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Vegetation Community Composition within Bison Wallows in a Lowland Tallgrass Prairie



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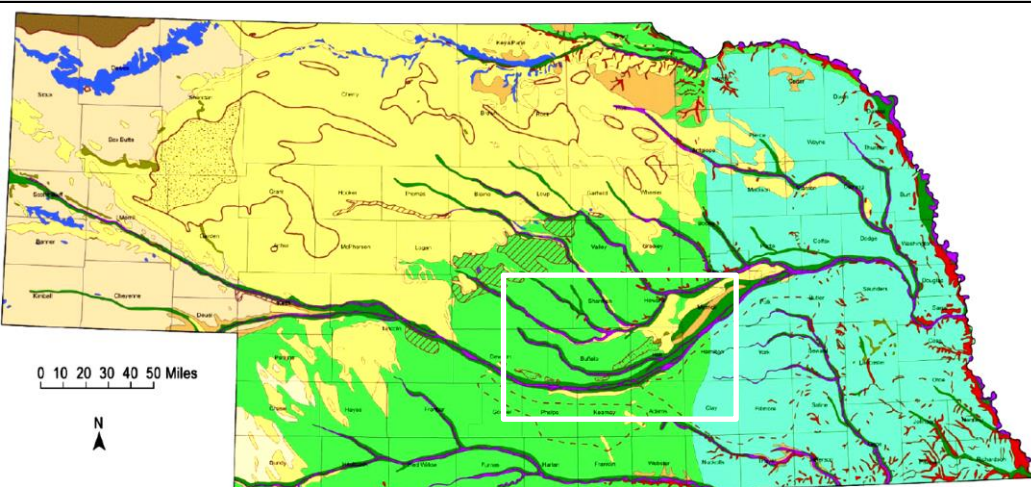
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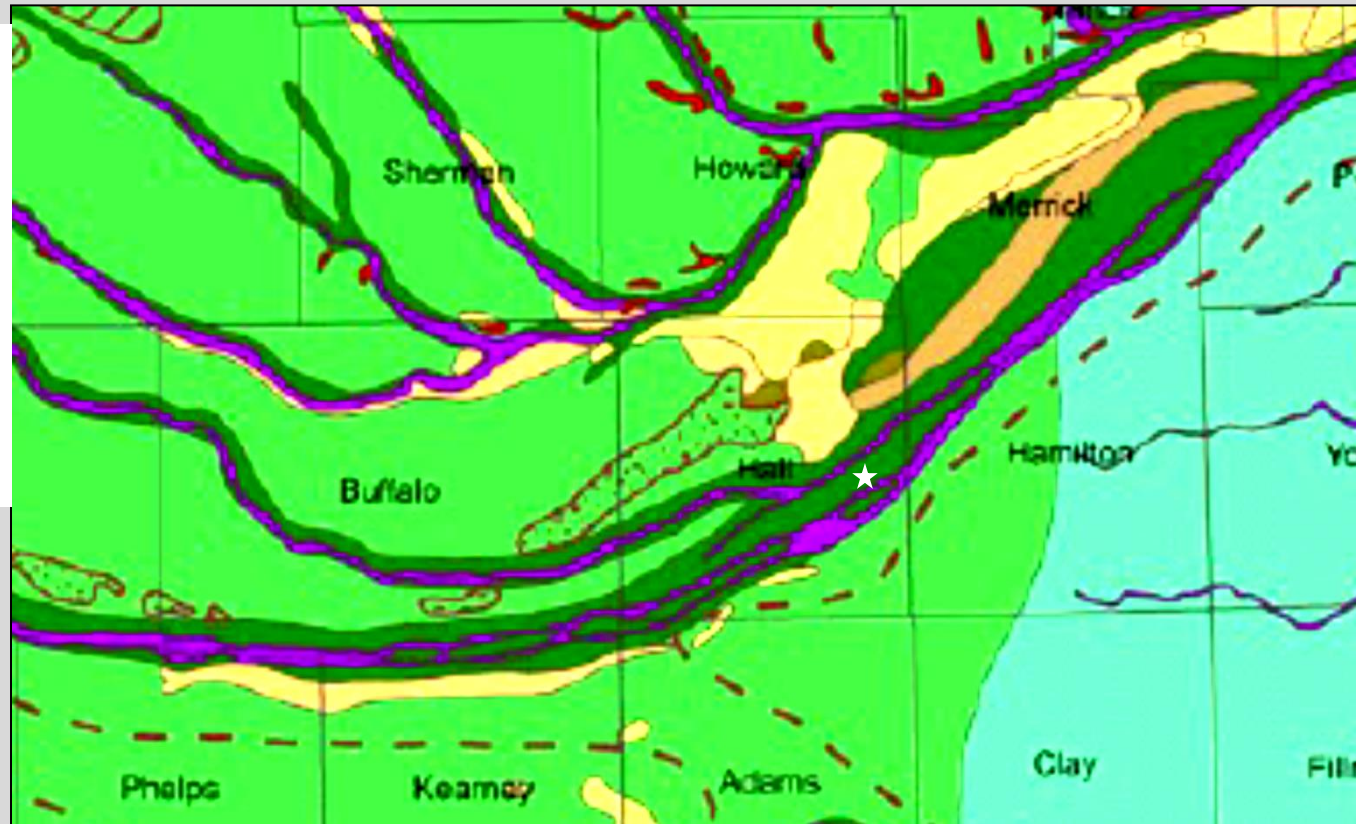
†Photo Credit: Tim Smith, Crane Trust

Site Description – Subirrigated Lowland Tallgrass Prairie



Grasslands

- Upland Tallgrass Prairie
- Lowland Tallgrass Prairie
- Loess Mixed-grass Prairie
- Sandhills Mixed-grass Prairie
- Sandsage Mixed-grass Prairie
- Sandhills Borders Mixed-grass Prairie
- Gravelly Mixed-grass Prairie
- Shale Mixed-grass Prairie
- Mosaic of Mixed-grass/Shortgrass Prairie



Map Adapted From:

Kaul, R., S. Rolfsmeier. 1993. Native vegetation of Nebraska. UNL Conserv. Surv. Div. <http://nebraskamaps.unl.edu>.

