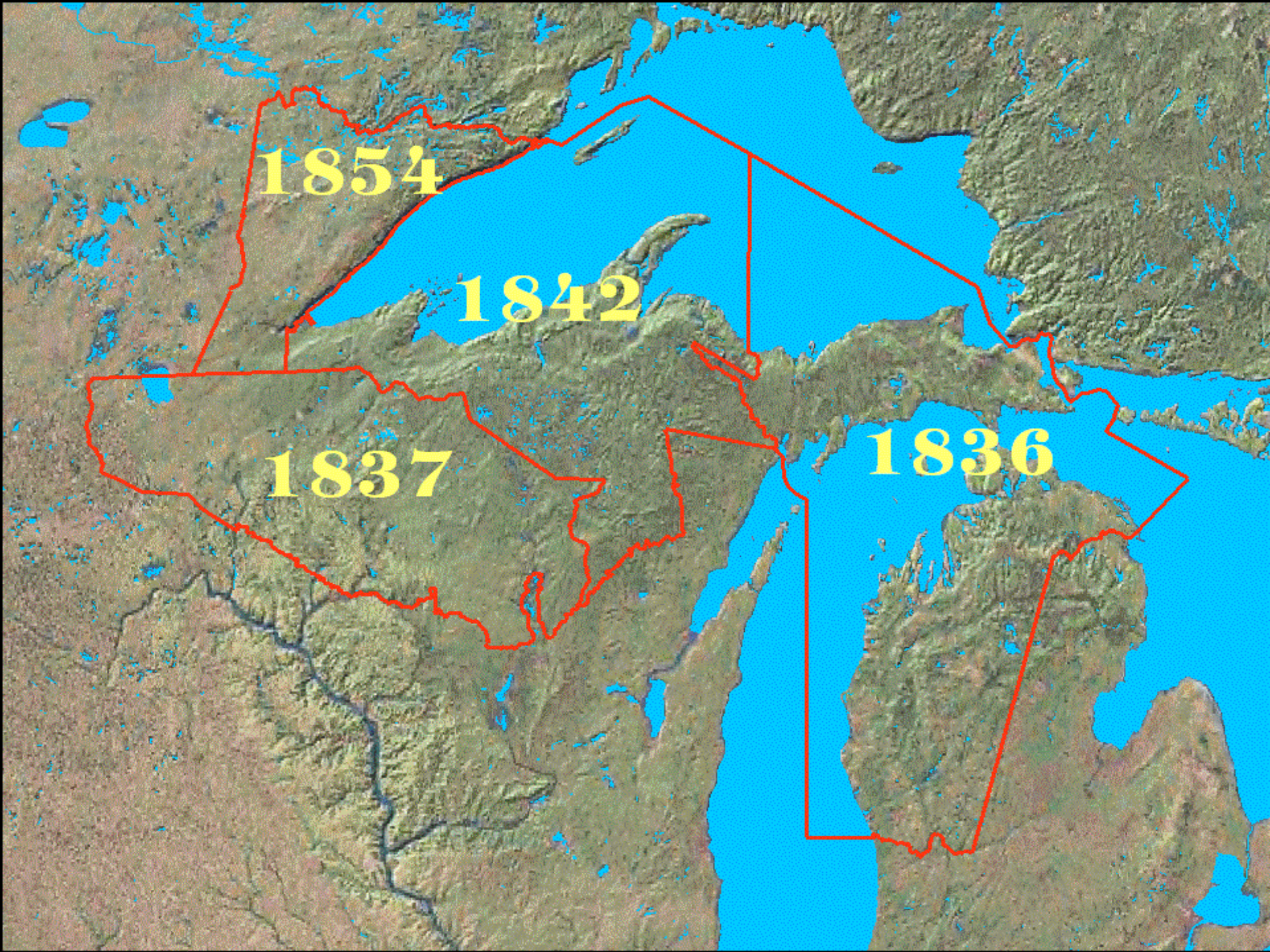
Predicting the Distributions of Invasive Plants Across Northern Wisconsin



Presented by:
Miles Falck, Wildlife Biologist
November 9, 2010

Acknowledgments

- Funding:
 - NRCS
 - WTCAC Small Projects
 - BIA
 - Invasive Species Initiative
 - Noxious Weed Program
 - EPA – GLNPO (2010-2012)
- Personnel
 - Steve Garske, Invasive Plant Specialist
 - Dara Olson, GIS Specialist



1854

1842

1837

1836

1854



1842



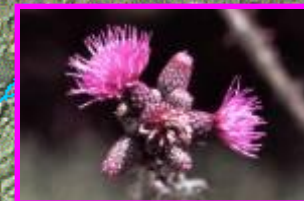
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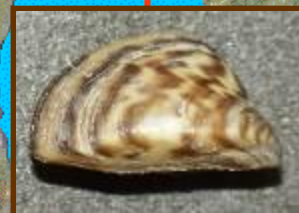
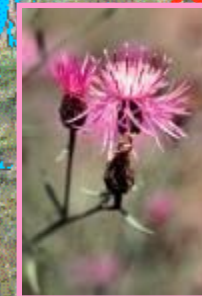
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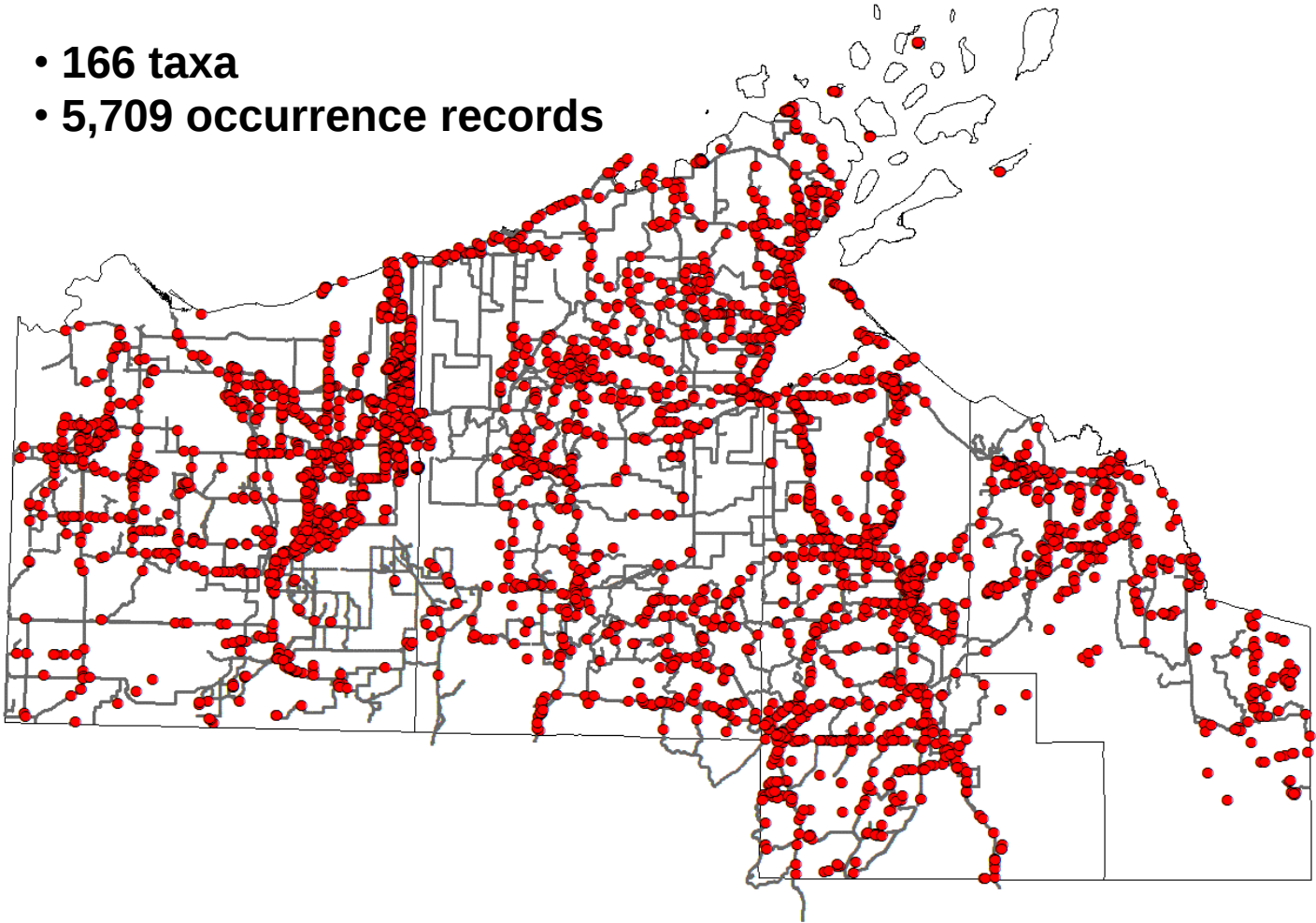


