

# Cross-ecosystem effects of plant invasions on serpentine plant-pollinator networks



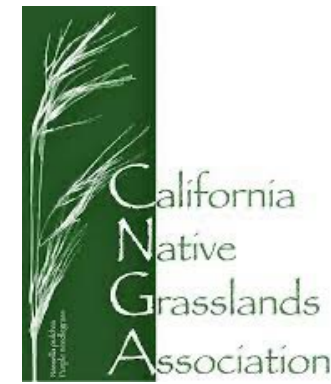
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Fernanda Valdovinos,  
Neal Williams, and Susan  
Harrison

# Acknowledgements

For thousands of years, the land where this study took place has been the home of Patwin, Wappo, Pomo, and Miwok peoples. Full land acknowledgment at: <https://politicalecologylab.ucdavis.edu/uc-davis-pe-lab-land-acknowledgement>

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Photos taken by Becca Nelson unless otherwise noted.



Hopland Scholars Fund



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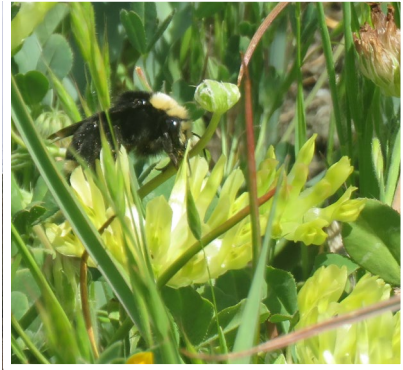


Irene Brown Memorial Fund



**Serpentine Grasslands are refugia.**

# Pollinator Spillover in Patchy Landscapes



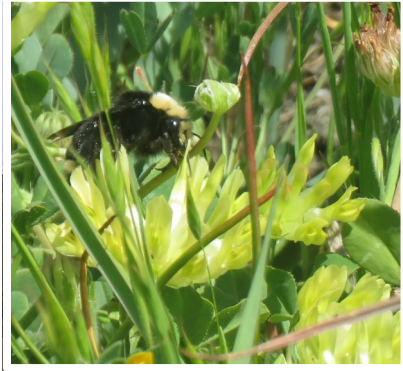
**serpentine grassland**



**invaded grassland**



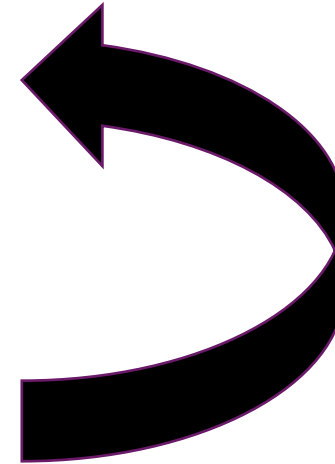
# Pollinator Spillover in Patchy Landscapes



serpentine grassland



invaded grassland



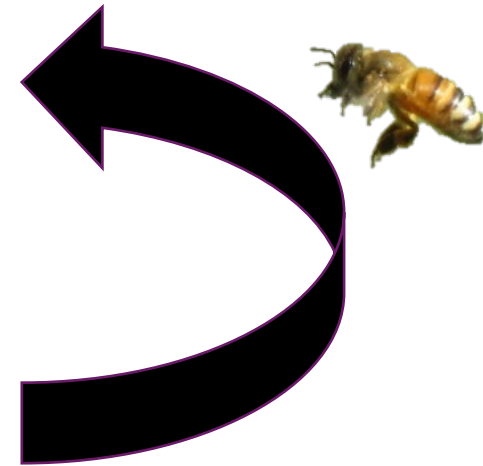
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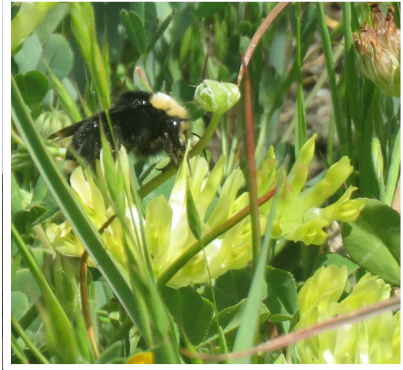
serpentine grassland




invaded grassland



# Pollinator Spillover in Patchy Landscapes



An aerial photograph of a serpentine soil landscape. The terrain is characterized by a mix of dark grey, brown, and green patches, indicating different soil compositions and vegetation. A prominent feature is a large, irregularly shaped area of bright yellow-green, which likely represents a dense patch of invasive plants. This area is surrounded by darker, more heterogeneous soil and vegetation. The overall scene is a natural, rugged landscape with distinct color patterns.

