

PhragNet: CROWDSOURCING PHRAGMITES MANAGEMENT DATA

Vicky Hunt

E. Lonsdorf, J. Fant, S.
Jacobi, P. Hartzog, D. Larkin



CHICAGO BOTANIC GARDEN

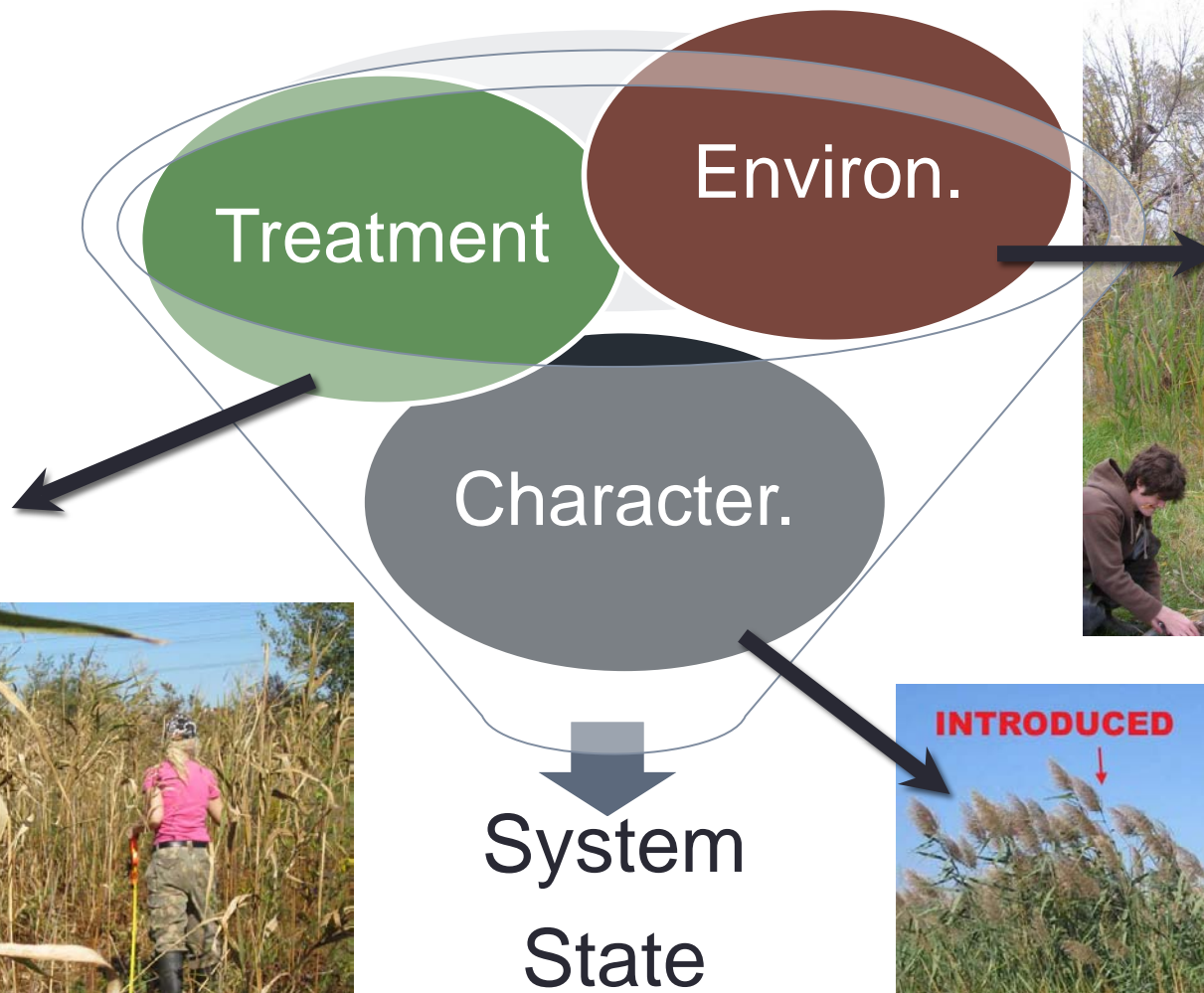


Background

- What is PhragNet?
 - Collaborative effort to improve *Phrag* management
 - Reduce uncertainties

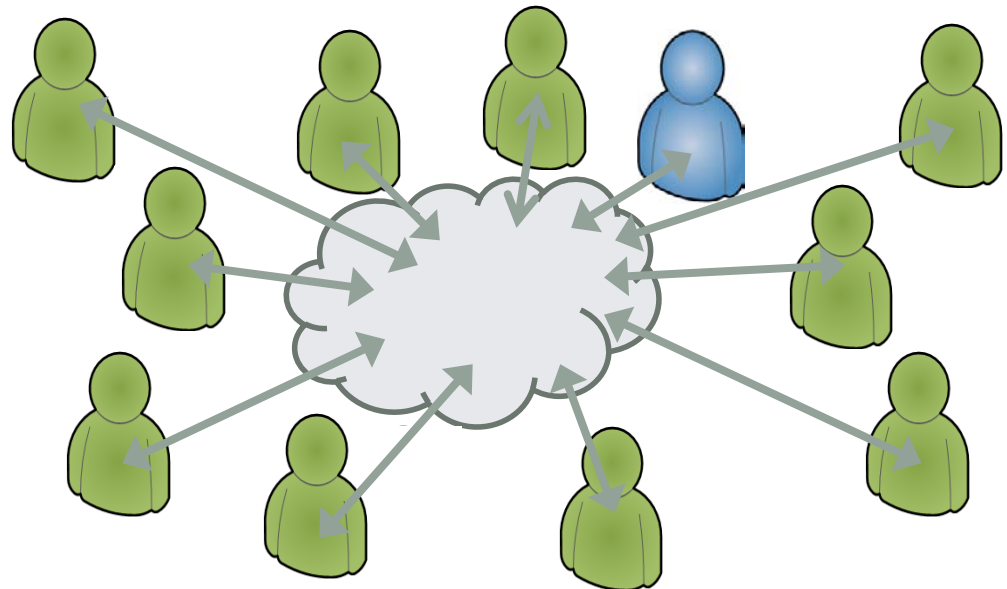
Price et al., Ecology of native vs. exotic *Phragmites australis* (common reed) in Chicago-area wetlands. Biological Invasions.