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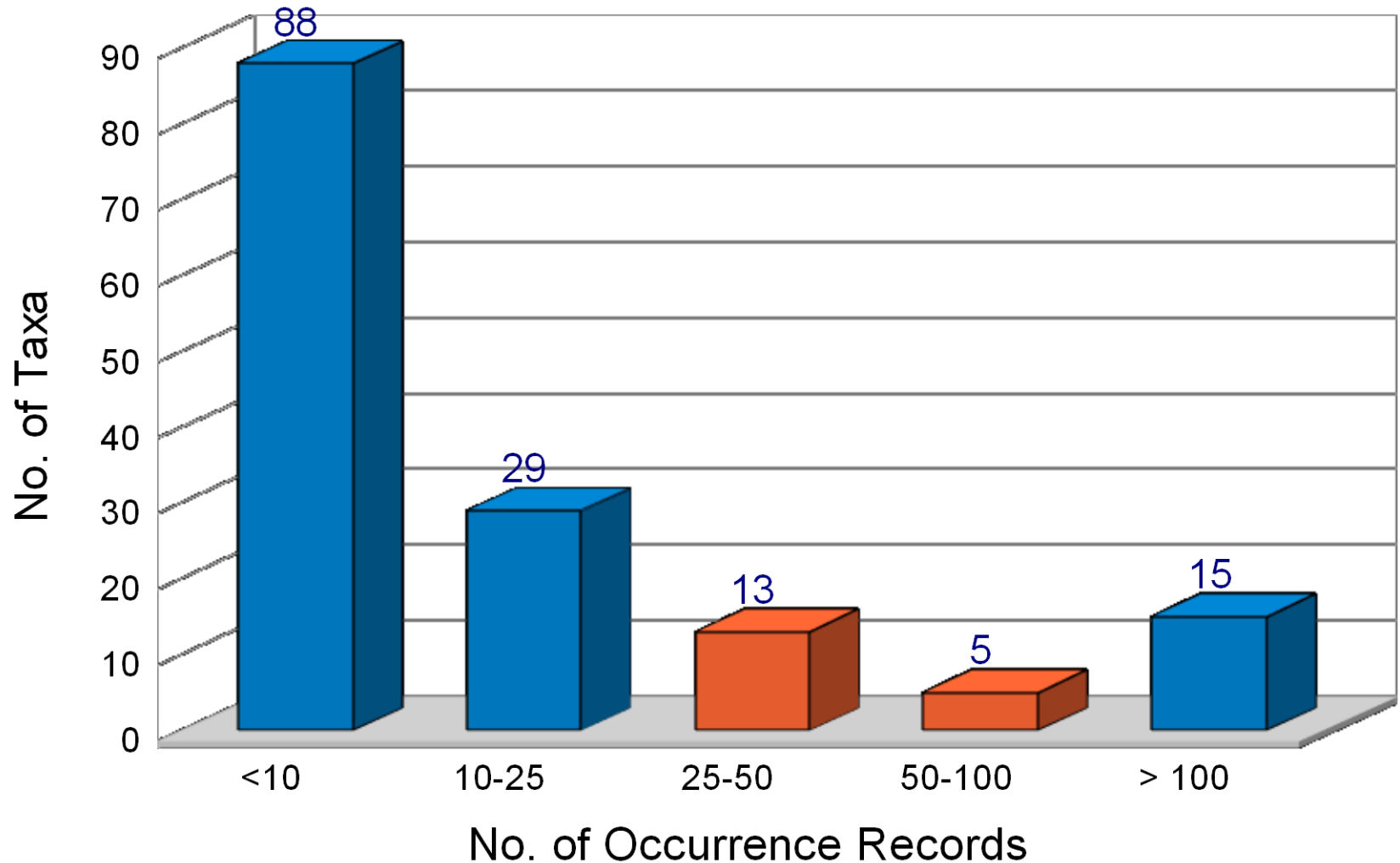


Survey Efforts 2000-2009

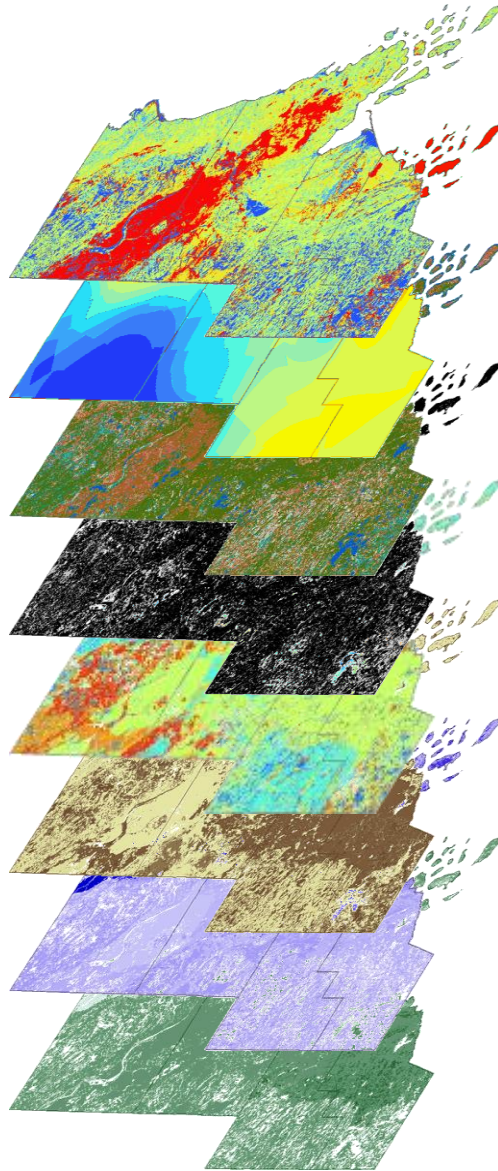
- 166 taxa
- 5,709 occurrence records



Distribution of Occurrence Data



Environmental Layers



Soil Drainage

Minimum Annual Temperature

Landcover

Shade

Frost Free Days

Soil Organic Matter

Soil Water Content

Soil pH

Methods

- Biomapper
- BIOCLIM
- Boosted Regression Trees
- GAM
- GARP
- GLM
- MARS
- **Maximum Entropy**

Maximum Entropy

Steven J. Phillips , Robert P. Anderson and Robert E. Schapire, Maximum entropy modeling of species geographic distributions. *Ecological Modelling*, Vol 190:3-4 pp 231-259, 2006.

- Consistent positive reviews in literature
- Uses categorical AND continuous data
- Target background layer
- GIS grid output
- User friendly
- Free
 - <http://www.cs.princeton.edu/~schapire/maxent/>

Maxent

Maximum Entropy Species Distribution Modeling, Version 3.2.0

Samples

File: C:\tutorial\samples\bradypus.csv **Browse**

☒ bradypus_variegatus

Environmental layers

Directory/File: C:\tutorial\layers **Browse**

☒ cld6190_ann	Continuous
☒ dtr6190_ann	Continuous
☒ ecoreg	Categorical
☒ frs6190_ann	Continuous
☒ h_dem	Continuous
☒ pre6190_ann	Continuous
☒ pre6190_I1	Continuous
☒ pre6190_I10	Continuous
☒ pre6190_I4	Continuous
☒ pre6190_I7	Continuous
☒ tmn6190_ann	Continuous

