

SAN BERNARDINO VALLEY MUNICIPAL WATER DISTRICT

Sunrise Ranch

DRAFT MASTER PLAN



1,658 Acres of Opportunity for *everyone*



Message from the Board of Directors

Since 1954, San Bernardino Valley Municipal Water District (San Bernardino Valley) has worked to secure a reliable and sustainable water supply while embracing its role as a regional leader in water and watershed management. Sunrise Ranch, a 1,658-acre property situated at the confluence of the Santa Ana River and Mill Creek, presents a unique opportunity to continue that legacy, with potential opportunities for new water infrastructure which strengthens our mission. Just as the Santa Ana River and Mill Creek come together near the site, Sunrise Ranch brings together the opportunities for water supply, environmental stewardship, and public engagement to benefit the entire region.

The Sunrise Ranch property holds great potential to support San Bernardino Valley's mission through the evaluation of potential facilities that will enhance storage, reliability, and resilience in our water supply. At the same time, the site provides opportunities for habitat conservation and mitigation values to meet water project permit requirements, protection of open space at the wildland-urban interface, and additional community benefit projects, such as a place for public recreation and environmental education. This vision integrates water supply reliability with the preservation and enhancement of the watershed, ensuring that taxpayer investments are not only durable but also deliver multiple layers of public value.

The Sunrise Ranch Master Plan Report is intended to highlight possibilities as a framework for an intentional path forward. It identifies strategies for developing water infrastructure while also creating spaces for people to learn about their watershed, increasing the understanding of who we are as an agency, and engaging with the habitats and natural systems that sustain our region. The report is intended to be a living document that can be used as a tool for future decisions of the Board of Directors to ensure that Sunrise Ranch serves as a resource that supports water reliability, conservation, and community well-being for decades to come.



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Sunrise Ranch

DRAFT MASTER PLAN

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WSC — Communications and Outreach
Minds Illustrated — Technical Writing



**SAN BERNARDINO
VALLEY** | A REGIONAL WATER
AGENCY SINCE 1954

The *Sunrise Ranch* Master Plan presents opportunities to enhance the storage capacity, reliability, and resilience of our region's water supply while also providing protected spaces for our region's people and environment.

Thank you to the community and interested parties who helped create this vision for our future.

ACRONYMS AND ABBREVIATIONS

ac	Acre
AF	Acre-feet
AFY	Acre-feet per year
Board	San Bernardino Valley's Board of Directors
BVMWC	Bear Valley Mutual Water Company
CDFW	California Department of Fish and Wildlife
cfs	Cubic feet per second
cy	Cubic yards
DEIR	Draft Environmental Impact Report
DWR	California Department of Water Resources
DSOD	DWR Division of Safety of Dams
EBX	East Branch Extension
EIR	Environmental Impact Report
EVWD	East Valley Water District
HCP	Habitat Conservation Plan
LEED	Leadership in energy and environmental design (certification)
MGD	Million gallons per day
MSHCP	Multiple Species Habitat Conservation Plan
OCFCD	Orange County Flood Control District
PS	Pump station
RWQCB	Regional Water Quality Control Board
SART	Santa Ana River Trail
SBKR	San Bernardino kangaroo rat
SBVMWD or San Bernardino Valley	San Bernardino Valley Municipal Water District
SBVWCD	San Bernardino Valley Water Conservation District
SCE	Southern California Edison
SGPWA	San Geronio Pass Water Agency
SSC	Species of Special Concern
Sunrise Ranch	Property acquired by San Bernardino Valley that is the subject of this Master Plan
SWP	State Water Project
TBD	To be determined
TLMWC	Tres Lagos Mutual Water Company
USACE	U.S. Army Corps of Engineers
USGS	United States Geological Survey



SUNRISE RANCH MASTER PLAN

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Introduction

In February 2022, San Bernardino Valley Municipal Water District (San Bernardino Valley) acquired a 1,658-acre property (referred to as Sunrise Ranch) from the Orange County Flood Control District (OCFCD) through a public auction.

When the Board of Directors made this purchase, it recognized a once-in-a-generation opportunity to shape the future of our watershed—an investment in lasting resilience for our region’s people and environment. By securing this extraordinary property, which is perfectly situated to enhance regional water security, preserve rare habitats, and create new possibilities for public open space and beyond, the Board took a visionary step toward safeguarding our shared future.

The purchase of Sunrise Ranch was initially guided by two key objectives: (1) to support water supply reliability by providing high-elevation storage capacity that could enhance and expand San Bernardino Valley’s existing water system, and (2) to generate significant economic value through protection of habitat suitable for mitigation, associated either with San Bernardino Valley’s water infrastructure permitting requirements and/or through mitigation credit sales to outside parties.

Guided by these priorities, the property holds the promise of becoming a vibrant hub for community connection and learning—offering opportunities such as surface storage reservoir(s), scenic walking trails with educational signage, drought-tolerant demonstration gardens, and an inviting campus-style Agency Headquarters that welcomes the public and fosters a shared commitment to sustainability and discovery. Following initial discussions, the Board commissioned development of a planning-level document to guide future decisions regarding the property—a vision now realized in the Sunrise Ranch Master Plan (Master Plan). This document stands apart in its purpose and spirit. Drawing inspiration from the clarity and structure of formal government plans, it invites us to imagine what is possible for the Sunrise Ranch property before any single step is taken. More than a plan, it is a visioning tool—one that opens the door to creativity, thoughtful exploration, and strategic alignment. By presenting a range of opportunities for the site as a whole, it empowers the Board of Directors to establish clear direction, set priorities, and shape the future of Sunrise Ranch with purpose and intention.



MASTER PLAN *Chapters*

The Master Plan is presented in five Chapters:

Chapter 1. Water Supply Infrastructure Opportunities

Water Supply Infrastructure Opportunities represent the Board's highest priority, as they directly advance the Agency's mission to ensure a reliable and sustainable water supply. These opportunities include exploring potential new reservoirs and conveyance infrastructure to enhance system resilience and capacity and maximize the State Water Project water benefits.

Chapter 2. Habitat and Mitigation Opportunities

Habitat and Mitigation Opportunities include potential mitigation activities for sensitive species designed to produce credits applicable for water infrastructure permitting pursuant to the Upper Santa Ana River Habitat Conservation Plan (HCP), as well as the designation of acreage for a mitigation credit account which will allow sale of mitigation values to other entities, the revenue from which can be used to fund San Bernardino Valley local projects at the Board's direction. In partnership with 10 other agencies, the HCP will mitigate impacts of water activities in the Santa Ana River through conservation of the native ecosystems. This allows for much needed water projects to be built while also supporting the ecological integrity of the Santa Ana River and the communities within its watershed.

Chapter 3. Public Recreation Opportunities

Public Recreation Opportunities describe potential features that could be developed further, while keeping water infrastructure and habitat conservation as top priorities. Through positive, self-guided activities—such as walking, observing nature, or enjoying scenic views—the site can offer the public opportunities to build a connection to the landscape, the watershed, and gain a deeper understanding of the work that San Bernardino Valley does to protect and manage public resources. The property's trails system could be designed in a way that links and extends existing trail systems like the City of Highland, San Bernardino National Forest, and Santa Ana Regional Trails.

Chapter 4. Facilities Opportunities

Facilities Opportunities advance the Agency's long-term goals by strengthening operational efficiency, enhancing collaboration, and creating spaces that reflect our commitment to water supply, native habitat and watershed ecosystems, public engagement, and community value.

Strategic investments—such as a modern Headquarters large enough to meet the Agency's staff and Board needs, a regional watershed-focused education center, or essential fire training facilities developed in partnership—will serve as key infrastructure to support the Agency's mission and regional leadership. These facilities will not only improve service delivery and staff coordination but also provide platforms for stakeholder and community engagement, education, and stewardship—showcasing how the San Bernardino Valley Municipal Water District sustains and enriches the region's natural and human resources.

Chapter 5. Next Steps

Next Steps describes a potential path from vision to reality, guiding the potential implementation of the concepts included in the Master Plan through development of an integrated site design and preliminary engineering, building strong partnerships and external funding opportunities, exploring sustainable finance strategies, securing durable mitigation credit value, and transparent communication.

The Master Plan does not prescribe how the property must be used in the future. Instead, it presents options identified within the broad categories described above, along with related evaluations, assessments, and findings for each category. The Master Plan is meant to guide the Board and staff as they consider future actions, approvals, and activities to further explore individual opportunities.

The Master Plan provides a snapshot of what is possible at this point in time, based on the possibilities explored thus far. New opportunities may emerge as work continues, while some elements may later prove less feasible after further study. Many factors—such as available funding, permitting requirements, and successful partnerships—will all influence how and when opportunities move forward.



ABOUT *Sunrise Ranch*

The Sunrise Ranch property sits at the foothills of the San Bernardino mountains, rising in elevation over 1,100 feet from west to east towards the entry of the San Bernardino National Forest.

During the late 1800's and early 1900's the area operated as multiple citrus groves including the Roberts Ranch and other small neighboring ranches. In the 1920's, the properties were consolidated and became known as Sunrise Ranch.

The Orange County Flood Control District (OCFCD) originally acquired the property in 1997 for soil extraction to support construction of the Seven Oaks Dam. In 2010, a proposal was introduced to develop approximately 3,600 residential units on the site. However, the project was canceled in 2018, and OCFCD subsequently placed the property up for auction in 2019. The San Bernardino Valley Water District submitted the highest bid and purchased the property for \$31.8M.

The property is well suited to advancing San Bernardino Valley's mission to reliably deliver water to its constituents. Sunrise Ranch possesses several key hydrologic and water resource attributes, including its strategic location at the confluence of the Santa Ana River and Mill Creek, as well as its relatively high elevation within the watershed. This higher elevation enables water from the State Water Project to be delivered to the site by gravity, stored in an on-site reservoir, and then distributed—again by gravity—to lower-elevation areas throughout the service area.

Water can also be delivered to higher elevations with the use of existing pumping facilities in the vicinity or new pumping facilities that could be built in the future, if needed.

Sunrise Ranch is bordered by Greenspot Road, Florida Avenue, Garnet Street, and Mill Creek Road to the south and west, and the San Bernardino National Forest to the north and east (Figure 1). The property lies within the City of Highland, adjacent to the unincorporated community of Mentone and the City of Yucaipa. The opportunities developed on the site are anticipated to serve communities across the region, both within and beyond San Bernardino Valley's service area.



Figure 1. Sunrise Ranch Property Location



MISSION-DRIVEN PLANNING PROCESS

Established in 1954, the San Bernardino Valley Municipal Water District was created as a regional agency to secure supplemental water supplies and support long-range water resource planning.

Today, the Agency imports water through the State Water Project (SWP) for both direct delivery and groundwater recharge. It also serves as co-watermaster for the Western-San Bernardino and Orange County Judgments and holds additional water rights to surface flows of the Santa Ana River. Beyond water management, the Agency leads regional efforts in water infrastructure permitting and provides essential environmental and technical support services to neighboring water agencies—all to enhance the quality of life for residents across its 353-square-mile service area.

The Board provided clear direction that the Master Plan should align and support the organization's established Mission, Vision, and Values. In April and July 2022, the Board and staff participated in collaborative workshops to develop the foundational concepts for the future Sunrise Ranch Master Plan.

MISSION STATEMENT

Work collaboratively to provide a reliable and sustainable water supply to support the changing needs of our region's people and environment.

The workshops culminated in a shared vision that prioritized the identification of the following types of opportunities:

SUNRISE RANCH OPPORTUNITIES



Water Supply Infrastructure Opportunities

(e.g., reservoirs and conveyance)



Habitat and Mitigation Opportunities

(e.g., restoration, preservation, conservation and mitigation, HCP environmental obligations, and revenue for other projects)



Public Recreation Opportunities

(e.g., walking/hiking trails, educational signage)



Facilities Opportunities

(e.g., buildings and utilities)

Working alongside a team of specialized consultants, the Sunrise Ranch planning process included extensive research and data collection to explore a range of potential uses for the property. This foundational work will help guide the future actions based on the Board of Directors guidance.

From 2023 to 2024, San Bernardino Valley hosted four community workshops to share updates on the Master Plan progress and to gather valuable input from the community. In addition, feedback was encouraged at various community events and presentations.



Master Plan Overview

Chapters 1 through 4 of the Master Plan highlight the opportunities identified so far for Sunrise Ranch. These opportunities are organized into four main categories and cover all areas of the property, as shown in **Figure 2**.

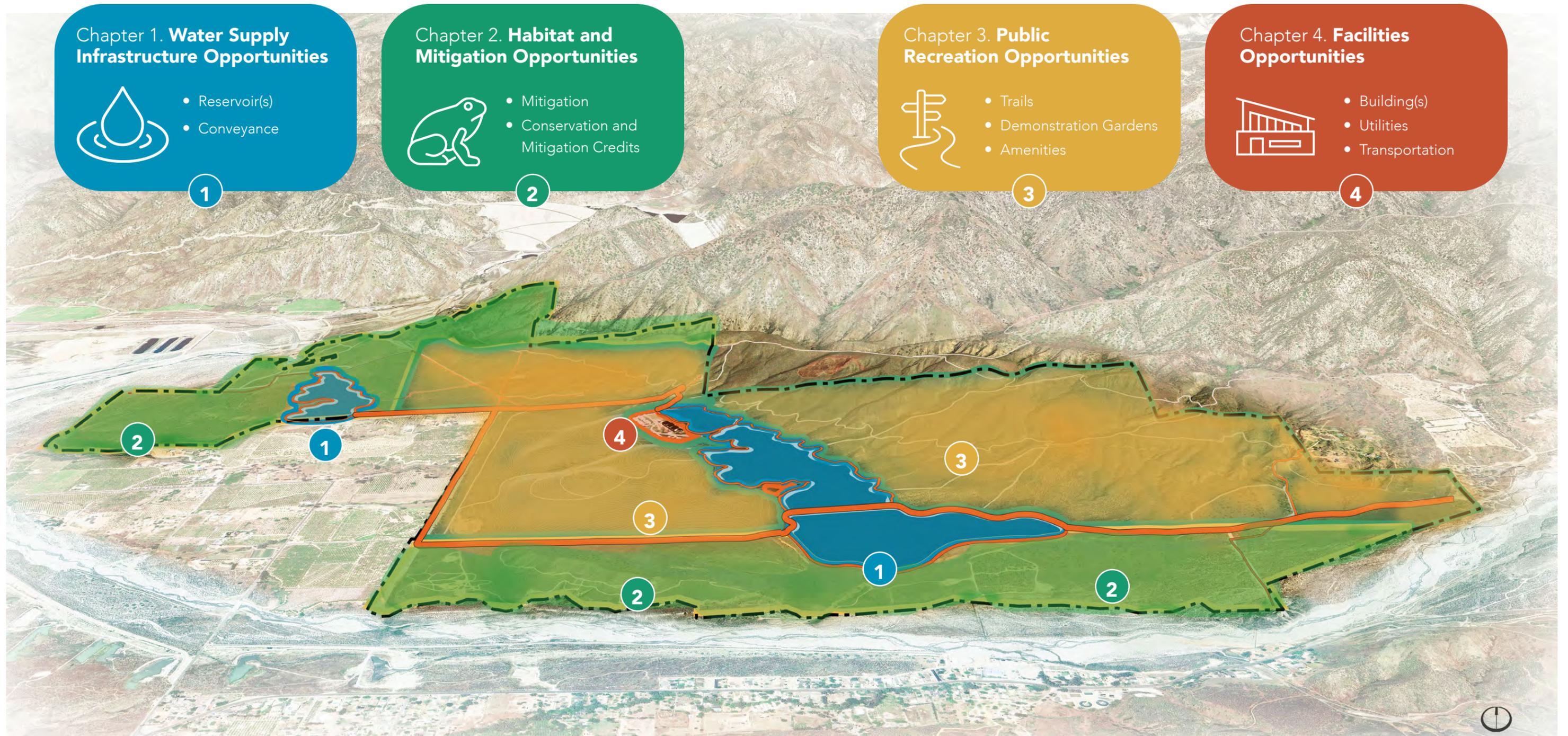


Figure 2. Master Plan Opportunities by Chapter and Location

The Master Plan development represents the first step in exploring potential future projects for the Sunrise Ranch site (Figure 3). It offers an initial assessment of the opportunities identified so far. Before any specific project can move forward—such as beginning detailed planning and design, entering permitting, or securing funding—the Board of Directors must first review and approve the specific elements to move forward in the process.

Even after the Master Plan is adopted, the Board will continue to receive regular updates and specific action requests on all elements proposed to move forward, allowing the Board to provide guidance and adjust priorities as needed.

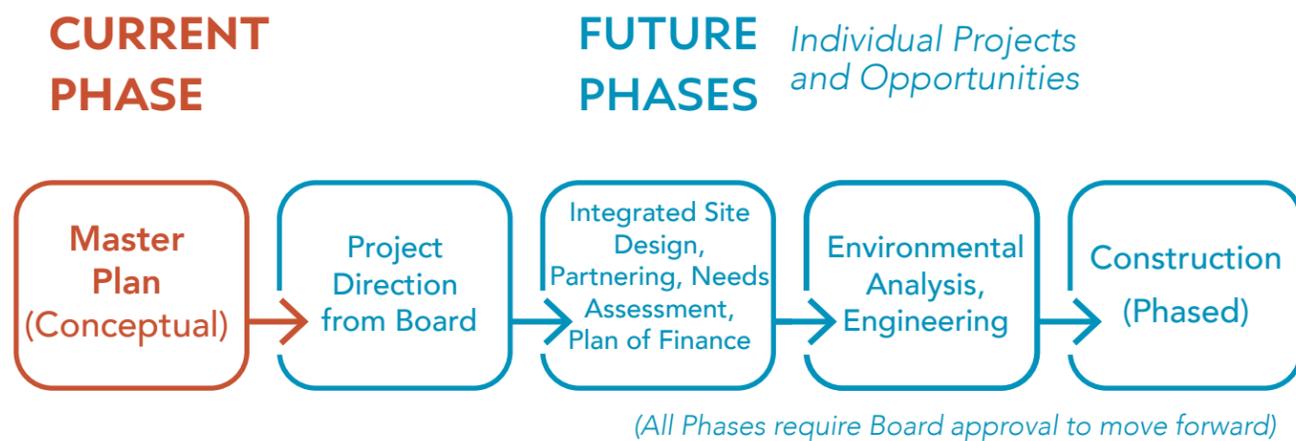


Figure 3. Current and Future Phases

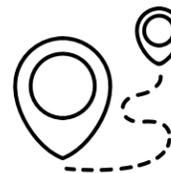


Benefits

The opportunities outlined in the Sunrise Ranch Master Plan highlights ways the project could bring lasting value to the community and region.



Water and Environmental Benefits The Master Plan highlights potential to protect and enhance local natural resources. Potential projects may improve water supply reliability, enhance water management operations, restore native habitats, and promote long-term environmental sustainability.



Headquarters Benefits Locating a headquarters on the Sunrise Ranch site could provide space for modern, efficient facilities that strengthen the Agency's operational capabilities. A thoughtfully designed headquarters could improve coordination, accessibility, and service to the public while supporting the long-term needs for staff and Board.



Education Center Benefits A watershed-based education center at Sunrise Ranch could serve as a hub for community learning, offering programs and exhibits focused on water efficiency and conservation, environmental stewardship, and local ecology. It would provide opportunities for students, educators, and residents to engage with the Agency's mission.



Trails and Programs Benefits Plans identified within the Master Plan for public trails and community programs would create new opportunities for passive recreation and connection with nature centered around the watershed resources and function. These elements would encourage outdoor activity, wellness, and appreciation of the local landscape.



Economic Benefits The Master Plan could bring meaningful economic value by creating a new source of more than \$150 million in estimated revenue to the Agency's General Fund from sale of mitigation credits. These financial resources could be used to fund local water projects and infrastructure.

These categories represent key themes but do not fully reflect the wide-range of benefits that could result from implementing the opportunities outlined in the Master Plan. Many of these benefits overlap- enhancing and supporting one another across categories. A summary of these interconnected benefits is provided in Table 1 to help frame the context for the following opportunity chapters.

Table 1. Sunrise Ranch Master Plan Opportunities Benefits

Natural Resources Benefits		Headquarters Benefits	Education Center Benefits	Trails/Programs Benefits	Economic Benefits
<p>Water Resources Benefits</p> <ul style="list-style-type: none"> • Increase water storage capacity in San Bernardino Valley's service area of Table A imported water • Reduce the need for new pump stations • Provide short-term, rapid-response emergency supply following earthquakes or other unexpected SWP interruptions • Provide redundancy for local storage facilities and store water during times of constrained supply • Serve as a flow equalization, peak shaving, and surface water/groundwater conjunctive use reservoir to reliably meet forecast growth • Enhance flexibility with two reservoirs operating in tandem • Provide water for firefighting and act as a large fire break • Provide additional storage to Santa Ana River and Mill Creek spreading grounds for local aquifer recharge to enhance water supply reliability • Provide operational redundancy to facilitate operations of the Santa Ana River – Mill Creek Cooperative Water Project Agreement, a.k.a., the Exchange Plan • Provide an additional settling location to improve the clarity and quality of turbid water diverted from Seven Oaks Dam during summer operations • Seasonal capture of stormwater run off during and immediately after rainstorms • Enhance the District's capacity to maximize the beneficial use of its full surface water right from the Santa Ana River • Maximize local groundwater storage • Provide an alternative to meet in-lieu water obligations to Bear Valley Mutual Water Company 	<p>Environmental/Habitat Benefits</p> <ul style="list-style-type: none"> • Provide 349 acres of the property to offset environmental impacts associated with San Bernardino Valley's and partner agencies' future projects, ensuring compliance with water infrastructure permits • Establish a Mitigation Credit Account for up to 900 acres to generate revenue through the sale of ecological credits, helping to fund the construction and operation of essential water infrastructure projects • Provide mitigation opportunities at Sunrise Ranch for Least Bell's vireo, California gnatcatcher, Western spadefoot, Santa Ana River woolly-star, and San Bernardino kangaroo rat • Support approximately 5.7 miles of streams, approximately 47.5 acres of stream and stream-dependent habitat, and 1.6 acres of seasonal wetland/vernal pool habitat • Maintain biodiversity, protect habitats of various wildlife species, and preserve critical ecological processes 	<ul style="list-style-type: none"> • Create a collaborative work environment that facilitates greater service and innovation • Allow team to be directly connected to the watershed landscape • Provide more functional space for all staff and Board to conduct their work • Exemplify and model commitment to climate resiliency • Offer flexible meeting and event spaces where regional partners, community organizations, and educational groups can gather for conferences, workshops, and collaborative initiatives • Meeting space to host regional events with over 150 attendees • Connects employees and visitors to the water resources and natural environment that sustain the region 	<ul style="list-style-type: none"> • Provide educational opportunities to the community on local history and heritage • Foster community engagement and stewardship 	<ul style="list-style-type: none"> • Provide venue for visitors, schools, and community groups to learn about water management, ecology, and conservation • Foster a sense of community and shared experience 	<ul style="list-style-type: none"> • Streamlines the permitting process, reduces administrative burden, and speeds up project timelines • Maintain biodiversity, protect habitats of various wildlife species, and preserve critical ecological processes • Economically viable to implement high-quality conservation practices • Significant benefits to wildlife movement, water quality, and overall ecosystem health • Support improved environmental outcomes compared to those achievable under existing conditions • Provide greater than \$150M estimated new revenue to the Agency





Sunrise Ranch Public Workshop



San Bernardino Valley and the City of Highland hosted a Trails Day in 2024 with activities, hiking, and a vendor event on the Sunrise Ranch Property. San Bernardino Valley had an information table to introduce the Master Plan, answer questions, generate a community list, and solicit initial ideas.

Community Engagement

A comprehensive community engagement process ensured that local residents, partner agencies, and other stakeholders near Sunrise Ranch had meaningful opportunities to share their input on future planning efforts. Areas of focus during the public workshop series included the following:

1. **Introduction to the Master Plan** – Introduced the community to the purpose of the Master Plan, its planning process, and the areas under consideration.
2. **Site History and Early Findings** – Provided an overview of the site’s historical significance, critical habitat areas, initial findings related to potential water supply infrastructure, trail systems, and recreational programming opportunities.
3. **Concept Development and Environmental Considerations** – Explored conceptual water supply infrastructure, discussed potential mitigation credits, and examined how visitors might experience and interact with the site.
4. **Habitat and Site Design** – Focused on existing critical habitat and opportunities for enhancement and preservation, followed by a presentation of conceptual building designs that could be integrated into the site.

Events were held in a variety of locations and times to encourage a broad spectrum of participants. Community Workshops were open to the public and were publicized on social media and in local newspapers.

General Community Feedback



- "The ability to conserve and preserve additional land is an exciting development for this city and surrounding communities."*
- "Considerations for something such as the development of a nature center could help draw people and families in from all surrounding areas."*
- "Allow for educational opportunities regarding preservation, species, history, and importance of the area for the community."*
- "Public access with hiking, biking, or walking trails would be such a benefit to our community."*
- "Open space, trees, trails, protection of land, park site—no home development!"*
- "We would love more places to enjoy the land and be outside with our kids."*
- "I would love to see public access trails and habitat restoration/species conservation most!"*

Additional comments and data collected through community engagement are included in the Appendix.

Next Steps

Chapter 5 outlines the next steps, including potential individual elements or projects and opportunities that could be further explored, as directed by the Board.

Sunrise Ranch offers San Bernardino Valley an exciting opportunity to advance its mission of providing a reliable and sustainable water supply for the region. Through future projects—such as a potential new water storage reservoir(s), habitat mitigation credit areas and new campus facilities—the site can play a key role in supporting water resiliency, environmental stewardship, and community benefits.

The research conducted throughout this process revealed a range of promising opportunities for the Board to consider as it determines next steps. These opportunities are designed to align closely with the Agency’s mission and advance its long-term goals.

Each project will require common element consideration such as environmental permitting and preliminary engineering (Figure 4). The multi-phase next steps could include

Phase I – Foundational Planning and Integration

The first phase focuses on creating a strong foundation for future development by coordinating all aspects of the Master Plan and establishing key partnerships.

Develop an Integrated Design that brings together all Master Plan elements desired by the Board for inclusion into a cohesive site vision.

Developing an Integrated Design Plan will serve as a comprehensive framework that brings together all elements of the Sunrise Ranch Master Plan—including water infrastructure, habitat conservation, recreation, education, and administrative facilities—into a cohesive, functional, and sustainable site vision. The Integrated Design Plan will transform the Master Plan’s concepts into a comprehensive, actionable, and visually cohesive site strategy by creating a detailed site plan/ map, developing preliminary engineering plans and specifications, conducting advanced environmental permitting analysis, and further analyzing infrastructure and utility needs/timeline.



Plan of Finance and Develop Partnerships/Sponsorships



Detailed Site Plan and Map



Advanced Environmental and Permitting Analyses



Preliminary Engineering Plans and Specifications



Infrastructure and Utilities Development Timelines

Figure 4. Example Integrated Design Elements

Establish and Engage a Partnership/Sponsorship Network

Develop a partnership and sponsorship network to foster collaboration with our public agencies, private entities, educational institutions, nonprofit organizations, and community groups that share San Bernardino Valley's goals of water resiliency, education, and sustainability. There are several governmental agencies, tribal nations, institutional organizations, community groups, and public utilities identified in the Master Plan whose goals and missions align with San Bernardino Valley. Strong partnerships and coordination with these like-minded organizations, and reaching out to new potential partners, could help advance the Sunrise Ranch vision with San Bernardino Valley's values and goals. Building and maintaining strong partnership networks will be essential to advancing several opportunities within the Master Plan.