Ridge and Swale Topography and Associated Wetland and Vegetative Zones

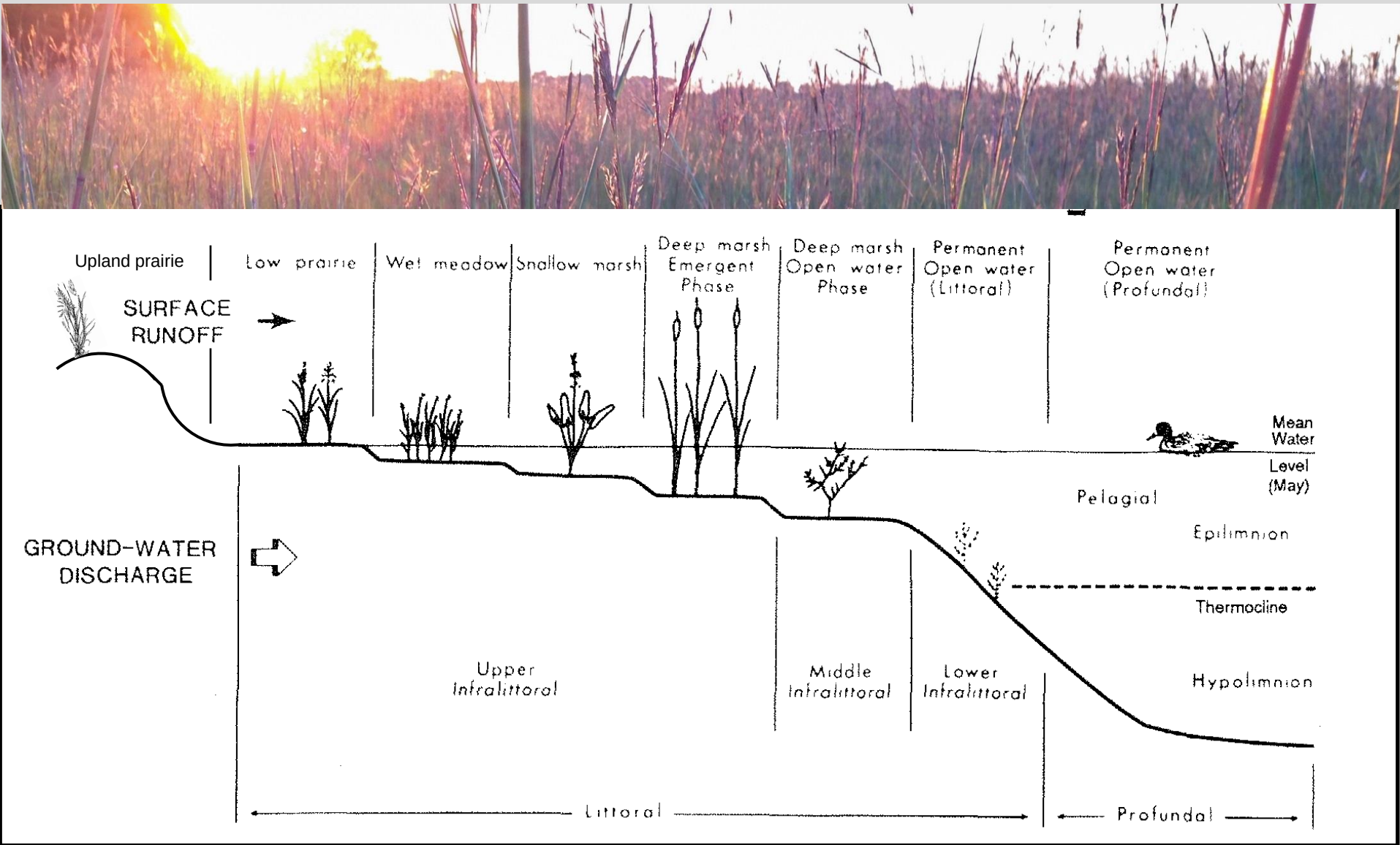


Figure Adapted From:

Kantrud, H.A., G.L. Krapu, and G.A. Swanson. 1989. Prairie basin wetlands of the Dakotas: a community profile. U.S. Fish and Wildlife Service, Biological Report 85, Washington, DC.

Aerial Photo of Shoemaker and Mormon Islands: Ridge and Swale Topography

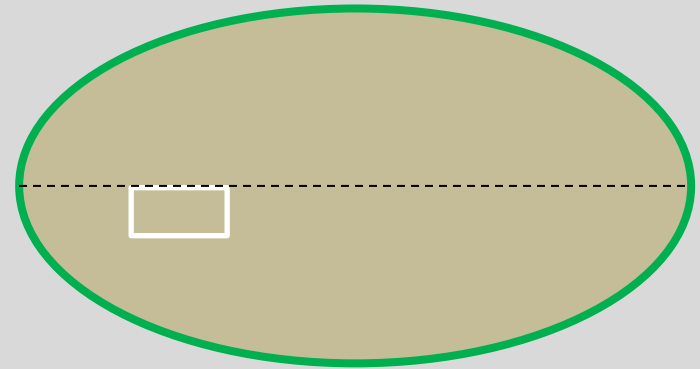
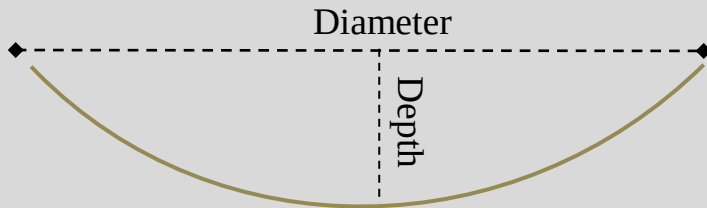


