

A pollinator paradox: weedy wildflowers support native pollinators under global changes



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Acknowledgments

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This research took place on the unceded, ancestral lands of the Patwin, Wappo, Pomo, Miwok, Shóqowa and Mono peoples.



Protecting nature. Preserving life.TM



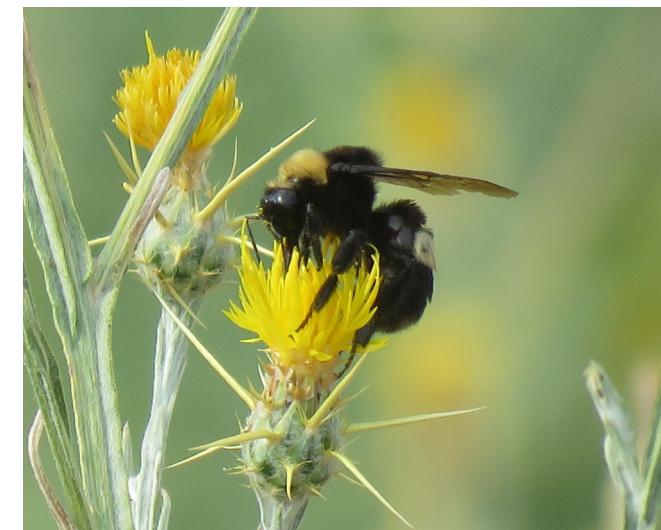
**Hopland
Scholars
Fund**



Irene Brown Memorial Fund



The Paradox of Invasive Wildflowers



...but invasional meltdowns



Testing a Paradox



**Biological
Invasions**

Testing a Paradox

**Nutrient
Enrichment**



**Biological
Invasions**

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Defaunation

**Biological
Invasions**

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Invasions**

Defaunation



Borer et al. 2020 *Nature Communications*;
Nelson et al. 2025
Communications Biology

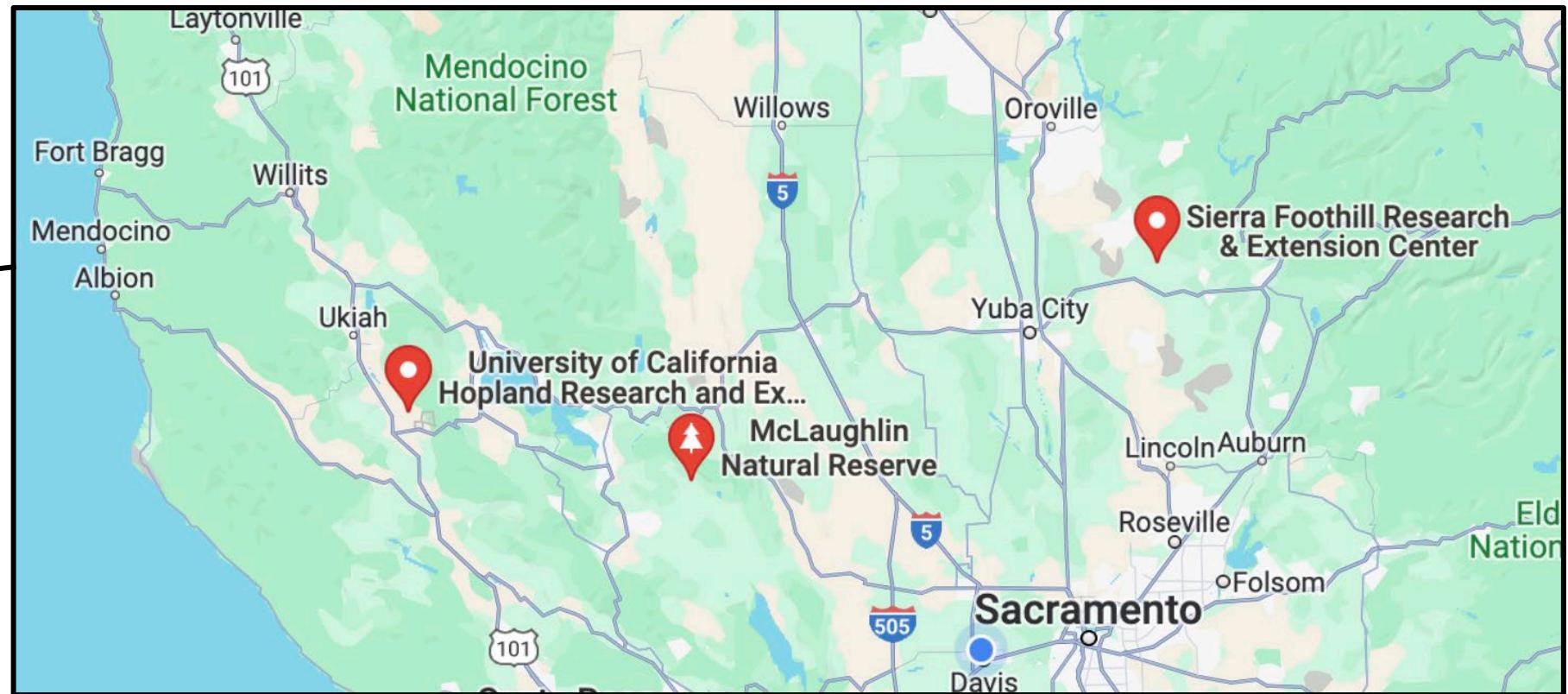
Do exotic wildflowers compensate pollinators for losses of native wildflowers under nutrient enrichment and defaunation?



