Implementing Climate-Smart Restoration along California's Central Coast

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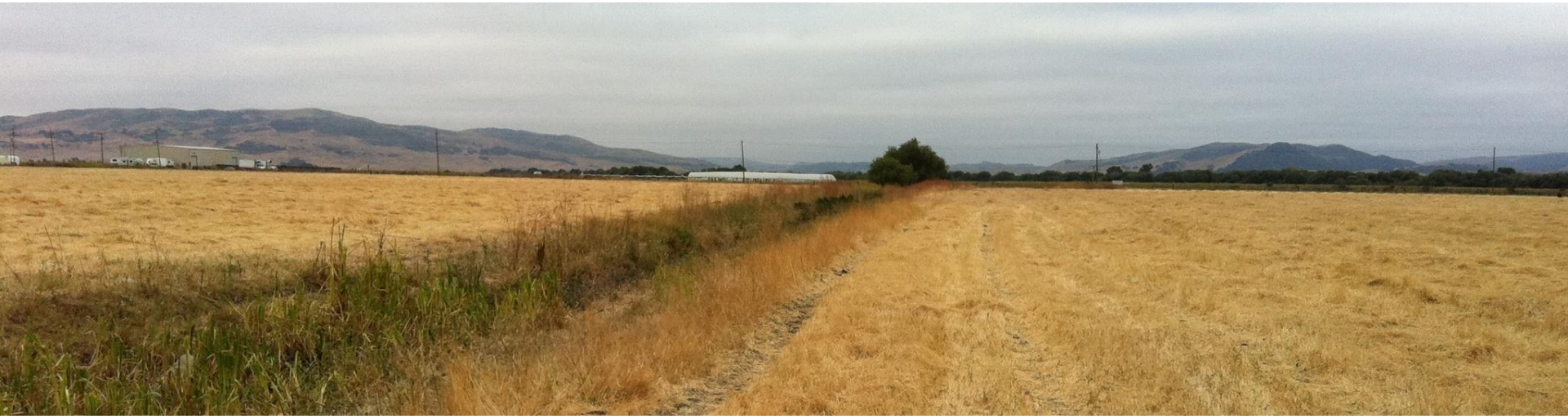

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Thanks

Thanks to the generous support of the California Landscape Conservation Cooperative, Point Blue Conservation Science, The Nature Conservancy, and the Elkhorn Slough Coastal Training Program were able to develop a suite of climate-smart restoration practices in the Central Coast Ecoregion, pilot those practices on the Upper Pajaro River, and share knowledge gained and developed with the local community as well as with the broader restoration community in California.

The following provides high level results of our work with links to the products developed.