Photo Credit, Eric Fowler, Nebraskaland Magazine

Wallows within our study site – April 2016



Methods



Vegetation Quadrats

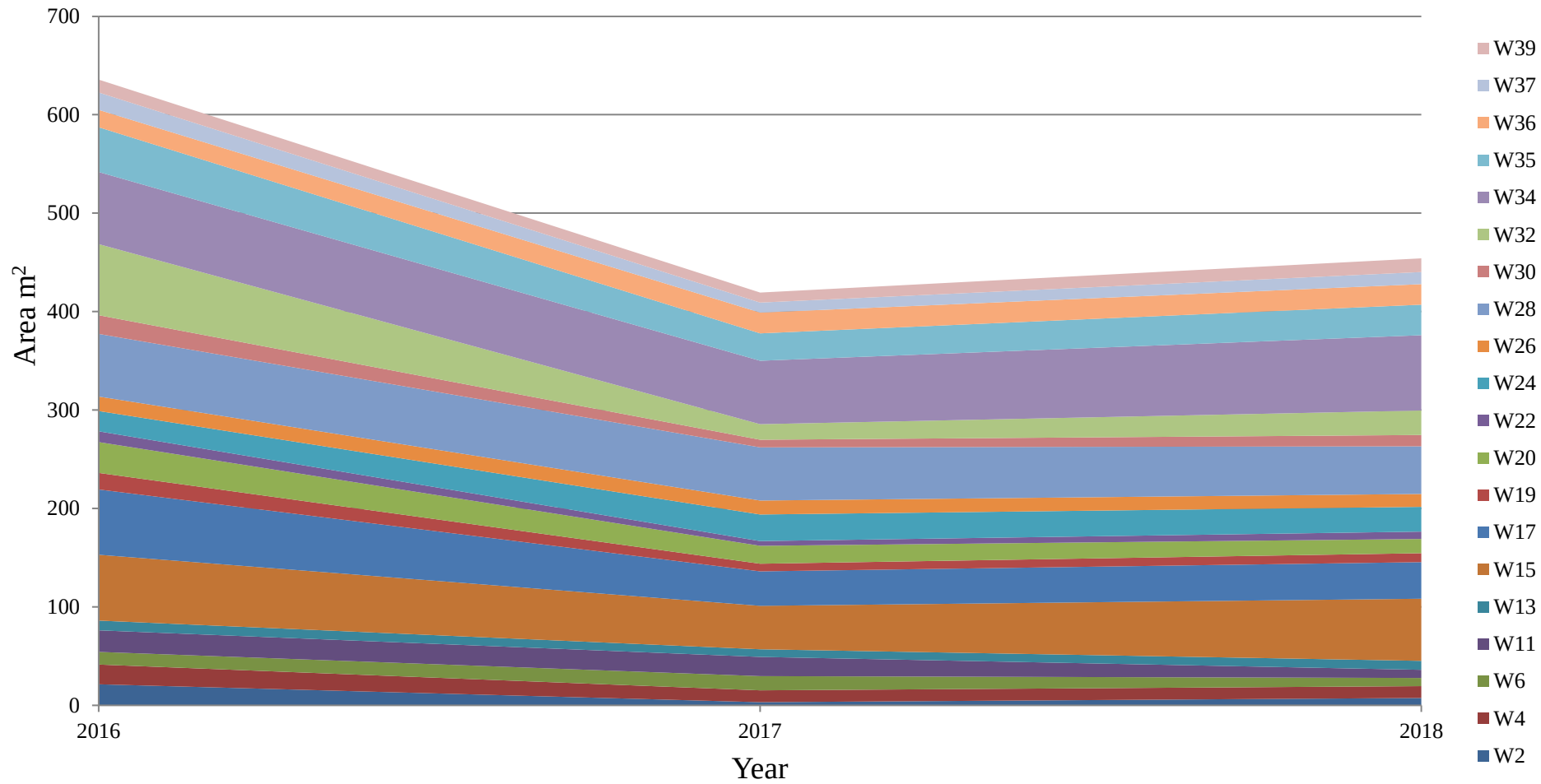


Wallow no. 2 throughout our study

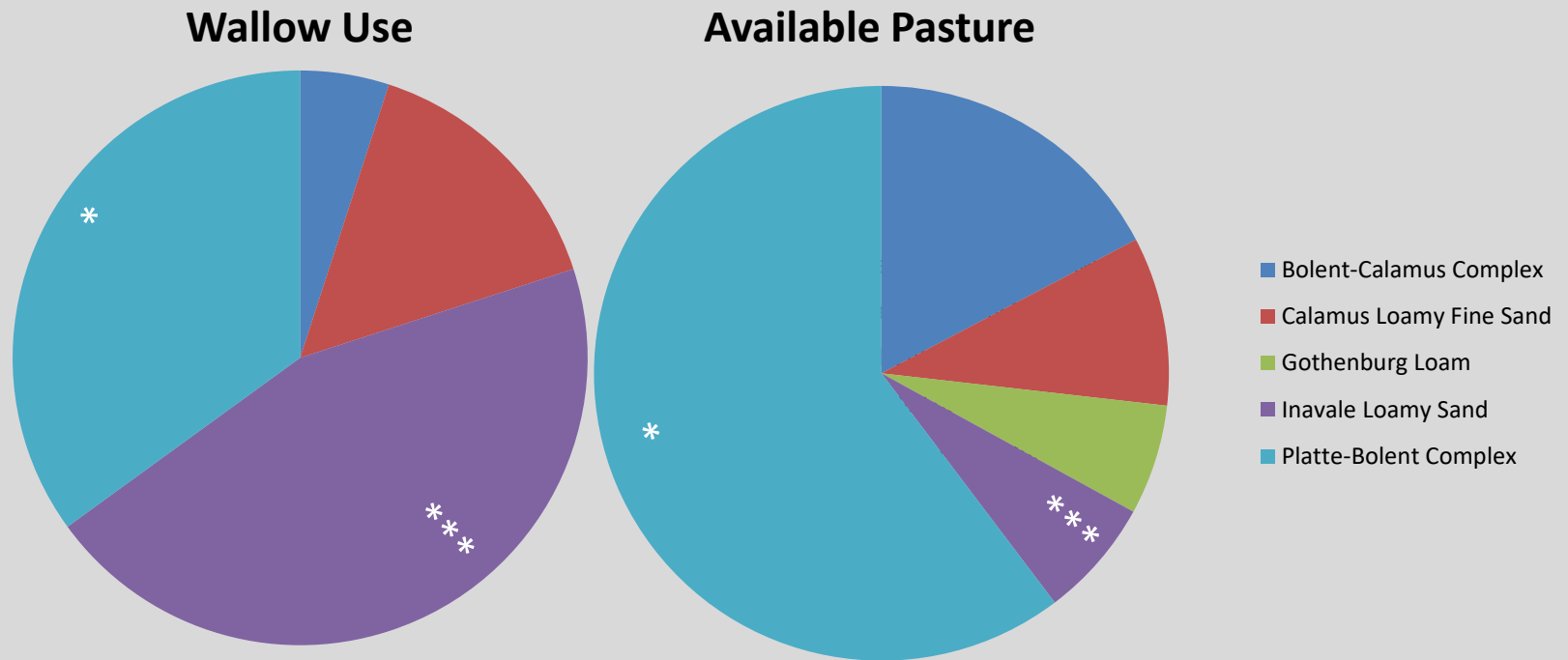


Results

Cumulative and individual wallow area by study year



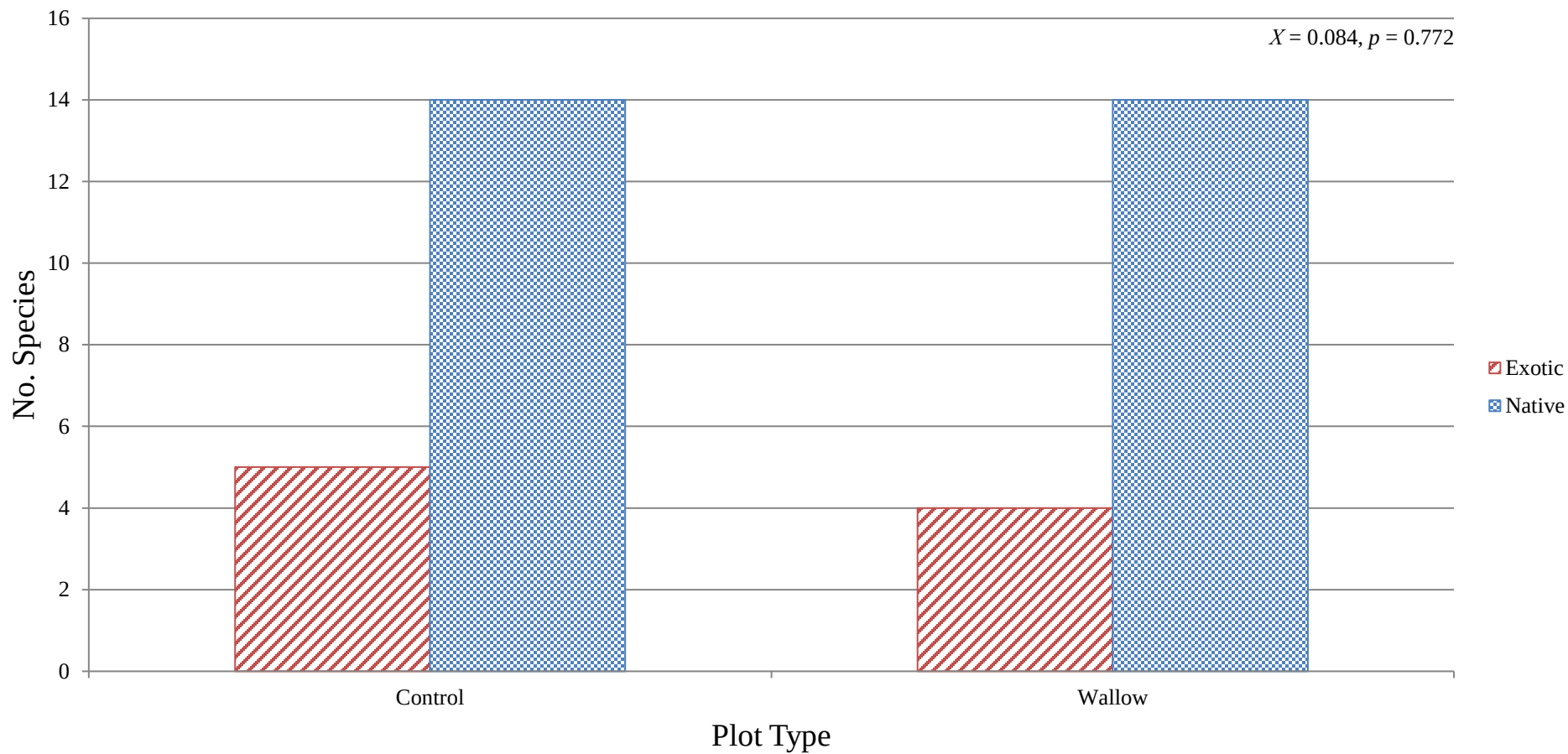
Wallow use by soil type as compared to availability within study area



