

# A Flora of the Chiquito Springs Basin in the Santa Ana Mountains, California

Harrison McGowan

California State University Long Beach, Department of Biological Sciences, 1250 Bellflower Blvd., Long Beach, CA 90840

**Abstract:** The California Floristic Province is home to at least 6,143 plant species and a level of plant diversity similar to the entire Northeastern US. However, approximately 75% of natural habitat in California has been altered from its natural state. Of the habitat remaining, the additional and continued stress of temperature rise and habitat loss may pose a threat to California's native plants. However, in many areas there has been no recent cataloging of species to monitor the effects of habitat loss and climate change on native plant populations. **The goal of this project is to survey the vascular plant diversity of the Chiquito Basin in the Santa Ana Mountains of Southern California.** The results from this work will allow us to determine whether there has been a substantial change in the flora since a survey of the Santa Ana Mountains in 1978. **I hypothesize that plants in the Santa Ana Mountains are being affected by and increasing development that has led to local extinction and migration of plant species.** We will compare historic and recent herbarium specimens from Chiquito Basin and use this data in combination with temperature data from a NOAA weather station as well as the habits, and lineages of each species to determine if any change location or elevation has occurred. This project will advance our understanding of the flora of the Santa Ana Mountains and test if broad hypotheses about plant responses to climate change are affecting plants in our Southern California Coastal Mountains.

## Introduction:

Chiquito Springs is a 44 km<sup>2</sup> area located in the Santa Ana Mountains in the Peninsular Range of California. This area is part of the California Floristic province which is an area of high biodiversity. The Cleveland National Forest Service has in particular marked Chiquito Basin as an Area of Botanical Interest. However, the last comprehensive flora of this area was conducted in the 1970s by Lathrop and Thorne with their Flora of the Santa Ana Mountains. Since then global temperatures have risen potentially imperiling the plants in this region. **In order to address these concerns a checklist of the vascular plant species in the Chiquito Spring Basin will be created.** This will ensure the biodiversity in this area is documented for posterity as well as documenting new plants and confirming the continued presence of others. I will also conduct a transect of the area. **The goal of this transect is to get a detailed elevation to plant community map bisecting the study area.** This transect will allow for the future observations on how plant communities shift over time due to temperature or otherwise.

## Methods:

### Collecting:

- Approximately once a week during the Spring I will collect plant specimens. And visit all possible squares .

- For each specimen I will take field notes on:
  - Habit (shrub, annual, vine, aquatic)
  - Flower descriptions
  - Height, hairiness, smell
  - Latitude and Longitude, Elevation
  - Associated plant taxa
  - Identify specimens to lowest taxon by using the Jepson e-flora key and other available keys.

### Historic Specimens:

- The checklist of Chiquito Springs will include new specimens and historic specimens. To search for historic specimens- I will use: the Long Beach State Herbarium (18,000 specimens total, many collections from Chiquito Springs from 1950s-2019)
- I will download specimen data for Chiquito Springs from the Consortium of California Herbaria 1 (CCH1) and the Consortium of California Herbaria 2 (CCH2) using search terms for localities in the study area.
- I will visit at least three herbaria to document and confirm the identification of voucher specimens that were collected in the study area.

### Testing Elevation Change:

- we will take a 10-meter survey of all plants in the area every 500 meters and whenever there is a significant change in the dominant species in the area.
- Once the dominant species is identified an initial will be marked on the GPS relating to the dominant species in the area surveyed.