The California Floristic Province: A Global Biodiversity Hotspot



Study Sites



Nutrient Network Experimental Design



Fence



Fence +
NPK μ



NPK μ



Control



Nutrient Network Experimental Design



Fence



Fence +
NPK μ



NPK μ

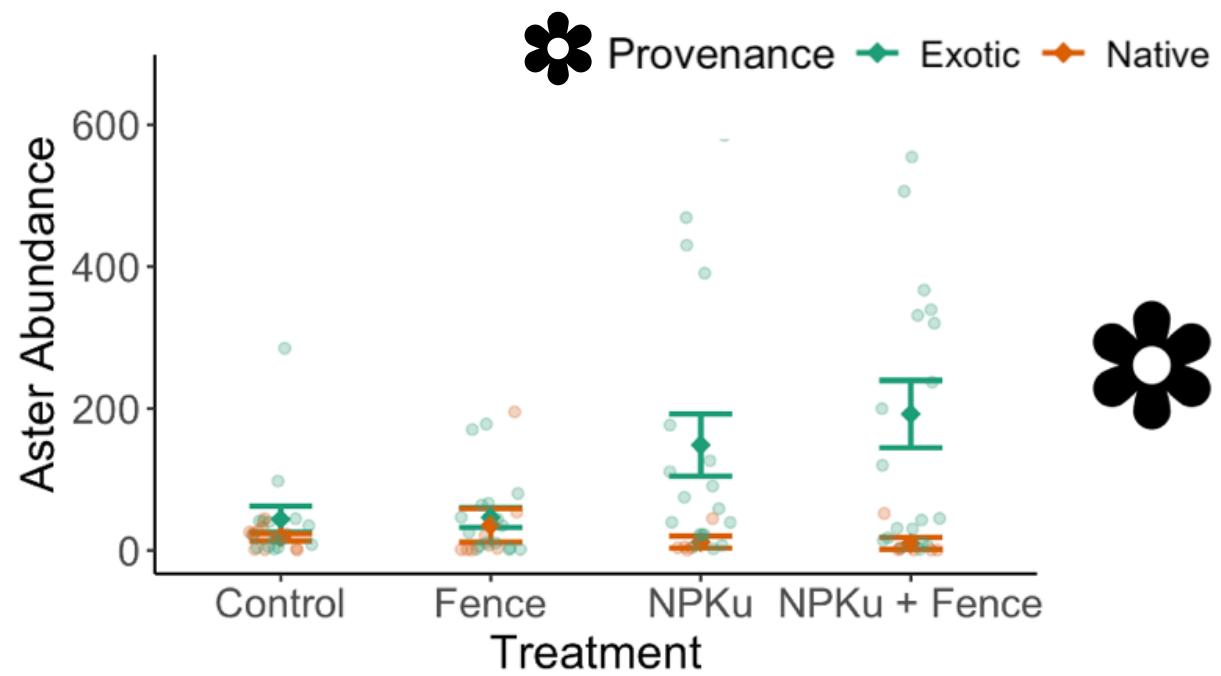
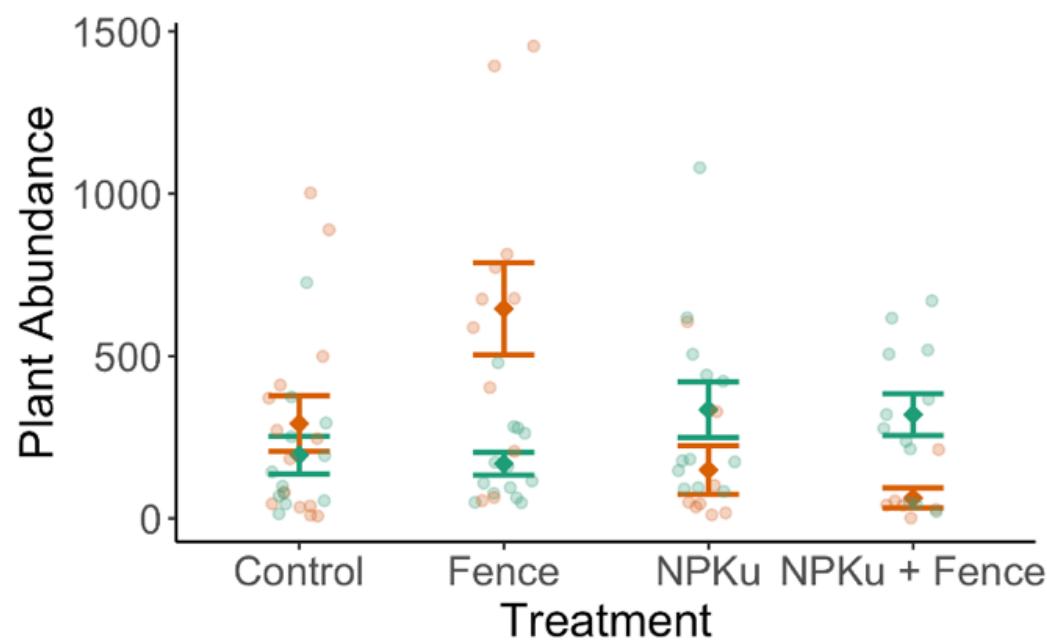
Control



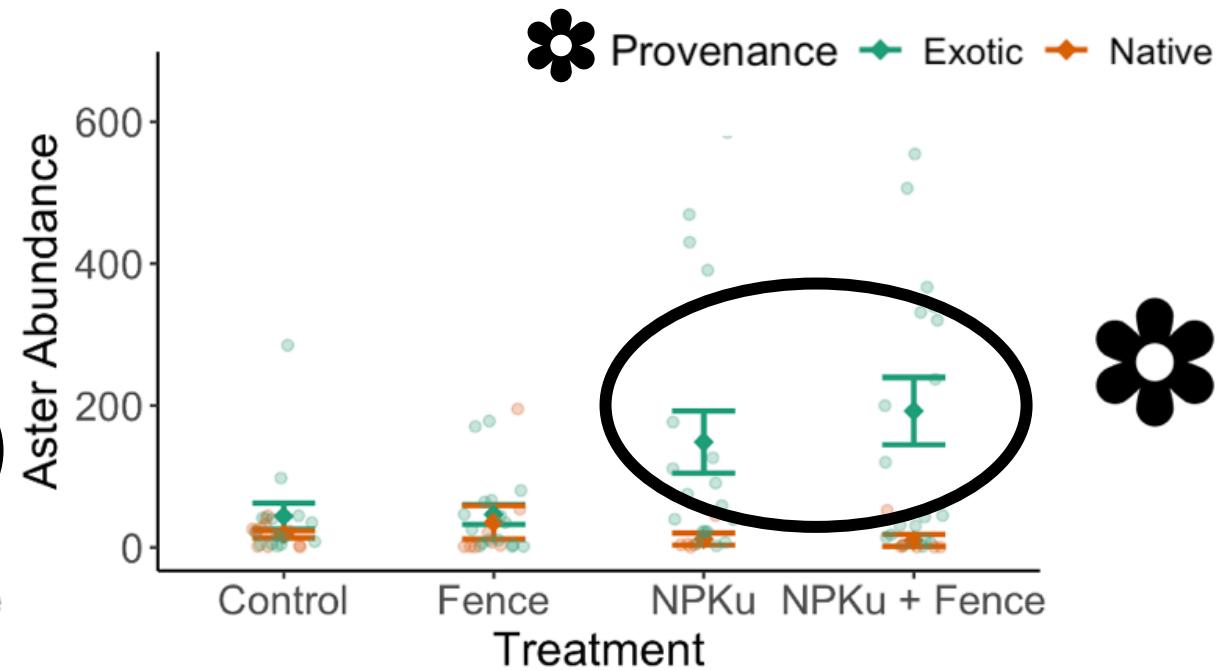
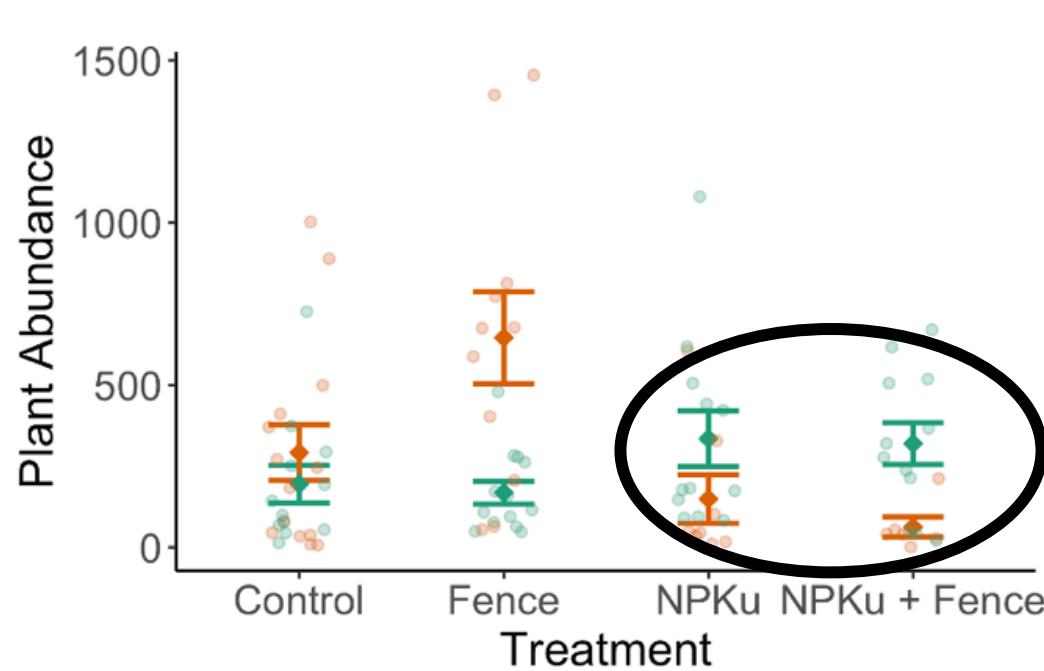
Surveys of **floral visitation & floral abundances** throughout season for two years

