Ecological Monitoring and Adaptive Management on Southeast Minnesota Bluff Prairie Restorations

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The Nature Conservancy



Southeast MN Protection and Restoration Program

- Partnership between TNC, MLT, TPL
- Long-running program, currently on Phase 15 of funding
    - **12,178 acres restored or enhanced**
    - **11,201 acres protected**



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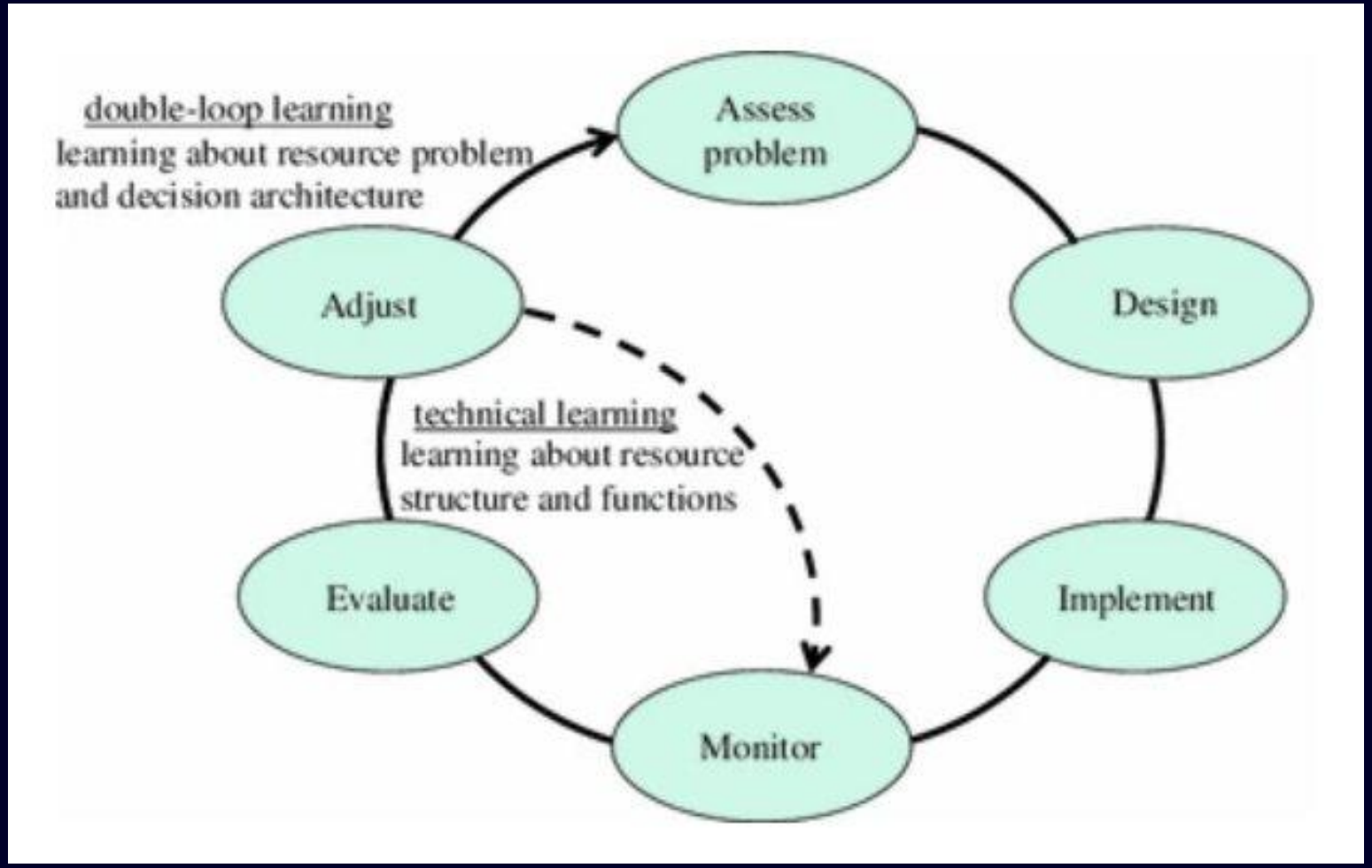
- **How has that work benefitted wildlife?**

