

Richness of pollinators on native buckwheat along the Santa Cruz coast

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INTRODUCTION

- Plant pollination by insects is one of the most ecologically and economically important processes worldwide.
- Pollinators have a vital role in supporting plant life and simultaneously, survive through their pollination. With the decline of pollinators in recent years, pollination is at risk.
- We surveyed native pollinators in Santa Cruz County's coastal habitats pollinating on multiple plant species, notably native buckwheat (genus *Eriogonum*).
- We used data collected by renowned naturalist Randall Morgan in the 1990s coupled with data collected in 2021.
- I examined how plant richness has changed overtime using data from the past and how that might affect the number of pollinator species aggregating on native buckwheat.

Questions:

- Is pollinator richness on *Eriogonum sp.* different between the 1990's and current day?
- Is overall plant richness related to changes in pollinator richness on *Eriogonum sp.*?



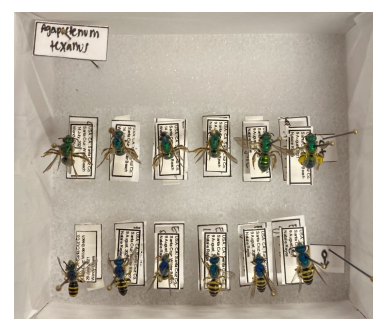
Bombus sp. pollinating buckwheat

METHODS

- My team and I collected pollinators (bees and flies) at four coastal dune sites in Santa Cruz County, CA between July and August 2021.
- We also collected data on plant species pollinated by the insects we collected.
- Each specimen was pinned, labeled, and keyed to species/morpho- species using microscopes and dichotomous keys.
- Data from the 1990's came from the Randall Morgan Insect Collection obtained from the SCAN database.
- We tested hypotheses with binomial and Poisson generalized linear mixed models and likelihood ratio tests.



Cuckoo wasp (family Chrysididae) pinned and viewed through microscopic lens



Sweat bees (*Agapostemon texanus*) pinned and labeled after keyed to species.

RESULTS

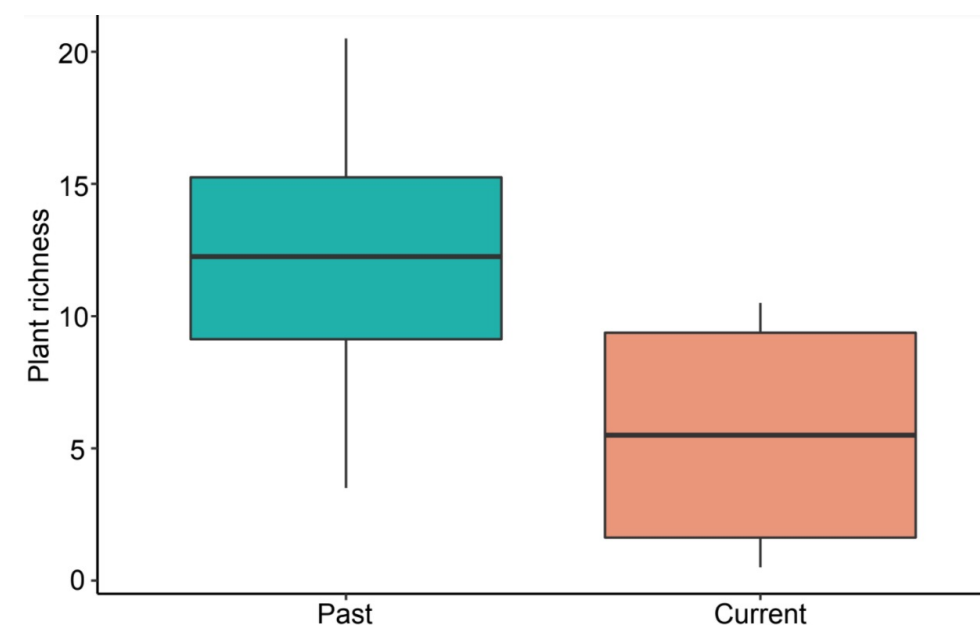


Figure 1. Relationship plant richness between the past (1990s) and current day (2021) Plant richness has decreased significantly ($\chi^2 = 12.84$, $p < 0.001$).

