

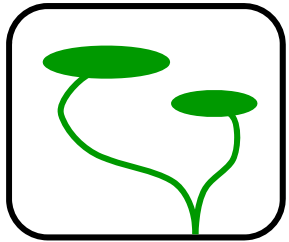
Rapid Macrophyte Assessment: Pilot Study for the 2012 NLA



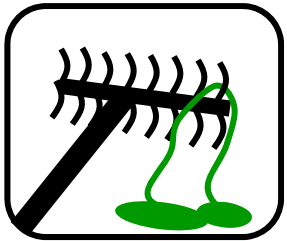
**Alison Mikulyuk, Kelly Wagner
& Tim Asplund**

Wisconsin Department of Natural Resources

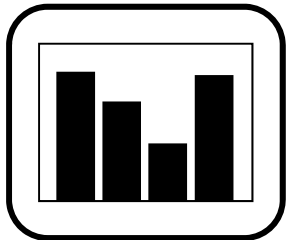
Outline



Background

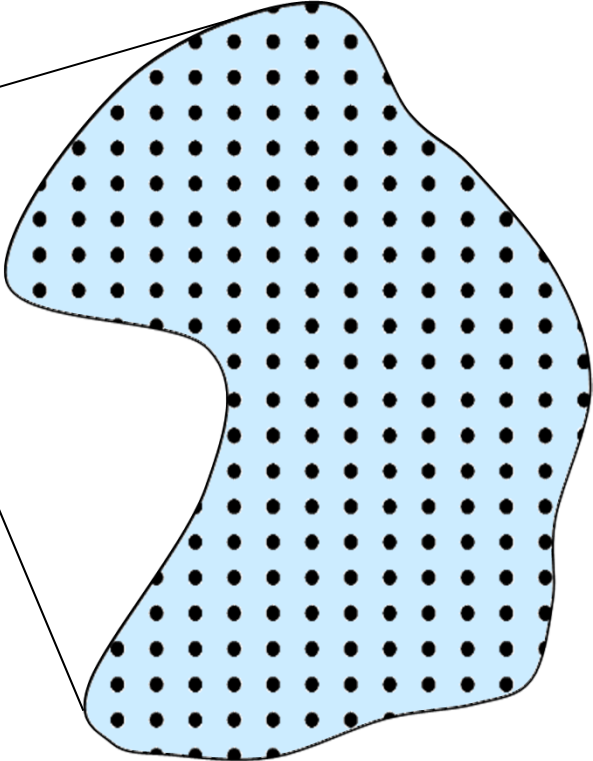
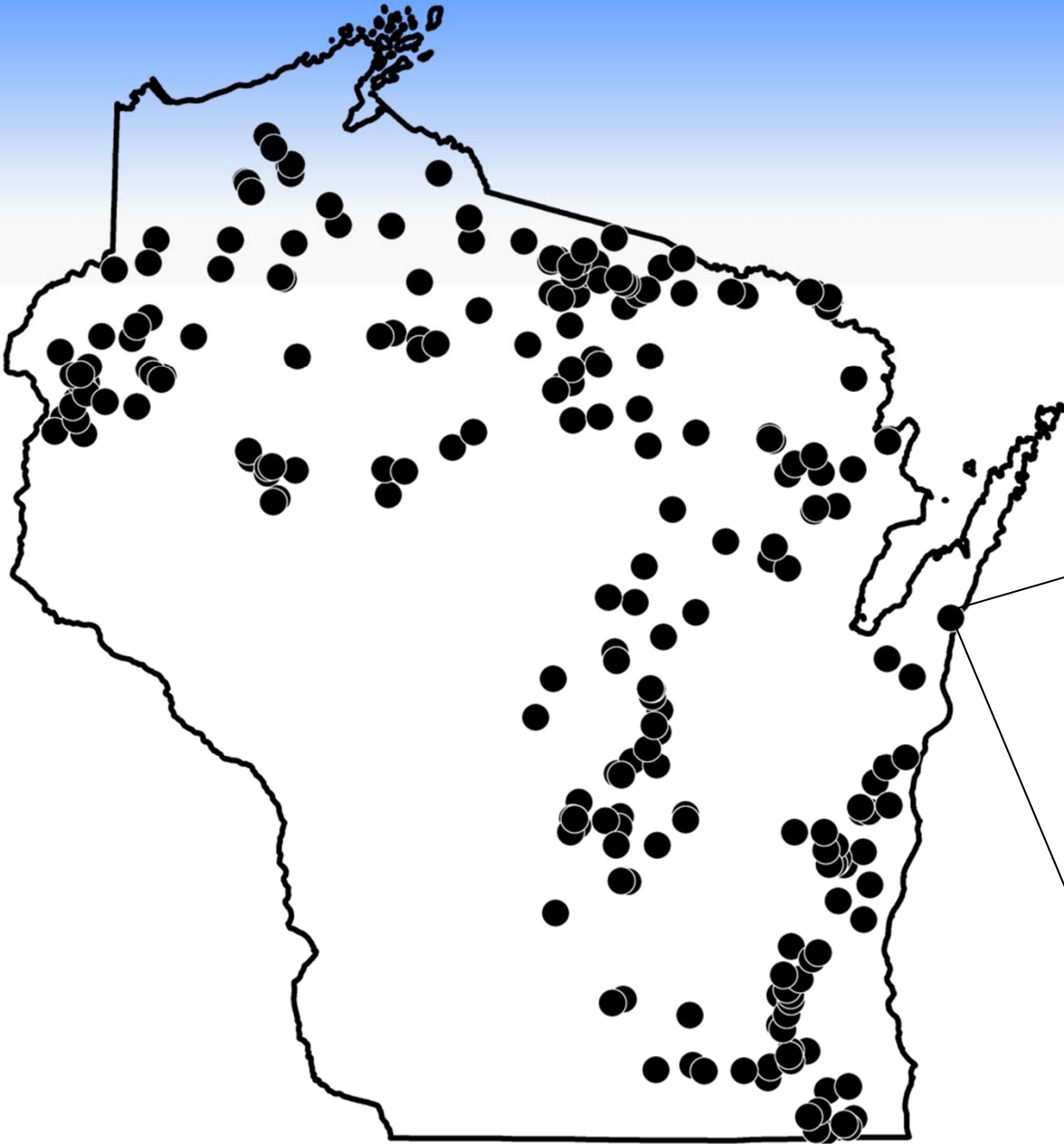
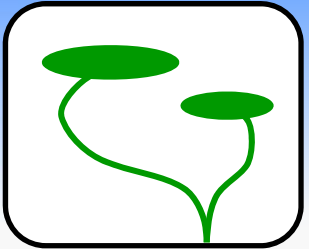


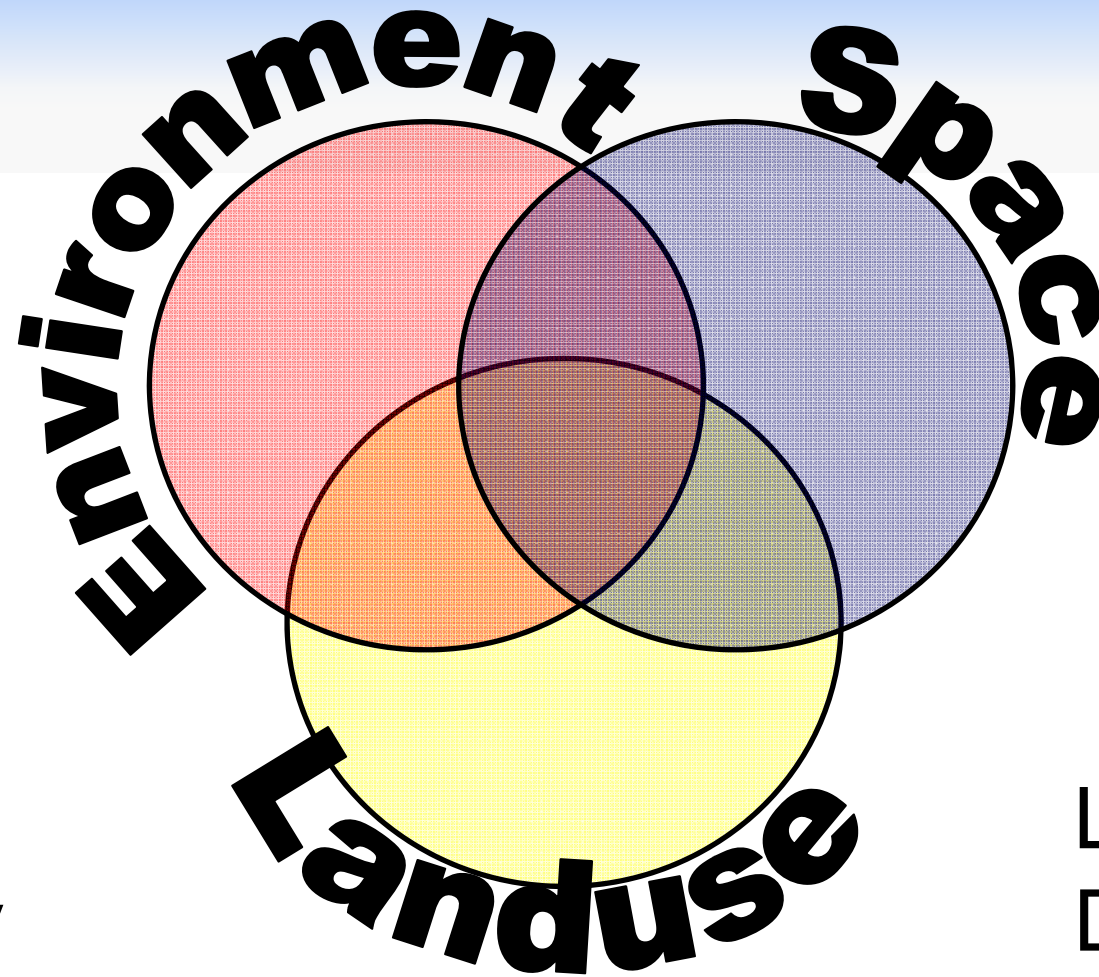
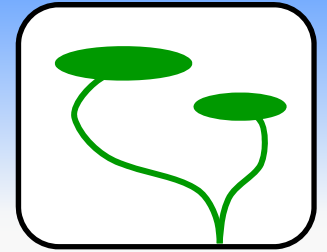
Method Design & Pilot



