

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



Dr. Rebecca A. Nelson
Michigan State University,

Dr. Eric Seabloom &
Dr. Elizabeth Borer
University of Minnesota



nels1128@msu.edu

Collaborators



Dr. Eric Seabloom
University of Minnesota



Dr. Elizabeth Borer
University of Minnesota

Acknowledgments

Wolter, K.T. Lynch, S. Tantuico, N.T. Tat, A. Karp, A. Appelgate, Z. Schneider and R. Li for assistance in the field; I. Slette, P. Wilfahrt, and A. Krause for assistance with data; and C. Koehler and P. Aigner (University of California McLaughlin Reserve), J. Bailey and G. Solberg (Hopland UC Research and Extension Center), and M. Flavell and A. Northup-Warner Sierra Foothills UC Research and Extension Center) for maintaining field sites and facilities. J. Cancela, L. Carvalho, & H. Olde-Venterink for add-on protocol. T. Zavortink (Bohart Museum of Entomology) identified insect specimens. R. Dirzo, S. Harrison, and N. Williams provided feedback on this project.

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



Protecting nature. Preserving life.™



**Hopland
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Irene Brown Memorial Fund



The Paradox of Invasive Wildflowers



...but invasional meltdowns



Testing a Paradox



**Biological
Invasions**

Testing a Paradox

**Nutrient
Enrichment**



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Defaunation

**Biological
Invasions**

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Defaunation



**Biological
Invasions**

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

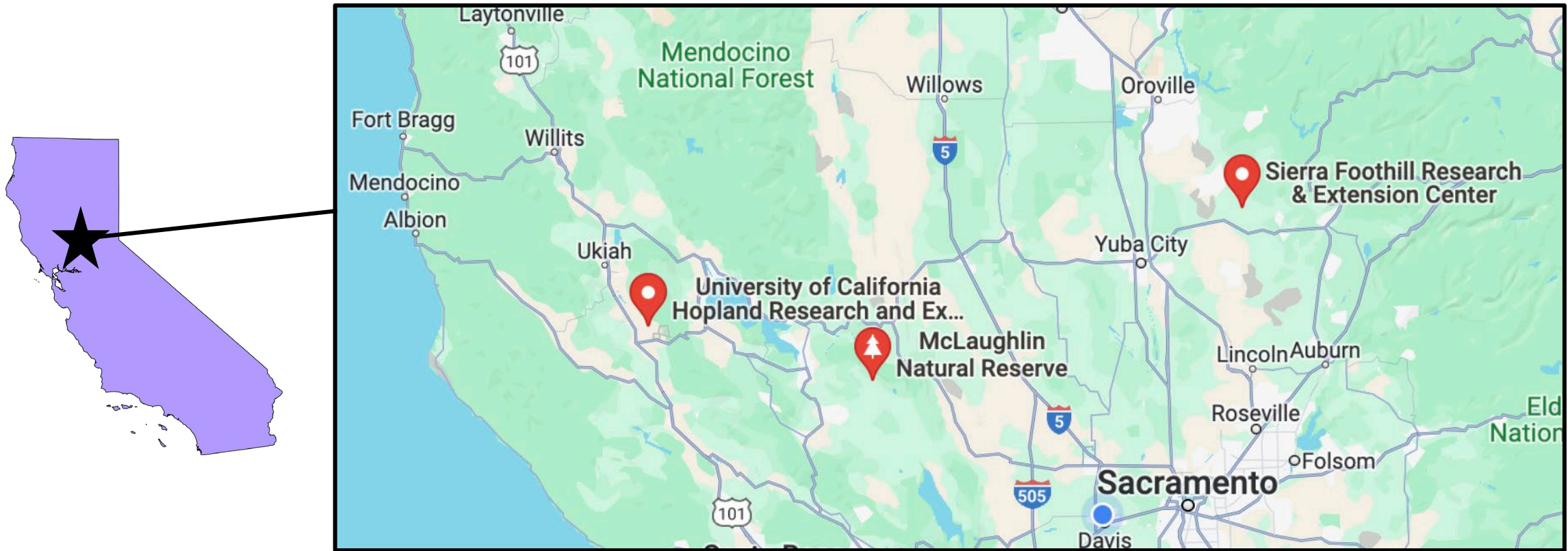
Do exotic wildflowers compensate pollinators for losses of native wildflowers under nutrient enrichment and defaunation?



