Wild Bee Response to Habitat Restoration, and Further Steps to Survey

Beckett Staubs-Friedmann

Collaborators:

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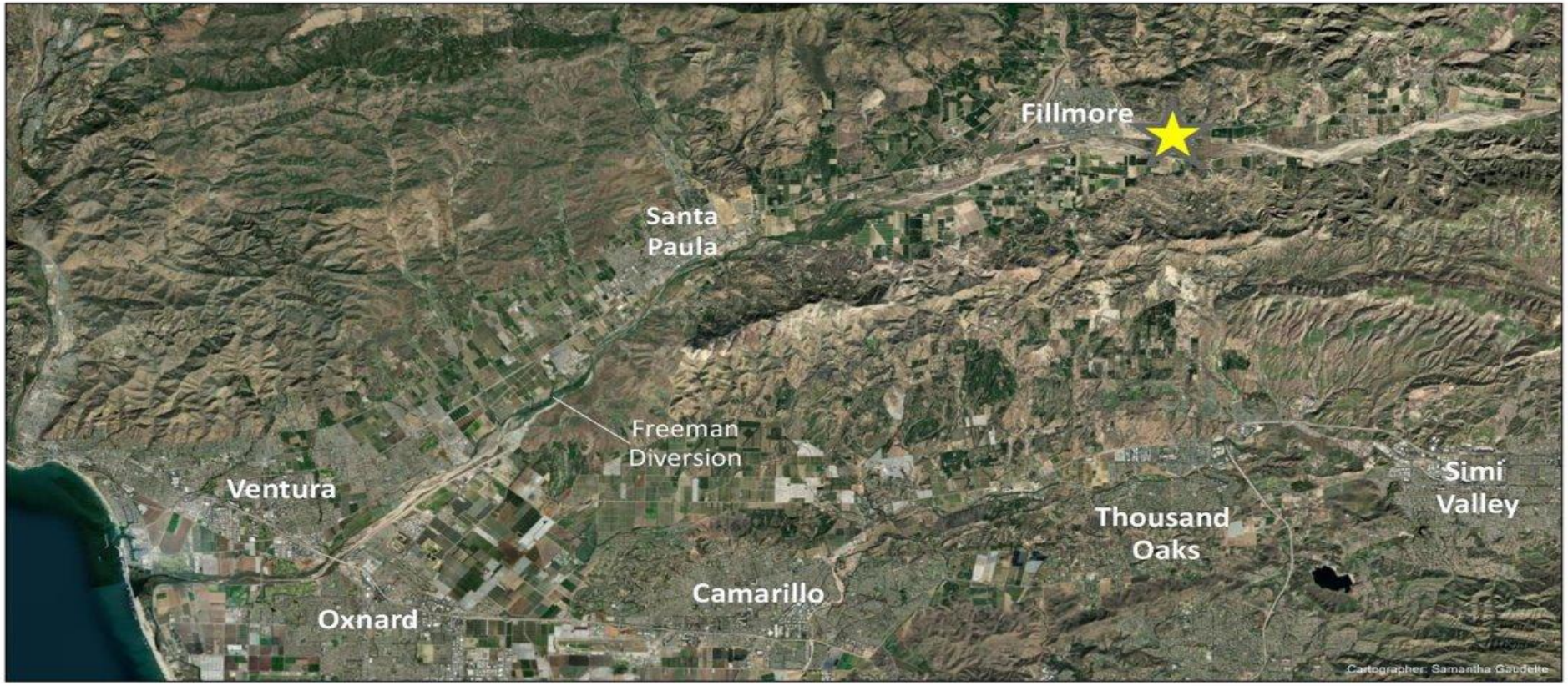
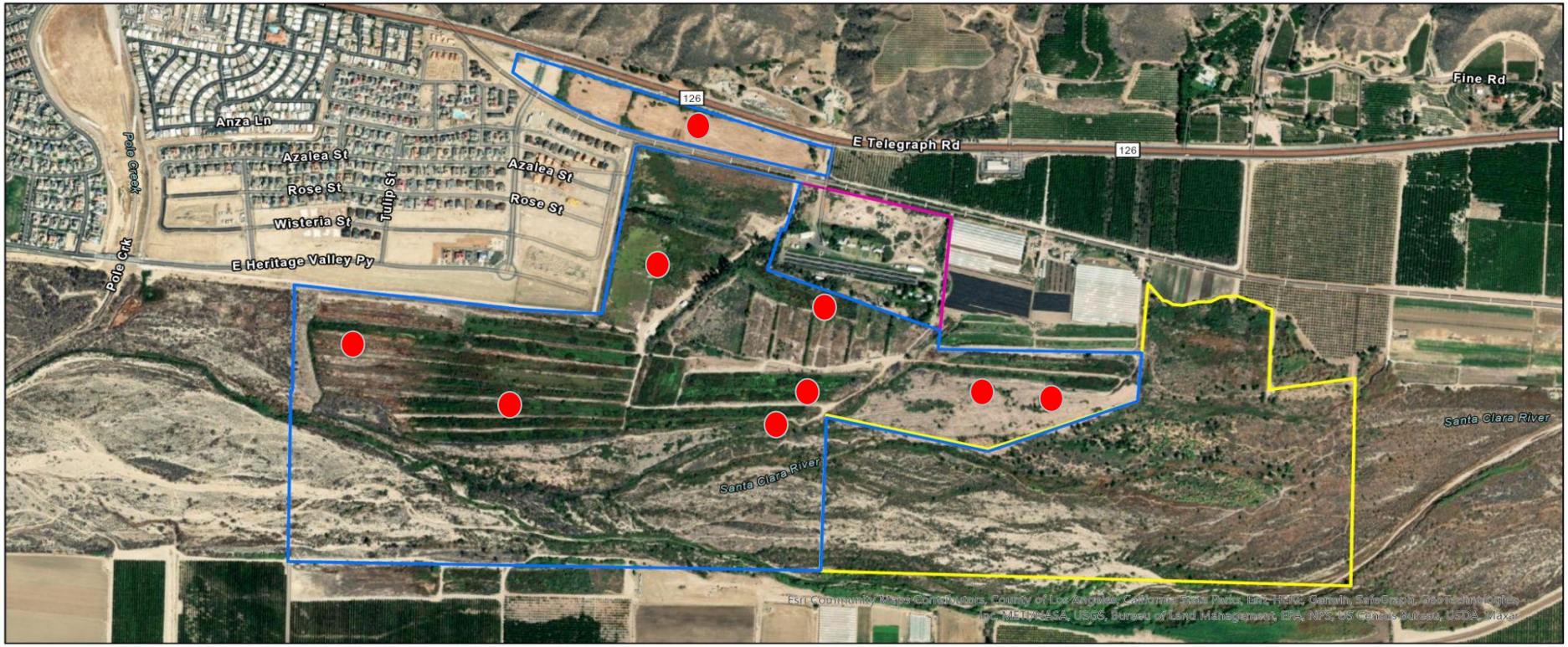