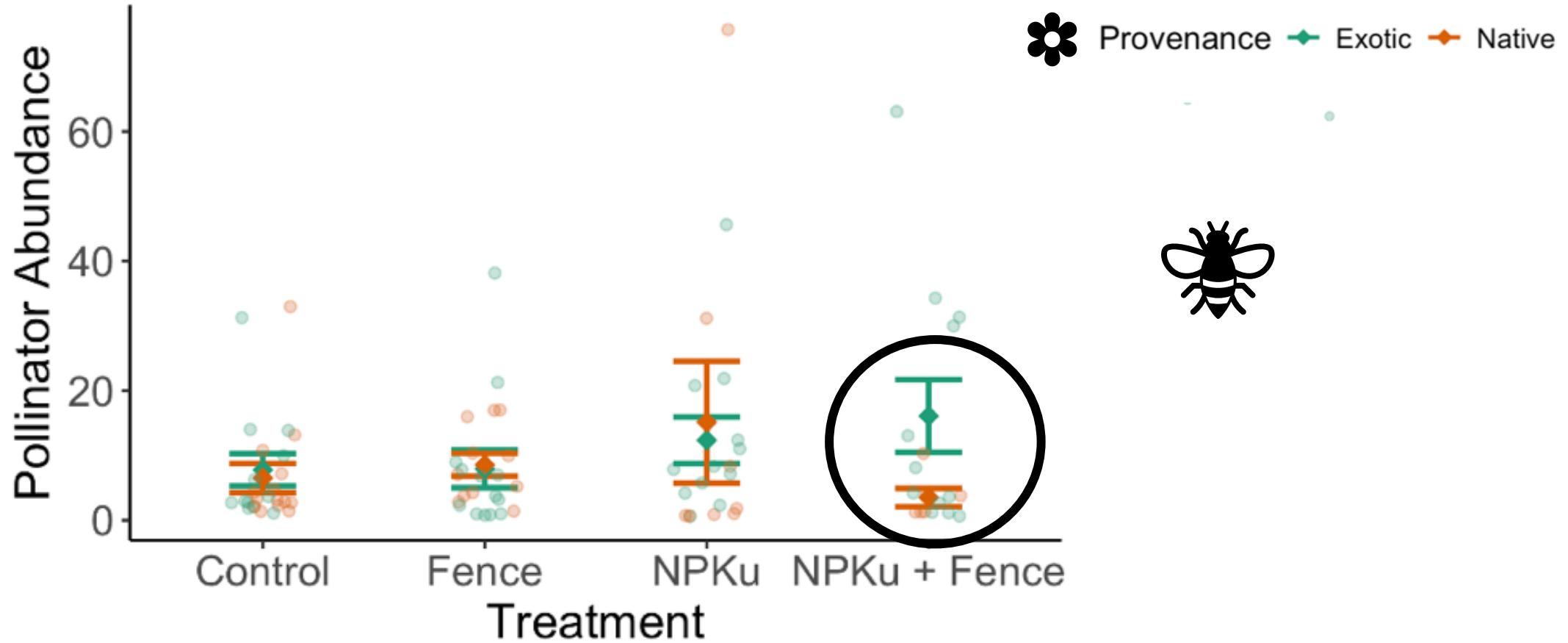


Results

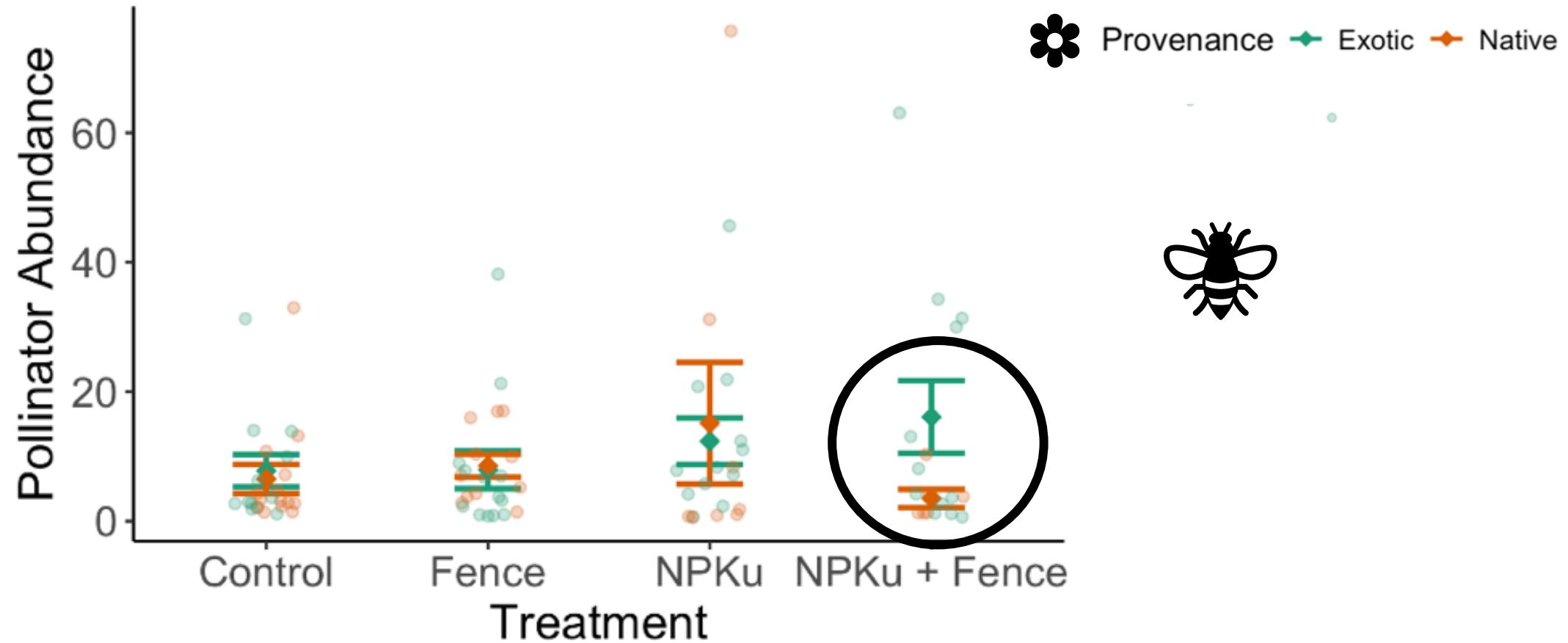


Nutrients increase exotic wildflower abundance, especially asters.

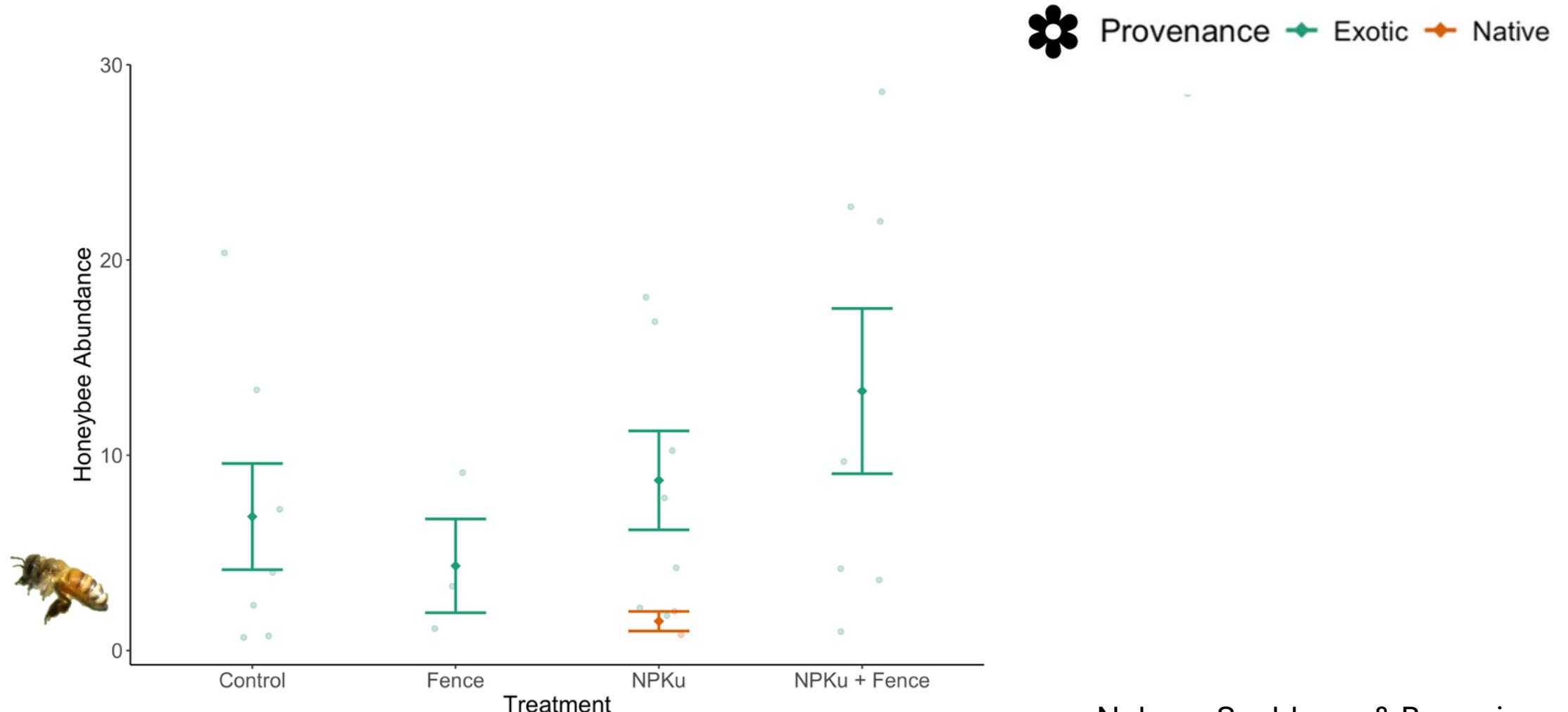




Native pollinators shift from native to exotic wildflowers combined nutrients & fencing.

