Whitewater Ranch Restoration and Research

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Goose Creek Restoration

The goal of the Goose Creek restoration is to support watershed health. Riparian habitats are vital ecosystems providing water filtration services, water temperature regulation for fish populations, and habitat for native pollinators. Our research provides a better understanding of what actions efficiently drive biodiversity, productivity, and resilient ecosystems.

Methods

Data was collected on previous restoration efforts, tracking height and vigor through status, growth, and damage characteristics. Photopoints were taken at similar times yearly in the same position and recorded restoration progression. Invasive species, Himalayan Blackberry, and Reed Canarygrass were removed by hand. Native plants were planted within the riparian area to establish the shoreline.
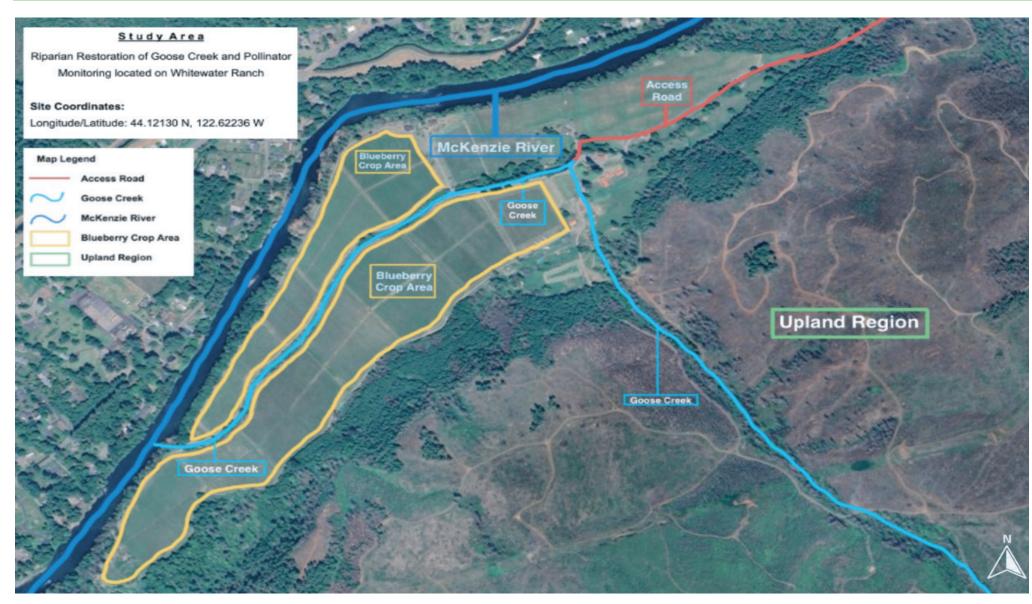
Results