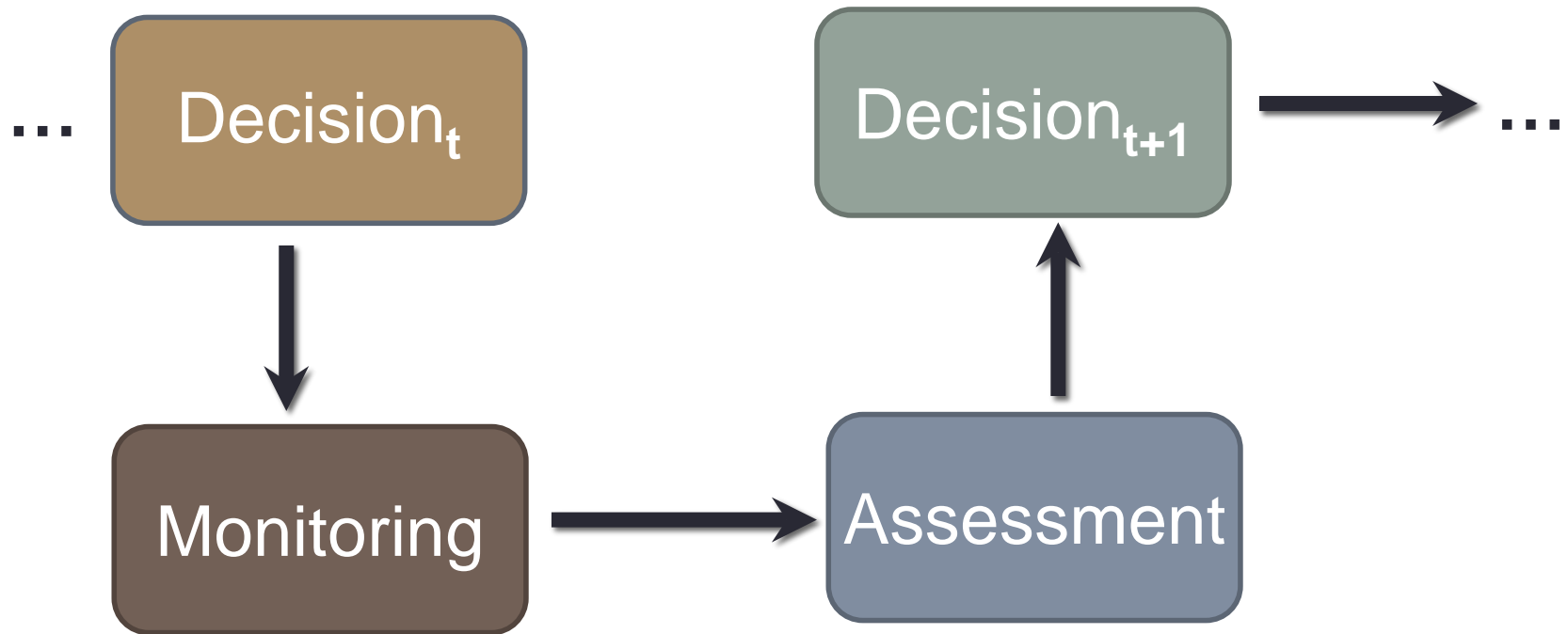


Objectives

- Use Adaptive Management (AM) to ID effective treatment(s)
- Develop learning **network**
 - Professionally-diverse
 - Great Lakes focus
 - Repetition



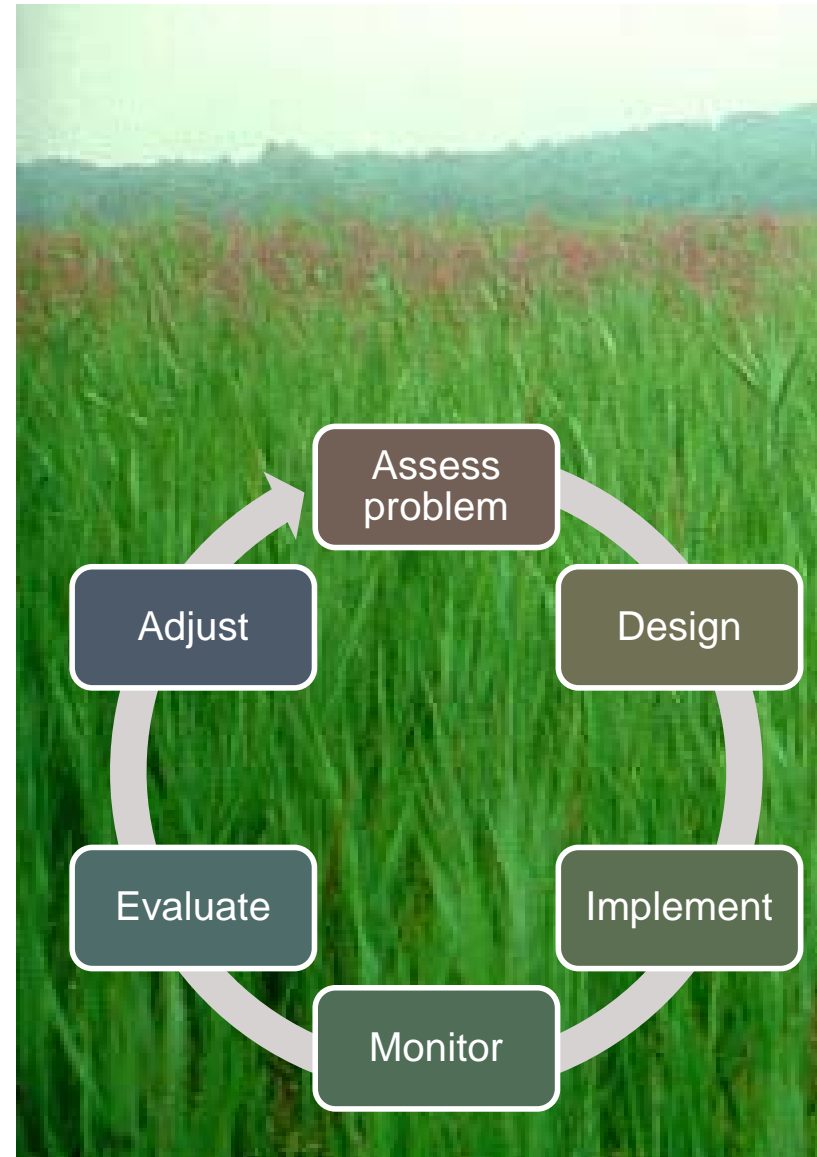
AM Sequence



- Objectives guide decisions at each time (t)
- Monitoring tracks system responses
- Combine new info with previously collected info → model
- Adjust decisions based on that improved understanding

AM Criteria

- Critical uncertainty
 - If I knew the true state, would it affect my actions?
- A way to predict outcomes for different actions
 - Models represent hypotheses
- A way to test those predictions
 - Focused monitoring



Communication - Crowdsourcing

Cons

Pros

Low
commitment

Lacks
repeatability

Management
ongoing

Novel
opportunity

Professionally
diverse



Communication Hub

<https://sites.google.com/site/phragmitesnet/>

PhragNet

Search this site

Home

Announcements

FAQ

Monitoring Forms

▼ Protocol

Info for Canadian
Participants

Sitemap

Home

We are seeking participants in a collaborative effort to improve management of wetlands invaded by *Phragmites*. Our goal is to harness the collective, already on-going efforts of managers to accelerate learning about how to most effectively control *Phragmites* and restore impacted habitats.

What would this entail? If you have areas with *Phragmites* where you plan to, or someday hope to, implement control practices (or that you are simply keeping your eyes on)... we would love some basic information about these areas, your management actions, and samples of leaf tissue for genetic analyses and soil for nutrient analyses.

What would you get out of it? For your site(s), genetic identification of whether you have the native or exotic subspecies and information about how soil conditions might be influencing *Phragmites* abundance. Collectively and over the longer term, we will use the tools of adaptive management to identify which actions are most effective for controlling *Phragmites* and reestablishing desired plant communities.