**Do invasive plants have pollinator-mediated effects on neighboring serpentine plants?**



# Focal Plants

Bull Clover  
(*Trifolium  
fucatum*)



Hairy Vetch  
(*Vicia  
villosa*)

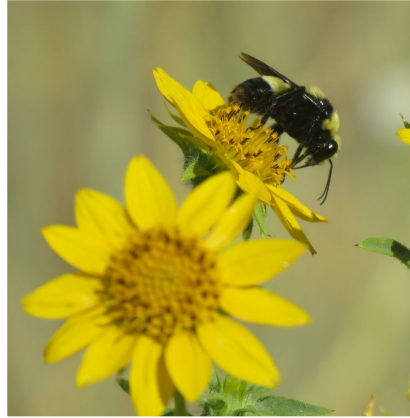


# Focal Plants

Bull Clover  
(*Trifolium fucatum*)



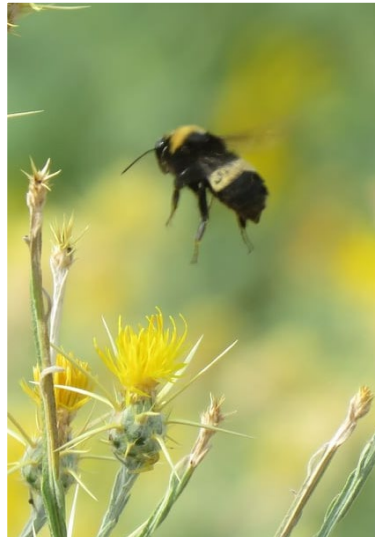
Serpentine Sunflower  
(*Helianthus exilis*)



Hairy Vetch  
(*Vicia villosa*)



Yellow Starthistle  
(*Centaurea solistalis*)



# Methods



- Focal Plants
- Seed set
- Network

Increasing invasion

# Results



1. Pollinator Visitation

2. Seed Set

3. Plant-Pollinator Networks



# Results



## 1. Pollinator Visitation

## 2. Seed Set

## 3. Plant-Pollinator Networks



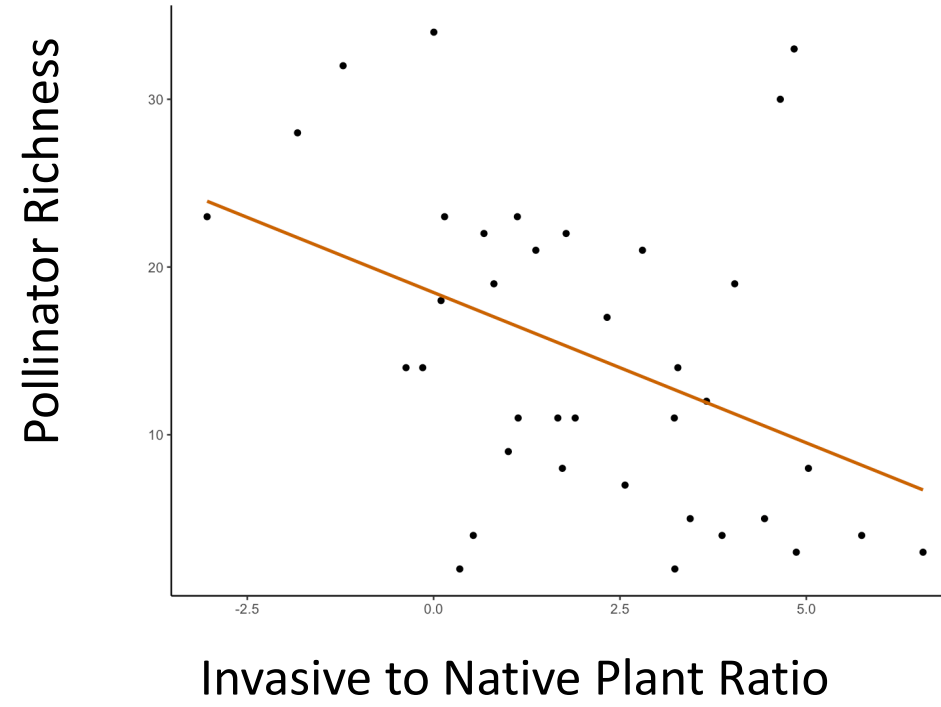
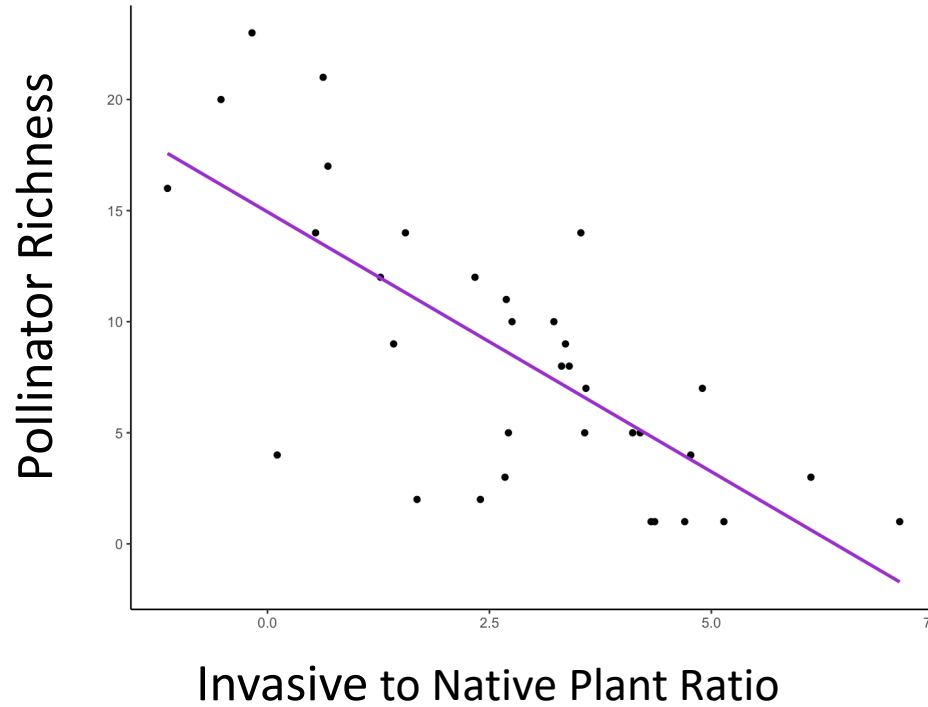
# 1. Pollinator Visitation to Native Plants



