

# Protecting Groundwater Through Open Space Conservation

## SERIES OVERVIEW

In 2022, California is in the midst of a severe drought — just a few years after the worst drought in a millennium ended in 2017.

This pattern of accelerating and deepening droughts is consistent with climate change models for the state, which forecast longer, more severe and more frequent droughts punctuated by heavy rain and flooding.

Unlike past droughts, these events are not periods to survive until “normalcy” returns. Instead, they are a sign that the climate is changing — and that the state must fundamentally change how it uses water.

These six case studies — a follow-up to SPUR and Pacific Institute’s report *Water for a Growing Bay Area* — highlight leaders who are pioneering more sustainable approaches to water in Northern California. We highlight public water agencies, private corporations, nonprofit affordable housing developers and local land use authorities who are using water more efficiently, protecting groundwater supplies, reusing stormwater and recycling water.

Water sustains life, and its status — whether it is plentiful or scarce, clean or polluted, fresh or salty — shapes the well-being of all living creatures. These six case studies illustrate strategies for California to meet the challenge of a changing climate and emerge with a healthy environment and flourishing communities.

## Key Takeaways

- Coyote Valley is an expansive open space at the perimeter of San José, and until recently much of it was unprotected from urban growth.
- Urban development in the area would have potential to reduce groundwater recharge, increase contamination of aquifers and increase downstream flooding.
- Using zoning laws to preserve lands connected to sensitive groundwater resources as agriculture and open space, while concentrating growth within urban boundaries, benefits groundwater resources and flood prevention.

Stretching between the coastal Santa Cruz Mountains and the rugged Diablo Range, Coyote Valley is an expansive 7,400-acre open space landscape with remarkable natural value. The broad, sloping valley, which borders the southern reaches of the City of San José, offers essential wildlife habitat, rich farmland, outdoor recreation and vast water resources. Coyote Valley’s waterways and groundwater provide drinking water, while the natural floodplains capture and recharge groundwater and prevent flooding.

Protecting Coyote Valley from development is key to securing the Bay Area’s water future as the region responds to a changing climate that strains drinking water supplies and triggers severe droughts, frequent wildfires and more extreme weather. More than 30 creeks wind their



## A view of Coyote Valley.

Photo by Ron Horii, courtesy Santa Clara Valley Open Space Authority



way through the hills, ranges and floodplains of the roughly 325 square miles of Coyote Creek Watershed, the largest and most diverse watershed in Santa Clara County. These streams flow into Coyote Creek and eventually into the San Francisco Bay. Surface water and rainwater percolate through the highly porous sections of the valley floor, replenishing groundwater basins that supply more than half of Santa Clara Valley's drinking water, reducing flooding and contributing to long-term water security.

## Groundwater

North Coyote Valley presents a unique opportunity to protect groundwater and drinking water quality for thousands of San José residents. Physical characteristics of the land make it one of the most vulnerable areas in Santa Clara County for contamination, but widespread industrial development has not yet occurred here. The risk from that development can still be prevented entirely, while in already-developed

areas it can only be managed. Protecting Coyote Valley from development will be key to securing San José's groundwater supplies.<sup>1</sup>

Coyote Valley has an immense capacity to store groundwater that is critical to water supplies for thousands of people in Santa Clara County. The estimated 1,758 acre-feet of groundwater recharge in Coyote Valley is equivalent in volume to the annual water use for about 9,015 households.<sup>2</sup> Santa Clara Valley Water District estimates that Coyote Valley can store between 23,000 and 33,000 acre-feet of usable groundwater at full capacity.<sup>3</sup>

If developed, these lands would be highly vulnerable to groundwater contamination due to the high water table and soil permeability.<sup>4</sup> Unlike most other locations in Santa Clara County, the drinking water aquifer is near the surface and is unconfined, meaning it is not shielded by an overlying impermeable layer of rock or clay. A contamination event that might not reach the groundwater table in other locations will likely

<sup>1</sup> Coyote Valley and Groundwater Protection, Greenbelt Alliance, Brian Schmidt, Program Director. <https://www.greenbelt.org/research/white-paper-coyote-valley-groundwater-protection/>. Accessed September 16, 2020.

<sup>2</sup> Bay Area Greenprint, Coyote Valley Report online, <https://bit.ly/31yAKI7>. Accessed August 27, 2020.