- **What has the impact been on SGCN species?**



Adaptive Management

- Cycle of action, assessment, and improvement



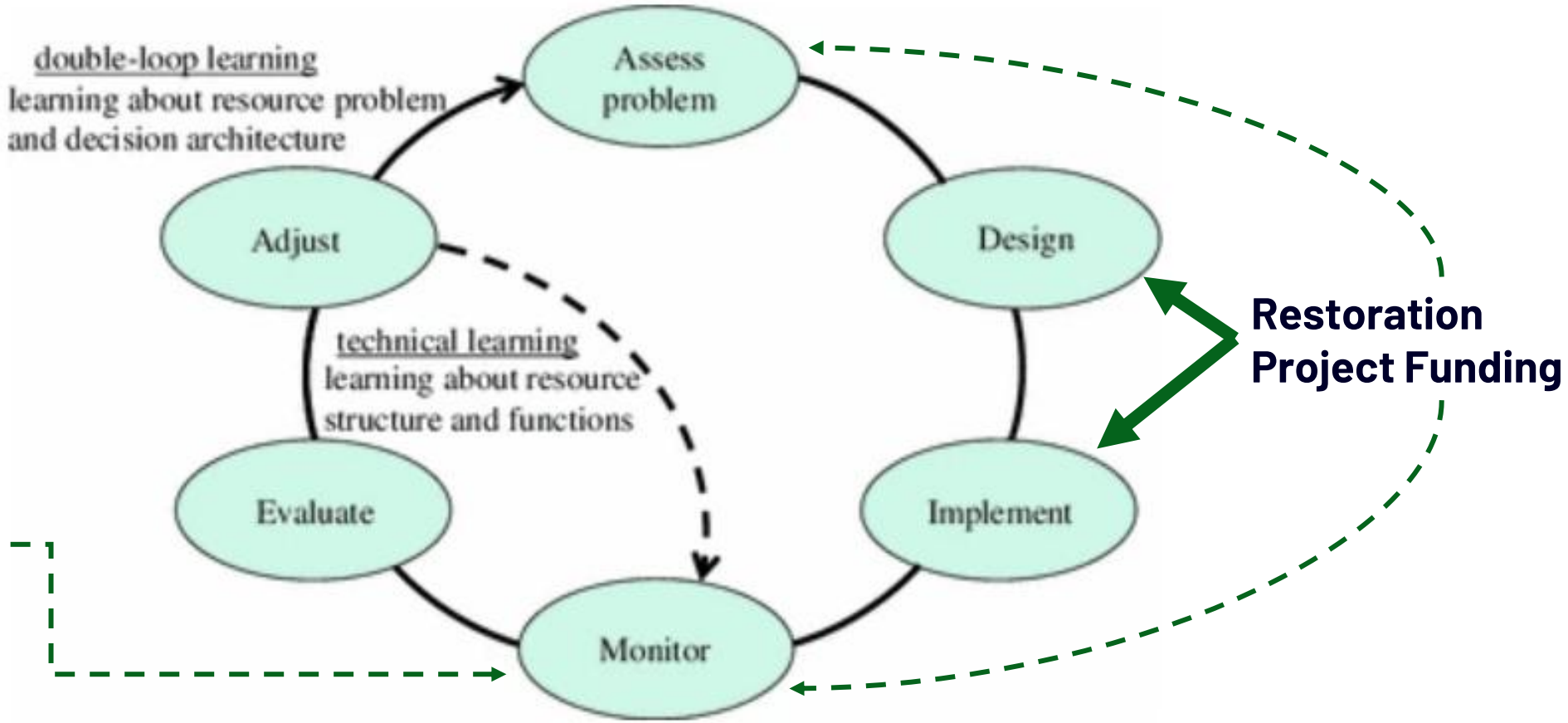
Williams and Brown 2014, Minnesota Wildlife Action Plan 2015-2025