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

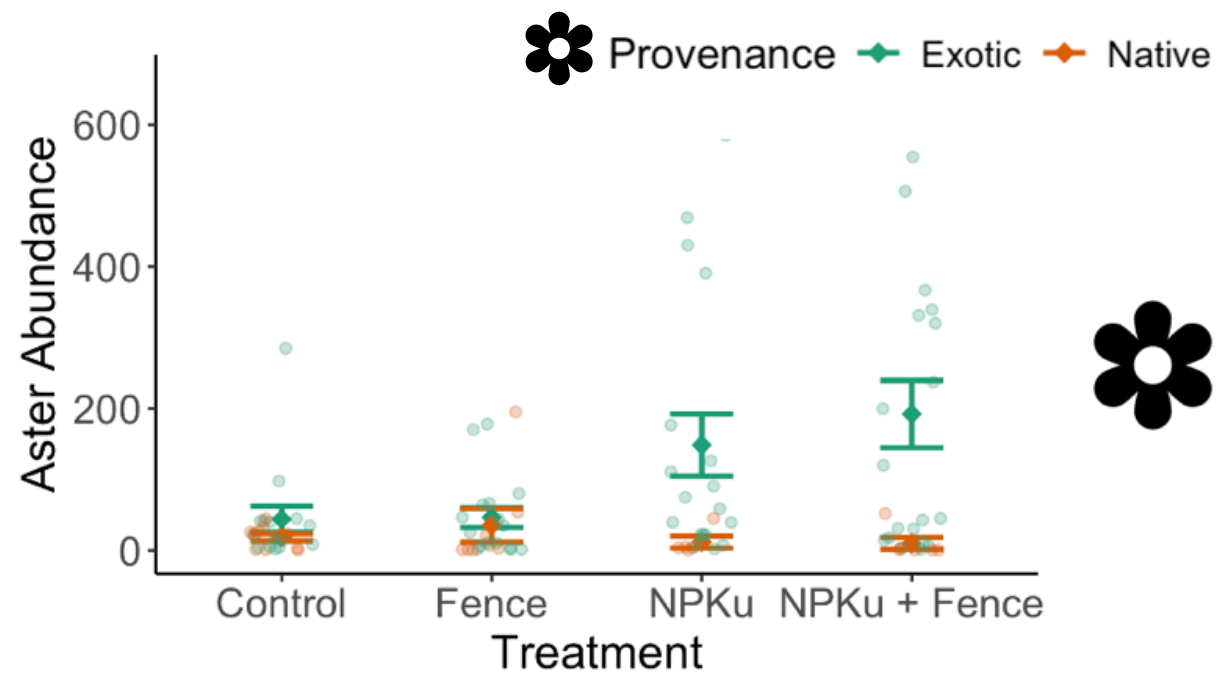
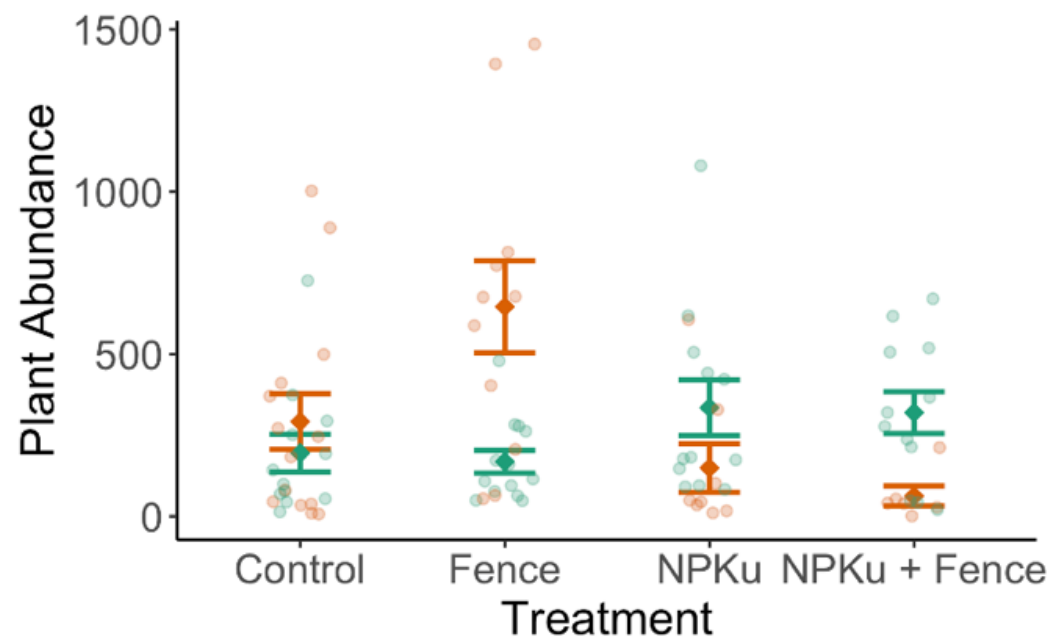
Control



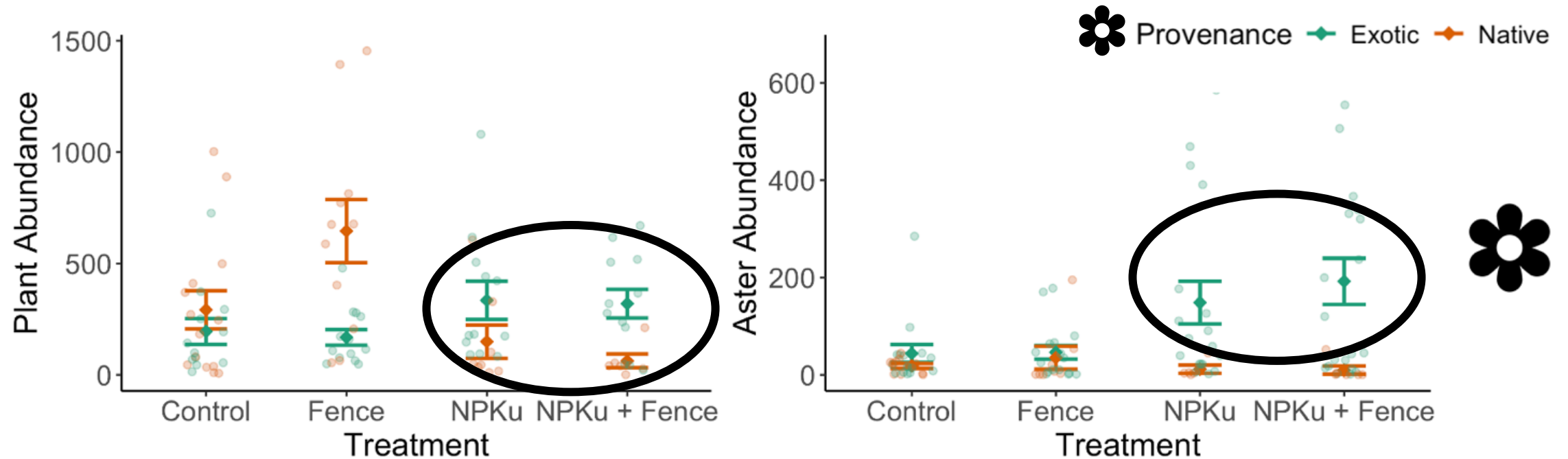
Surveys of **floral visitation** & **floral abundances** throughout season for two years