Discussion

Plant Establishment: A majority of the previous years riparian plantings have not reached free-to-grow status and are primarily supported using weed mats. They will attain free-to-grow status in the coming years. The decrease of *R. pisocarpa* (ROPI) height was caused by damage from wild-life, due to improper protections.
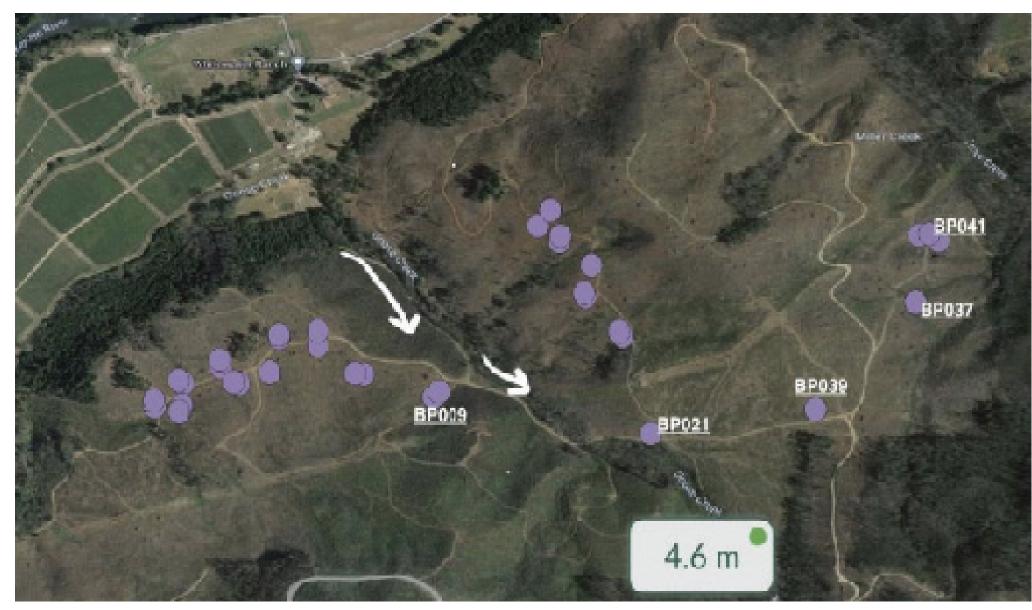
Water Quality: Temperature is used as a tool to monitor restoration progress, indicating established plantings' contribution to shade that cools the creek. Through our findings, influences outside of shading that affect water temperature include; local climate, precipitation, and the rising temperature of the global climate. While the locations differ in temperature, there has been a steady increase in temperature across the breadth of this project.
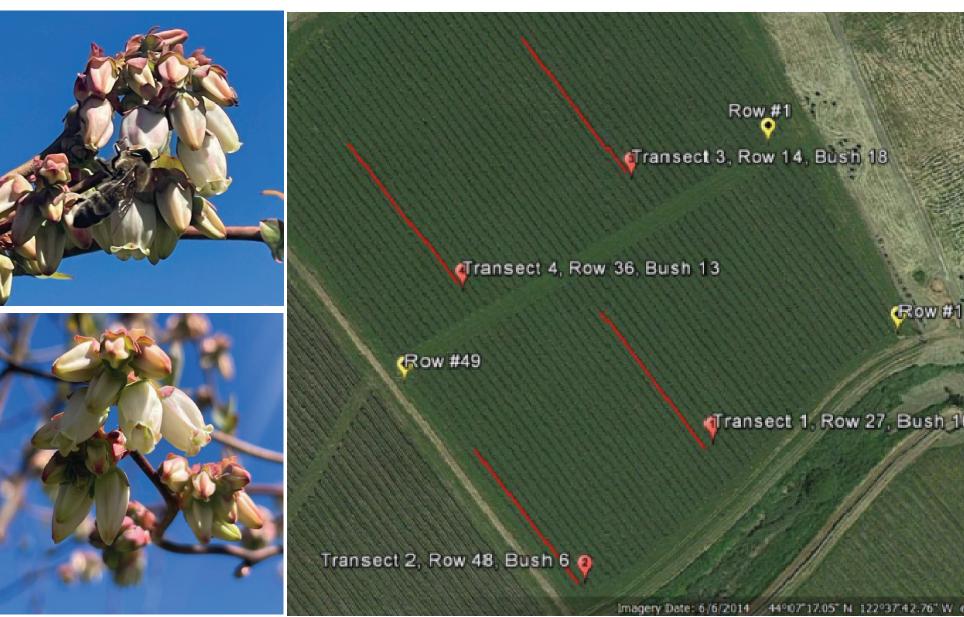
Goose Creek Study Area