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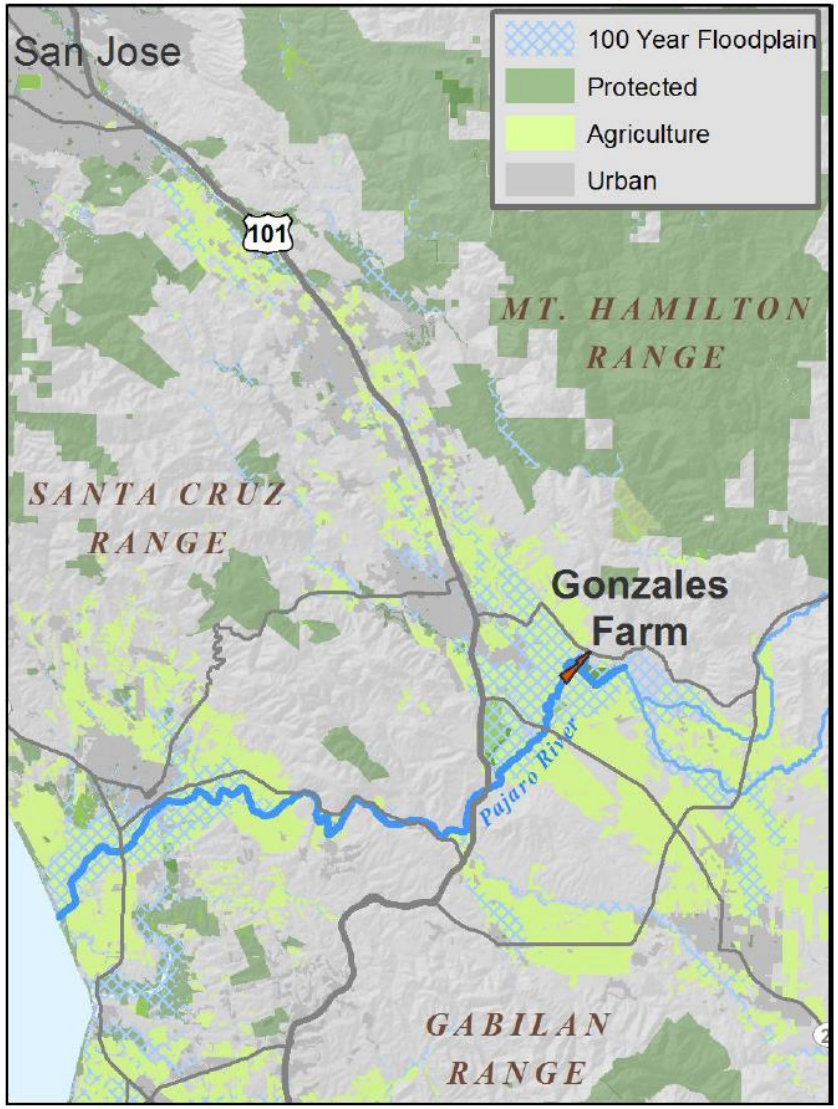
Geographic Scope

The geographic scope is within the California Landscape Conservation Cooperative's **Central Coast Ecoregion**.

The **case study** restoration site is the on the Gonzales Farm in the **Upper Pajaro River floodplain**, 30 miles south of San Jose.

Some of the deliverables are specific to this geography (e.g., Restoration Design Database) but the approach and content (e.g., community engagement, climate analogs, restoration framework) can be used anywhere and in any ecological community thereby extending the reach **globally**.



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Project Goals

Our **goals** were to:

1. **Establish native riparian vegetation** using **climate-smart restoration designs** that will benefit wide-ranging wildlife and prepare the region for the consequences of climate change.

2. **Engage and educate local communities** as advocates for conservation, habitat restoration, and climate resilience.

3. **Develop a community of conservation professionals** prepared to employ climate-smart restoration practices tailored to the Central Coast ecoregion.

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How we accomplished our goals

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What we did, our deliverables

Restoration Design Database

We developed the Riparian Restoration Design Database to help restoration practitioners in the Central Coast Region develop planting designs that:

(1) reduce the vulnerability of a project area to extreme weather events by increasing the capacity of the restoration to rebound from longer and/or more frequent periods of drought, floods, and fire
(2) reduce the vulnerability of wildlife to phenological mismatches by selecting species that provide resources (cover, food) throughout much or all of the year.

It can be used to develop planting palettes to meet climate change- project-specific restoration goals and/or to add ecological redundancy to a design.

It can be modified by adding plant species to fit your project's goals.

Deliverables

Riparian Restoration Design Database, Central Coast

How To Guide and Metadata

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Measuring success, lessons learned

Restoration Design Database

Measuring Success

Because the Restoration Design Database was a tool we developed to help achieve our goals, we did not set specific success criteria for it. However, in the future we will be able to report on the number of downloads which can serve as a high level indicator of use.

We also used it to help design the Pajaro Project which improved and made transparent our logic and also served as a teaching tool at the workshops. See Workshops for more information.

Lessons Learned

Several workshop participants expressed interest in creating restoration design databases for other ecoregions and for additional vegetation communities.