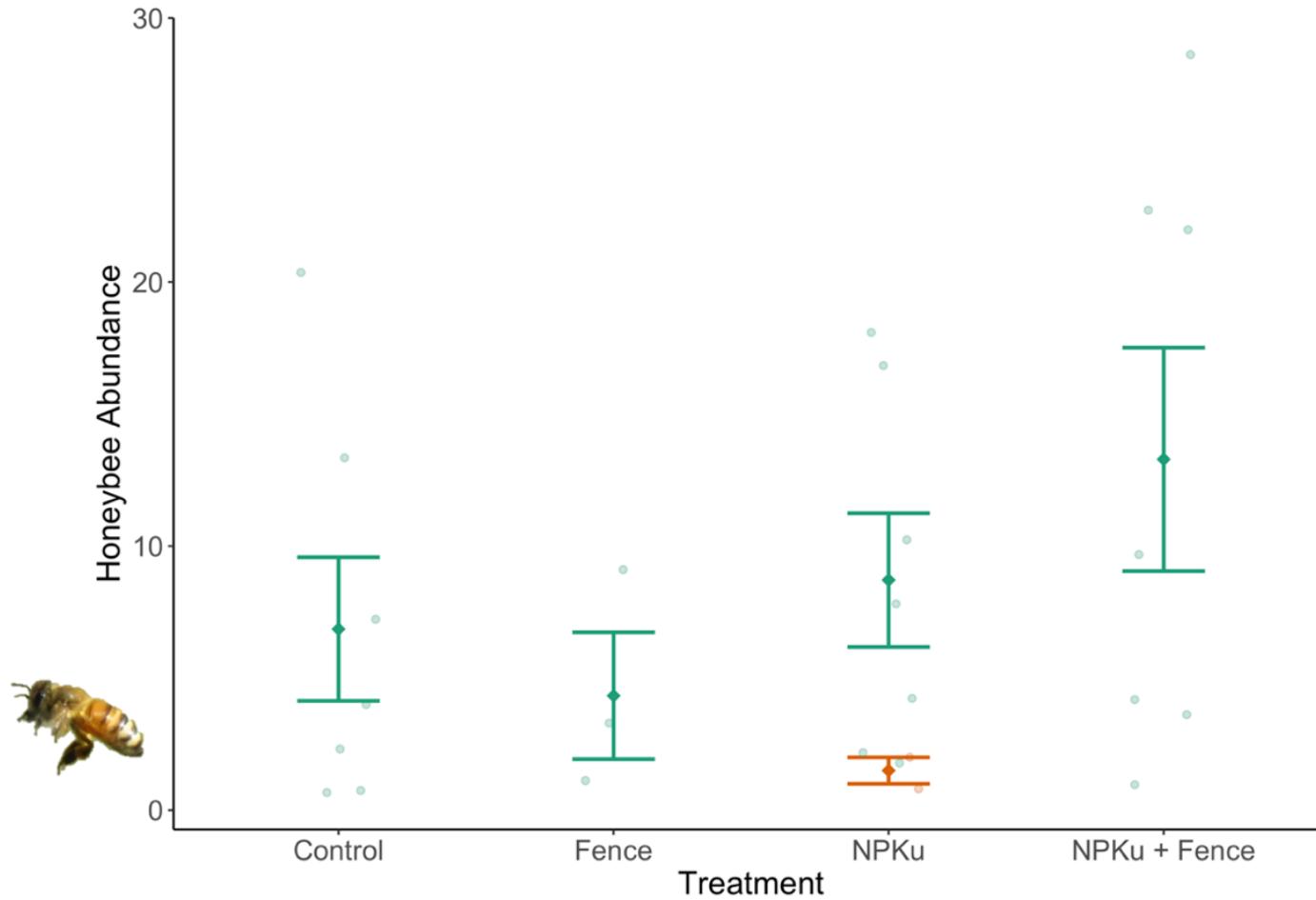


Invasional meltdowns may happen as well.



Nelson, Seabloom & Borer, *in revision*
Ecosphere

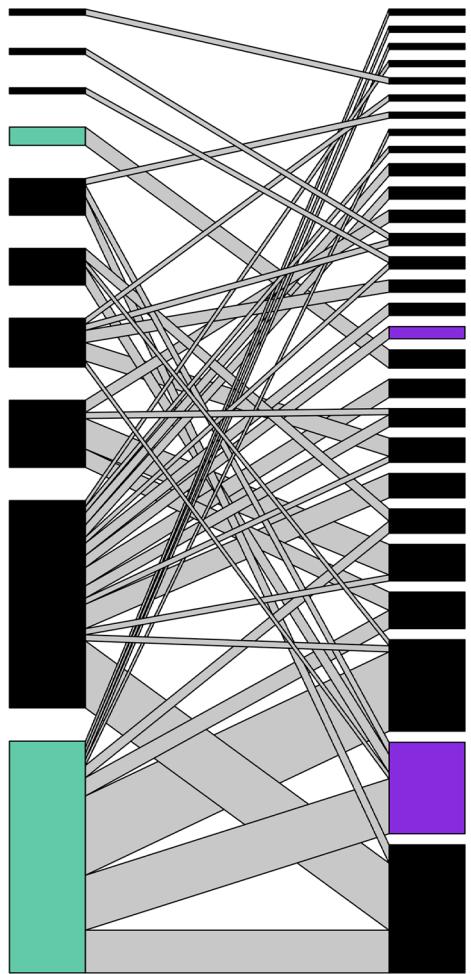
Invasional meltdowns may happen as well.



Provenance  Exotic Native



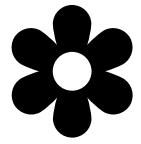
