Climate Smart Actions for Natural Resource Managers Workshop
Case Study: Upper Pajaro River Floodplain Restoration Project

By Sasha Gennet and Kirk Klausmeyer, The Nature Conservancy
November 29, 2012

Lead Agency/Organization and Partners: This project is highly collaborative with different partners focusing on different actions/areas:

- The Nature Conservancy – planning, research/monitoring, implementation.
- Santa Clara Valley Water District
- Pajaro Valley Water Management Authority and the Integrated Regional Water Management Plan partners
- Natural Resources Conservation Service
- Silicon Valley Land Conservancy
- Santa Clara County Open Space Authority
- Living Landscape Initiative partners
- San Benito and Santa Cruz Resource Conservation Districts
- PRBO Conservation Science
- Watsonville Wetlands Watch
- Wild Farm Alliance

Project Description: The Mt. Hamilton, Santa Cruz, and Gabilan Mountain ranges meet at the Pajaro River, an area rich in wildlife, water, agriculture and ranching (Figure 1). Birds use the coastal and floodplain wetlands as major resting points along the Pacific flyway. Wild animals such as mountain lions and badgers migrate and disperse through the landscape. The watershed contains some of California's most productive farmlands and many of the remaining large ranches in and around Silicon Valley.

Upper Pajaro River floodplain looking east. Photos courtesy William K. Matthias and Living Landscape Initiative.

The region contains some of the last streams supporting steelhead trout along the Central Coast. These streams flow into the Pajaro River, which in turn drains into the Monterey Bay, a National Marine Sanctuary. As our climate changes and habitats shift, keeping these lands intact and connected will be critical for allowing plants and animals to persist and adapt.

The critical corridor of the Upper Pajaro River floodplain and the adjacent foothills of the three coastal mountain ranges are threatened by conversion to intensive agriculture and development. This landscape is part of the beautiful Santa Clara Valley, is just 30 minutes from San Jose and has been proposed for a number of transportation and housing development projects. While focused on the entire landscape our immediate goal is to protect - through conservation easements and habitat restoration projects - several properties in that landscape

to conserve the ecological values and function of the upper floodplain and wildlife corridors. The protection of the upper floodplain also ensures critical flood protection for the lower floodplain, more specifically for the towns of Pajaro, Watsonville and the surrounding strawberry and lettuce farms.

Approach to Vulnerability Assessment: Protecting the upper Pajaro River floodplain was a conservation priority of The Nature Conservancy even before we began comprehensive climate change planning and vulnerability assessments for this area. Our vulnerability assessment indicated this landscape provided climate as well as conservation values, and helped to drive more organizational focus toward protecting the region.

Our climate change planning effort began by identifying six key species and habitats in the Mount Hamilton project area, which includes the upper Pajaro River floodplain, that are likely to be vulnerable to climate change. We then used a step-by-step approach to develop adaptation strategies following a method similar to the one described by Poiani *et al.* (2011)[1]. This approach involved developing climate change informed "hypotheses of change" for each species/habitat, and then bringing a team of experts together in a workshop setting to develop adaptation strategies to minimize the negative impacts of climate change. We relied on climate change data and modeled species range shifts developed by TNC. The entire process took about one year. Full details about the species, methods, and workshop participants, and the prioritization process are available here: http://conserveonline.org/workspaces/CA.climate.change/documents/mount-hamilton-climate-adaptive-strategies/view.html.

Development pressure from Santa Clara Valley.. Photos courtesy William K. Matthias and Living Landscape Initiative.

Adaptation Actions: As a result of our climate change planning, we developed a large list of potential actions to help the 6 focal species/habitats adapt to climate change. We looked for areas where multiple focal species were found, and identified the Pajaro as one important area because it contains a steelhead stream, supports important amphibian habitat for species like the California Tiger Salamander, and has the potential to add connectivity for wide-ranging mammals like the Badger. We also chose this site because it helps humans adapt to climate change by storing floodwaters and helping to protect the downstream agricultural lands and the towns of Watsonville and Pajaro.

The key actions we selected to implement in the Pajaro include land protection and restoration of riparian habitat. We chose these actions because much of the potential corridor is not protected, and land protection is designed to last in perpetuity. These actions are well suited to TNC's capacity, and they also align with existing priority actions from previous planning efforts.

[1] Poiani, K., R. Goldman, J. Hobson, J. Hoekstra, and K. Nelson. 2011. Redesigning biodiversity conservation projects for climate change: examples from the field. Biodiversity and Conservation 20:185-201.

Implementation: Through the years, we have documented our planning and anticipated actions in initial assessments, restoration plans and grant proposals. To date, several properties have been protected by TNC and partners; restoration has been completed on at least two properties and two additional are in the planning/fundraising phase. In addition, baseline wildlife monitoring has been completed.

Monitoring and Management: For the lands we protect through conservation easement, annual monitoring will be completed in perpetuity. For the restoration projects in planning phase, our partners will complete several years of post-restoration monitoring, and adaptive management actions (e.g., planting, invasive species control) will be based on survivorship and wildlife use monitoring.