General Findings

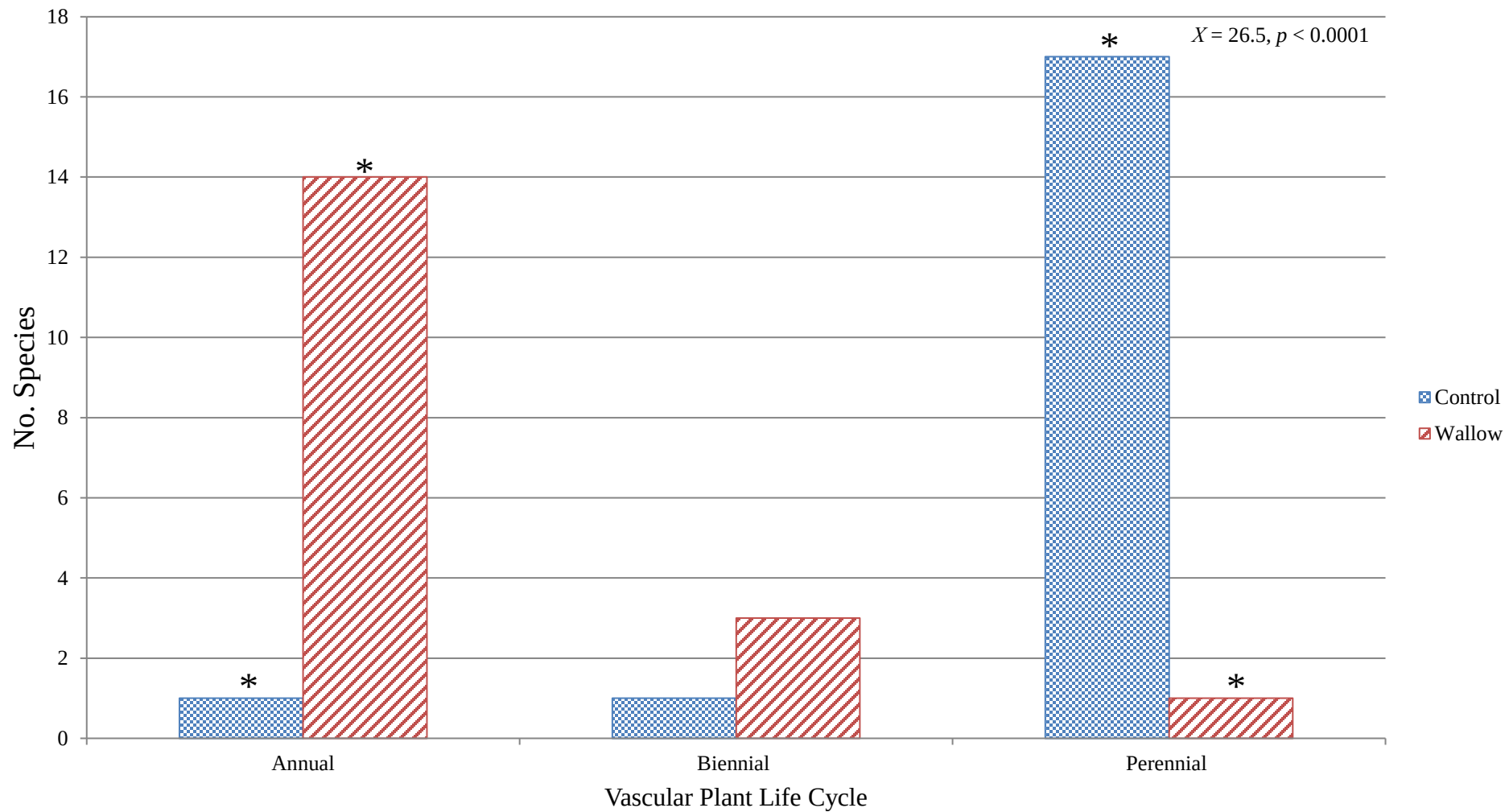
- We identified 109 species of vascular plants within wallows and in surrounding controls
- 18 species were more abundant within wallows
- 19 species were more abundant outside of them
- 35 species demonstrated no significant difference
- There was insufficient data to categorize the response of 37 species.

Count of species with a higher percent cover in wallow or control plots by status as exotic and native

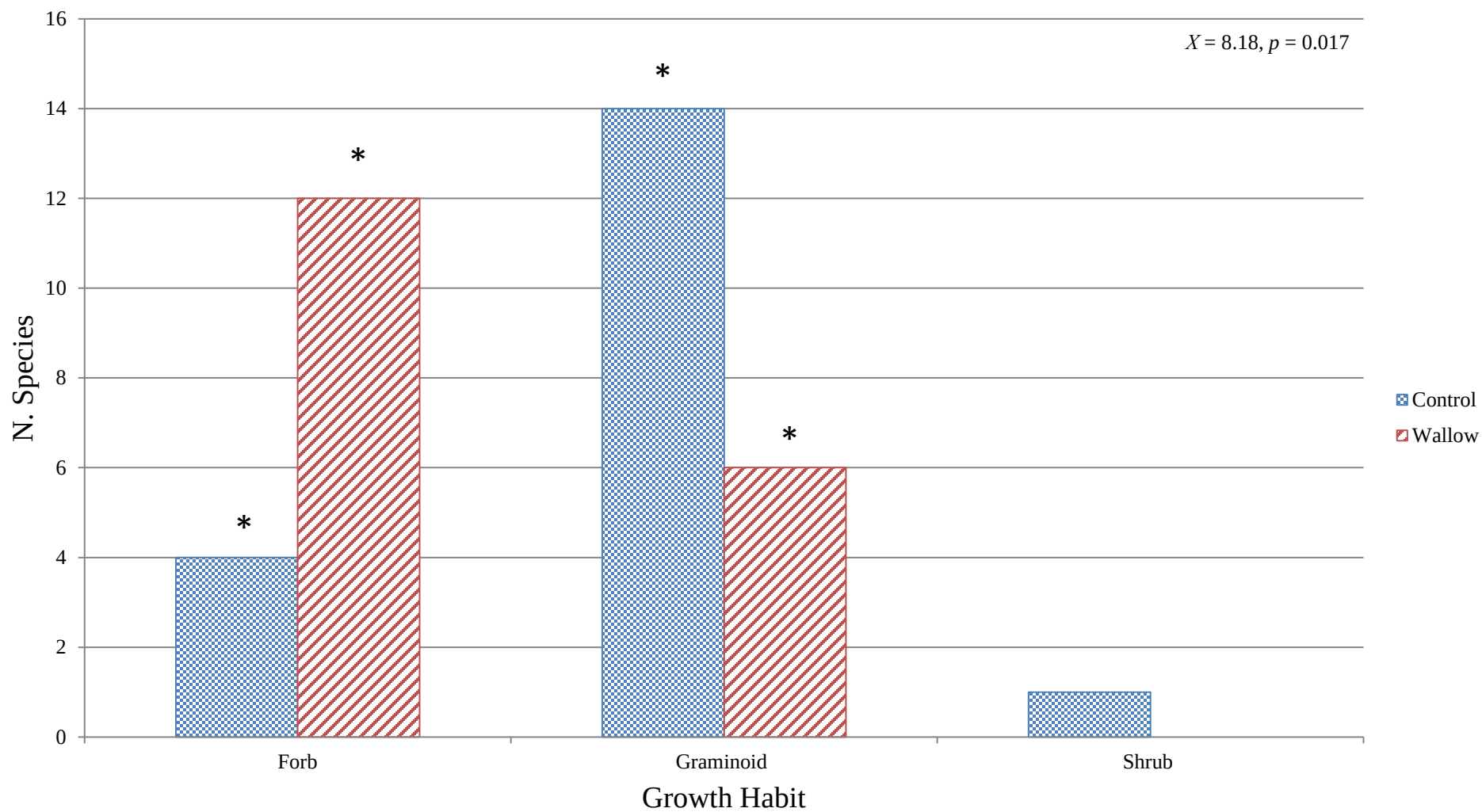




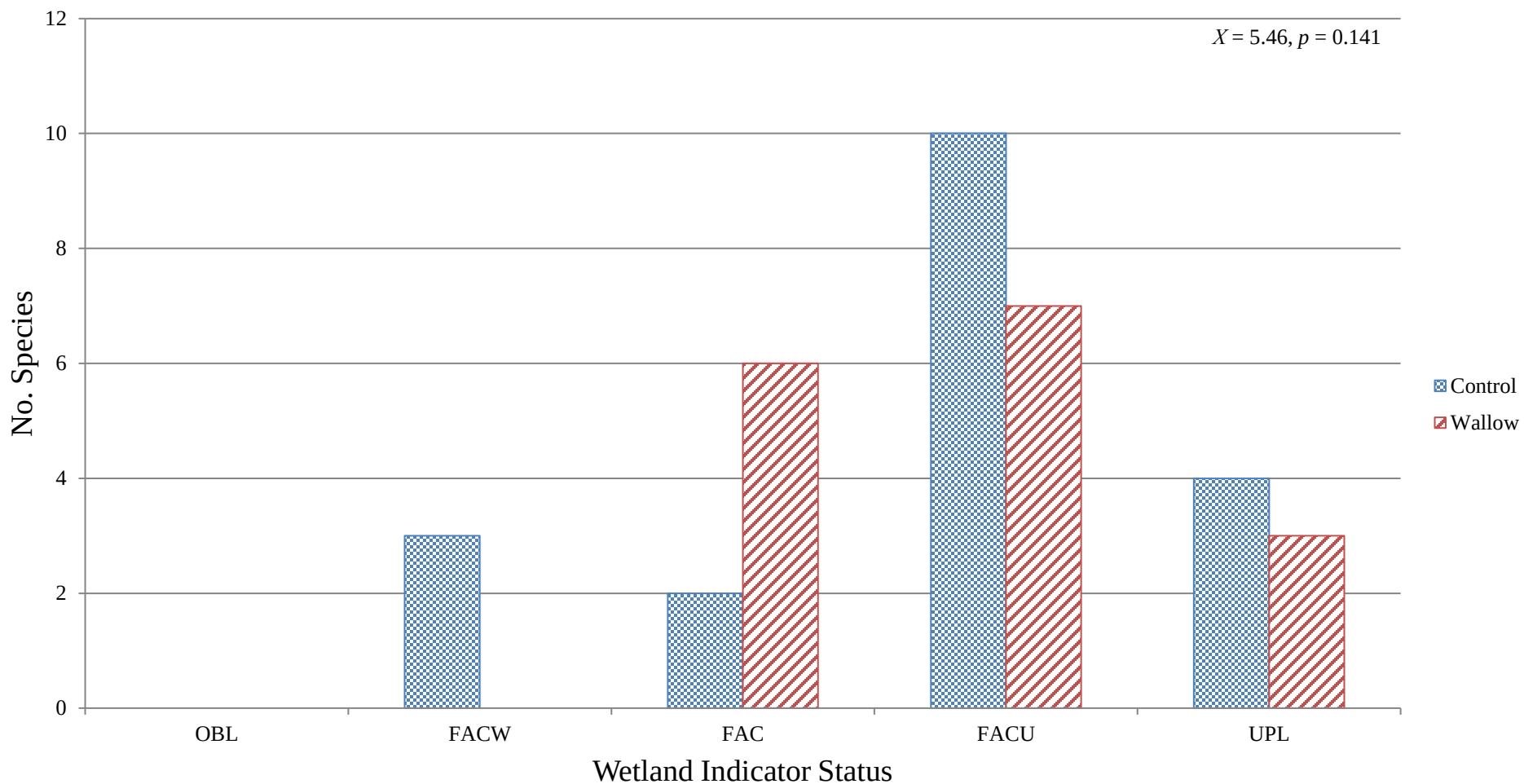
Number of species with a higher percent cover in wallow or control plots by life cycle