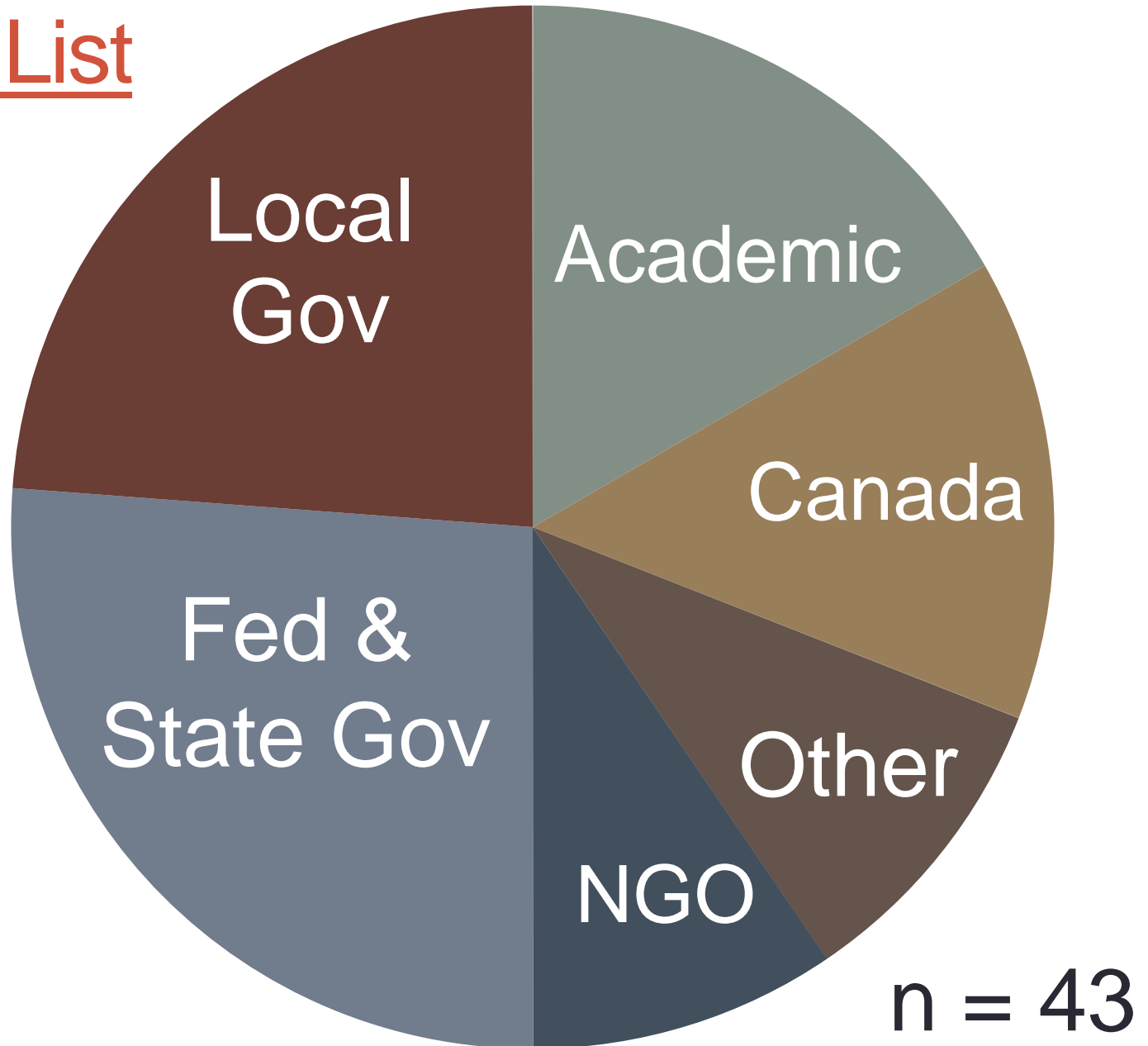
Potentially interested in getting involved? If so, please contact us at Phragnet@gmail.com for more information.

Best regards,
Dan Larkin, Jeremie Fant, Vicky Hunt, Sarah Jacobi, Eric Lonsdorf, and Clement Kouyoumdjian

Chicago Botanic Garden
Glencoe, IL

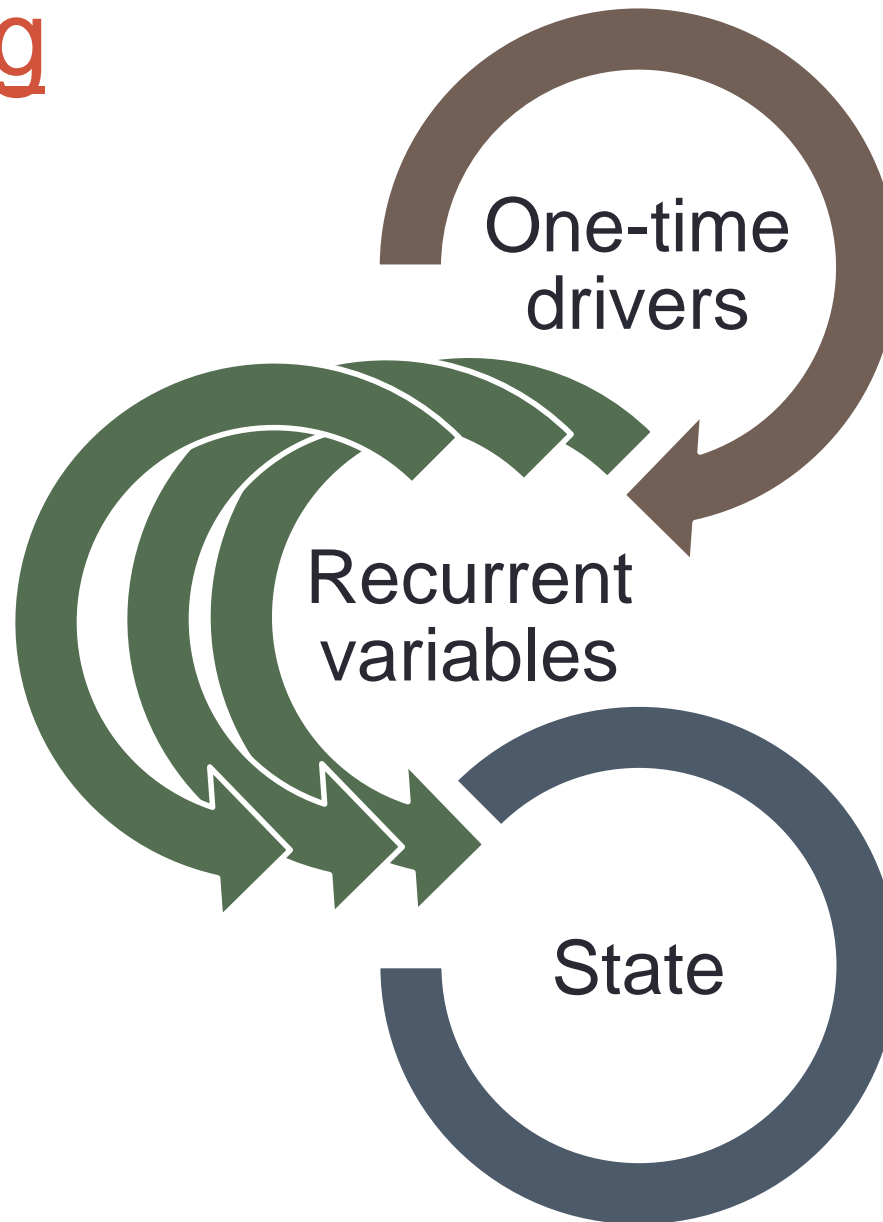
Powered by [Google Sites](#)

Mailing List



Monitoring

- Patch size
- Cover
- Native sp.
- Invasive sp.