Analyzing the data

– Data: opportunities, possibilities



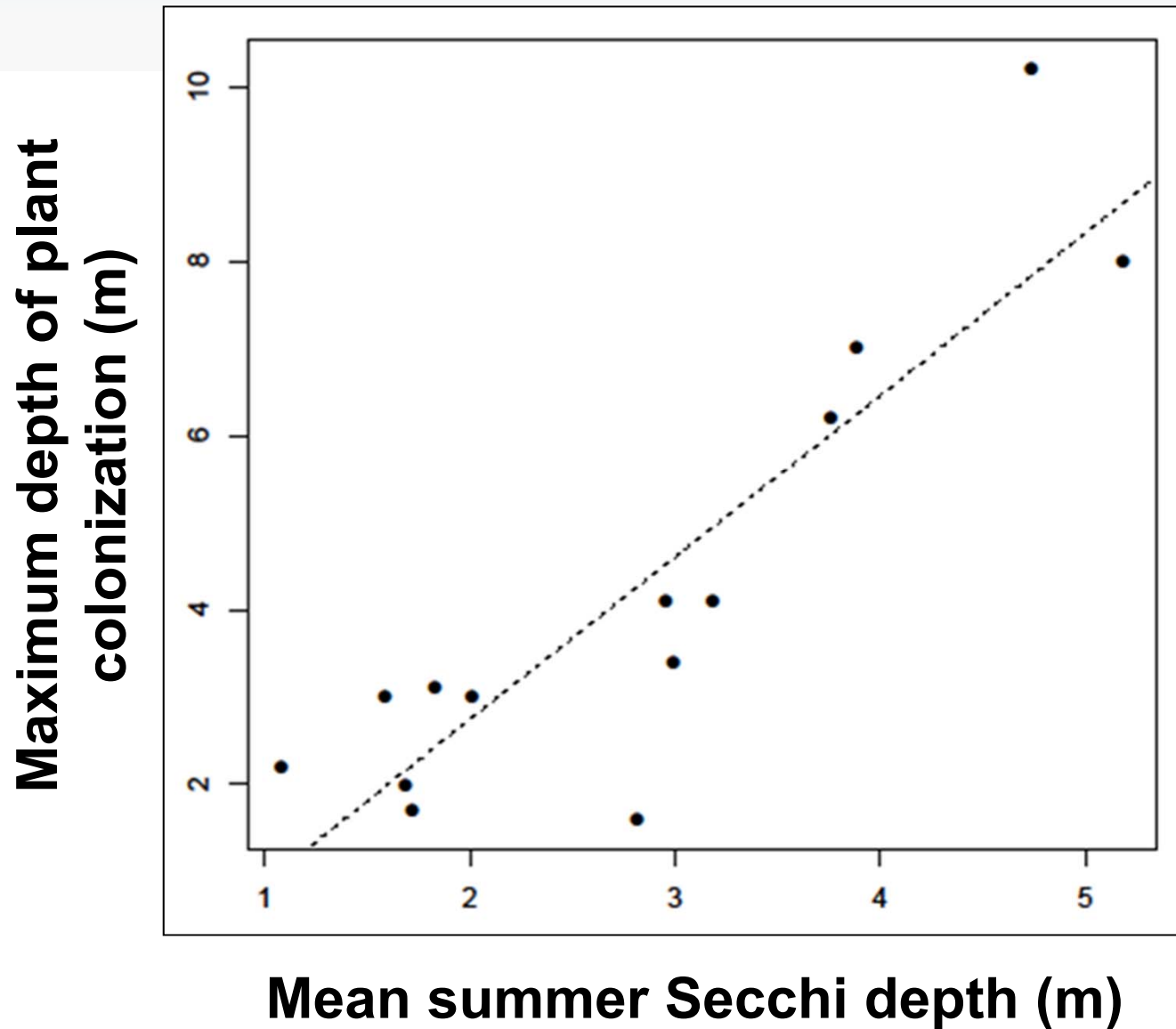
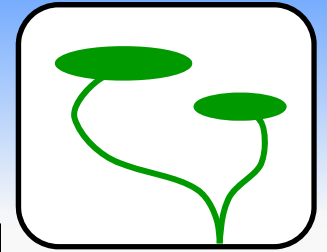


Alkalinity
pH Clarity
Erodibility

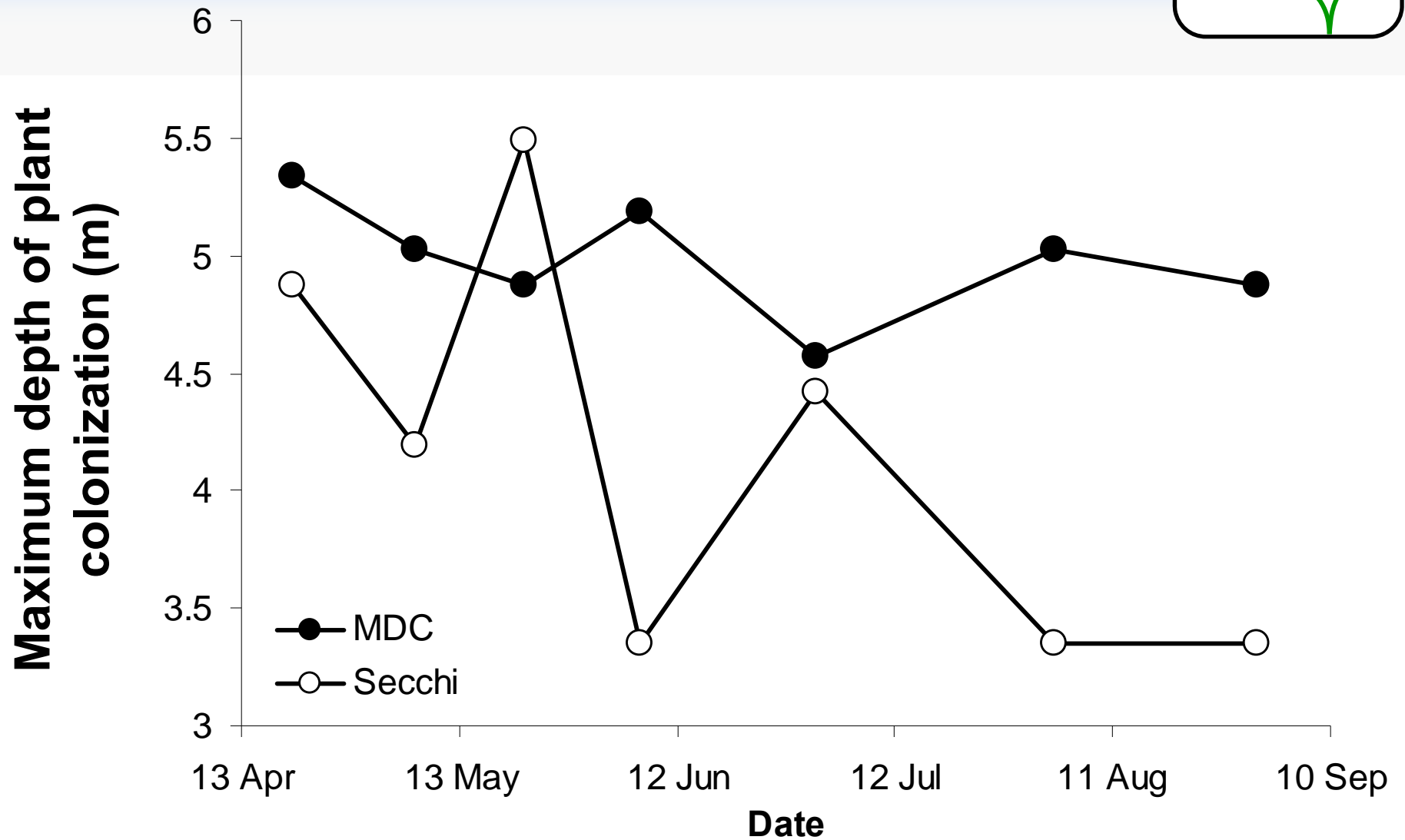
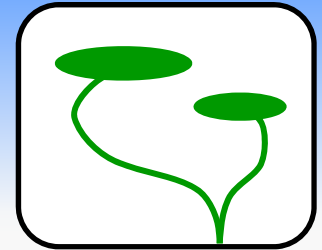
Agriculture
Urbanization