Current Monitoring

Restoration Work	"Dollars in the Ground"
	Pre-and post-assessment
Ecological Research	Hypothesis-based
	Study design prioritizes testing over restoration
Long-term Monitoring	Disconnected from management
	Often single-species focus

Adaptive Management

Ecological Research



Restoration Project Funding

Long-term Monitoring

Community Response Monitoring for Adaptive Management in Southeast Minnesota

M.L. 2023, Chp. 60, Art. 2, Sec. 2, Subd. 03r

"$483,000 the first year … to assess community-level plant and animal responses to past restoration efforts in select southeast Minnesota conservation focus areas to determine if management outcomes are being achieved."

- Direct connection to management
- Community-level focus

- What impact has our restoration work achieved?
- How can we improve our work?

ENVIRONMENT AND NATURAL RESOURCES TRUST FUND



The Nature Conservancy

Driftless Bluff Prairies

- DNR Native Plant community UPs13c Dry Bedrock (Southern) Bluff Prairie
- Bluff prairies have history of management, high biodiversity, and remnant areas
- Many Species of Greatest Conservation Need (SGCN) use these prairies



Management of Driftless Bluff Prairies

- Invasive woody encroachment is a major threat
- Eastern Red Cedar, Buckthorn, and honeysuckle
- The goal is to get these bluffs back to a state where they can be burned