- Location
- Hydrology
- Soil
- Genetics

Monitoring Protocol

Importance

- Participation
- Momentum
- System state

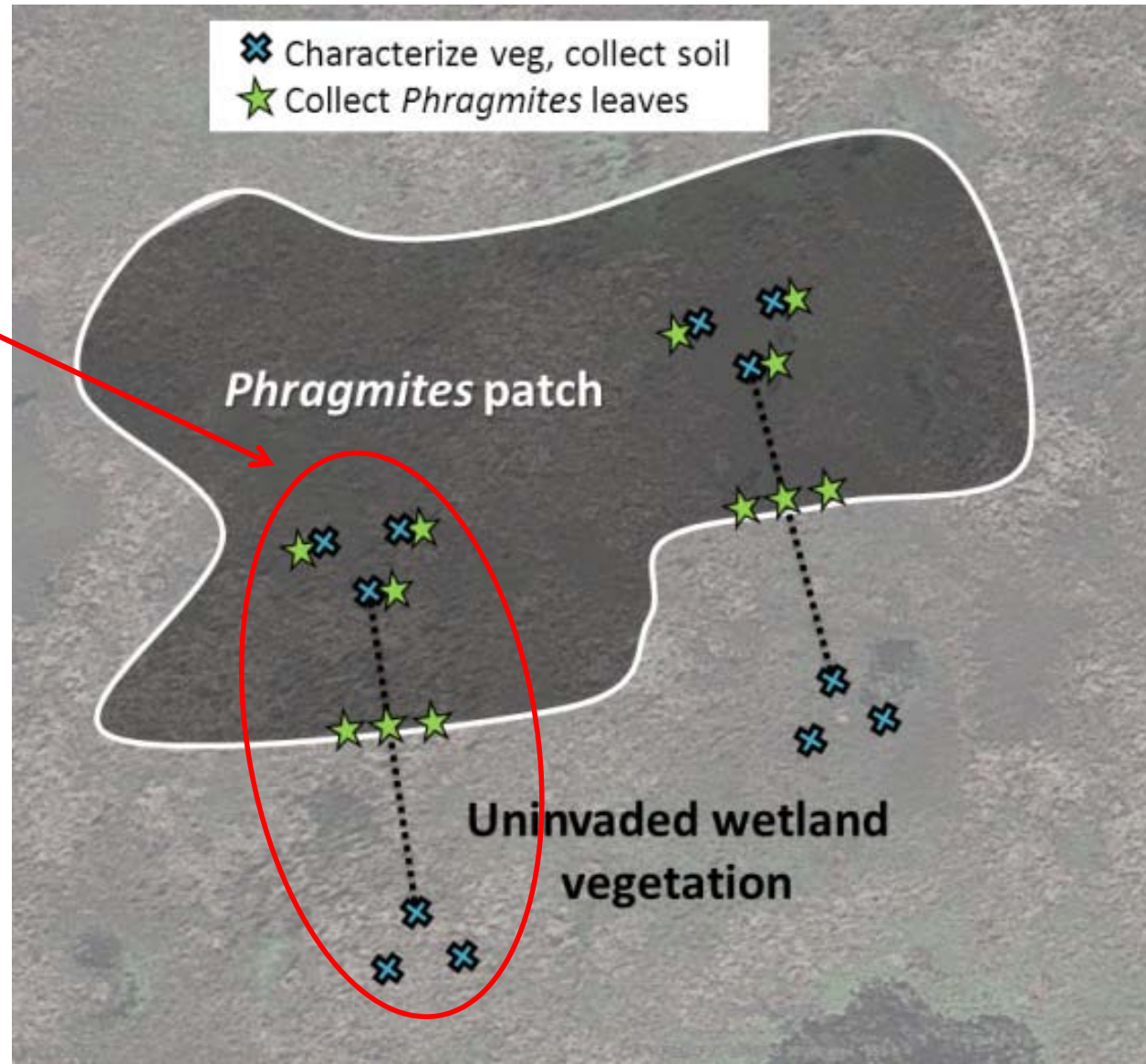
Characteristics

- Accessible
- Rapid
- User-friendly
- Scalable
- Flexible

One time Drivers

Soil

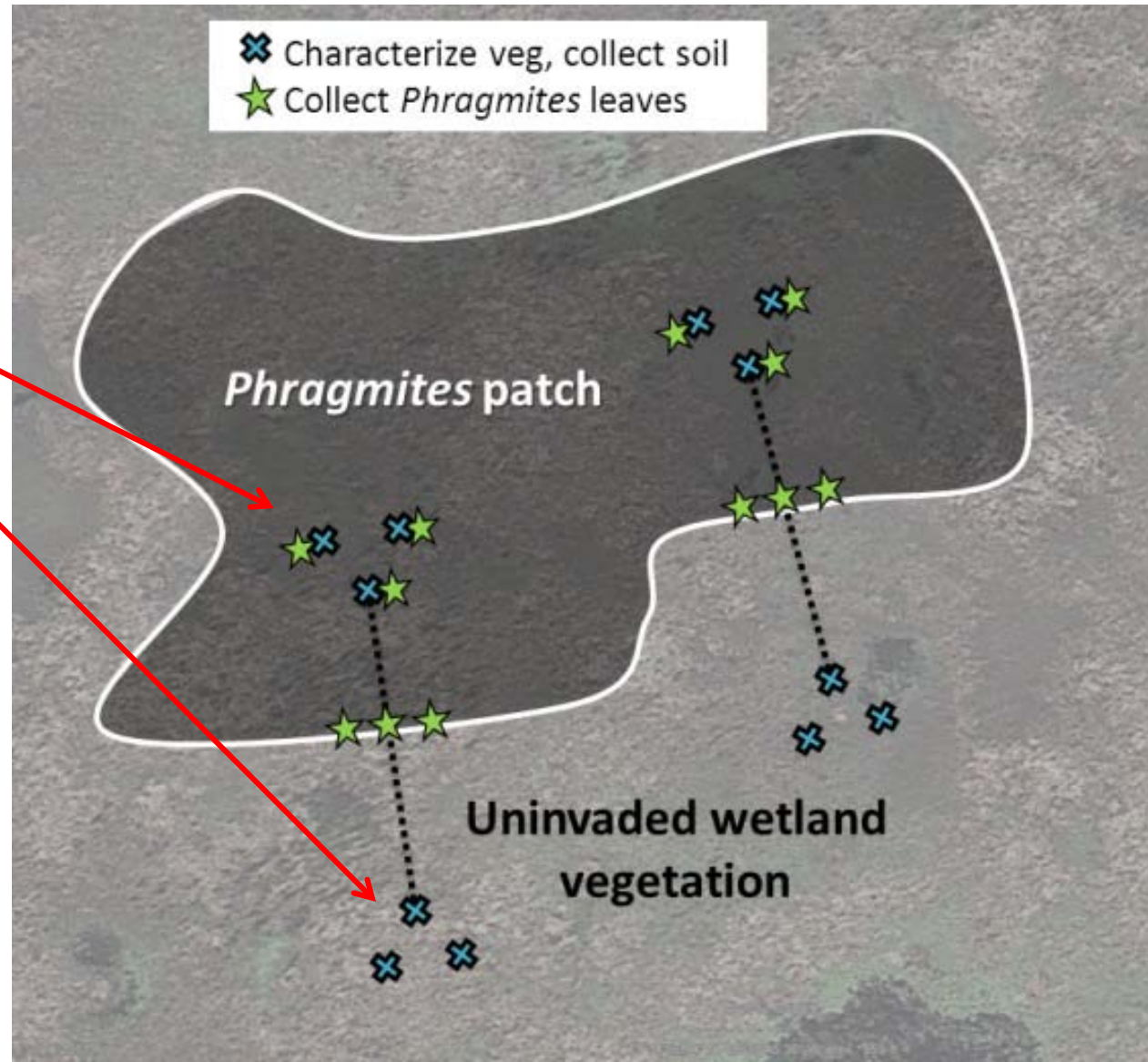
- Transect



One time Drivers

Soil

- Samples



One time Drivers

Soil

Sample

- 3 tbs soil from 10 cm depth
- Ziplock bag
- Mail to CBG lab

Nutrients

- Ammonium
- Nitrate
- Phosphorous

Physical characteristics

- % moisture
- Electrical conductivity

One time Drivers

Soil: Preliminary results