<sup>3</sup> Sustainable Agriculture Education (SAGE), Conserving Coyote Valley Agriculture Feasibility Study, Phase One Report, 2012. <https://www.sagecenter.org/wp-content/uploads/2015/11/Coyote-Valley-Agriculture-Feasibility-Study-Phase-1-Report.pdf>

<sup>4</sup> Coyote Valley and Groundwater Protection, Greenbelt Alliance, Brian Schmidt, Program Director. <https://www.greenbelt.org/research/white-paper-coyote-valley-groundwater-protection/>. Accessed September 16, 2020.



reach it in Coyote Valley and then spread with the moving groundwater.

An estimated 4,365 acres of open space in Coyote Valley could be developed in the near future.<sup>5</sup> According to the Santa Clara Open Space Authority, “with over 60% of the landscape that once recharged Santa Clara County’s aquifers now urbanized, Coyote Valley represents the largest remaining undeveloped recharge area for the groundwater basin that serves Silicon Valley.”<sup>6</sup>

## Floodwaters

Coyote Valley’s 2,500 acres of floodplains slow and retain floodwater upstream of urban communities in the City of San José.<sup>7</sup> In recent years, San José suffered intense urban flooding downstream of Coyote Valley, with severe impacts on low-income and homeless communities. Urbanization in Coyote Valley could worsen downstream flooding, while restoration of the valley’s historic floodplains would reduce flood risks for urban communities. Coyote Valley is among San José’s growing network of open space that provides residents with stormwater management services valued at \$6.43 million annually.<sup>8</sup>

This ability to capture and retain water could decline if the valley is developed. Development in Coyote Valley could reduce groundwater recharge by an estimated 25% and would require significant new stormwater infrastructure to avoid additional downstream impacts.<sup>9</sup> Coyote Valley, especially North Coyote Valley, stands at the confluence of threat and opportunity.

## Water-Smart Planning

Fortunately, Coyote Valley is positioned to become a national model of water-smart planning. For many years, conservation leaders have worked diligently to preserve the area’s unique natural resources. For example, in 2015, Greenbelt Alliance, Committee for Green Foothills and others raised concerns about a proposal to build a major warehouse facility in the valley near Fisher Creek. This advocacy helped convince the property owner to sell the contested lands to Peninsula Open Space Trust (POST), safeguarding an essential pathway for wildlife movement and a watercourse that is a lifeline for thirsty bobcats, coyotes, foxes and other wildlife.

In 2018, San José residents voted to adopt Measure T, a citywide infrastructure bond, which includes up to \$50 million for conservation and restoration activities in Coyote Valley. That November, the new funds were used, along with funding from POST and the Santa Clara Valley Open Space Authority, to acquire 937 acres of land in Northern Coyote Valley. The purchase is intended to protect the aquifer and natural floodplain from future development and set the stage for large-scale restoration and green infrastructure projects. Measure T sets a precedent for integrating nature-based water management strategies into infrastructure planning. The size of the investment is also critical: It substantially expands the scope of potential conservation and restoration activities in the valley and, hopefully, will attract more funding from public and private sources.

5 Bay Area Greenprint, Coyote Valley Report online, <https://bit.ly/31yAKI7>. Accessed August 27, 2020.

6 Santa Clara Valley Open Space Authority 2014 cited in Batker, D., Schwartz, A., Schmidt, R., Mackenzie, A., Smith, J., Robins, J. 2014. Nature’s Value in Santa Clara County. Earth Economics, Tacoma, WA, & the Santa Clara Valley Open Space Authority, San José, CA. [https://www.openspaceauthority.org/system/user\\_files/Documents/NaturesValue\\_SCC\\_int.pdf](https://www.openspaceauthority.org/system/user_files/Documents/NaturesValue_SCC_int.pdf)

7 Santa Clara Valley Open Space Authority and Conservation Biology Institute. 2017. Coyote Valley Landscape Linkage: A Vision for a Resilient, Multi-benefit Landscape. Santa Clara Valley Open Space Authority, San José, CA. [https://www.openspaceauthority.org/system/documents/Coyote%20Valley%20Landscape%20Linkage%20Report\\_Final\\_lowres.pdf](https://www.openspaceauthority.org/system/documents/Coyote%20Valley%20Landscape%20Linkage%20Report_Final_lowres.pdf)

8 Ibid.

9 Ibid.





In 2019, San José city leaders built on this new green infrastructure investment by committing to explore Coyote Valley's long-term future in its citywide General Plan Review. This process will seek to reallocate planned development from Coyote Valley to urban infill locations and change the zoning code to limit the valley's use to agriculture and open space. This action by the city, along with ongoing land conservation efforts, sets the stage for Coyote Valley to demonstrate how natural and working lands can be managed for flood and groundwater protection, climate change resilience and wildlife habitat. The zoning changes will also prevent greenhouse gas emissions and reap carbon sequestration benefits from conserving and restoring Coyote Valley instead of developing it.