Select all **Deselect all**

☐ Linear features ☐ Create response curves

☐ Quadratic features ☐ Make pictures of predictions

☐ Product features ☐ Do jackknife to measure variable importance

☐ Threshold features

☐ Hinge features

☒ Auto features

Output format: Logistic

Output file type: .asc

Output directory: C:\tutorial\outputs **Browse**

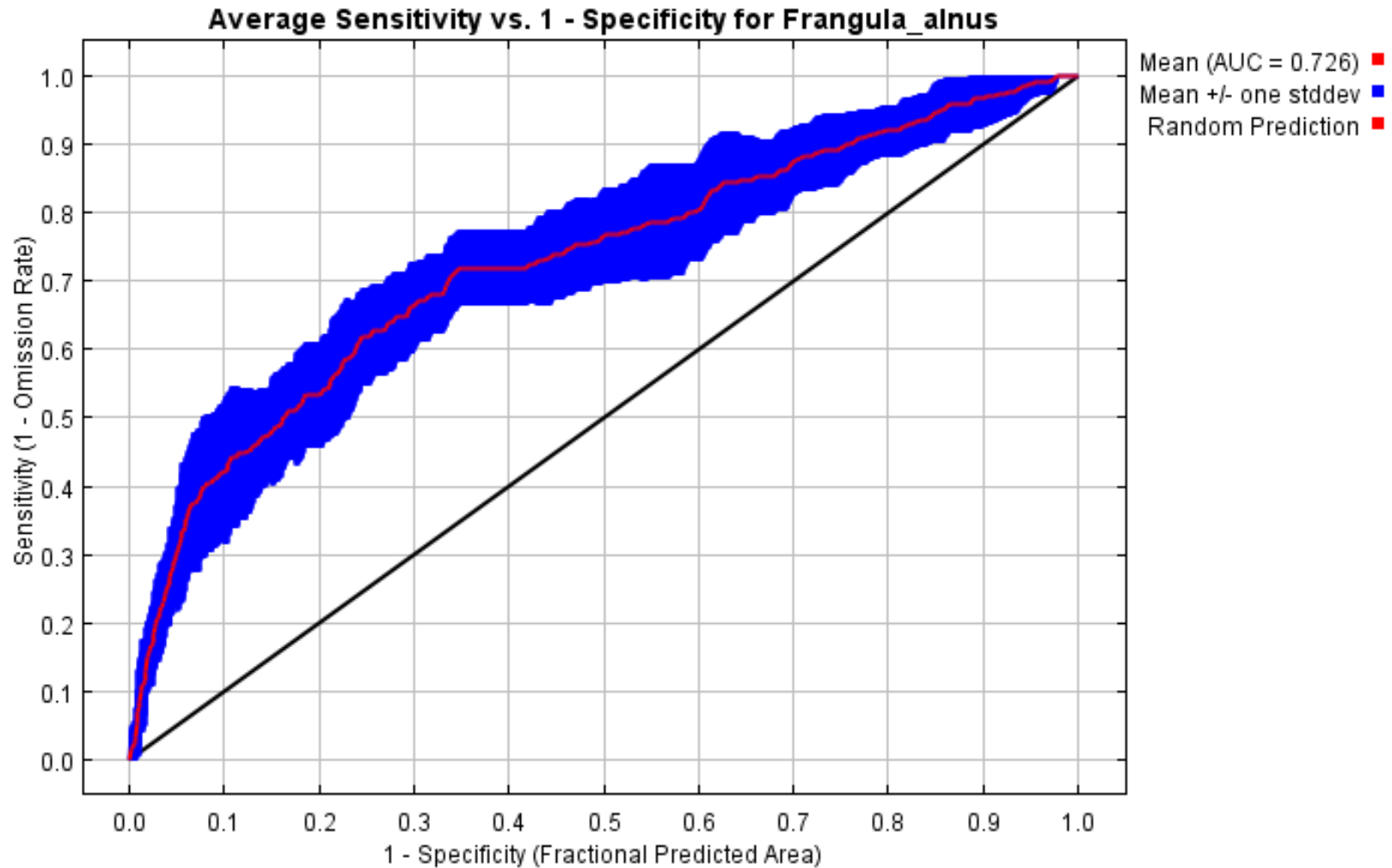
Projection layers directory/file: **Browse**

Run **Settings** **Help**

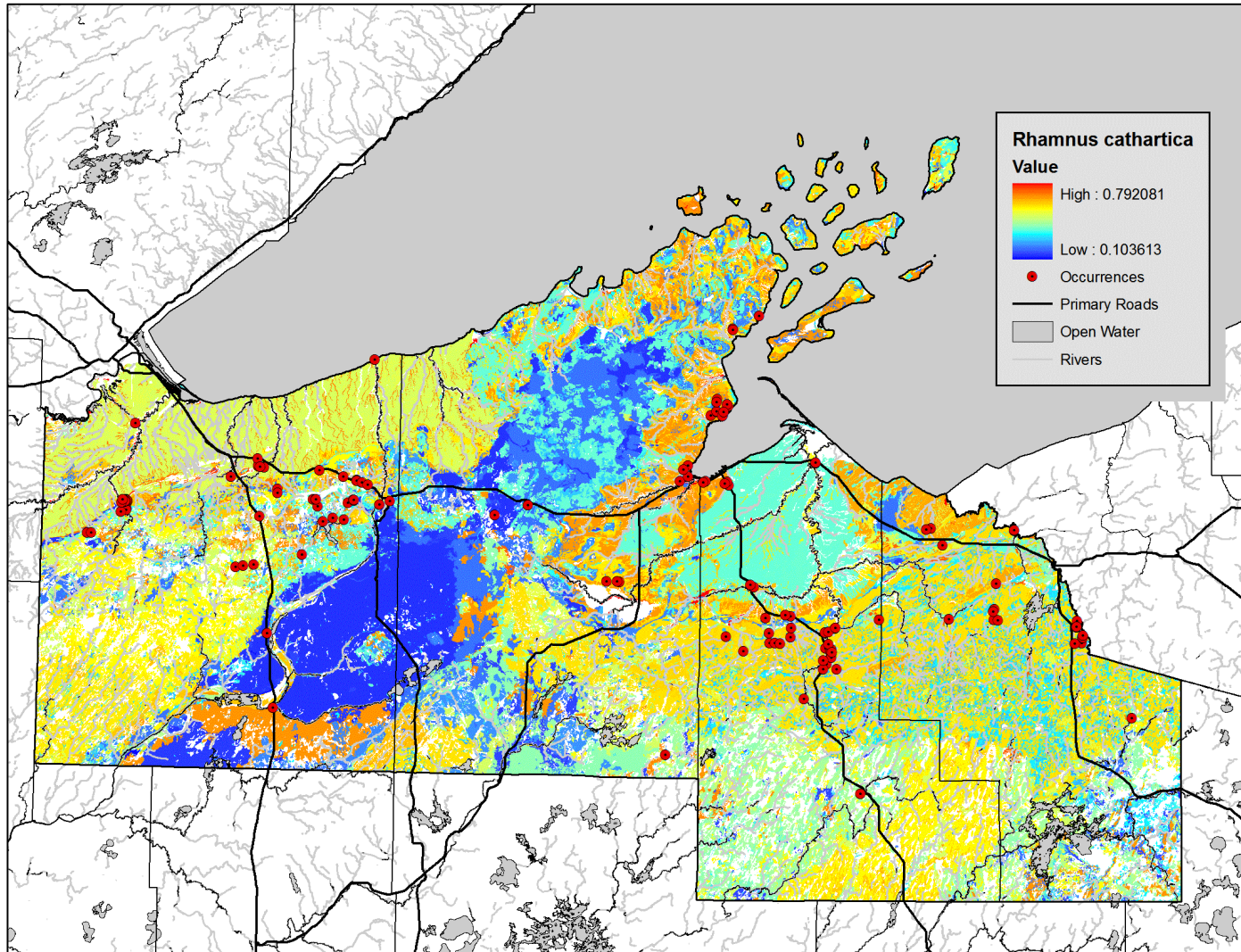
Model Selection

Variable	Percent Contribution
Soil Surface Texture	36.3
Landcover	23.9
Distance From Road	21.2
Soil Organic Matter	13.9
Soil Water Content	4.7