Image Credit (Chainsaw Crew): Jaime Edwards

Community Response Monitoring for Adaptive Management



Plants



Reptiles



Insects

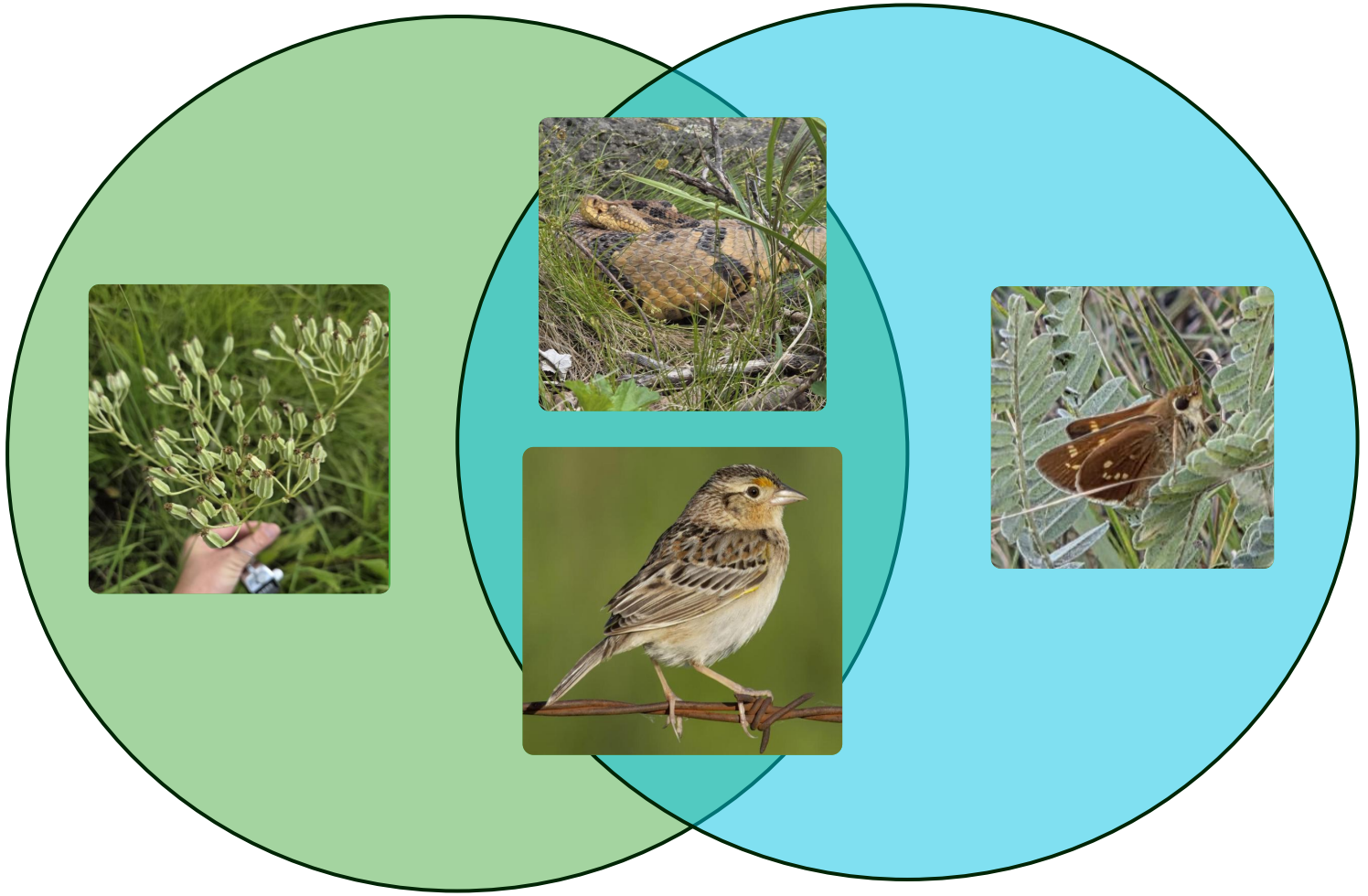


Birds

Image Credit (Grasshopper Sparrow) Marky Mutchler/ Macaulay Library

Choosing protocols set our " biological community"