Latitude
Dispersal
Connection

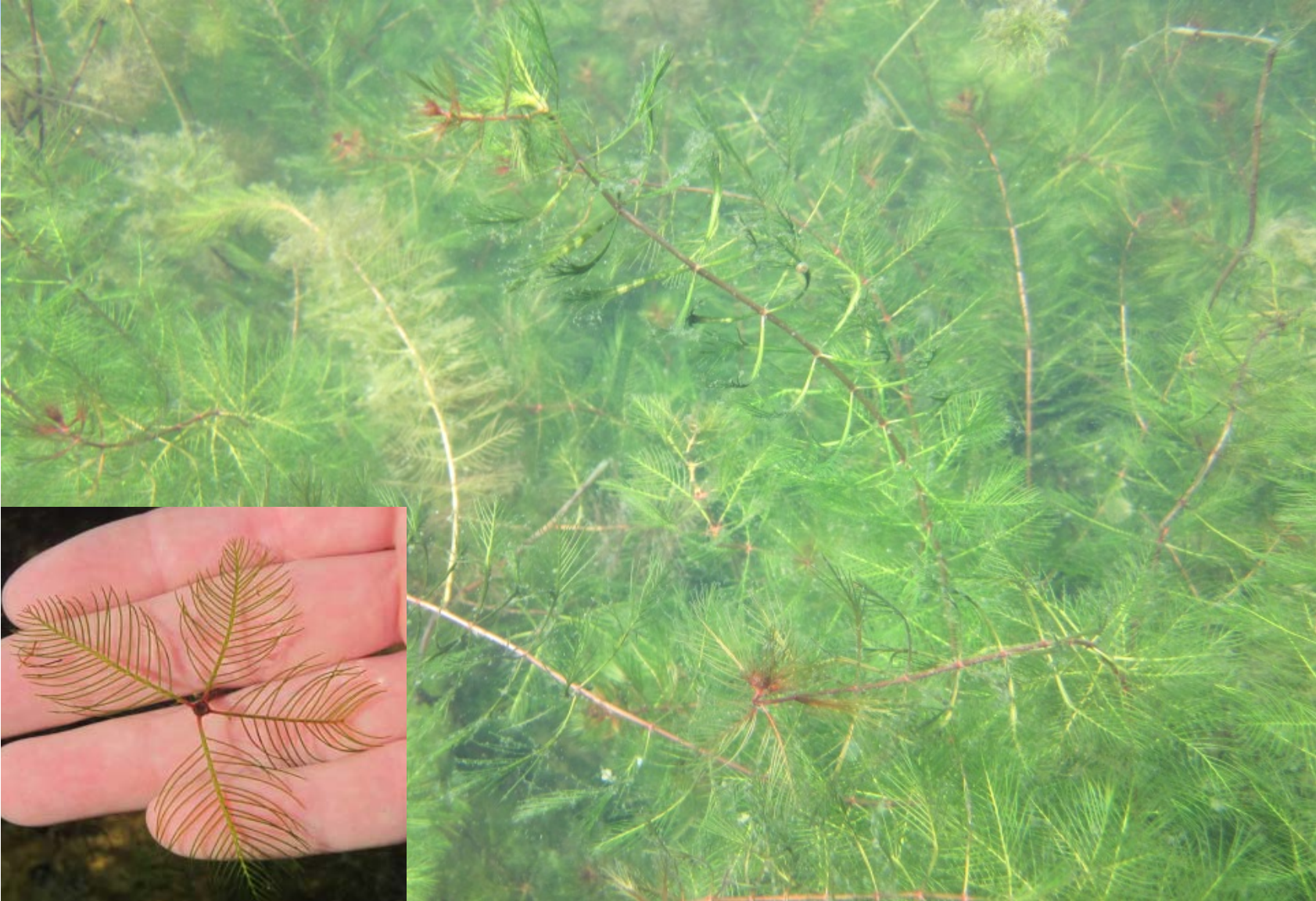
Maximum Depth of Plant Colonization



MDC less variable than Secchi



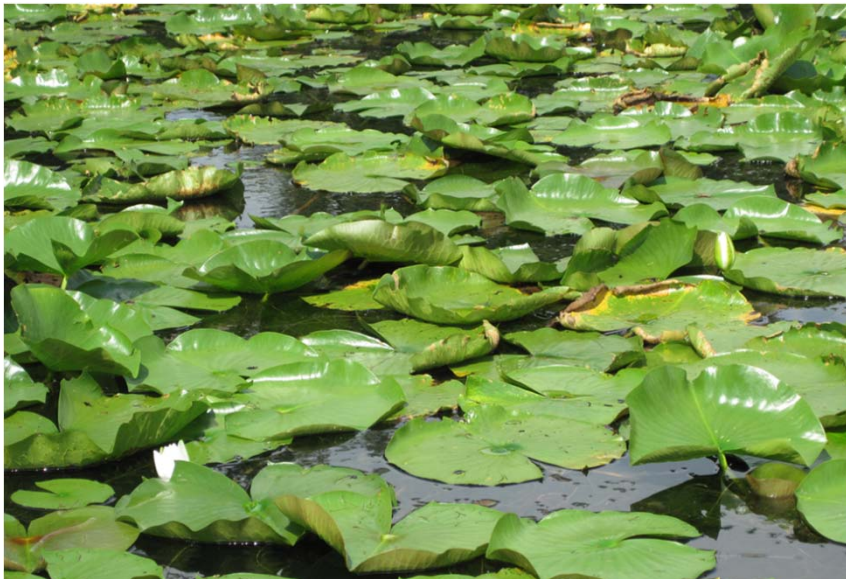
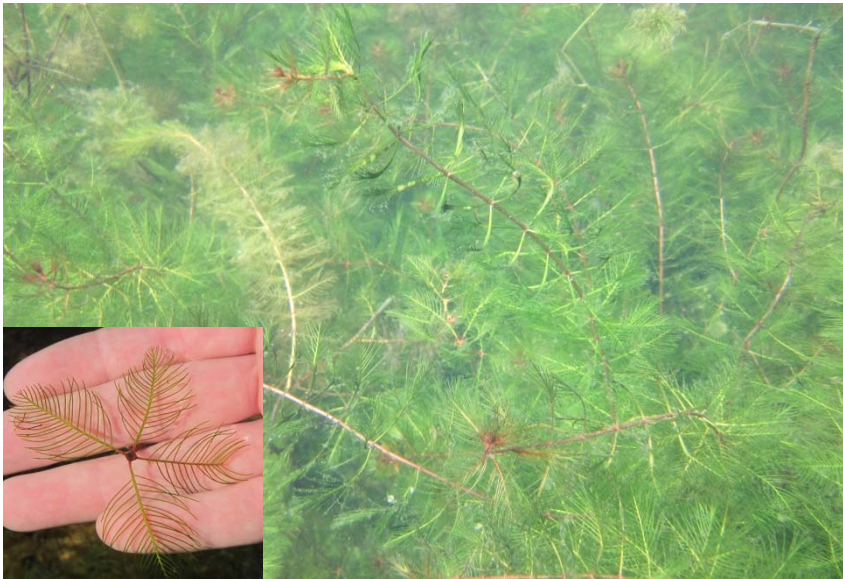
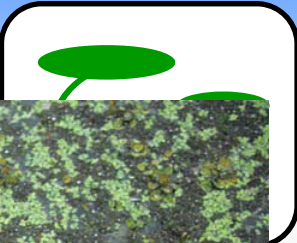






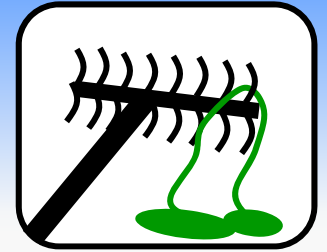


Landoltia, Azolla and Salvinia
Photo by Ann Murray
© 2000 University of Florida

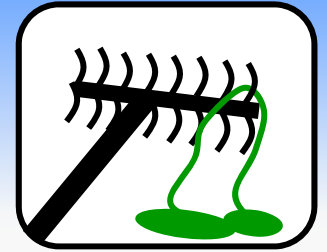




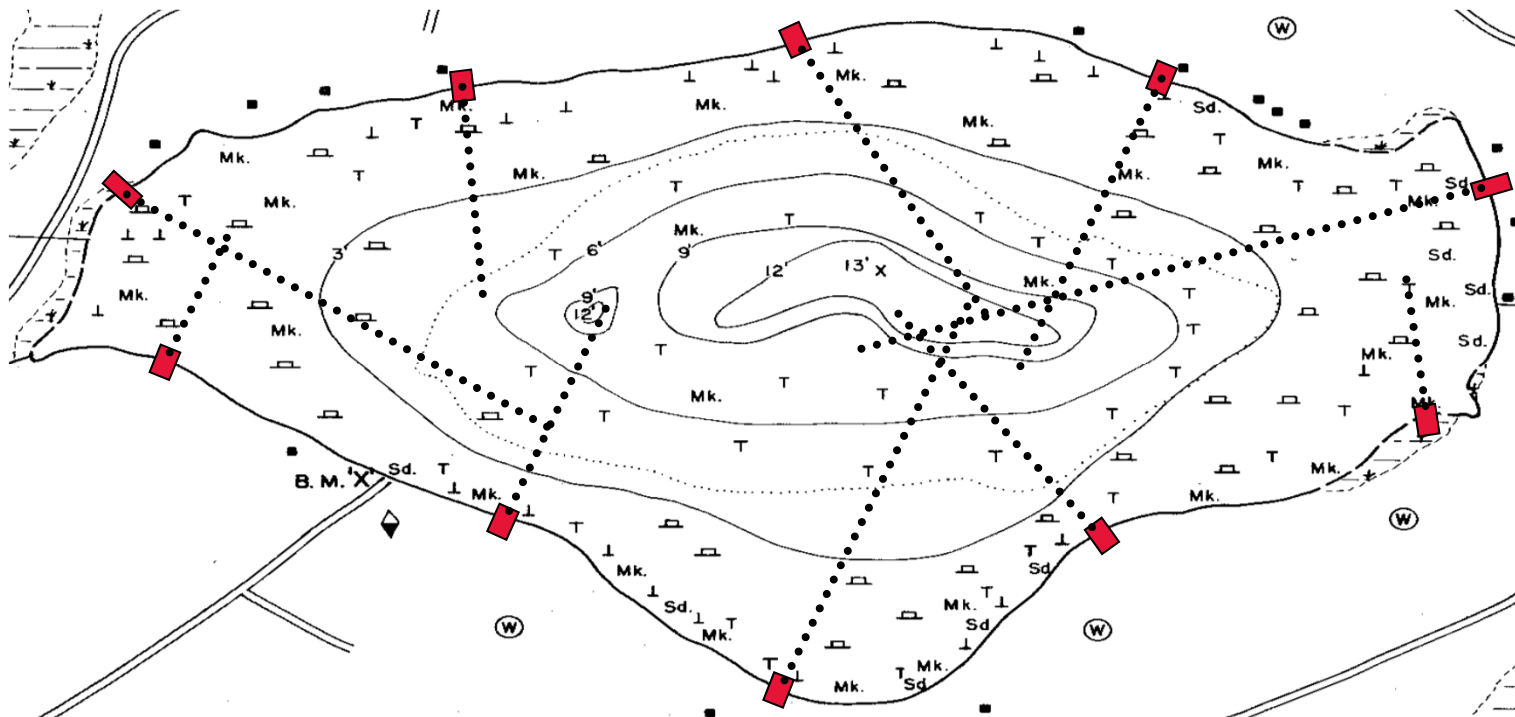
Rapid Assessment



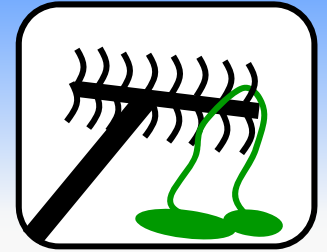
Rapid Assessment Pilot



- 10 Transects
- ≥ 6 depth-stratified points per transect
 - 0.5m, 1m, 2m, 3m, 4m...



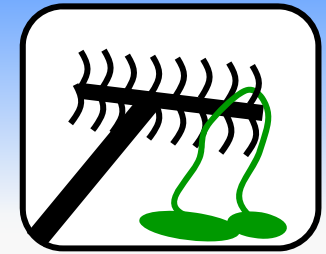
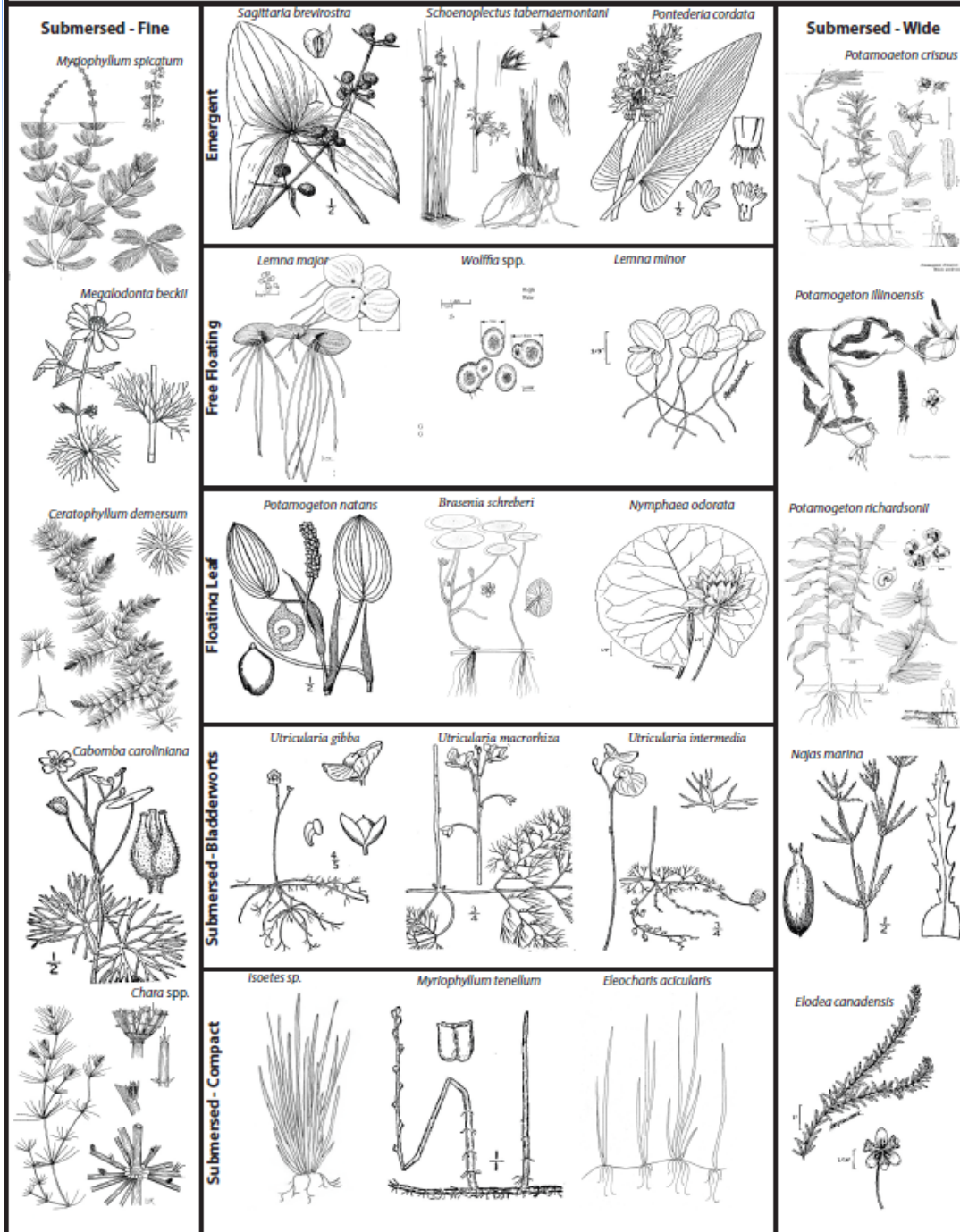
Collecting Data