Prepare a Comprehensive Plan of Finance

Develop a Comprehensive Plan of Finance to guide and support the phased implementation of the Sunrise Ranch project, incorporating a variety of funding mechanisms to ensure financial sustainability and long term project success.

Sunrise Ranch was originally acquired for its potential to support water infrastructure development and to offset mitigation requirements associated with projects identified in the Upper Santa Ana River Habitat Conservation Plan (HCP). Most of the projects proposed in this Master Plan including the reservoir(s) and headquarters remain conceptual. At this stage, detailed cost estimates and defined funding sources have not yet been established. To advance the most promising concepts, additional financial analysis will be required. This could be accomplished through a Plan of Finance, which would refine project-specific funding needs, identify potential funding sources, and align future investments with the Board’s priorities and implementation schedule.

This plan will outline the financial framework, funding sources, and cost strategies needed to move each project component—from design through construction—forward in a coordinated and sustainable manner.

Finalize Mitigation Acreage Identification and Incorporate into the Mitigation Credit Agreement

Confirm and document the specific acreage on the Sunrise Ranch property that will be designated for habitat mitigation and conservation purposes. This process will ensure that the identified areas align with regulatory requirements, environmental priorities, and San Bernardino Valley long-term mitigation strategy.



Conducting this step early in the process will provide the foundation for a self-sustaining mitigation program, allowing San Bernardino Valley to both offset environmental impacts from future projects and generate revenue through credit sales, supporting continued investment in water resiliency and habitat protection.

Enhance Communication and Engagement with Neighboring Communities and Stakeholders

Strengthen communication and collaboration with neighboring communities, partner agencies, and key stakeholders to promote transparency, trust, and shared understanding throughout the planning and implementation of the Sunrise Ranch project.

Phase II – Design, Environmental Review, and Early Implementation

Building on the foundational work completed in Phase I, this phase focuses on advancing the technical design, environmental review, and initial implementation of key project components. The goal is to translate the Integrated Design into actionable steps that prepare the project for construction while maintaining environmental stewardship and regulatory compliance. This phase would require future Board approval to move forward.

Phase III – Construction and Implementation

The third phase marks the transition from planning and design to full-scale construction and implementation of the Sunrise Ranch project, approved by the Board. This stage will focus on building the approved facilities and infrastructure while maintaining a strong emphasis on safety, environmental stewardship, and long-term performance. This phase would require future Board approval to move forward.

By incorporating a phased approach, the process provides for multiple discussions and direction for possible action by the Board of Directors while allowing for more detailed analysis and planning to facilitate informed policy guidance.



Next Steps at *Sunrise Ranch*





Water Supply

INFRASTRUCTURE OPPORTUNITIES

CHAPTER 1. WATER SUPPLY INFRASTRUCTURE OPPORTUNITIES

In alignment with San Bernardino Valley's Mission to provide a reliable and sustainable water supply for the region's people and environment, Water Supply Infrastructure Opportunities are the top priority for Sunrise Ranch.

The following features make Sunrise Ranch ideally suited for Water Supply Infrastructure Opportunities:



EXISTING INFRASTRUCTURE

There is substantial existing water supply infrastructure both on-site and off-site such as Greenspot Pipeline and Bear Valley High Line.



WATER SOURCES

Sunrise Ranch is located near significant local water sources such as the Santa Ana River and Mill Creek and can receive imported water supply from the State Water Project.



OPTIMAL LOCATION

The property is located on the east end of San Bernardino Valley's service area at an elevation above most of San Bernardino Valley's service area, allowing water conveyed from the property to primarily flow by gravity to its destination.

With 1,658 acres, close proximity to existing water infrastructure, and multiple water sources, the property is ideally suited for new water supply storage. Water stored on-site could be managed to enhance the Agency's operational flexibility—supporting supplemental and emergency water supplies, fire suppression needs, and groundwater recharge at nearby locations. An overview of this infrastructure and opportunities is presented in Chapter 1.





1.1. Existing Conditions

San Bernardino Valley's service area covers 353 square miles in southwestern San Bernardino County, 60 miles east of Los Angeles, serving a population of about 714,000. It spans the eastern two-thirds of the San Bernardino Valley, the Crafton Hills, and a portion of the Yucaipa Valley, and includes the cities and communities of Bloomington, Colton, Grand Terrace, Highland, Loma Linda, Mentone, Redlands, Rialto, San Bernardino, and Yucaipa. The San Gorgonio Pass Water Agency (SGPWA) service area is adjacent to San Bernardino Valley's (Figure 5) at the eastern boundary, and the Metropolitan Water District of Southern California is adjacent at the western boundary.

Like San Bernardino Valley, SGPWA is a State Water Contractor that receives water from the SWP. SWP water is conveyed through San Bernardino Valley's service area via two large, regionally connected pipelines: the Foothill Pipeline, and the East Branch Extension (EBX) pipeline, which conveys water from the Devil Canyon Afterbay into SGPWA's service area. Both San Bernardino Valley and SGPWA are located along the EBX of the State Water Project, in the southernmost area of the state.

The EBX is shown in yellow on Figure 6.



Figure 5. San Bernardino Valley Municipal Water District and SGPWA Service Areas



State Water PROJECT



The State Water Project is a combination of water capture, reservoir storage, and conveyance on a state-wide scale stretching from northern California to San Bernardino and beyond. Reservoirs throughout the system are regularly filled with rain and snowmelt and deliver water when and where it is needed through more than 500 miles of canals and pipelines. This system (Figure 6) is the backbone of California's water supply and helps provide some reliability from nature's irregular supplies.

Water stored in local reservoirs could serve an important need when SWP deliveries are limited by factors such as drought or emergency interruption and could supplement imported water supply during normal years.

SWP Facts

- Serves 27 million Californians throughout the state and 750,000 acres of farmland
- Consists of a 705-mile interconnected network of canals, dams, reservoirs, hydropower plants, and pumping plants
- Provides flood protection, including the Oroville Dam
- Would rank as the world's 8th largest economy if the SWP's service area were its own nation
- Generates 1,748 megawatts of electricity (enough to power 1.3 million homes)
- Provides recreation and education facilities with 3.7 million unique visitors a year

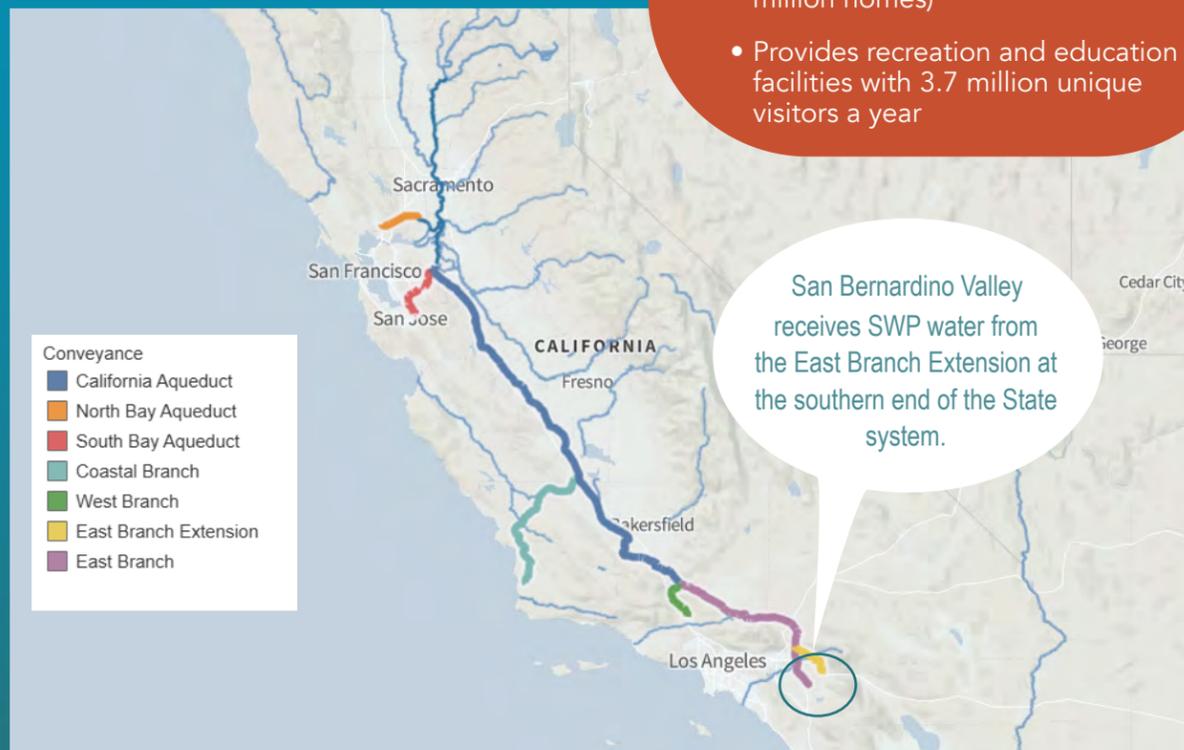


Figure 6. SWP Conveyance Systems (modified from DWR SWP webpage)



Mill Creek

Image: [CC2.0 Jonathan Cook-Fisher](#)

Sunrise Ranch is situated at the confluence of Santa Ana River and Mill Creek – a geographic location with significant advantages. The local surface water resources and the infrastructure in and around the site offer valuable opportunities to be modified, enhanced, or integrated with the new projects as future plans are implemented. **Figure 7** displays water infrastructure within the property boundary, as well as bodies of water and relevant water infrastructure in the local vicinity.



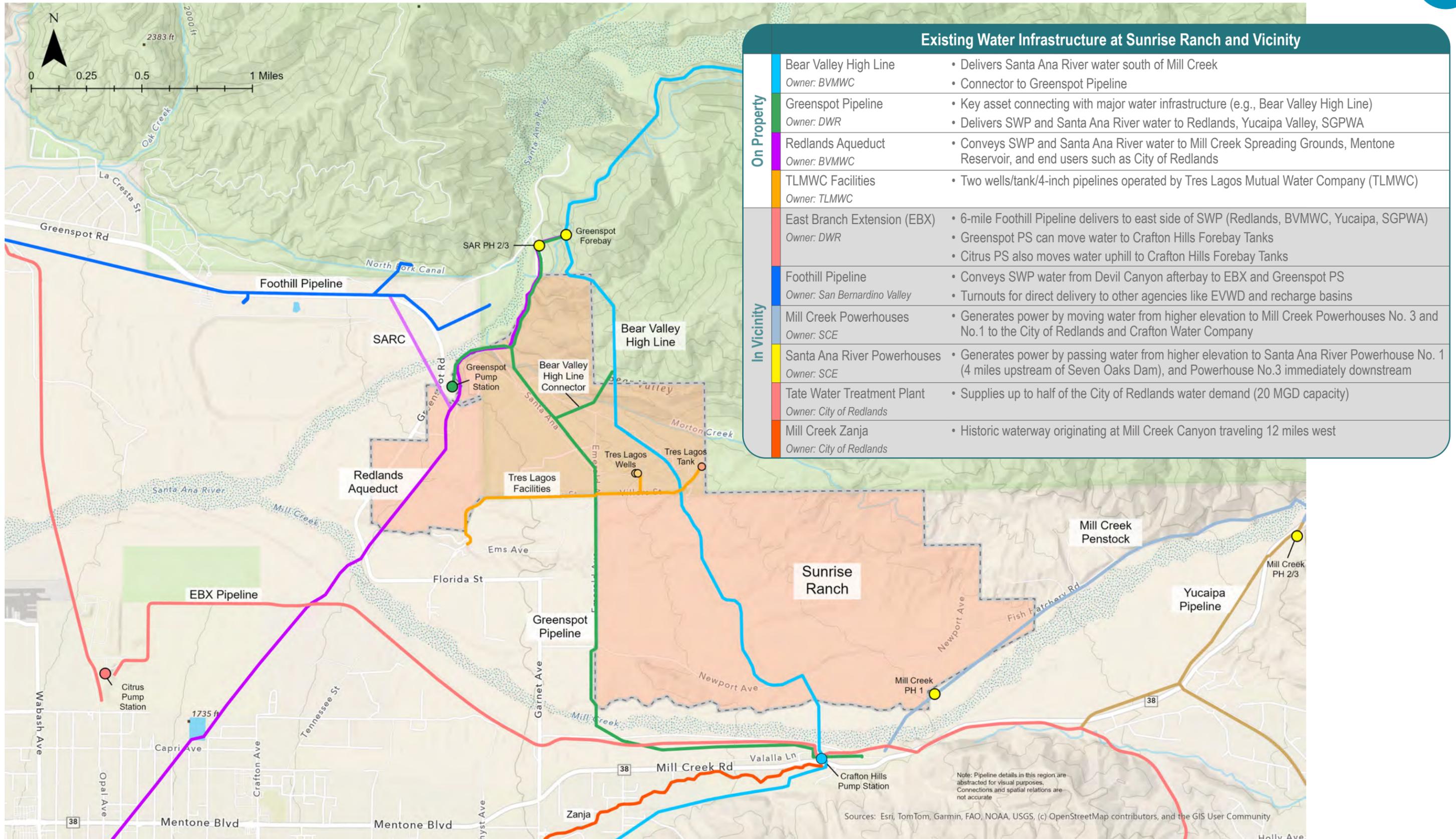


Figure 7. Existing Water Infrastructure at Sunrise Ranch and Vicinity





1.1.1. Existing Water Infrastructure on Property

Following are descriptions of water infrastructure located on-site at Sunrise Ranch.

Bear Valley High Line and Connector

The Bear Valley High Line is a 10,350-foot pipeline owned and operated by the Bear Valley Mutual Water Company (BVMWC). It is one of the oldest and most historic water facilities in the region. The original facility used a system of tunnels and flumes to transport Santa Ana River water through the valley, across Mill Creek, and southwest along the Crafton Hills towards the City of Redlands. Today, this facility is used to convey Santa Ana River water at a range of flow rates approximating between 5 cfs and 10 cfs, depending on water availability in the upper Santa Ana River. Most of the Bear Valley High Line system traverses the Sunrise Ranch property. The Bear Valley High Line receives its water from the Greenspot Forebay of Southern California Edison's (SCE) the Santa Ana River Powerhouse No.3. It sits at an elevation of 2,310 feet above mean sea level and was designed to both feed both the hydropower penstock (old and retired) and to deliver water to the Bear Valley High Line by gravity. The 1,400 foot Connector, also within the property, connects the Bear Valley High Line with the Greenspot Pipeline. The Connector is a cement mortar lined and coated steel pipe with a 30-inch diameter.

BEAR VALLEY HIGH LINE KEY PLANNING FACTORS

- Owner:** BVMWC
- Length:** 10,350 ft. (Highline), 1,400 ft. (Connector)
- Material:** 36" concrete pipe
- Flow Rate:** 5-10 cfs
- Water Source:** Upper Santa Ana River
- Uses:** Delivers water to the Zanja and end users south of Mill Creek in the Redlands area
- Connections:** Greenspot Pipeline

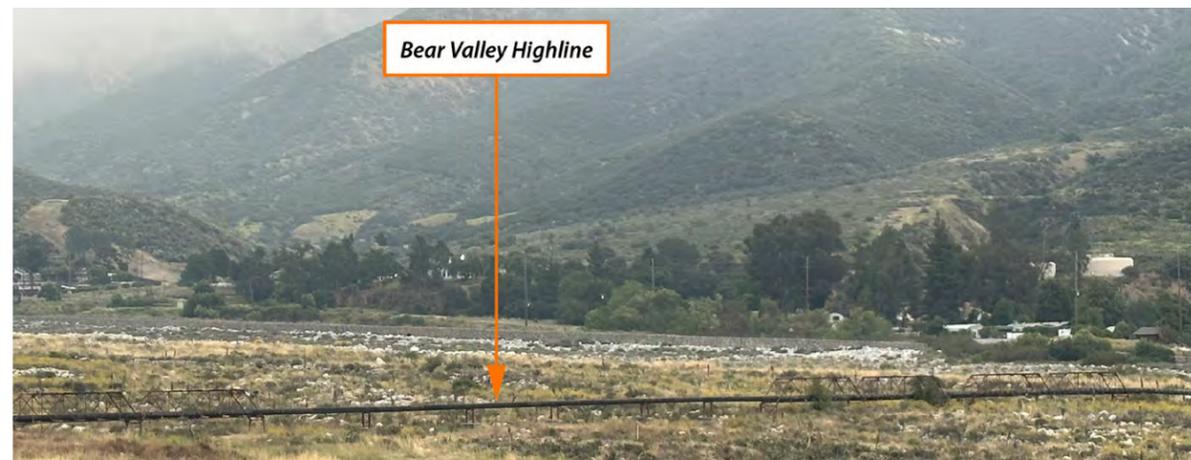


Figure 8. Mill Creek and Bear Valley High Line

Greenspot Pipeline

The Greenspot Pipeline can deliver up to 60 cfs from the SWP and/or the Santa Ana River to key facilities on the eastern side of San Bernardino Valley service area, including the City of Redlands, Yucaipa Valley Water District, and SGPWA. This facility enhances operational flexibility by supporting water transfers between various regional water agencies.

In addition, water conveyed through the Greenspot Pipeline can be delivered to the San Bernardino Valley Water Conservation District (SBVWCD) for distribution into the Mill Creek Spreading Grounds, where it contributes to groundwater recharge. Any future relocation of this pipeline segment must continue to fulfill the operational purposes and needs of the SBVWCD's facilities.

GREENSPOT PIPELINE KEY PLANNING FACTORS

- Owner:** San Bernardino Valley
- Length:** 9,900 ft.
- Material:** 48" CMLC
- Flow Rate:** 60 cfs
- Water Sources:** State Water Project, Santa Ana River
- Uses:** Delivers water to end users such as City of Redlands, Yucaipa Valley, and the San Gorgonio Pass Water Agency
- Connections:** Bear Valley High Line, Crafton Hills Pump Station, Mill Creek Spreading Grounds



Figure 9. Powerhouse 3 Forebay Pipeline to Bear Valley High Line





Redlands Aqueduct

Redlands Aqueduct begins approximately 400 feet east of Greenspot Road at the mouth of the Santa Ana Canyon and extends about 7,750 linear feet, ending near the intersection of Cajon and Crescent Streets, near Ford Park. Originally constructed in the early 1880s, the aqueduct was lined with loose rock and dirt-rock. In the 1900s, portions were upgraded to wooden trestles, concrete pipe sections, and riveted steel pipe for the Mill Creek crossing.

In 1961, the alignment was modified by Caltrans to accommodate the construction of Interstate 10. Today, the Redlands Aqueduct conveys water from the SWP and the Santa Ana River, primarily to serve end users in and around the City of Redlands. It also conveys water from the Santa Ana River Powerhouse 3 Afterbay to the Mill Creek Spreading Grounds, supporting groundwater recharge and regional management efforts.

REDLANDS AQUEDUCT KEY PLANNING FACTORS

- Owner:** BVMWC
- Length:** 7,750 ft.
- Material:** Varies in diameter and shape (some portions are a canal)
- Flow Rate Range:** 40 to 50 cfs
- Water Sources:** State Water Project, Santa Ana River
- Uses:** Conveys water to end users such as City of Redlands
- Connections:** Mill Creek Spreading Grounds

Tres Lagos Mutual Water Company Facilities

The Tres Lagos Mutual Water Company system on Sunrise Ranch is composed of two wells located next to each other, a steel tank, and a small 4-inch pipeline that varies in material between steel and PVC. The tank capacity is 65,000 gallons. Tres Lagos Mutual Water Company provides water for domestic and irrigation purposes to its shareholders, who are located immediately west of the Sunrise Ranch property boundary. San Bernardino Valley provided an easement for the facilities, allowing Tres Lagos Mutual Water Company to operate and maintain the infrastructure.

TRES LAGOS MUTUAL WATER COMPANY FACILITIES KEY PLANNING FACTORS

- Owner:** Tres Lagos Mutual Water Company
- Length:** 7,700 ft.
- Material:** 4" steel and PVC
- Water Sources:** Groundwater
- Uses:** Irrigation for the groves and crops on the property (previous)
- Connections:** 6 property owners east of Sunrise Ranch

1.1.2. Water Infrastructure in Vicinity

Several water facilities are located in the general vicinity of the property and could play an important role in managing and moving water in and around Sunrise Ranch. Because of their location, these facilities could work hand-in-hand with the Water Infrastructure Opportunities identified within the Sunrise Ranch property, as described in Section 1.2.

East Branch Extension (EBX) System

The East Branch Extension (EBX) System includes the Foothill Pipeline, three pump stations, and two reservoirs located to the east and south of Sunrise Ranch. The system is owned by the California Department of Water Resources (DWR) and operated by San Bernardino Valley to manage deliveries from the State Water Project.

Southern California Edison Hydropower Facilities

Hydropower facilities owned by SCE convey water after it has been used for power generation, working in coordination with other regional pipelines to deliver water to various agencies and locations. The existing Santa Ana River Powerhouse 3 Forebay (at an elevation of 2,310 feet) and Afterbay (at 1,950 feet), together provide the hydraulic pressure needed to move water through the hydroelectric system. **Figure 10** highlights the key hydroelectric facilities at Powerhouse No. 3.

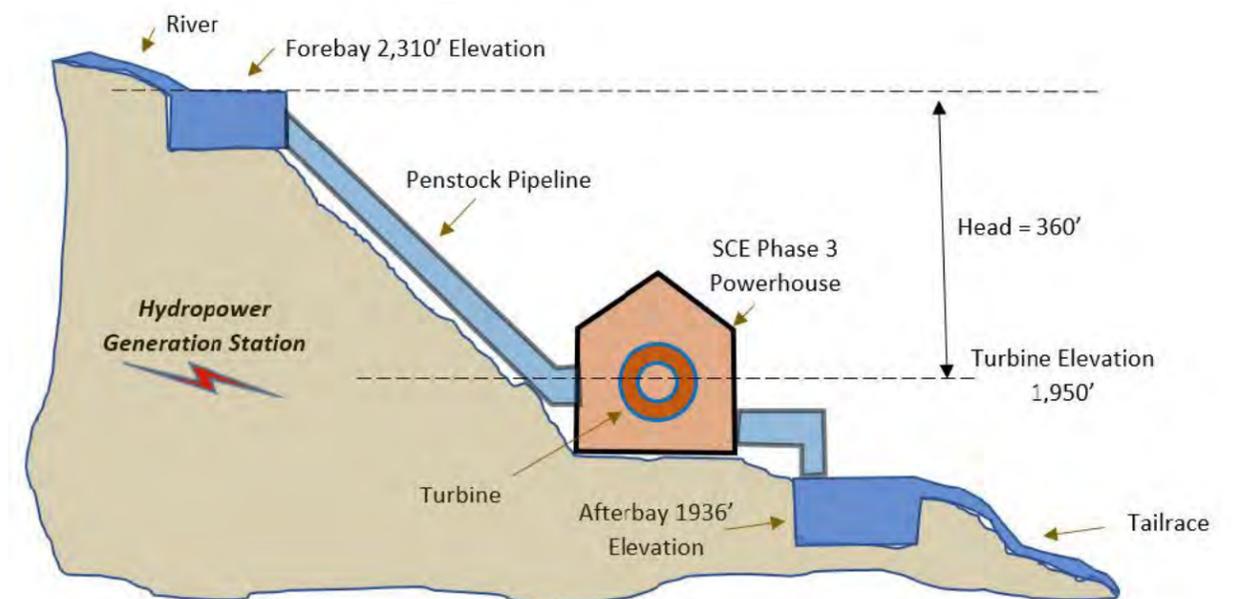


Figure 10. Hydropower Generation at Santa Ana River Powerhouse 3





Tate Water Treatment Plant

Tate Water Treatment Plant is located on the south bank of Mill Creek, along State Route 38, and operated by the City of Redlands for drinking water supply.

Mill Creek Zanja

Originally constructed in 1820s, the Mill Creek Zanja is the oldest irrigation canal in San Bernardino County and a significant part of the region’s history. Built to supply water to the extensive citrus groves and other agricultural production areas surrounding the City of Redlands, the canal resembles a natural creek in some places and a lined or unlined ditch in other places, stretching approximately 12 miles in length. Its water sources include SWP water delivered through the EBX, local water from the Greenspot Pipeline, or diverted flows from Mill Creek. Today, the Zanja continues to deliver irrigation (non-potable) water to users in the Redlands area, including the City of Redlands, Crafton Water Company, and BVMWC.



1.2. Evaluation and Assessment

Wholesale water agencies such as San Bernardino Valley provide valuable storage of supplemental supplies to ensure backup capacity for use during low Table A allocations, drought, or emergencies. One of the most effective ways to build resilience under these uncertain conditions is to strengthen the existing water infrastructure—capturing and storing water during wet periods so it can be used later during droughts or when imported supplies are limited.

Developing a more robust system of water infrastructure at Sunrise Ranch would take advantage of the property’s large area to create additional storage and conveyance capacity. This added redundancy within the Agency’s system would enhance operational flexibility, improve efficiency, and strengthen overall water reliability.

Opportunities at Sunrise Ranch to strengthen San Bernardino Valley’s Water Supply Infrastructure include the following:

RESERVOIR OPPORTUNITIES



New reservoir(s) at Sunrise Ranch could provide valuable water storage to use supplemental supplies to provide backup capacity in case of drought preparedness and emergencies. Beyond water reliability, the reservoir(s) could also support public recreation, provide community amenities, and assist with firefighting and wildfire suppression efforts.

The Reservoir Opportunities outlined in the Master Plan examine potential locations, available water sources, and conceptual approaches to design and operation.

CONVEYANCE OPPORTUNITIES



Enhancing and expanding the existing water conveyance system could improve operational flexibility, make better use of stored water, and support additional groundwater recharge. The Conveyance Opportunities identified in the Master Plan draw from a variety of water sources, with each opportunity specifying the source or combination of sources it would convey.





1.2.1. Reservoir Opportunities

Developing new water storage facilities at Sunrise Ranch would substantially strengthen the region's ability to adapt to changing water conditions and enhance long-term supply reliability.

Preliminary analyses indicate that the property could accommodate up to three reservoirs capable of storing 3,450 AF. These facilities could offer nearly ten times more storage capacity than the Citrus Reservoir, one of the primary storage facilities owned by DWR and operated according to their requirements and operational needs. Constructing an Agency-owned and operated reservoir—that is built to enhance the reliability and operational advantages for delivery of SWP—would create an opportunity to expand regional water management capabilities.

Design and operation of new water storage facilities at Sunrise Ranch would require careful coordination with existing regional infrastructure to ensure system compatibility and maximize efficiency. Site selection would consider topography, hydrology, proximity to conveyance systems, compatibility with existing facilities, and environmental factors to identify the most suitable reservoir locations and size(s). Operational modeling would evaluate how stored water can best support customer demand patterns, system reliability, and emergency response needs.

Integration with current pipelines, pump stations, and spreading basins would enhance system flexibility and allow for seamless transfers between facilities. Collectively, these considerations would guide the development of a storage system that is technically sound, environmentally

responsible, and operationally resilient, supporting both short-term reliability and long-term sustainability across the region.

Additional design considerations could include incorporating historical and cultural references—such as creating three reservoirs that honor the historic Tres Lagos once located on the property. This approach would celebrate the site's heritage while serving a modern water management purpose.