Figure 1: Maps showing my study area in relation to Southern California



## Preliminary Results:

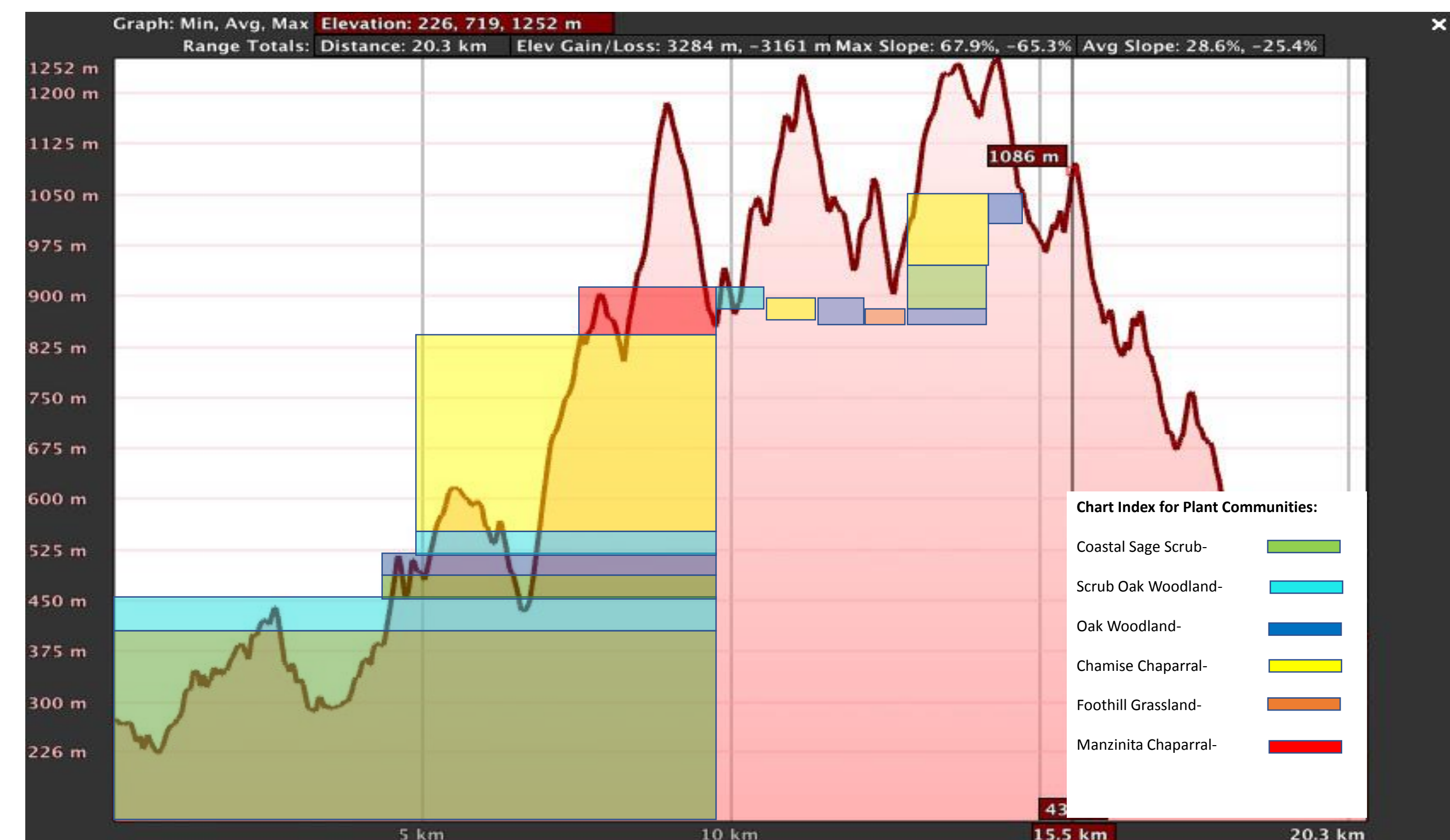
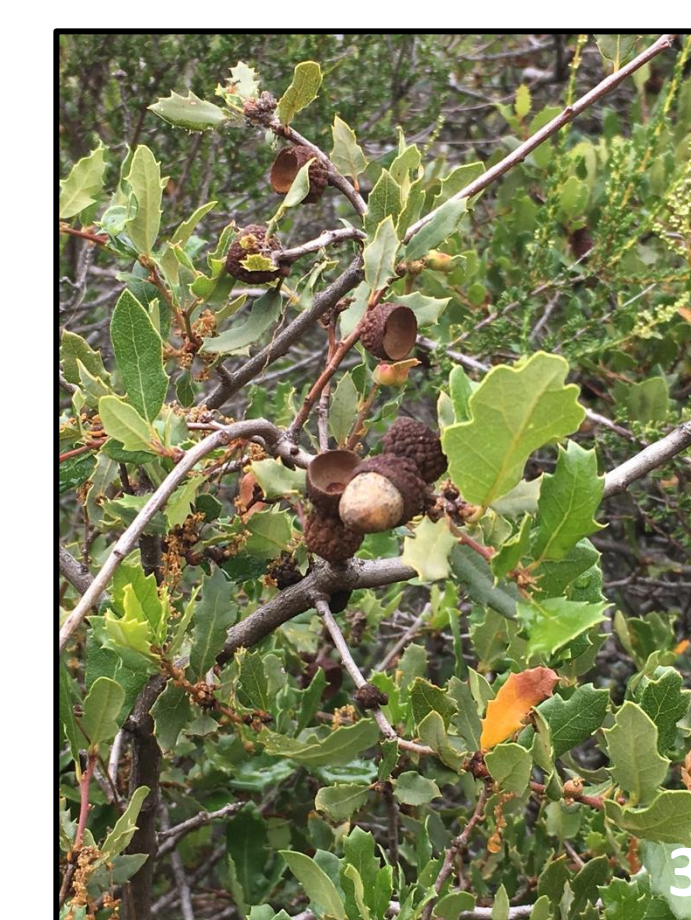
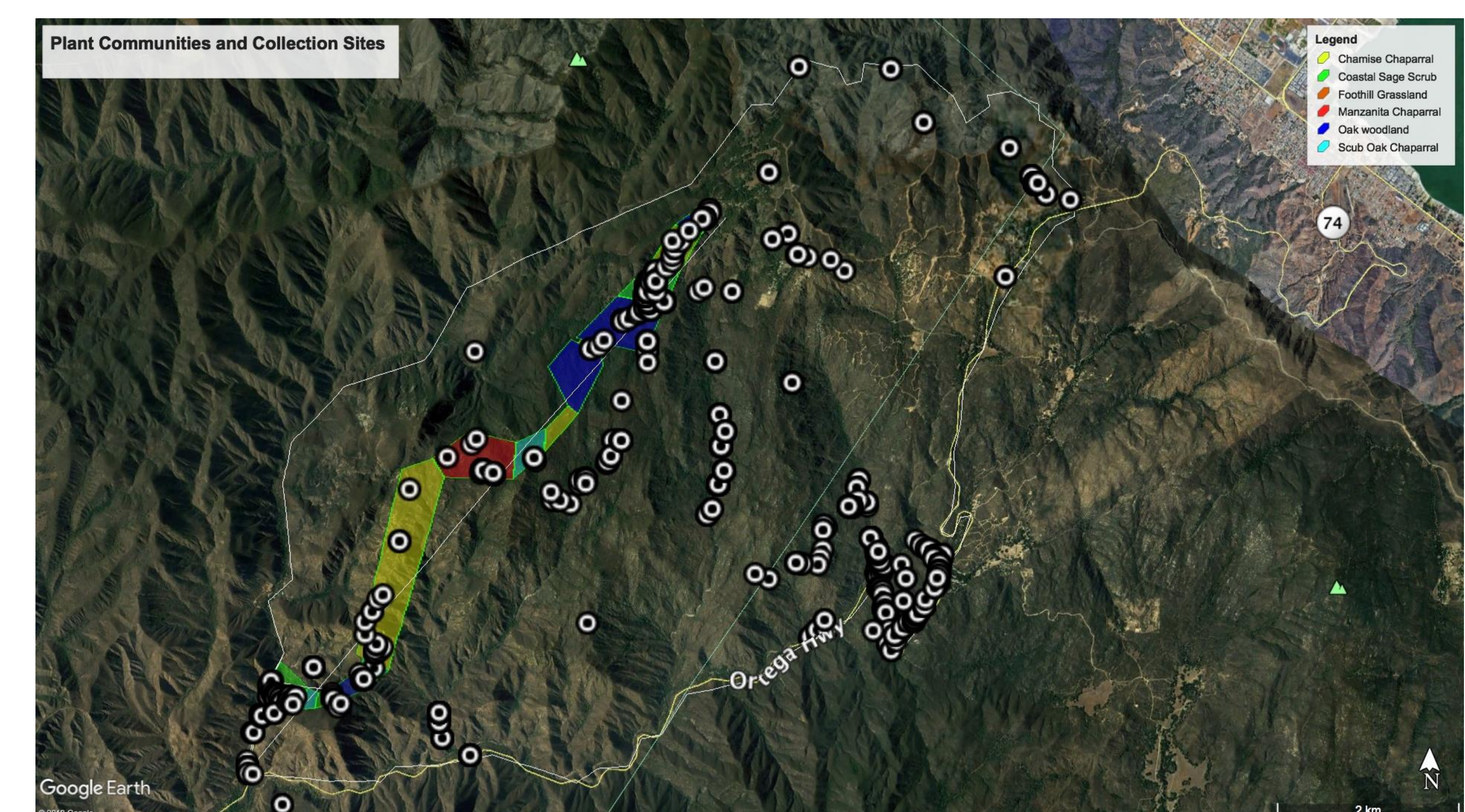