- Rake Sampler
- Record Depth
- Total Rake Fullness
- Fullness by Growth Form
- Invasive Species
- Biodiversity



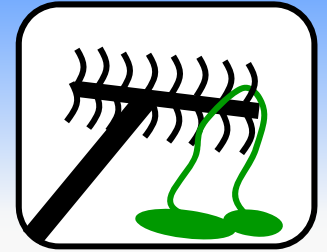
Plant Growth Form Guide



Growth Form

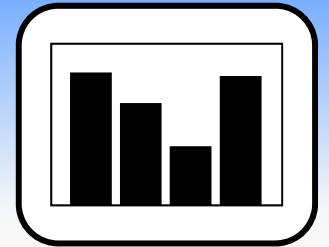
- Emergent
- Free-floating
- Floating leaf
- Submersed [Bladderwort]
- Submersed [Fine]
- Submersed [Wide]
- Submersed [Compact]

Pilot Implementation



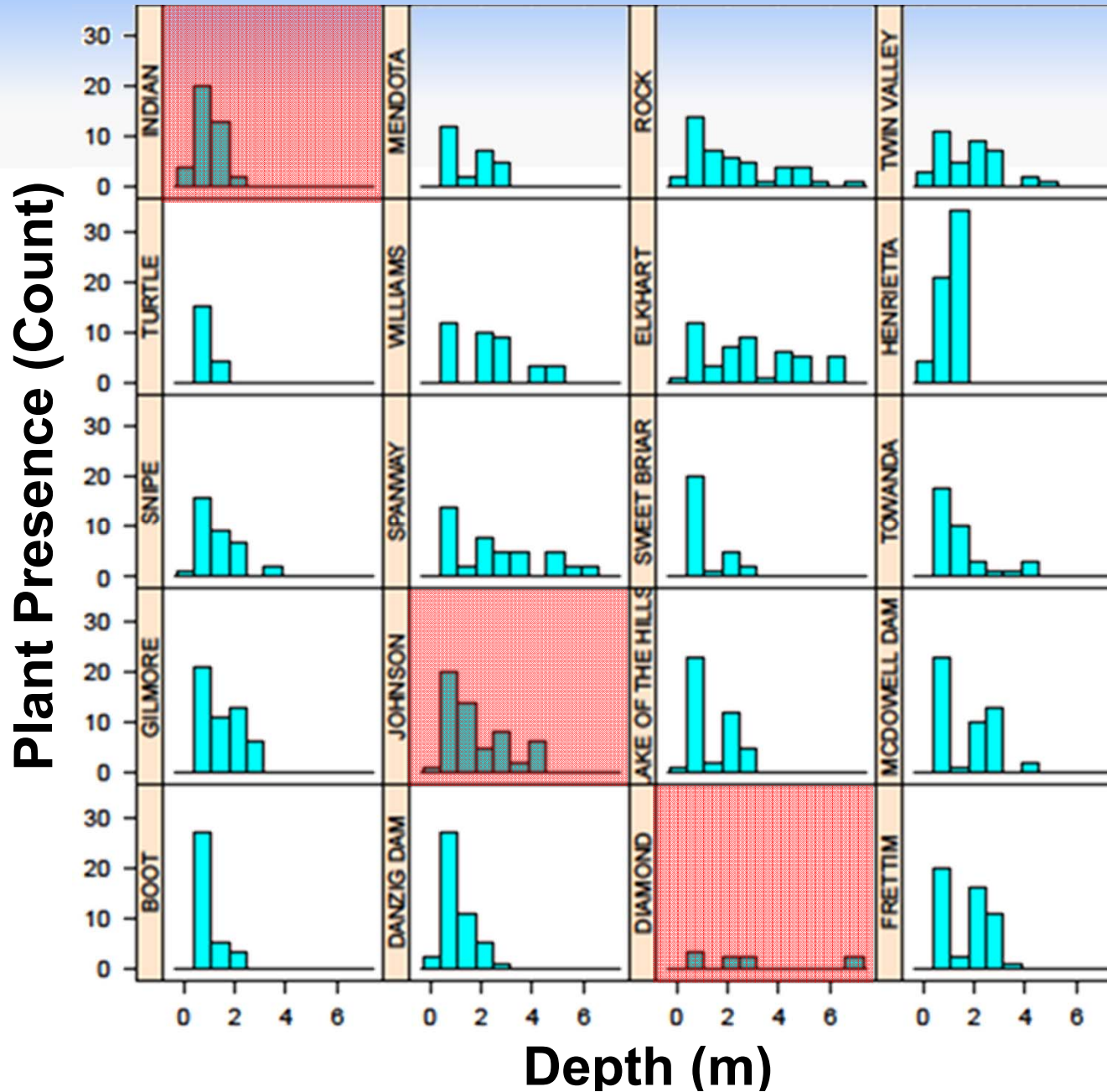
- 7 lakes in SE Wisconsin
- 9 lakes in N Wisconsin
- 5 lakes in North Dakota
- 1 lake in Washington
- 0 lakes in Colorado (lost rake sampler)
- 0 lakes in Vermont (Hurricane)

Data, Effort, and Opportunities

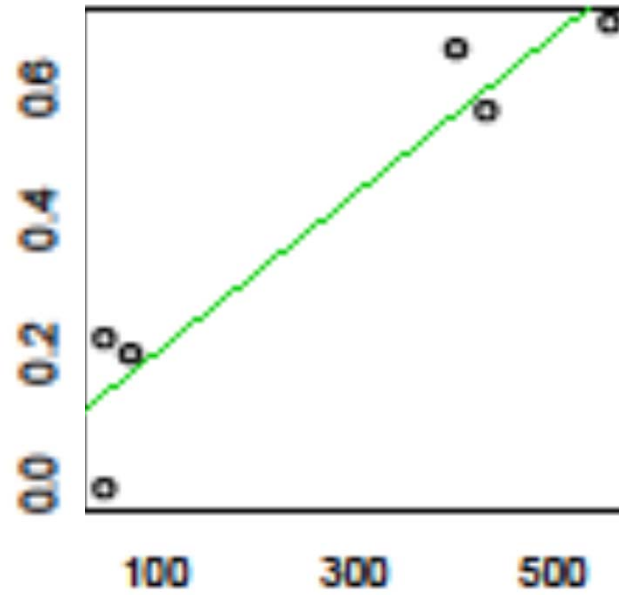


- Main Metrics
 - Maximum depth of colonization
 - Frequency of guild occurrence
 - Habitat structure
 - Habitat heterogeneity
 - Invasive species presence
 - Morphological richness
 - Guild community composition

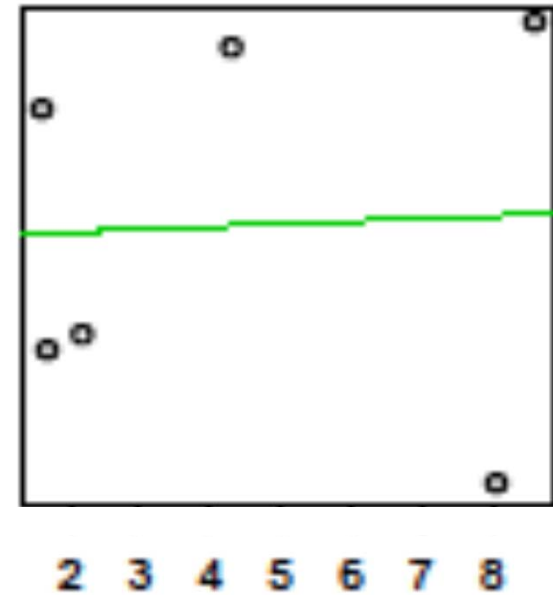
Do Metrics Vary?



Stressor response?

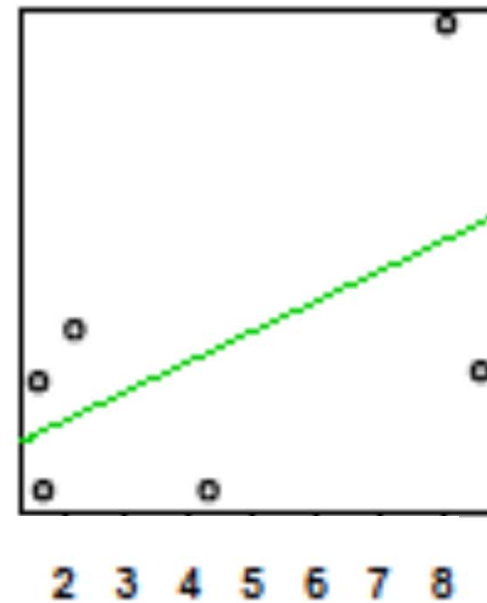
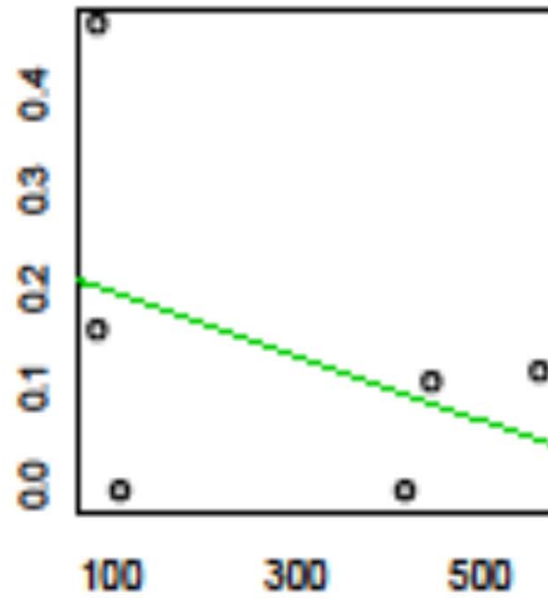