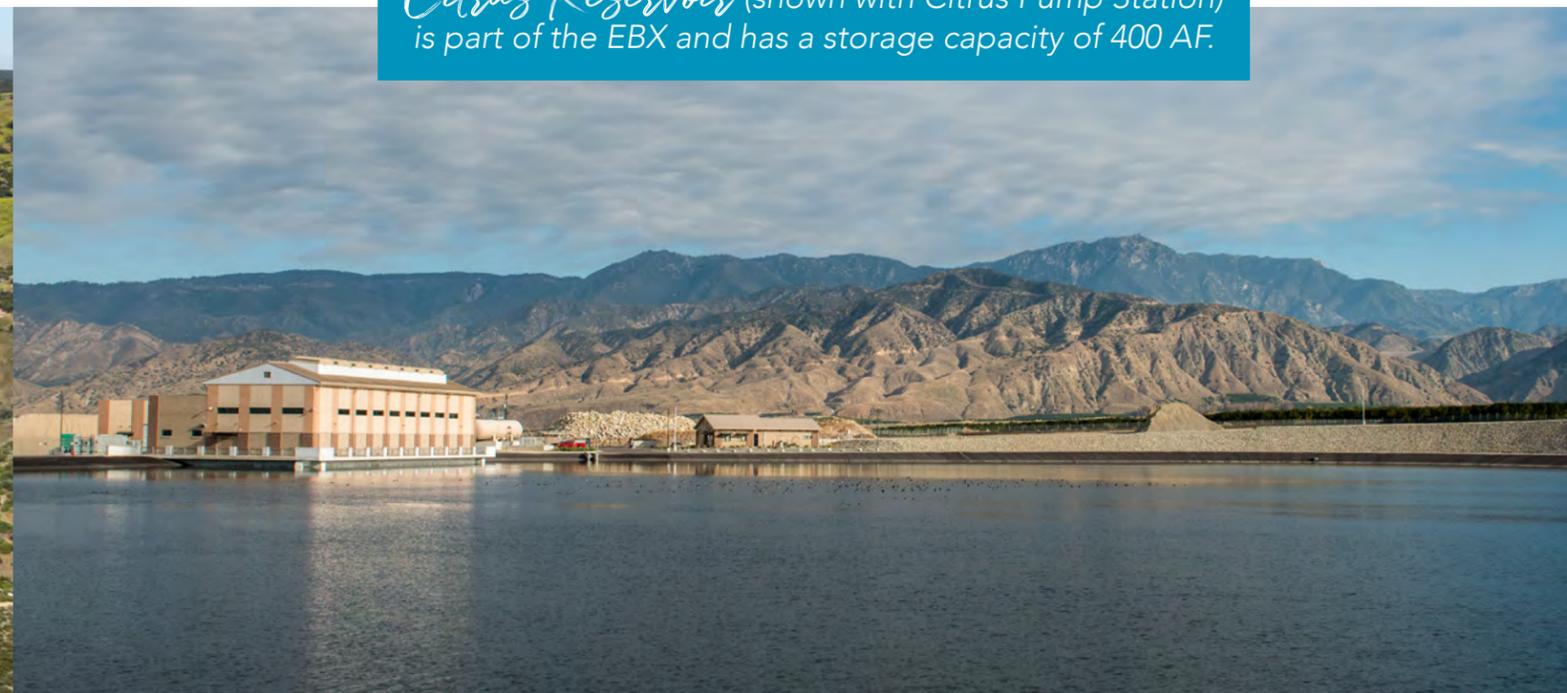
New facilities could also be designed to enhance the Agency's operational flexibility by improving the ability to store SWP supplemental water and move it eastward within the system or maintaining operations during temporary DWR initiated State Water Project shutdowns. The reservoir(s) support the Agency's commitment to the SWP system to supply water and manage those imported supplies efficiently and safely. Together, these elements would not only strengthen regional reliability, but also create a meaningful connection between the area's history and its sustainable water future.

A review of the property identified several key factors that would need to be evaluated if the Board authorizes the development of the reservoir projects. These considerations include maximizing storage capacity while accounting for site topography, minimizing earthwork and the export of soil materials. In addition, the presence of sensitive plant and wildlife species on the property will require detailed environmental analysis to guide responsible design and construction. It is also important to note that land used for water infrastructure facilities typically cannot be included within the Agency's Mitigation Credit Account.

Crafton Reservoir was utilized for air operations in response to the 2024 Line Fire.



Citrus Reservoir (shown with Citrus Pump Station) is part of the EBX and has a storage capacity of 400 AF.





For more information regarding sensitive species habitat and potential mitigation credit sales, see Chapter 2.

The proposed reservoirs also present valuable opportunities for collaboration with regional fire suppression agencies, including CalFire, the U.S. Forest Service, Yuhaaviatam of San Manuel Nation, and San Bernardino County Fire. These agencies could use the reservoirs to support both aerial and ground-based wildfire response efforts. In summary, the development of new reservoirs at Sunrise Ranch offers a unique opportunity to advance regional water reliability, environmental stewardship, and emergency preparedness. By thoughtfully balancing engineering design, habitat protection, and operational efficiency, the project can achieve multiple public benefits—providing critical water storage, supporting wildfire response efforts, and fostering partnerships with local, state, federal, and tribal agencies.

Through thoughtful planning and collaboration, the Agency can ensure that the Sunrise Ranch reservoirs not only enhance water management capacity but also contribute to a safer, more sustainable future for the entire region. The specific names of the reservoirs can be determined at later project phases should they move forward, however for purposes of this Master Plan, each reservoir is referenced according to its proposed elevations:

- ① **Reservoir Area 2310**
Proposed elevation head of 2,310 feet
- ② **Reservoir Area 1938**
Proposed elevation head of 1,938 feet

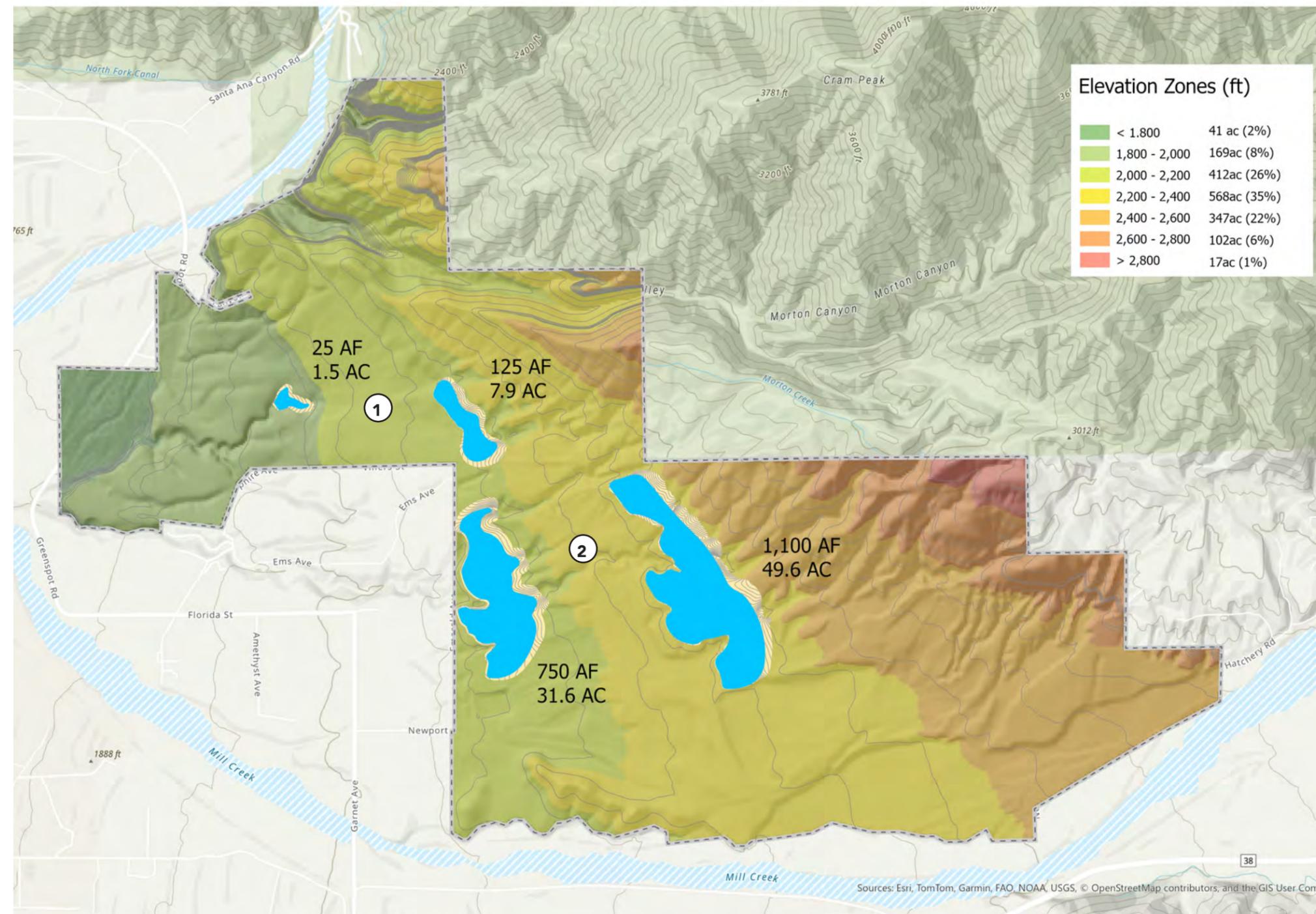


Figure 11. Conceptual Reservoir Opportunities consider placements that maximize gravity to function in concert with existing SWP facilities at elevations 2310 and 1938 feet.

Reservoir Opportunities

The proposed locations of the reservoirs are strategically selected due to the elevations matching with the elevations of the Bear Valley High Line and Crafton Hills Pump Station Forebay Tanks (2,310 feet), the Devil Canyon Afterbay. Building reservoirs at the same elevations as SWP infrastructure facilitates the opportunity for operations of the reservoirs, to enhance the operational flexibility and system redundancy.

The proposed onsite reservoirs may also be operated in tandem, with transfer of water back and forth between Reservoir Area 2310 and Reservoir Area 1938 for the purposes of circulating water and generating hydropower. However, the designs included are conceptual and would be further analyzed if directed by the Board.



Simulation of Reservoir 2310

Simulation of Reservoir Area 2310





Opportunity 1: Reservoir Area 2310

Building new reservoir(s) at the elevation of 2,310 feet would allow it to be filled with water from the State Water Project via Greenspot Pipeline.

This reservoir area option provides operational flexibility, as it can convey water to several locations at the same elevation for beneficial uses. These locations include:

- The Bear Valley Highline to the Mill Creek Zanja
- The Forebay Tanks of the Crafton Hills Pump Station
- The Greenspot Pipeline to the Mill Creek Zanja and Tate Pump Station



Seven Oaks Dam and Santa Ana River Enhanced Recharge Phase 1-A

Water flow from Reservoir Area 2310 to Reservoir Area 1938 or to any facilities below would be by gravity, not requiring pumping. However, sending water from Reservoir Area 2310 to higher elevations on the east side of the San Bernardino Valley service area would require pumping via the Crafton Hills Pump Station over to the Yucaipa Valley or beyond.

Opportunity 2: Reservoir Area 1938

Reservoir Area 1938 could be located at a key elevation-the same elevation as the SWP deliveries that come through the existing Foothill and Santa Ana River Crossing pipelines.

Under normal operations, this reservoir(s) could work in tandem with Reservoir Area 2310.

From this position, Reservoir Area 1938 could convey water to the Redlands Aqueduct and the Greenspot Pump Station. It could also convey water to several other locations operating at the same elevation and pressure, including:

- Edwards Box
- Santa Ana River Enhanced Recharge Project
- North Fork Flume
- Turnouts along the Foothill Pipeline

The following sections outline possible water sources for the proposed reservoirs and present several conceptual design alternatives.

Water Source Opportunities

The proposed reservoirs could be filled by three general water sources: the SWP, the Santa Ana River, and local groundwater. The proposed main reservoir would be able to serve as an essential facility for receiving, storing, and regulating SWP Table A water in accordance with the Agency's long-term SWP contract. Further analysis would need to consider the benefits and compatibility of each water supply to support the Agency's mission.

Stored SWP supply could provide operational flexibility during times of need or sent through Reservoir Area 1938 to spreading basins for groundwater recharge.

Five **Water Source Opportunities** were identified for the new reservoirs. Each of these sources and their locations relative to the proposed reservoirs are shown in **Figure 12** and described. Additional details are provided in the Appendix. Determining the ultimate water source for the reservoir(s) would be included in future analysis.





a SANTA ANA RIVER ABOVE SEVEN OAKS

The Santa Ana River flows through the existing Bear Valley High Line, which runs from above Seven Oaks Dam south.

SANTA ANA RIVER ABOVE SEVEN OAKS	
Water Source	Santa Ana River (above Seven Oaks Dam)
Infrastructure Owner	Bear Valley Mutual Water Company
Capacity	Up to 9.1 cfs
Connections	Tate Pump Station, Crafton Hills Pump Station

b SANTA ANA RIVER BELOW SEVEN OAKS

The Santa Ana River flows through the existing Santa Ana River Crossing, diverting from below Seven Oaks Dam and pumping it up using the existing Greenspot Pump Station.

SANTA ANA RIVER BELOW SEVEN OAKS	
Water Source	Santa Ana River (below Seven Oaks Dam)
Infrastructure Owner	SBWCD/San Bernardino Valley
Capacity	Shared right with WMWD for 500 cfs
Connections	Enhanced Recharge Project, Foothill Pipeline, Santa Ana River Crossing and Greenspot Pipeline

c SWP VIA FOOTHILL PIPELINE

SWP currently flows through the **Foothill Pipeline**.

SWP VIA FOOTHILL PIPELINE	
Water Source	State Water Project
Infrastructure Owner	DWR (San Bernardino Valley/San Gorgonia Pass Water Agency share capacity)
Capacity	Maximum 102,600 AF annually
Connections	SWP, Greenspot Pipeline and Pump Station

d SWP VIA CITRUS PUMP STATION

SWP makes deliveries through **Citrus Pump Station**.

SWP VIA CITRUS PUMP STATION	
Water Source	State Water Project
Infrastructure Owner	DWR
Capacity	Maximum 102,600 AF annually
Connections	EBX, Bear Valley High Line and Greenspot Pipeline

e LOCAL GROUNDWATER WELLS

Sunrise Ranch is located between the San Andreas and Oak Glen Faults, on top of a local groundwater basin known as the Greenspot Area. This basin is considered a small subbasin within the larger San Bernardino Basin Area. Because this Greenspot Area is hydrogeologically isolated with limited flow into the Mentone and San Bernardino Basin Area, it does not currently play a significant role in the area’s groundwater supply.

This separation from the main basin, combined with the property’s historically low permeability, limits the potential benefits of using the site for groundwater storage or recharge.

However, the existing infrastructure and water conveyance systems on the property make it possible to transfer water to other more suitable groundwater recharge sites nearby.

Additionally, one or more wells could be drilled on the Sunrise Ranch property and connected to the Greenspot Pipeline.

LOCAL GROUNDWATER WELLS	
Water Source	Greenspot Area Groundwater Aquifer (confined)
Infrastructure Owner	Wells (old or new) on the property would be owned by San Bernardino Valley
Capacity	TBD
Connections	EBX, Bear Valley High Line





Reservoir Conceptual Design Alternatives

Although the Sunrise Ranch site covers a large area, some locations are better suited for reservoir construction than others. The reservoir concepts presented here focus on increasing water storage capacity and enhancing operational flexibility while also maximizing the potential value of mitigation credit acreage.

In California, dams are regulated to prevent failures, protect lives, and safeguard property. The Department of Water Resources' Division of Safety of Dams (DSOD) is responsible for reviewing and approving inundation maps for dams that meet certain size thresholds. A single large reservoir at this site would fall under DSOD jurisdiction, and is listed as the jurisdictional option. The other potential designs would not require DSOD regulatory approval. **Table 2** presents a summary of the reservoir concept alternatives.

Co-Benefit Alternative: This option was developed by engineering and environmental staff to strike a thoughtful balance between the need for water storage and the preservation of the property's most financially valuable habitat. It also creates a unique opportunity to establish new riparian stream habitat by linking a series of reservoirs—an approach that would increase the value of the HCP and mitigation bank credits while providing additional educational opportunities.

Maximum Water Storage Alternative: This option offers the greatest possible storage capacity, with its shape and size constrained only by the surrounding topography. However, it would also create substantial negative impacts on nearby endangered species habitat and greatly reduce the number of potential mitigation credits available to support the HCP or to sell to outside parties.

Minimum Water Storage Alternative: This option prioritizes avoiding endangered species habitat, preserving the greatest possible habitat value for use by the HCP or for mitigation credit sales to outside parties, and therefore offers the highest revenue potential. However, it provides the smallest amount of water storage.

Hybrid Alternative: This option is intended to balance acres of storage capacity, offering slightly more than the minimum alternative, but reduces the impacts to surrounding mitigation areas, most notable the designated critical habitat of San Bernardino kangaroo rat. However, it only offers slightly more storage than the minimum alternative.

Jurisdictional Alternative: This option provides a large amount of water storage within a single restricted footprint; however, the depth required would trigger DSOD approval, adding significant time and financial costs that are likely untenable.

Table 2. Reservoir Conceptual Design Alternatives Data Summary

Conceptual Design Alternative	Overall Storage (AF)	Surface Area (Acres)	Drawdown Only (100 cfs) (Days)
Co-Benefit	2,000	90	5.5
Maximum	3,450	140	9.2
Minimum	1,310	59	3.2
Hybrid	1,450	67	3.3
Jurisdictional	3,000	110	9.0





Co-Benefit Alternative

Developed in-house, this option balances storage needs with conserving the site's highest-value habitat. It also creates new riparian stream habitat by linking reservoirs, increasing HCP and mitigation credit potential and supporting future educational use.

The Co-Benefit Alternative (Figure 13) would consist of a series of reservoirs that maximizes site topography while minimizing impacts to areas designated as critical habitat. This allows the preserved land to remain eligible for inclusion in mitigation credit programs. Compared to the other Alternatives, the Co-Benefit Alternative provides **2,000 AF** of water storage while also providing a unique opportunity to create riparian habitat in the areas connecting the reservoirs.

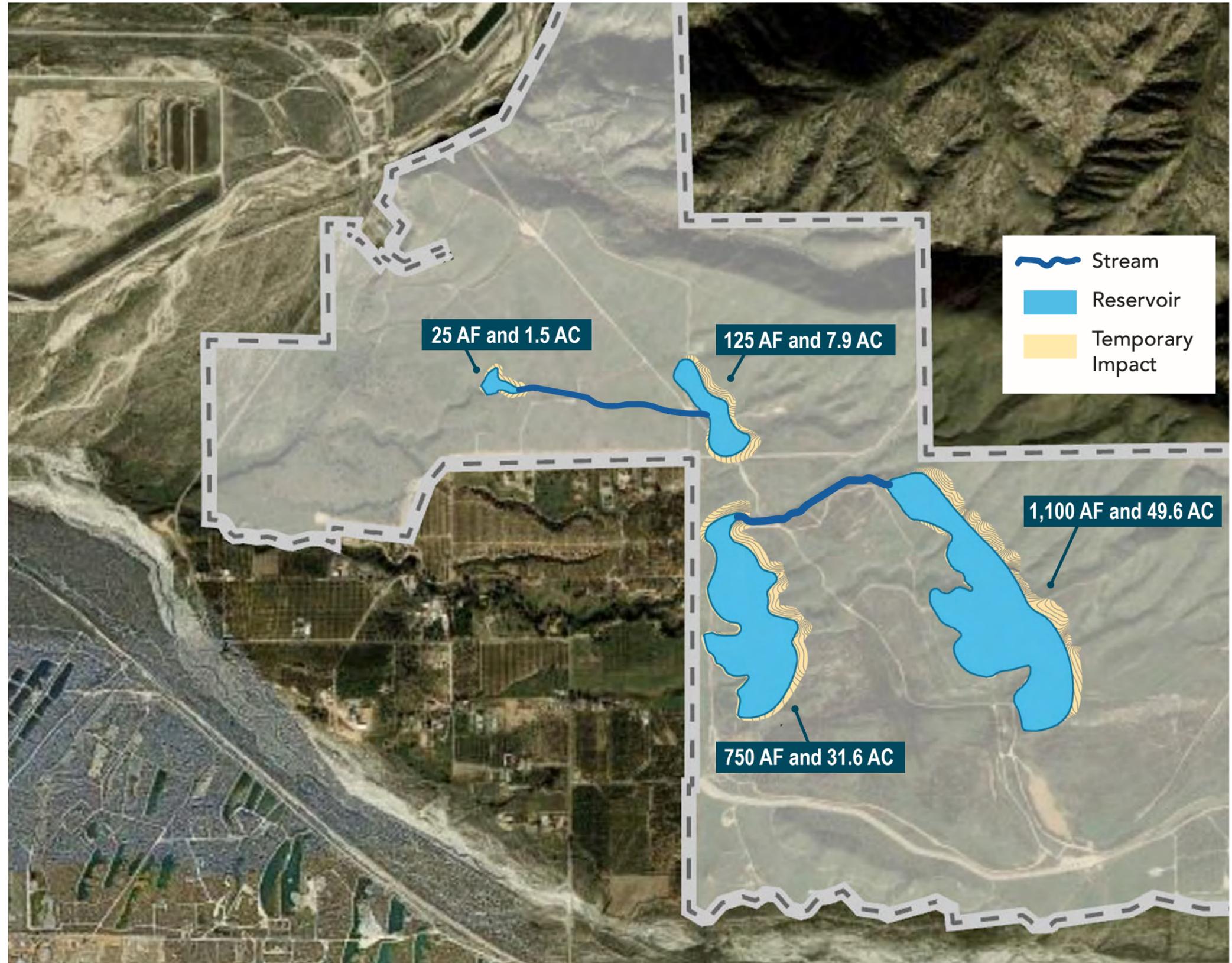


Figure 13. Co-Benefit Alternative





Maximum Alternative

The maximum alternative concept prioritizes two of the largest possible storage volume reservoirs within the physical constraints of the topography of the Sunrise Ranch property while avoiding the creation of a jurisdictional dam, based on height of the reservoirs.

The Maximum Alternative (Figure 14) divides Reservoir 2310 into two sections, with a combined storage capacity of approximately 3,000 acre-feet. This increased capacity would enhance the East Branch Extension’s ability to deliver supplemental water to customers during years with low allocations given that Devil Canyon is located at 1,938 above mean sea level. It would also improve preparedness for temporary system maintenance shutdowns and expand the State Water Project’s wet season storage capacity. This reservoir design takes advantage of the existing “borrow pit” that was created during the construction of the Seven Oaks Dam, which could be expanded through additional excavation to deepen the downstream end of the reservoir. This alternative has significant potential impacts to critical habitat, eliminating the ability to include it as a benefit of the HCP or mitigation credit bank and requiring use of additional acreage to mitigate project impacts.

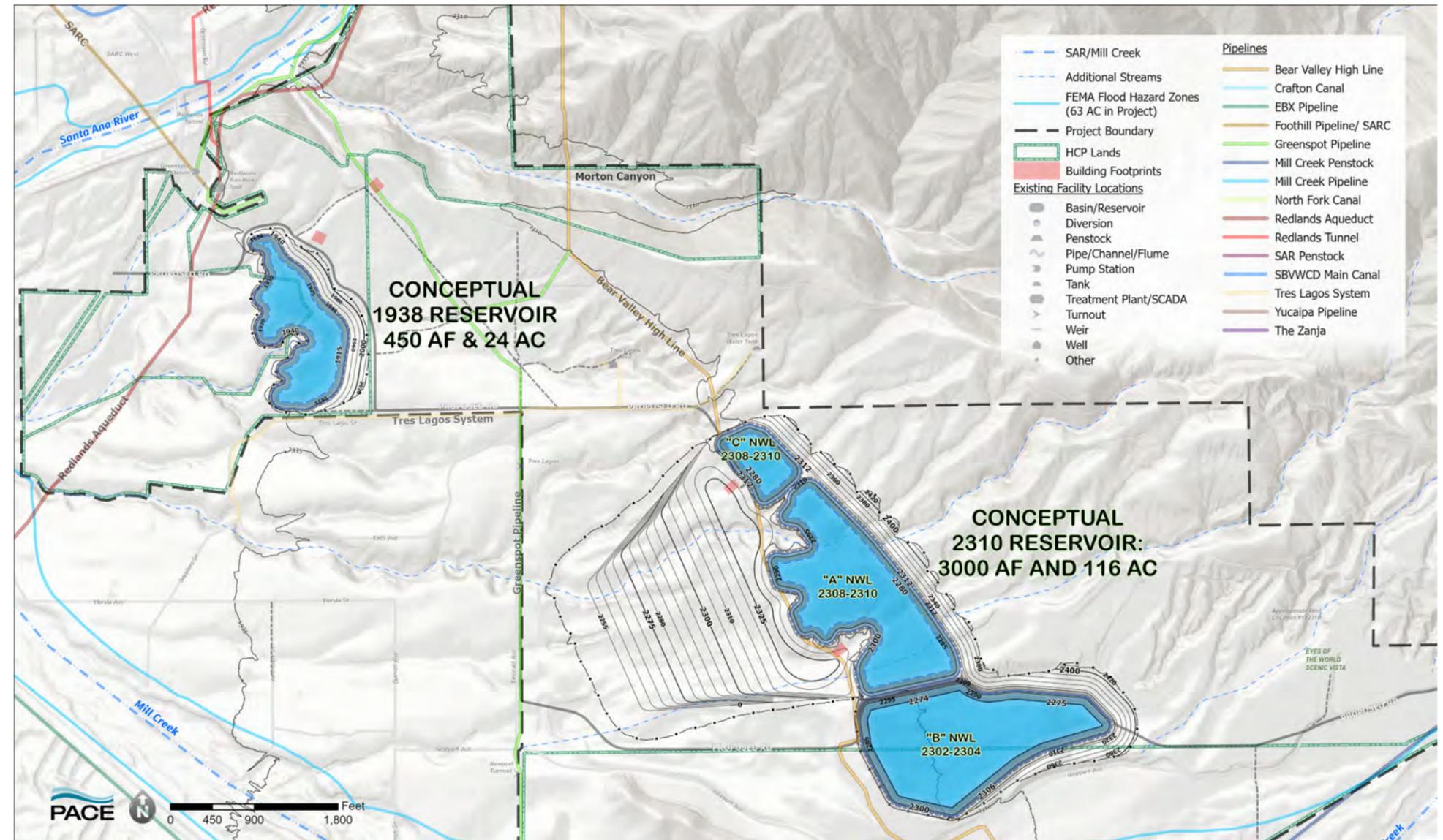


Figure 14. Maximum Alternative



Minimum Alternative

The Minimum Alternative avoids impacts on critical habitat and avoids creation of a jurisdictional dam.

The Minimum Alternative (Figure 15) is designed to avoid impacts on designated critical habitat—such as portions of the Santa Ana River and Mill Creek—that are legally protected and require substantial mitigation if impacted. By doing so, this alternative reduces construction-related mitigation requirements and helps preserve the financial value of those lands for potential future sale as mitigation credits.

To avoid sensitive and valuable habitat, Reservoir 2310 in the Minimum Alternative does not extend as far north as the Maximum Alternative. It is designed as a single-basin with a capacity of 1,100 AF. Reservoir 1938 would add another 210 AF, resulting in a total combined storage capacity of 1,310 AF for this alternative.