**Bull Clover**



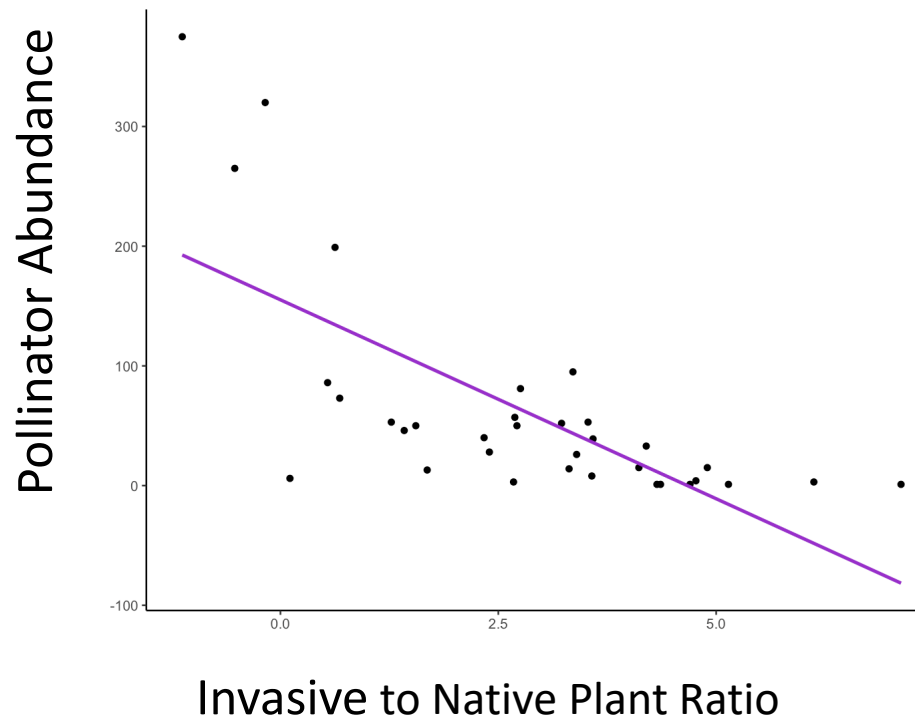
**Serpentine Sunflower**



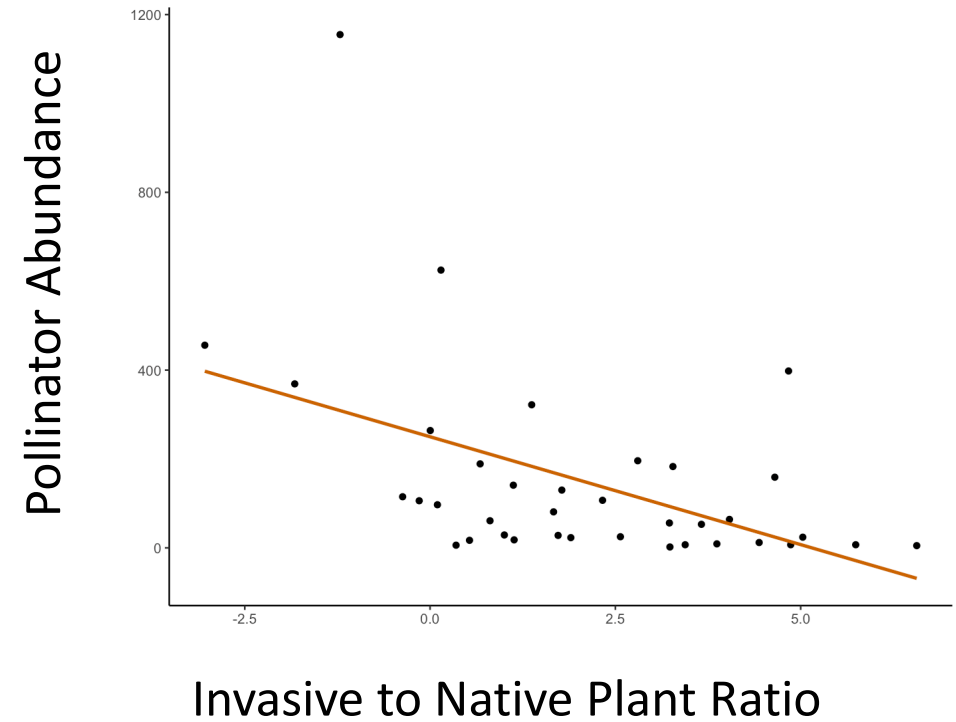
# 1. Pollinator Visitation to Native Plants