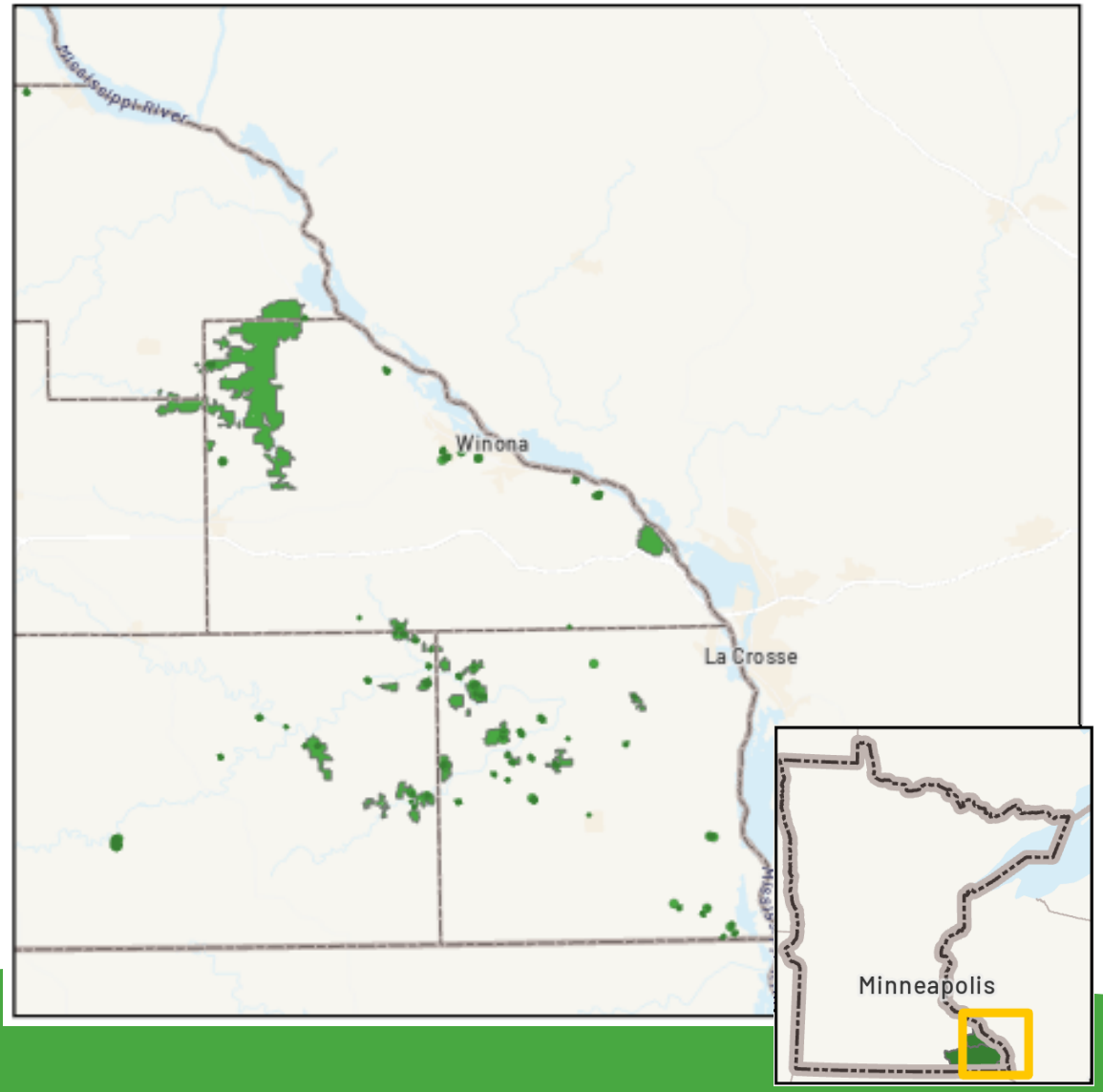
Community Sampling Protocols



Single Species Sampling Protocols

Image Credit (Grasshopper Sparrow) Marky Mutchler/ Macaulay Library

We surveyed across the Driftless for three summers

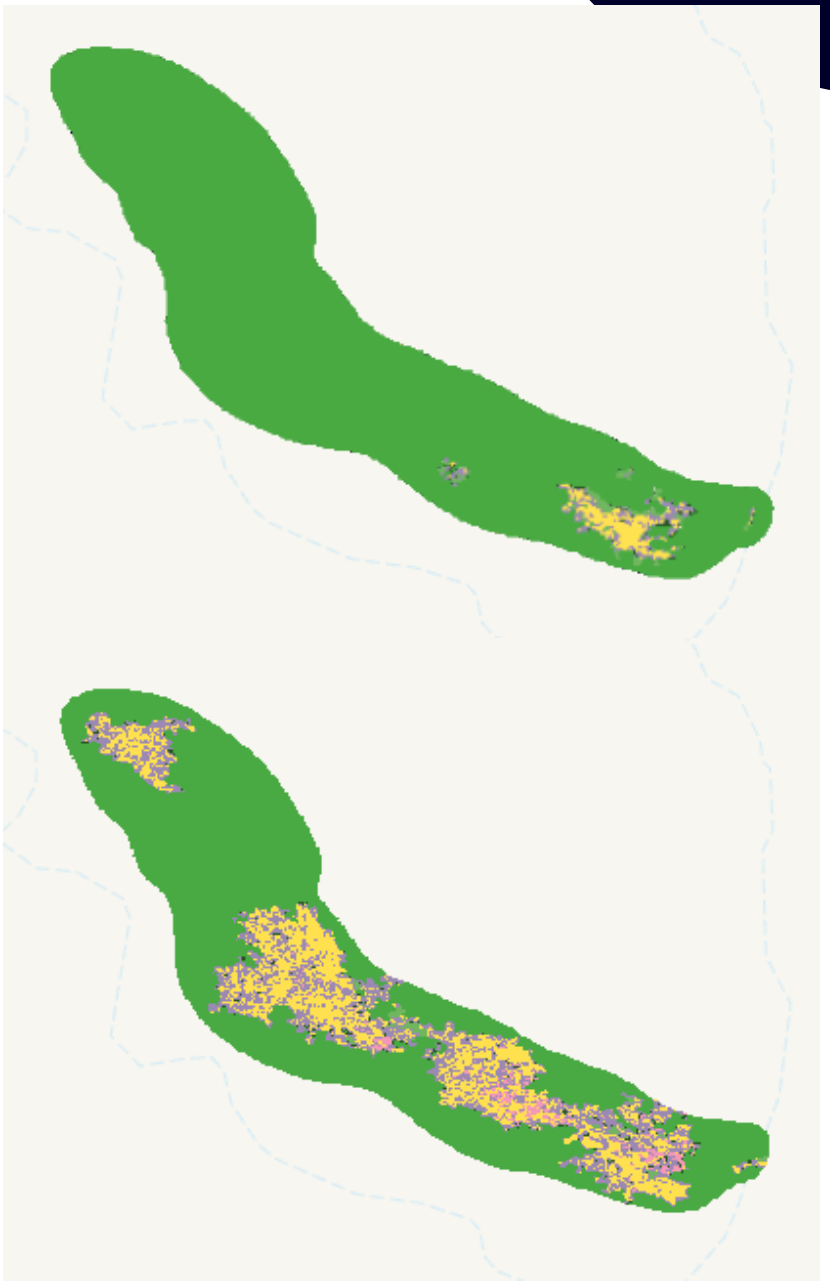


- Surveyed over 100 bluffs
- Worked closely with land managers to choose sites