Conductivity (μS)



Secchi (m)

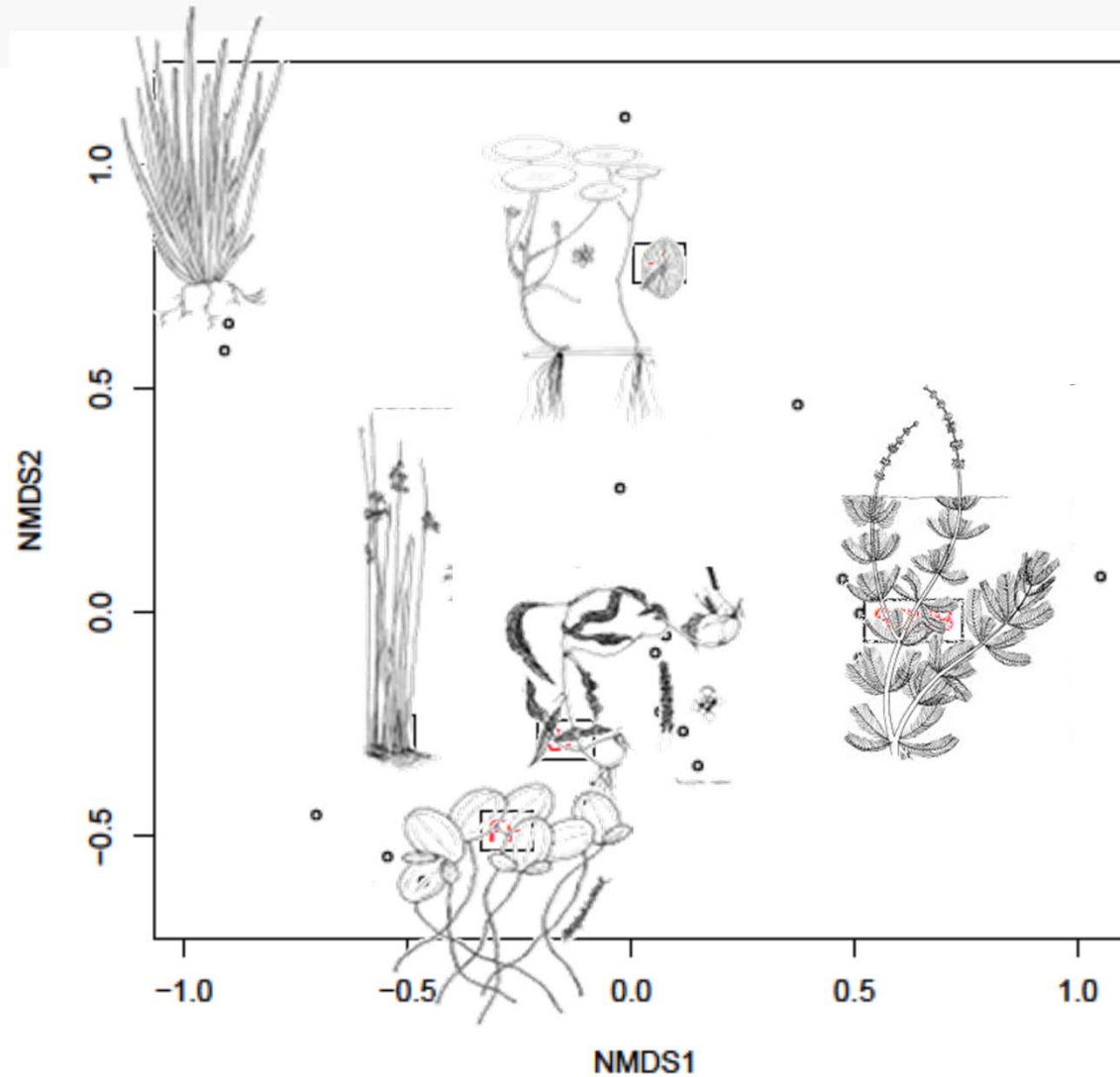
Stressor response?



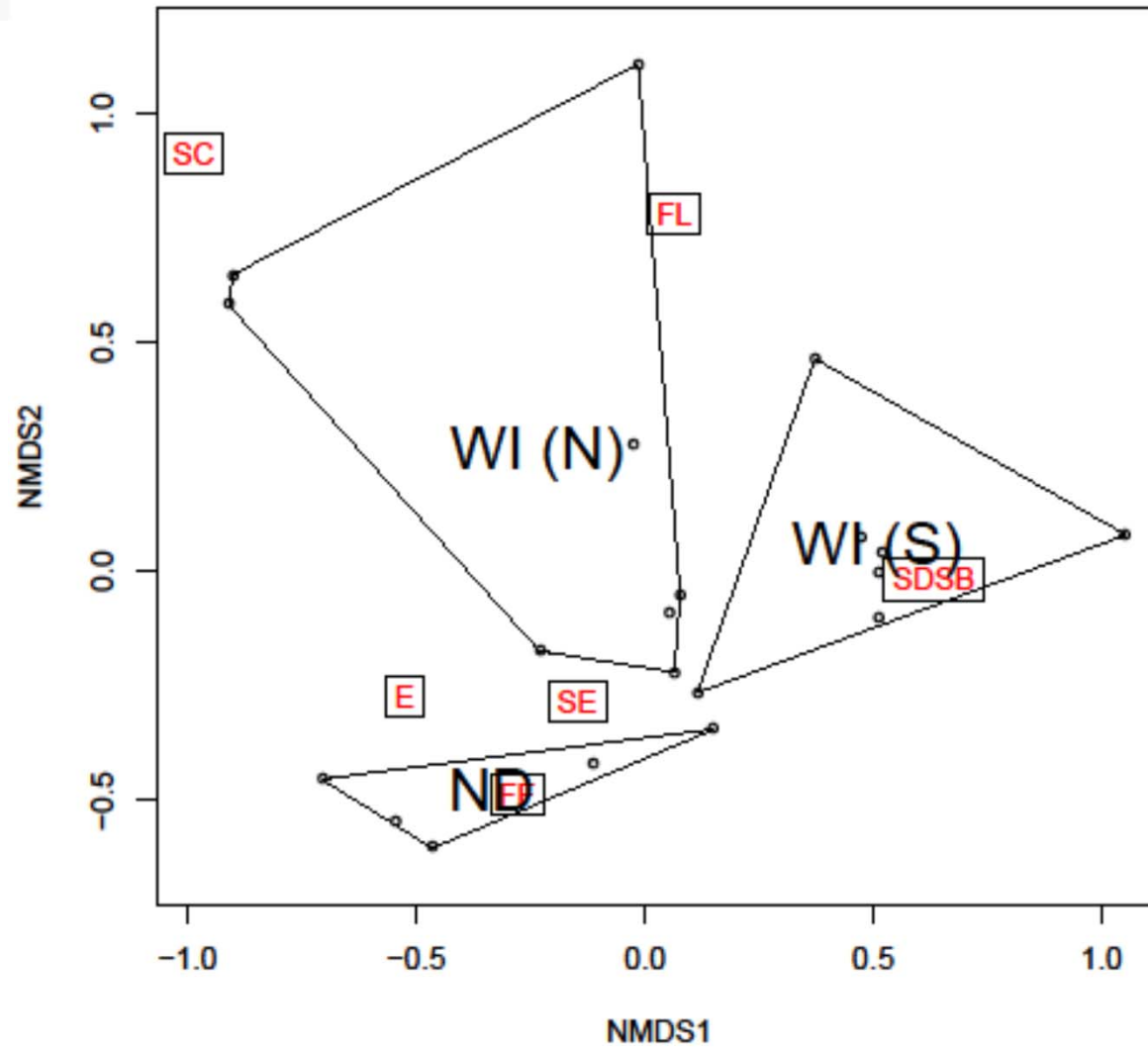
Conductivity (µS)

Secchi (m)

Patterns in composition?



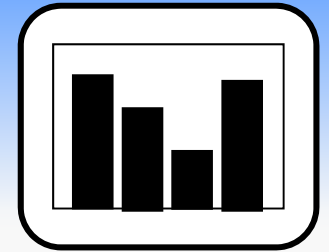
Patterns in composition.



Final Rapid Assessment Method

- Time and logistical restraints require reduction in effort
 - 5 instead of 10 transects
 - No morphological diversity
- What happens when we reduce to 5 transects?

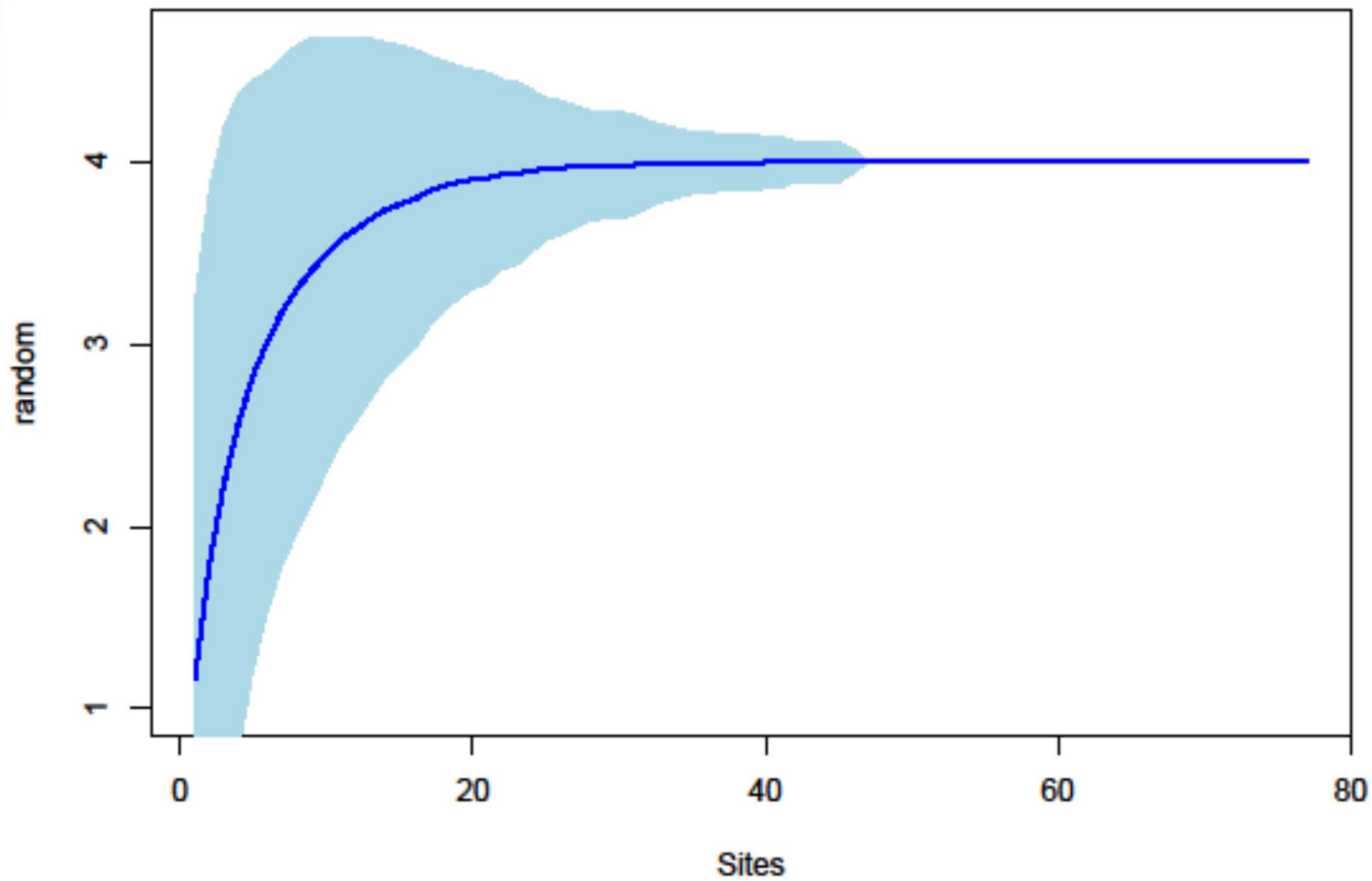
How much data is enough?