**Bull Clover**



**Serpentine Sunflower**



# Results



1. Pollinator Visitation

2. Seed Set

3. Plant-Pollinator Networks





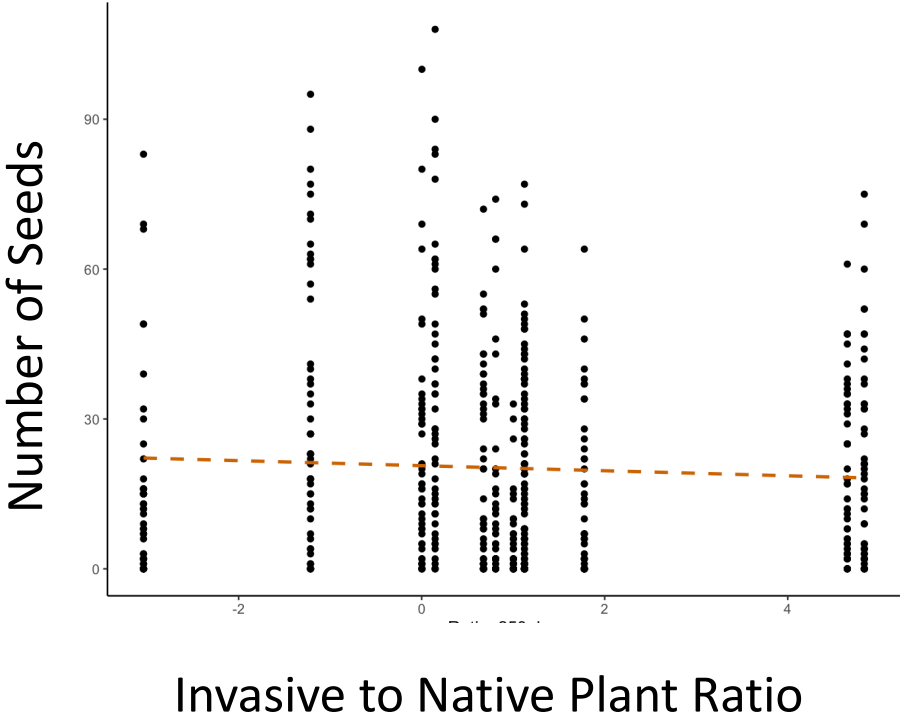
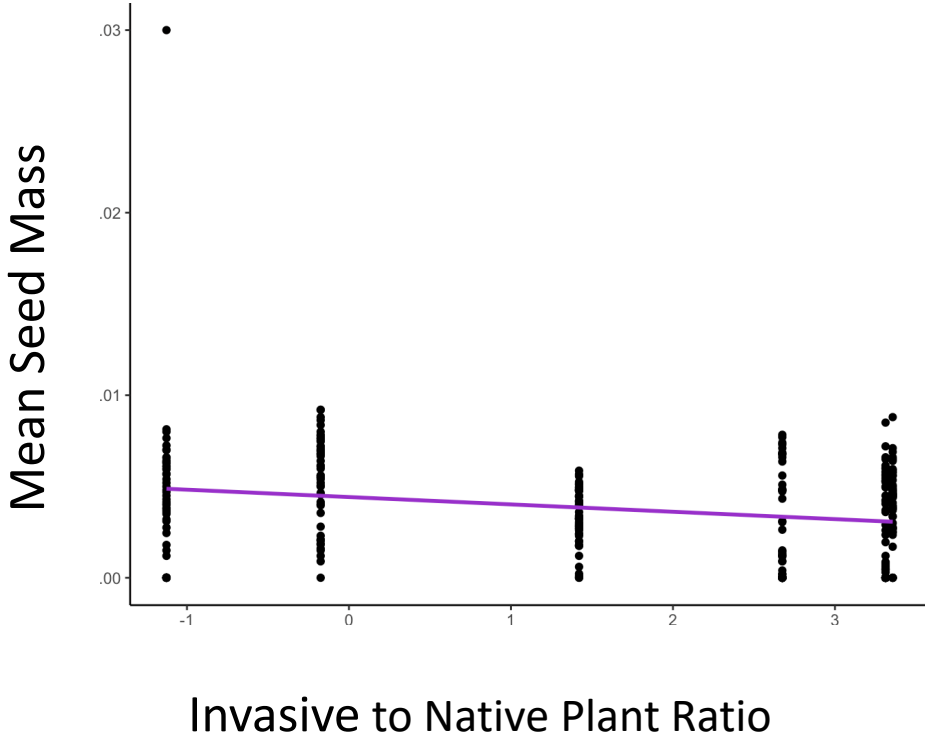
# 2. Seed Set



