

LOCAL GRASSLAND RESTORATION AFFECTS INSECT COMMUNITIES



IN THIS STUDY:
WE WERE INTERESTED IN
HOW LOCAL-SCALE GRASSLAND
RESTORATION COULD BE USED TO
IMPROVE HABITATS FOR
NATIVE INSECTS
THAT ARE DECLINING,
ESPECIALLY NATIVE
BUMBLEBEES.

SCAN FOR PAPER



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INTRODUCTION

1) Land use change causes loss of native grassland habitats, leading to declines in native insects.⁽¹⁾

2) Ecological restoration is a tool designed to recover damaged ecosystems and has been shown in other places to support a greater diversity of native insect species.⁽²⁾

3) Because restoration can lead to more functional redundancy in grasslands, loss of a single species from the ecosystem would be less likely to impact overall ecosystem function.⁽³⁾

4) The microhabitats that restoration may create, can support diverse communities and more functional redundancy.⁽⁴⁾



METHOD

10 A.M. ~ 4 P.M.



2x2 m²

observing for 9 weeks

plants & insects
Measured
Variables:

- 1) Identification
- 2) Abundance 
- 3) plant abundance
- 4) Plant life form



Nets



Aspiration



Dissection



Hand
collection



Beating

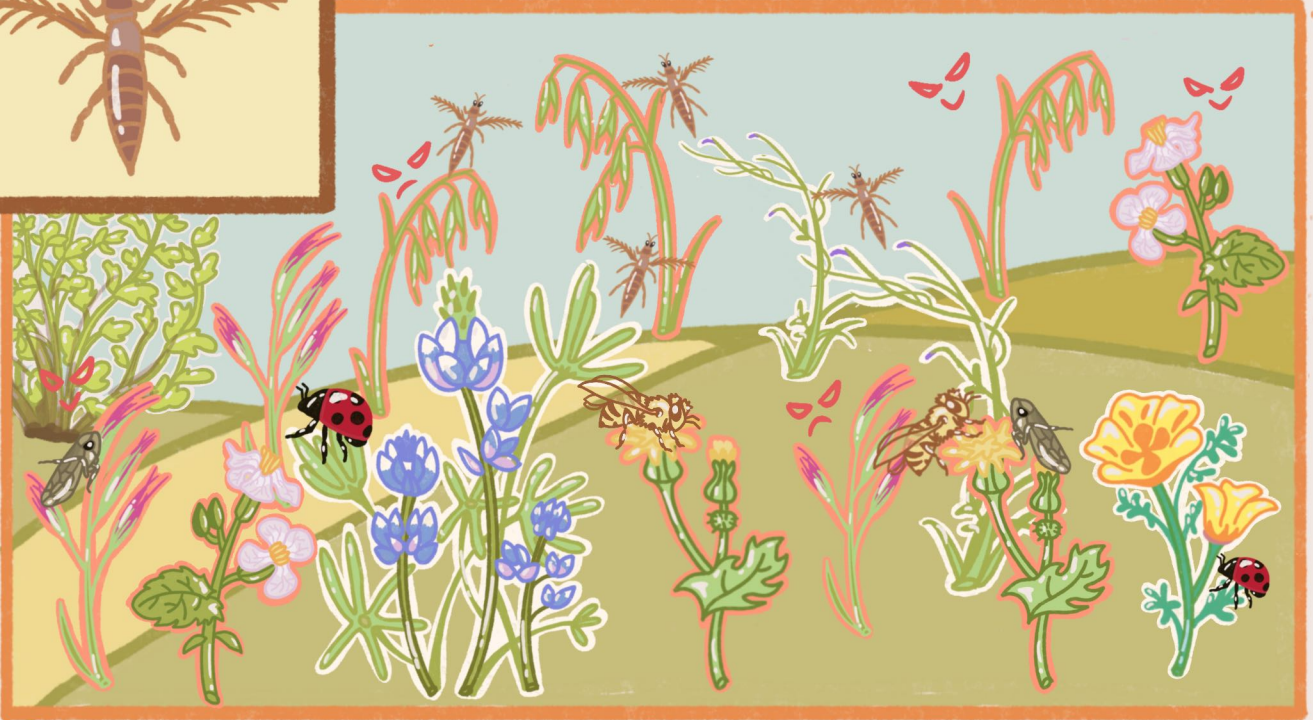


Lupinus bicolor (Miniature lupine) is an annual pea family plant (Fabaceae) commonly used for California grassland restoration. It was selected as a target species for focused insect collection.

No.1



Non-restored sites



These sites were selected because *L. bicolor* was documented at each site in previous years.