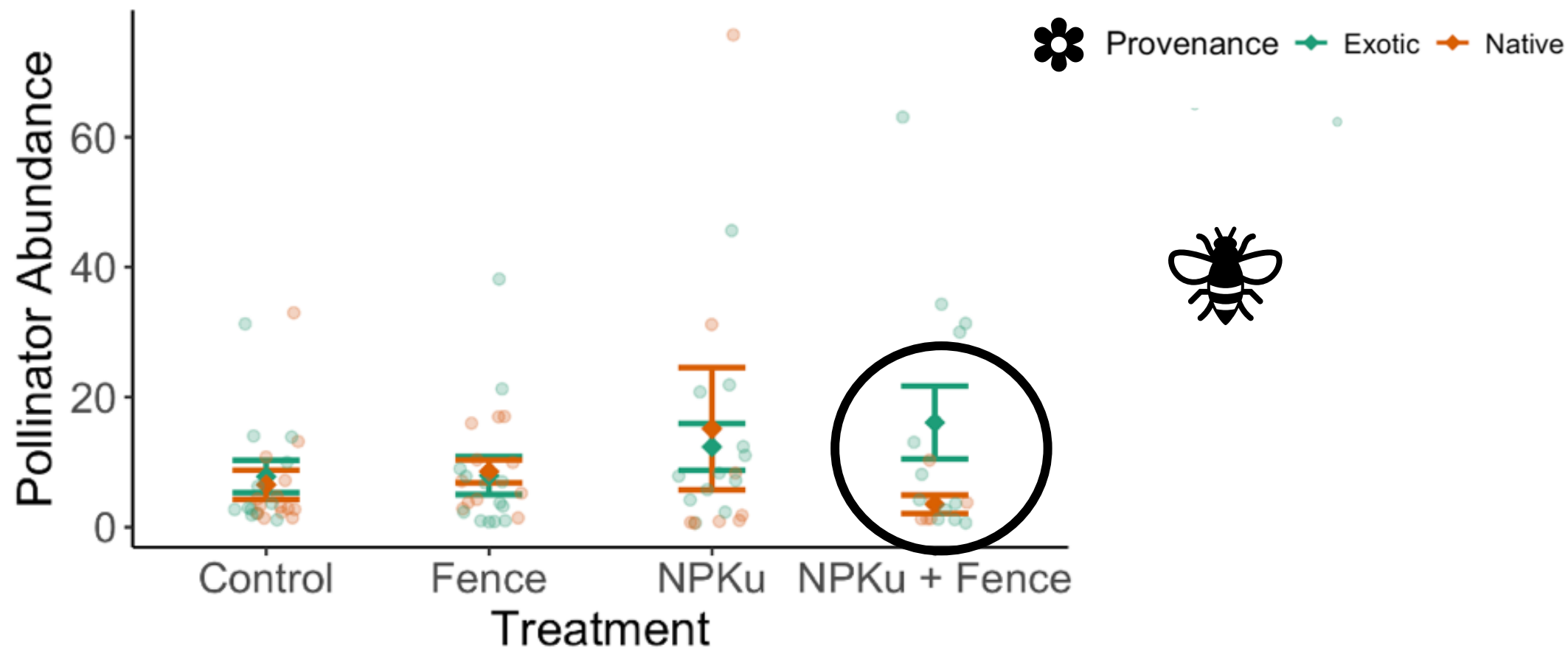


Results

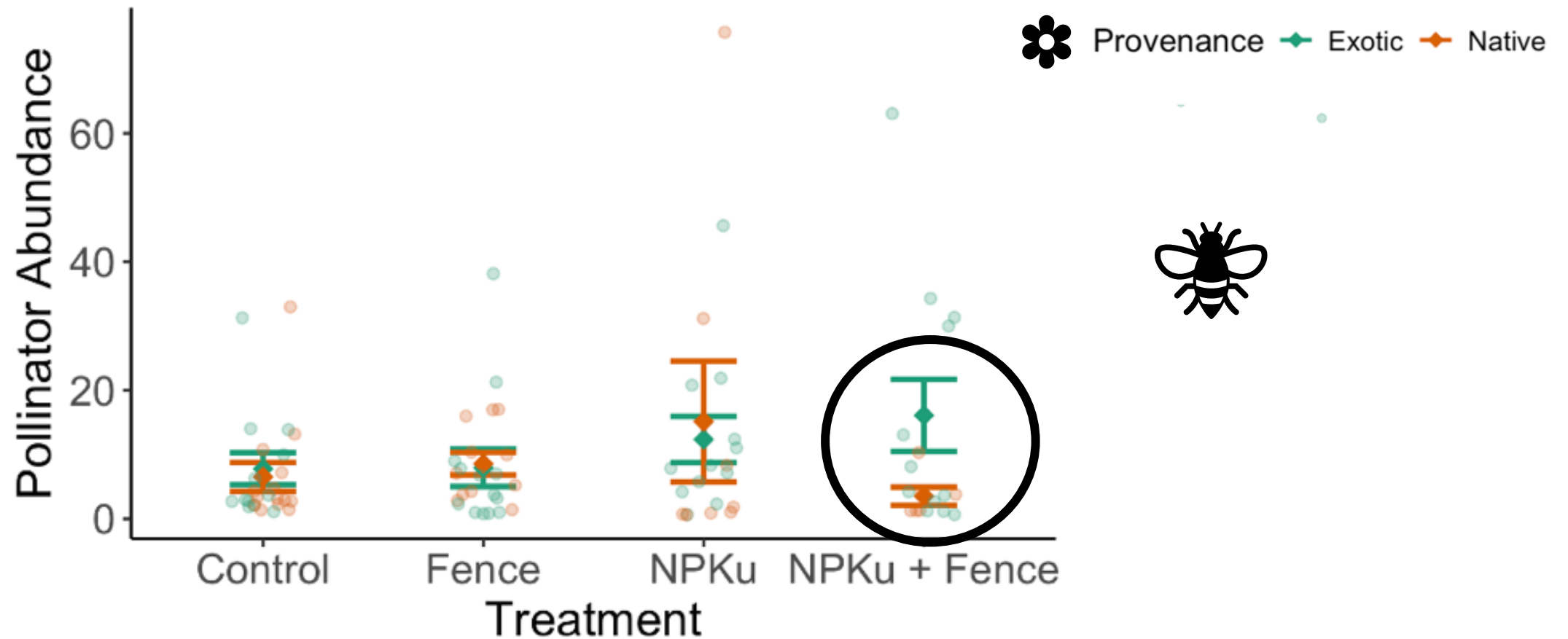


Nutrients increase exotic wildflower abundance, especially asters.