**Bull Clover**



**Serpentine Sunflower**



# Results



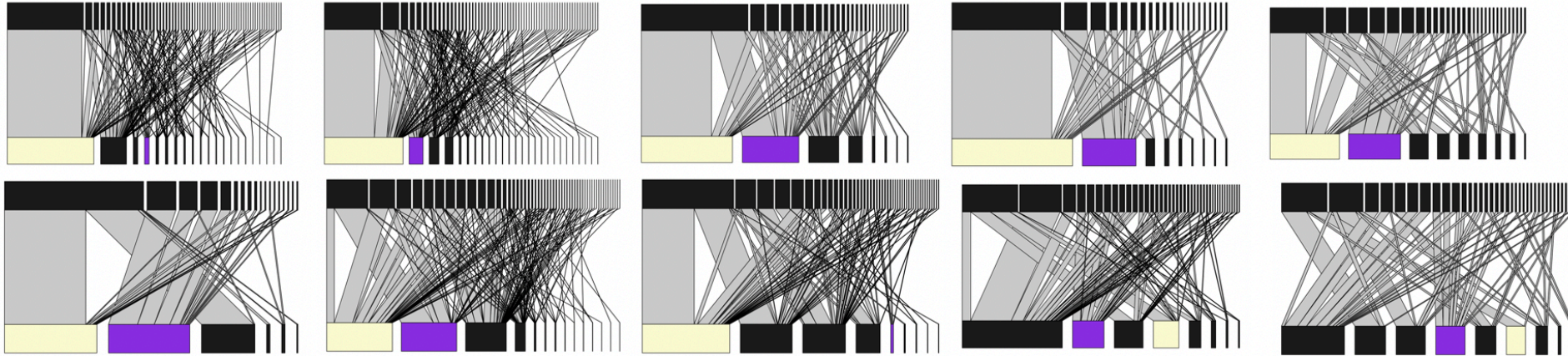
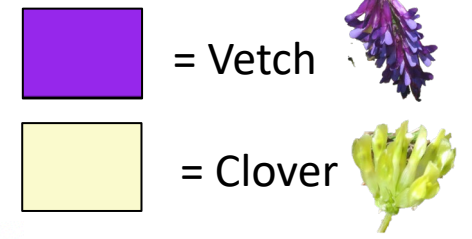
1. Pollinator Visitation

2. Seed Set

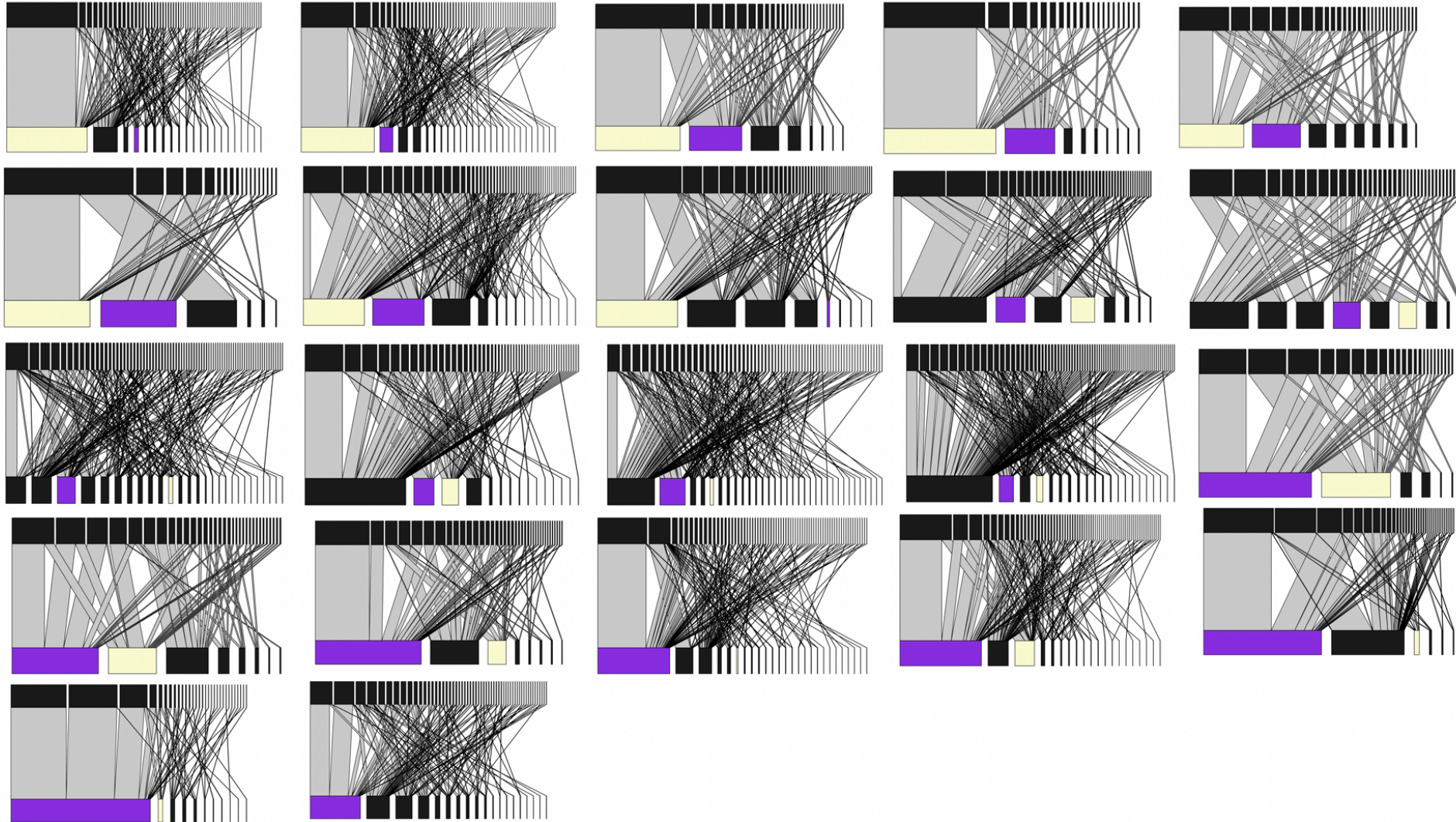
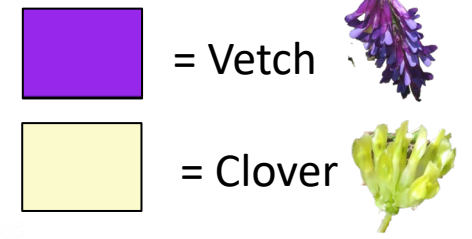
**3. Plant-Pollinator Networks**