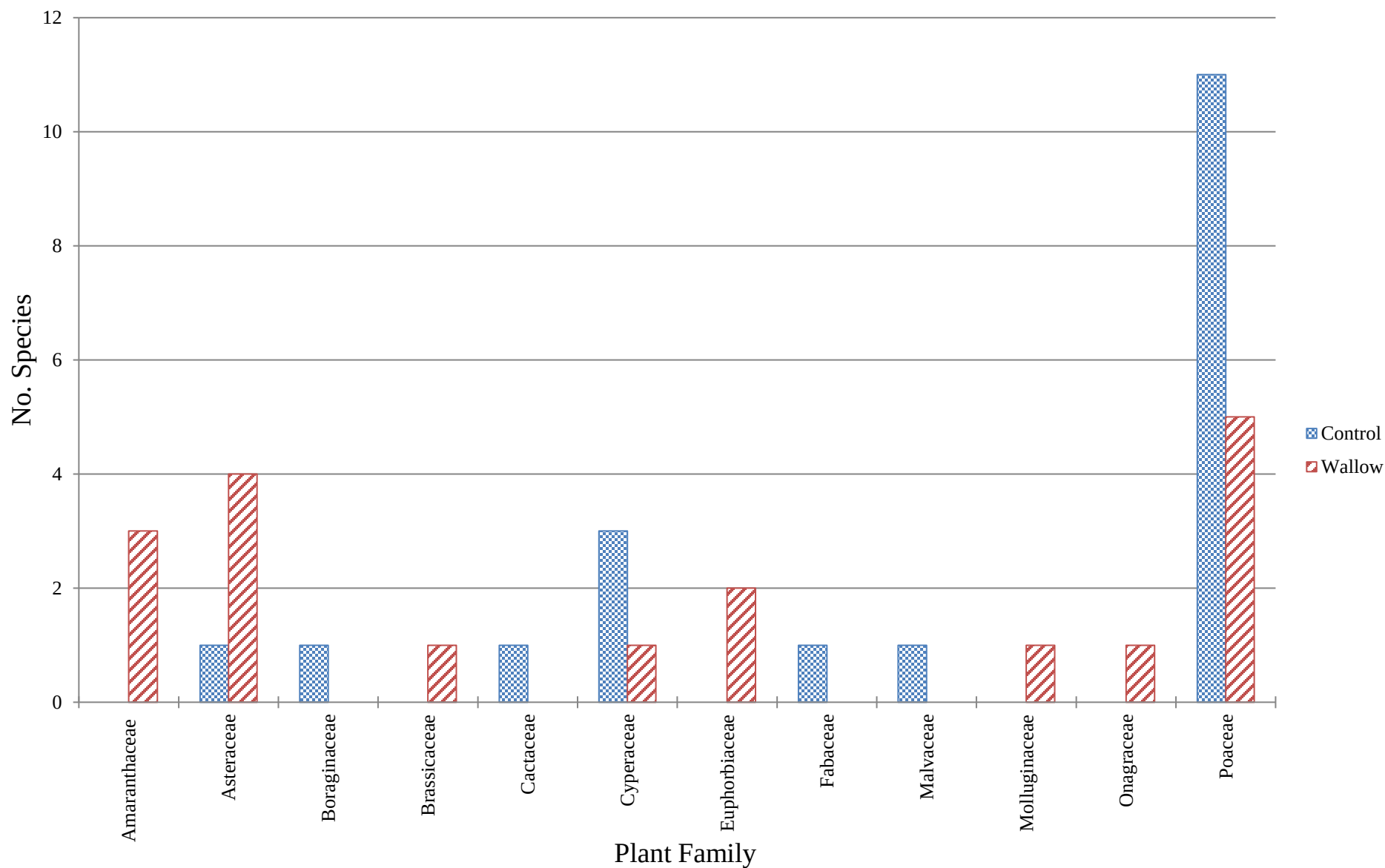
Number of species with a higher percent cover in wallow or control plots by growth habit



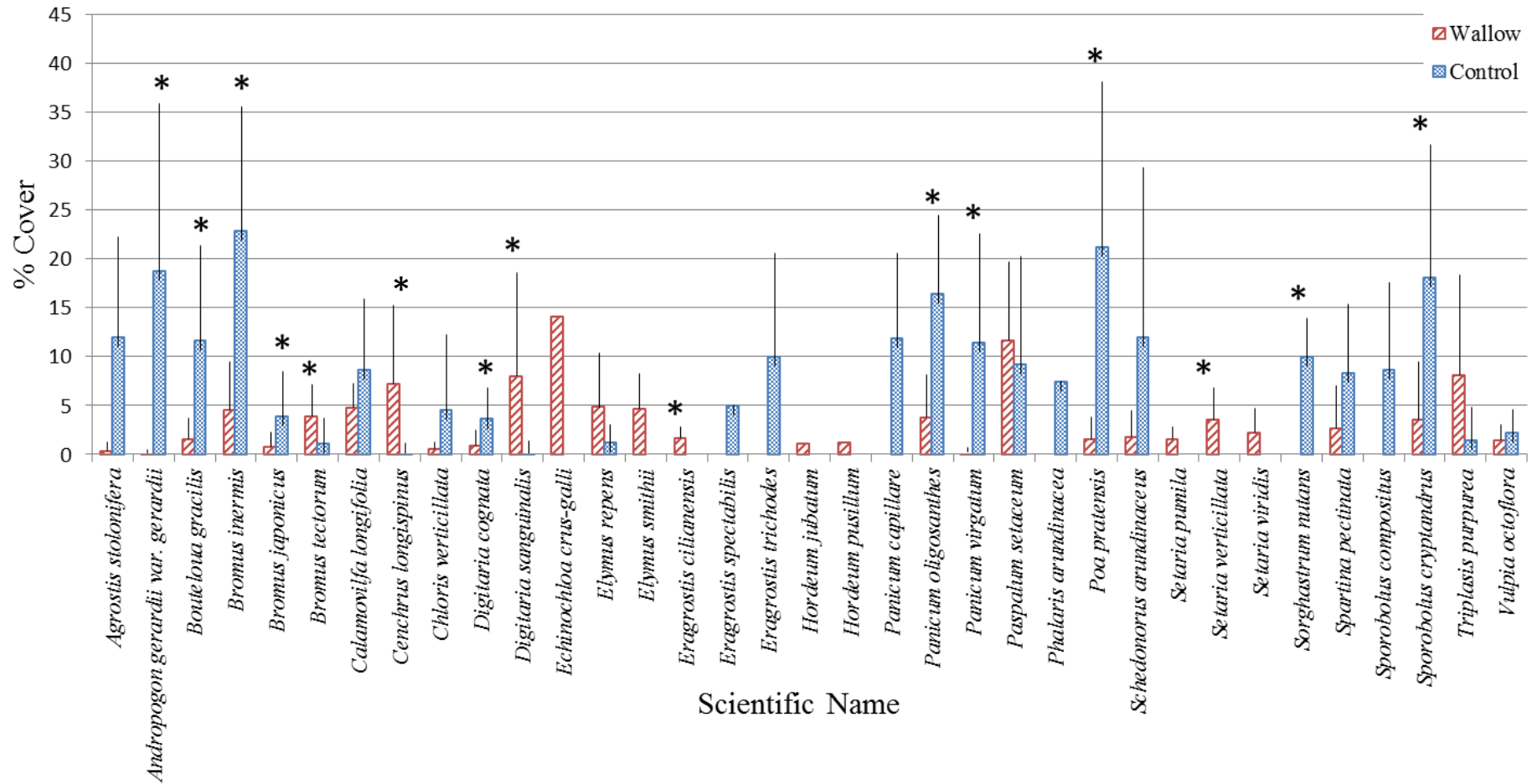
Number of Species with a higher percent cover within wallow or control plots by wetland indicator status