What we did, our deliverables

We conducted a climate analog analysis to identify riparian areas within California today that have the most similar climate and hydrology conditions to future conditions at the Gonzales Farm.

The results of our climate analog analysis can be used to inform the design of climate smart restoration projects by using the types of vegetation and wildlife that occur at analog locations as a reference. The maps can also be used as a communication tool to effectively communicate the magnitude of projected climate and hydrological change to a broad audience.

We also used the opportunity presenting the climate analogs to discuss regional climate change and climate data resources for the Bay Area and California.

Deliverables

Slide deck from Workshop 1

Methods and Maps

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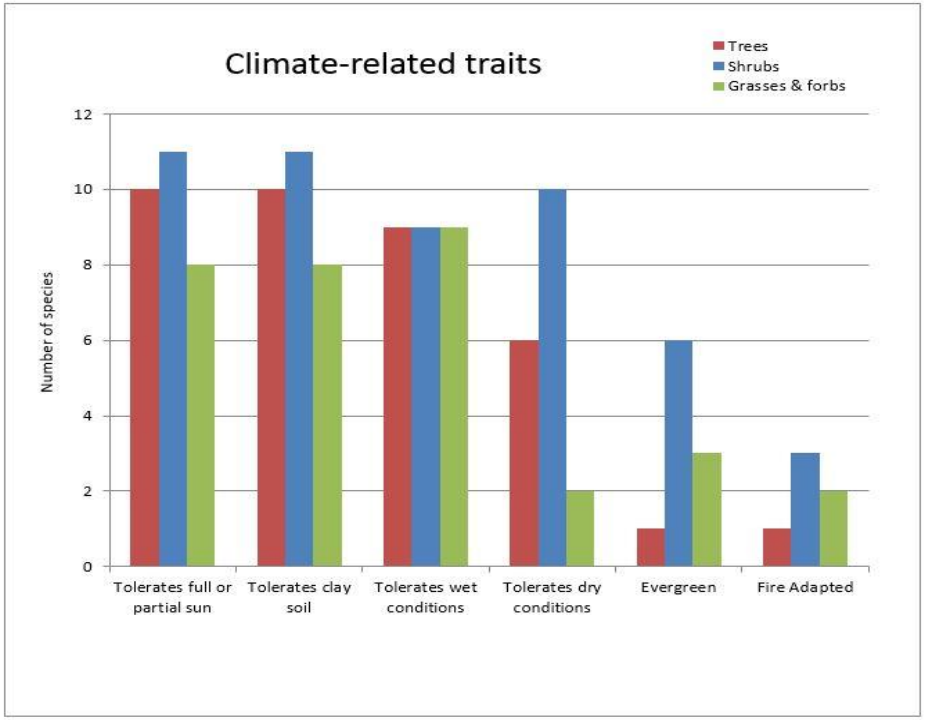
What we did, our deliverables

Implement Restoration

We used the Riparian Restoration Design Database to design a project that provided **climate resiliency** by reducing the likelihood of plant mortality (see example figure), providing key **wildlife resources year round**, while creating a **wildlife corridor** and meeting the **needs of special status species**.

Over **19 days**, we planted **1,250 plants** of **26 species** along **1.02 miles of river** corridor for a total of **8.6 acres**.

A summary of the restoration effort can be found in here.



This figure illustrates how many of the 26 species in our planting design address each climate-related trait. By creating redundancy among species with similar traits, we are able to reduce the vulnerability of a project to extreme weather events for example.

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Implement Restoration

Measuring success, lessons learned

Measuring Success

Measuring success for this restoration project is beyond the scope of this grant.

We have established standardized monitoring baselines for wildlife and the riparian plantings and hence will be able to measure success as the vegetation matures (pending availability of funds).

Lessons Learned

The restoration plantings were challenged in several ways.

Drought – we installed irrigation and relied on it more than normal to increase survival.

Flooding – newly established plants were inundated for several months causing some mortality.