# 3. Plant-Pollinator Networks



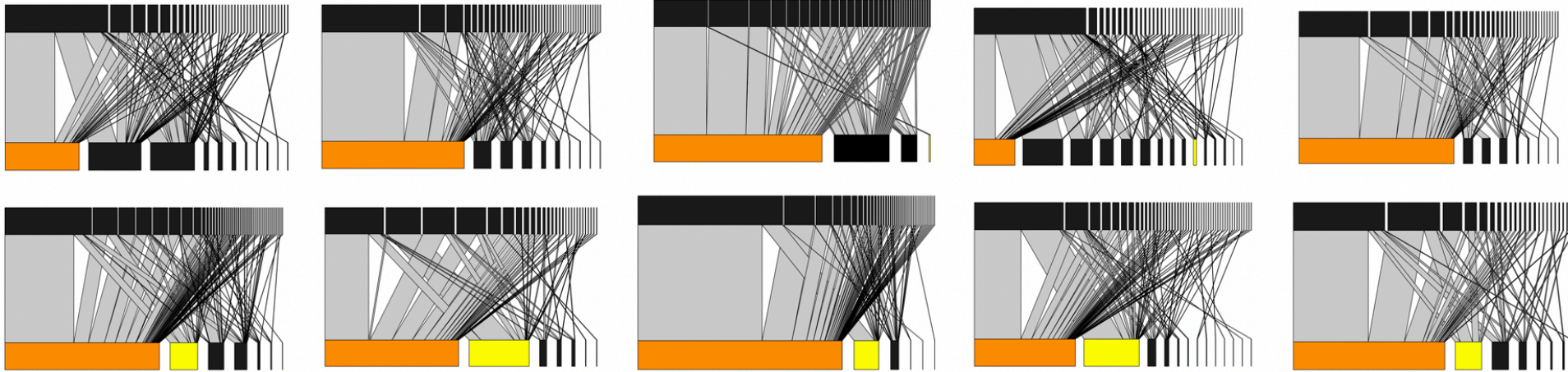
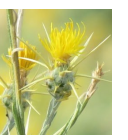
# 3. Plant-Pollinator Networks




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 = Thistle

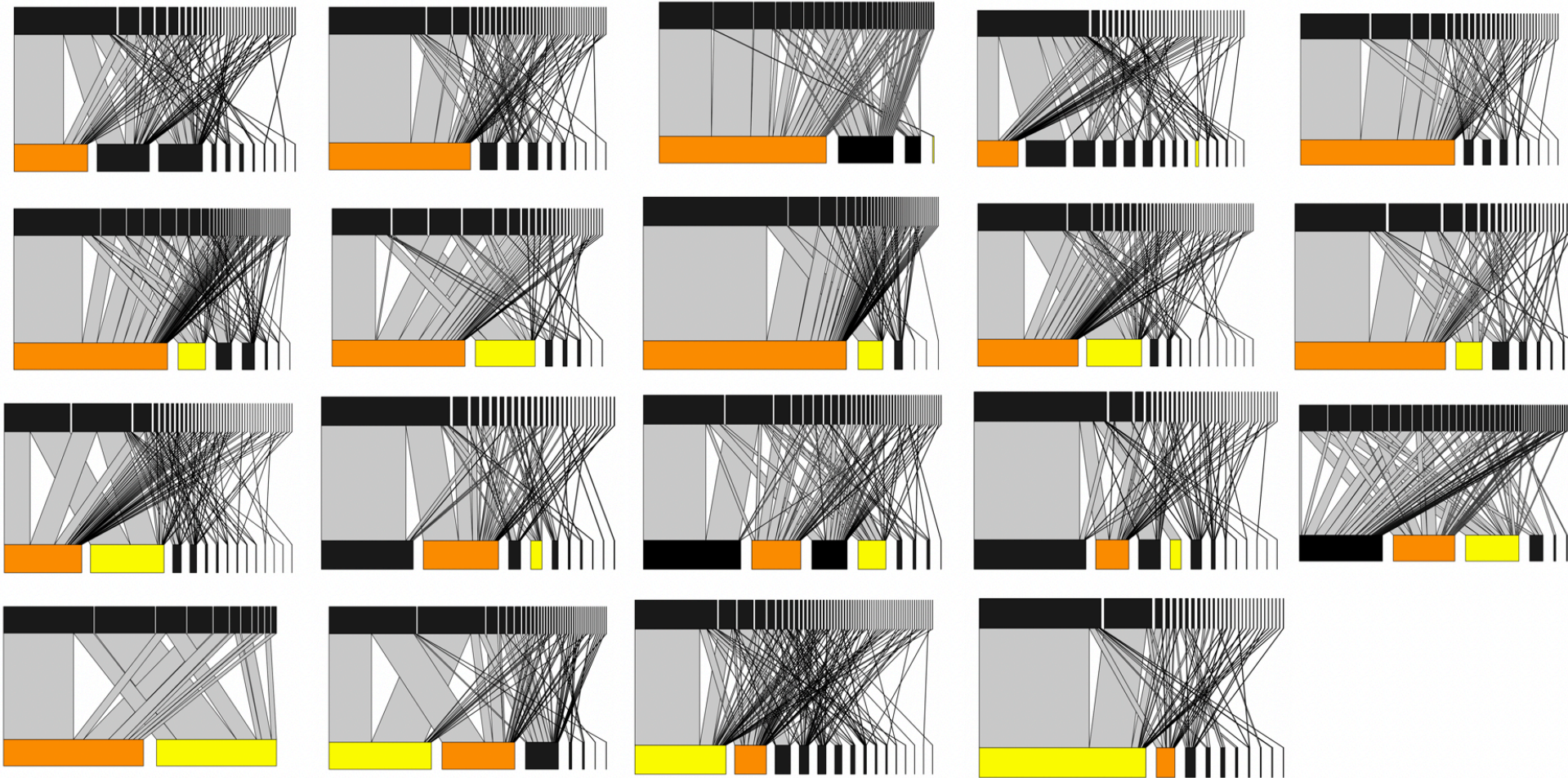
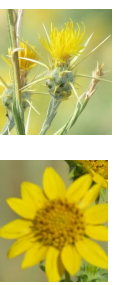
 = Sunflower