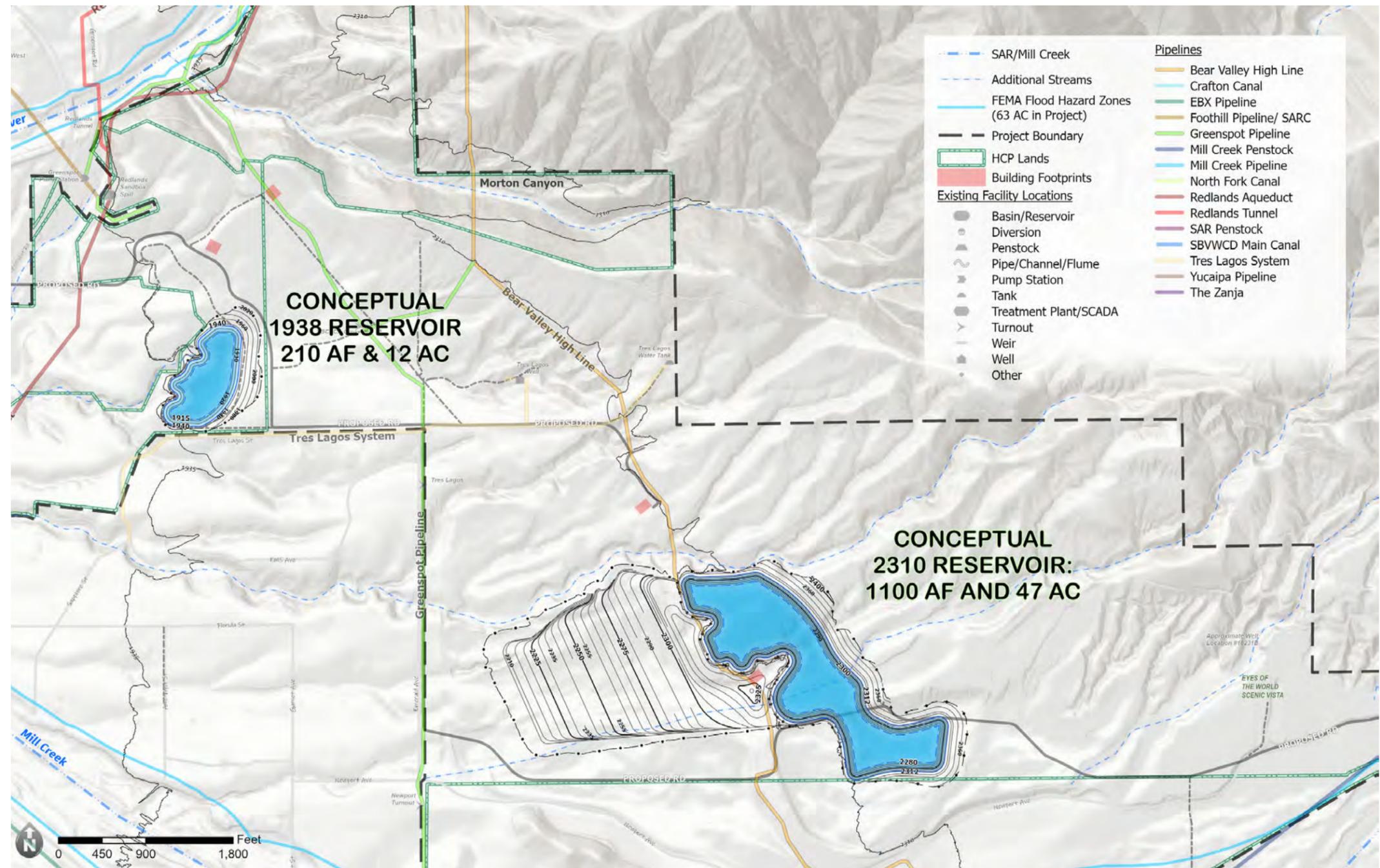


Figure 15. Minimum Alternative





Hybrid Alternative

The Hybrid Alternative avoids critical habitat while providing greater storage capacity than the Minimum Alternative and avoiding creation of a jurisdictional dam.

The Hybrid Alternative (Figure 16) would have a larger and more elongated footprint than the Minimum Alternative but would still avoid most areas designated as critical habitat. This allows the preserved land to remain eligible for inclusion in mitigation credit programs.

Compared to the Maximum Alternative, the Hybrid Alternative provides less than half the total storage volume. In this configuration, Reservoir 2310 would have a capacity of 1,200 AF and Reservoir 1938 would have a capacity of 250 AF, for a combined total storage of 1,450 AF.

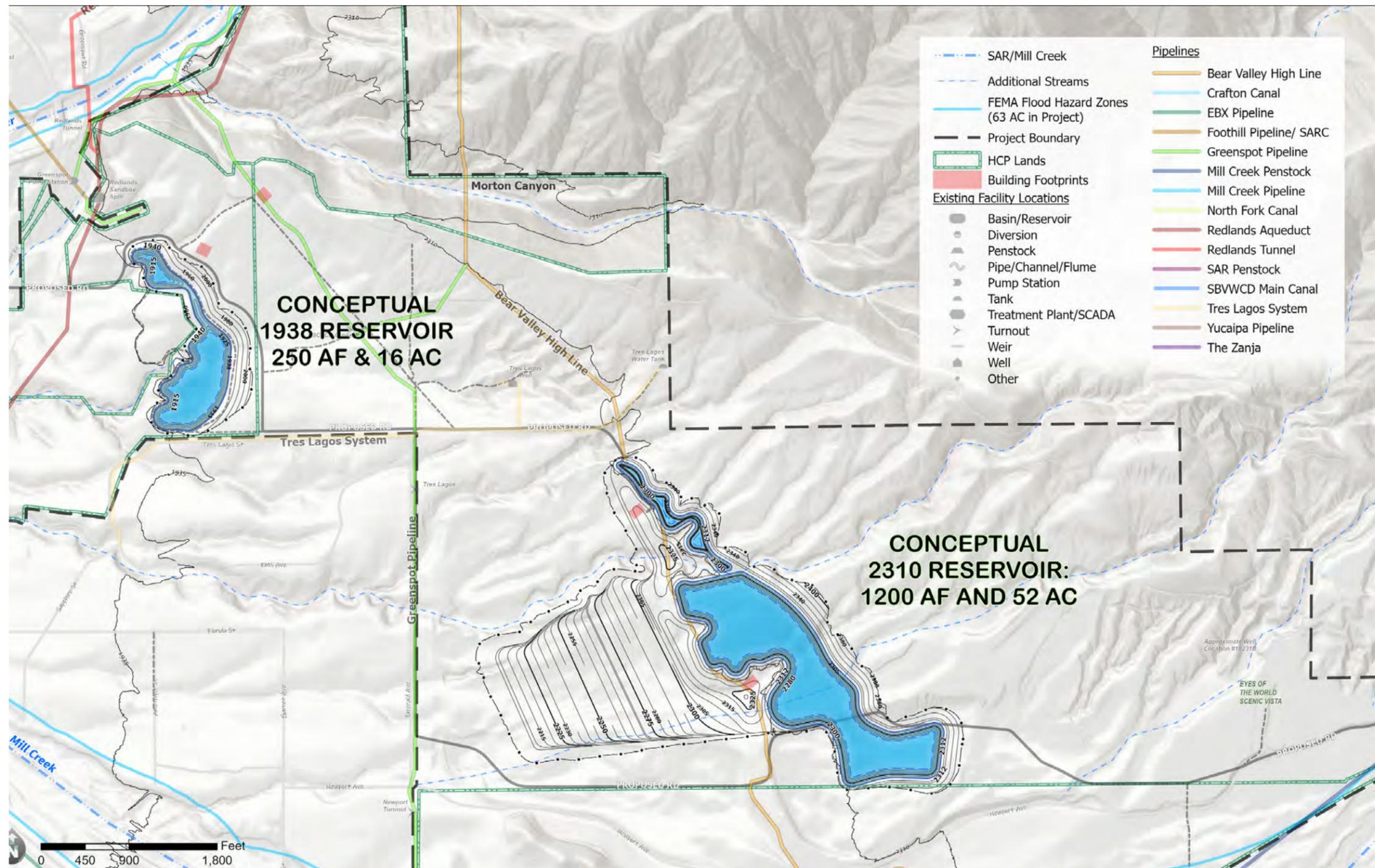


Figure 16. Hybrid Alternative





Jurisdictional Alternative

Another option, requiring additional regulatory approvals related to certification of the facility by DSOD, would be to create a jurisdictional dam. This Jurisdictional Alternative would allow for 3,000 AF of water storage with a much smaller amount of earthwork than the Maximum Alternative.

As shown in Figure 17, the Jurisdictional Alternative is compared to the Maximum Alternative.

This option would cover a smaller area, which would help reduce construction costs and avoid disturbing sensitive habitat. The conceptual design features a “kidney bean” shape, but could be reconfigured during further analysis.

Because this reservoir would be contained by an earthen berm, it would require regulatory approval and regular safety inspections. A jurisdictional dam also brings additional requirements, such as compliance obligations, annual inspections and fees, and stricter design and construction standards. These factors could extend project timelines and increase costs during both construction and long-term maintenance. An Emergency Action Plan would also be required, adding some administrative responsibilities and costs.

San Bernardino Valley is familiar with DSOD compliance processes through its operation of the Crafton Hills Reservoir and Yucaipa Regional Park, which follow similar regulations.

From a visual standpoint, the embankment design would create more obstructed views across the property compared to the other alternatives. The other concepts would maintain better sightlines from areas being considered for new facilities, such as a future San Bernardino Valley Headquarters.

If the Board chose to move forward with the Jurisdictional Alternative, adjustments to other project components—such as recreation features and facility design priorities—would likely be needed.

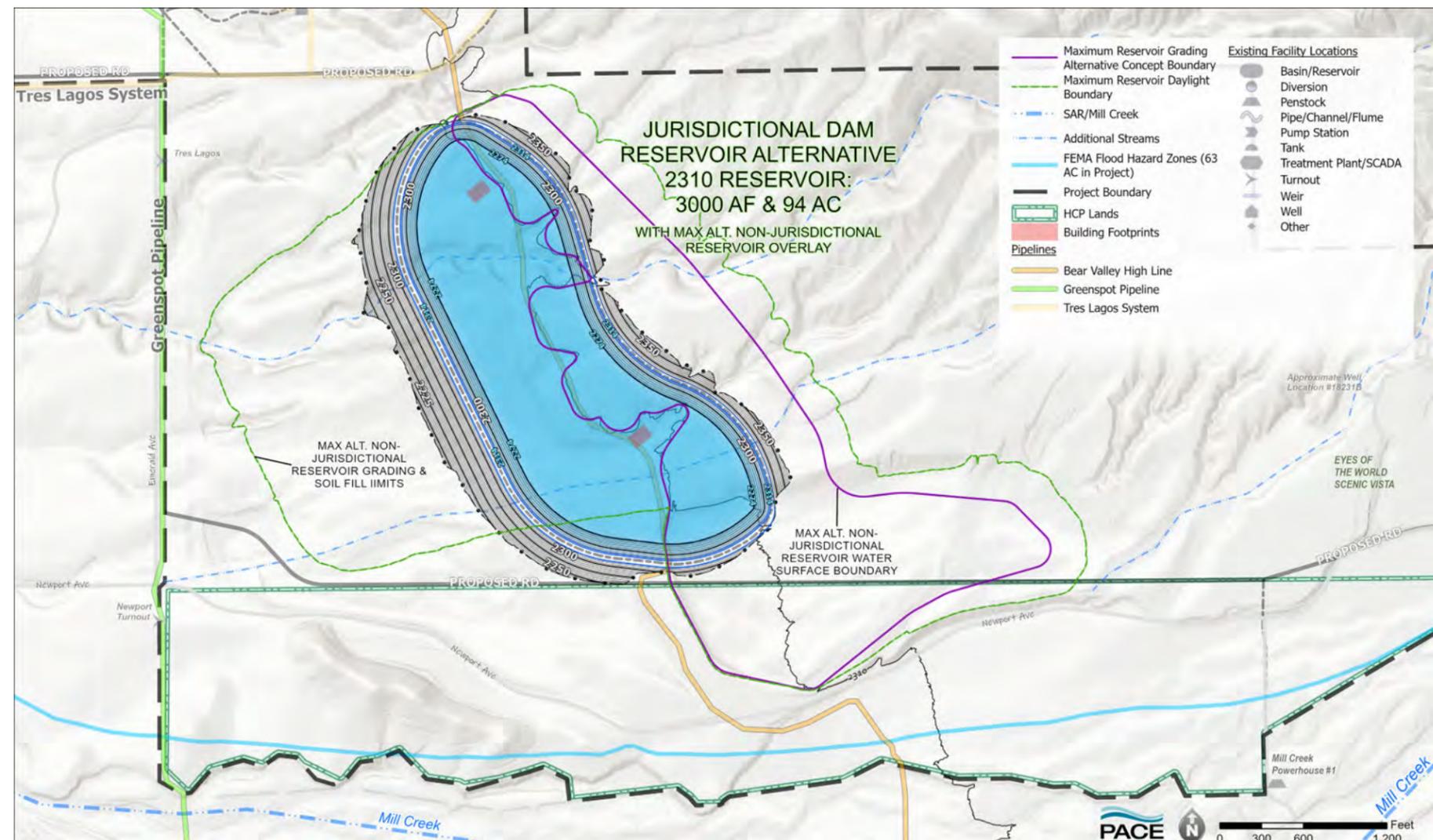


Figure 17. Jurisdictional Alternative





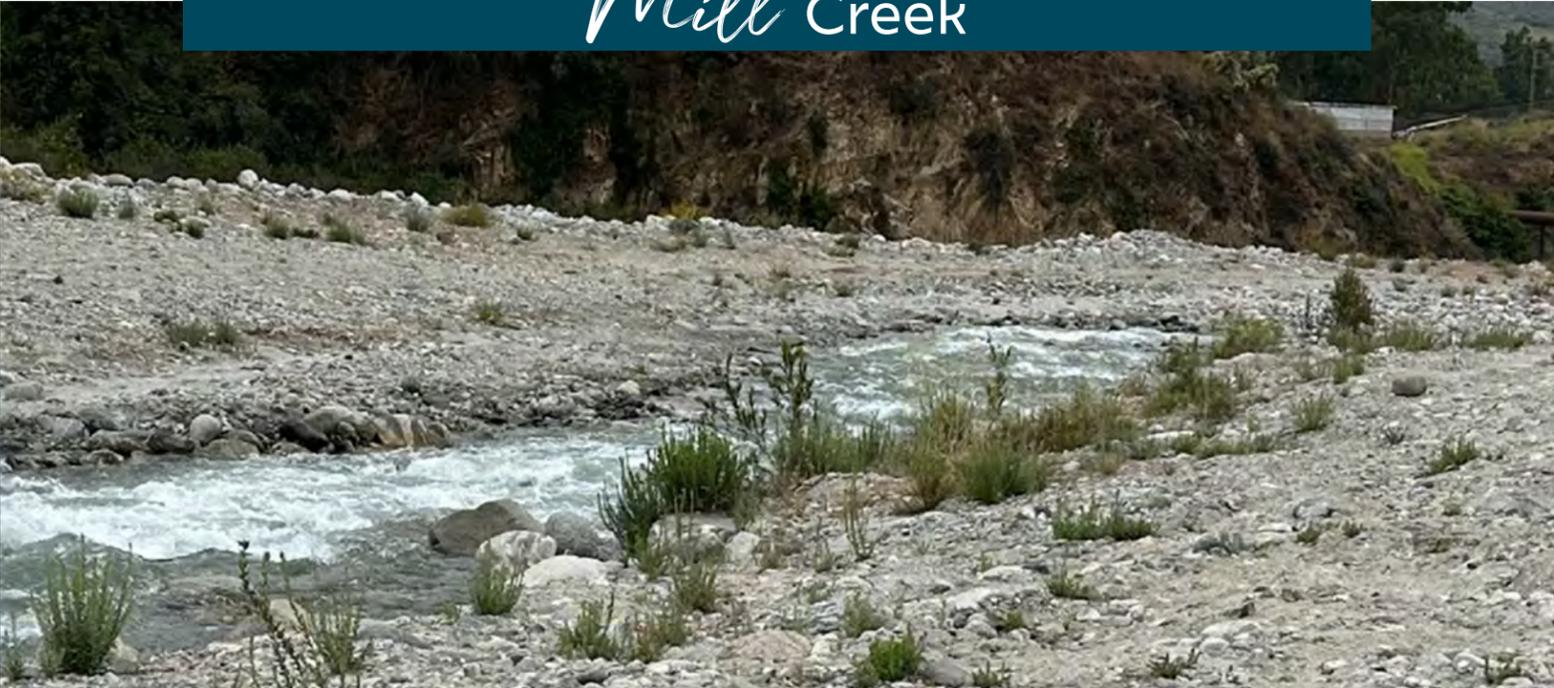
Adding new water storage at Sunrise Ranch would provide extra capacity and backup supply, greatly improving the region's ability to adapt to changes and fluctuations in water availability.

1.2.2. Conveyance Opportunities

Sunrise Ranch's location and elevation make it well-suited for potential new and upgraded conveyance opportunities to enhance existing water infrastructure and leverage the new proposed reservoir system. For example, new or modified conveyance would benefit the east end of the San Bernardino Valley service area and allow water to be redirected to the west side of the service area via the Foothill Pipeline.

As part of evaluating the proposed reservoirs, the project would also consider the conveyance infrastructure needed to move water to and from the site. In addition to meeting the reservoir's operational needs, this effort could help address several existing infrastructure challenges, such as replacing older or outdated facilities. Where possible, the reservoir design and construction could include space for future water conveyance connections to support long-term system improvements and other emerging needs such as connection to reliable water supplies for firefighting efforts in various conditions.

Mill Creek





WATER SUPPLY INFRASTRUCTURE

Summary

1.3. Summary Findings

The Water Supply Infrastructure Opportunities outlined in this chapter have the potential to significantly strengthen water resource sustainability, resiliency, and conservation throughout the region.

When the Board first acquired this property, the vision was to develop water infrastructure that enhanced the region's ability to adapt and respond to changing water conditions. This aligns with San Bernardino Valley's broader goals—to maximize the regional benefit of supplemental water by, expanding storage capacity, for drought preparedness, emergency water supply continuity, and managing imported supplies efficiently and safely

Following the initial site review, there are multiple reservoir options that could be further explored based on the Agency's priorities for water storage and/or critical habitat.





Habitat AND MITIGATION OPPORTUNITIES



CHAPTER 2. HABITAT AND MITIGATION OPPORTUNITIES

Habitat and mitigation opportunities are considered a top priority for Sunrise Ranch as they will contribute to San Bernardino Valley’s mission to provide a reliable and sustainable water supply to support the changing needs of our region’s people and environment.

With multiple new water infrastructure projects proposed for the coming decades, and a large network of existing facilities requiring ongoing maintenance, San Bernardino Valley is pursuing cost-effective strategies to facilitate the construction, maintenance, and permitting of the region’s essential water infrastructure. These efforts aim to strengthen water security and reliability within the region while mitigating associated ecological impacts. Habitat acreage beyond the needs of the Upper Santa Ana River Habitat Conservation Plan could be placed in a mitigation bank, or other system to generate revenue for local projects while providing needed mitigation credits for other regional efforts.

Several unique features make Sunrise Ranch ideally suited to provide Habitat and Mitigation Opportunities:



LARGE AREA OF OPEN SPACE

The property encompasses 1,658 acres of largely undeveloped land, offering ample space for habitat preservation and restoration.



RARE AND SENSITIVE RESOURCES

Sunrise Ranch supports natural stream systems, diverse plant communities, and occurrences of species listed under state and federal endangered species acts.



STRATEGIC LOCATION

Situated at the confluence of the Santa Ana River and Mill Creek, and directly adjacent to the San Bernardino National Forest, the property connects key ecological corridors that are vital to regional biodiversity.



Sunrise Ranch’s expansive size, its proximity to the San Bernardino National Forest, and the presence of multiple rare and sensitive plant and wildlife species make it an exceptional site for habitat restoration and conservation. These natural features, combined with opportunities to enhance the property’s ecological value, create two key pathways to advance San Bernardino Valley’s long-term vision for water security and reliability:

- **Compensatory Mitigation for San Bernardino Valley and HCP Partners:** Portions of the property may be used to offset environmental impacts associated with San Bernardino Valley’s and partner agencies’ future projects, ensuring compliance with water infrastructure permits.
- **Ecological Credit Programs:** The establishment of a Mitigation or Conservation Bank (or similar advanced mitigation crediting program) could generate revenue through the sale of ecological credits, helping to fund the construction and operation of essential water infrastructure projects.

Chapter 2 provides an overview of existing ecological conditions at Sunrise Ranch and opportunities for creating compensatory mitigation areas and developing a Mitigation/Conservation Bank to support these goals.

MITIGATION 101

If a project impacts a water resource (streams, lakes, wetlands, etc.) or special status species and/or their habitat, mitigation will often be needed to replace or provide in-kind or substitute resources for ecological resources that are impacted. Mitigation often takes the form of land acquisition and permanent protection. Mitigation is typically satisfied through the purchase of credits from a mitigation or conservation bank, or through a Do-It-Yourself (DIY) approach referred to as Permittee-Responsible mitigation.

- **Mitigation/Conservation Bank:** Mitigation and conservation banks are established through regulations and are pre-approved by a handful of regulatory agencies (agencies responsible for protecting stream systems, wildlife, and plant species). Mitigation/conservation banks provide units of ecological resource value (referred to as “credits”) that can be purchased to offset impacts to similar ecological resources at a different location. Mitigation/conservation banks make it easier for a permittee (project proponent) to balance development with environmental protection. Instead of creating their own habitat restoration projects, project proponents can purchase credits from an approved mitigation bank. These credits represent land that has been restored and protected to the benefit of the species or system impacted by the project, and

it allows the developer to meet environmental requirements easily (i.e. a project proponent writes a check to the mitigation bank and the compensatory mitigation requirements for a project are satisfied).

- **Alternative Mitigation Credit Option - Mitigation Credit Agreement:**

- ◊ A Mitigation Credit Agreement (MCA) is a new mechanism for mitigation credits available through California Department of Fish and Wildlife’s Regional Conservation Investment Strategies Program.
- ◊ While an MCA is less common, it requires much of the same documentation as a traditional Mitigation Bank, and functions in a similar manner: providing units of ecological resource credits that can be purchased to offset project-related impacts.
- ◊ The Board gave direction in March 2025, for San Bernardino Valley to begin the process of developing an MCA for properties owned by the Agency.
- ◊ Sunrise Ranch could be incorporated in this agreement based on the direction of the Board.
- ◊ For the sake of the Sunrise Ranch Master Plan, an MCA is considered one of the advanced mitigation crediting programs noted above.

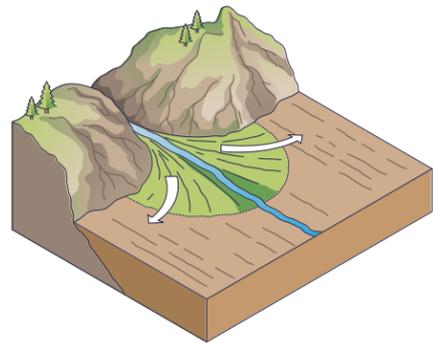
- **Permittee-Responsible Mitigation:** Permittee-Responsible is the most traditional form of compensatory mitigation and represents the majority of mitigation provided to offset project impacts. As its name implies, the project proponent is responsible for the acquisition, protection, and in-perpetuity management of compensatory mitigation lands, and ensures that all required compensation activities (e.g., actions to improve habitat conditions) are completed and successful.





2.1. Existing Conditions

The geographic location of Sunrise Ranch has greatly influenced the varied natural resources found on the property. Located between two stream systems (the Santa Ana River and Mill Creek), with the San Andreas fault traversing the northern portion of the property, the site supports alluvial fan habitat, perennial and seasonal streams, riparian resources, a variety of plant communities, and open space that supports locally unique rare flora and fauna.



An alluvial fan is a fan-shaped deposit of sediment formed where a stream flows from a steeper, narrower area (e.g., a canyon) onto a flatter area, like a valley floor.

The following sections describe the streams and riparian systems, plant communities (habitats), wildlife species, and ecological functions present on-site.

2.1.1. Streams and Seasonal Wetlands

Although Sunrise Ranch sits at the base of the San Bernardino Mountains, most of the property receives very little water from the mountains of the upper watershed. However, there are four main exceptions—Morton Canyon, Deep Creek, the Santa Ana River, and Mill Creek—which form natural boundaries along the northern, western, and southern edges of the property and convey flows from the national forest lands. Small, unnamed streams are located within the central portions of Sunrise Ranch. These streams are ephemeral—only conveying flows during and immediately following rain events—and have relatively small watershed areas.

The property's southern perimeter is adjacent to Mill Creek and the western boundary is adjacent to the

STREAMS AND SEASONAL WETLANDS ON SUNRISE RANCH

Streams: Four large stream systems, multiple unnamed ephemeral streams.

Morton Creek in Morton Canyon is the largest drainage traversing the property.

Streams length on property: 5.7 miles

- 2.1 miles in Morton and Deep Creeks (and their tributaries)
- 3.6 miles of unnamed ephemeral streams

Santa Ana River. Both watersheds are managed with existing water infrastructure, such as dams and pipelines, and have been modified through the construction of flood control structures (e.g., levees). Both watercourses contain year-round flows that fluctuate with seasonal weather and moisture patterns.

Deep Creek and Morton Canyon, located within the northwestern area of Sunrise Ranch, have not been modified by flood control or water infrastructure facilities. These systems have intermittent to perennial flow and support areas of riparian habitat.

Sunrise Ranch also supports seasonal wetlands/vernal pools. Vernal pools are a special type of seasonal wetland that form in shallow depressions, often on hard clay or rock surfaces that prevent water from soaking into the ground. They fill with rainwater during the winter and spring and dry out completely in the summer. Because these seasonal wetlands are dependent on rainfall, their size and period of inundation can vary greatly year to year. Vernal pools create a unique environment where certain plants and animals—many of them rare or endangered—have adapted to survive.

Vernal pools are seasonal wetlands that form in shallow depressions often with hard clay or rock that keeps water from soaking into the ground. They fill with rainwater in winter and spring, then dry out in summer, creating a unique habitat where many specialized—often rare or endangered—plants and animals thrive.

Environmental surveys conducted for the Harmony Development Environmental Impact Report (EIR)—a previously proposed residential project—identified and measured the stream systems on the property that fall under the jurisdiction of the Clean Water Act, and California Fish and Game Code. **Table 3** provides a summary of stream acreages, quantified by each agency with regulatory authority over the stream resources located on the property.

Table 3. Waters of the United States and State of California Jurisdiction on Sunrise Ranch Property

	Permitting Agency		
	USACE (acres)	RWQCB (acres)	CDFW (acres)
Morton Creek	0.51	5.23	5.23
Deep Creek	0.15	0.69	0.69
Unnamed Drainages	1.65	41.58	41.58
Wetlands and Vernal Pools		1.61	1.61
Total	2.31	49.11	49.11

Note: The amount may differ based on EPA 2023 Rule





2.1.2. Plant Communities and Land Cover

Plant community mapping was conducted over Sunrise Ranch as part of this Master Plan effort. Plant community mapping provides an understanding of the different habitats present and their suitability to support native wildlife species. It also identifies opportunities for habitat improvement actions, where conditions are found to be degraded. A total of 82 vegetation community classifications and two land cover types were identified on the property (refer to Appendix). However, for planning and analysis, these classifications were simplified as either stream/wetland associated (referred to as “riparian” habitat) or non-stream/wetland associated (referred to as “terrestrial” habitat) and then grouped into more general habitat types. Riparian habitat was separated into three groupings: Riparian Woodland, Riparian Shrub, and Nonnative Riparian Woodland, and Terrestrial habitat was separated into four groupings: Riversidean Alluvial Fan Sage Scrub, Riversidean Sage Scrub, Chaparral, and Grassland (Figure 19).



Riparian Habitat

Riparian plant communities were mapped along Morton Canyon, along an unnamed drainage located on the western perimeter of the property, and at scattered locations within unnamed drainages located within the central portion of the property (Figure 19). Approximately 32 acres of riparian habitat were mapped within Sunrise Ranch, with Morton Canyon supporting the largest area of riparian habitat (approximately 12 acres).

