



To: Santa Clara Valley Water District
From: Andrea Mackenzie, General Manager, Santa Clara Valley Open Space Authority
Date: 5 August 2016
Subject: Summary of The Coyote Valley Water Resource Investment Strategy Phase 1 findings

Overview

The Santa Clara Valley Open Space Authority and the Santa Clara Valley Water District have a shared history of collaboration on watershed protection to advance our agencies' goals. We have recently completed Phase 1 of a joint enterprise to understand and test opportunities in Coyote Valley for long-term protection and enhancement of water resource ecosystem services to advance multiple conservation goals. This memo summarizes the findings from Phase 1 and their implications for Phase 2 of our collaborative work.

Background

The Santa Clara Valley Water District (SCVWD) and the Santa Clara Valley Open Space Authority (OSA) share a commitment to protecting watersheds of the Santa Clara Valley, recognizing that investments in watershed conservation and management support the long-term sustainability and resiliency of our water resources and natural communities. The agencies have worked together to conserve watershed lands in Upper Penitencia Creek and Coyote Ridge, and OSA will soon be implementing the South Valley Meadow Restoration, a riparian and wetland restoration project at the Coyote Valley Open Space Preserve that is partially funded through the SCVWD's Safe, Clean Water Grant Program. In 2015, our two agencies entered a formal Partnership Agreement to work on projects and initiatives that increase the pace and scale of watershed conservation in the Santa Clara Valley, advancing the goals of both agencies' strategic plans, specifically SCVWD's One Water Master Plan and OSA's Santa Clara Valley Greenprint.

Our partnership is based on the understanding that protection and restoration of watershed lands not only ensures safe and reliable water resources, but also bolsters the resiliency of the ecosystems and human communities they support. The concept of ecosystem services is fundamental to this approach. Ecosystem services, also referred to as benefits from nature, provides the understanding that natural landscapes and systems are in fact providing measurable benefits and value to our local communities. Known as green infrastructure, these natural systems often provide services more efficiently and at a lower cost than built infrastructure. Unlike built infrastructure, which depreciates over time and requires costly maintenance and replacement, green infrastructure appreciates over time and is largely self-sustaining. Planning for conservation and enhancement of green infrastructure is encouraged and increasingly required by many State and Federal agencies.

As a part of the Healthy Lands & Healthy Economies Initiative, the OSA released “Healthy Lands & Healthy Economies: Nature’s Value in Santa Clara County,” the first effort to comprehensively value ecosystem services in Santa Clara County. The report found that conservatively, green infrastructure in Santa Clara County provides somewhere between \$1.6 and \$3.9 billion dollars in benefits each year. Given the immense value of green infrastructure and the fundamental role of water resources in supporting ecosystem services, the report recommended that the OSA and the SCVWD work together to develop and “implement a Water Resources Master Plan partnership for achieving integrated water resources management outcomes.”

For all of these reasons, OSA staff seek to work with SCVWD to identify opportunities for green infrastructure projects as a part of SCVWD’s One Water Master Plan and the OSA’s Santa Clara Valley Greenprint, a 30-year strategic plan for land conservation in the Santa Clara Valley.

The opportunity: A pilot project in Coyote Valley

The development of the Coyote Creek Watershed One Water Master Plan presents a strategic opportunity for our agencies to collaborate in the Coyote Valley, a 18,500-acre sub-basin within the Coyote Creek Watershed, located just downstream from Anderson Reservoir. The OSA’s Santa Clara Valley Greenprint has identified the Coyote Valley as a Conservation Focus Area based on the outstanding diversity and abundance of its conservation values and opportunities for watershed-scale resource conservation and ecosystem service enhancement projects.

The Coyote Valley landscape supports a critical wildlife linkage, connecting immense wildlands in the Santa Cruz Mountains and the Diablo Range, as well as Coyote Creek – an aquatic linkage between the San Francisco Bay and the upstream-most habitat for anadromous steelhead. Over 3,700 acres of farmland are in active production and serve as the closest foodshed to the Silicon Valley. The foothills on either side of the valley provide habitat for special status species, including the California red-legged frog, California tiger salamander, Bay checkerspot butterfly, and a host of rare plants that occur only in serpentine grasslands. The valley floor supports the Laguna Seca wetland, a historical 1,000+-acre wetland complex that is still largely undeveloped, which presents an irreplaceable opportunity for regionally significant wetland and riparian habitat restoration.

The water resources of the Coyote Valley are also unparalleled in the Coyote Creek’s upper watershed. The Coyote Valley groundwater sub-basin is the only sub-basin feeding groundwater to the Santa Clara Plain Basin. It contains significant amounts of rural, undeveloped land overlying a large unconfined aquifer, surrounded by open hillsides and drainages that recharge Coyote Valley’s aquifer with rainfall and stream flows. The Coyote Valley also encompasses more than 2,500 acres of undeveloped floodplains upstream from communities in urban San Jose.

Despite the diversity and abundance of conservation values supported in the Coyote Valley, this landscape has a number of alterations and impairments that have reduced its hydrologic function and ability to support sensitive habitats. Green infrastructure investments in the Coyote Valley could be designed not only to reverse many of these impairments, but also mitigate many of the effects anticipated to occur with climate change.

For all of these reasons, our agencies have begun working on the development of a collaborative and scientifically-based assessment of opportunities for large-scale watershed restoration in the Coyote Valley. The Coyote Valley Water Resource Investment Strategy is analyzing the performance and value of green infrastructure investments within the Coyote Valley, specifically looking at how we can 1) better leverage stormwater and vast undeveloped areas to increase groundwater recharge, 2) reduce the impact of flooding by capturing stormwater, and 3) identify those recharge and flood mitigation

projects that also provide multiple conservation benefits (*e.g.*, provisioning of cool base flows into Coyote Creek, re-watering wetlands/springs, carbon sequestration, subsidence prevention, reduction of sediment and other pollutants, and increased biodiversity), and 4) improve and enhance the quality of surface water and groundwater.