No.1

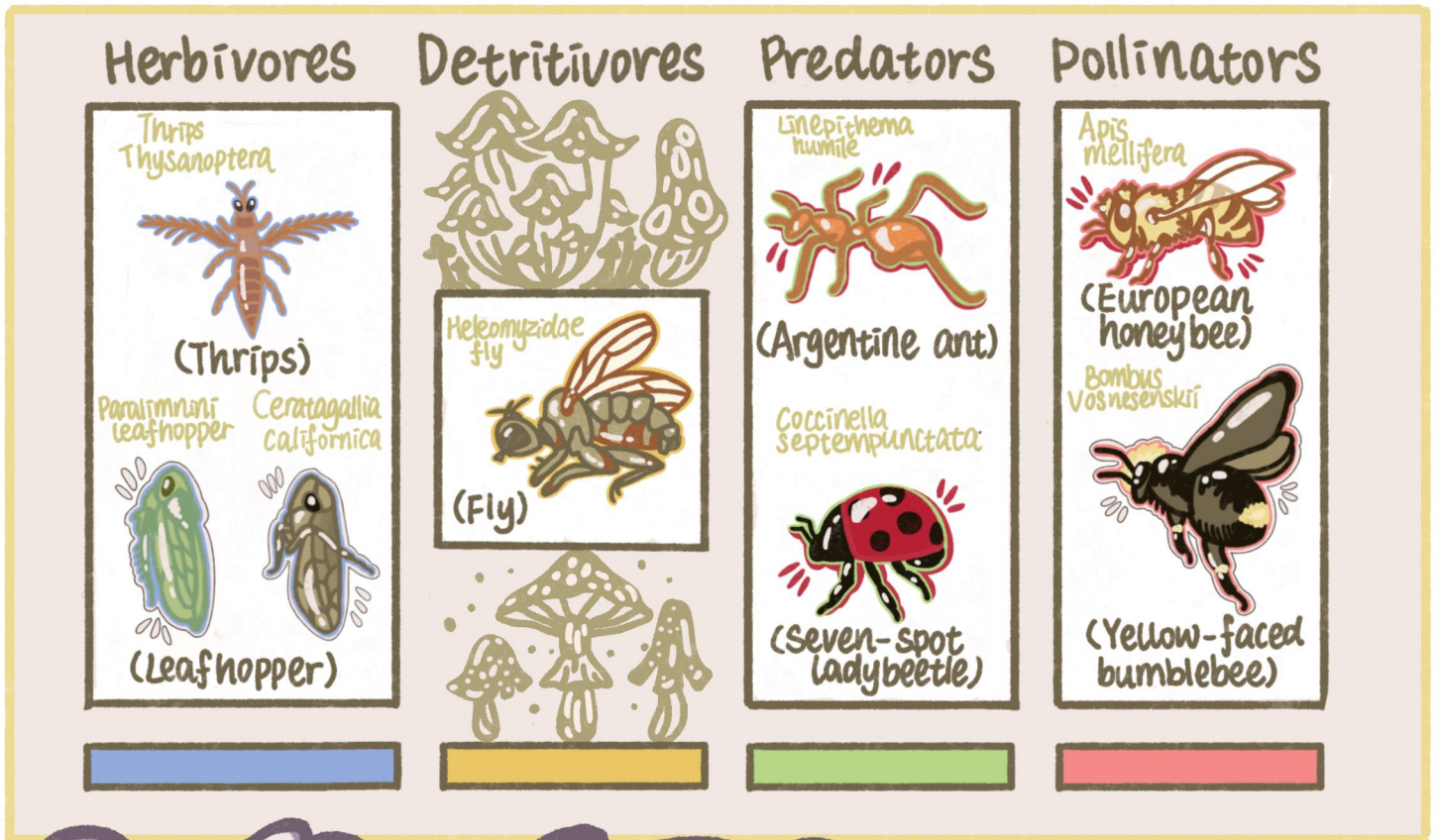


Restoration consisted of planting native species and weeding non-natives.