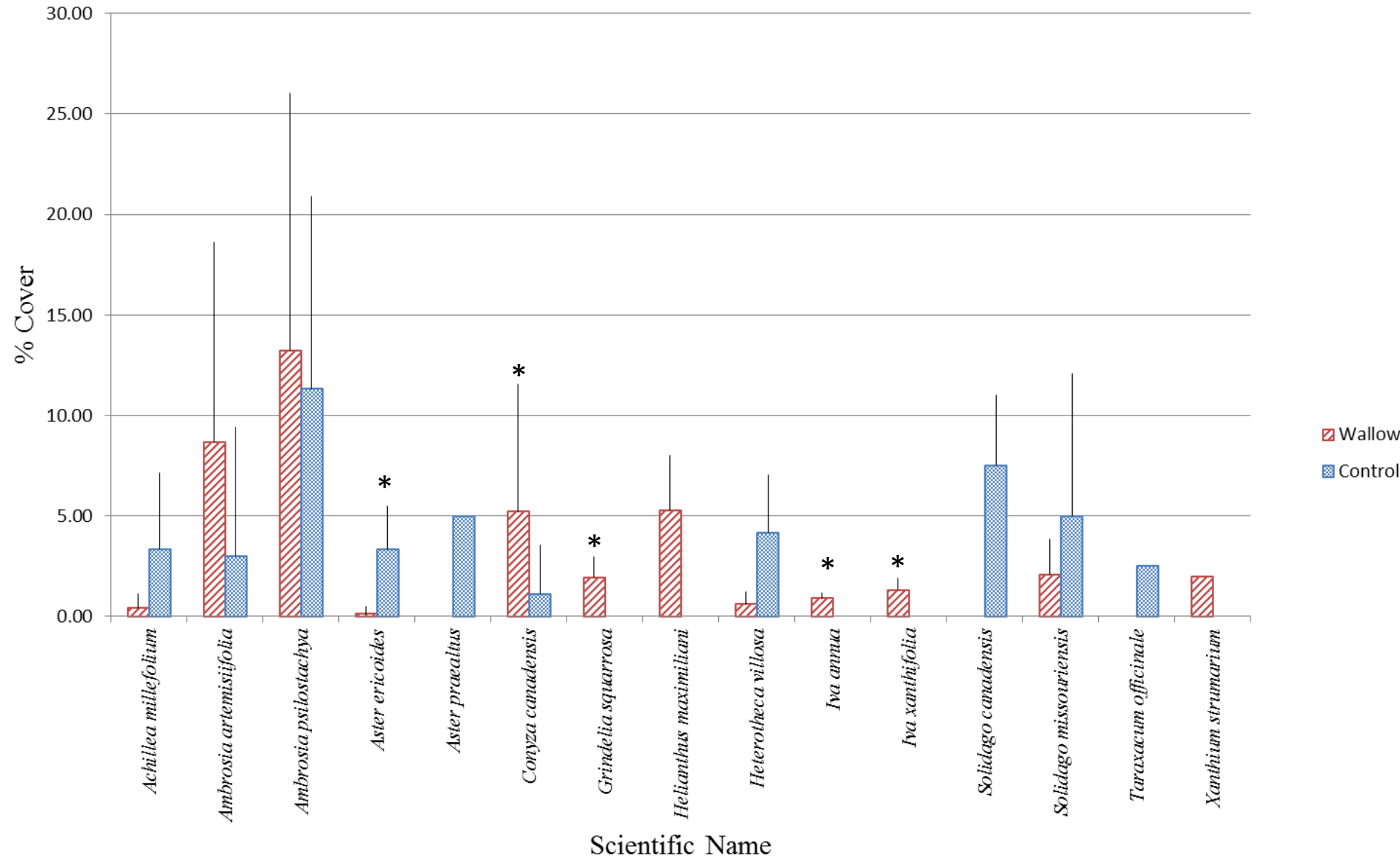
Number of Species with a higher percent cover in wallow or control plots by
Plant Family