The Santa Clara Valley Open Space Authority and Santa Clara Valley Water District are also developing a Water Resource Investment Strategy for the valley that will make better use of open space areas to detain stormwater for downstream flood protection, improve water quality in Coyote Creek and Fisher Creek, preserve groundwater recharge and storage, and restore wetlands and riparian areas to increase ecological resilience.

After a decades-long debate, in November 2021 the San José City Council approved land use changes to indefinitely protect the bulk of North and Mid-Coyote Valley from major development. As part of the vote, city leaders rezoned 314 acres of remaining undeveloped land in North Coyote Valley from an industrial park designation to agriculture, blocking proposed construction of warehouses and distribution centers on the valley floor.<sup>10</sup>

These efforts can serve as a template for

wise management of watershed lands across the Bay Area. Today, roughly 1.2 million acres — more than a quarter of all the land in all nine Bay Area counties — catch and filter rainwater and replenish local water supplies.<sup>11</sup> Continued deployment of nature-based solutions to protect and restore these lands can safeguard water supply and quality.

## Strategies to Protect Groundwater Resources

### **Map highly vulnerable groundwater resources and groundwater-dependent ecosystems around the Bay Area.**

Identifying high-priority groundwater resources and those ecosystems highly dependent on groundwater will provide critical information to guide policymaking that can protect these resources from contamination and depletion. For example, while an Environmental Impact Report (EIR) is generally required for development plans and projects, additional mapping and prioritization of water-resourced areas can ensure that projects that do not threaten prioritized areas and reduce the region's overall resource use are approved.

**Who has authority:** Drinking water utilities, San Francisco Bay Regional Water Quality Control Board

### **Preserve highly vulnerable groundwater resources for conservation as open space.**

For watersheds to properly drain and filter water to replenish groundwater supply, there must be sufficient undeveloped natural land nearby. As the climate changes, conserving and restoring open spaces are important strategies for securing

<sup>10</sup> The Mercury News. "The Right Thing to Do: North Coyote Valley Will Be Preserved as Open Space and Farmland," November 17, 2021. <https://www.mercurynews.com/2021/11/16/north-coyote-valley-will-be-preserved-for-open-space-and-agriculture>.

<sup>11</sup> Greenbelt Alliance. "At Risk: The Bay Area Greenbelt," 2017. <https://www.greenbelt.org/research/at-risk-the-bay-area-greenbelt-2017/>.



FIGURE 1

## Vulnerable Groundwater Resources in Coyote Valley

The blue shaded area shows the extent of Coyote Valley’s unconfined groundwater, a body of underground water that is not shielded by an overlying impermeable layer of rock or clay. Coyote Valley is a place where water soaks into the soil and recharges the aquifer. Development and pollution are threats to the groundwater resource.

Source: Coyote Valley and Groundwater Protection, Greenbelt Alliance, Brian Schmidt, Program Director. <https://www.greenbelt.org/research/white-paper-coyote-valley-groundwater-protection/>. Accessed September 16, 2020



groundwater resources while mitigating downstream flooding and drought.

**Who has authority:** Cities, counties, open space districts and land trusts

**Employ a suite of plans and policies that protect open space from development to ensure sustainable groundwater resources for decades.**

Land use tools such as urban service areas, urban growth boundaries, urban limit lines and city limits promote infill development and preserve water resources provided by surrounding natural infrastructure. Additional measures that protect water-rich open spaces include agricultural protections, watershed protections and riparian protections. More can also be done to ensure that groundwater-dependent ecosystems are resilient to droughts and climate change by managing aquifers to support and enhance them now and into the future.

**Who has authority:** Cities, counties, Metropolitan Transportation Commission/Association of Bay Area Governments

Read all the case studies at [spur.org/watershedmoments](http://spur.org/watershedmoments)



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