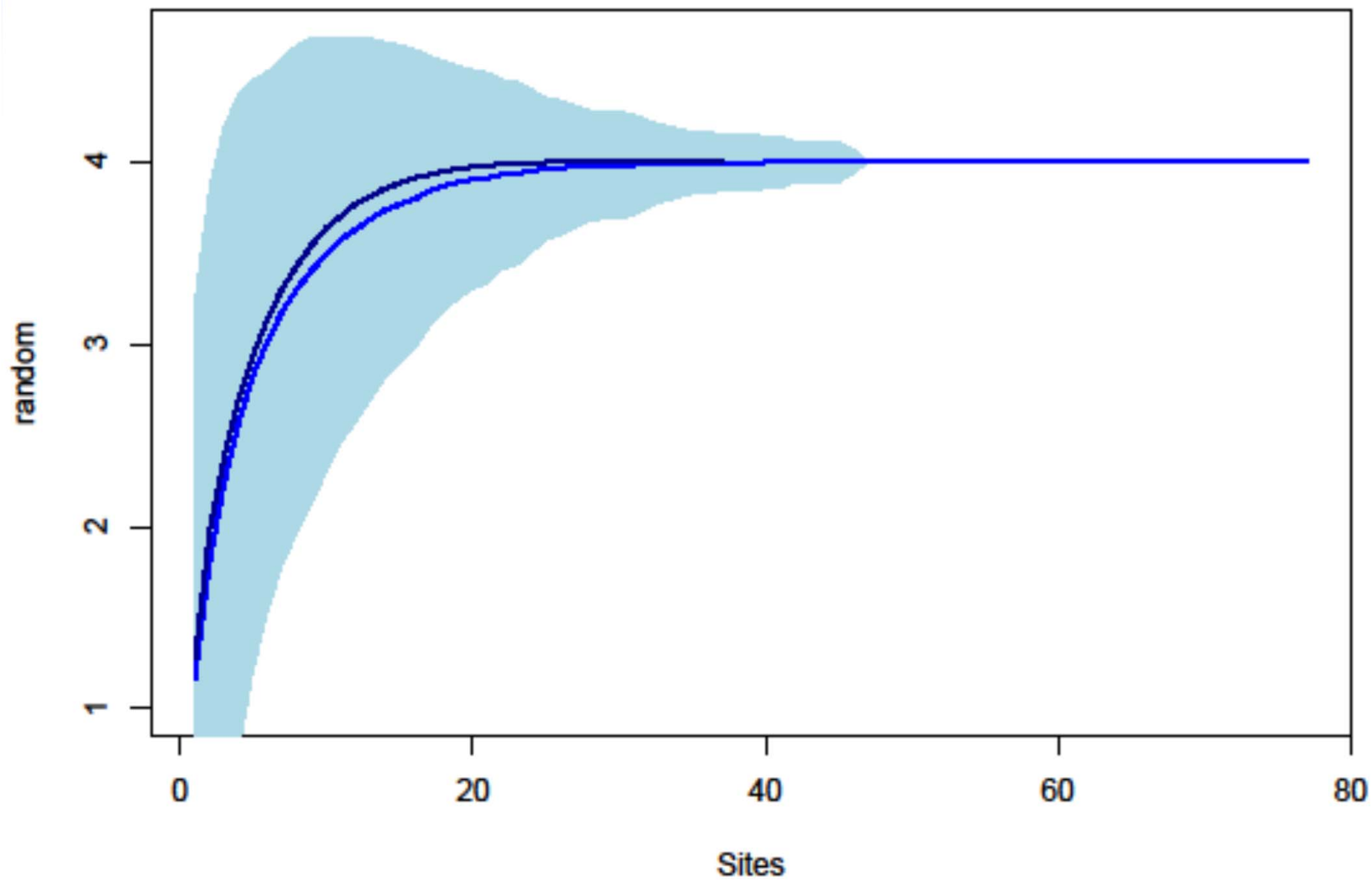
What happens when we sample only 5 transects?

	Mean change
Mean Species / point	0.133 sp
Max Species / point	0.3 sp
Mean Density	0.06 density units
Mean SE FOO	4 %
Mean MDC	0.15 m