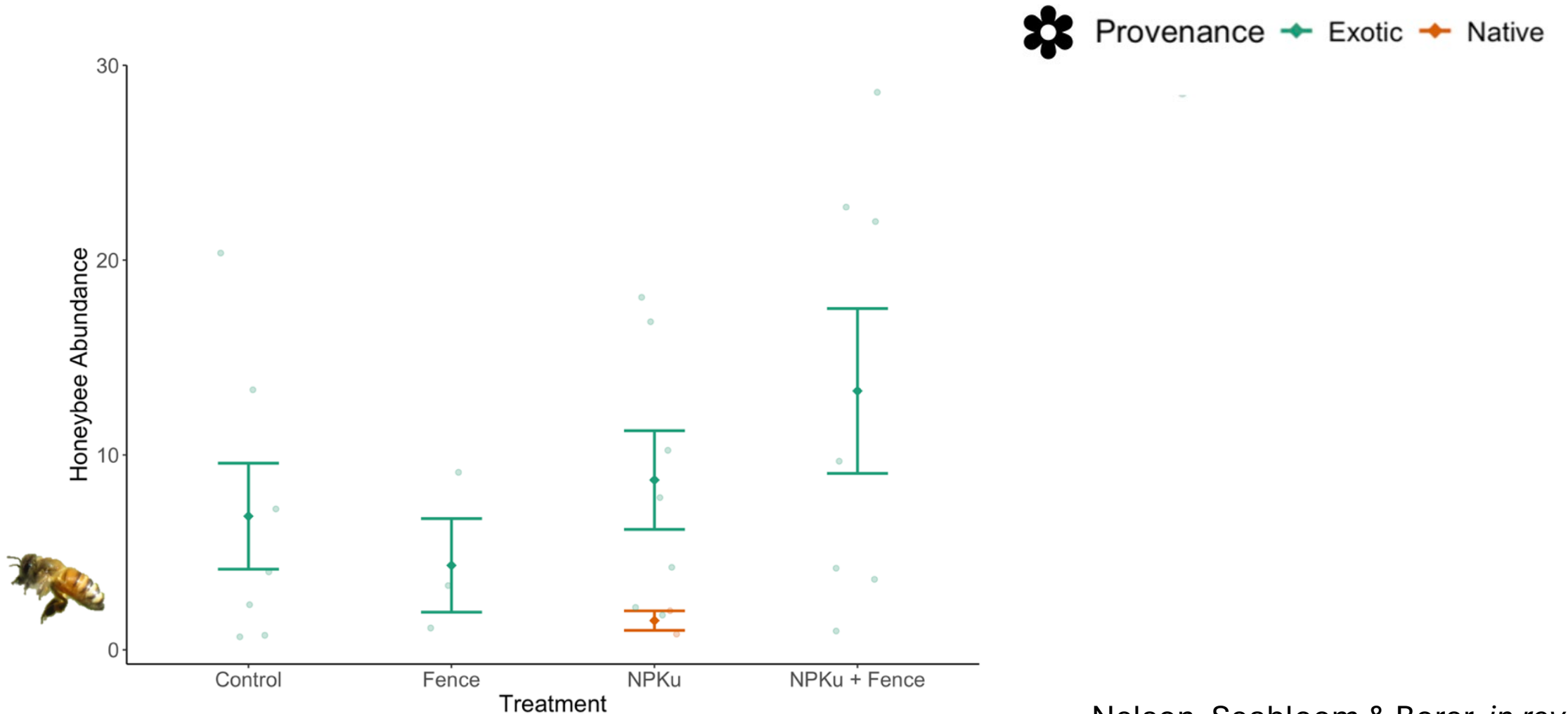




Native pollinators shift from native to exotic wildflowers combined nutrients & fencing.

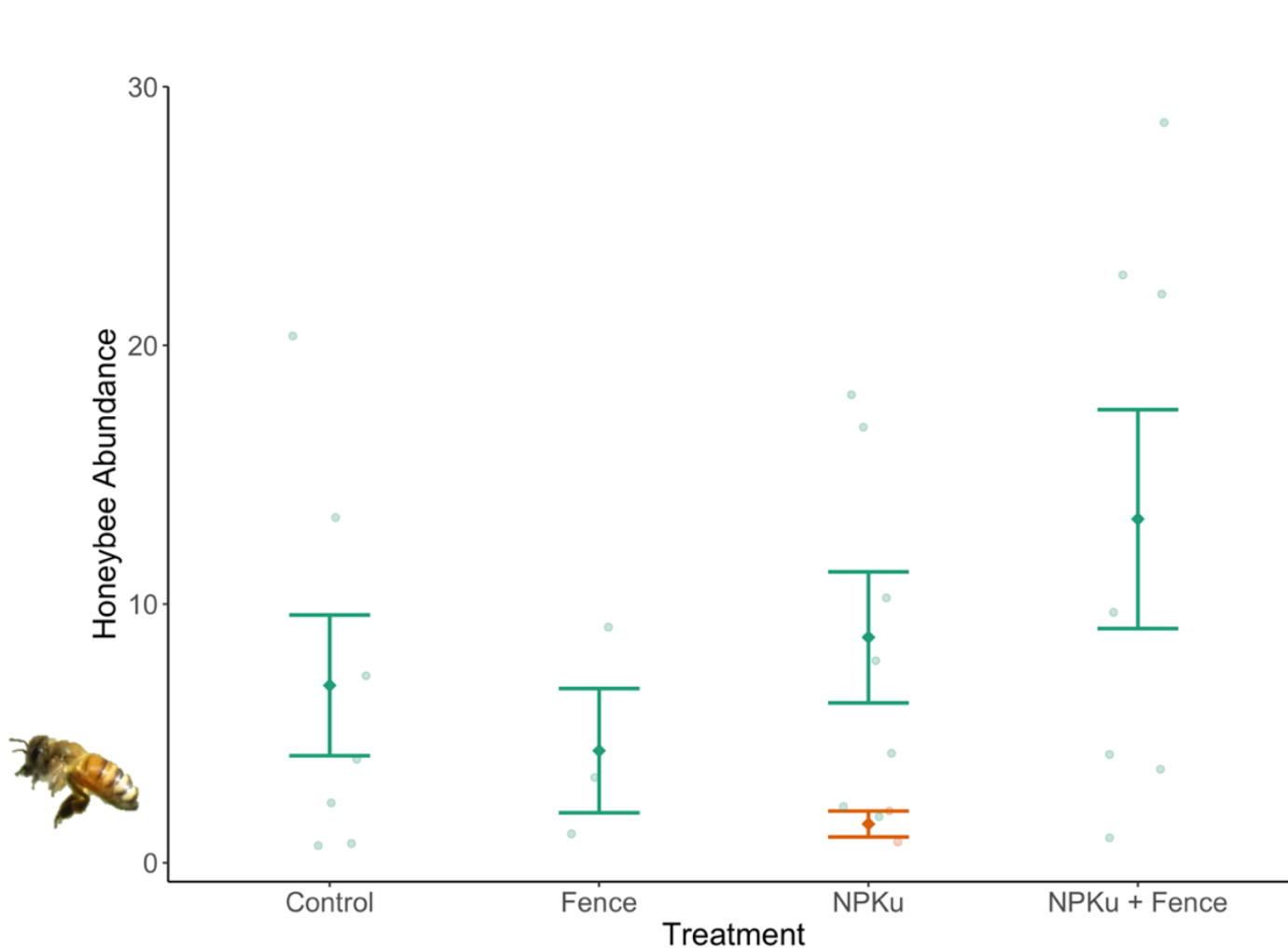


Invasional meltdowns may happen as well.