Project goals include:

1. Use SCVWD hydrologic and hydraulic models to evaluate performance of green infrastructure in enhancing/protecting local water resources under current and future conditions;
2. Characterize and quantify the suite of co-benefits that could be provided by these types of green infrastructure projects, and calculate the economic return on investment and/or benefit-cost of these investments;
3. Identify scenarios for the Coyote Valley that illustrate how green infrastructure can enhance ecosystem services/landscape resiliency and/or mitigate impacts caused by future development;
4. Inform land use planning and proactive land conservation strategies in the Coyote Valley, and identify/secure continued funding to implement large-scale watershed restoration projects; and
5. Implement projects with agency partners and willing landowners.

Phase 1 Work and Findings

Our agencies have just completed the first phase of this work by completing a rapid assessment of the range of water resource benefits possible within the Coyote Valley within the context of SCVWD operations in the Lower Coyote Creek watershed. Specific questions included:

1. Are there opportunities in the Coyote Valley to **enhance groundwater recharge** through improved land management to capture stormwater? If so, how much, and where could it be captured and percolated?
2. What will be the change in downstream **flood risk** if we increase stormwater capture in Coyote Valley?
3. Where are the best opportunities for **multiple benefit ecological restoration** actions to improve habitat for wildlife while promoting aquifer recharge and flood attenuation?
4. Can green infrastructure within Coyote Valley improve and enhance **surface and groundwater quality**?

A technical memo developed by Alnus Ecological with support by the OSA (“Technical Memo: Water-Related Ecosystem Services in the Coyote Valley”) details the methods and results and conclusions of this first phase of work. The following provides a brief overview of these findings.

1. Enhance groundwater recharge

We found that a large amount of water is already naturally recharging in the Coyote Valley and the stormwater flowing out of Fisher Creek represents an opportunity for additional stormwater capture and groundwater recharge. The western foothills of the Coyote Valley capture enough water during a single 10-yr storm event to support approximately 2,000 families for a year. If we look at opportunities to increase stormwater capture of just a fraction of the 3,910 to 10,626 acre-feet that flow through Fisher Creek between “normal” and “wet” years, respectively, we can make meaningful gains in the benefits we receive from our stormwater.

Early results suggest that four of the ten Fisher Creek sub-basins in the Coyote Valley are highly suitable for additional stormwater capture and groundwater recharge. These basins are generally located in the drainages of the western foothills of the Coyote Valley and encompass the majority of Fisher Creek.

2. Flood risk

Our modeling shows that if we were to capture all stormwater in Fisher Creek, downstream peak flows would be reduced as much as 3-4.5%, capturing more than 57% of the flows that floods the Williams Street location during 10-yr events. Although capture of all storm flow from Fisher Creek would be infeasible and is not desirable, this gives us the absolute upper bounds estimate of the potential downstream flood risk reduction offered by stormwater capture projects in the Coyote Valley. Given that SCVWD has considered hundreds of millions of dollars in flood risk reduction projects at the Williams Street reach of Coyote Creek, these results indicate that there are measurable and potentially very valuable flood risk reduction benefits from conservation and green infrastructure investments in stormwater capture in the Coyote Valley.

3. Multiple benefit ecological restoration

Well-planned watershed restoration projects are designed to provide multiple benefits. Coyote Valley offers opportunities to restore tributaries and alluvial fans flowing from the Santa Cruz Mountains into Fisher Creek and the Coyote Valley. Our research indicates that restoring a mosaic of habitat types spanning from the Santa Cruz Mountain drainages through a realigned and greatly expanded Fisher Creek corridor and into a portion of the historic Laguna Seca, would increase meadow and riparian habitat, increase groundwater storage capacity, reduce peak flows, and reduce sediment delivery to Fisher Creek.

This scale of watershed restoration is possible and can be compatible with some development within the Coyote Valley. Even focusing on just a subset of the original area occupied by the historic Laguna Seca, this work could result in thousands of linear feet of restored riparian corridor along Fisher Creek, and hundreds of acres of wetlands, wet meadows, and valley oak savannah.

4. Surface and groundwater quality

Surface water monitoring has shown that suspended sediment, nitrate, and fecal coliform are known to be problems in runoff from Fisher Creek and its tributaries, degrading waters that support fish populations in Coyote Creek. Domestic drinking water wells in the South County area (including Coyote Valley) show levels of nitrate 31% above the maximum contaminant level, and over a quarter of these wells are indicated to be contaminated by coliform bacteria.

Well-designed recharge and restoration projects could improve water quality for human and wildlife. Green infrastructure in the form of managed treatment wetlands or filtration wetlands can effectively reduce nitrate levels in the water through denitrification and reduce suspended sediment and fecal coliform loads through increased residence time and exposure to biogeochemical reactions.

Next Steps

The findings from Phase 1 of our work indicate that we have significant opportunities to leverage and enhance green infrastructure to improve water supply and quality while also providing flood risk mitigation and habitat improvements.

Phase 2 of this project will build from this work and will identify suitable and optimal locations for green infrastructure projects, specific types of projects, and more granular modeling of projected benefits,

along with an economic assessment of investments in Coyote Valley. Phase 3 will work from the most promising results of the project to develop a scientifically-based plan with specific design concepts for green infrastructure enhancement and restoration within the Coyote Valley.

Through the next phases of this project, our aim is to identify a suite of cost-effective, practical restoration projects that are appealing to funders and can be implemented in partnership between OSA, SCVWD, the wildlife agencies, and willing landowners.