Morton Canyon supports large California sycamore trees with broad tall canopies, several species of smaller willow trees, and a dense understory (i.e., wild grape, common bracken fern, nettle, mugwort, and mulefat). The downstream portion of the drainage is comprised of riparian woodland and is densely vegetated with large, mature native trees. The remainder of the drainage is vegetated with mature riparian trees and shrubs in a patchier distribution. The

RIPARIAN HABITAT ON SUNRISE RANCH

Riparian Woodland: Covers approximately 24 acres of Sunrise Ranch. Riparian plant species included in this grouping include California sycamore, Fremont cottonwood, Gooding’s black willow and other willow species, mulefat, and elderberry.

Riparian Shrub: Covers approximately 7 acres of Sunrise Ranch. Plant species found in the riparian shrub grouping include mulefat, sandbar willow, and elderberry.

Nonnative Riparian Woodland: Encompassing at least 1-acre, nonnative tree species within this grouping include olive, eucalyptus, and pepper trees.

adjacent canyon walls rise steeply from the drainage; the south-facing slope is vegetated with drier, terrestrial habitat communities (Chaparral and Riversidean Sage Scrub).

Deep Creek also supports riparian habitat (i.e., California sycamore, Fremont cottonwood, possible ash species), however compared to Morton Canyon, riparian habitat is sparse and widely distributed, intermixed with drier terrestrial plant species (i.e., Mexican elderberry scrub oak, California sagebrush, and California buckwheat). Similarly to Morton canyon, the adjacent slopes of Deep Creek rise steeply from the drainage and are vegetated with drier terrestrial habitat communities (Riversidean Sage Scrub and Chaparral) typical of the surrounding area (i.e., Riversidean Sage Scrub and Chaparral).

Vegetation along the multiple unnamed drainages within the more central portion of Sunrise Ranch varies but primarily consists of terrestrial habitat communities (Riversidean Sage Scrub and Grassland).

There are several seasonal wetlands on the property: two moderately large basins in the south-central portion of the property that were created during construction of the Seven Oaks Dam and a larger eastern basin. The basins/ponded water areas function as vernal pools, being seasonally inundated with rainfall that drains to the basins but remaining dry during periods of drought. Vegetation surrounding these seasonal wetlands is varied but is primarily comprised of terrestrial habitat communities (Riversidean Sage Scrub and Grassland).





Terrestrial Habitat

Terrestrial plant communities cover the majority of Sunrise Ranch (approximately 1,533 acres). As described above, terrestrial habitats were separated into four groupings: Riversidean alluvial fan sage scrub, Riversidean sage scrub, chaparral, and grassland.

Areas mapped as Riversidean alluvial fan sage scrub occur along the western perimeter of the property within the historic floodplain of the Santa Ana River, and along the southern edge of the property within the floodplain of Mill Creek. Riversidean alluvial fan sage scrub, a rare plant community within California, is comprised of predominantly drought-deciduous shrubs, but with significant cover of larger perennial species typically found in chaparral. This vegetation type is distinctive because of the co-occurrence of evergreen shrubs, drought-deciduous shrubs, riparian species, and upland annual species near one another. Because Riversidean alluvial fan sage scrub is intermediate between chaparral and Riversidean sage scrub, it shares many of the same species.

Riversidean sage scrub is found across much of the property, irrespective of terrain: the habitat occurs on both flatter and steeper areas. Within gentler topography areas, scrub habitat varies in quality. The northern part of the property supports steeper, exposed south-facing slopes with smaller stature shrubs. The sloped areas above Mill Creek and the Santa Ana River also support scrub habitat. This plant community is comprised predominantly of drought-deciduous, semi-deciduous, and evergreen shrubs, such as California buckwheat, California sagebrush, and California brittle bush.

Chaparral is interspersed across Sunrise Ranch but primarily occurs on south-facing slopes in areas of steeper terrain. This plant community is comprised predominantly of woody, drought-tolerant, evergreen shrubs.

Areas of grassland are interspersed across Sunrise Ranch. These areas support a variety of nonnative plant species.

TERRESTRIAL HABITAT ON SUNRISE RANCH

Riversidean Alluvial Fan Sage Scrub: Covering approximately 42 acres, representative plant species found in this community on Sunrise Ranch include brittle bush, yerba santa, yucca, and scale broom.

Riversidean Sage Scrub: Covering approximately 1,145 acres, representative plant species found in this community on Sunrise Ranch include California buckwheat, brittle bush, and California sagebrush.

Chaparral: Covering approximately 232 acres, representative plant species found in this community on Sunrise Ranch include chamise, scrub oak, toyon, skunkbrush, sugar bush, and elderberry.

Grassland: Covering approximately 113 acres, representative plant species are primarily nonnative: brome and other nonnative annual grasses, mustards, etc.

In addition to the four terrestrial habitat communities, two land cover types were also mapped on Sunrise Ranch: disturbed and developed. Approximately 3 acres of developed lands, predominantly consisting of buildings, paved roads, and concrete pads were mapped on Sunrise Ranch. Dirt roads and areas maintained as fire buffer zones were mapped disturbed. These areas comprise approximately 89 acres.





Rare and Sensitive Plant and Wildlife Species

Despite much of the property being subject to various disturbances dating back to before 1938 (citrus groves) to as recently as 1995 (large-scale sediment removal to support the construction of the Seven Oaks Dam), the vegetation has recovered over many of these areas and now provides suitable habitat conditions for a variety of species.

Several steps were taken to help identify rare and special-status species that may occur within, or near, the property boundaries. The first step involved review of previous biological survey reports prepared for prior proposed projects on the property, and from adjacent areas, and review of existing databases maintained by state and federal wildlife agencies (California Department of Fish and Wildlife, and the US Fish and Wildlife Services), and others. The databases included:

- California Natural Diversity Database
- California Native Plant Society
- Carlsbad United States Fish and Wildlife Service database
- Incidental species observations (such as in eBird or iNaturalist)

Additionally, incidental species observations were documented during plant community mapping completed over the course of three days in 2023.

In total, 84 species have been recorded within the vicinity of the property, with 25 species being previously observed or likely to occur and 10 species having a moderate potential to occur on the property. For those that are federally and/or state listed (or recently proposed for listing) as threatened or endangered (Table 4), a more detailed analysis was performed.



Table 4. Special status species observed on the Sunrise Ranch property

Species	Habitat Preference
<i>Recently Observed</i>	
Santa Ana River woolly-star (<i>Eriastrum densifolium</i> ssp. <i>sanctorum</i>)	Sandy soils on river floodplains or terraced fluvial deposits in coastal scrub and chaparral
Western spadefoot (<i>Spea hammondi</i>)	Open treeless grasslands, scrub, or mixed woodland and grassland with aquatic breeding habitat
Coastal California gnatcatcher (<i>Polioptila californica californica</i>)	Low, coastal sage scrub in arid washes and on mesas and slopes
<i>Species Previously Observed and/or Likely to Occur</i>	
Least Bell's vireo (<i>Vireo bellii pusillus</i>)	Low riparian forest, scrub, and woodland in vicinity of water or in dry river bottoms
San Bernardino kangaroo rat (<i>Dipodomys merriami parvus</i>)	Early to intermediate seral stages of alluvial scrub on sandy loam substrates characteristic of alluvial fans and flood plains

Locations of special-status species at Sunrise Ranch are shown in Figures 18 and 19. For a complete account of non-listed species that have been previously observed on the property or are likely to occur, as well as their regulatory status, potential to occur, and associated habitats, refer to the Appendix.



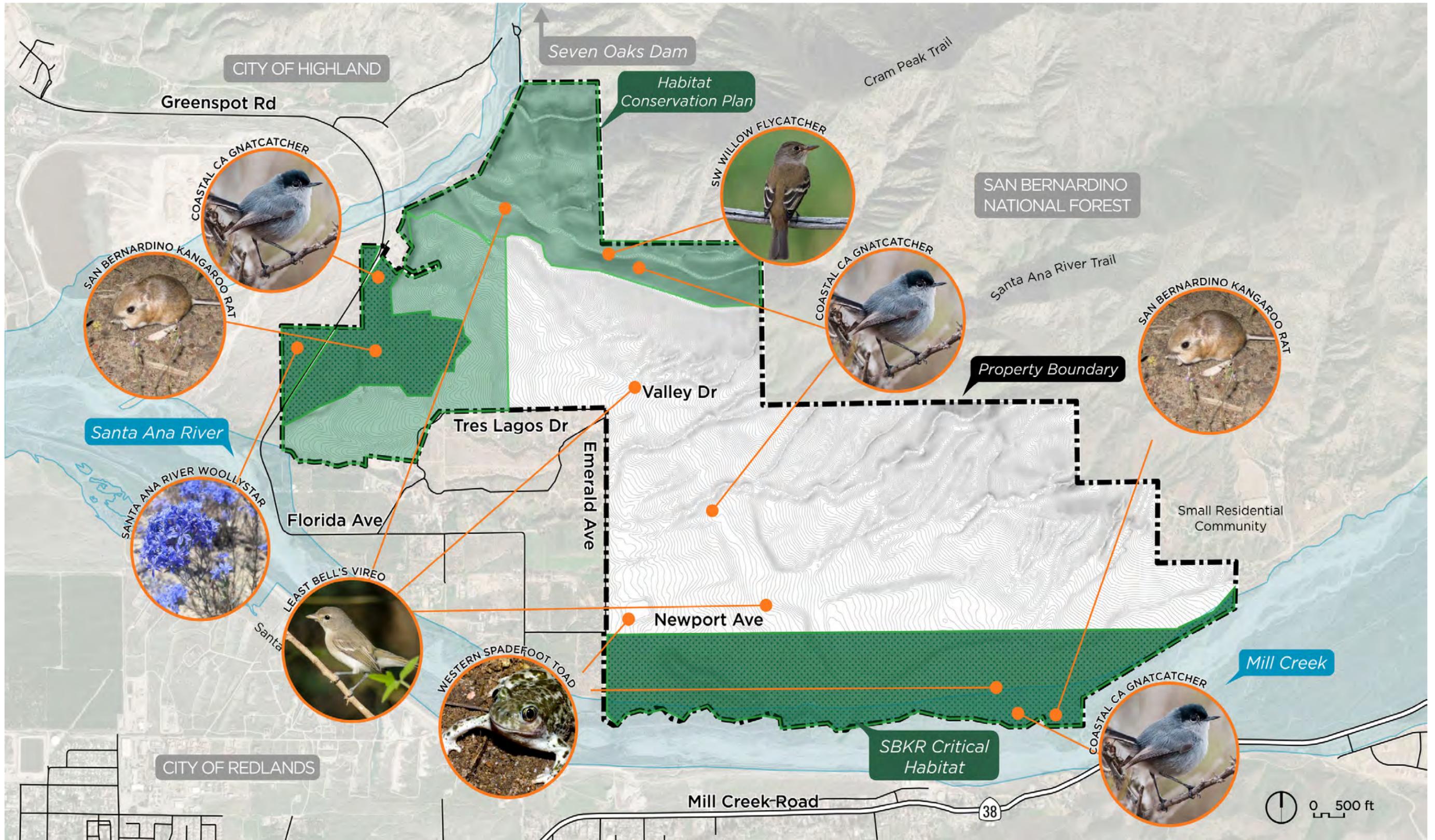


Figure 18. Observation locations of special status species on Sunrise Ranch

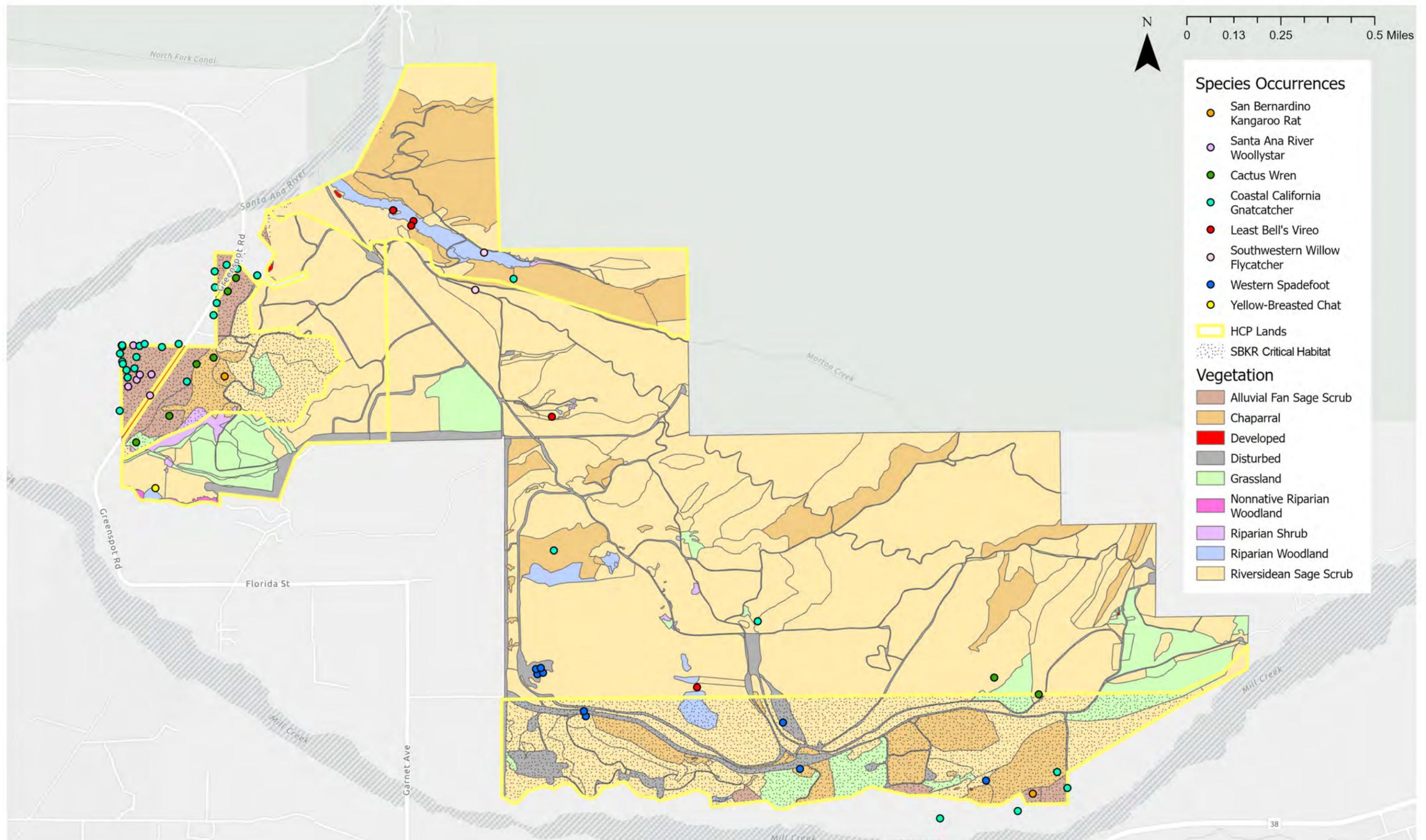
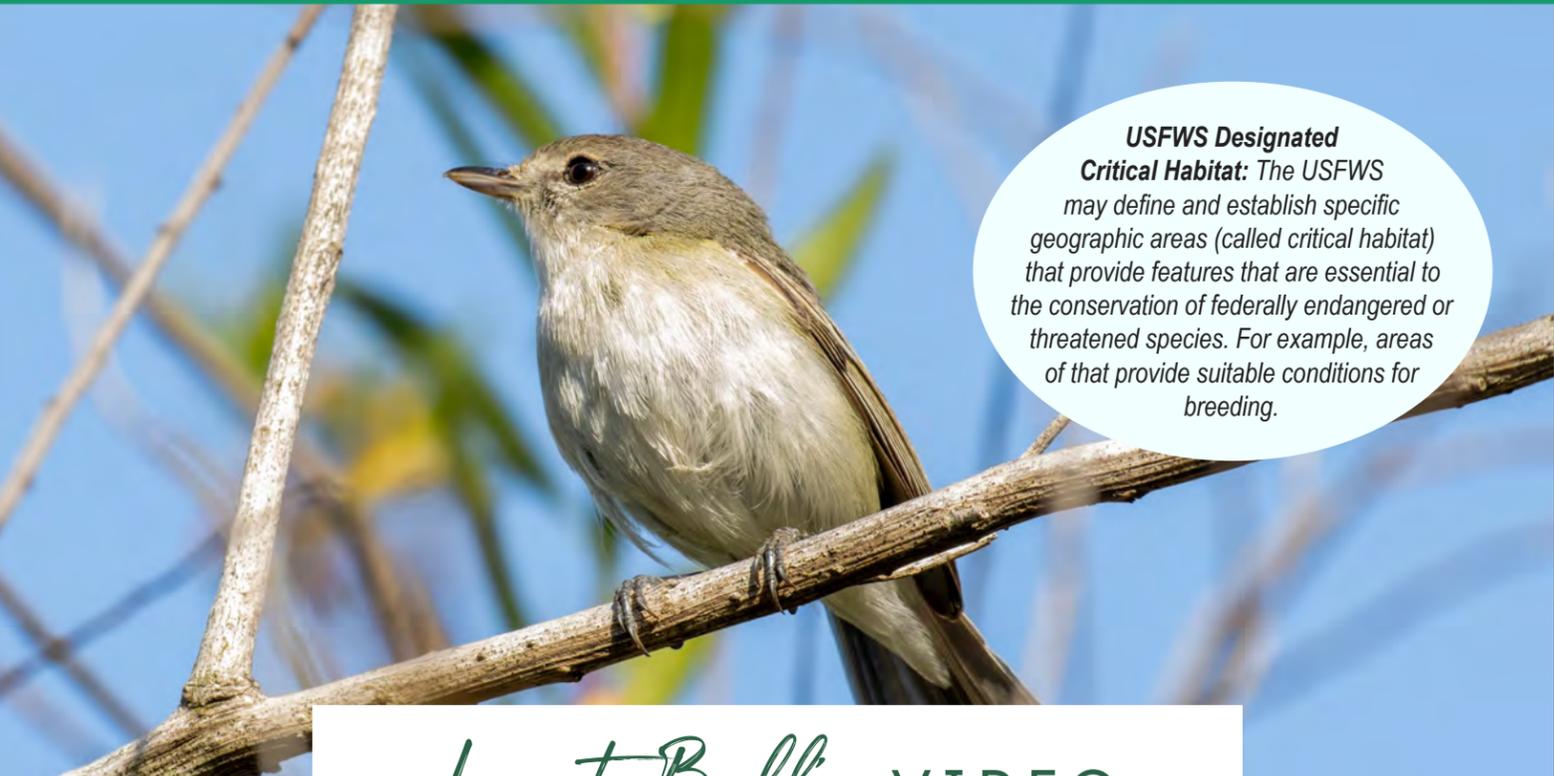


Figure 19. Plant communities and special status species observed on Sunrise Ranch property



USFWS Designated Critical Habitat: The USFWS may define and establish specific geographic areas (called critical habitat) that provide features that are essential to the conservation of federally endangered or threatened species. For example, areas of that provide suitable conditions for breeding.

Least Bell's VIREO

Conservation Status

The least Bell's vireo is a federally and state endangered species.

Distribution

Least Bell's vireos were previously observed adjacent to Sunrise Ranch within Santa Ana River and Mill Creek, and on the property in Morton Canyon within riparian woodland habitat (i.e., California Sycamore Woodland, California Sycamore-Willow Woodland, black willow thickets, willow-mulefat) (Figure 19).

Although not documented (to date) in areas where riparian shrub (i.e., mulefat thickets) occurs on the property, least Bell's vireos are frequently found nesting and foraging within these habitats.

The property also supports nonnative riparian woodland (European Olive-Eucalyptus-Pepper Trees, European Olive Grove) intermixed with riparian woodland (Freemont Cottonwood Woodland). While no individuals have been documented (to date) within these areas onsite, the species has been documented utilizing this habitat type at other locations within its range.

Additional Note: No USFWS least Bell's vireo designated critical habitat overlaps with the Sunrise Ranch. The closest critical habitat occurs along the Santa Ana River in the City of Riverside, approximately 19 miles southwest of the property.



Coastal California GNATCATCHER

Conservation Status

The coastal California gnatcatcher is a federally threatened species and a CDFW species of special concern (SSC).

Distribution

Focused coastal California gnatcatcher non-breeding surveys were conducted in 2013-2014 (Kidd Biological 2014a) and breeding surveys in 2014 (Kidd Biological 2014b) on the property to support the Harmony EIR. No individuals were observed. Since the time of those surveys, vegetation on the property has continued to naturally develop and additional areas have become suitable with the removal of orchards.

Recent focused breeding surveys (2018–2023) conducted immediately southeast of the property by Southern California Edison found individuals in Mill Creek both upstream and downstream of the property. Breeding surveys conducted as part of the SBVWCD Santa Ana River Wash HCP found individuals near the property. These surveys suggest that the California gnatcatcher population is growing in the region. California gnatcatchers were recorded on the property during vegetation mapping surveys (within alluvial fan sage scrub, Riversidean sage scrub, and chaparral) (Figure 19). The sloped areas above Mill Creek and the Santa Ana River support scrub habitat but may be less suitable because of terrain. However, based on observations, these areas have the potential to support the species.

Additional Note: No USFWS coastal California gnatcatcher designated critical habitat overlaps with Sunrise Ranch. The closest critical habitat is in Reche Hills; approximately 9 miles southwest of the property boundary.



Western SPADEFOOT

Conservation Status

Western spadefoot is federally proposed as threatened and a CDFW species of special concern.

Distribution

Western spadefoots, like all amphibians, require aquatic habitat for breeding. Outside of breeding, spadefoots are found in terrestrial habitats. The species constructs burrows (using a hard fingernail-like “spade” located on each hindfoot) and may spend extended periods of time underground in a dormant state. Availability of sandy, friable soils (soils that easily crumble and break apart), that facilitate burrowing may be an important requirement in areas adjacent to breeding habitat.

There are several ponded areas located in the south-central portion of the property that were created during construction of the Seven Oaks Dam. The basins/ponded water are located on clay soils and function as vernal pools, seasonally holding water following rain events, and remaining dry during periods of drought. In August 2023, these ponds were filled during summer monsoons. Western spadefoots were recorded in the basins in 2019 and 2023. There are also several ponded areas on the existing unpaved access roads that provide potential breeding habitat, as this type of habitat is frequently occupied by this species in other locations in the area.



Santa Ana River WOOLLY-STAR

Conservation Status

The Santa Ana River woolly-star is a federally and state endangered species.

Distribution

The Santa Ana River woolly-star is found on alluvial terraces of open floodplains. The species needs disturbance to scarify seeds for successful germination, which usually occurs through flood events that replenish the sandy substrate and maintain an open vegetation canopy.

The Santa Ana River woolly-star was documented in 2023 within the property boundary, just west of Greenspot Road, on a historical terrace of the Santa Ana River (**Figure 19**). Santa Ana River woolly-stars have also been recorded in Mill Creek west of Garnet Street, where sandy soils are present. Although open sandy terraces exist along Mill Creek within the property, no plants were observed within these areas during recent surveys.



San Bernardino KANGAROO RAT

Conservation Status

San Bernardino kangaroo rat is a federally and state endangered species.

Approximately 366 acres of USFWS designated San Bernardino kangaroo rat critical habitat overlaps with the property. Approximately 91 acres overlap the western boundary of the property along the Santa Ana River, and approximately 274 acres overlap the southern boundary along Mill Creek (Figure 20).

Distribution

Like the Santa Ana River woolly-star, the San Bernardino kangaroo rat needs disturbance to create and maintain their preferred sandy substrate and vegetation cover.

San Bernardino kangaroo rat has been documented along the Santa Ana River, immediately west of the property, and there is high potential for presence on lands located west of Greenspot Road. Within Mill Creek, upstream of Garnet Street, San Bernardino kangaroo rat occurrences have not been well documented. Areas of open sandy terraces are present along Mill Creek within the property, and the species has been documented downstream of Garnet Street, and south of Mill Creek. However, it is unknown whether these nearby occupied areas are close enough to allow individuals to recolonize portions of the property.

The population has a disjunct distribution (Figure 21) with three critical core areas that are essential for the primary biological needs (i.e., foraging, reproducing, rearing of young, intra-specific communication, dispersal, genetic exchange, or sheltering):

- Santa Ana River watershed where the property is located
- Cajon Wash/Lytle Creek watershed to the west
- San Jacinto watershed, located in Riverside County, to the south

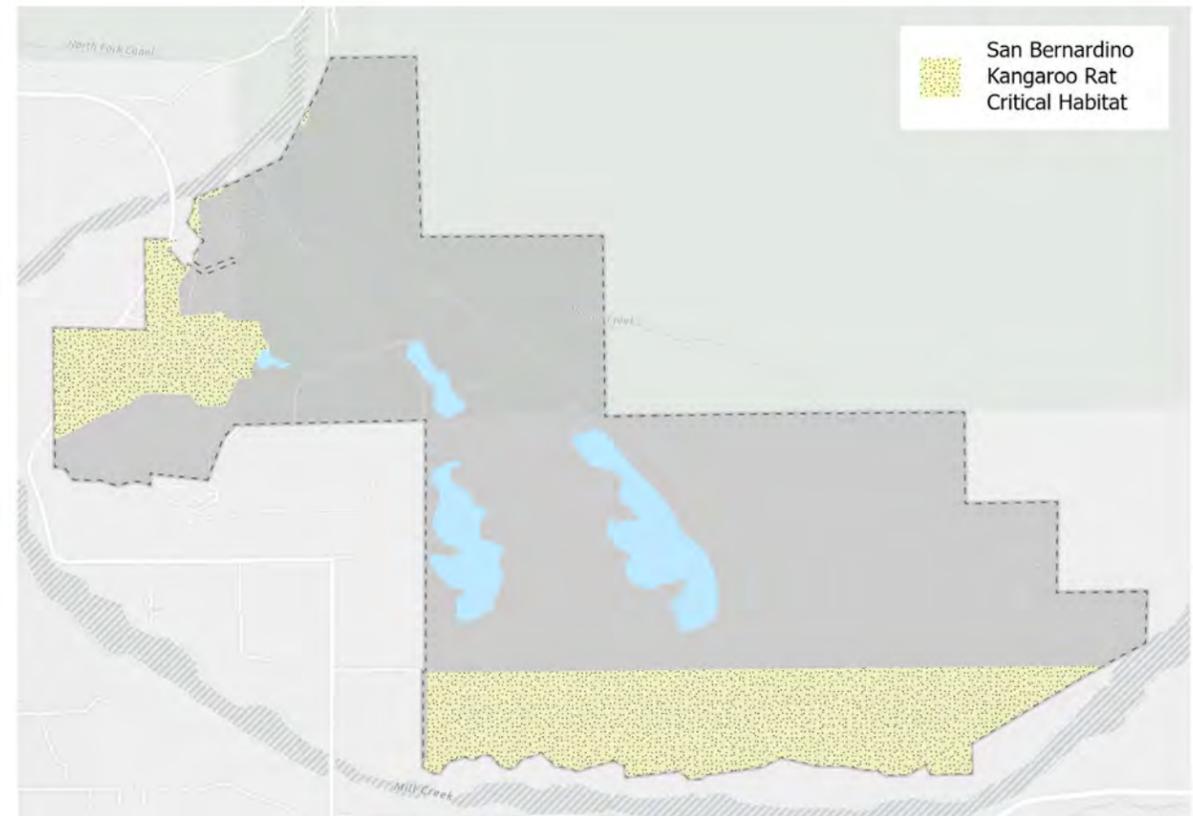


Figure 20. USFWS designated critical habitat for San Bernardino kangaroo rat that occurs within Sunrise Ranch

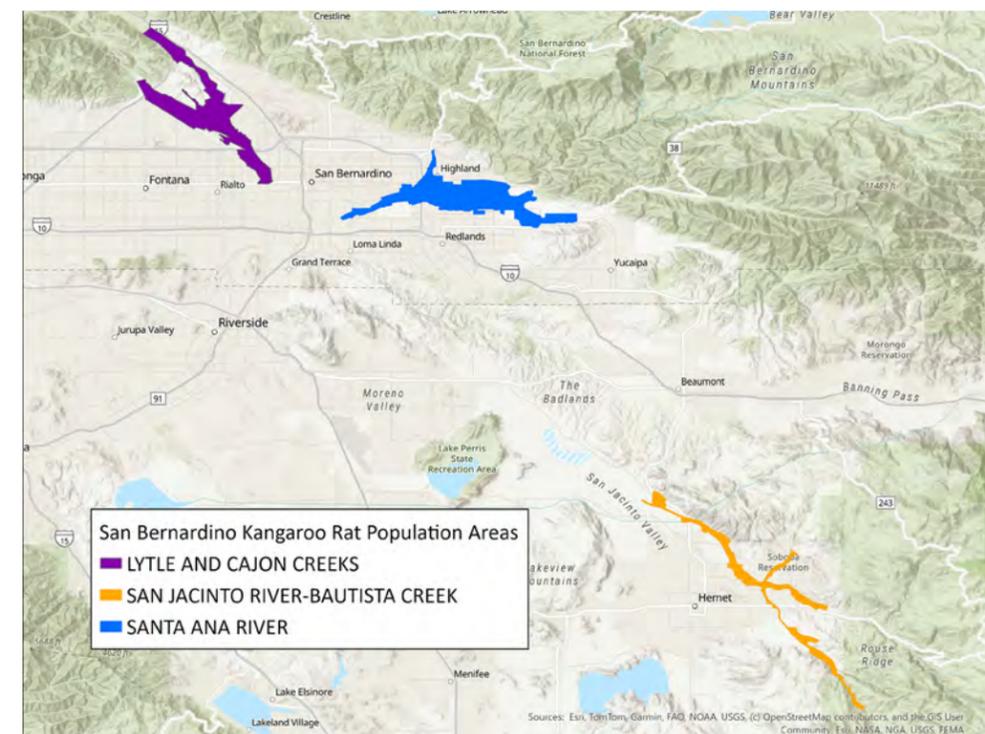


Figure 21. San Bernardino kangaroo rat distribution.