Cienega Springs Ecological Reserve (CSER), Fillmore, CA

Cienega Springs Ecological Reserve (CSER) and surrounding conservation areas

Santa Clara River, Fillmore, CA



CDFW Cienega Springs Ecological Reserve boundary

CDFW Fillmore fish hatchery boundary

TNC Shiells-Sommers boundary

N

0 0.13 0.25 0.5 Miles

0 0.25 0.5 1 Kilometers

Vegetation Monitoring

- 50 meter lines
- Native and Non-native cover
- Species composition

0 m

50 m

Objectives / Goals

- Enhance riparian habitat to benefit pollinators
  - Increase abundance and richness
- Get an overview of what pollinators are present
- Determine how species composition might change over time
  - Generalist vs. Specialist
- Employ routinely used sampling protocols as an assessment tool
  - Can it work for our purposes?

Survey Methodology

- 9 sampling points
  - Wetland
  - Riparian Forest
  - Riparian Scrub
- Surveys twice a year for 6 hours a day (May/August 2022-2025)
- 4 bowls (blue, white, 2 yellow) and blue vane trap

Diadasia bituberculata

Lasioglossum Dialictus

Agapostemon texanus

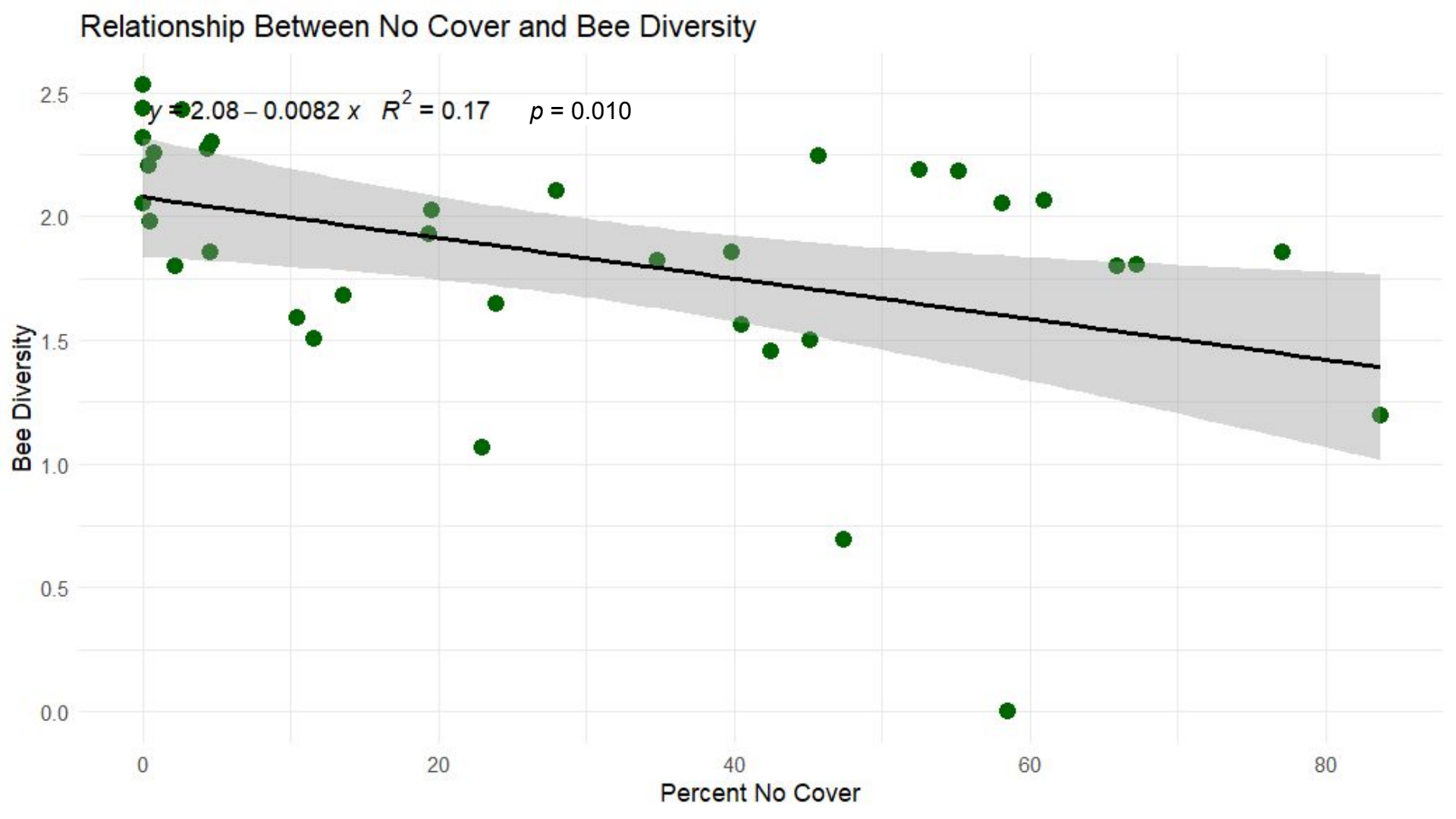
Bombus californicus

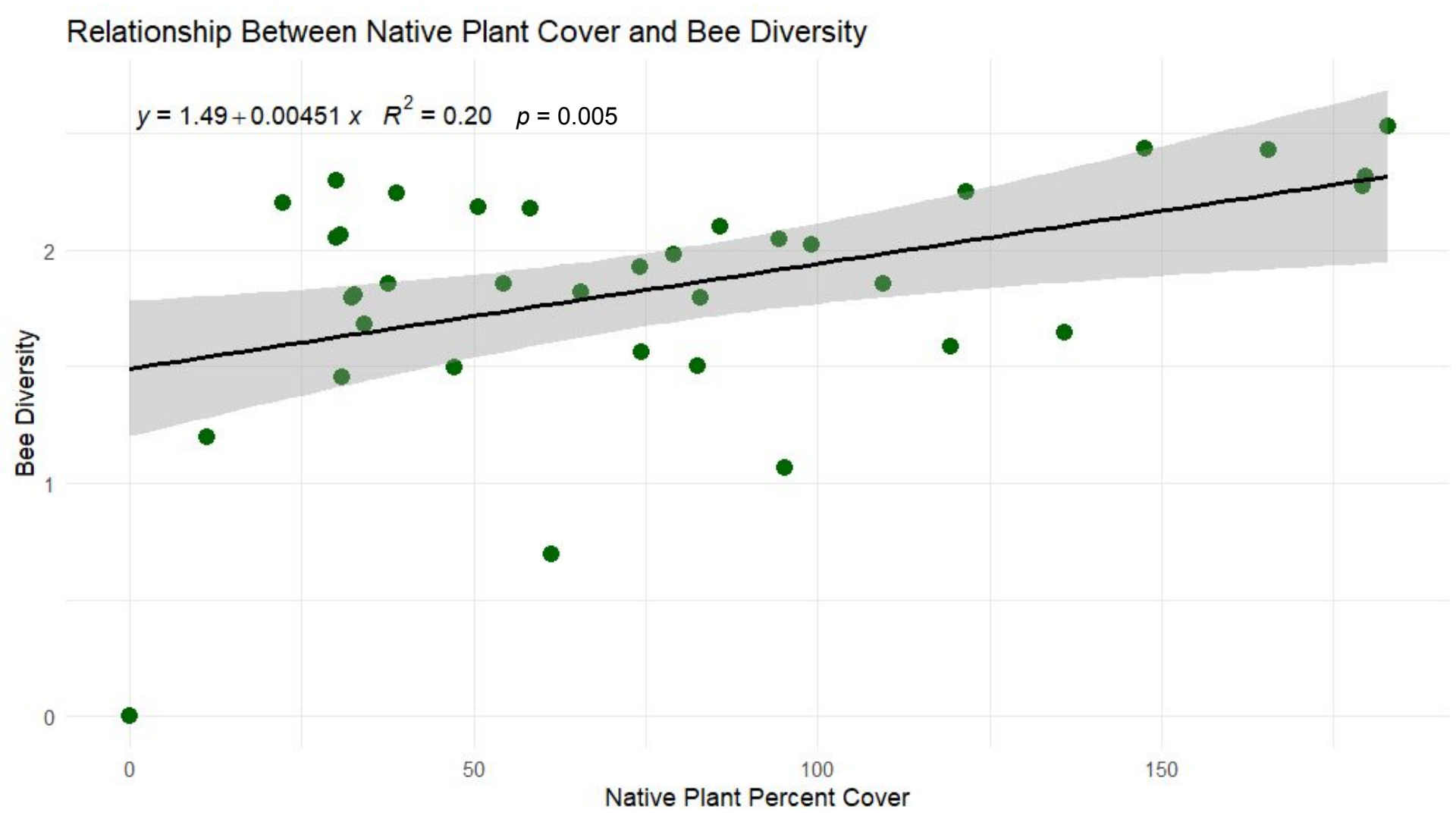
Halictus tripartitus

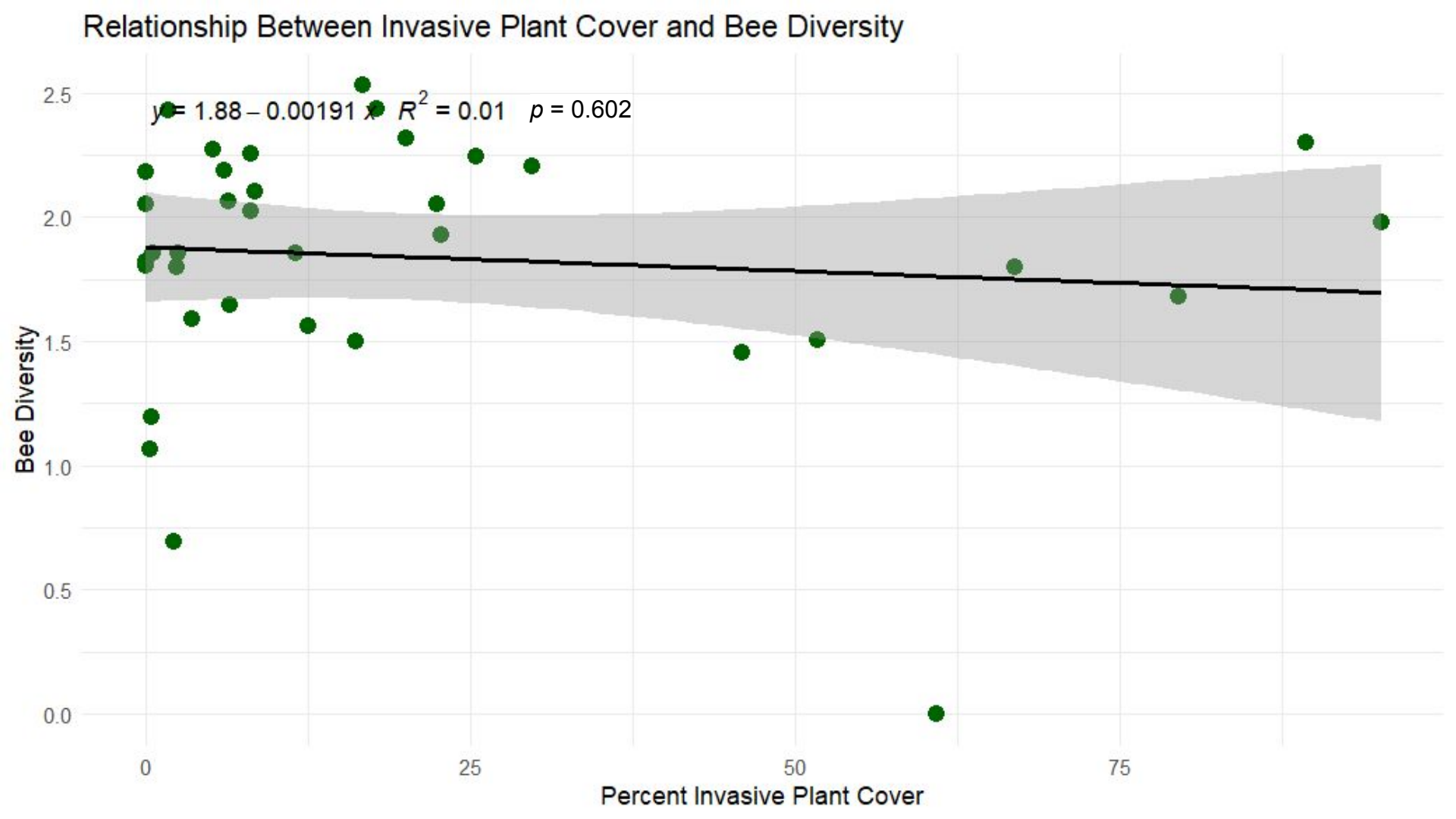
Ceratina acantha

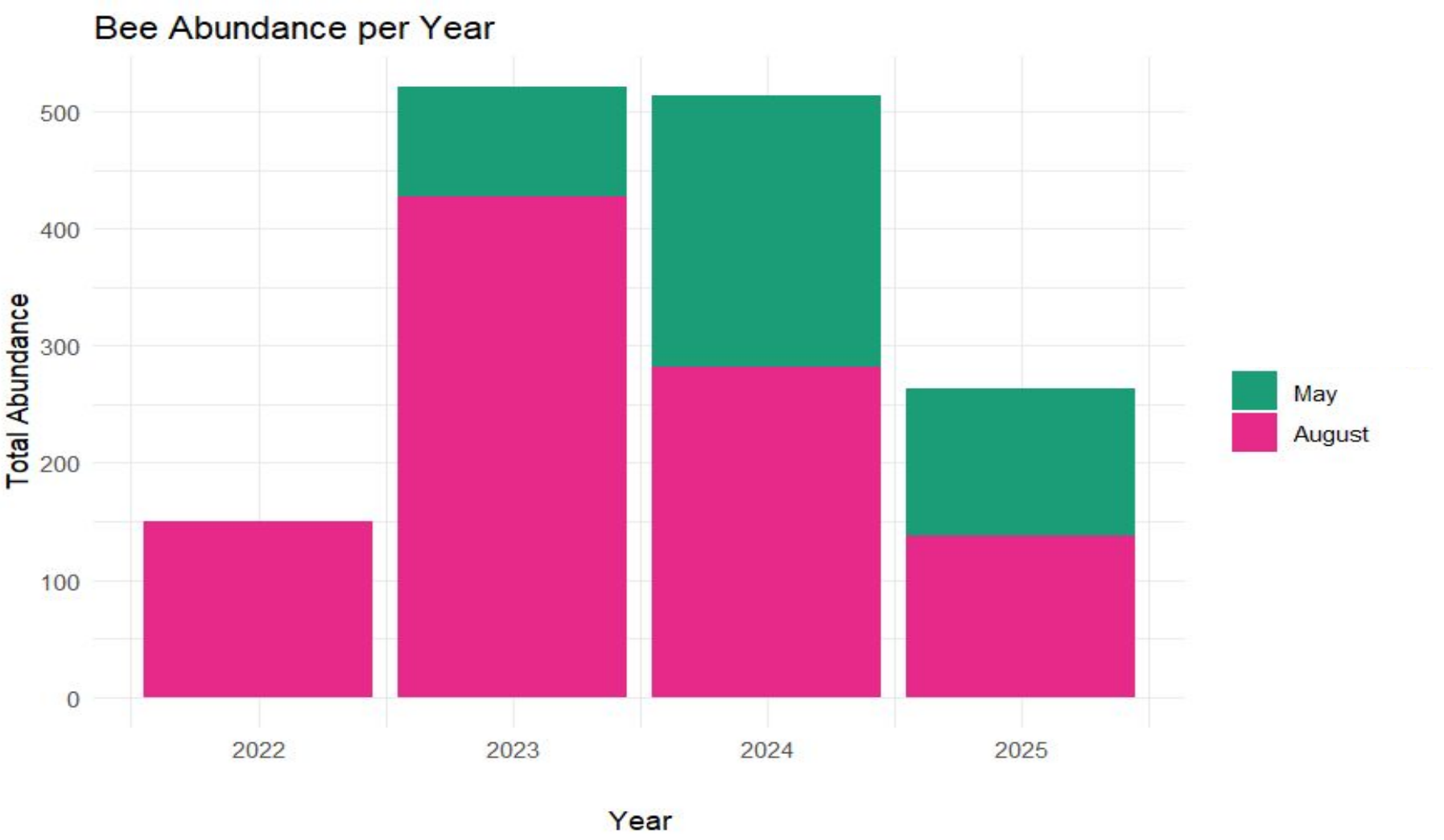

2022

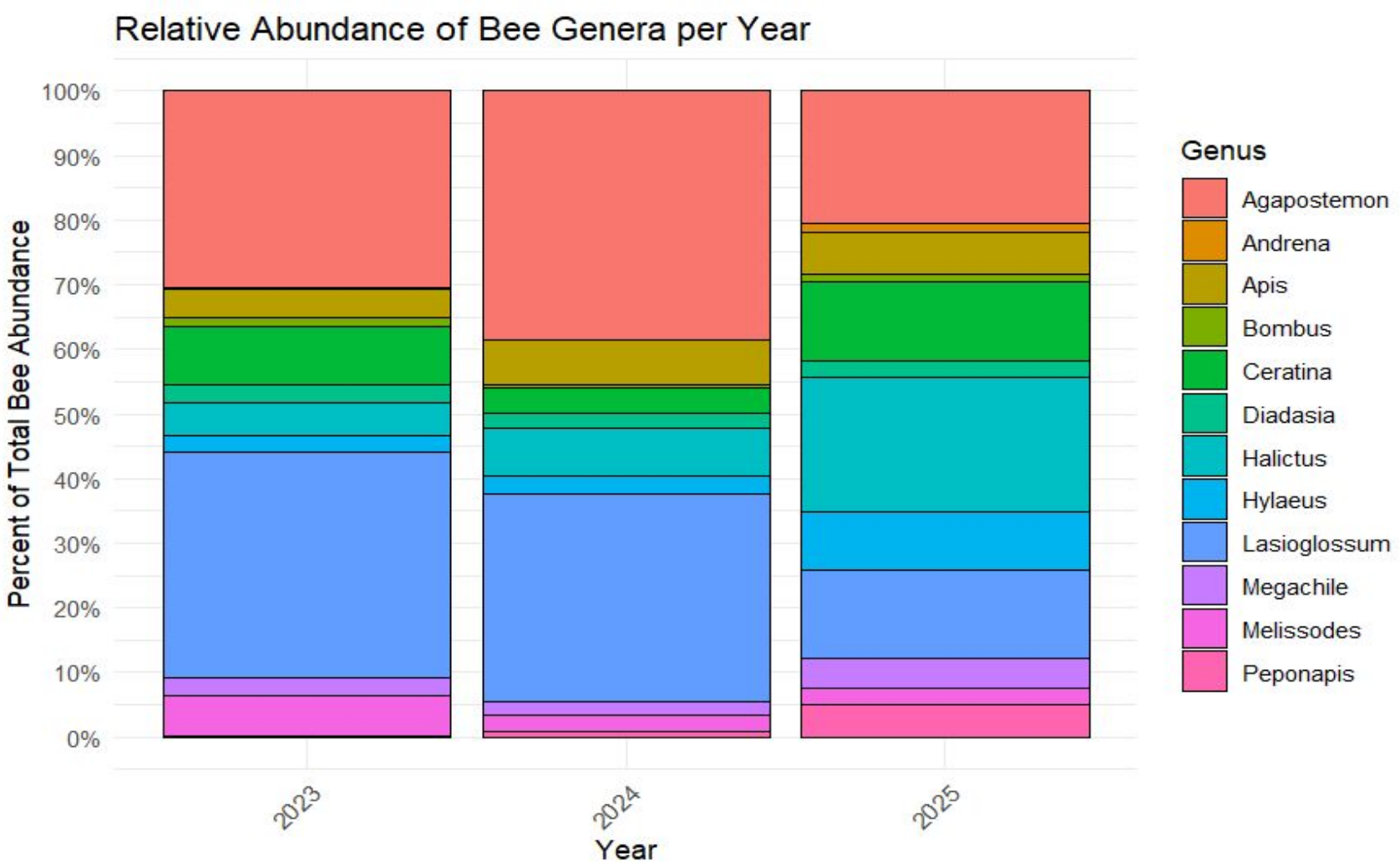

2025


Relationship Between No Cover and Bee Diversity
y = 2.08 – 0.0082 x R2 = 0.17 p = 0.010
Bee Diversity
2.5
2.0
1.5
1.0
0.5
0.0
0
20
40
60
80
Percent No Cover


Relationship Between Native Plant Cover and Bee Diversity
y = 1.49 + 0.00451 x R2 = 0.20 p = 0.005
Bee Diversity
0
1
2
0
50
100
150
Native Plant Percent Cover


Relationship Between Invasive Plant Cover and Bee Diversity
y = 1.88 – 0.00191 x R2 = 0.01 p = 0.602
Bee Diversity
2.5
2.0
1.5
1.0
0.5
0.0
0
25
50
75
Percent Invasive Plant Cover


Bee Abundance per Year
Total Abundance
500
400
300
200
100
0
2022
2023
2024
2025
Year
May
August


Relative Abundance of Bee Genera per Year
Percent of Total Bee Abundance
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
2023
2024
2025
Year
Genus
Agapostemon
Andrena
Apis
Bombus
Ceratina
Diadasia
Halictus
Hylaeus
Lasioglossum
Megachile
Melissodes
Peponapis

Recommendations for Practitioners:

- More sampling (April, May, July, August)
- Point veg surveys with flower abundance
- Selective sampling
- Netting and emergence tents

Thank you!

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