Nelson, Seabloom & Borer, *in revision*
Ecosphere

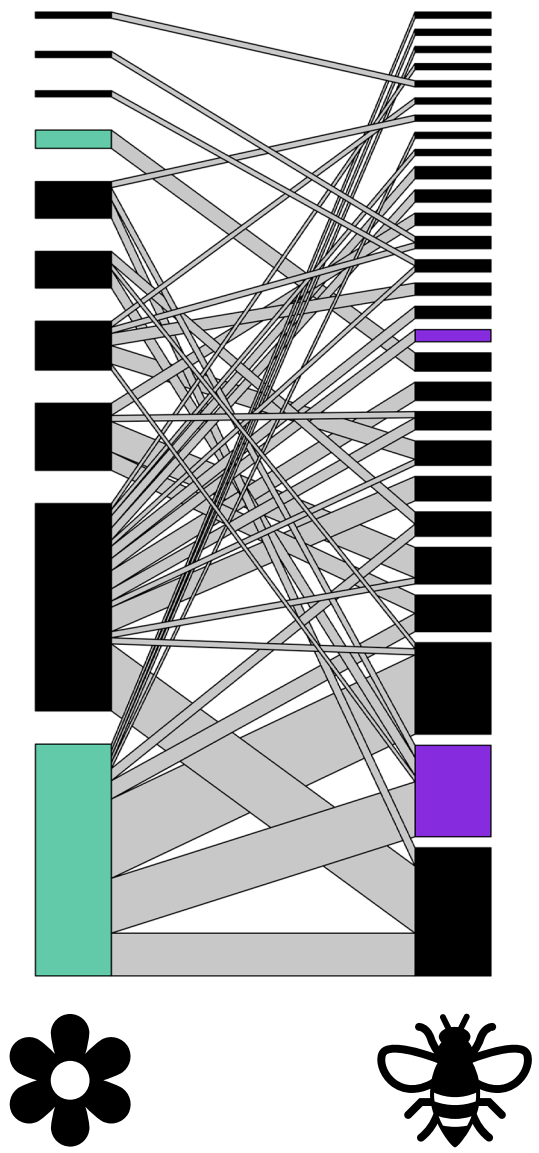
Invasional meltdowns may happen as well.



Provenance Exotic Native

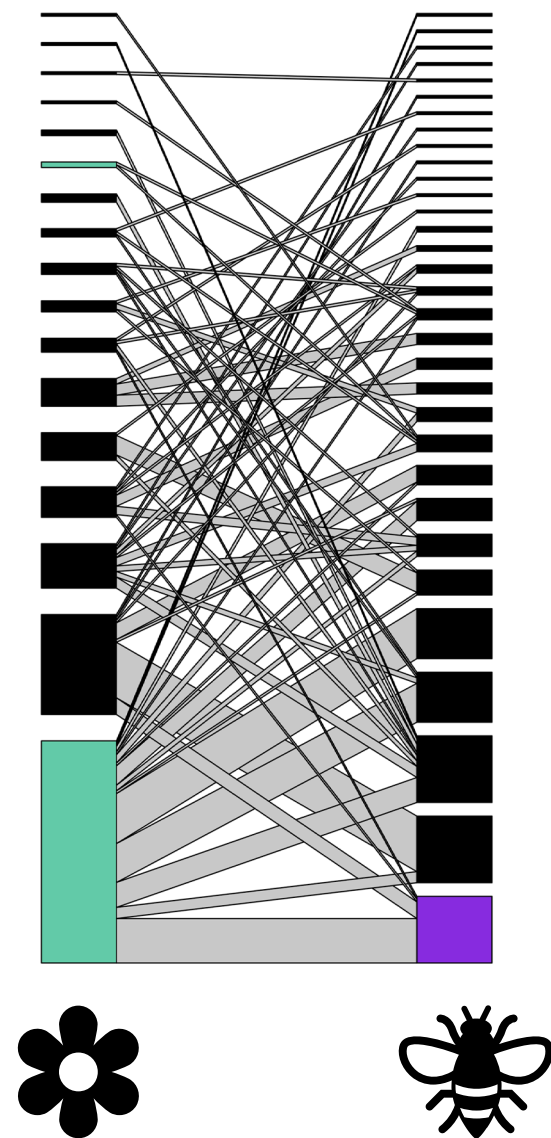
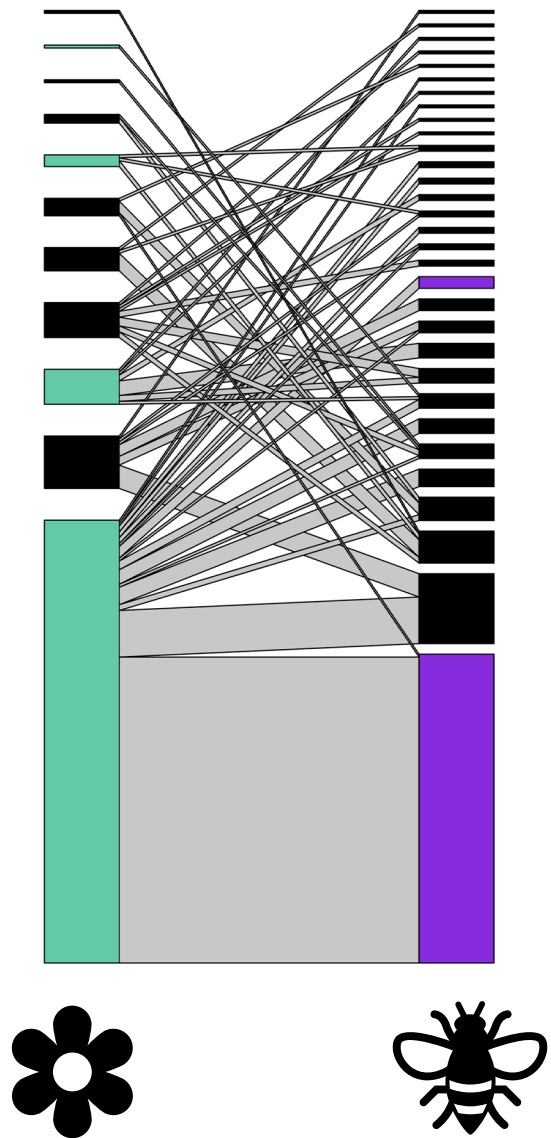
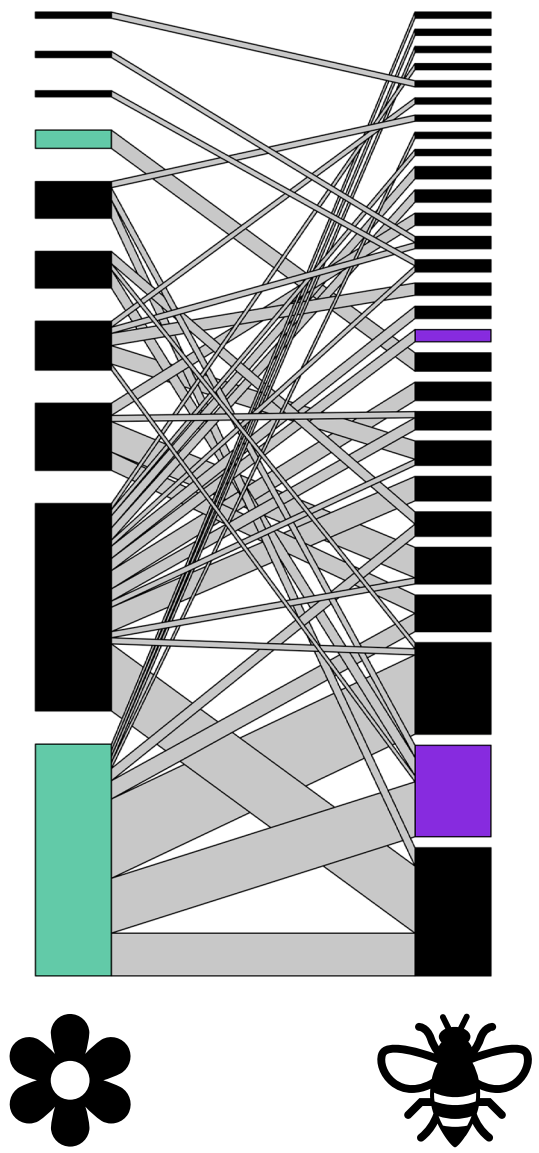