Sunrise Ranch WILDLIFE

2.1.3. Wildlife Corridors/Linkages Movement

The ability of individual animals to move across complex landscapes is critical for maintaining regional populations and for species to shift their geographic range in response to climate change. For long-term viability, movement corridors are important for gene flow among populations to maintain local genetic variation and spread potentially advantageous genes, or dilute genetic vulnerability to disease or other risks within a population.

Human-made linear corridors, particularly unpaved, low-traffic roads (e.g., unnamed dirt roads on the property), and under/overcrossings (e.g., under Garnet Street bridge over Mill Creek, under culvert along Greenspot Road) can act as a small-scale corridors for wildlife movement that links populations found in otherwise isolated patch habitats. Conversely, paved, higher-traffic roads can present a barrier to wildlife movement.

Sunrise Ranch is in an important location for wildlife connectivity due to its location south of the San Bernardino National Forest lands and adjacency to other conserved lands (the Upper Santa Ana River Wash Habitat Conservation Plan lies to the west, and Mill Creek and the Crafton Hills Preserve lies to the south). Because large-bodied mammals need extensive areas that can cover multiple conservation/public areas to survive, connectivity within and between lands by these species is often viewed as an important variable to consider. Larger bodied mammals that occur in southern California that have substantial home ranges and travel distances have been observed on the property (black bear, mule deer, coyote, bobcat, and mountain lion were documented on the property in 2025).

Movement by these wider-ranging large mammals likely occurs in many directions on the site (Figures 22 and 23). Future studies to evaluate the movement patterns of different species will be important for identifying and improving corridors.



Bobcat



Mountain Lion



Black Bear



Coyote



Mule Deer

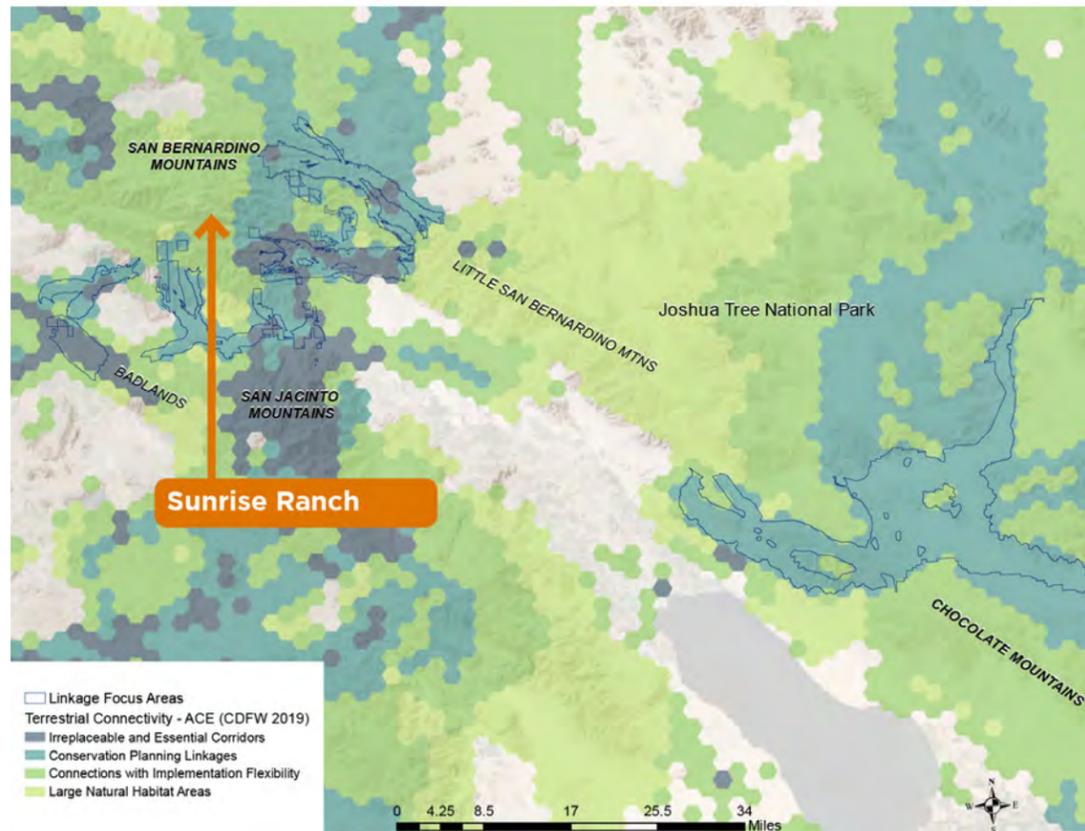
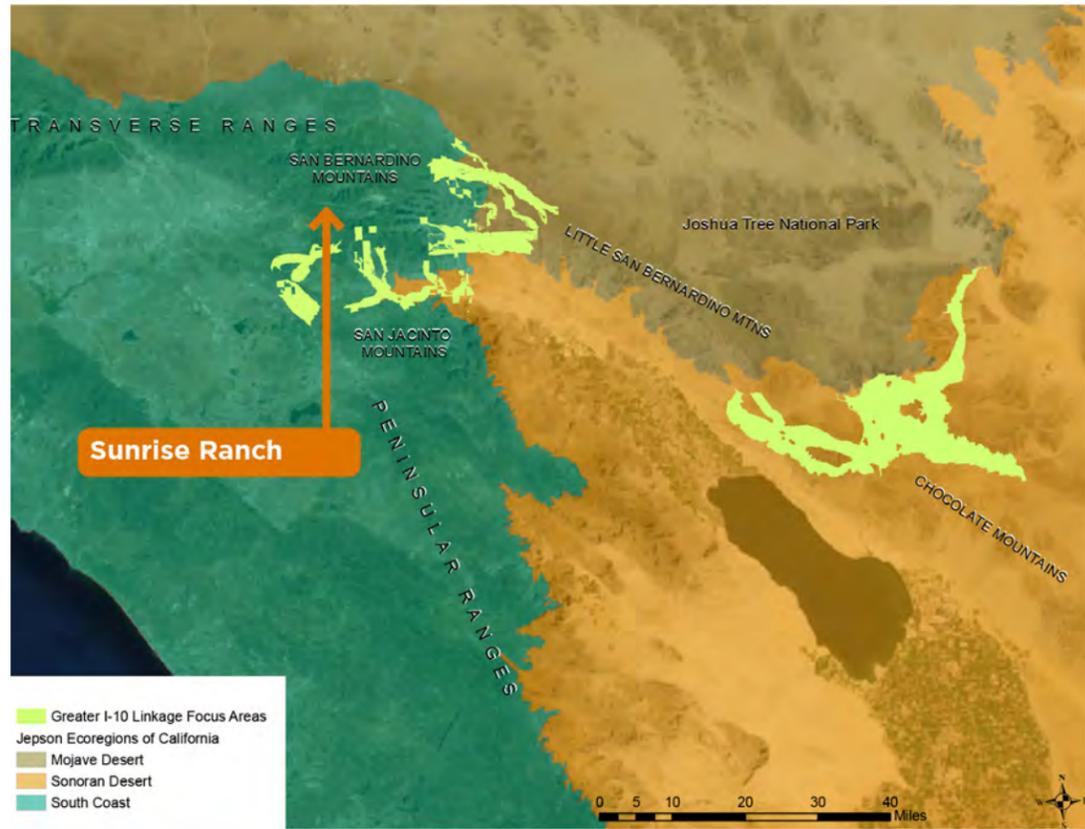


Figure 22. Terrestrial connectivity and eco-regional connections

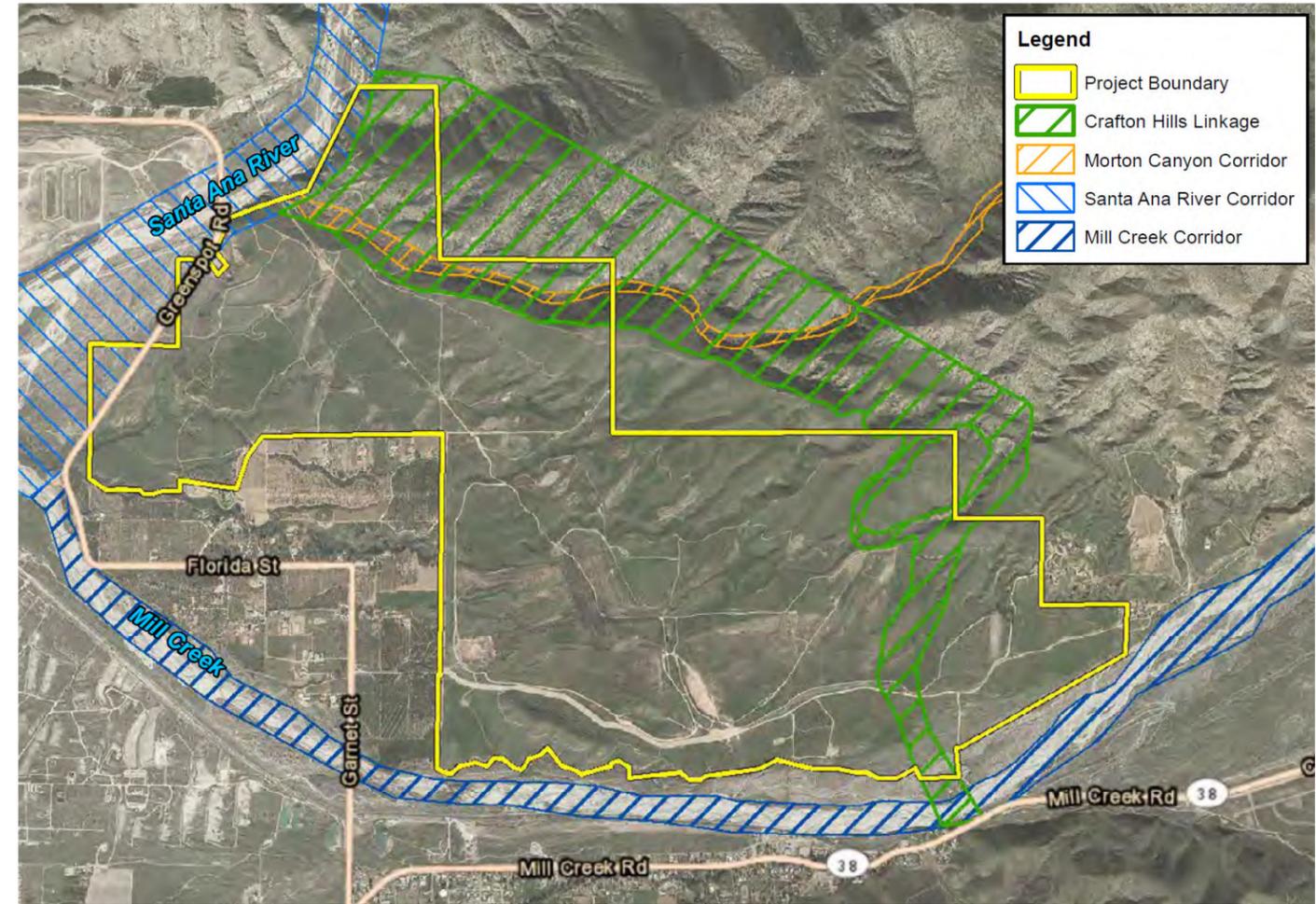


Figure 23. Localized wildlife movement per the 2014 FEIR Harmony Development review; Illustration based on field observations and area topography





2.2. Evaluation and Assessment

The large acreage of open space at Sunrise Ranch, its adjacency to national forest and other conserved lands, the presence of threatened and endangered species and stream and wetland resources, coupled with the implementation of actions to improve current degraded habitat conditions to enhance ecological value, affords two key opportunities:

Compensatory Mitigation: Acreage on the property can be used as compensatory mitigation to offset Agency impacts to special status/sensitive species and habitats resulting from water infrastructure projects.

Conservation/Mitigation Banking: Acreage on the property can be used to generate revenue through the establishment of a mitigation/conservation bank (or similar advanced mitigation crediting program) and sale of ecological credits.

2.2.1. Compensatory Mitigation Opportunities

Sunrise Ranch provides opportunities for stream and wetland compensatory mitigation, as well as species compensatory mitigation. The following federal and/or state threatened or endangered (or recently proposed for listing) species and their associated habitats have the potential to provide compensatory mitigation opportunities at Sunrise Ranch:

- Least Bell's vireo
- California gnatcatcher
- Western spadefoot
- Santa Ana River woolly-star
- San Bernardino kangaroo rat

Specific opportunities for stream and wetland mitigation, and species mitigation are described below.

ENHANCEMENT: Habitat enhancement refers to improving the ecological conditions in an area, e.g., removal of nonnative plant species to facilitate growth of native plant species.

CREATION: Habitat creation involves establishing a new habitat in an area where it did not previously exist, e.g., the creation of a wetland within an area that was previously grassland and did not hold standing water.

Streams and Seasonal Wetlands

As described in Section 2.1.1., Sunrise Ranch supports approximately 5.7 miles of streams and approximately 47.5 acres of stream and stream-dependent habitat. Stream types range from ephemeral systems that only convey flows during and immediately following rain events, to larger systems that convey flows perennially (year-round). Similarly, these systems support a range of associated riparian vegetation communities, with the ephemeral systems supporting sparsely distributed riparian shrub, or even drier communities more indicative of terrestrial habitats, and perennial systems supporting areas of riparian woodland. Sunrise Ranch also supports approximately 1.6 acres of seasonal wetland/vernal pool habitat.

All streams and seasonal wetland features have compensatory mitigation value, and there are opportunities to enhance stream associated habitat condition and create new seasonal wetlands/vernal pools.

Least Bell's Vireo

Riparian woodland and riparian scrub, as well as areas that can be restored to these general habitat communities, have the potential to support least Bell's vireo. Approximately 27.9 acres of riparian habitat that were, or could be, suitable for least Bell's vireo was identified on the property (Table 5).



Table 5. Potential riparian habitat mitigation opportunities within Sunrise Ranch

Vegetation Type	Vegetation Alliance/Association	Enhancement	Creation	Total Habitat Acreage
Riparian Shrub	Sandbar Willow Thickets	0.32	0	0.32
	Mulefat Thickets	1.12	0	1.12
	Mulefat - Blue Elderberry	0	5.73	5.73
	Subtotal	1.44	5.73	7.17
Riparian Woodland	Black Willow Thickets	19.84	0	19.84
	California Sycamore Woodland			
	California Sycamore-Red Willow			
	Fremont Cottonwood Forest			
	Willow-Mulefat			
	California Sycamore-Blue Elderberry			
Subtotal	19.84	0	19.84	
Nonnative Woodland	European Olive-Eucalyptus-Pepper Trees	0	0.60	0.60
	Subtotal	0	0.60	0.60
Total Credit Acreage		21.28	6.63	27.91



California Gnatcatcher

Previous studies and direct observations confirm that California gnatcatchers use multiple scrub habitat types. For example, nearby studies of California gnatcatchers have documented breeding territories in alluvial fan sage scrub, Riversidean sage scrub, riparian shrub, and chaparral habitats. Though nesting California gnatcatchers are primarily documented in areas of flatter terrain, they have been observed nesting on sloped terrain in the Santa Ana River wash near the property. Nearly the entire property is currently suitable, or could become suitable, for the California gnatcatcher (Table 6).



Table 6. Potential scrub habitat mitigation opportunities within Sunrise Ranch

Vegetation Type	Vegetation Alliance/Association	Enhancement	Creation	Total Habitat Acreage
Riparian Shrub	Mulefat Thickets	1.23	0	
	Mulefat-Blue Elderberry	0	5.73	
	Subtotal	1.23	5.73	6.96
Nonnative Woodland-Riversidean Sage Scrub	Pepper Tree Groves-Brittlebush	0	2.77	
	Brittlebush-Tamarisk	0.63	0	
	Subtotal	0.63	2.77	3.40
Riversidean Sage Scrub	Brittlebush Scrub- Upland Mustard			
	Brittlebush-California Buckwheat-Upland Mustard			
	Brittlebush-California Sagebrush			
	Brittlebush-California Sagebrush - Chamise			
	Brittlebush-California Sagebrush-Upland Mustard			
	Brittlebush Scrub			
	Brittlebush Scrub-Annual Brome Grassland			
	Brittlebush Scrub-Upland Mustard-Nonnative Grassland			
	Brittlebush-Toyon			
	Bush Mallow Scrub			
	California Buckwheat Scrub			
	California Buckwheat-Brittlebush			
	Ca Buckwheat-California Sagebrush-Brittlebush			
California Sagebrush Scrub				

Vegetation Type	Vegetation Alliance/Association	Enhancement	Creation	Total Habitat Acreage
Riversidean Sage Scrub (continued)	California Sagebrush-Black Sage Scrub	1314.73	0	1335.45
	California Sagebrush-California Buckwheat Scrub			
	California Sagebrush-Ca Buckwheat-Yerba Santa			
	California Sagebrush-Upland Mustard-Wild Oat Grassland			
	Chamise-California Buckwheat-Upland Mustard			
	Deer Weed Scrub			
	California Sycamore-Blue Elderberry			
	Chamise Chaparral			
	Chamise-Brittlebush			
	Chamise-Brittlebush-California Buckwheat			
Chamise-Yerba Santa-California Sagebrush				
Subtotal	1314.73	20.72		
Riversidean Alluvial Sage Scrub	Alluvial Brittle Bush Scrub	42.41	0	42.41
	Scale Broom-Yerba Santa-Chaparral Yucca			
	Subtotal			
Chaparral-Riversidean Sage Scrub	Basket Bush Thickets	196.79	0	196.79
	Blue Elderberry-Brittlebush			
	Blue Elderberry-Brittlebush-California Buckwheat			
	Blue Elderberry-Brittlebush-Upland Mustard			
	Blue Elderberry-California Sagebrush-California Buckwheat-Yerba Santa			
	Blue Elderberry Stands			
	Brittlebush-Toyon			
	California Sagebrush Scrub			
	California Sagebrush-Scrub Oak			
	Chamise-Brittlebush			
	Chamise-Blue Elderberry-California Sagebrush			
Subtotal	196.79	0		
Chaparral	Blue Elderberry Stands	72.25	0	72.25
	Blue Elderberry-Toyon			
	Hairy Leaf Ceanothus-Chamise			
	Hairy Leaf Ceanothus-Chaparral			
	Subtotal			
Total Credit Acreage		1,628.04	29.22	1657.26





Western Spadefoot

Currently, there are 6.6 acres on-site that include potential breeding pools that may be suitable for Western spadefoot and one depression that is only occasionally ponded. Because dispersal distances of up to 600 meters between breeding ponds and terrestrial dormancy sites have been recorded, seasonal wetlands/vernal pools could be created to establish new breeding locations for Western spadefoot. The creation of new breeding ponds and documented use (breeding) by the species following construction has been successfully achieved at other locations in southern California, including nearby locations within the Santa Ana River wash. Consequently, areas of flatter terrain across the property would be suitable for the creation of new breeding habitat for Western spadefoot.



Santa Ana River Woolly-star

Santa Ana River woolly-star was recorded on the property in 2023, and they are found in immediately adjacent areas. Because this species responds well to seeding, portions of Sunrise Ranch could be enhanced to create suitable conditions. Areas mapped as Riversidean alluvial fan sage scrub, as well as areas with suitable sandy soils, that can be restored to Riversidean alluvial fan sage scrub, have the potential to support Santa Ana River woolly-star. Currently, there are approximately 42 acres of Riversidean alluvial fan sage scrub mapped on Sunrise Ranch that could support Santa Ana River woolly-star.



San Bernardino Kangaroo Rat

Given the narrow, restrictive range of San Bernardino kangaroo rats and limited mitigation opportunities where they occur, a focused assessment to map and quantify locations for existing and future mitigation opportunities on Sunrise Ranch was performed by a qualified biologist. San Bernardino kangaroo rats are found in alluvial fan sage scrub habitat; consequently, the focused assessments were completed in areas adjacent to the Santa Ana River, and Mill Creek. Although trapping has not been conducted to confirm presence, approximately 11.3 acres were identified as likely/possibly occupied by San Bernardino kangaroo rat. Of the approximate 42 acres of Riversidean alluvial fan sage scrub mapped on Sunrise Ranch, the focused assessments determined that approximately 32 acres is, or could be, suitable for San Bernardino kangaroo rat. Approximately 366 acres of USFWS designated critical habitat for the San Bernardino kangaroo rat overlaps with Sunrise Ranch. Approximately 91 acres overlap the western boundary of the property along the Santa Ana River, and approximately 274 acres overlap the southern boundary along Mill Creek.



MITIGATION OPPORTUNITIES AT SANTA ANA RIVER

Along the Santa Ana River, portions of the property located west of Greenspot Road are likely occupied by San Bernardino kangaroo rat. However, because the species likely does not currently occur east of Greenspot Road, movement corridors may be needed. Movement could be facilitated through the placement of culvert(s) underneath the roadway or retrofitting the existing large concrete box culvert, located just outside of the southwest corner of the property (Figure 24). Additionally, habitat improvement actions, including the removal of predator perches, and the removal and management of nonnative grasses across all areas of alluvial fan sage scrub, would increase habitat quality for the benefit of San Bernardino kangaroo rat. Habitat management actions that could be implemented to create and/or expand habitat for San Bernardino kangaroo rat include:

- Mechanical clearing/thinning of dense vegetation
- Controlled water source to create scour
- Nonnative plant removal
- Substrate augmentation

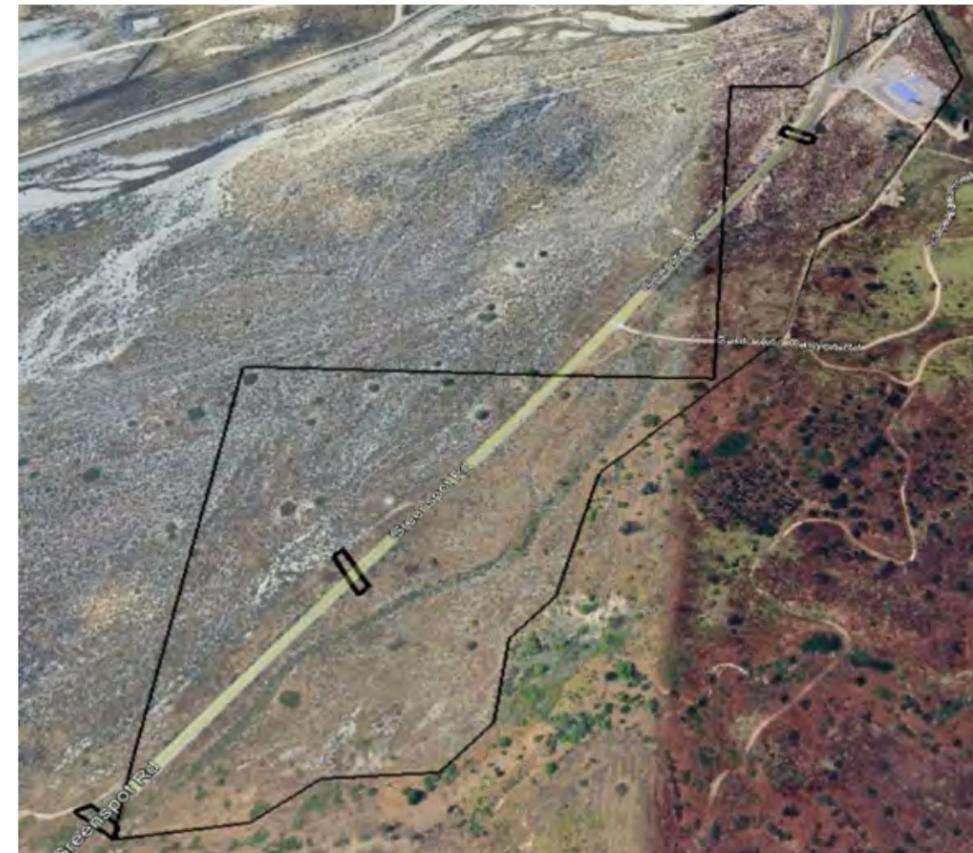


Figure 24. Potential movement corridors for San Bernardino kangaroo rat



Refer to Appendix for specific details on areas assessed for San Bernardino kangaroo rat habitat suitability and management opportunities.

MITIGATION OPPORTUNITIES ALONG MILL CREEK AT SUNRISE RANCH

Although 274 acres of USFWS designated San Bernardino kangaroo rat critical habitat overlaps with the southern boundary of Sunrise Ranch along Mill Creek, it is unlikely that San Bernardino kangaroo rat are currently present. However, because the species is present downstream in Mill Creek, and south of the southern bank of Mill Creek, habitat improvement actions, and the creation of movement corridors from these occupied areas to Sunrise Ranch could facilitate presence of the species in the future. In addition to the management actions identified above, movement corridors may be needed in areas to increase movement connectivity. More specifically, because portions of Mill Creek are incised, with steep slopes and terracing between the property and the creek bottom, these areas are unlikely to be traversable by San Bernardino kangaroo rat. Consequently, to facilitate movement slope grading or the creation of earthen ramps may be needed.

Other Species Opportunities

Because comprehensive surveys have not been completed, other rare and sensitive species may be present on the property or could occupy the site in the future (particularly following habitat restoration efforts based on habitat suitability). For example, there is high likelihood that the site supports Crotch's bumblebee, which is a candidate for listing under the California Endangered Species Act. Additionally, Sunrise Ranch supports occurrences of Parry's spineflower, which is ranked by the California Rare Plant Rank system (maintained by the California Native Plant Society) as a 1B.1 species, meaning that the species is rare, and is considered "...seriously threatened in California." Impacts on plants with

a rank of 1B.1 are required to be addressed under the California Environmental Quality Act (CEQA).