Restored Sites



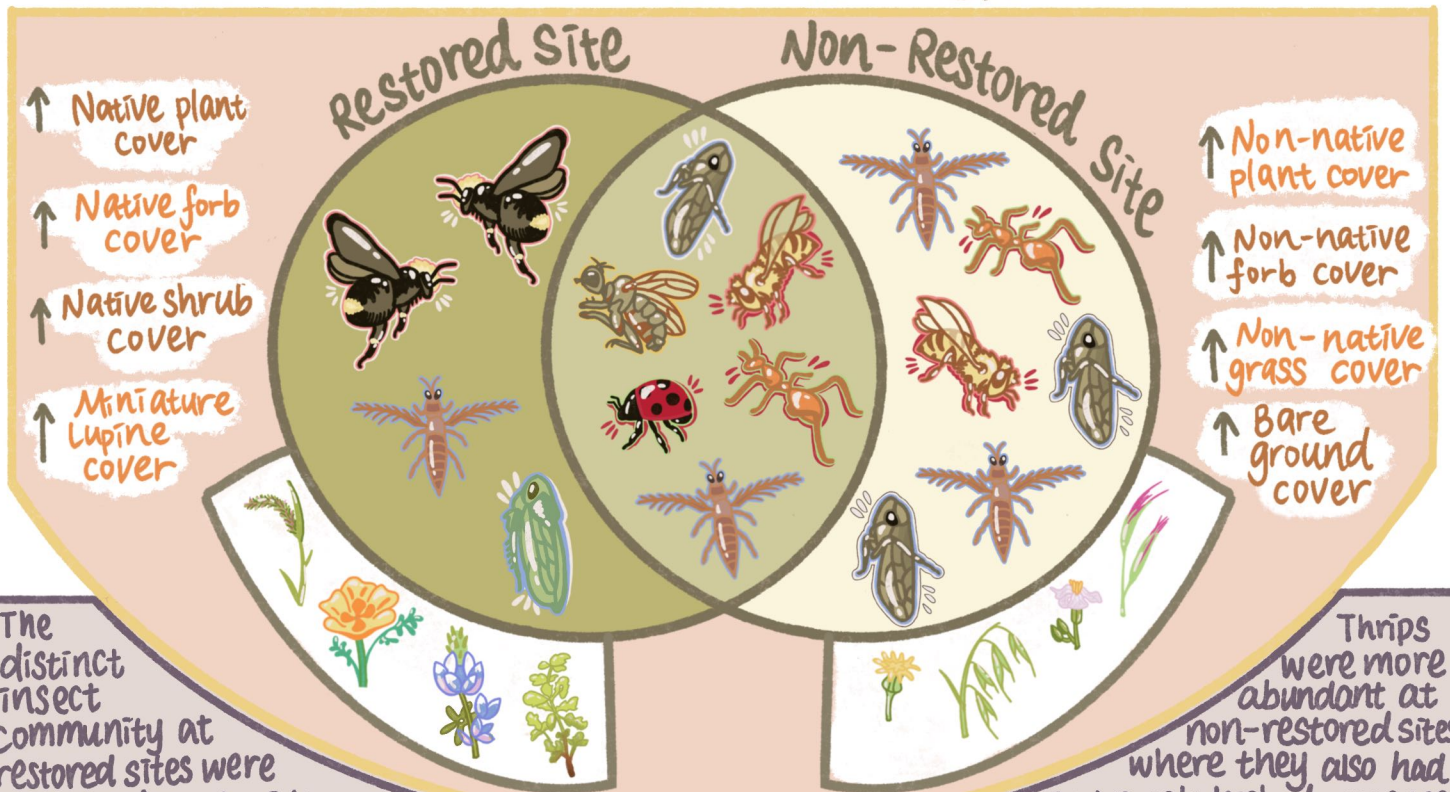
INSECT COMMUNITIES



RESULTS

Restored grasslands had different insect community composition compared to non-restored areas, but there were some similarities.

RESTORED SITE VS. NON-RESTORED SITE



The distinct insect community at restored sites were associated more with native plant cover, especially native forbs and shrubs compared to those from the non-native sites.

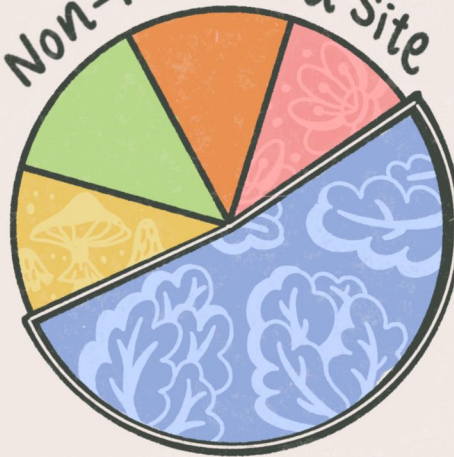
Thrips were more abundant at non-restored sites, where they also had extremely high dominance. Conversely, thrips were less dominant at restored sites, and not in the top observed species.

FEEDING GUILD PERCENTAGE

Restored site



Non-restored site



■ Detritivore
 ■ Herbivore
 ■ Nectivore
 ■ Parasitoid
 ■ Predator

• Non-restored sites were dominated more so by herbivores than any other feeding guild.

• Although herbivores were also abundant at restored sites, they were only more dominant compared to parasitoid and predatory insects, but not compared to detritivore and nectivores.