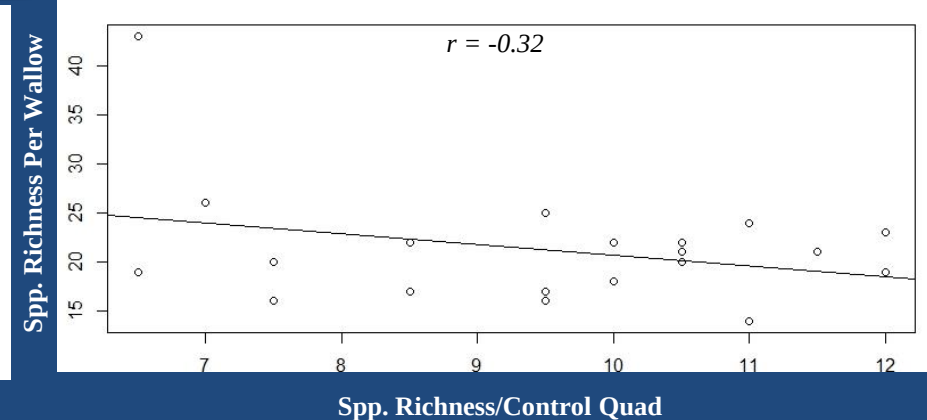
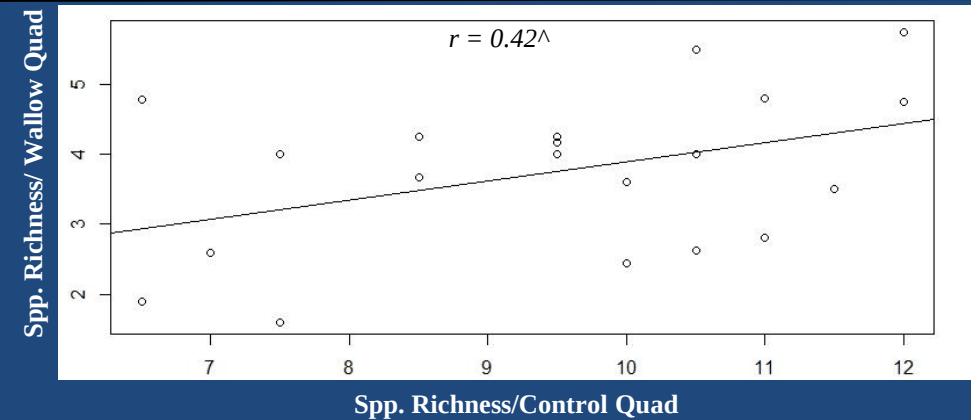
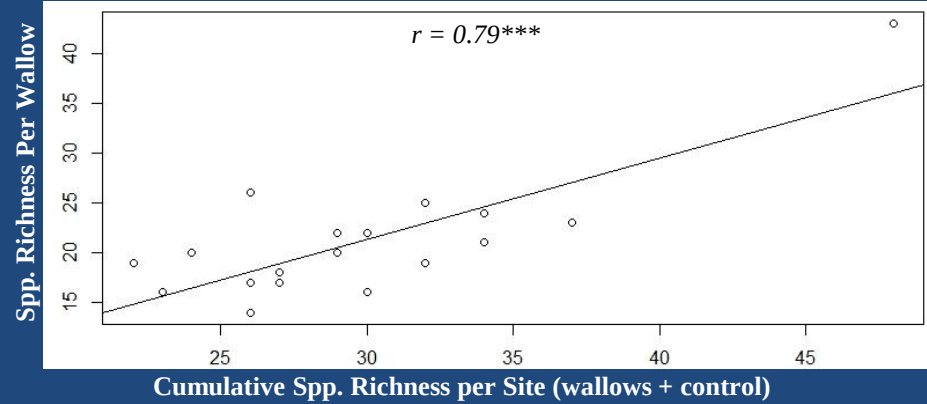
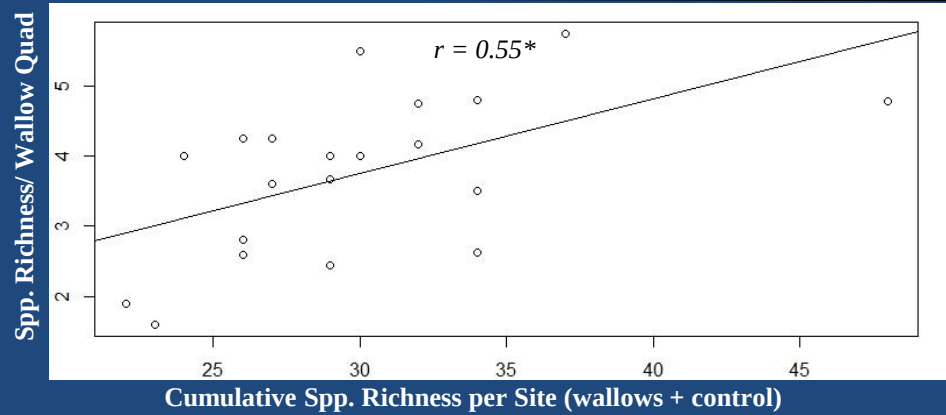
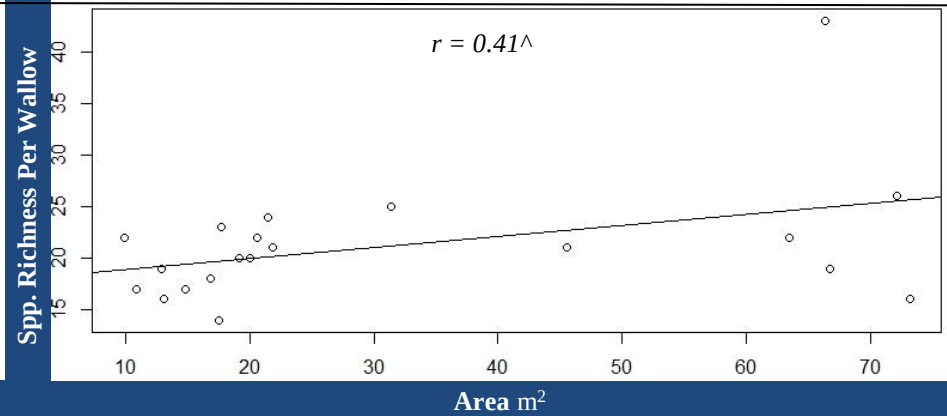
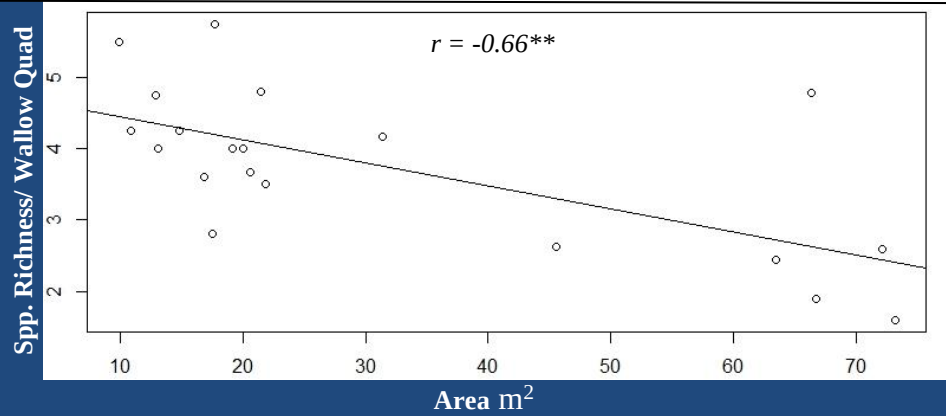
Percent cover of Poaceae spp. in wallow or control plots by scientific name



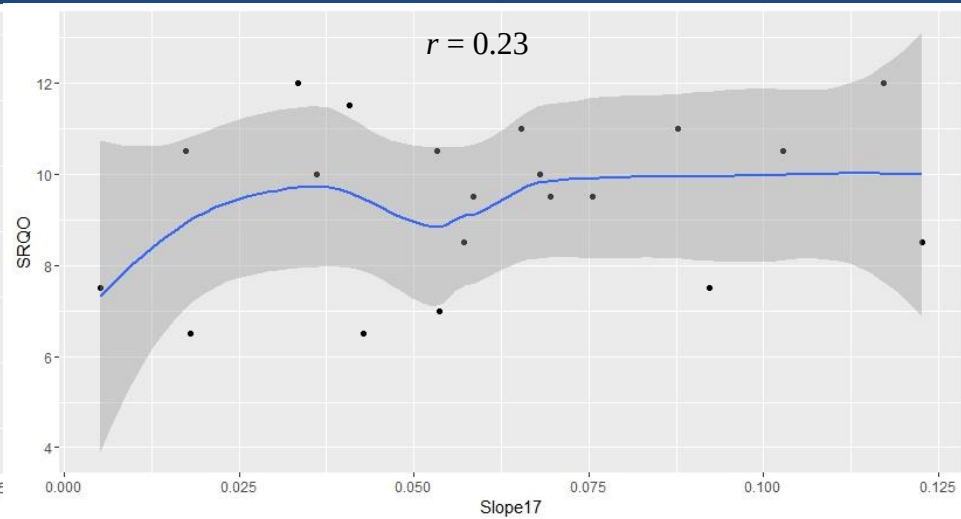
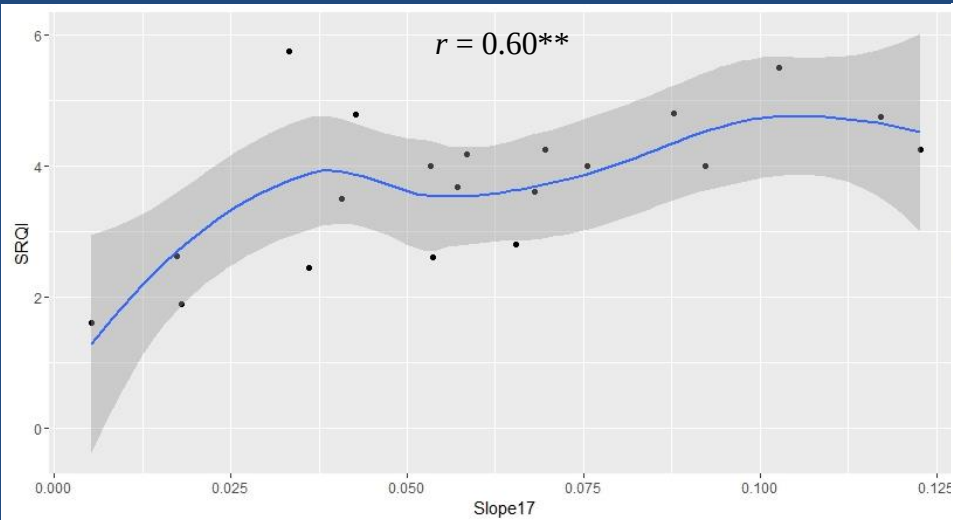
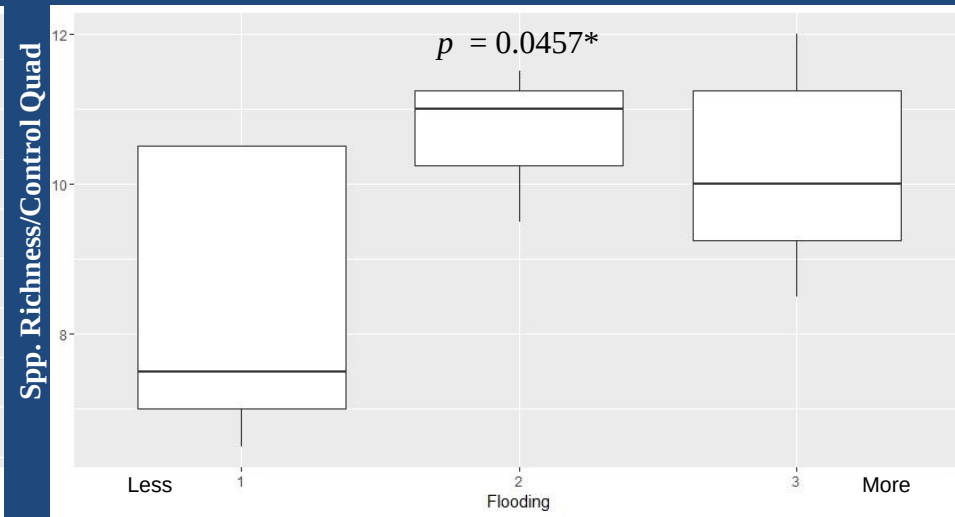
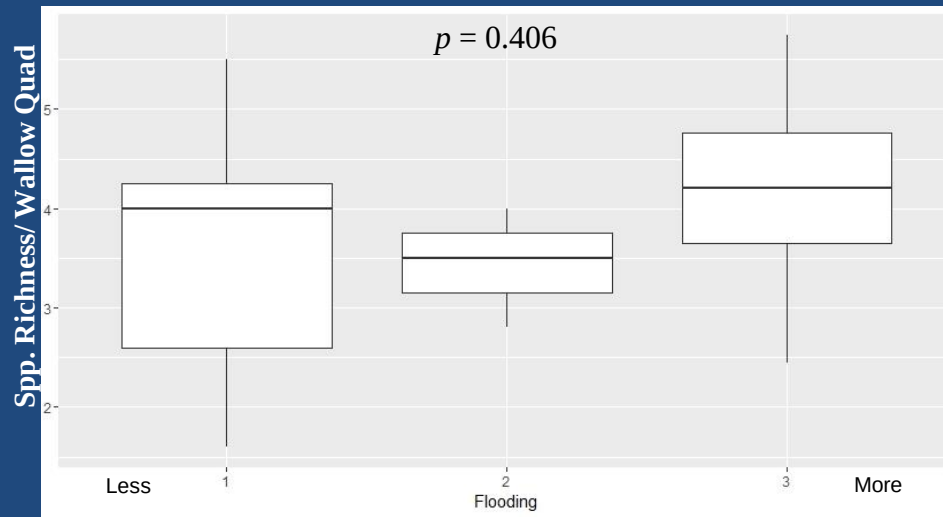
Percent cover of Asteraceae spp. in wallow or control plots by scientific name