It is anticipated that additional mitigation opportunities would be explored later, e.g., during the development of an advanced mitigation crediting program (e.g., Conservation Bank or Mitigation Credit Agreement).

2.2.2. Conservation and Mitigation Bank Opportunities

Both public and private entities can establish and own conservation and mitigation banks. Bank lands are permanently protected, managed, and monitored. Habitat improvements are often undertaken to increase value. The environmental credits created through a bank can be sold to developers or private entities or used by the bank's sponsor to meet mitigation requirements associated with environmental permits.

A conservation or mitigation bank should protect important, high-value ecological areas and wildlife habitat values at both a local and landscape scale. These areas may include habitats that support diverse fish and wildlife populations, as well as species or ecosystems that are endangered, threatened, rare, or declining. The bank should be large enough to maintain healthy ecosystems, connect with other conserved lands, and provide contiguous habitats that support long-term ecological integrity and resilience. Additional factors to consider include:

- **Proximity to other conservation areas:** Sites located next to existing conserved lands are ideal, as they expand habitat connectivity and strengthen landscape-scale conservation.
- **Alignment with conservation initiatives:** Evaluate how the site supports or complements current and planned conservation programs, partnerships, or regional plans.
- **Water resources:** Assess the availability, reliability, and quality of water on the site, as well as any legal rights or restrictions related to water use.
- **Site and resource viability:** Consider the site's long-term capacity to sustain or improve its ecological resources. Factors include the overall size of the conservation unit and the long-term condition of surrounding and upstream lands.
- **Climate change resilience:** Identify potential threats such as the drying of wetlands, shifts in habitat types, or other climate-related changes, and plan for adaptive management to address these evolving needs.





If a conservation or mitigation bank—or a similar crediting program—is established using available habitat beyond the Agency's needs, it is essential to coordinate closely with the appropriate regulatory agencies to ensure that all expectations are met.

This coordination typically involves confirming the amount and quality of land that qualifies as mitigation habitat, securing permanent protection through a recorded conservation easement, assessing the land's value, and determining how much of it can be sold as different types of environmental credits.

Credit Types

Credits are established to offset unavoidable impacts on aquatic resources, special-status species, or habitats. The regulatory agencies that oversee conservation and mitigation banks recognize five main types of credits:

CREATION (RE-ESTABLISHMENT)

Rebuilding a former habitat or aquatic resource to restore its natural or historic functions. This may involve modifying the site's physical, chemical, or biological characteristics. To qualify, creation must result in a net gain in both resource area and ecological function.

ESTABLISHMENT

Developing a new habitat or resource in an area where it did not previously exist by altering the physical, chemical, or biological features on the site. Like creation, establishment must result in a net gain in resource area and ecological function.

ENHANCEMENT (REHABILITATION)

Improving or intensifying specific functions of an existing habitat or aquatic resource through targeted management or restoration activities. This credit type results in the gain in ecological function, but not an increase in resource area.

BUFFER

As defined by U.S. Army Corps of Engineers, a buffer is an upland or riparian area that protects or enhances aquatic resource functions – such as those associated with wetlands, rivers, streams, lakes, marine, and estuarine systems—from disturbances caused by nearby land uses.

WILDLIFE LINKAGE

Under Senate Bill 790 (Fish and Game Code Sections 1955–1958), mitigation credits may also be established for projects that improve wildlife movement and connectivity. These efforts are recognized through the California Department of Fish and Wildlife's Conservation and Mitigation Banking Program.

Currently Available Conservation/Mitigation Banks

Conservation and mitigation banks define specific, approved geographic service areas where permitted environmental impacts can be offset (i.e. compensated). The level of regulatory approval and the types of credits offered may vary from one bank to another.

Currently, four mitigation banks have service areas that overlap San Bernardino Valley's jurisdiction. To identify the types of credits available for purchase from these banks—and to assess local market demand—data were reviewed from the Regulatory In-lieu Fee and Bank Information Tracking System (RIBITS), and the Conservation and Mitigation Banks Established in California Service Area Dashboard were reviewed. A summary of the four mitigation banks is presented next.





CAJON CREEK CONSERVATION BANK

Cajon Creek Conservation Bank is in unincorporated San Bernardino County near the City of Rialto in the alluvial floodplain and active channel of Lytle Creek, just downstream from the confluence of Lytle and Cajon Creeks. The bank supports over thirty special-status species, including San Bernardino kangaroo rat and Santa Ana River woolly-star.

Cajon Creek Conservation Bank offers mitigation credits for Riversidean alluvial fan sage scrub, special-status species, and aquatic areas regulated by California agencies (i.e., Regional Water Quality Control Board, and California Department of Fish and Wildlife). The Cajon Creek Conservation Bank has been in operation since 1996. The bank is not currently approved by CDFW to sell credits for San Bernardino kangaroo rat. Credits from the Cajon Creek Conservation Bank are approximately \$305,000 per acre.

LYTLE CREEK CONSERVATION BANK

Lytle Creek Conservation Bank is immediately adjacent to the Cajon Creek Conservation Bank and provides habitat mitigation credits to offset unavoidable impacts to San Bernardino kangaroo rat and Santa Ana River woolly-star within its approved service area.

Lytle Creek Conservation Bank has been approved only by the U.S. Fish and Wildlife Service to sell credits for alluvial wash habitat, whether occupied or unoccupied by the San Bernardino kangaroo rat. The bank began selling credits in 2016 (7.47 credits sold) and continued in 2017 (13 credits sold), followed by a period of inactivity until 2022, when 16 credits sold. No additional credits have been sold since 2022. Of the 36.47 credits sold to date, nearly all were purchased

by private developers and utility companies, with a very small portion being purchased by local government entities to offset impacts to occupied San Bernardino kangaroo rat habitat. Credits from the Lytle Creek Conservation Bank are approximately \$220,000 per acre.

RIVERPARK MITIGATION BANK

The Riverpark Mitigation Bank is located in the valley below Perris Reservoir, at the southern terminus of the State Water Project. It protects several endangered plant species and rare vernal pools on the historic floodplain of the San Jacinto River. The bank also lies within one of the priority areas designated by the Western Riverside County Multiple Species Habitat Conservation Plan/Natural Community Conservation Plan (Western Riverside County MSHCP).

Credits from the Riverpark Mitigation Bank provide compensatory mitigation for permits issued by California Department of Fish and Wildlife under the Lake and Streambed Alteration Program, and by the Regional Water Quality Control Board and U.S. Army Corps of Engineers for permits issued under the Clean Water Act. The bank also provides compensatory mitigation for impacts on riparian and riverine resources associated with the Western Riverside County MSHCP.

The Riverpark Mitigation Bank has been approved by all regulatory agencies to sell riparian rehabilitation and establishment credits. From 2020 to 2024, a total of 15.94 credits have been sold for impacts on state and federal waters, as well as riparian and vernal pool habitat. Approximately two-thirds of these sales were for riparian habitat re-establishment, with most credits being purchased by private developers. Credits from the Riverpark Mitigation Bank range from approximately \$365,000 to \$425,000 per acre.





SOQUEL CANYON MITIGATION BANK

Soquel Canyon Mitigation Bank is a natural open space area near the junction of San Bernardino, Orange, Riverside, and Los Angeles Counties. Adjacent to Chino Hills State Park, it provides a vital link in the Puente-Chino Hills biological corridor, a region encompassing more than 14,000 acres of oak woodlands, sycamores, and rolling grass covered hills.

The bank provides habitat mitigation credits for several habitat types, including wetland, streams, riparian areas, oak woodlands, mulefat scrub, grasslands, coastal sage scrub. Soquel Canyon Mitigation Bank is recognized by all regulatory agencies and has been selling credits for federal and state waters since 2014. Credits offered at the bank include perennial, intermittent, and ephemeral streams as well as buffer areas surrounding those streams. To date, a total of 93.95 credits have been sold. In the ten years since establishment, nearly all enhancement credits for each stream type have been fully allocated, with the majority purchased by private developers and local government agencies. Credits from the Soquel Canyon Mitigation Bank range from approximately \$100,000 to \$350,000 per acre.

Bank Establishment

Establishing a conservation or mitigation bank at Sunrise Ranch to protect streams, seasonal wetlands, special-status species, and wildlife corridors is a plausible opportunity. The number of credits available for release to sell would be determined by the regulatory agencies overseeing

the bank, typically the U.S. Fish and Wildlife Service and the California Department of Fish and Wildlife. The credits are established based on the ecological values created, reestablished, or enhanced. The same agencies also determine the bank's service area and the phasing of credit releases. This is all done in close coordination with the bank's sponsor (owner).

The market value of bank credits is established through private market demand, with the bank sponsor holding exclusive authority to set sale prices for available credits.

Key factors that determine value of the bank include:

- Acreage values are not additive, as many resource areas overlap (for example, aquatic habitats that also support the least Bell's vireo).
- While credit prices are set by the bank sponsor, the regulatory agencies ultimately determine whether the proposed credits adequately compensate for project impacts.
- The presence of suitable habitat does not guarantee that a species occupies the area. Conversely, even where a special-status species is present, there could be limited demand for compensatory mitigation over time, dependent upon the overall species population conditions and the market needs for that type of credit.





Acres Committed for San Bernardino Valley and Partner Agencies Projects under the Upper Santa Ana River HCP

Given the proximity to other conserved lands and the San Bernardino National Forest located to the north-northeast, as well as the diverse native vegetation communities and high-quality habitat present which support numerous rare native and endemic plant and wildlife species, a portion of the mitigation commitments included within the Upper Santa Ana River Habitat Conservation Plan (HCP) has been allocated to Sunrise Ranch.

Under the HCP, four areas within Sunrise Ranch—totaling approximately 349 acres—have been identified as optimal sites for compensatory mitigation based on the needs of the HCP and their relatively lower cost compared to other mitigation options for HCP-related water projects (Figure 25).

The committed locations include:

- **Morton Canyon:** 30 acres allocated to provide mitigation for riparian bird species.
- **Upper Santa Ana River:** 89.53-acre area allocated for alluvial fan sage scrub, and associated species, including Santa Ana River woolly-star, coastal California gnatcatcher, cactus wren, and California glossy snake.
- **Upper Santa Ana River Plateau:** 146.72-acre area allocated for Western spadefoot, burrowing owl, coastal California gnatcatcher, cactus wren, and California glossy snake
- **Mill Creek:** 82.79 acres allocated for alluvial fan sage scrub, and alluvial scrub dependent species, including Santa Ana River woolly-star, coastal California gnatcatcher, cactus wren, and California glossy snake.

Only a subset of the Morton Canyon and Mill Creek Areas would be used by the Upper Santa Ana River HCP.

Table 7. Sunrise Ranch Acreage Committed for San Bernardino Valley and Partner Agency Projects under the Upper Santa Ana River HCP

Upper Santa Ana River HCP Conservation Area Name	Upper Santa Ana River HCP Conservation Measure ID	Acres Committed to Upper Santa Ana River HCP
Morton Canyon	Conservation 22	30
Upper Santa Ana	Conservation 23	89.53
Mill Creek	Conservation 24	82.79
Upper Santa Ana River Plateau	Conservation 25	146.72
Total		349.04

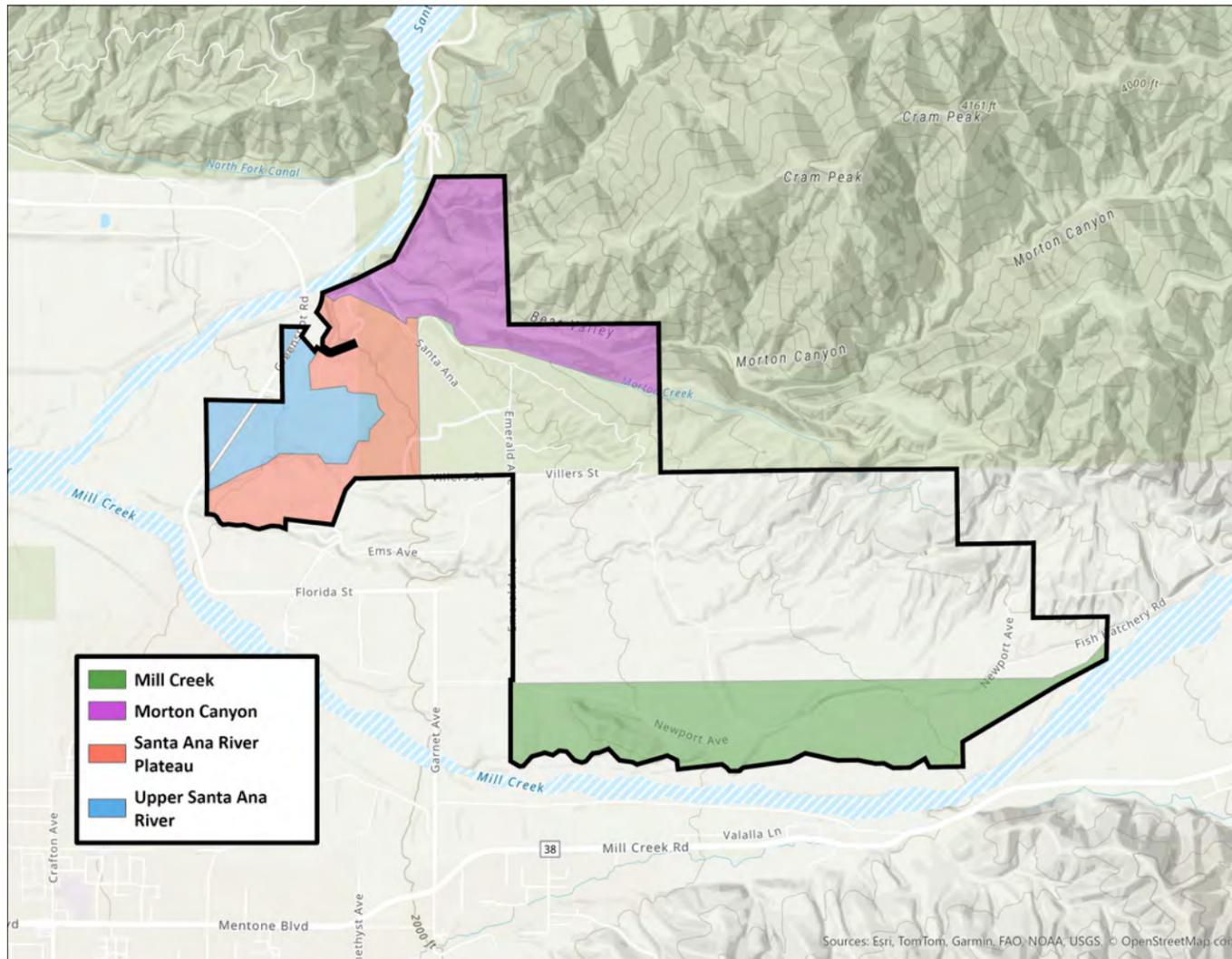


Figure 25. General areas with some portion dedicated to the mitigation requirements of the Upper Santa Ana River HCP



HABITAT AND MITIGATION

Summary



2.3. Summary Findings

As discussed in Section 2.2.2, only four conservation and mitigation banks are currently operating within the San Bernardino Valley area, and just two have been approved by more than one regulatory agency. The limited number of banks and the restricted types of credits they offer—combined with the high ecological value of the resources found on Sunrise Ranch—make the site an attractive candidate for establishing a new conservation or mitigation bank, or another advanced mitigation crediting program.

Sunrise Ranch currently supports, or has the potential to support, five special-status, threatened, or endangered species, as well as streams, wetlands, and Riversidean alluvial fan sage scrub. Each of these resources holds significant financial and ecological value within the regional conservation and mitigation credit market.

Assessments completed to date indicate that nearly all of Sunrise Ranch is suitable—or could become suitable—for the California gnatcatcher. A biologist with expertise in the San Bernardino kangaroo rat identified 19 potential mitigation opportunities for that species. Additional opportunities also exist to establish new populations of the Santa Ana River woolly-star and western spadefoot, as well as to create seasonal wetlands and enhance or restore stream habitats.

Up to approximately 900 acres within the property could be developed into a conservation or mitigation bank (Table 8). This estimate accounts for the 349 acres already allocated as compensatory mitigation under the San Bernardino Valley and partner agency HCP projects (as described above). The total acreage would ultimately be influenced by the estimated acreage required for other priority opportunities that may be developed onsite—such as reservoirs, administrative headquarters, trails, and other facilities—described in earlier chapters.

The final acreage dedicated to a conservation or mitigation bank will ultimately be determined by the Board, following a careful evaluation of the Agency’s infrastructure and investment needs relative to the potential financial returns that could be achieved through land conservation.

Table 8. Mitigation acreage summary by species

Habitat Type	Special-status Species	Enhancement (acres)*^A	Re-establishment (acres)*^A	Creation (acres)*^A
Riparian	least Bell’s vireo	25.4	6.3	TBD
Terrestrial	California gnatcatcher	870	29.2	TBD
	Western spadefoot	TBD	TBD	TBD
	San Bernardino kangaroo rat	24	43.2	56.8
	Santa Ana River woolly-star			

* All acreages listed are estimates

^ Because the same areas may be used by multiple species, the acreages listed in the table sum to more than 900 acres. For example, areas suitable for San Bernardino kangaroo rat and Santa Ana River woolly-star may also be suitable for California gnatcatcher; consequently, the 24 acres of enhancement listed for San Bernardino kangaroo rat is a subset of the 870 acres of enhancement identified for California gnatcatcher.





Public Recreation OPPORTUNITIES

CHAPTER 3. PUBLIC RECREATION OPPORTUNITIES

The Master Plan explores how Sunrise Ranch can help meet San Bernardino Valley's long-term water management needs while also providing meaningful benefits that may be enjoyed by the surrounding community, including local residents, school groups, civic organizations, partner agencies, and the taxpayers we serve.

For more than three decades, while under the public ownership of the County of Orange, Sunrise Ranch has been open for recreation—mainly hiking and bicycling along its existing access roads and trails. The Public Recreation Opportunities described in this chapter represent potential features that could be developed further, while keeping water infrastructure and habitat conservation as top priorities.

Sunrise Ranch is a unique and valuable regional resource with its open space, rich cultural significance, and natural connection between the headwaters and the valley of the Santa Ana River. The site also contains historic water infrastructure that played a key role in shaping the region's growth and development over more than a century. Together, these features make Sunrise Ranch an ideal place for community learning and appreciation.

By creating opportunities for the public to visit and engage with the site, San Bernardino Valley can help foster a stronger understanding of local water resources, encourage environmental stewardship, and build a sense of community pride and belonging. During outreach discussions, community members expressed a strong desire to maintain access and connection with the landscape.

While protecting water infrastructure and sensitive habitats will remain essential, developing a designated trail system at Sunrise Ranch could offer safe, sustainable ways for people to enjoy the site's natural beauty. Such a system would also support San Bernardino Valley's broader goals for watershed education, community engagement, and outdoor recreation.





The trail evaluation reviewed the existing trail network at Sunrise Ranch, focusing on maintenance needs, accessibility, and opportunities for improvement. Special attention was given to the following considerations:

- **Protection of sensitive species and habitats** – Trails were evaluated based on their proximity to areas that support sensitive wildlife or habitat and consideration of the impacts that public trails may have on the environment. These habitat areas may be used as compensatory mitigation to offset impacts from San Bernardino Valley’s projects or those of partner agencies. They could also be incorporated into a mitigation or conservation bank, allowing the sale of habitat credits to generate revenue for future water infrastructure and environmental projects. Therefore, trails near these areas must be used and maintained in a way consistent with habitat goals.
- **Multi-purpose use** – Trails were assessed for their ability to serve multiple functions, such as patrol or maintenance roads, access routes for habitat restoration, and fire breaks for safety.
- **Access and emergency response** – The evaluation considered ingress and egress points to ensure adequate access for maintenance and emergency vehicles.
- **Connectivity with other facilities** – The proximity of trails to other potential San Bernardino Valley infrastructure, such as reservoirs or educational facilities, was also reviewed to support integrated planning.

Nearby regional trail systems—such as the Santa Ana River Trail (SART)—were factored into the assessment to explore possible connections and expand recreational opportunities for the community. Public input gathered during community workshops also helped shape this



evaluation. Suggestions for additional recreation features are summarized later in this chapter. Opportunities for educational programs and partnerships are explored further in the Facilities Opportunities chapter.

3.1. Existing Conditions

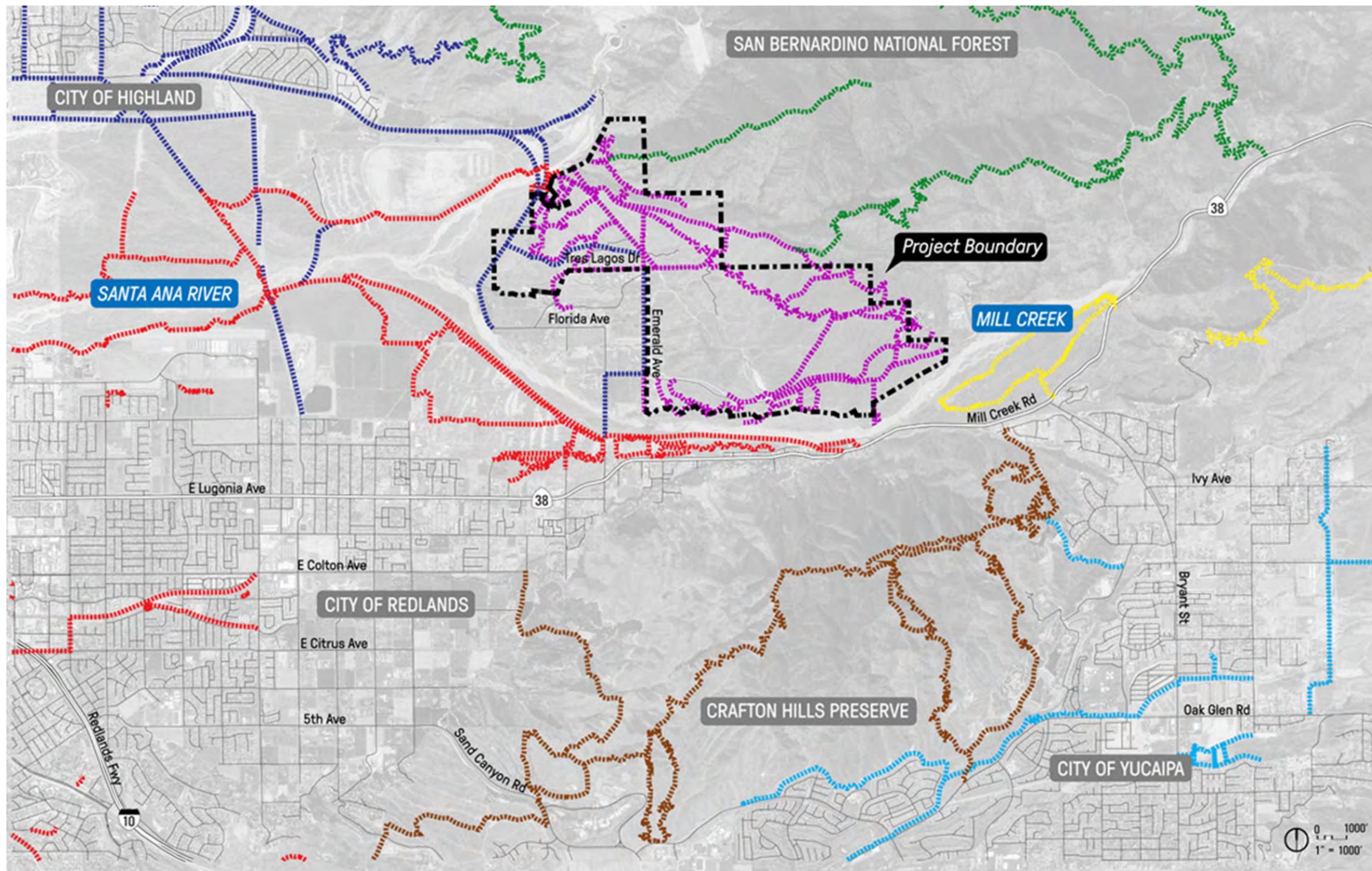
Sunrise Ranch currently contains several trails and unpaved roads, each in varying conditions. As part of this Master Plan, these existing routes were evaluated in relation to the property’s long-term vision to identify where trails could be compatible with future uses and provide opportunities for public education, passive recreation, and enjoyment.

The assessment began with a review of existing trail maps and guides from city, state, and local agencies, along with an analysis of GIS data and aerial imagery. Site visits were also conducted to observe the on-site conditions of trails and unpaved roads firsthand.

Additional details and field documentation collected during this assessment—including photographs and supporting information—are provided in the Appendix.

Table 9. Unofficial Trails at Sunrise Ranch

Trail Name	Length (miles)	Surface Material	Condition and Access
Eyes of the World Loop	0.4	Compacted natural soil	Relatively clear path, accessible from Newport Ave and Eyes if the World lookout point.
Seven Oaks Dam Lookout	0.6	Compacted natural soil	Relatively wide path clear of vegetation. Mostly flat except for a short section that reaches 16% slope for a short stretch.
Morton Canyon Overlook	1.0	Compacted natural soil	Path average width 2 to 8 feet. Well maintained and relatively flat. Accessible from site entrance off Emerald Ave.
Morton Canyon Overlook Loop	2.0	Compacted natural soil	Narrow path with average width 2 to 8 feet. Relatively exposed with no tree cover. Links to the Santa Ana River Trail off property.
Seven Oaks Dam Lookout	0.8	Natural soil	Narrow path with average width 2 to 3 feet. Relatively exposed with no tree cover. Links to the Santa Ana River Trail (off property).