- Management continuum from no management -> high management

One big question- did we create prairie?

Sometimes, yes!

	Prairie	Shrub	Forest
2013	2%	1%	97%
2025	14% ↑	17% ↑	67% ↓



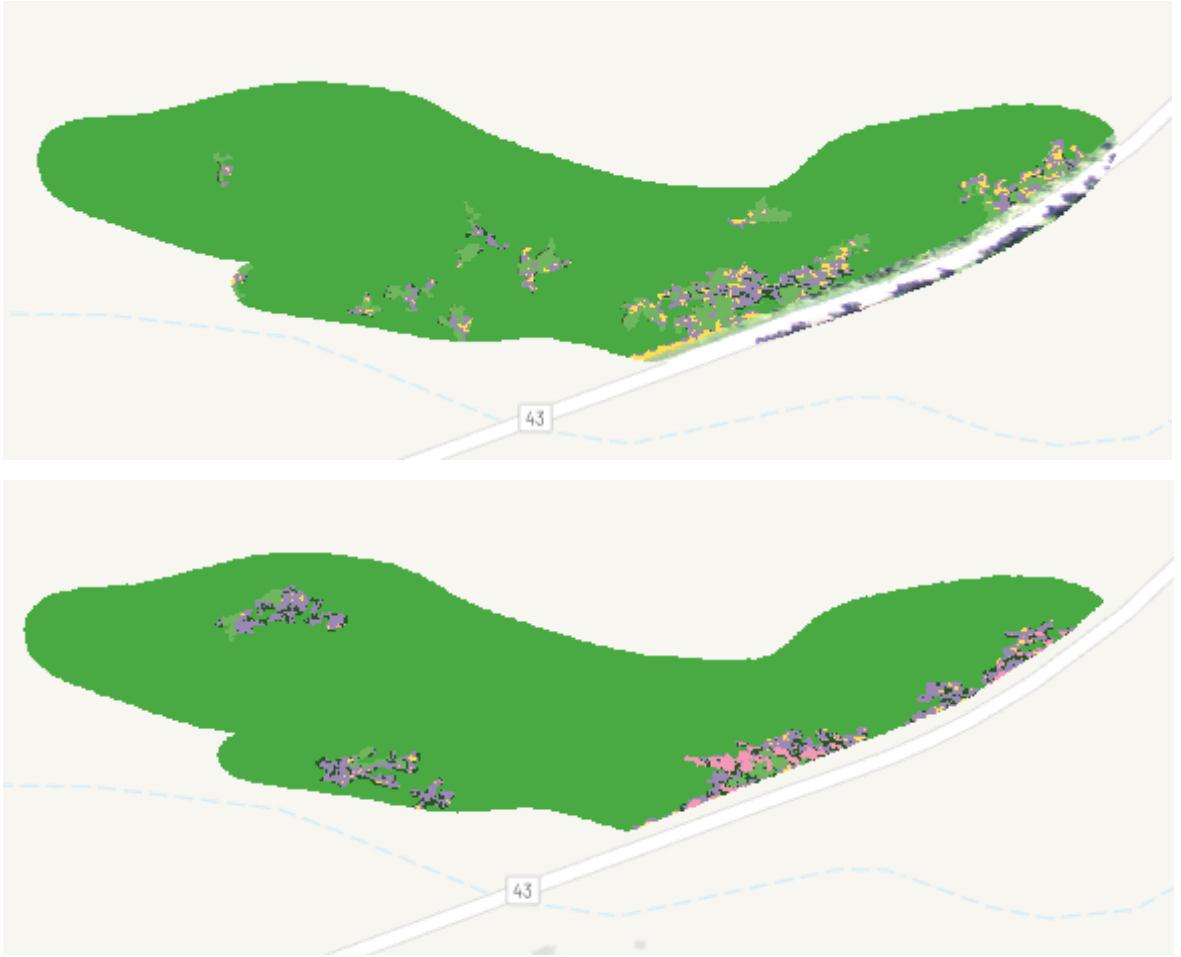
Yucatan Wildlife Management Area forest area decreased by 30% on three bluffs after clearing, fire, and goats