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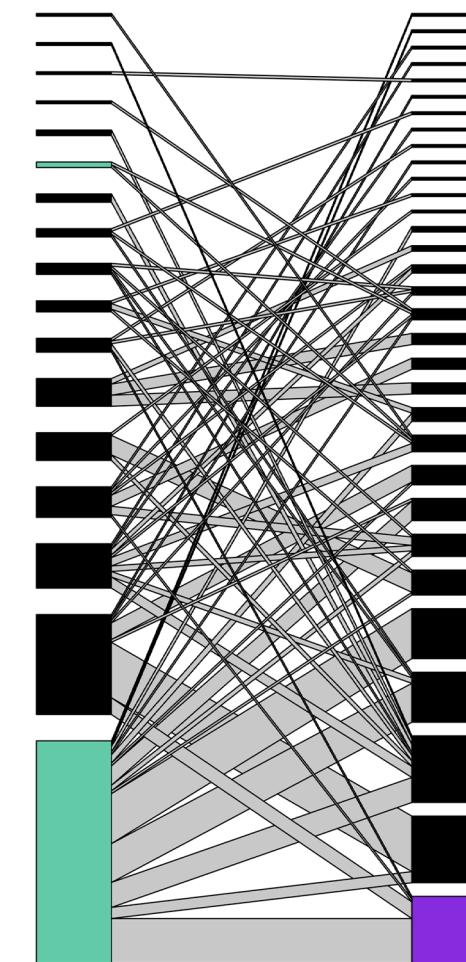
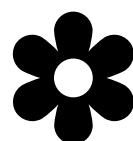
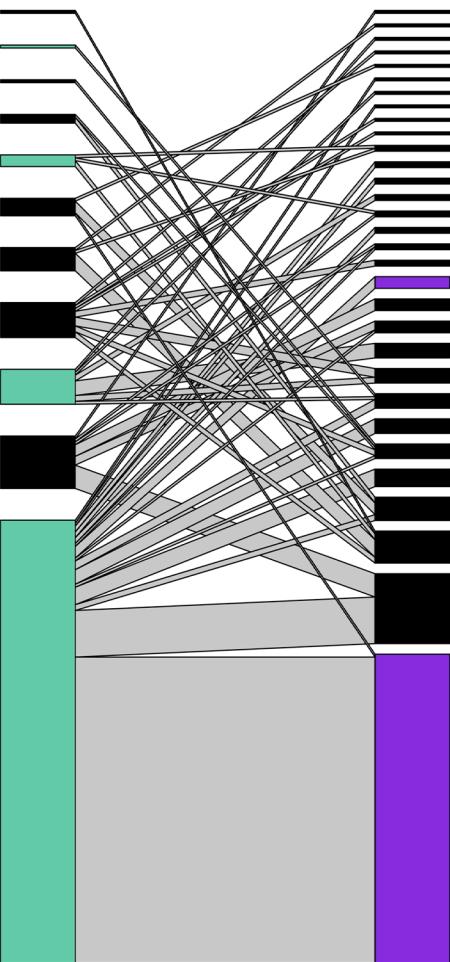
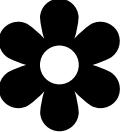
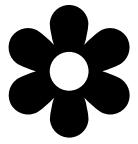
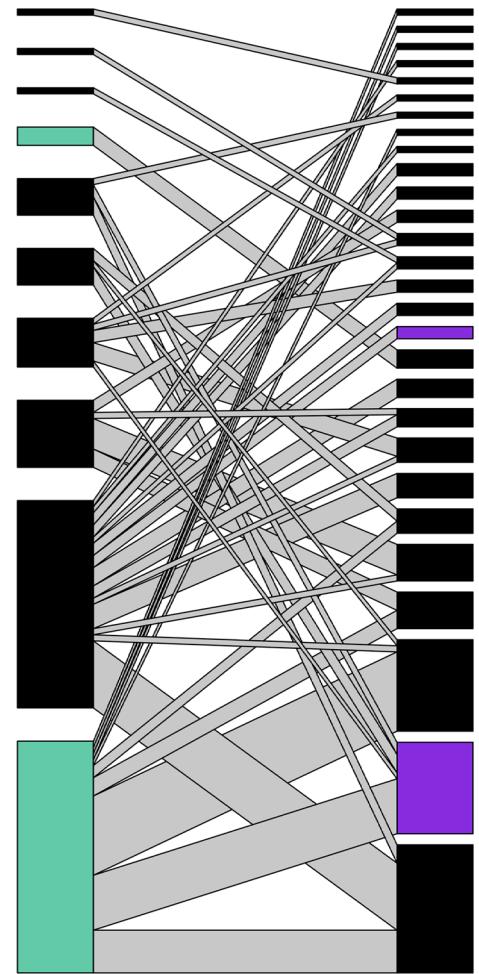