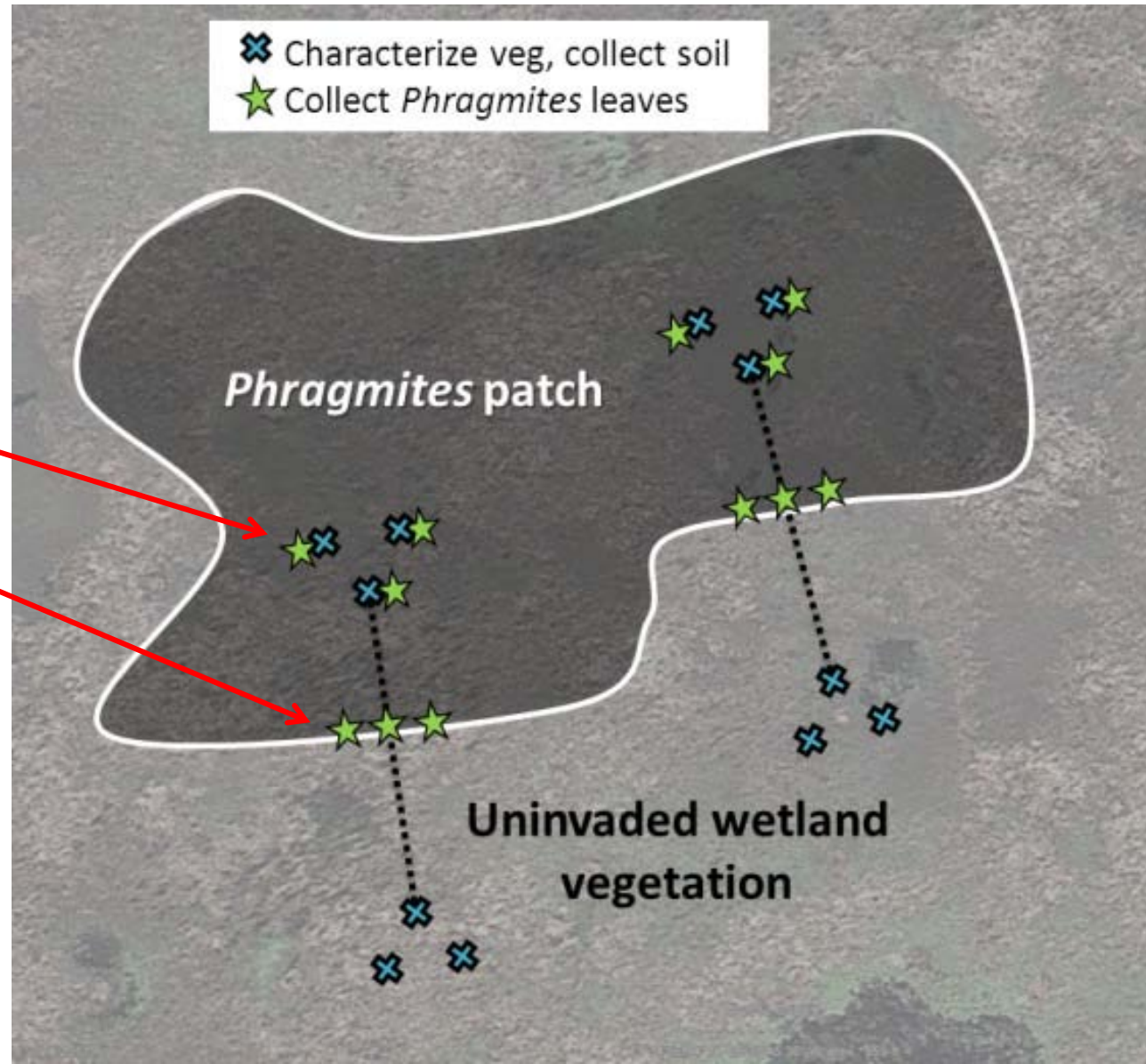
- Paired t-test: no significant differences
- Variation, outliers
- Labeling...



One time Drivers

Genetics

- Samples
 - Interior
 - Edge



One time Drivers

Genetics

Sample

- Leaves from 3 *phrag* stems
- Ziplock bag
- Mail



Genotype

- CBG lab
- 10 microsat.
- Saltonstall (2002, 2003)



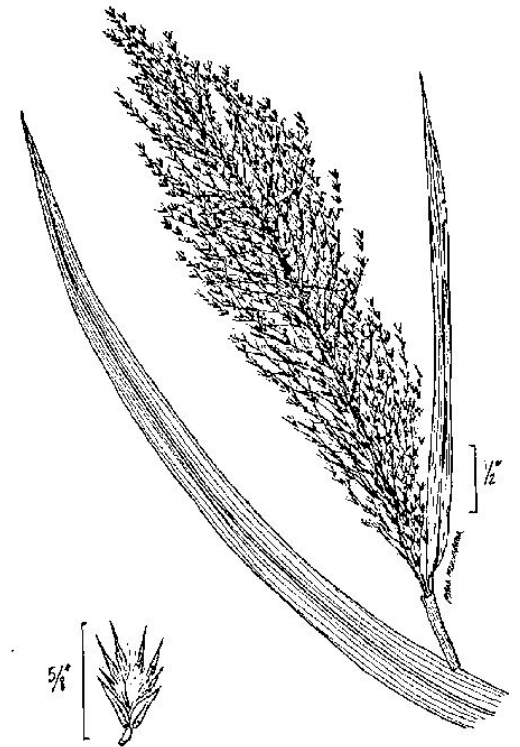
Analyze

- Subsp. ID
- Native or exotic
- Variation

One time Drivers

Genetics – Preliminary Results

- Perk of participation
- 100% genotyped samples identified as exotic subsp.
- Invasive is “bad apple”