Figure 2: Map showing each habitat present along a transect of the entire study area. 1. Coastal Sage scrub 2. Chamise Chaparral 3. Scrub Oak Chaparral 4. Oak Woodland 5. Foothill Grassland 6. Manzanita Chaparral. The 1086 meter mark shows the beginning of the transect.



Figure 3: Map showing the locations of the current collections based on where they were found in the study area. The colored regions shows the locations of each plant community on the map. Currently there are 585 taxa known to be found in this area based on historic and current collections. So far during this research 626 specimen collections have been made in the study area.



## References:

- Jepson eflora. The University and Jepson Herbaria University of California, Berkeley. (2018). from Regents of the University of California
- Lathrop E., & Thorne, R. (1978). Flora of the Santa Rosa Plateau of the Santa Ana Mountains, California. *Aliso: A Journal of Systematic and Evolutionary Botany*, 6(4), 17–40. doi:10.5642/aliso.19680604.03.
- Wolf, A., Zimmerman, N. B., Anderegg, W. R. L., Busby, P. E., & Christensen, J. (2016). Altitudinal shifts of the native and introduced flora of California in the context of 20th-century warming. *Global Ecology and Biogeography*, 25(4), 418-429. doi:10.1111/geb.1242
- California Native Plant Society. (2018). *California Native Plant Society*. <http://ucjeps.berkeley.edu/consortium/>
- Consortium of California Herbaria, CCH2 Portal. 2019. <http://www.cch2.org/portal/index.php>.

### Acknowledgements:

- I would like to thank Dr. Amanda Fisher
- Lab members Laymon Ball, Bryana Olmeda, Amy Nguyen, Sara Cuadra, Marina Rice, and Keana Tang for assistance in the field
- Mariangel Fernandez for assistance in the field
- Jenny Moore, Cleveland National Forest Botanist
- Kirsten Winter, Cleveland National Forest Biologist