Exotic
Asters



Exotic
Bees

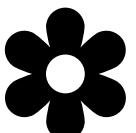
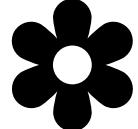
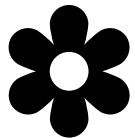
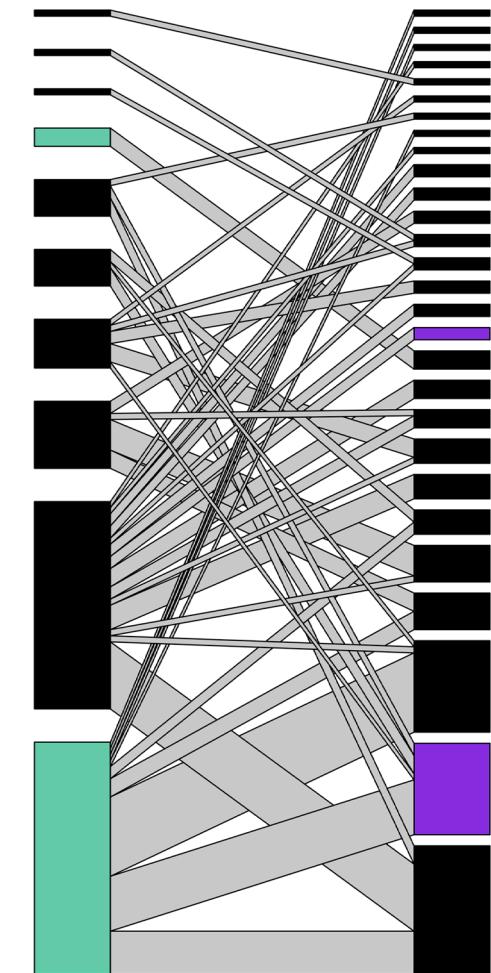




Exotic
Asters

Exotic
Bees

Invasive asters act as core network hubs.

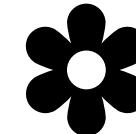
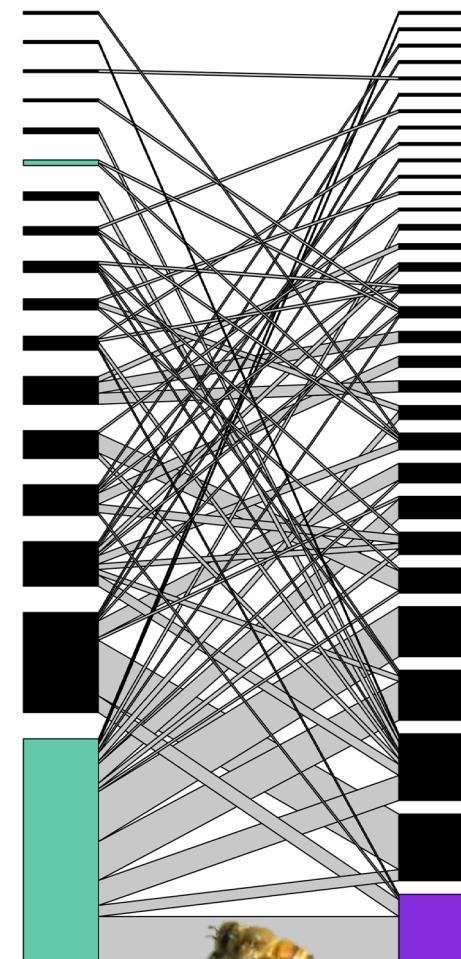
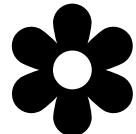
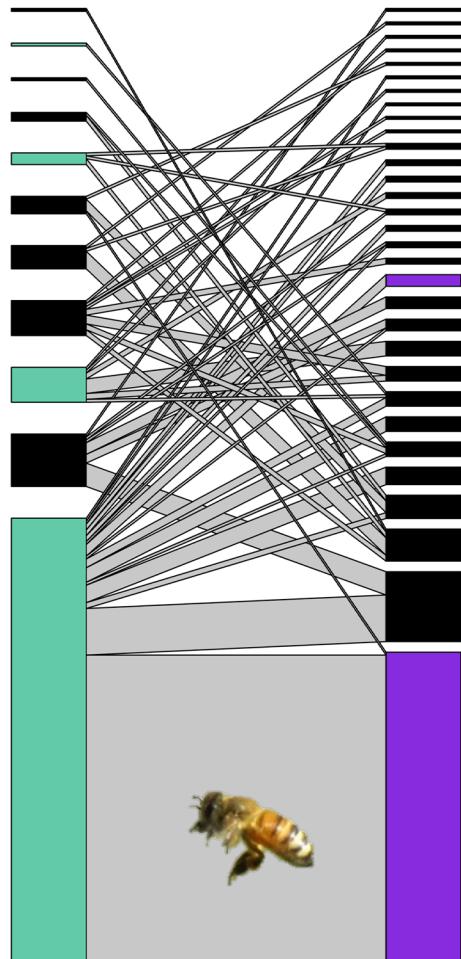
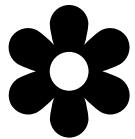
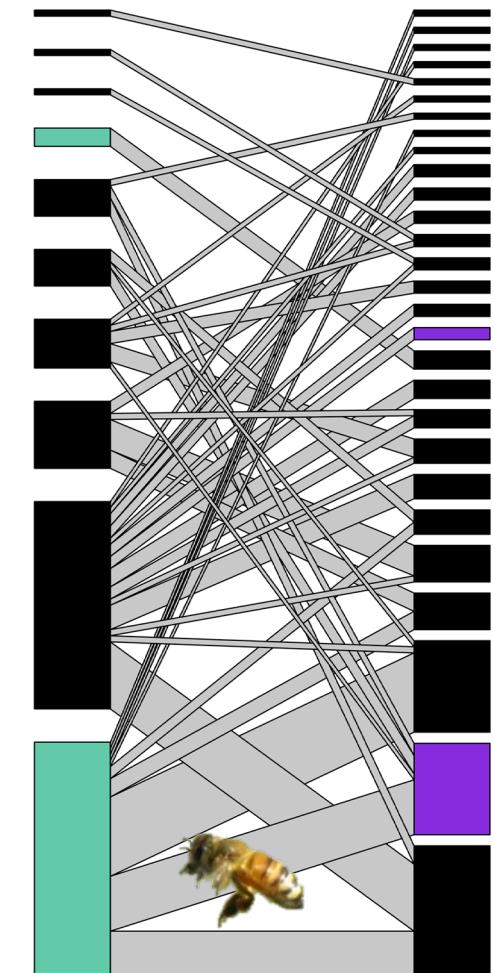