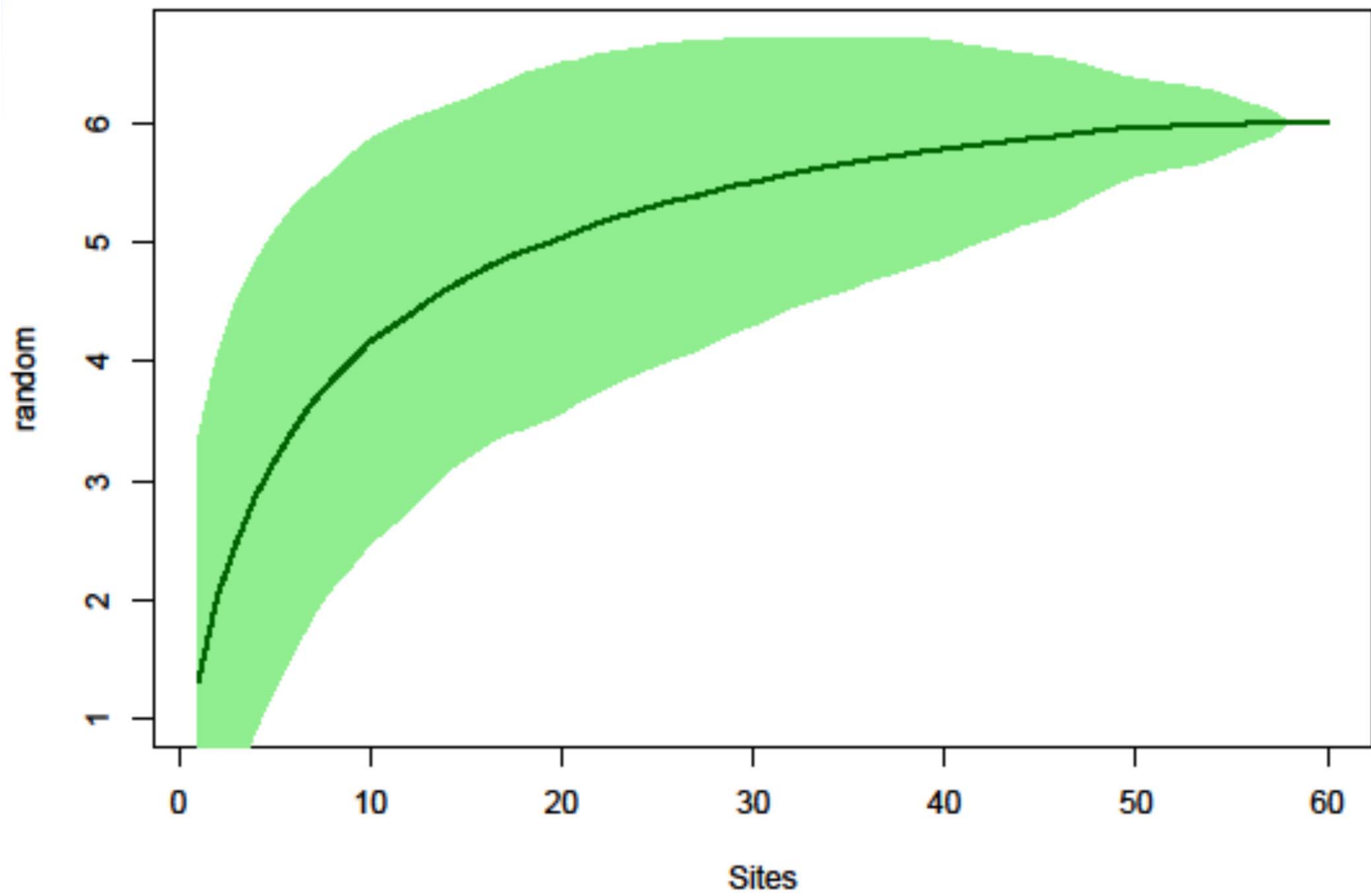
Elkhart



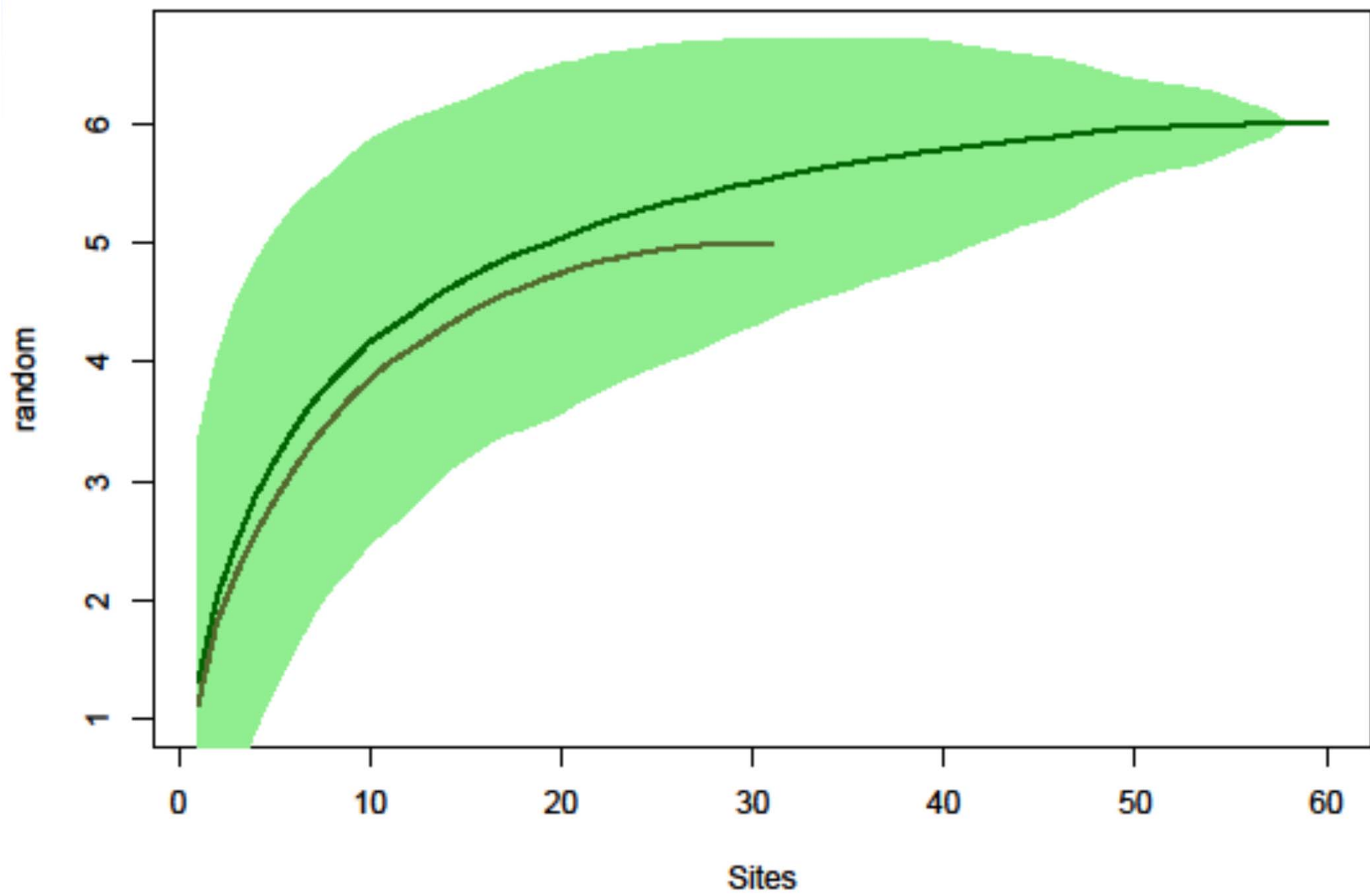
Elkhart



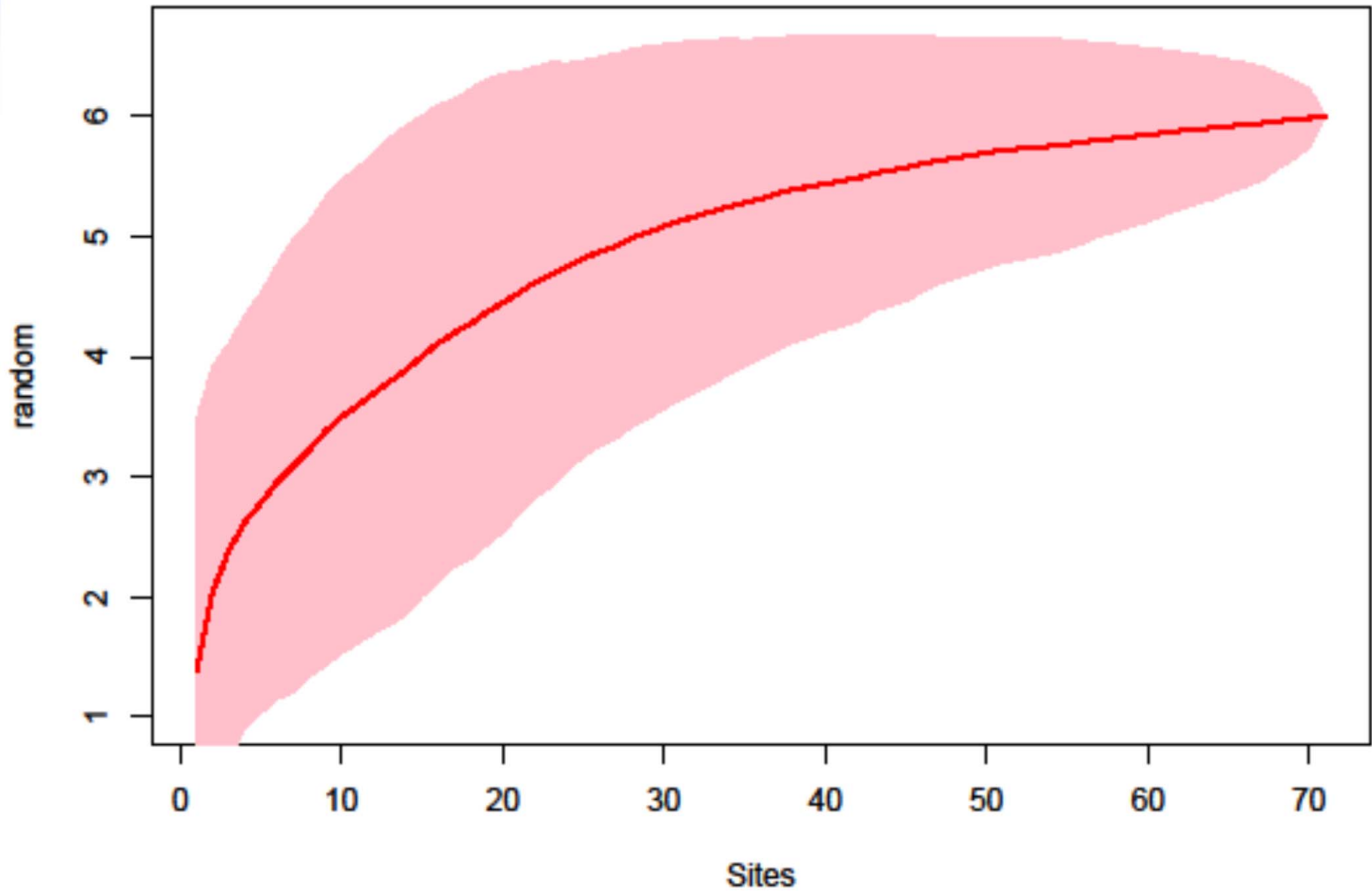
Rock



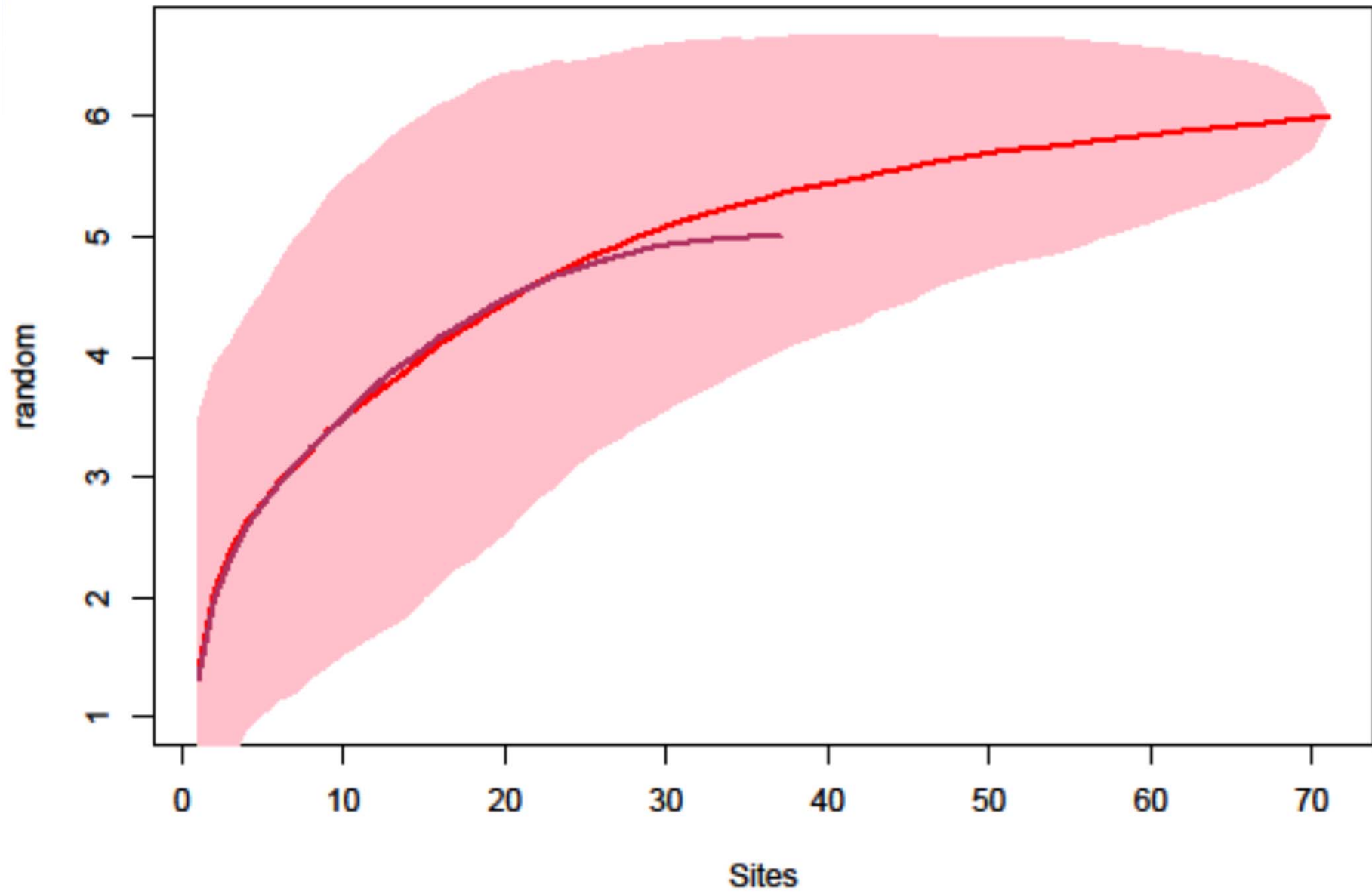
Rock

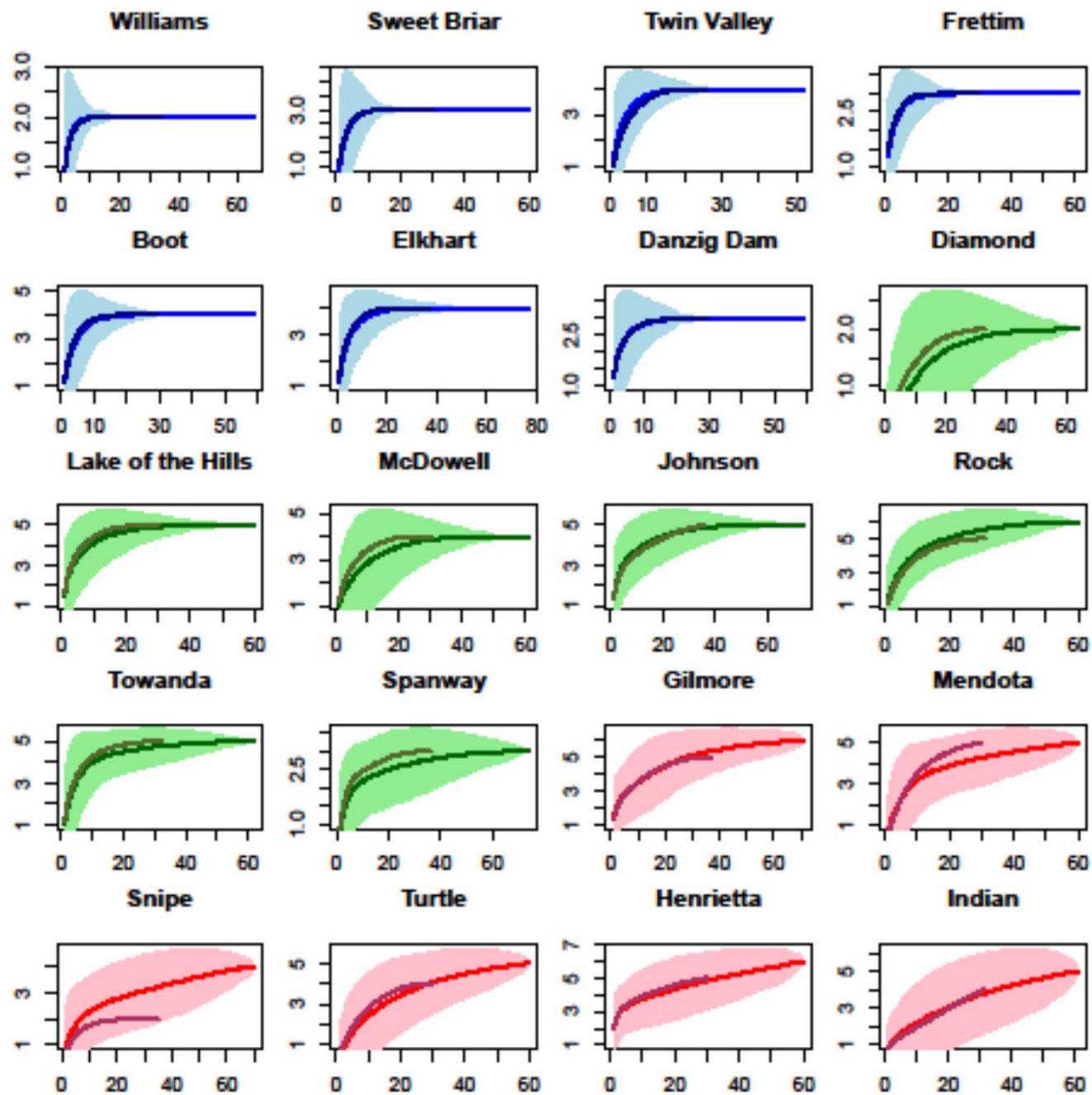


Gilman



Gilman

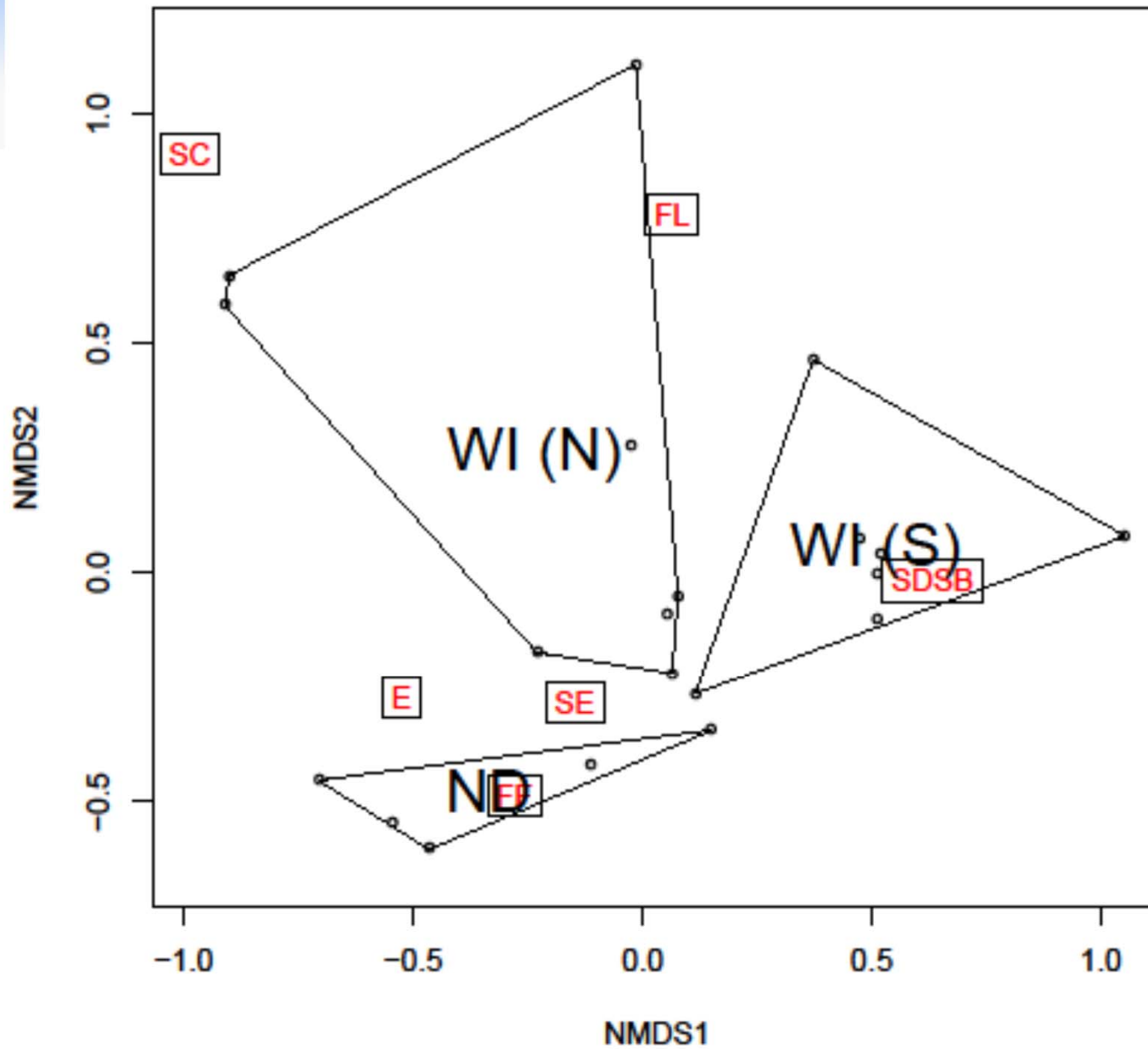




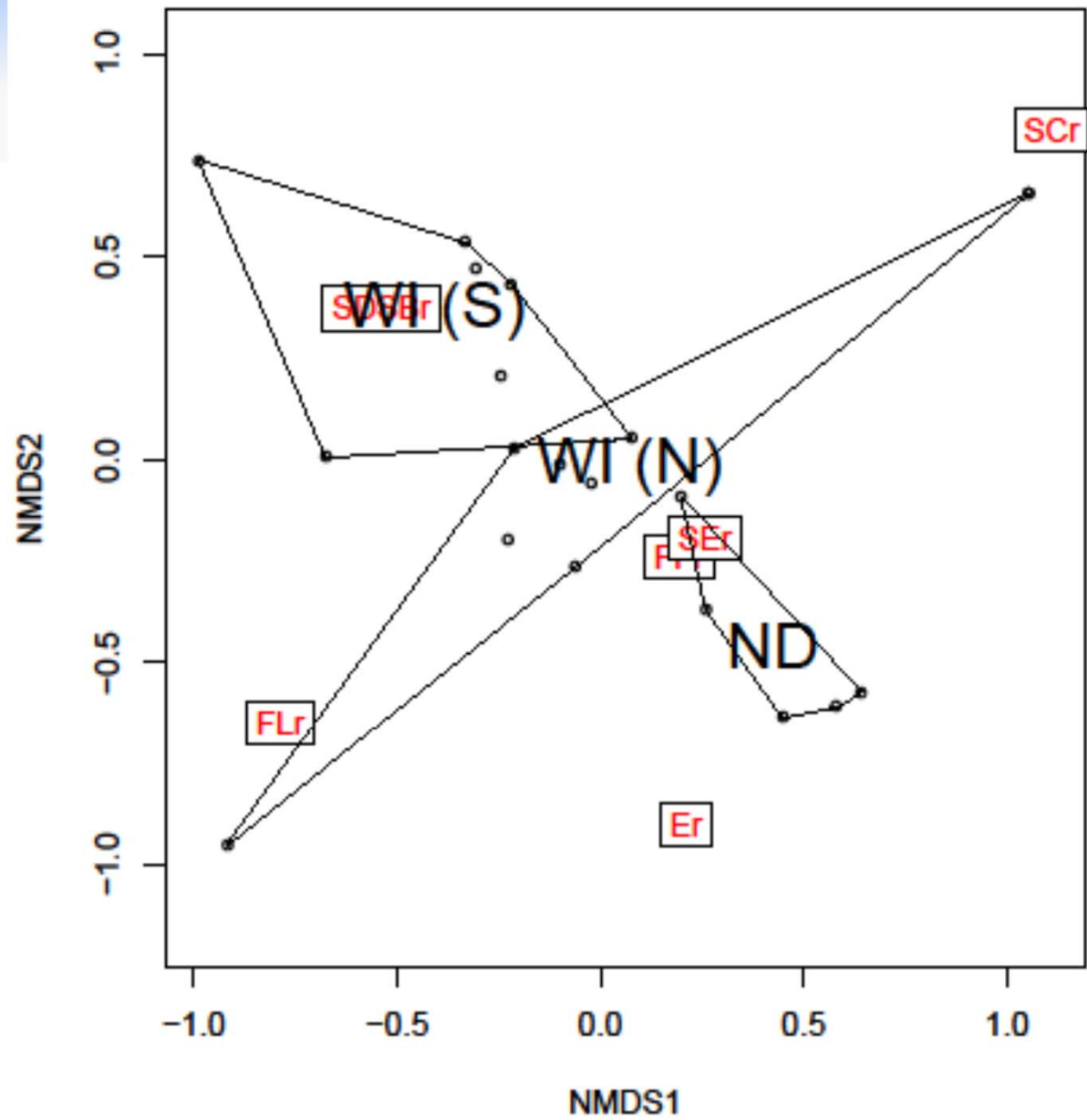


Species composition

10 Transects



5 Transects



Conclusion

- Index of Biotic Integrity
 - Multimetric and univariate
- Stressors
- Invasive extent and impact
- Habitat structural integrity
- Extensification in Wisconsin (10 v 5)
 - With full PI comparisons to evaluate data quality

Acknowledgements

- WDNR
- EPA and GLEC
- Erin Ridley
- UW-Madison – Susan Knight
- Michelle Nault
- Martha Barton