Model Selection

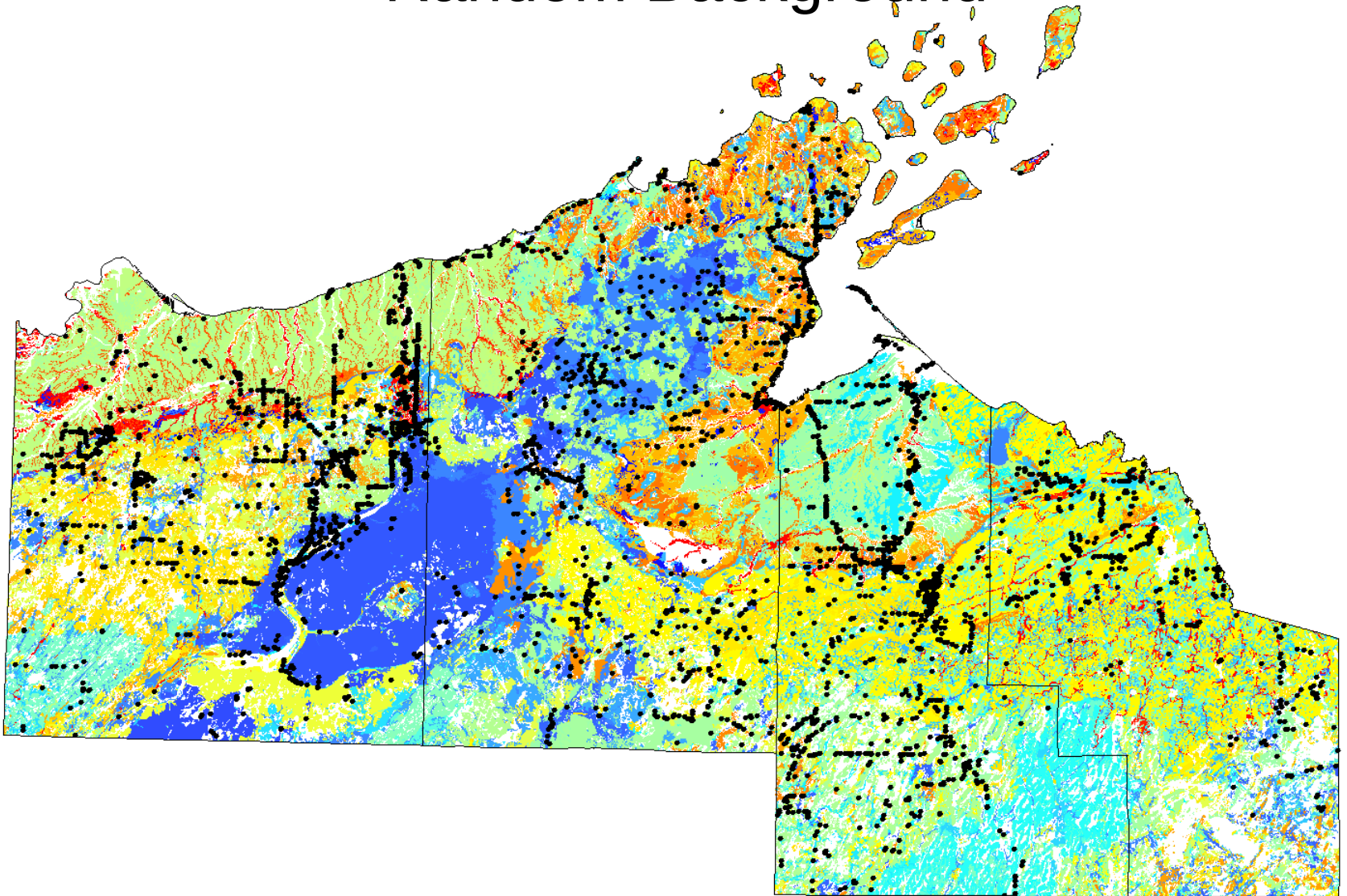


Model Output



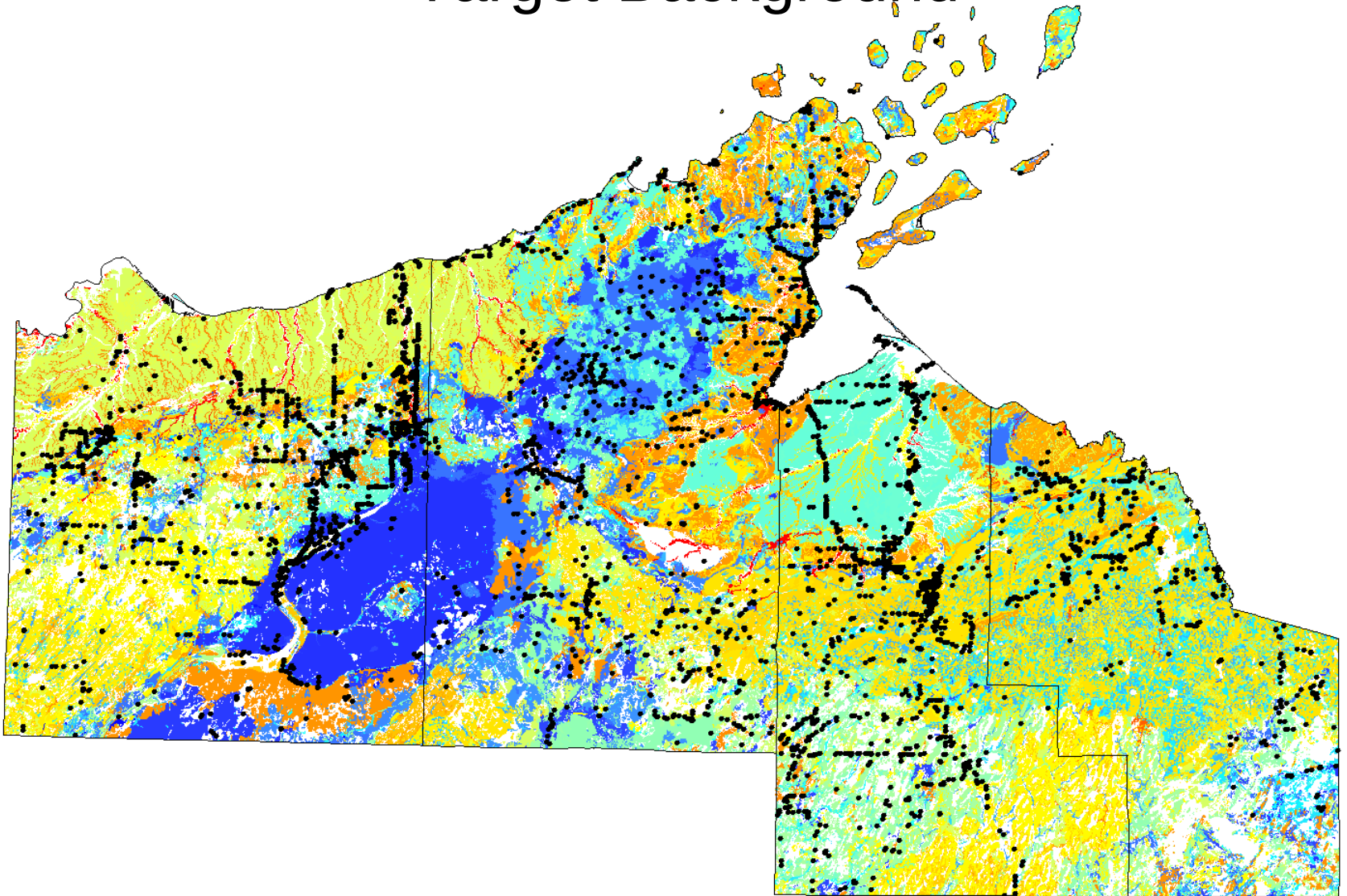
Rhamnus cathartica

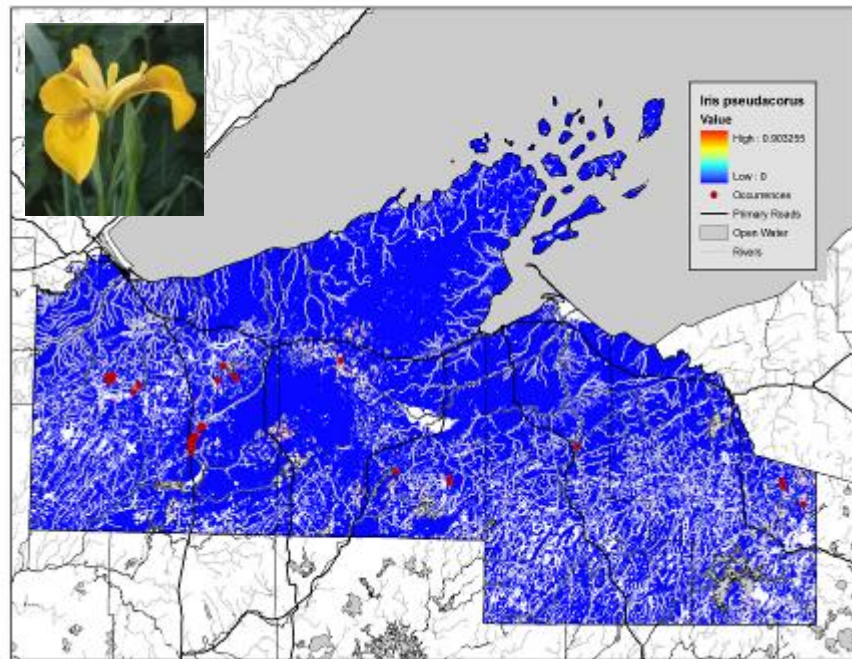