# 3. Plant-Pollinator Networks

 = Thistle

 = Sunflower



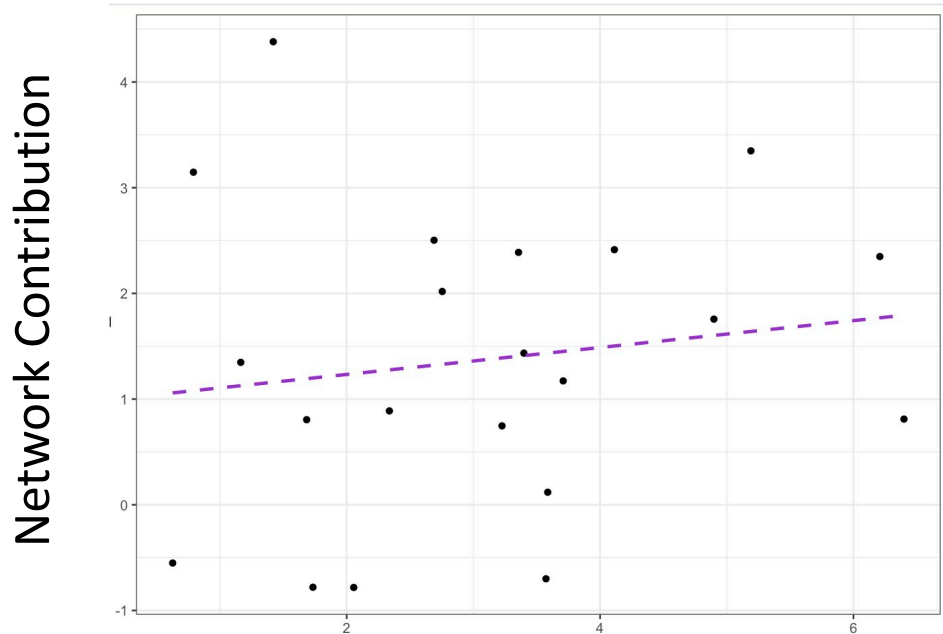
# 3. Plant Pollinator Networks



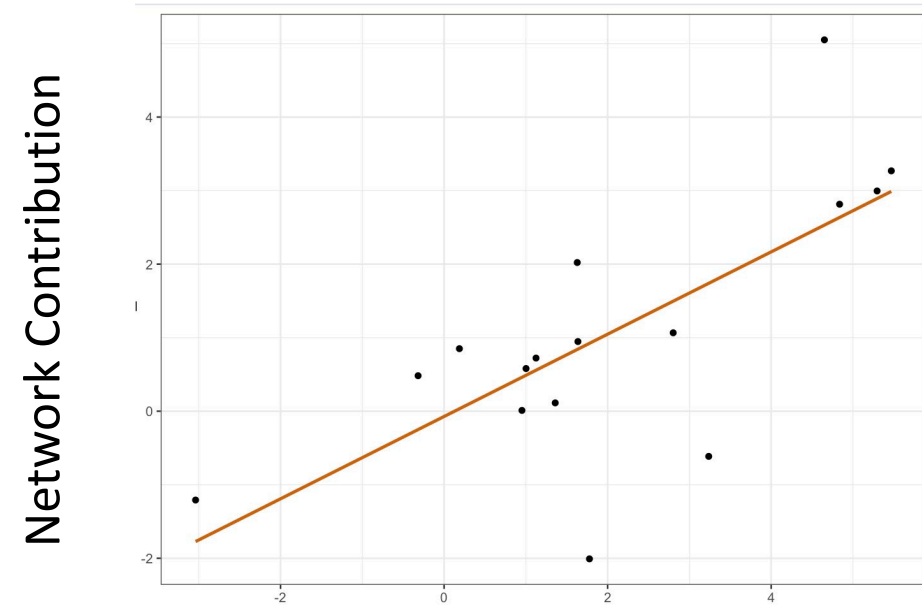
Hairy vetch



Yellow Star-thistle

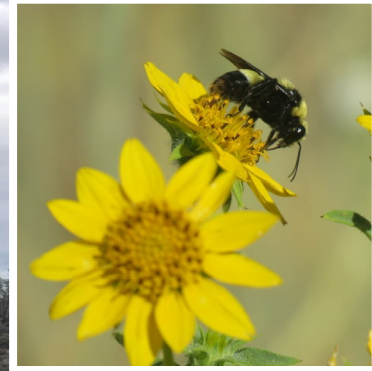


Invasive to Native Plant Ratio



Invasive to Native Plant Ratio

# Pollinator spillover tracks plant abundance



serpentine grassland



invaded grassland





# High Ratio of Invasive Plant to Native Plant



# Low Ratio of Invasive Plant to Native Plant





**Serpentine Grasslands are refugia but exist within patchy landscapes.**

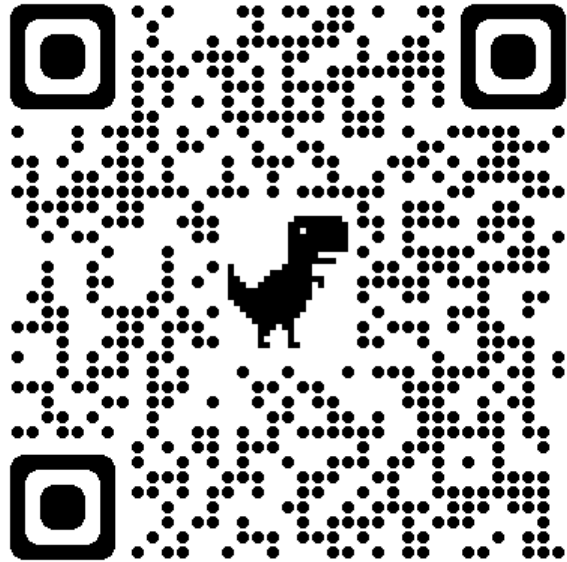