One time Drivers

Hydrology

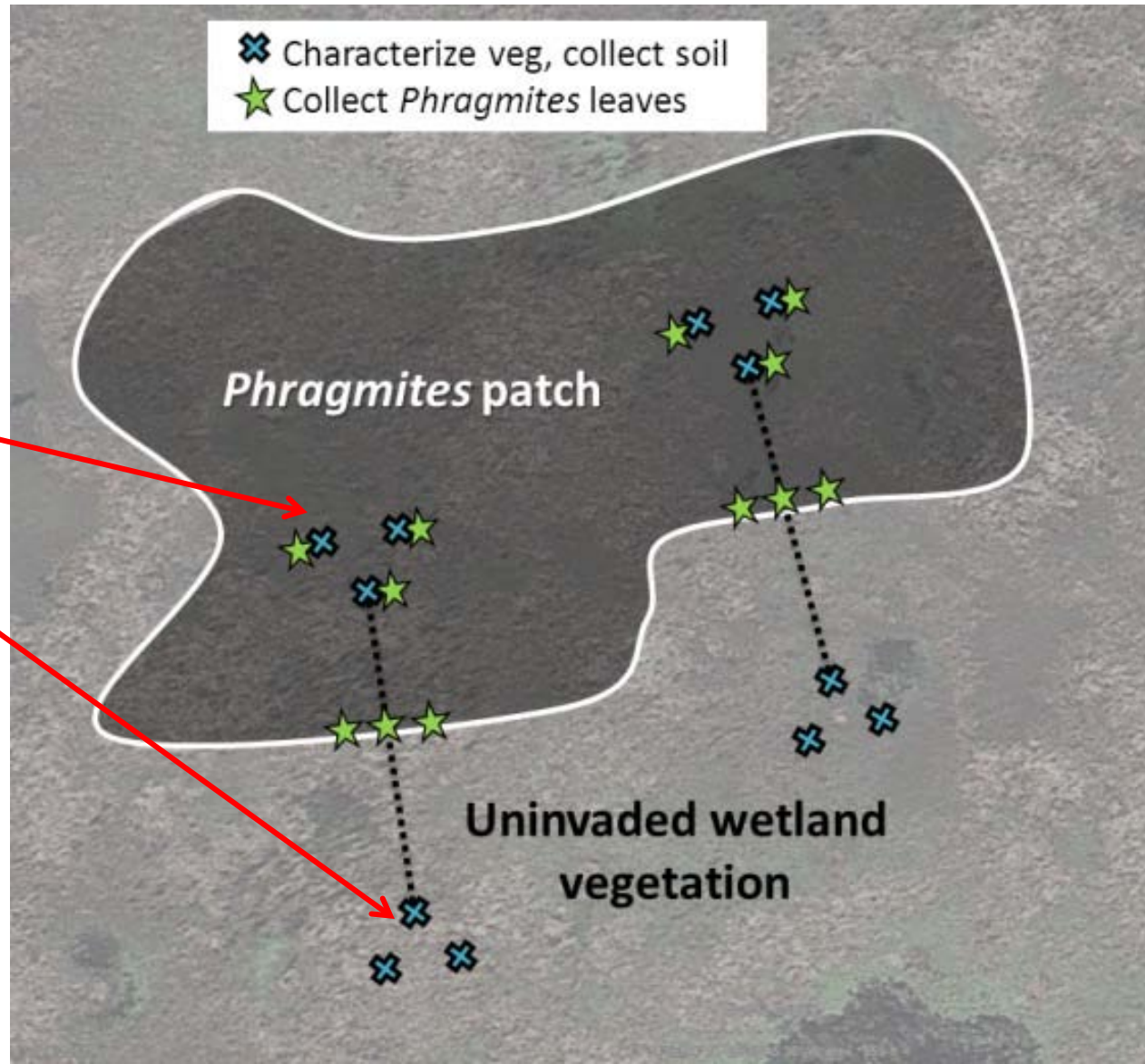
- Assess
 - Interior
 - Paired

Levels

Water

Muddy

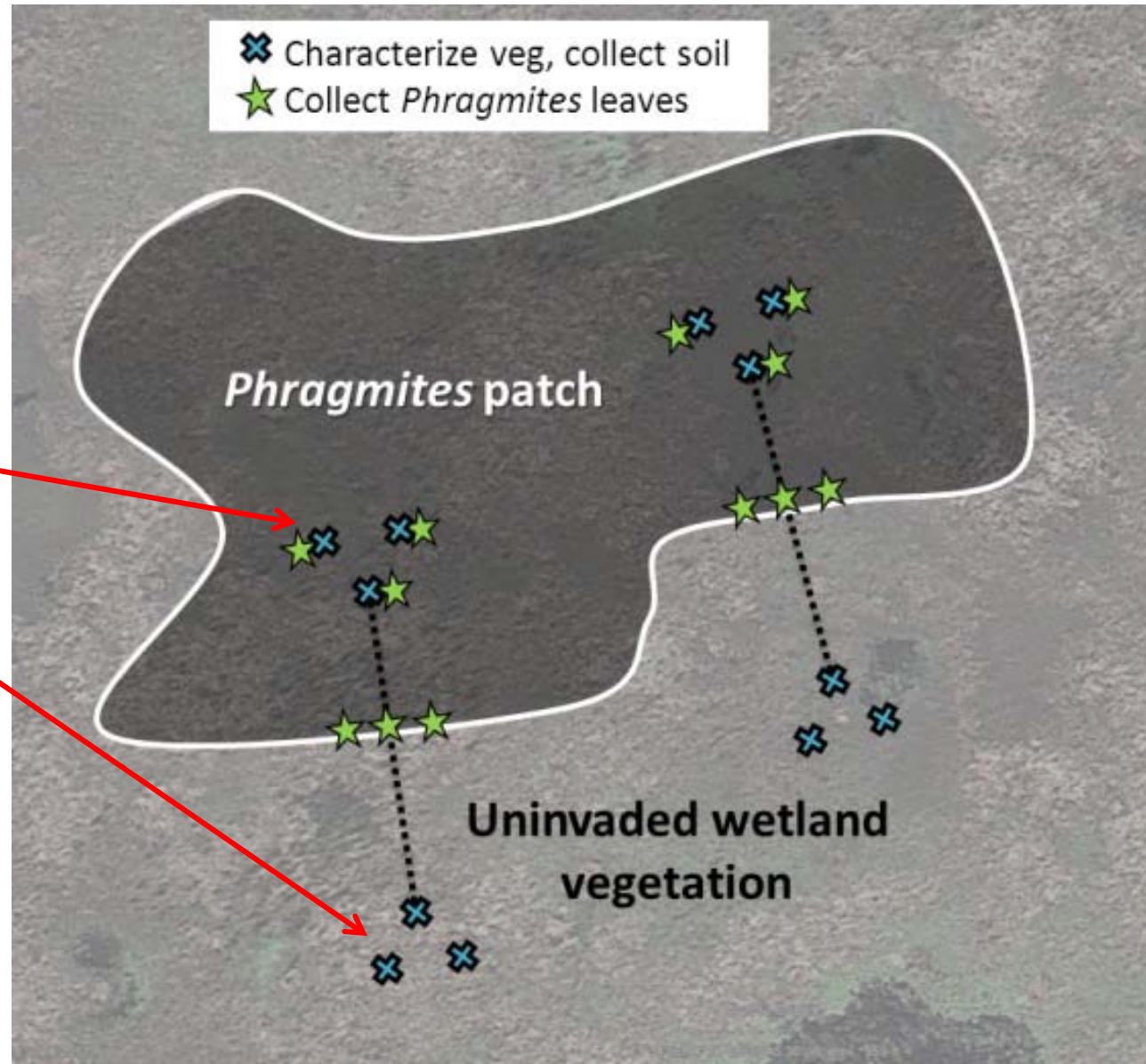
Dry



Recurrent Variable

Vegetation Abundance

- Assess
 - Interior
 - Paired



Recurrent Variables

Vegetation abundance

Phrag patch

Phrag

Other invasives

Native plants

Paired

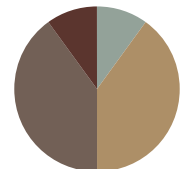
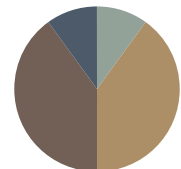
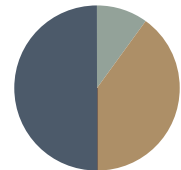
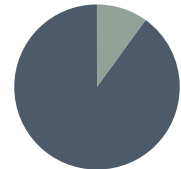
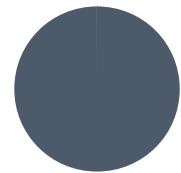
Dominant sp.

Species 2

Species 3

Vegetation abundance

Abundance Class	Percent Cover
None	0%
Low	0-10%
Med-Low	11-50%
Med-High	51-90%
High	91-100%