Nelson, Seabloom & Borer, *in revision Ecosphere*



 Exotic
Asters

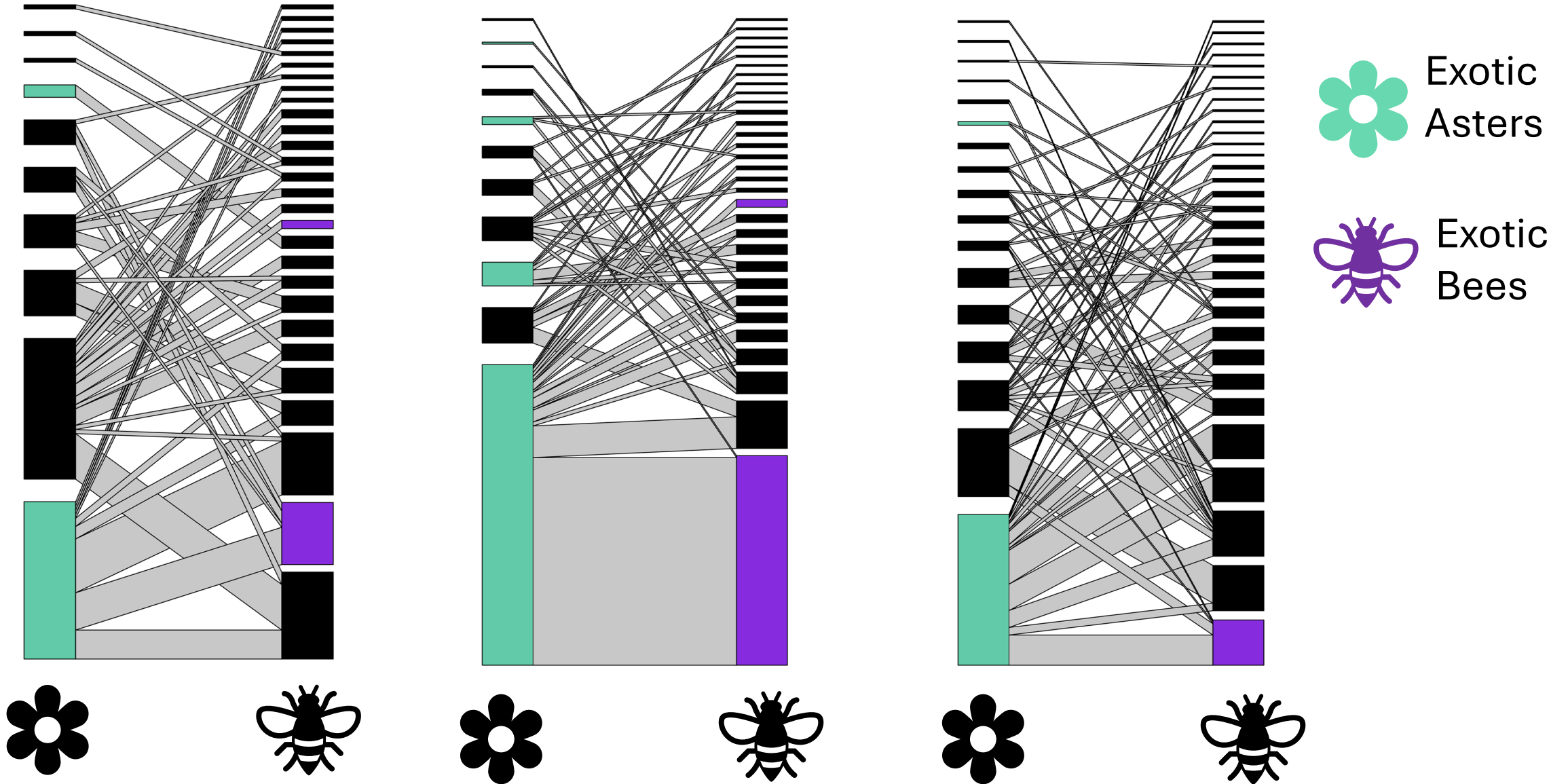
 Exotic
Bees



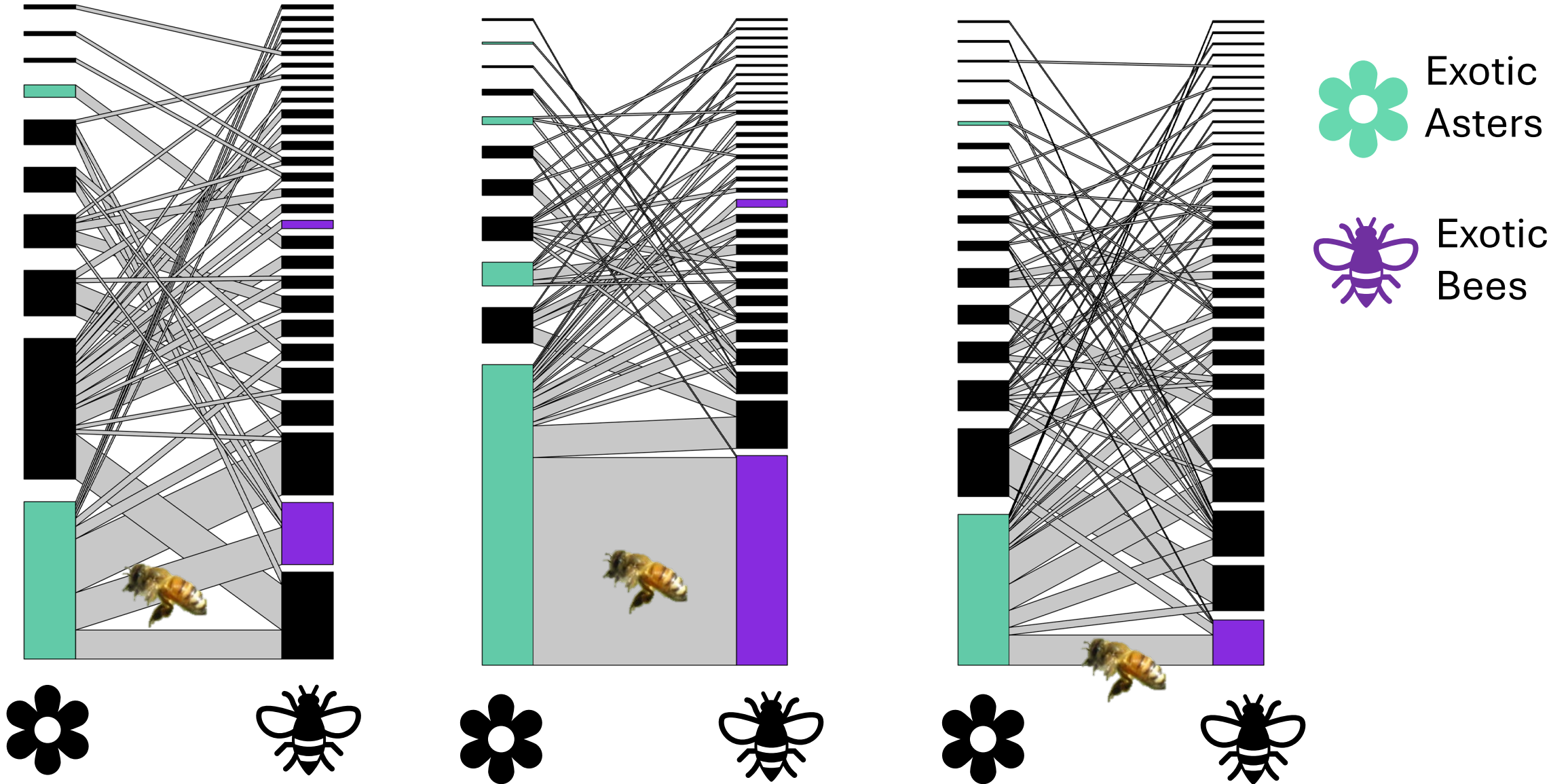
 Exotic
Asters

 Exotic
Bees

Invasive asters act as core network hubs.



