Mapping Potential Conservation Easements in the Salinas Valley

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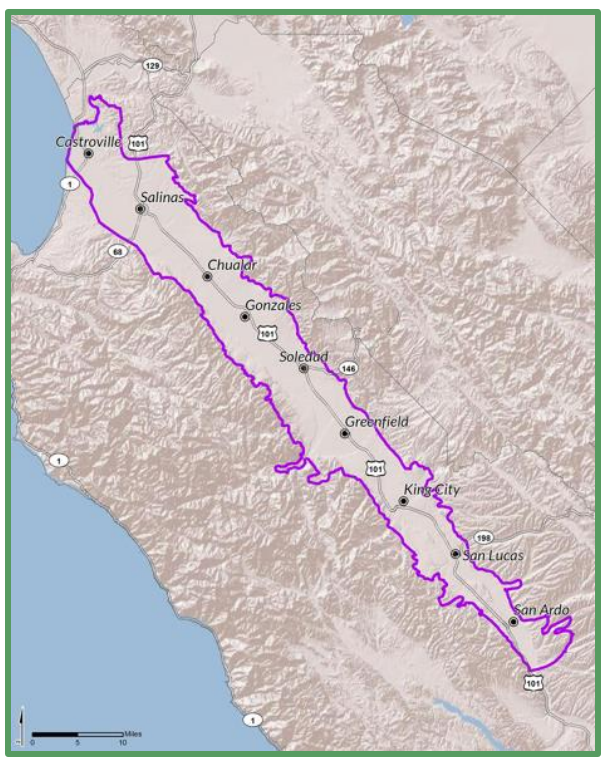
Objective:
Our group seeks to identify **potential conservation easements** within the agricultural lands of the Salinas Valley region that would **maximize tree corridor movement** and **minimize cost** to farmers.

Conservation Crisis in CA: The Urgency for Agricultural Lands

- According to a 2016 U.S. Geological Survey, only **22%** of California's 100 million acres is truly conserved.
- Over **27.6 million acres** in California has been set aside as **agricultural land**, either as pasture, rangeland, or cropland.
- Percentages of this agricultural land can be set aside by **farmers** as **conservation easements,** which act as critical habitat and wildlife corridors between protected areas.
- These easements will become increasingly important as **urban development** continues to encroach on California's farmland at a rate of **40,000 acres per year**.

Agricultural lands from the Carl M. Nielson Ranch in the Salinas Valley. Credit: Piini Realty / LoopNet



Map of the Salinas Valley region. Credit: Salinas Basin Agricultural Stewardship Group

Salinas Valley: The Salad Bowl of the World

- Monterey County is home to California's famous Salinas Valley, the **Salad Bowl of the World**, where over **1.4 million acres of county land** is dedicated to agriculture.
- The Salinas Valley alone provides **61%** of the country's lettuce, **57%** of the country's celery, and **48%** percent of the country's broccoli.
- Habitat destruction has been touted to increase food safety in the valley, but these practices have resulted in the **removal of grasses**, which are **important for filtering *E. coli*** and other pathogens.
- The Salinas Valley is bordered by the **Gabilan and Santa Lucia mountain ranges**, on the east and west, respectively. The Santa Lucia mountain range holds many wildlife species such as black bears, foxes, and coyotes while the Gabilan range supports the mountain lion, elk, deer, badger and bobcat.

Species of Interest

The barn swallow, the bobcat, and the bumblebee are critical species which dwell in the Salinas Valley and should be prioritized in California conservation efforts.

Barn Swallow. Credit: Mike Hamilton / BirdNote

Bobcat brother and sister within Monterey. Credit: Assignment Point

California bumblebee. Credit: Science Update

Methods: Least Cost Paths and Least Cost Corridors

01 Downloaded **tree canopy cover** of Monterey County from Forest Observatory and the CA **Protected Area Database** from CA Natural Resources Agency

02 Cropped the datasets to the **Salinas Valley** in QGIS and R

03 Created a **map of resistance** (cost map) of the movement of tree corridors

04 Calculated the **least cost paths** and **least cost corridor** for trees between protected areas of the Salinas Valley