Exotic
Asters



Exotic
Bees

Invasive asters act as core network hubs.



 Exotic
Asters

 Exotic
Bees

Key Takeaways



Centaurea solstitialis



Carduus pycnocephalus

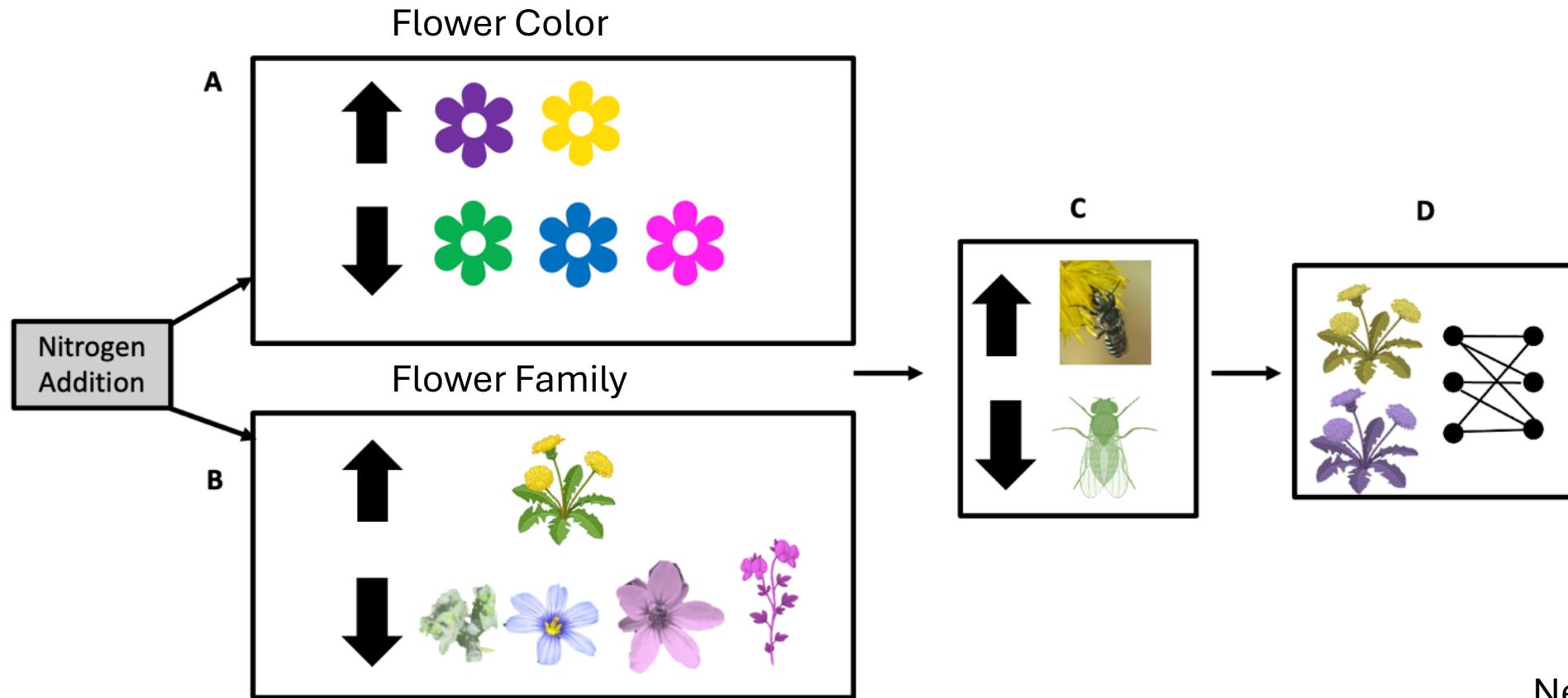
- Exotic asters pose a paradox by supporting native pollinators as network hubs
- But exotic asters also attract exotic pollinators.

Management Implications



- Pairing invasive wildflower removal with the **restoration of pollinator-friendly native wildflowers**
- Reduce nutrient pollution
- Rewilding of large mammalian herbivores

A Loss of Floral Trait Diversity



Nelson, Borer &
Seabloom 2025,
Ecology & Evolution

Thank you!