Voles – a large and unexpected vole population was causing plant mortality so we added additional protective cages.

Clay and saline soils – for clay we used mulch to fill cracks and for saline soils we conducted pilot planting and then modified our designs accordingly.

What we did, our deliverables

Community Engagement

Implemented the **Students and Teachers Restoring A Watershed Program (STRAW)** to complete the restoration.

Engaged students, teachers, family members, and local community groups in Santa Cruz, San Benito, and Santa Clara counties.

Provided **teacher training (3 workshops and ongoing mentoring)** and **classroom and field education (180 programs)**, including the **habitat restoration days** where students did the planting.

We reached a total of **45 classes, 1,112 students, 254 parents, and 3 community groups (200 people)**.

We developed a new, **standards-aligned curriculum** targeted to the region.

Deliverables

Standards-aligned curriculum

Community Engagement

Measuring success, lessons learned

Measuring Success

We measured the success of our educational effort for both students and teachers, through interviews and student reflection activities.

Teachers: We interviewed teachers at the beginning, during, and at the end of the programming to target our teaching to their needs and inform our tailored curriculum development. This occurred after school hours and during lunch breaks.

Students: We used Q/A during the first visit to assess general student knowledge of their local watershed and wildlife, and used written student reflection sheets at the end of lessons to assess knowledge gain. For the restoration day, we used informal student reflections at the opening and closing circles to assess knowledge gain on key concepts about the restoration.

Lessons Learned

Teachers appreciated tailored curriculum to local region and alignment with Next Generation Science Standards.

Teachers found attending workshops in the North Bay difficult but some attended when we provided travel and accommodation support. We will be offering teacher trainings in the Central Coast region as we proceed.

What we did, our deliverables

Workshops

We developed and conducted three workshops. We only proposed to do two workshops but because of the level of interest we added a third via webinar.

Workshop design was informed by a needs assessments conducted by Elkhorn Slough Coastal Training Center.

The first workshop, “Climate-Smart Riparian Restoration, For Restoration Practitioners On California’s Central Coast” attracted a total of **35 participants (with waitlist)**.

The second workshop “Helping to Make Riparian Restoration “Climate Smart” A Workshop for Funders, Regulators, and Public Trust Agency Staff” attracted **32 participants**.

The third workshop “Making Riparian Restoration Climate Smart “was delivered as a webinar and had **over 200 participants**.

Deliverables

Needs Assessment (workshop 1)
Needs Assessment (workshop 2)

Workshop 1 includes:
- Agenda
- Presentations
- Handouts
- Additional links
- Summary Report

Workshop 2 includes:
- Agenda
- Presentation
- Handouts
- Summary Report

Workshop 3
- Information and recording

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Workshops

Measuring success, lessons learned

Measuring Success

We conducted formal surveys of the success of each workshop (not the webinar).

Key results from the practitioners workshop include:

- 100% felt it was a good use of their time
- 100% increased their knowledge at least some
- 92% increased their skills at least some
- 88% learned something they will apply in their work

Key results from the funders/regulators workshop include:

- 92% said good use of time
- 97% said it increased knowledge (ranging from some – great deal)
- 68% answered "yes" to learning something they will apply in their work, 32% said maybe
- Comments positive; some did reflect they wanted more detail but unclear in what area

Added a webinar to help meet demand; it hosted the most participants of any California LCC webinar to date.

Lessons Learned

The demand was greater than our supply. Workshops filled to capacity quickly.

The full day workshop was well received and participants appreciated the group work and presentations. They also would have considered a second day to accommodate a site visit.

Regulator/Funder workshop requires more needs assessment.

Need to identify a better hosting system for webinars.

Additional workshops are needed in other geographies and other ecological systems.

Conclusions and Contacts

We accomplished our climate-smart restoration goals to develop and deploy restoration practices, share our lessons learned with a broad community of practitioners, and build local community knowledge and support.

We learned that there is great interest and much more to do to leverage our work throughout California.

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