05 Compared our least cost paths and least cost corridor to a **map of agricultural value from USDA**

Results: Least Cost Paths and Corridors of the Salinas Valley

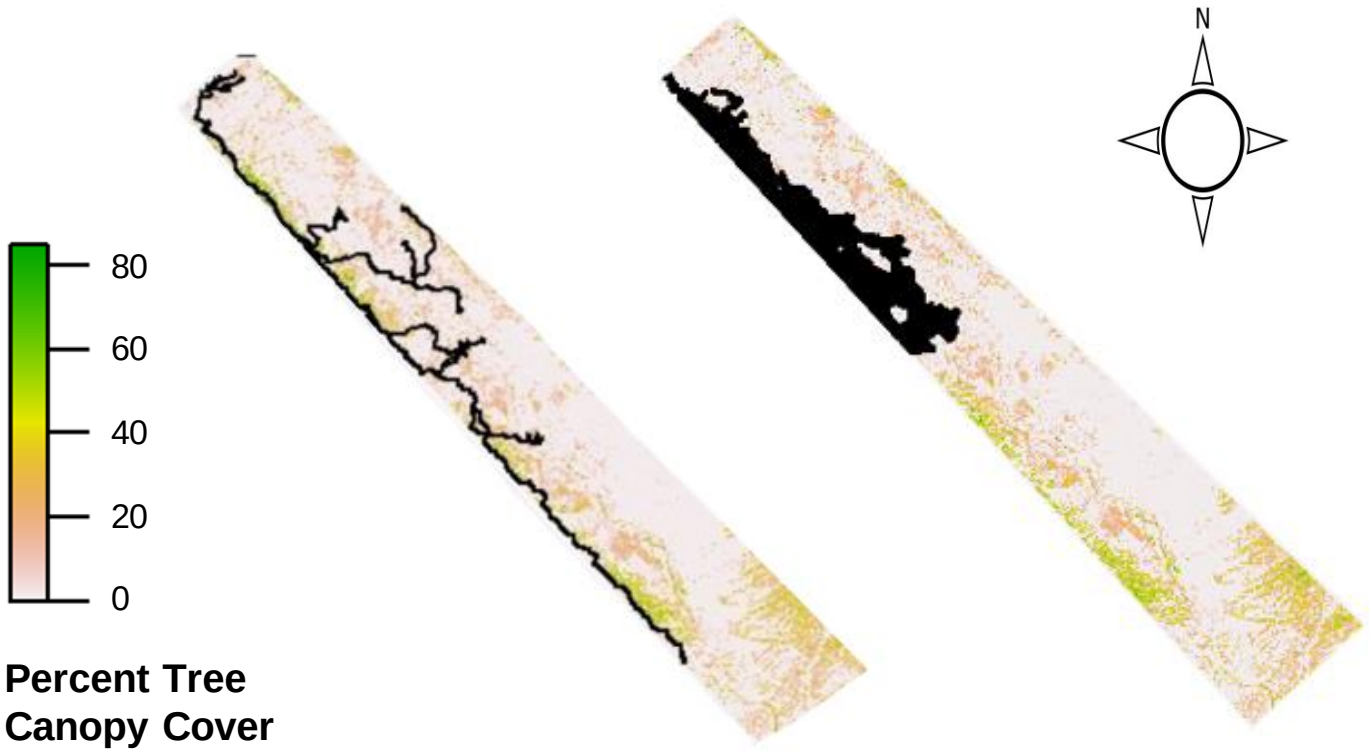


Figure 1a (left):
A map of **all least cost paths** (black) of tree corridors between protected areas within the Salinas Valley.

Figure 1b (right):
A map of the **least cost corridor** (black), or the top 10% of the most important least cost paths, of the tree corridors between the protected areas of Salinas Valley.

Results: Comparison of LCPs to Agricultural Value in the Salinas Valley

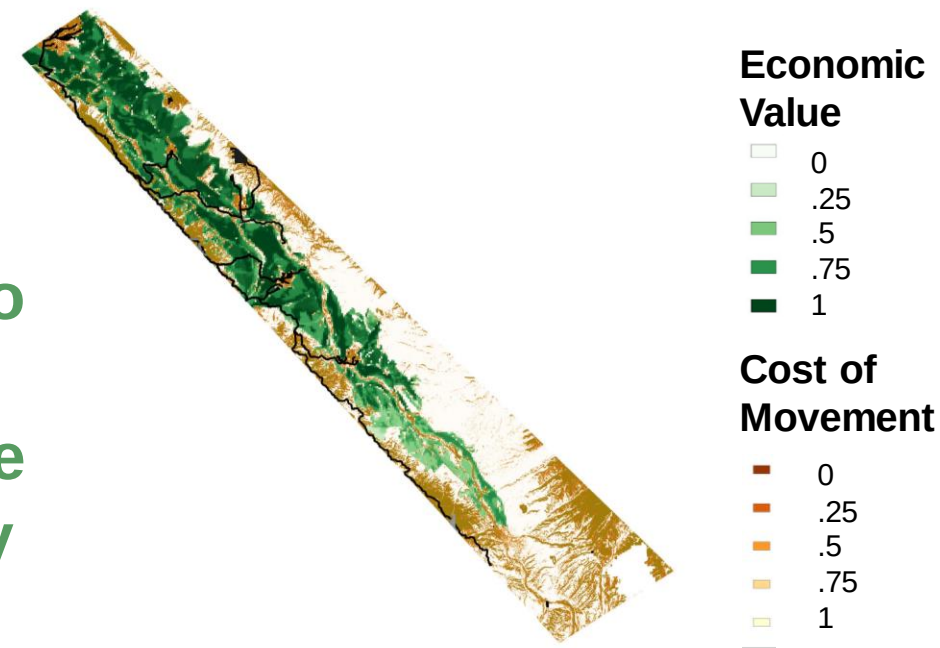


Figure 2:
A map indicating the **economic value** of agricultural land in the Salinas Valley that is overlapped with the least cost paths.

Data Interpretation and Recommendations for 30 x 30 in California

- The **northwestern and southern regions** of the Salinas Valley have critical tree corridors, which are the easiest (lowest cost) landscape for many species, like bobcats, to move through.
- The **northern region** of the Salinas Valley has the **highest economic value** for agricultural lands, and the value decreases in the southern direction.
- 30 x 30 representatives need to collaborate with farmers to implement conservation easements where tree corridors provide **necessary landscape connectivity.** This is most ideal where economic value for agriculture is low.
- We recommend a framework that **compares agricultural land value** to critical **wildlife corridors** for identifying potential **conservation easements** throughout California's agricultural landscapes.

Citations

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