# Management Implications

- Considering patchiness
- Considering relative plant abundance



# Questions? Contact [becca.nelson@usu.edu](mailto:becca.nelson@usu.edu)

Website &  
SciComm



Thank you for listening!

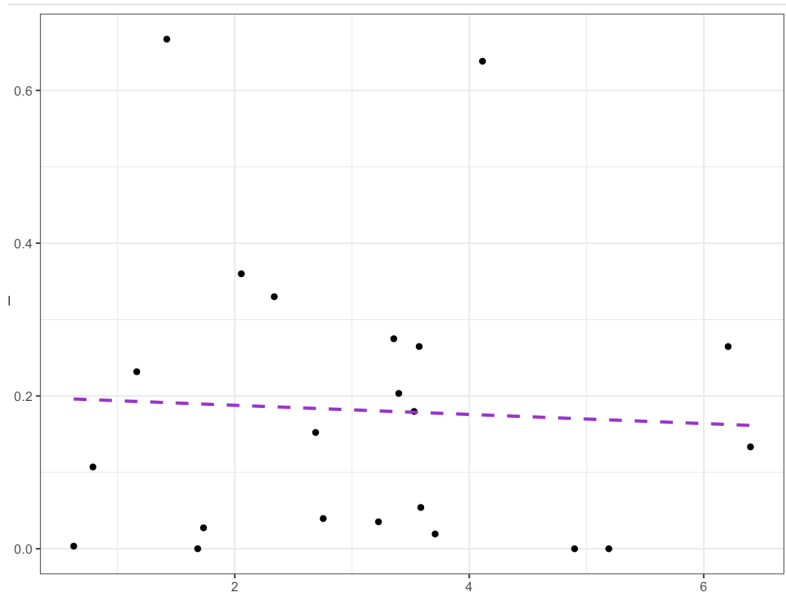


# 3. Plant Pollinator Networks



Hairy vetch

Indirect Effect on Native Plant

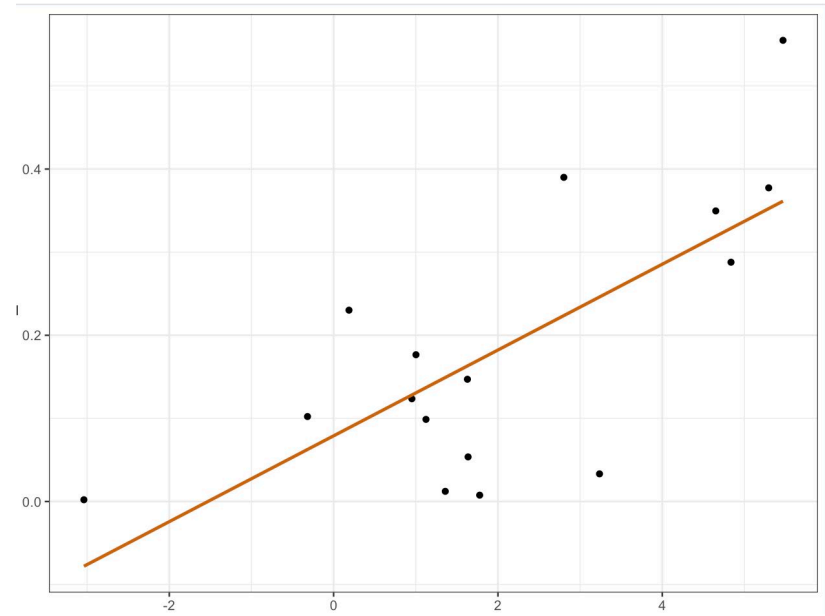


Invasive to Native Plant Ratio



Yellow Star-thistle

Indirect Effect on Native Plant



Invasive to Native Plant Ratio