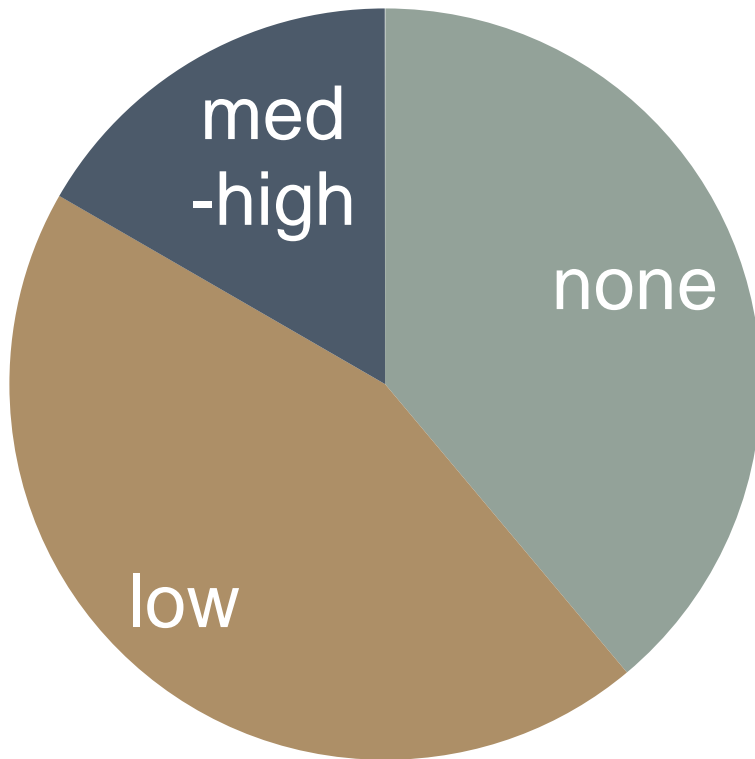


Prelim. results - Veg in paired plots

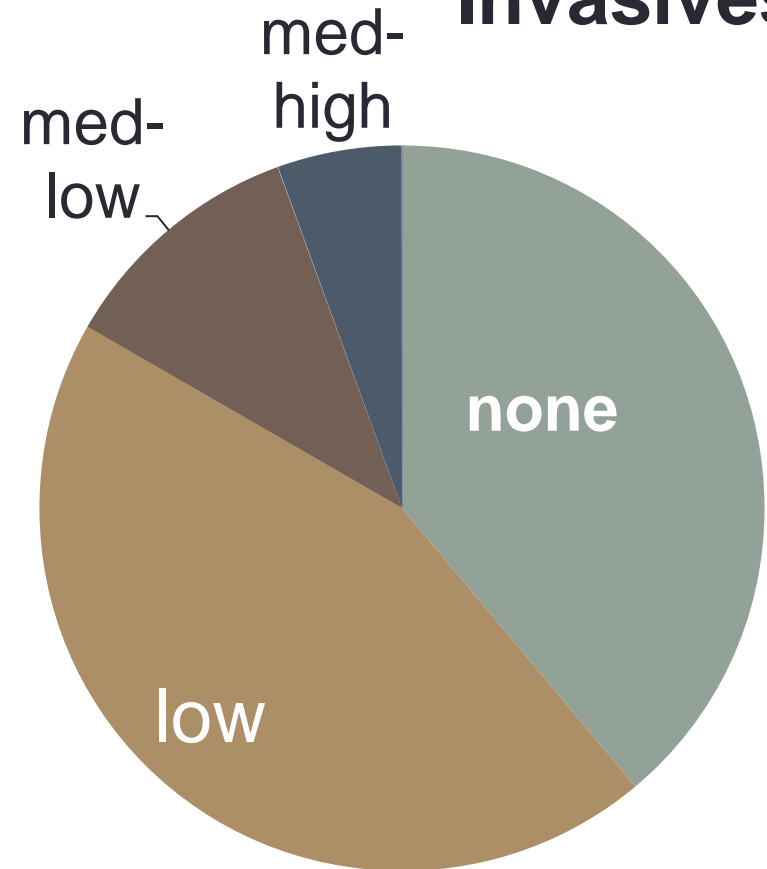
- Big Bluestem
- Boneset
- Bulrush
- Cattail
- *Cirsium arvense*
- Cottonwood
- Eastern red cedar
- *Eupatorium maculatum*
- Fine Grasses
- Goldenrod
- Grasses
- Indian Grass
- Mares tail
- Marram Grass
- Marsh elder
- Milkweed
- Native grass
- Poplar
- Prairie Cordgrass
- Red Osier Dogwood
- Reed Canary Grass
- Russian Olive
- Sedges
- Shrub Willow
- Smooth brome grass
- Soft rush
- Switch Grass
- Vetch