INSECT COMMUNITY RANKING BASED ON ABUNDANCE

RESTORED SITE

NON-RESTORED SITE

Rank	Species	Native Status
NO.1	Yellow-faced Bumblebee	Native
NO.2	European Honeybee	Non-native
NO.3	Paralimni leaf hopper	Native
NO.4	Heleomyzidae fly	Native
NO.5	Seven-spot Lady beetle	Native
NO.1*	THRIPS	Native
NO.2	Cerotagailia California	Native
NO.3	Seven-Spot Lady beetle	Native
NO.4	European Honeybee	Non-native
NO.5	Heleomyzidae fly	Native

* The font size represents the relative dominance of insect species.
 Red = non-native; Blue = native



1) Bumblebees were the most observed species at restored sites, but not even in the top five in non-restored sites.

2) Thrips are more commonly found in non-restored sites, where there was also less even distribution of species diversity compared to restored sites.

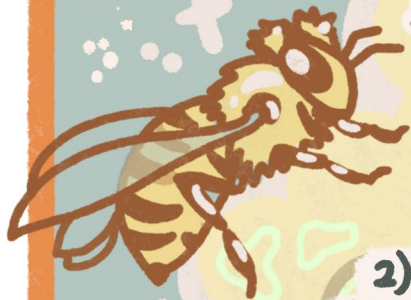
CONCLUSIONS

Based on this study from Santa Barbara, we found that local restoration is a potential tool for insect conservation in coastal CA, USA.

1) RESTORATION LED TO DIFFERENCES IN INSECT COMMUNITIES AND FEEDING GUILDS.

2) AT RESTORATION SITES, HERBIVORES ARE LESS DOMINANT AND POLLINATORS ARE MORE COMMON, COMPARED TO NON-RESTORED SITES.

3) NATIVE BUMBLEBEES, ARE KNOWN TO BE DECLINING, BUT OUR WORK SHOWS THAT LOCAL GRASSLAND RESTORATION CAN PROVIDE THEM HABITAT REFUGIA.



REFERENCES

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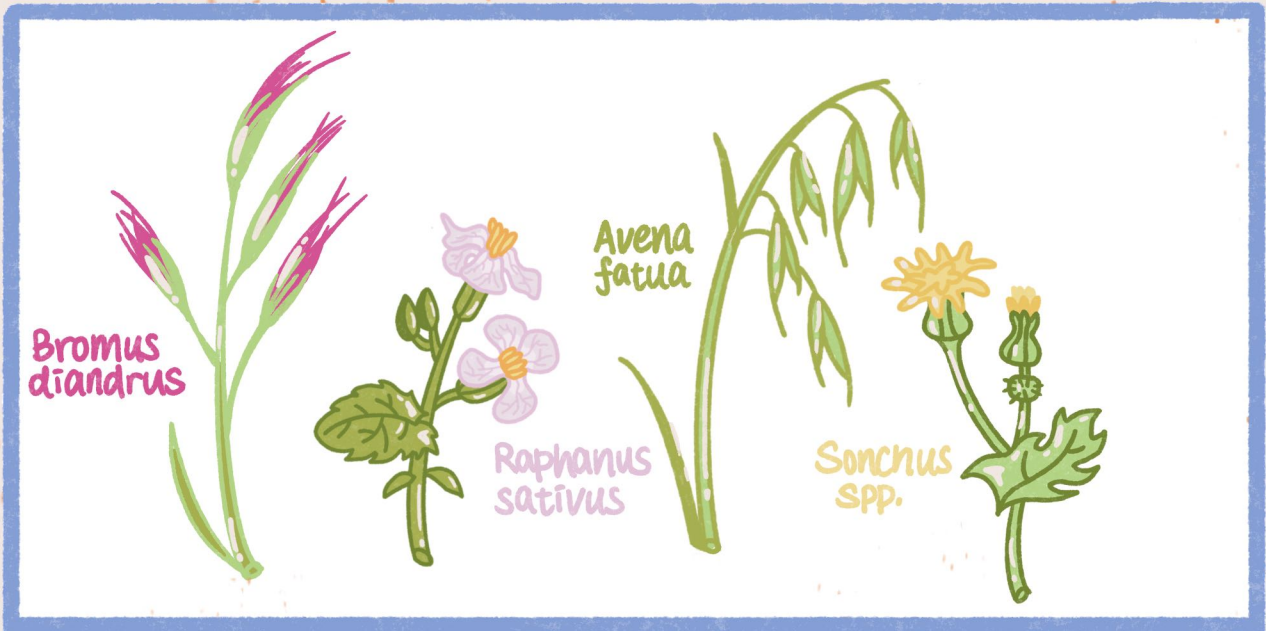
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APPENDIX

Common non-native plants



Common native plants