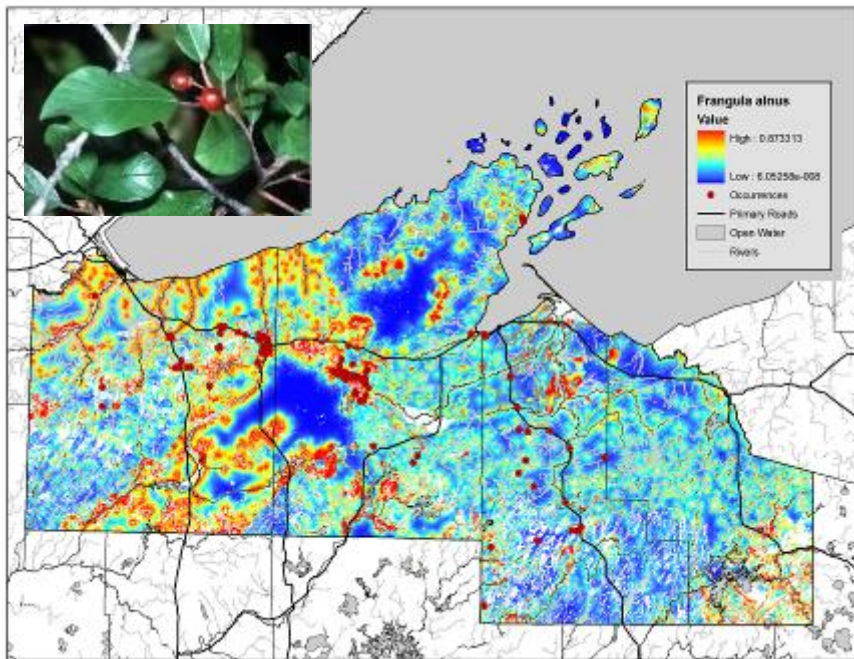
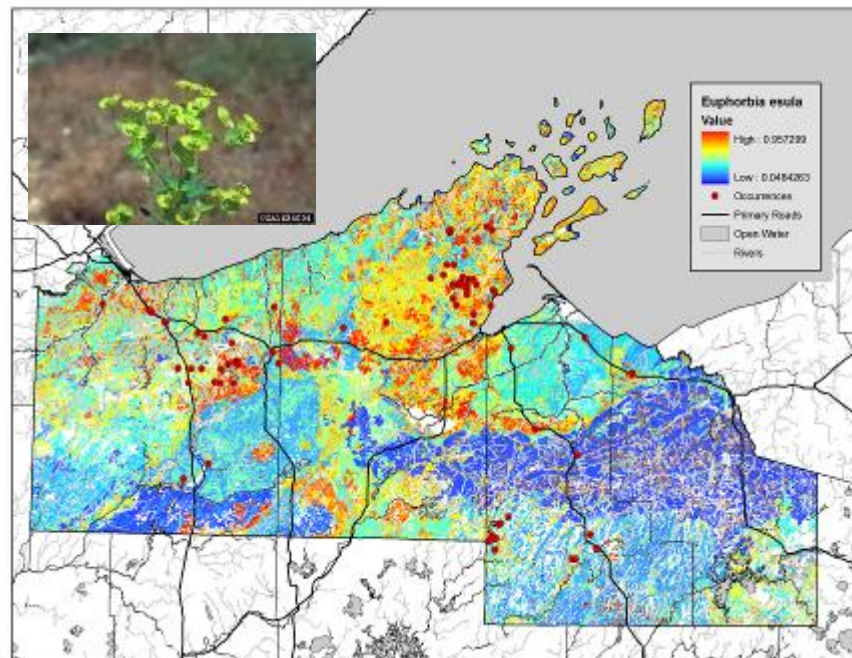
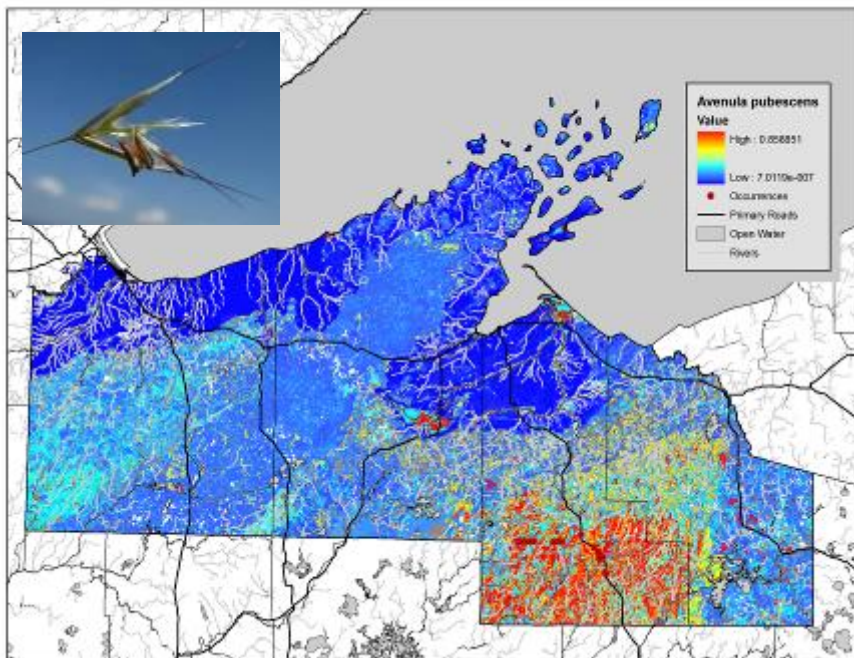
Random Background