Correlates of Spp. richness within wallows: Differing patterns at different spatial scales



Correlates of Spp. richness within and outside of wallows: Hydrological and topographical variation



Large wallow with summer regrowth: interior dominated by a few early successional species,

07-25-17 [↓ Spp. richness per quad, ↑ Spp. richness per wallow]



Small wallow with summer regrowth: a diversity of species inhabit a relatively wide buffer surrounding the wallow's edge, 07-25-17 [↑ Spp. richness per quad, ↓ Spp. richness per wallow]



Select individual species that respond positively to wallows



Photo Credit: Max
Licher, SEINet

Cut-Leaf Evening-Primrose –
Oenothera laciniata



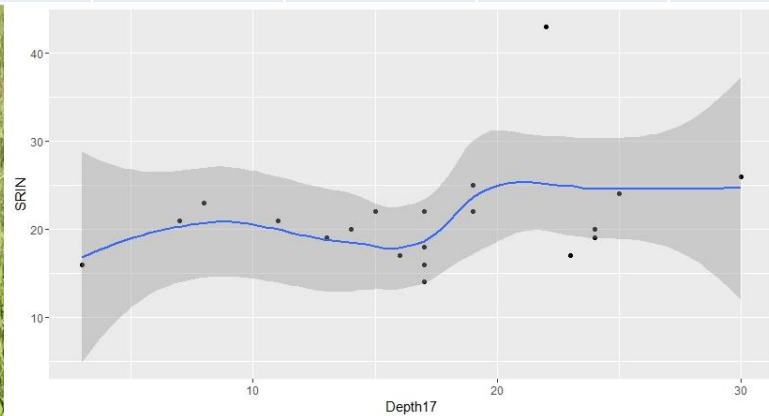
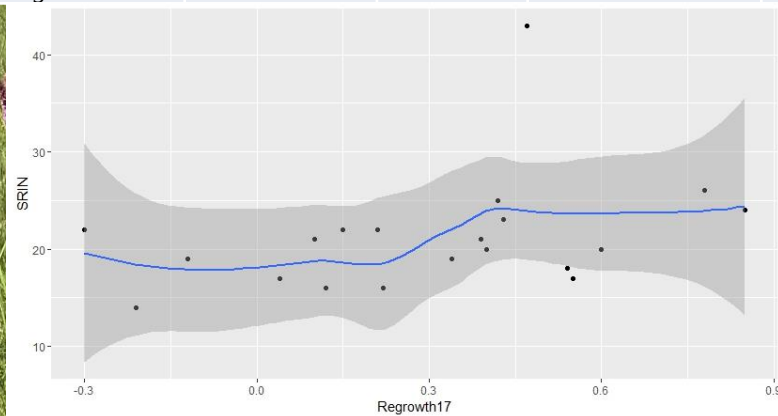
Photo Credit:
Patrick Alexander,
SEINet

Green Carpetweed –
Mollugo verticilata

Top Variables/Models Predicting Spp. Richness within wallows

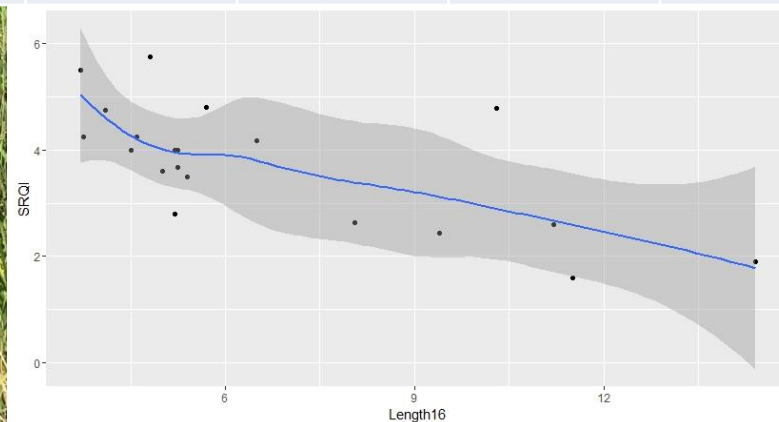
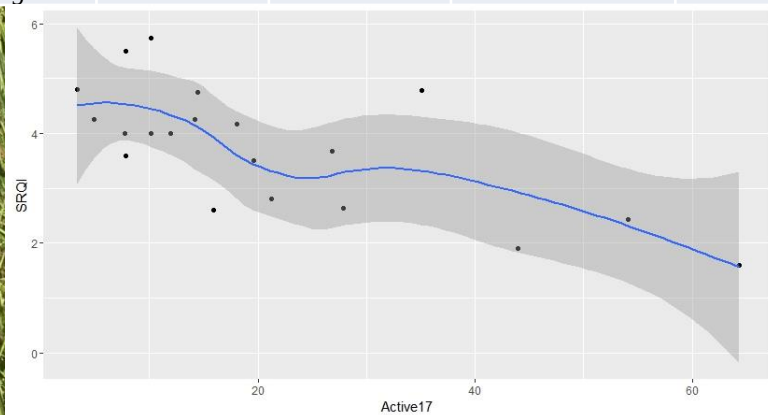
Model Selection Table – Total Species Richness in Wallows

Model Name	Intercept	Size 16	Regrowth 17	Depth 17	df	logLik	AICc	delta	weight
Size + Depth	2.647	0.0051		0.0139	3	-58.25	124	0	0.282
Size	2.898	0.0048			2	-60.097	124.9	0.9	0.180
Size + Regrowth	2.836	0.0041	0.2655		3	-58.839	125.2	1.18	0.157



Model Selection Table – Species Richness per Quadrat in Wallows

Model Name	Intercept	Size 16	Active 17	Length 17	df	logLik	AICc	delta	weight
Active	4.757		-0.04804		3	-23.384	54.3	0	0.311
Length	5.478			-0.2584	3	-23.798	55.1	0.83	0.206





Questions?