However, shrub area also increased

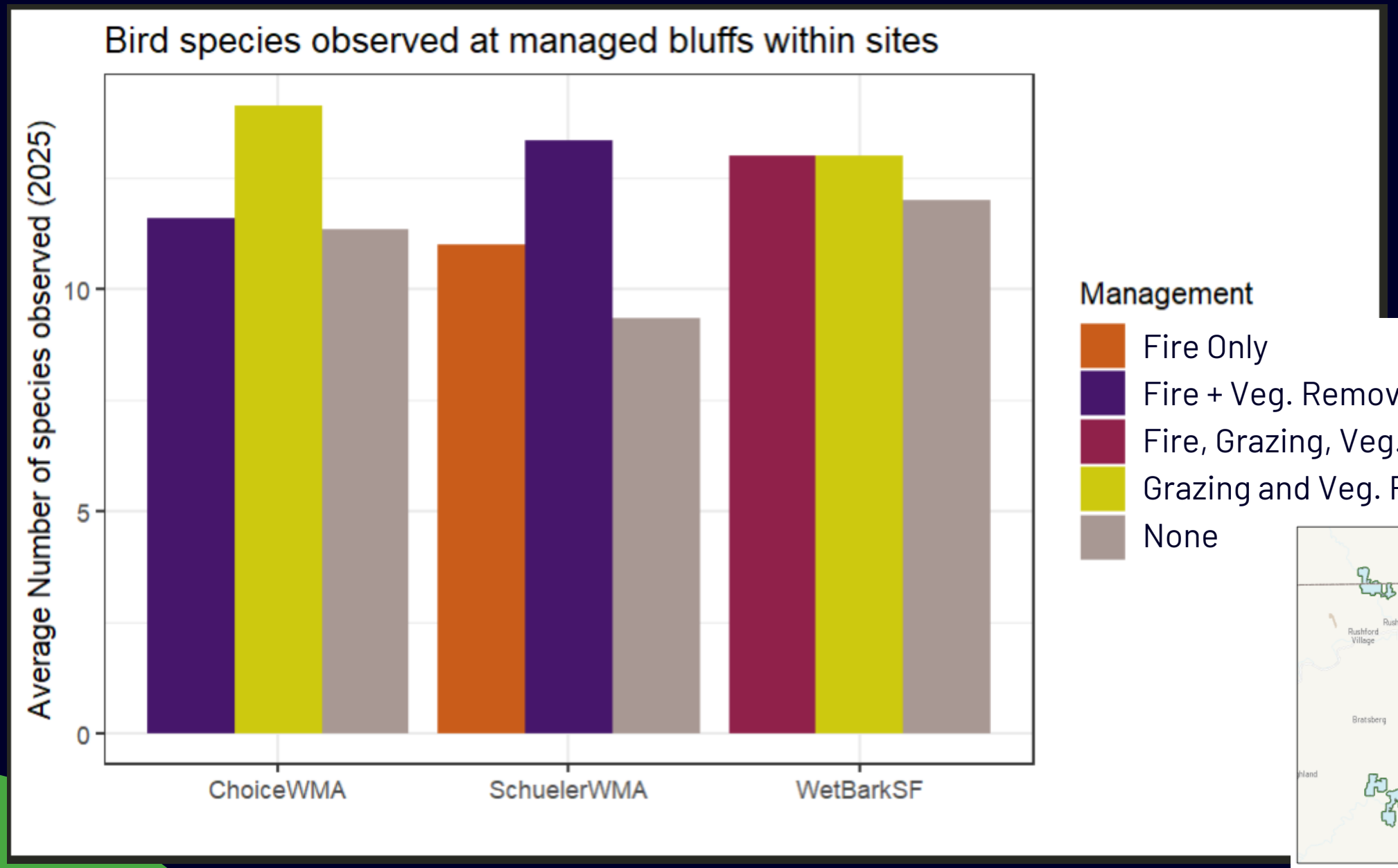
Prairie did not appear without management