Ponisio's Lab Study Area
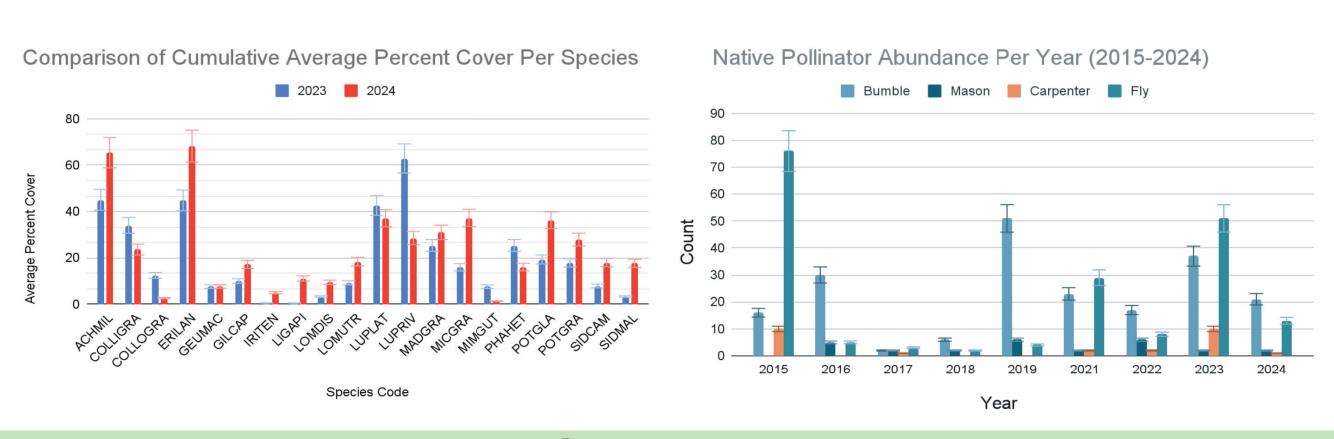

Ponisio's Lab Pollinator Plots

Local pollinator populations are threatened by intense ecosystem changes. Dr. Lauren Ponisio's Pollinator Enhancement Study, initiated in 2014, assesses and monitors pollinator plantings to restore biodiversity and agricultural productivity post-2020 Holiday Farm Fire. The result of the project will inform policymakers, farmers, and ecologists on promoting ecosystem integrity and agricultural sustainability.

Methods

Blueberries: Two surveys took place over 10 weeks under ideal conditions. Multiple 60-meter transects were surveyed for 20 minutes, and the types of pollinators and the number that visited the stigma of the blueberry were recorded.

Pollinator plants: Data consists of blocks, with each indicating burn piles. Plots were flagged with numbers, each indicating species planted within the plots. Plant guides were used to identify seedlings by measurement of the percent cover, the number of individuals, and how many plants had blooms within one square meter.

Results

Discussion

Blueberries: This year's pollinator surveys resulted in increased counts of honey bees, with decreases in bumblebee, fly, and carpenter counts, and minimal counts for mason bees, similar to previous years. Before the 2022 team's monitoring, honeybee hives were introduced, creating an increase of individuals. Fluctuation could be due to surveys in the early blooming season.

Pollinator plants: Success rates of each planting depend on percent coverage in the burn plots. Species with higher percent coverage are recommended for increased effectiveness.

Species with highest average percent cover were:
E. lanatum (ERILAN)- 66%
A. millefolium (ACHMIL)- 64%

Species with lowest average percent cover were:
M. guttatus (MIMGUT)- 1.35%
C. grandiflora (COLLOGRA)- 2.06%
I. tenax (IRITEN)- 4.97%

Citations:
Hanna, Dalal E.L., Ciara Raudsepp-Hearne, and Elena M. Bennett. "Effects of Land Use, Cover, and Protection on Stream and Riparian Ecosystem Services and Biodiversity." Conservation biology 34.1 (2020): 244–255. Web.
Kauffman, J Boone et al. "Riparian Vegetation Composition and Diversity Shows Resilience Following Cessation of Livestock Grazing in Northeastern Oregon, USA." PloS one 17.1 (2022): e0250136–e0250136. Web.
Mitchell, S. R., DeBano, S. J., Rowland, M. M., & Burrows, S. (2021). Feed the bees and shade the streams: riparian shrubs planted for restoration provide forage for native bees. Restoration Ecology, 30(3). https://doi.org/10.1111/rec.13525