Invasive asters act as core network hubs.



Key Takeaways



Centaurea solstitialis



Carduus pycnocephalus

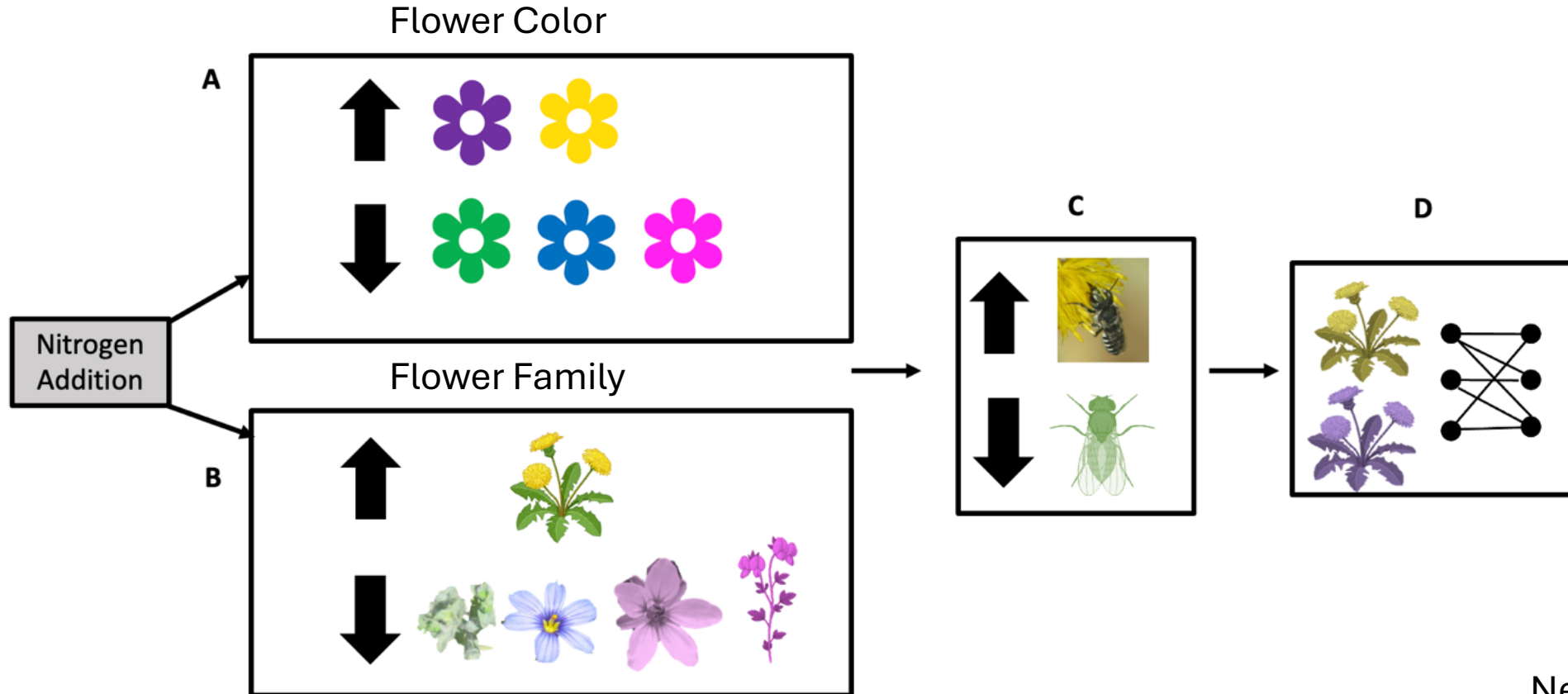
- Exotic asters pose a paradox by supporting native pollinators as network hubs
- But exotic asters also attract exotic pollinators.