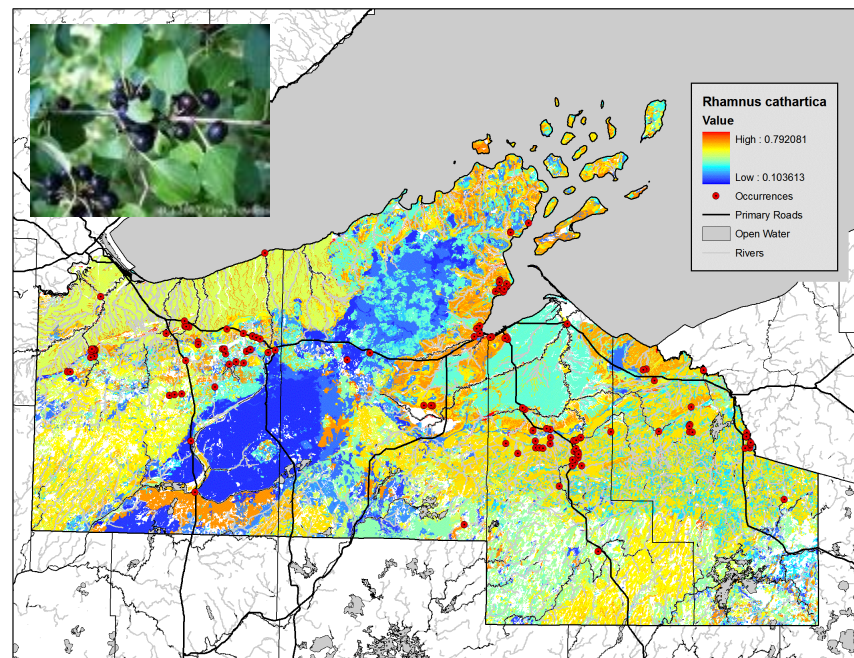
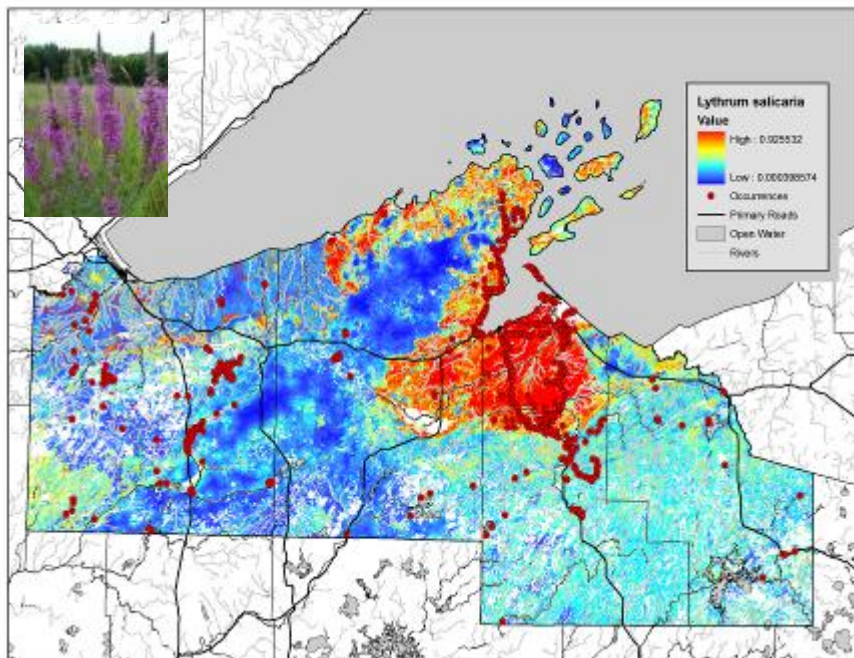
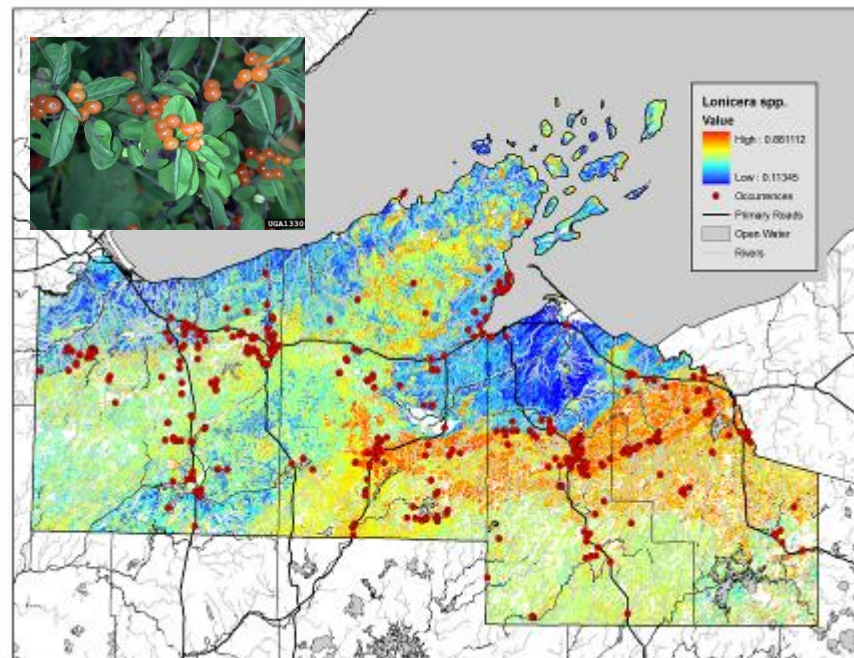
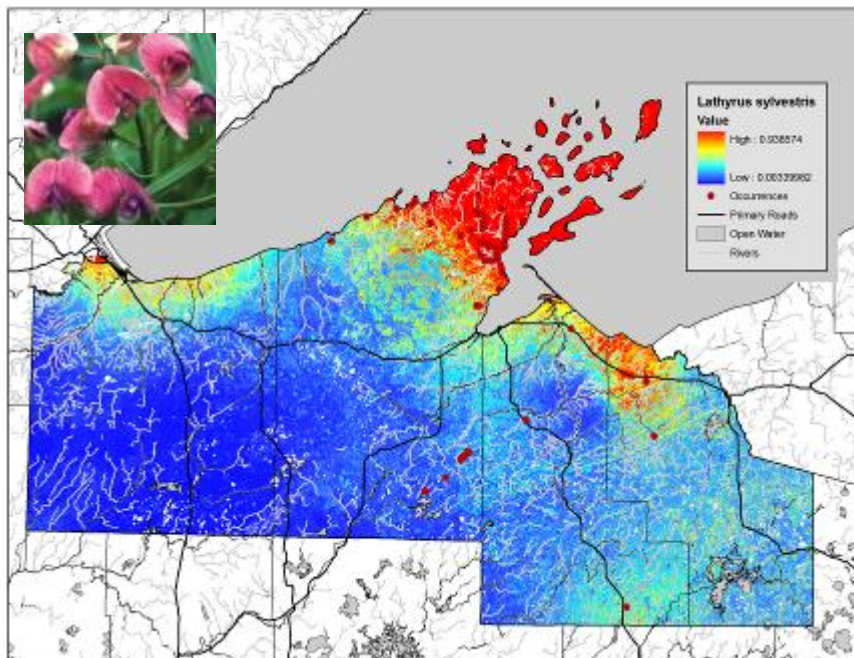


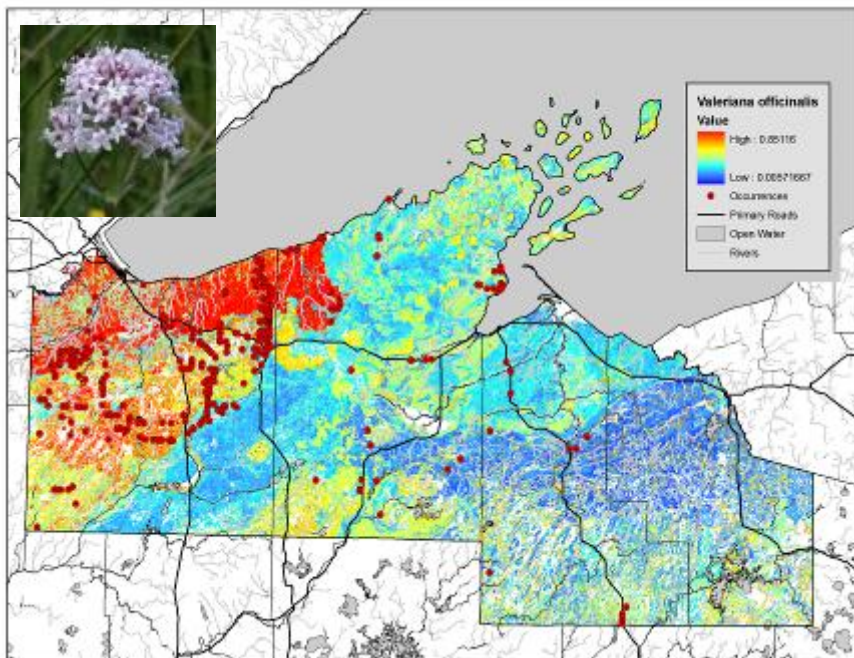
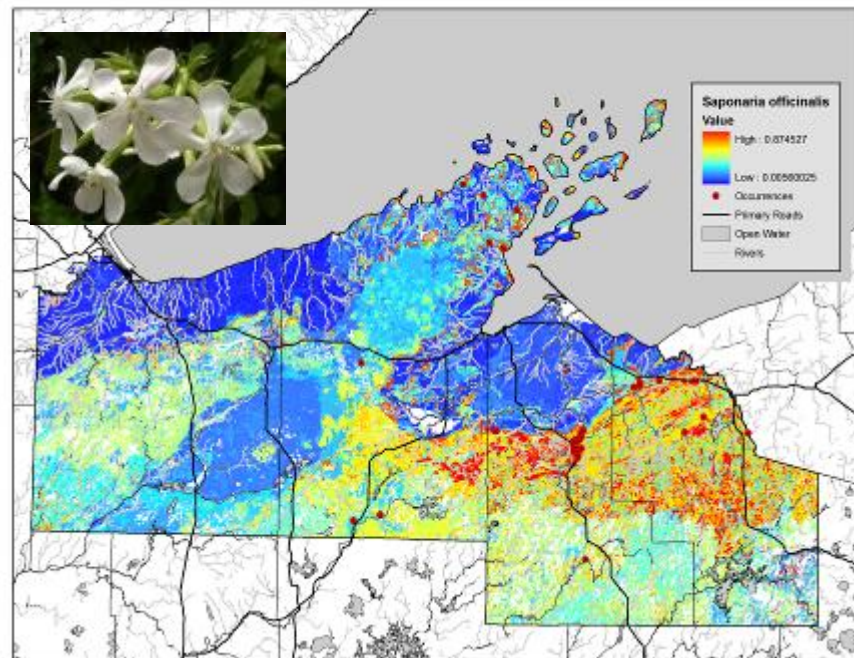
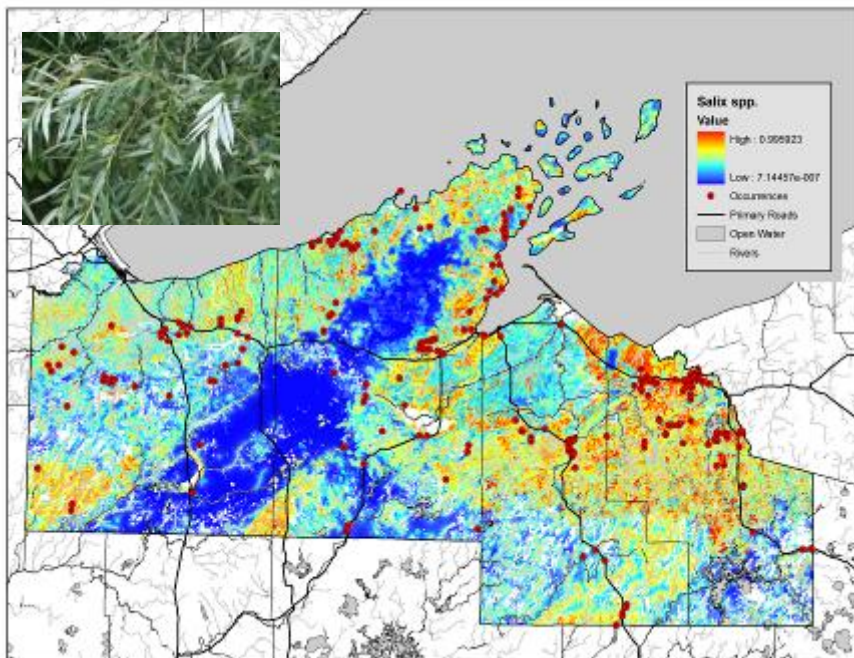
Rhamnus cathartica