Prelim. results - Veg in *Phrag.* plots

Natives

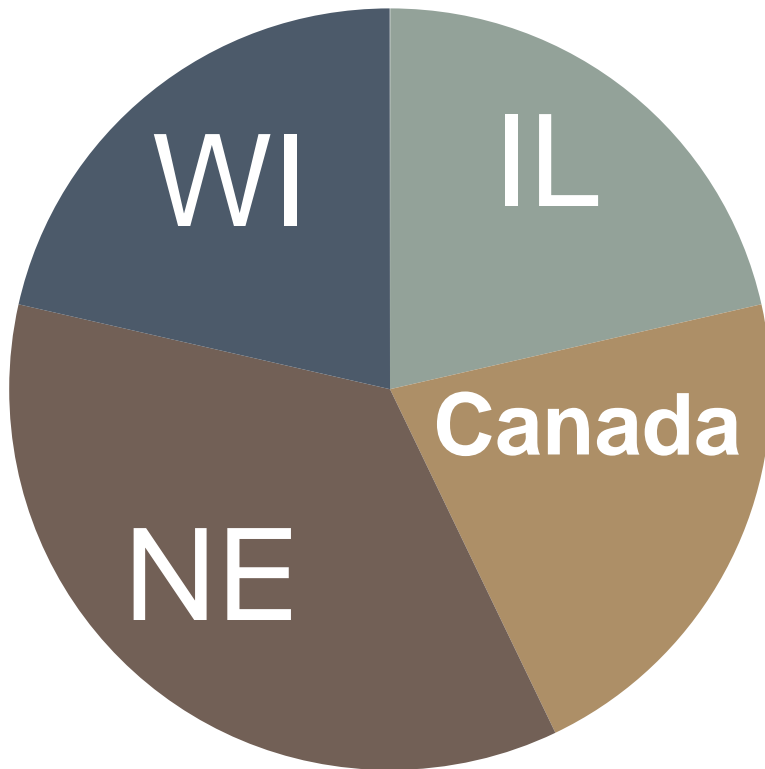


Invasives

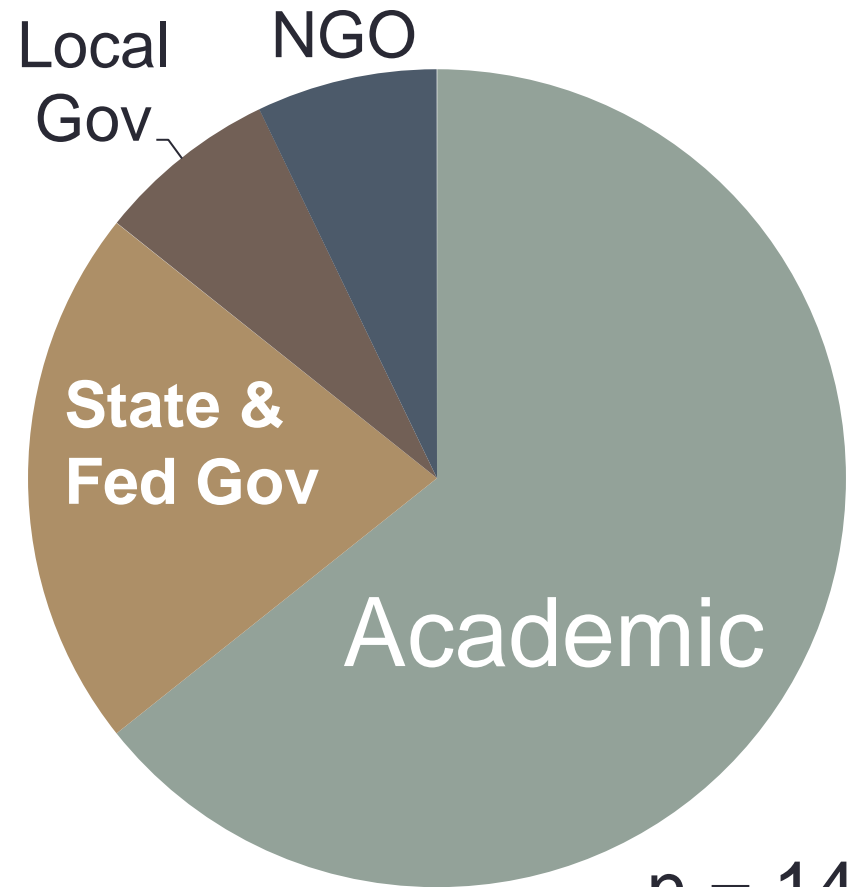


Management Units

Locations



Affiliations

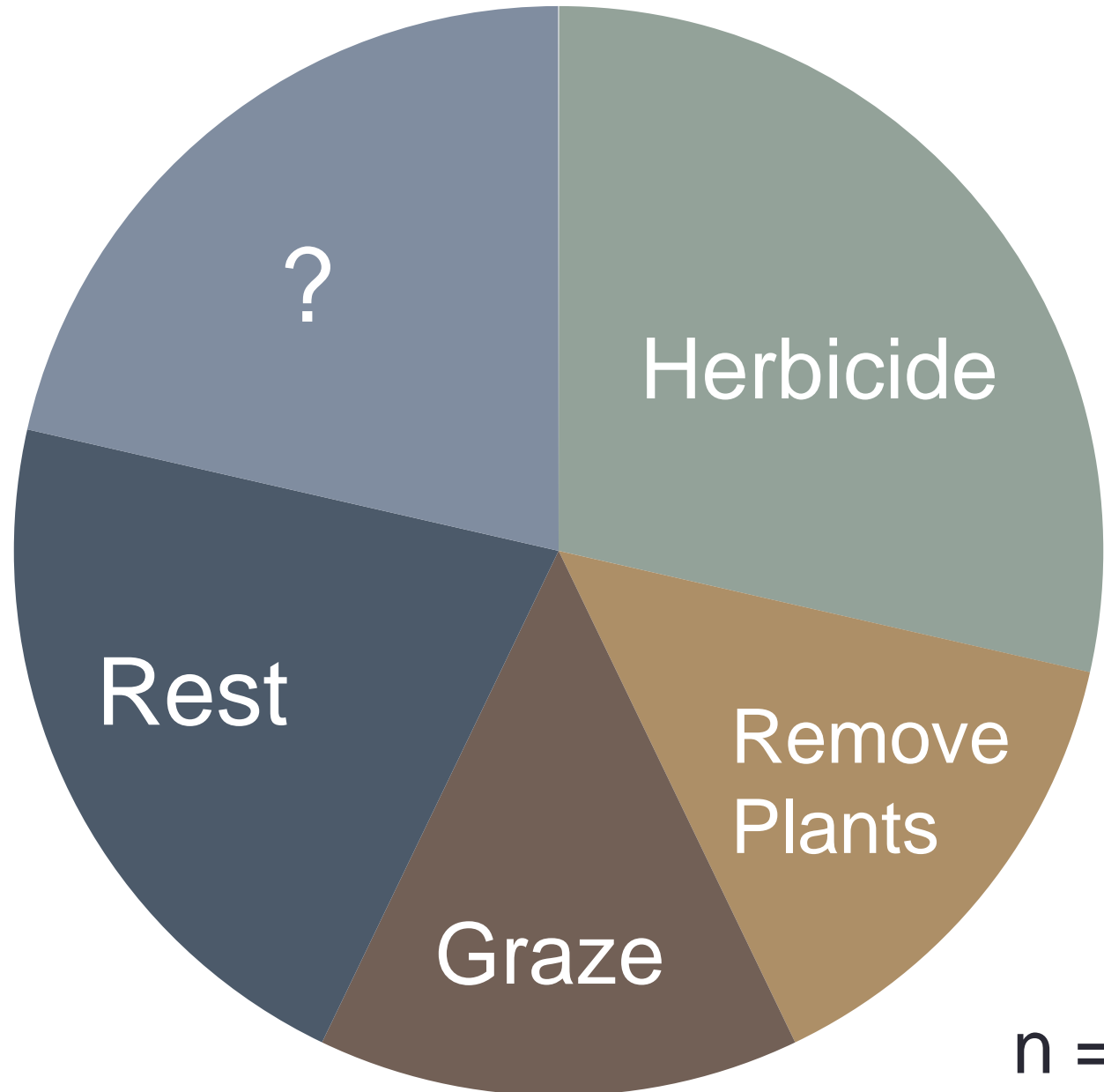


n = 14

Management Units



Actions



Collaborations

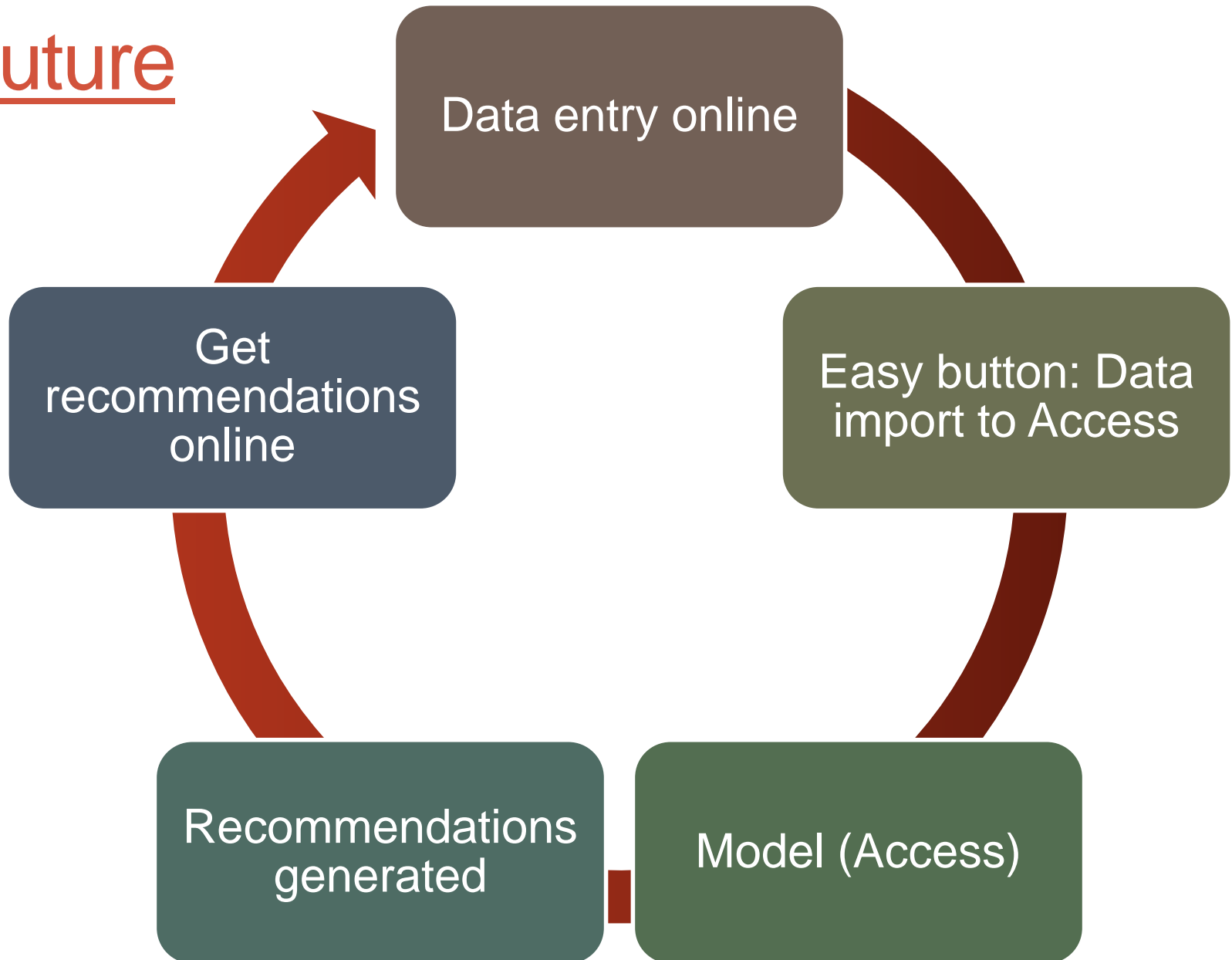
- USF&WS in Northeast and Midwest (Regions 5, 3)
- Spatial prioritization
- Decision support tools



Lessons learned

- Academics
 - Small % of respondents
 - Contributed majority of data
- Variety of management techniques
 - Potential to explore novel methods
 - Experimental alternatives
- Limits on recommendations

Future



Coauthors

- E. Lonsdorf, J. Fant, S. Jacobi, P. Hartzog, D. Larkin

Funding





Thank you. Questions?

Take Home Messages

- Managers targeting invasive haplotype
- “Crowdsourcing”
 - Clarity of protocol – Quality control
 - Pro: Get diversity of scenarios and management techniques
 - Con: Low repeatability
- Adaptive management used when there is
 - 1. (Critical) uncertainty
 - 2. Repeated decisions
 - 3. Decisions affect system state
- Potential for looking at experimental treatments