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
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Pollinator Paradox



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Floral Traits

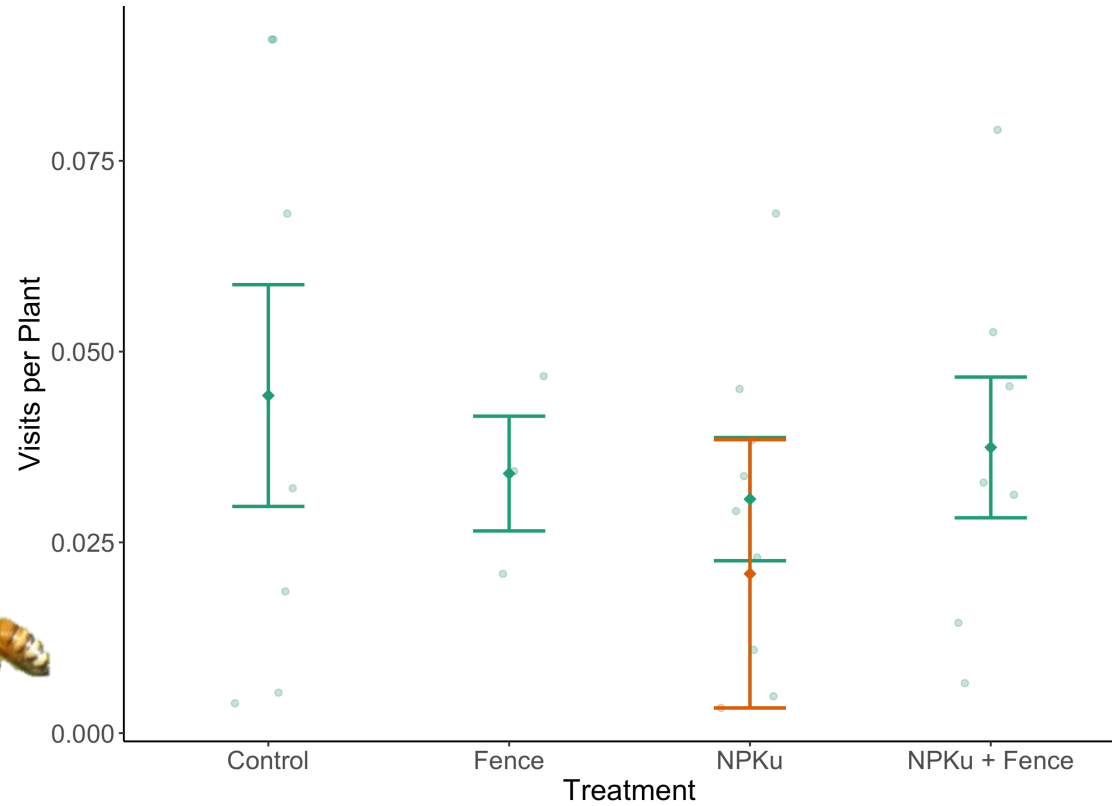


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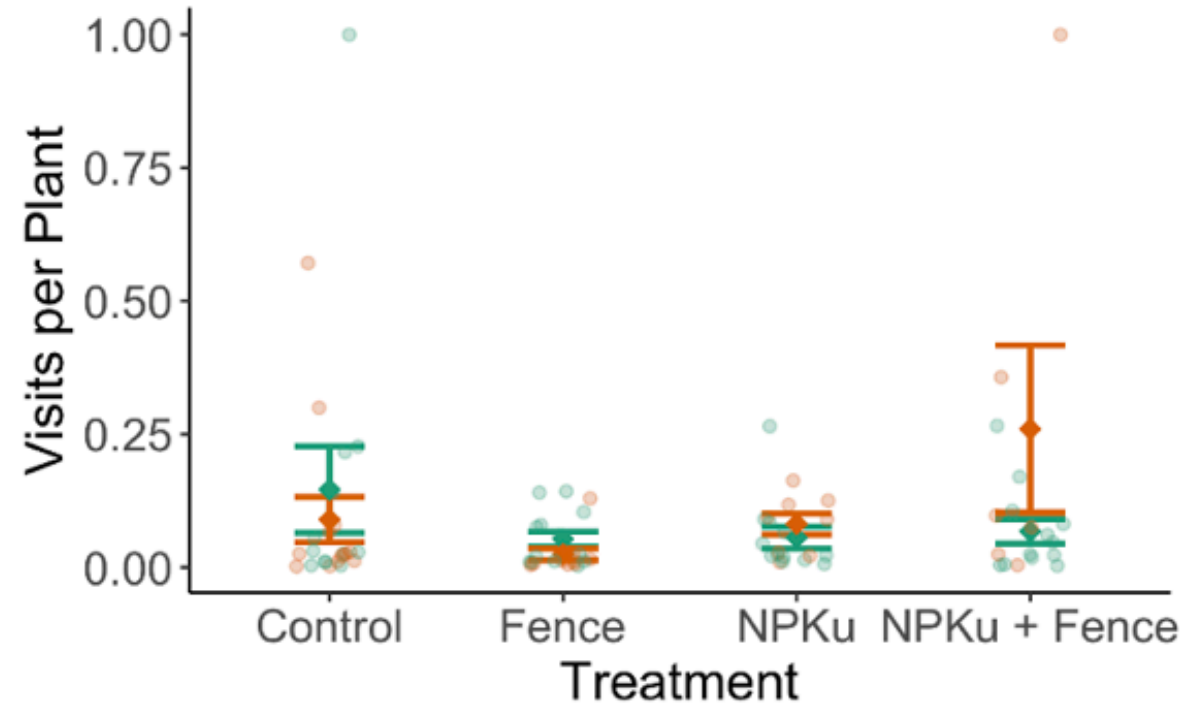
Per Plant Visits

Provenance Exotic Native

Exotic Honeybees



Native Pollinators



Website