Target Background



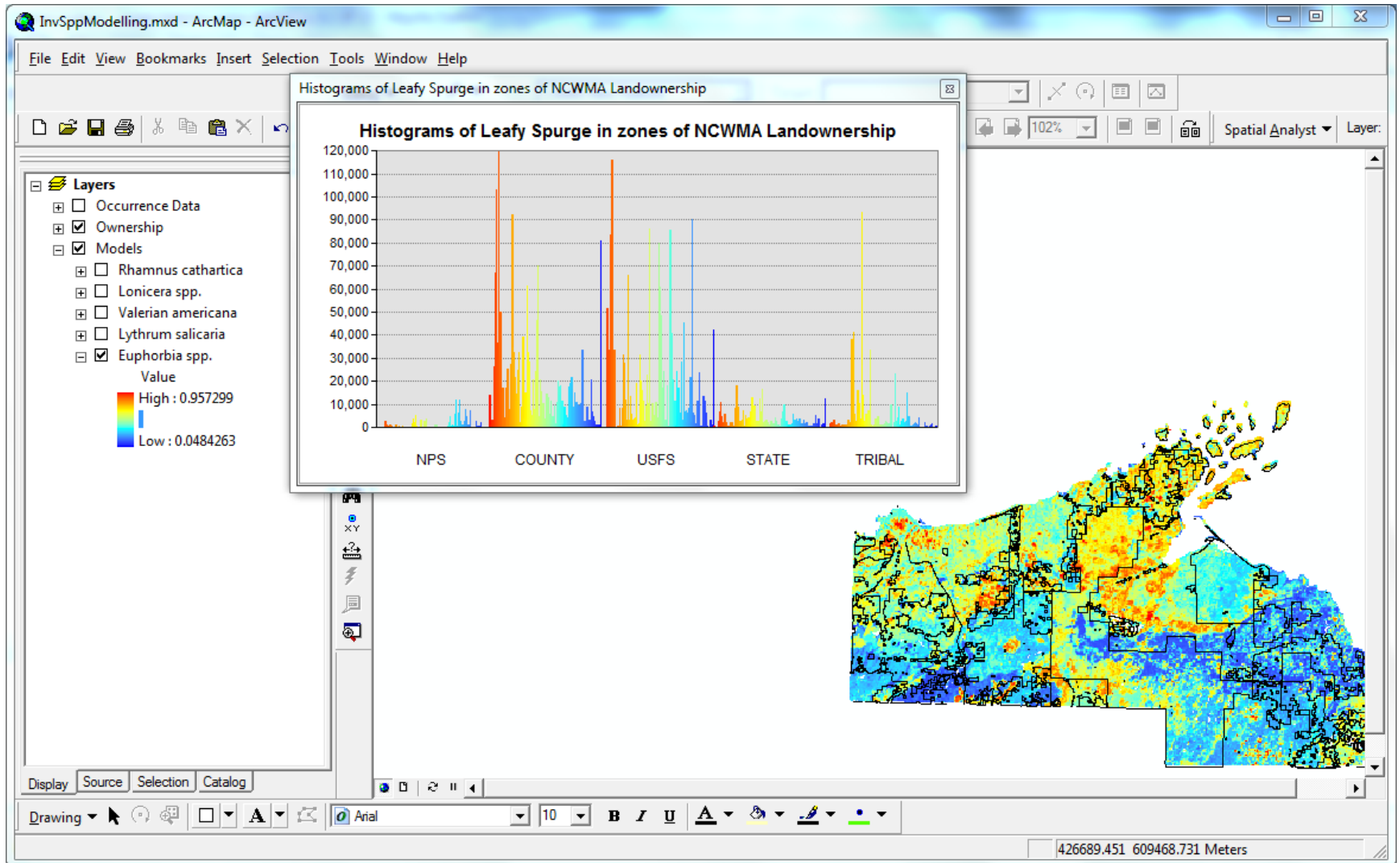




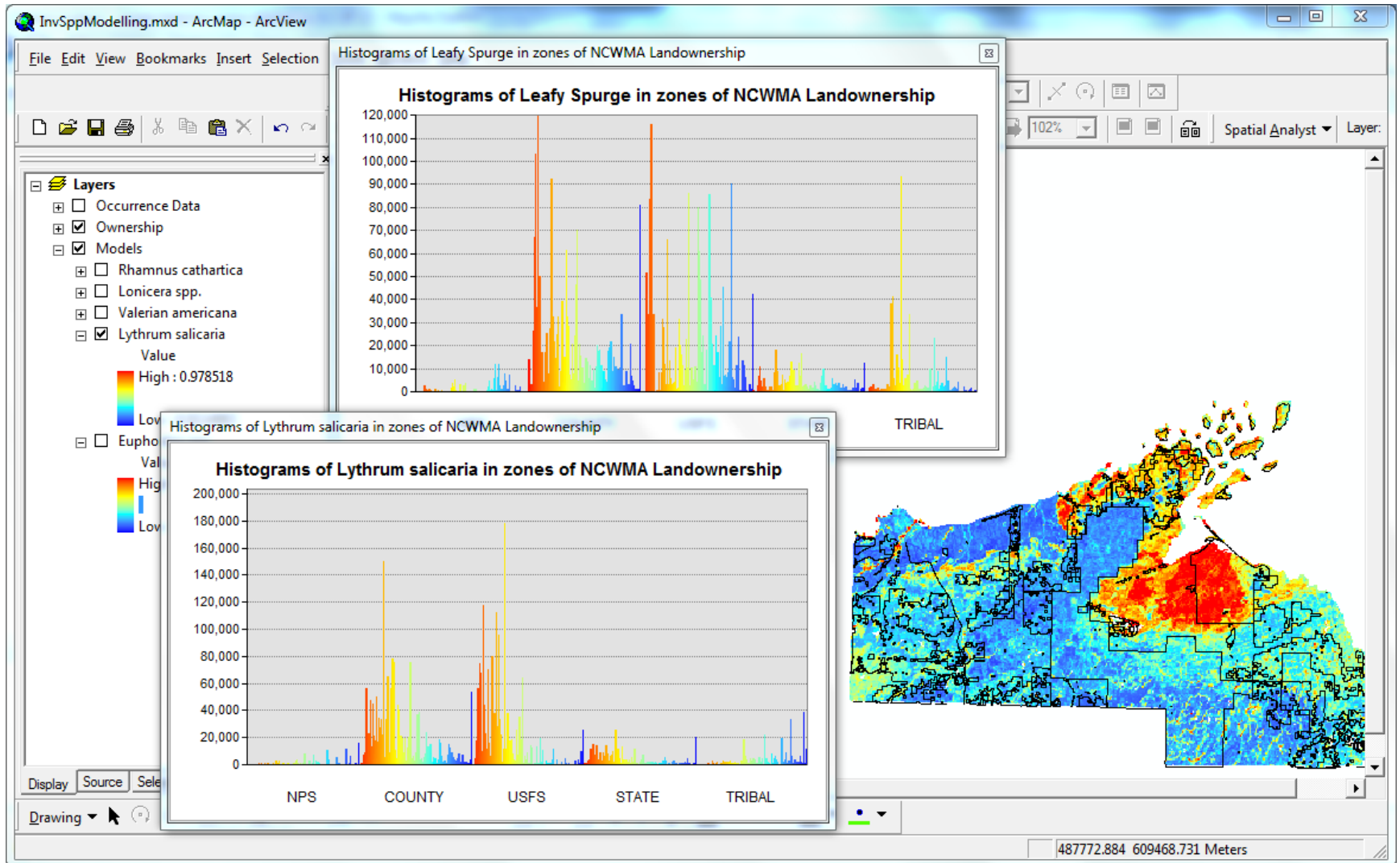


So what?