Lessons Learned: From the climate change planning, we distilled the following lessons learned:

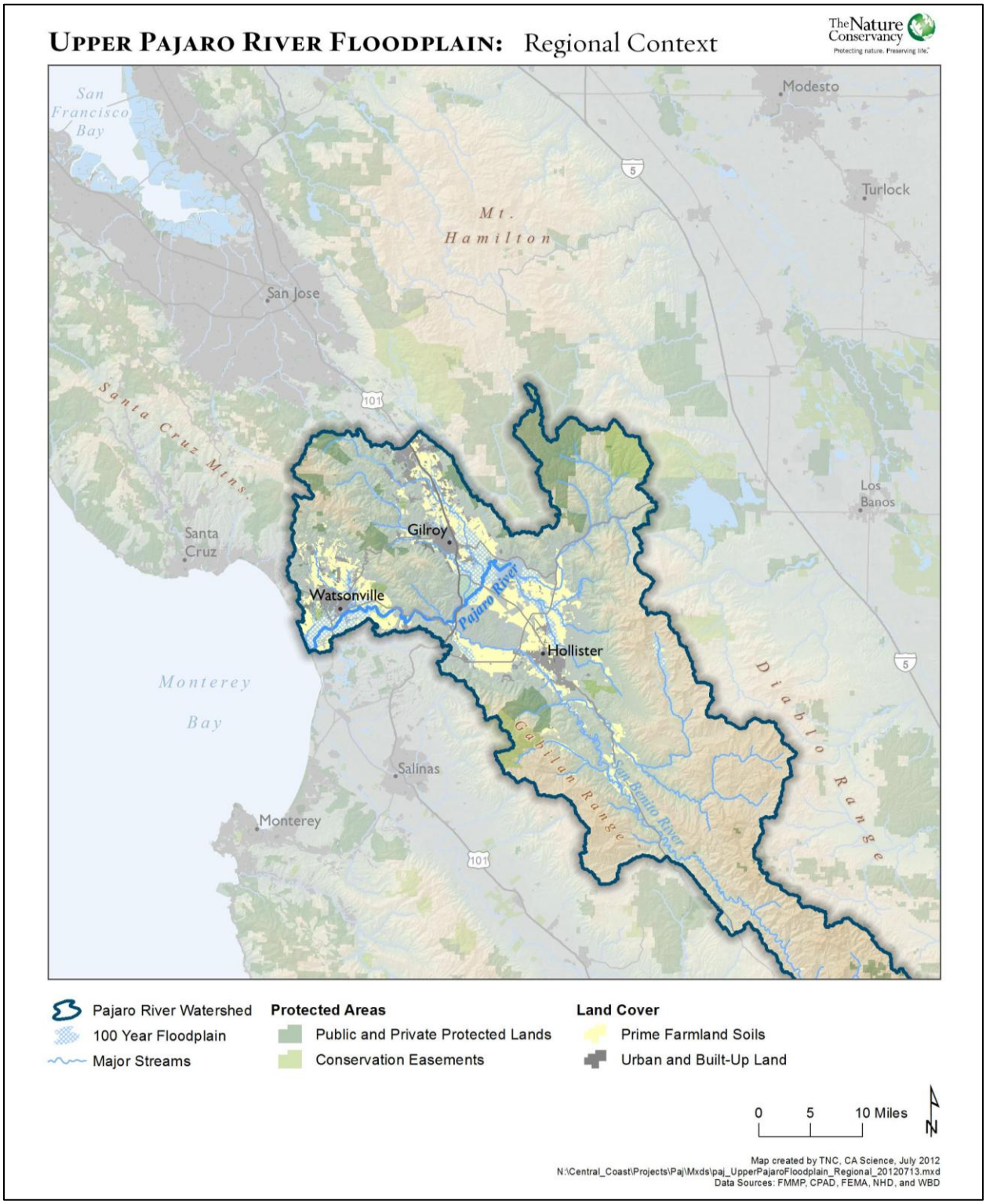
1. Keep it simple. Existing conservation plans, a history of successful implementation, narrow focal target lists, and scenario planning approaches that limit the number of futures considered all streamline decisions about what to do for climate adaptation.
2. Give ample time to set goals and objectives that define what you would like to adapt and what successful adaptation looks like, because the process often takes more time than expected.
3. When developing hypotheses of change, identify vulnerable ecological attributes of each species/habitat, then consider how these are impacted by historical climates as well as future climate projections.
4. Consider human response to climate change because in many cases this trumps the direct impacts of climate change on targets.
5. Pull from diverse stakeholder expertise and experiences.
6. Situational diagrams are a good way to capture complex interactions between humans, nature and climate, that also allow you to trace positive or negative effects on focal targets.

A full report on our lessons learned is available here: http://conserveonline.org/workspaces/CA.climate.change/documents/planning-for-adaptation-to-climate-change-methods**.**

In the implementation phase, we are finding that having a long-term commitment to goals, and ongoing communication with partners and landowners/community members are key elements that are working well.

For Further Information: Sasha Gennet, TNC Ecologist, 201 Mission St., 4th Floor, San Francisco, CA 94105, sgennet@tnc.org.

Figure 1


UPPER PAJARO RIVER FLOODPLAIN: Regional Context
The Nature Conservancy
Protecting nature. Preserving life.
San Francisco Bay
Modesto
Turlock
Mt. Hamilton
San Jose
Santa Cruz Mtns.
101
Los Banos
Gilroy
Santa Cruz
Watsonville
Pajaro River
Hollister
5
Monterey Bay
Diablo Range
Gabilan Range
San Benito River
Salinas
Monterey
101
Pajaro River Watershed
100 Year Floodplain
Major Streams
Protected Areas
Public and Private Protected Lands
Conservation Easements
Land Cover
Prime Farmland Soils
Urban and Built-Up Land
0 5 10 Miles
N
Map created by TNC, CA Science, July 2012
N:\Central_Coast\Projects\Paj\Mxds\paj_UpperPajaroFloodplain_Regional_20120713.mxd
Data Sources: FMMP, CPAD, FEMA, NHD, and WBD