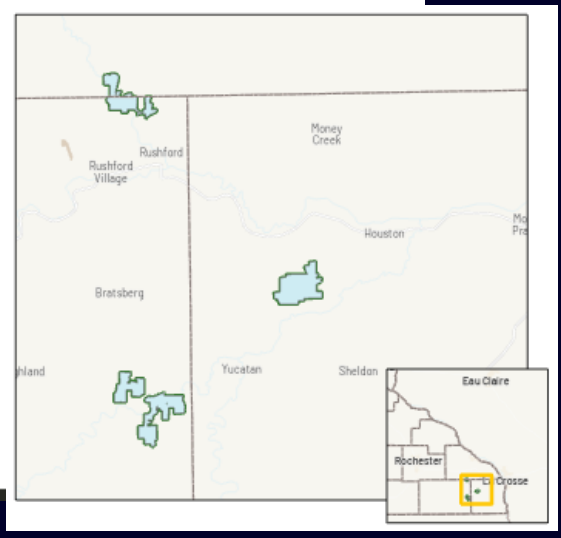
	Prairie	Shrub	Forest
2013	1%	4%	95%
2025	0%	4%	94%

Choice Wildlife Management Area Bluff 4 was unmanaged over the same time frame



*The remaining 2% unaccounted for in 2025 is “bare ground”


Bird species observed at managed bluffs within sites
Average Number of species observed (2025)
10
5
0
ChoiceWMA
SchuelerWMA
WetBarkSF
Management
Fire Only
Fire + Veg. Removal
Fire, Grazing, Veg. Removal
Grazing and Veg. Removal
None


Money Creek
Rushford
Rushford Village
Houston
Bratsberg
Yucatan
Sheldon
Eau Claire
Rochester
La Crosse

Two SGCN skippers use these prairies

- Few previous surveys on two species likely to strongly use bluff prairies
- Dusted and Leonard's Skippers were both found on about half the bluffs we surveyed in 2026 (16/31 and 12/23)
- Both species were found on intensively managed bluffs





Management Implications

1 **More recent restorations have responded differently than older restorations**

No longer safe to assume prairie communities will just "bounce back"

2 **Implementing follow-up work after initial brush clearing is critical**

Our invasive shrub problems are more entrenched- management timelines need to shift

3 **Having existing, diverse prairie cover on site makes success much more likely**

Finding thresholds for managers to use is a long-term goal to work towards



Image Credit: Matt Amberg

Big-picture take-aways

1 **Management is beneficial for overall communities**
More diverse prairie plant community benefits birds, insects, and reptiles

2 **Disturbance-sensitive species in disturbance-dependent habitats persist, even with management**
This was observed in all taxa

3 **Improved protocols for pre- and post-project assessment will inform future studies**
Better quantitative pre-project data will be especially useful

4 **Monitoring is critical for adaptive management**
Funding for that monitoring is a known gap for many projects and programs



Questions?