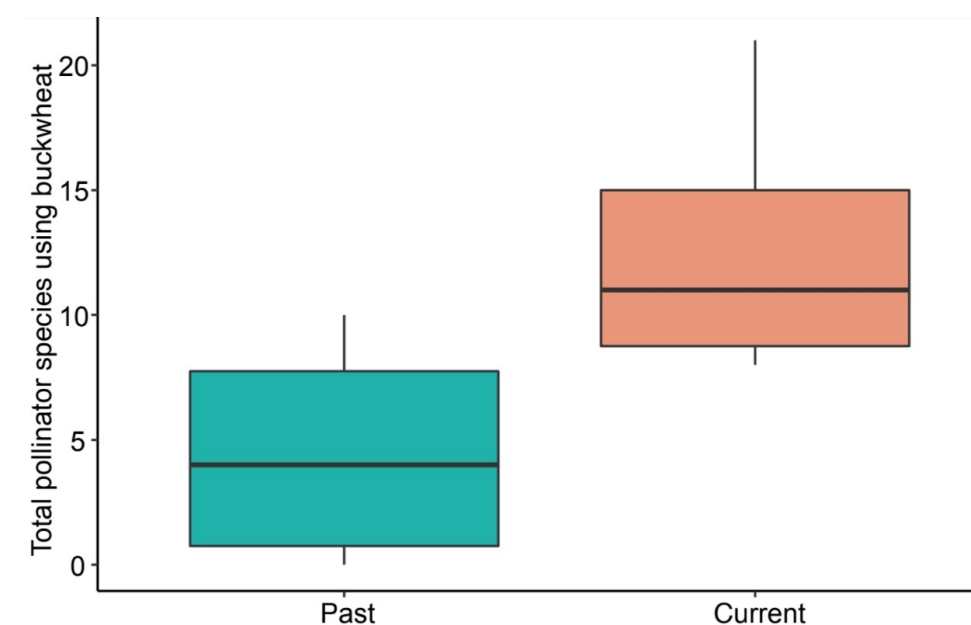


Figure 2. Total pollinator species using *Eriogonum sp.* between the past (1990s) and current day (2021). GLMM showed a significant increase in pollinator species using native buckwheat between past and present day ($\chi^2 = 16.45$, $p < 0.001$).

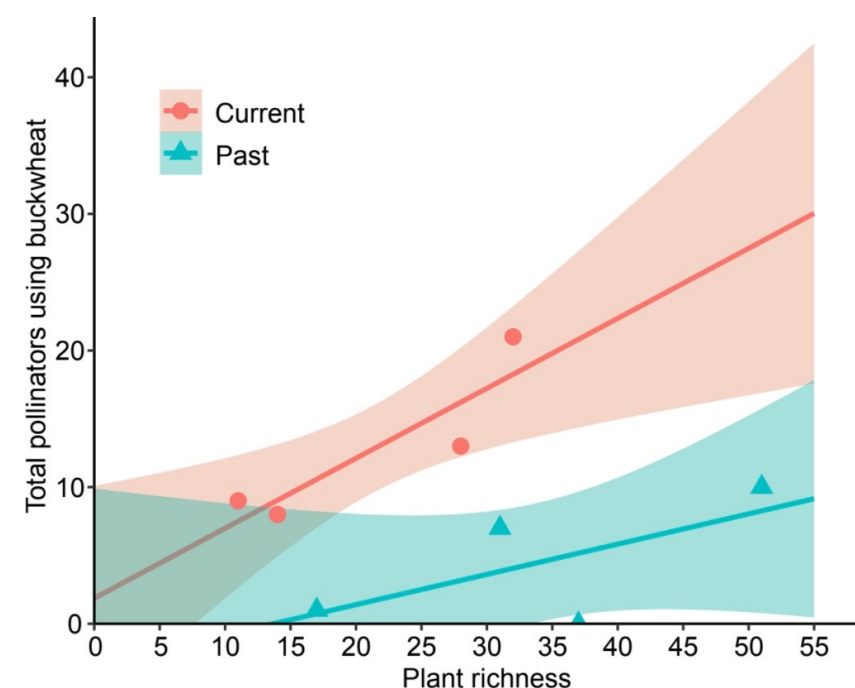


Figure 3. Relationship between time period and plant richness with respect to pollinators using buckwheat showing no interaction ($p = 0.68$).

DISCUSSION

- Native buckwheat species were used by more pollinator species in the current day than 30 years ago.
- Plant richness decreased over the two time periods.
- The interaction between time period and plant richness did not significantly influence pollinator richness but low sample size may have constrained this result.
- The increased use of buckwheat in the current day compared to the 1990's may be due to other processes not examined in this study like overall increases in pollinator richness, changes in pollinator community composition, or shifts in pollinator diet breadth towards generalist pollinators.

NATURAL HISTORY HIGHLIGHTS



Eriogonum latifolium (seaside wild buckwheat)

- Eriogonum latifolium* was on most of our beach research locations.
- The “long-blooming pom-pom” like flower heads are a major attraction for pollinators¹
- Once pollinated, the flowers on the plant begin to change to a red color.
- Bumble (*Bombus sp.*), plasterer (*Colletes sp.*), and metallic sweat bees (*Lasioglossum sp.*) were the most abundant pollinators of native buckwheat

ACKNOWLEDGMENTS

Many thanks to the CAMINO program and the Norris Center for this opportunity, Gizelle Hurtado and Justin Luong for being great mentors, and thanks to the rest of my team Wendy Olvera, Chiara Cantos, and Fana Scott.



CITATIONS

1. “*Eriogonum Latifolium*.” *Eriogonum Latifolium* | Home Ground Habitat Nursery, www.homegroundhabitatnursery.org/plants/erigonom-latifolium.