Questions? nels1128@msu.edu

Global Wildflowers



Nelson et al. 2025,
*Communications
Biology*

Pollinator Paradox



Nelson, Seabloom &
Borer, *in revision*
Ecosphere

Floral Traits

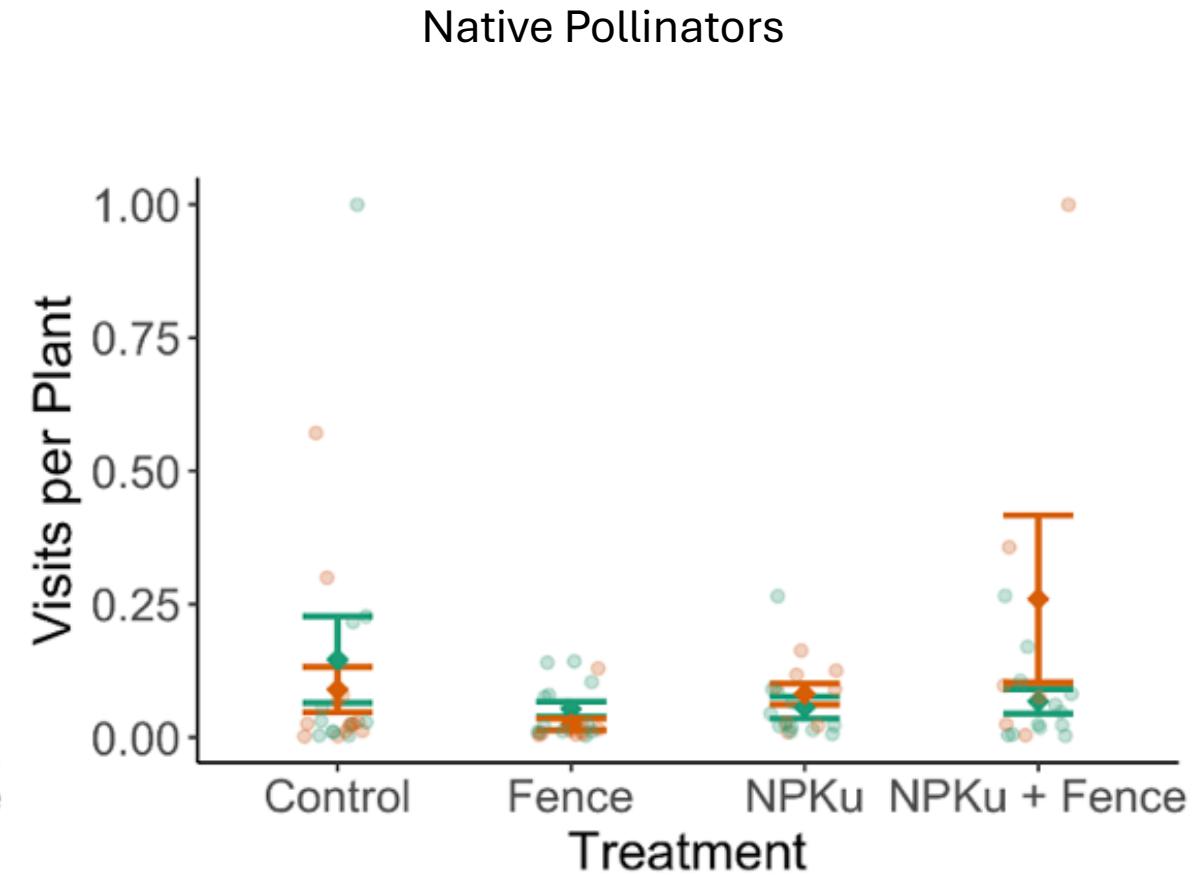
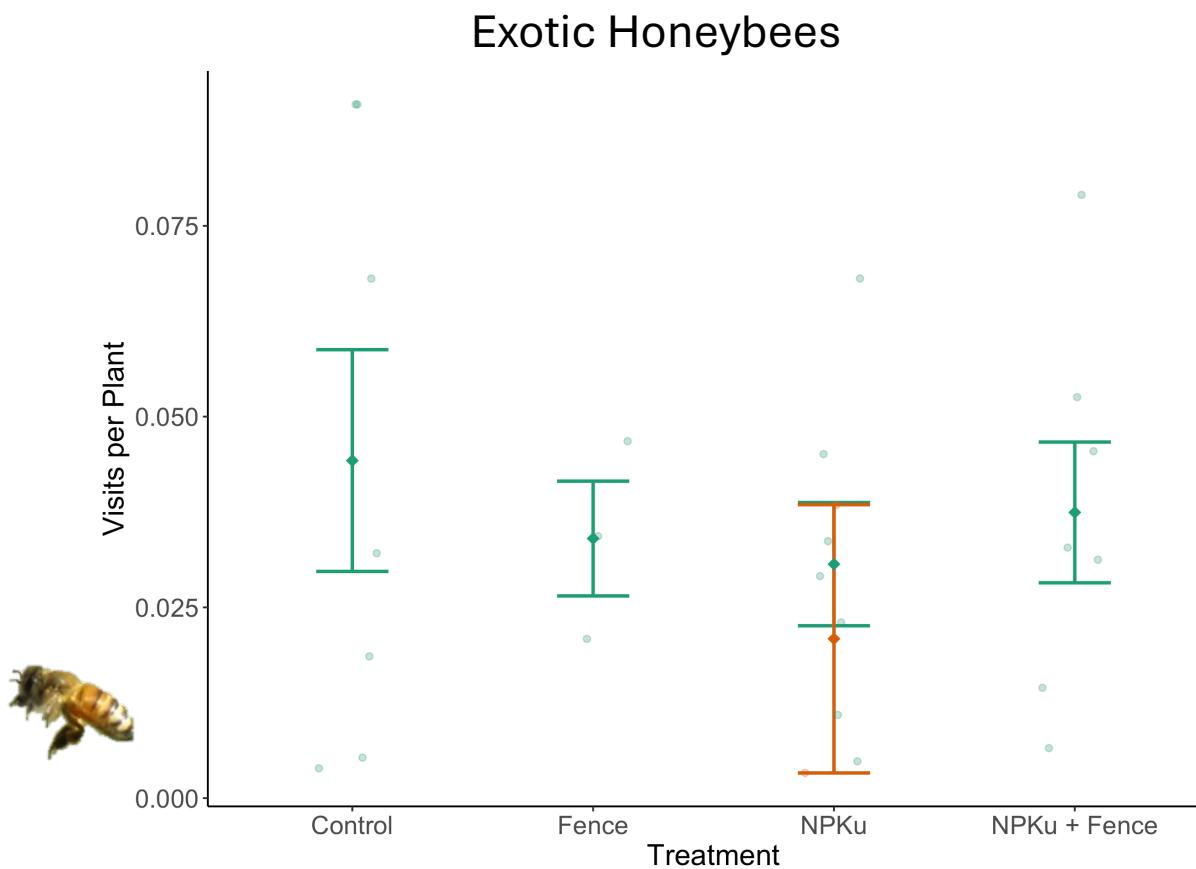


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Ecology & Evolution

Per Plant Visits



Provenance  Exotic  Native



Website