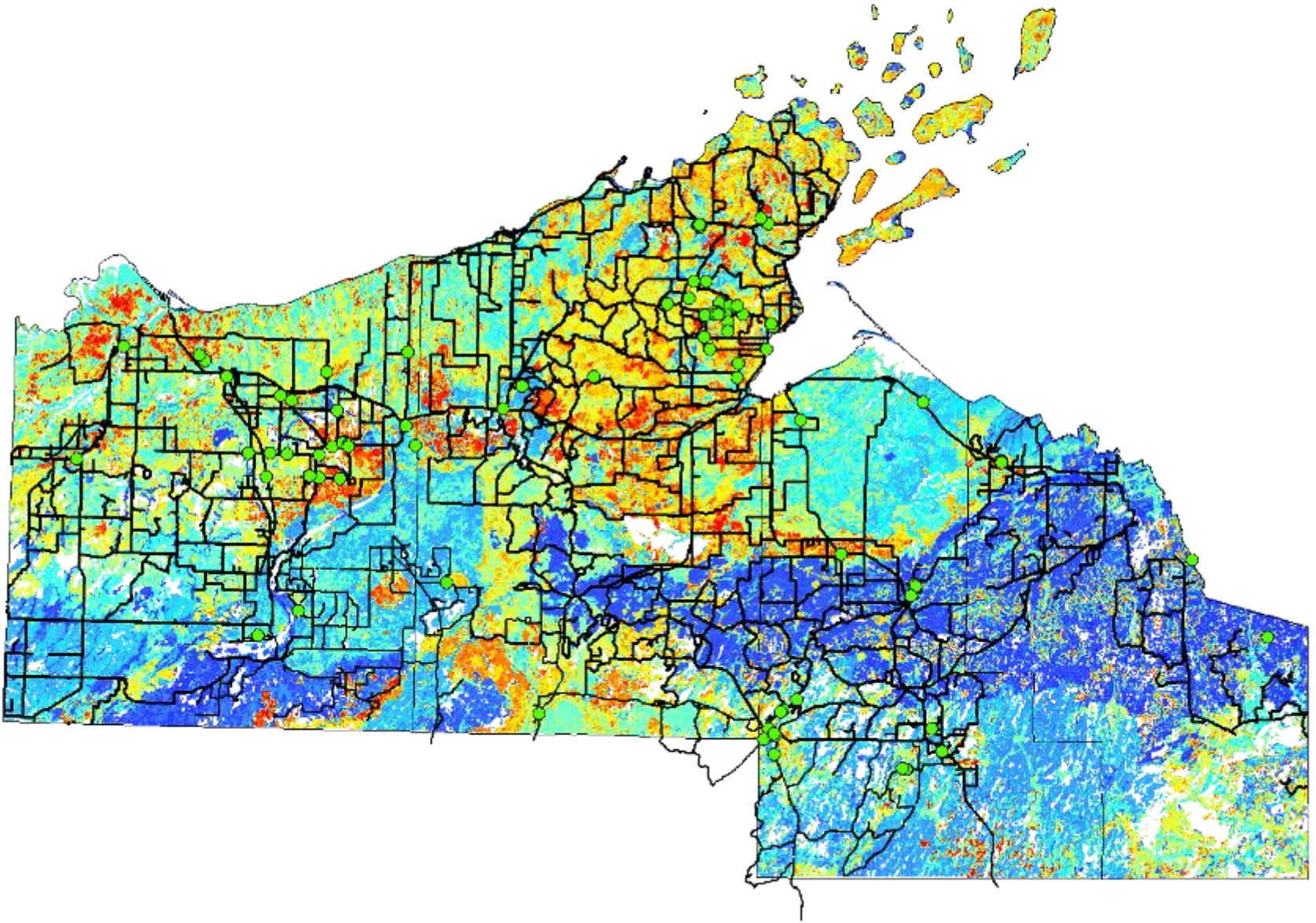
Quantify Risk



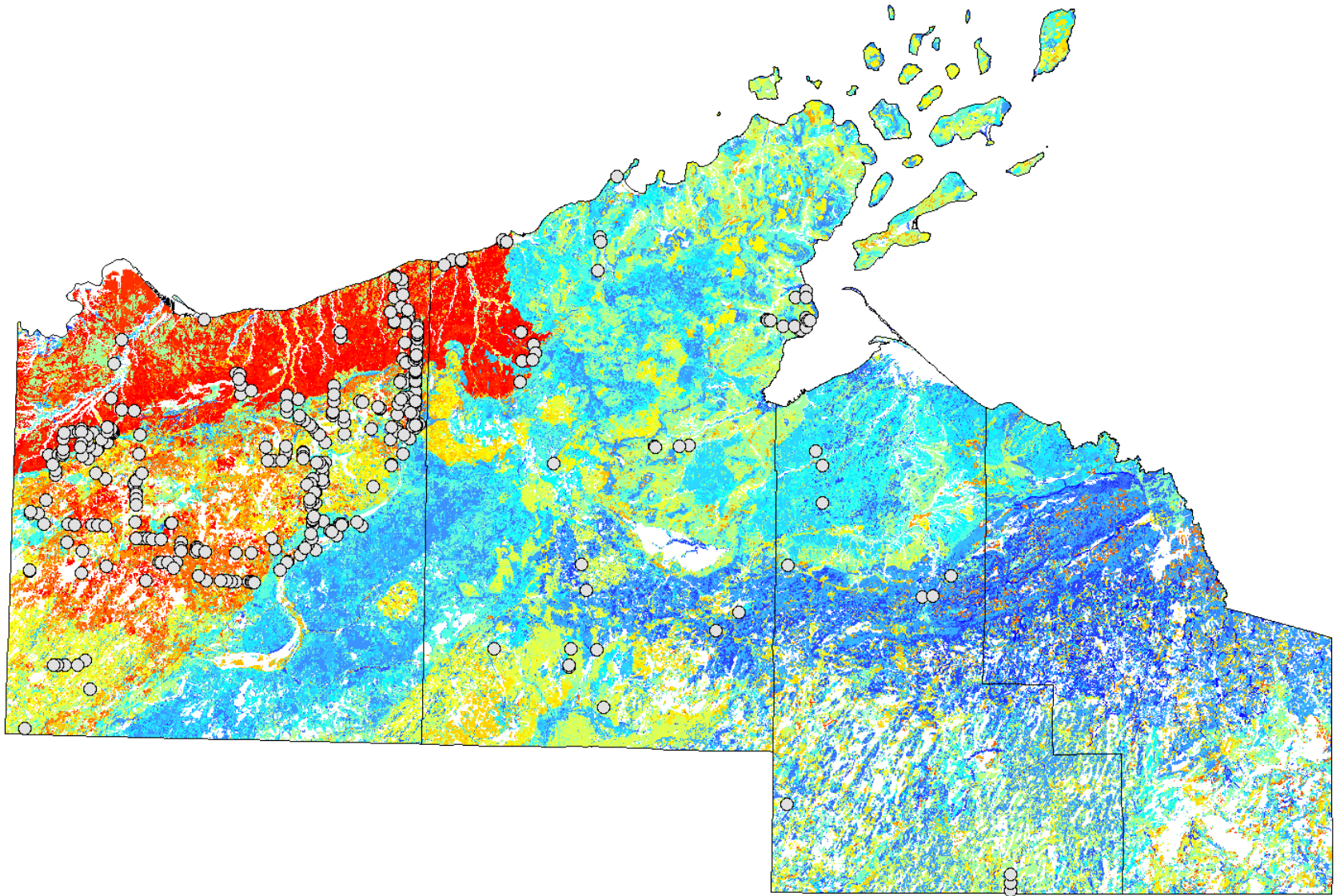
Evaluate Relative Risk



Prioritize Surveillance



Prioritize Treatment



What is at risk?