Selected Regional Trails

- San Bernardino Valley Municipal Water District
 - City of Highland
 - Aplin Trail ● ●
 - Fire Road 1N16 ● ●
 - Natural Parkland Trail ● ●
 - Northfork Trail ● ●
 - Shelton Trail ● ●
 - City of Redlands
 - Bluffs Trail ● ●
 - Orange Blossom Trail ● ●
 - Santa Ana River Trail ● ●
 - Zanja Trail ● ●
 - City of Yucaipa
 - Oak Glen Basins ● ●
 - Oak Glen Road Trail ● ●
 - East Schaefer Ranch ● ●
 - Trail Chapman Heights Trail ● ●
 - Wilson Creek Channel ● ●
 - US Forest Service
 - Cram Peak Trail ● ●
 - Mill Creek Angelus Oaks Bypass ● ●
 - Morton Ridge Trail ● ●
 - Upper Santa Ana Trail ● ●
 - Warm Springs Truck Trail ● ●
 - Crafton Hills Open Space Conservancy
 - Canyon Loop Trail ● ●
 - Crafton Hills Ridge Trail ● ●
 - Gold Loop Trail ● ●
 - Grape Avenue Trail ● ●
 - Highway 38 Loop ● ●
 - Regional Park Trail ● ●
 - Three Hawks Trail ● ●
 - Zanja Peak Trail ● ●
 - Other
- Pedestrian ● Bike ● Equestrian

Figure 26. Regional Trails surrounding Sunrise Ranch



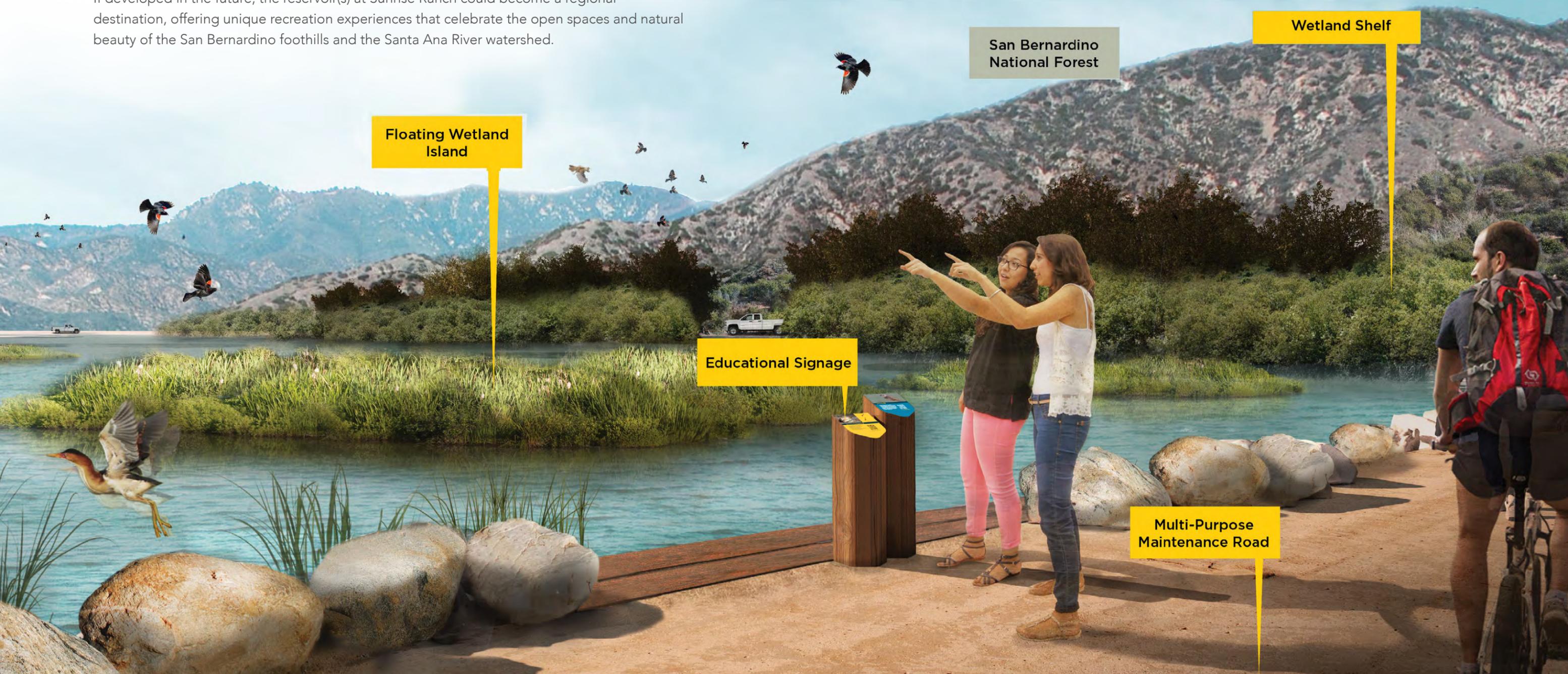
Figure 26 shows the trails within the Sunrise Ranch property boundary as well as other regional trail systems in direct proximity. One key trail system of note is the Santa Ana River Trail—a major regional trail route planned to extend roughly 100 miles across Southern California from the mountains to the ocean, once complete. An existing segment of the trail begins just south of the Sunrise Ranch property off Garnet Street. San Bernardino County has ongoing plans to connect the remaining segments of the Santa Ana River Trail, creating a continuous route through the region. This effort could offer a valuable partnership opportunity for San Bernardino Valley if existing trails at Sunrise Ranch are designated as part of the larger regional network.

3.2. Evaluation and Assessment

If developed in the future, the reservoir(s) at Sunrise Ranch could become a regional destination, offering unique recreation experiences that celebrate the open spaces and natural beauty of the San Bernardino foothills and the Santa Ana River watershed.

- Trails: Enhancements to existing trails and potential new routes for hiking, biking, and exploration.
- Demonstration Garden: A collection of gardens showcasing the wide variety of plants and drought-tolerant landscapes that thrive in the Inland Empire's climate.
- Amenities: Additional features designed to enhance the visitor experience and expand recreational options beyond traditional trail use.

Together, these recreation opportunities would connect open spaces throughout the property, guiding visitors to different areas and experiences that highlight Sunrise Ranch's rich cultural history and provide beautiful views of Highland, Mentone, and the greater Inland Empire.





3.2.1. Trail Opportunities

Trails offer a great way for people to explore and enjoy natural areas while learning about and protecting the environment. By guiding foot and bike traffic along designated paths, trails can minimize impacts to the sensitive ecosystems and wildlife habitats, while allowing people of all ages and fitness levels to access the public open space safely and responsibly.

As part of this Master Plan, existing trails were evaluated using several criteria including:

- Level of difficulty
- Anticipated users (such as hikers, bikers, or maintenance personnel)
- Surface material
- Existing conditions and trailhead accessibility
- Proximity to sensitive or critical habitat areas
- Unique scenic or natural features

New trails concepts were also developed to provide routes around the proposed reservoirs and connect key areas of interest. All trails—both existing and proposed—were prioritized to help guide phased implementation over time.

Trail Prioritization Categories:

- **High Priority (★★★)** Trails in good condition that require little maintenance and could be opened before major construction elsewhere on the property.
- **Medium Priority (★★)** Trails in good condition but need moderate maintenance or improvements.
- **Low Priority (★)** Trails that depend on future reservoir construction or are located farther from main access areas.

The prioritization considered factors such as trail condition, access points, connection to regional trail networks, and potential for multi-purpose uses (for example, patrol or maintenance roads, habitat restoration access, property maintenance, or fire breaks).

Table 10 provides the recommended prioritization for both new and existing trail opportunities, followed by descriptions of each trail.

Table 10. Recommended Trail Prioritization

Trail Name	Priority	Difficulty	Length (miles)
Eyes of the World Loop	★★★ High	Easy	0.4
Seven Oaks Dam Lookout	★★★ High	Easy	0.6
Morton Canyon Overlook	★★ Medium	Moderate	1.0
Morton Canyon Overlook Loop	★★ Medium	Moderate	2.0
San Bernardino Valley Overlook Trail	★★ Medium	Moderate	0.8
Main Reservoir Loop	★ Low	Easy	1.7
Western Reservoir Loop	★ Low	Easy	1.3
North Reservoir Loop	★ Low	Easy	0.6
Mid Reservoir Loop Trail	★ Low	Hard	1.5

Each trail offers a different level of accessibility for visitors. Based on patterns from other regional trail systems, most of these trails would be suitable for both pedestrians and non-motorized bicycles or mountain bikes.

Some of the trails and access roads with gentler slopes and smoother surfaces could also provide excellent opportunities for hikers with limited mobility and visitors using strollers. New trails that could be constructed as part of other infrastructure such as around the reservoir(s) could be built to accommodate wheelchairs or other mobility-assist devices, further improving accessibility and making the area more inclusive for a wide range of users.

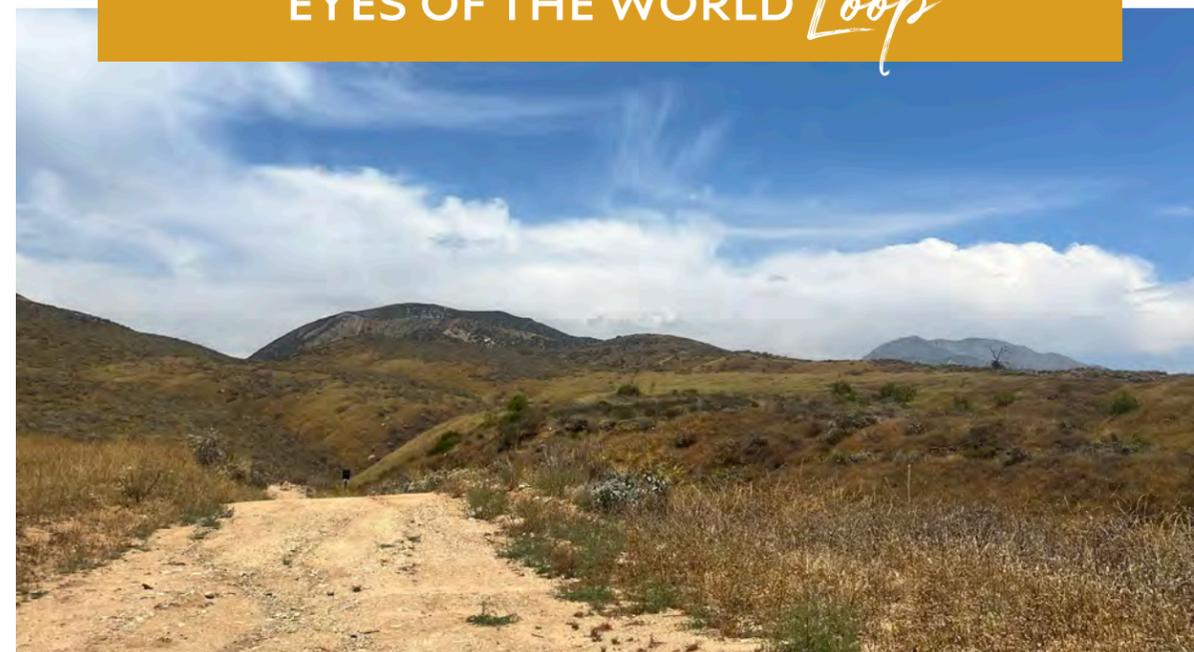
The following sections provide detailed descriptions of each trail, including their current conditions and recommendations for potential future improvements.

Final trail locations will need to be carefully planned to avoid conflicts with water infrastructure and to protect sensitive habitats on the property.

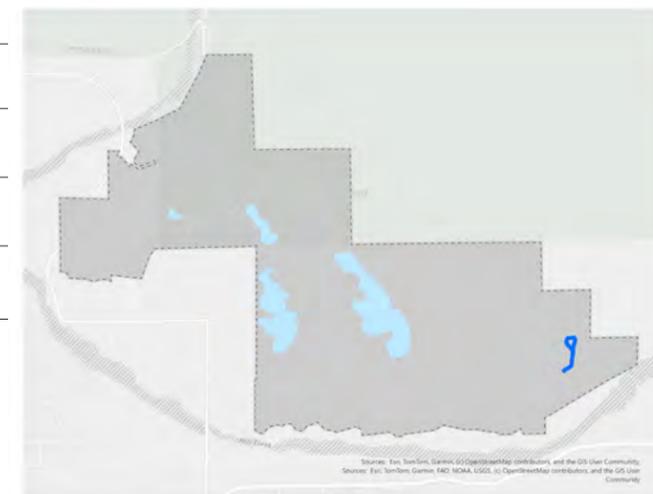




EYES OF THE WORLD Loop



Priority	★★★ High
Level of Difficulty	Easy
Distance	0.4 miles
Elevation Change	362 feet
Surface Material	Compacted natural soil, vegetation
Existing Conditions and Access	Relatively clear path, accessible from Newport Ave and Eyes of the World lookout point.



Identity Historic building foundations and irrigation canals along the road are reminders of the legacy of orange orchards on site. Trail offers views over small ravines and the future primary reservoirs.

- Potential Future Actions**
- Clear vegetation in path as needed
 - Plant large native trees for shade at key areas
 - Add directional signage at all trail intersections
 - Consider adding educational signage near relics

- Additional Uses**
- Maintenance road
 - Emergency vehicle access
 - Firebreak
 - Residential access

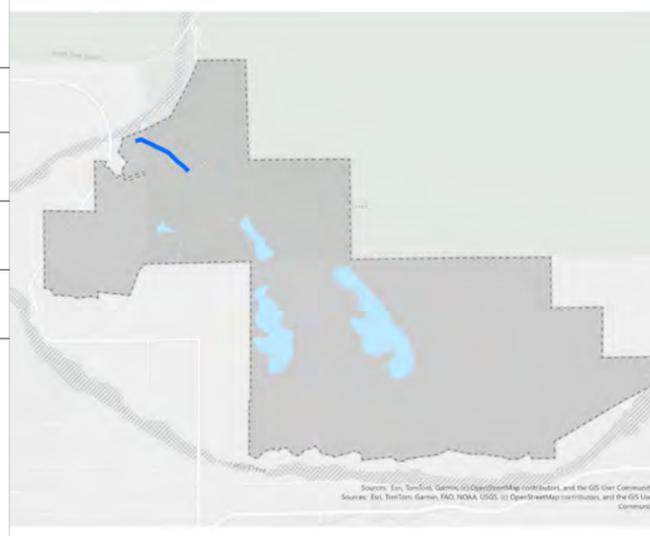




SEVEN OAKS DAM *Lookout*



Priority	★★★ High
Level of Difficulty	Easy
Distance	0.6 miles
Elevation Change	175 feet
Surface Material	Compacted natural soil
Existing Conditions and Access	Relatively wide path clear of vegetation. Mostly flat except for a short section that reaches 16% slope for a short stretch.



Identity Predominantly California sagebrush scrub and brittlebush scrub along the path with invasive mustards growing in density. Views of Seven Oaks Dam and the Greenspot Historic Bridge. A family-friendly hike with many potential resting areas.

Potential Future Actions

- Leave trail width as is but clear debris at trailhead
- Add benches and plant native shade trees near the lookout
- Add directional signage at all trail intersections
- Consider clearing and monitoring invasive mustards and grasses in accordance with general stewardship in HCP area

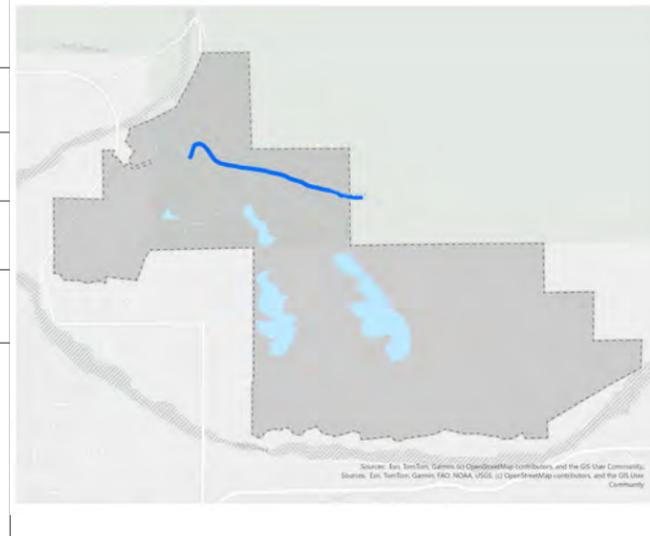
Additional Uses

- Maintenance road
- Emergency vehicle access
- Firebreak

MORTON CANYON *Overlook*



Priority	★★ Medium
Level of Difficulty	Moderate
Distance	1 mile
Elevation Change	196 feet
Surface Material	Compacted natural soil, overgrown vegetation
Existing Conditions and Access	Path average width 2 to 8 feet. Well maintained and relatively flat. Accessible from site entrance off Emerald Ave and potential headquarters campus.



Identity Dominated by California sagebrush, brittlebush, and scrub oak. Sweeping views towards Mentone and Highland looking south and Morton Peak and Constance Peak looking north.

Potential Future Actions

- Maintain variable width
- Clear vegetation in path
- Add directional signage at all trail intersections

Additional Uses

- Habitat/ mitigation credit access





MORTON CANYON OVERLOOK *Loop*



Priority	★★ Medium
Level of Difficulty	Moderate
Distance	2 miles
Elevation Change	500 feet
Surface Material	Compacted natural soil, overgrown vegetation
Existing Conditions and Access	Narrow path with average width 2 to 8 feet. Relatively exposed with no tree cover. Links to the Santa Ana River Trail off property.



Identity Dominated by California sagebrush, brittlebush, and scrub oak. Sweeping views towards Mentone and Highland looking south and Morton Peak and Constance Peak looking north.

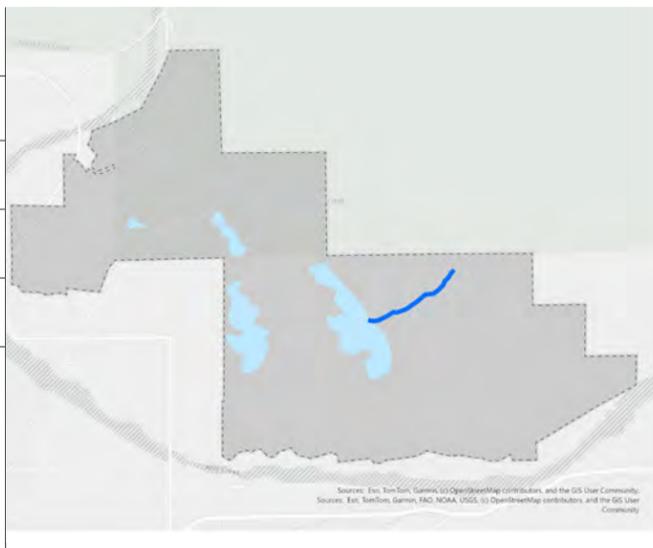
- Potential Future Actions**
- Maintain variable width, minimum 3 feet
 - Clear vegetation in path
 - Plant large native trees for shade at key intersections
 - Add directional signage at all trail intersections

- Additional Uses**
- Habitat/ mitigation credit access

SAN BERNARDINO VALLEY OVERLOOK *Trail*



Priority	★★ Medium
Level of Difficulty	Moderate
Distance	0.8 miles
Elevation Change	284 feet
Surface Material	Natural soil, vegetation
Existing Conditions and Access	Narrow path with average width 2 to 3 feet. Relatively exposed with no tree cover. Links to the Santa Ana River Trail (off property).



Identity Sweeping views of the San Bernardino valley to the west.

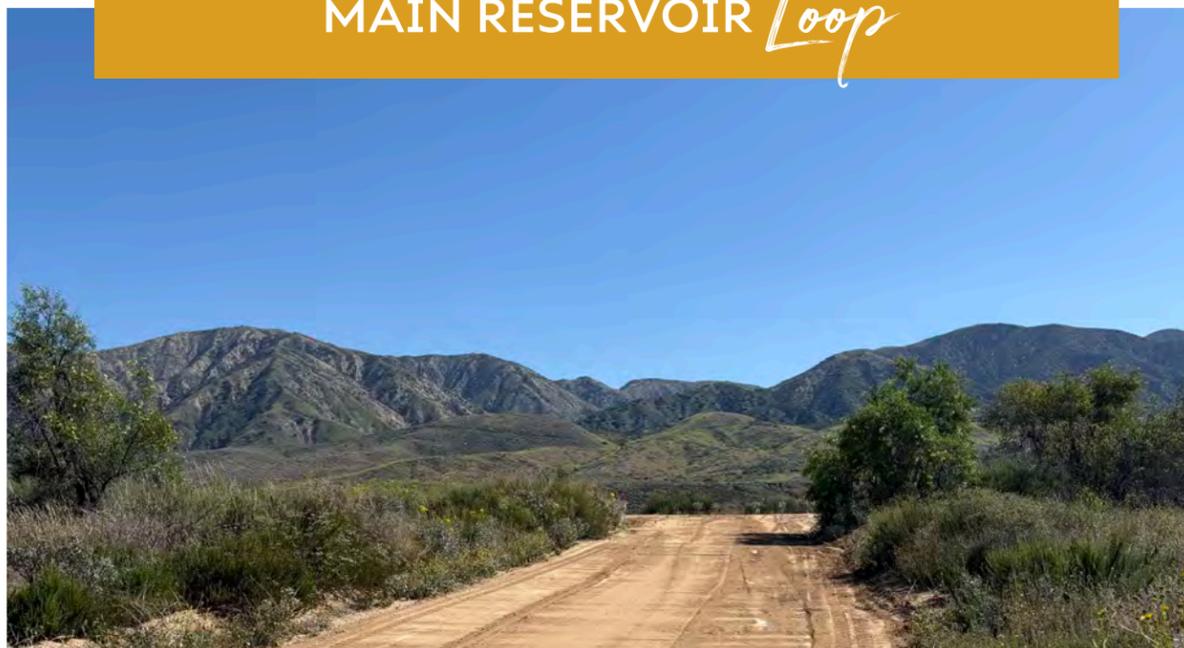
- Potential Future Actions**
- Widen path to lookout, minimum 3 feet, and clear vegetation
 - Add benches and native shade trees at lookout
 - Add directional signage at all trail intersections

- Additional Uses**
- Maintenance road (portion of trail along reservoir)
 - Habitat/mitigation credit access





MAIN RESERVOIR Loop



Priority	★ Low	
Level of Difficulty	Easy	
Distance	1.7 miles	
Elevation Change	6 feet	
Surface Material	Compacted natural soil	
Existing Conditions and Access	Path would be shared with reservoir maintenance road. Shrubs, trees, and boulders would provide buffer and create informal resting places along the trail. Links to trails upland and below reservoirs.	

Identity Trail would pass a variety of terrestrial and aquatic habitats. It would offer east views to revegetated hillside and west views to the reservoirs, Mentone, and Highland.

Potential Future Actions

- Plant vegetation and native trees for shade to increase user comfort
- Create resting areas along path with benches and boulders
- Add interpretive signage
- Could provide a path for visitors with decreased mobility

Additional Uses

- Maintenance road
- Emergency vehicle access
- Firebreak

WESTERN RESERVOIR Loop



Priority	★ Low	
Level of Difficulty	Easy	
Distance	1.3 miles	
Elevation Change	6 feet	
Surface Material	Compacted natural soil	
Existing Conditions and Access	Path shared with reservoir maintenance road. Well maintained and relatively flat. Links to trails located to the north and east.	
Identity	Trail would pass a variety of terrestrial habitats. It would offer east views to revegetated hillsides.	

Potential Future Actions

- Plant vegetation and native trees for shade to increase user comfort
- Create resting areas along path with benches, boulders, etc.
- Add interpretive signage

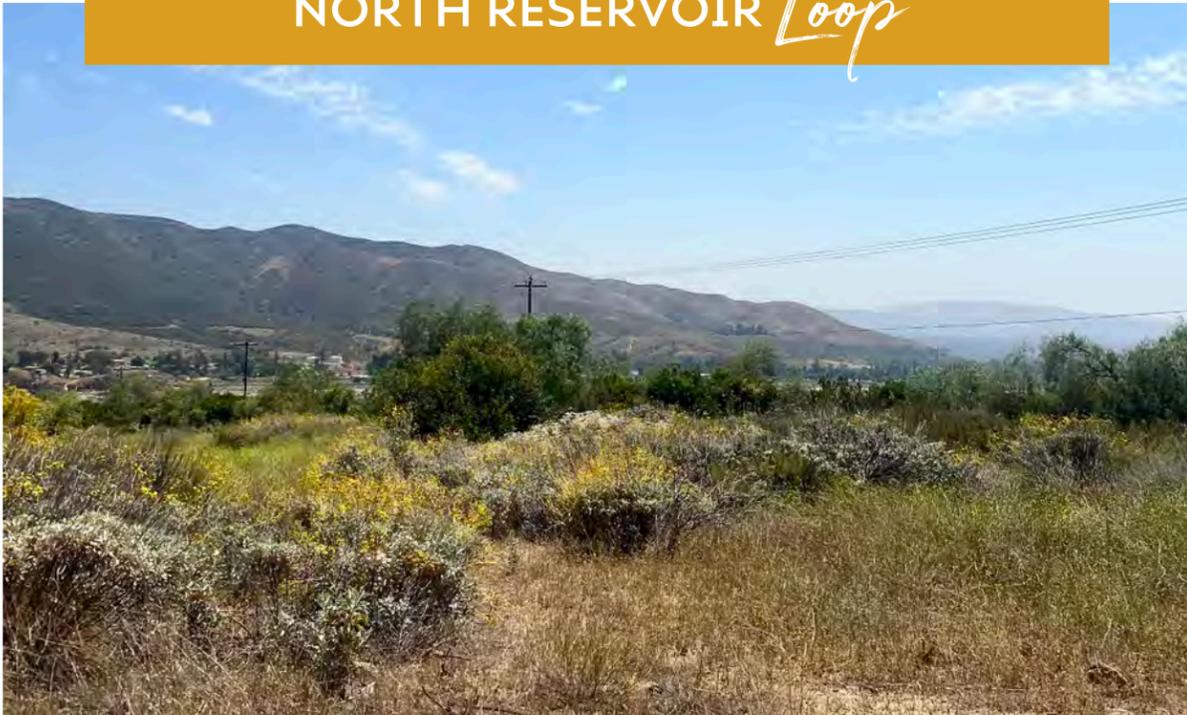
Additional Uses

- Maintenance Road
- Firebreak

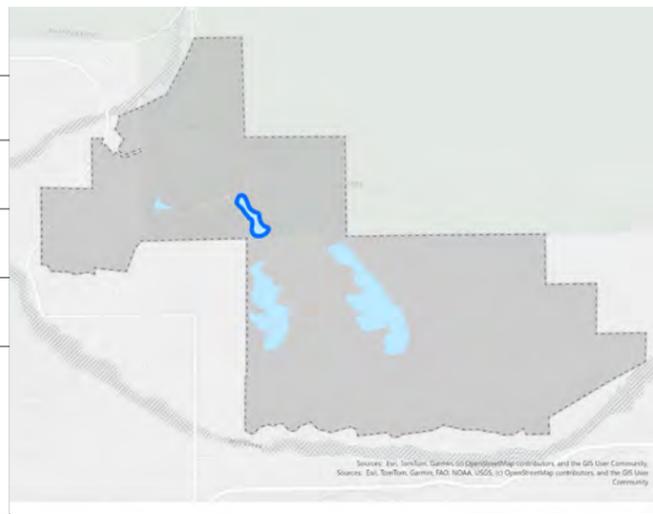




NORTH RESERVOIR Loop



Priority	★ Low
Level of Difficulty	Easy
Distance	0.6 miles
Elevation Change	120 feet
Surface Material	Compacted natural soil
Existing Conditions and Access	Path shared with reservoir maintenance road. Well maintained and relatively flat. Links to trails to the north.



Identity Trail would pass a variety of terrestrial habitats. It would offer views to revegetated areas to the east and west, and west views to the San Bernardino Valley.

Potential Future Actions

- Plant vegetation and native trees for shade to increase user comfort
- Create resting areas along path with benches and boulders
- Add interpretive signage

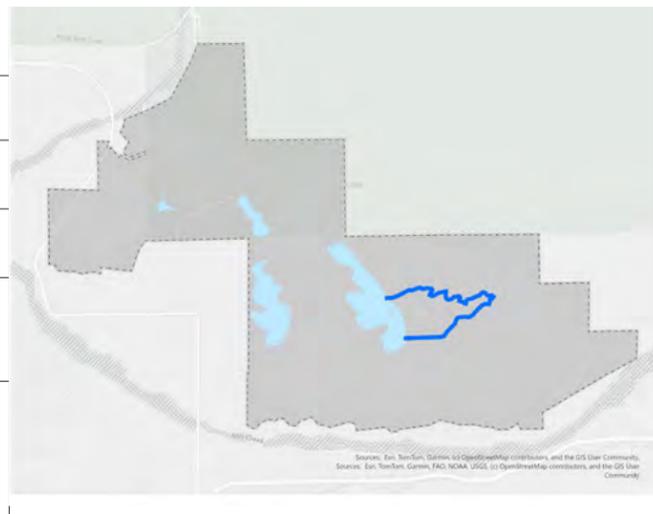
Additional Uses

- Maintenance road
- Fire break

MID RESERVOIR LOOP Trail



Priority	★ Low
Level of Difficulty	Hard
Distance	1.5 miles
Elevation Change	204 feet
Surface Material	Compacted natural soil, natural soil, and vegetation.
Existing Conditions and Access	Majority of trail overgrown and not easily traversed. Portion of trail shared with reservoir maintenance road.



Identity Trail would pass a variety of terrestrial habitats. It would offer west views of the San Bernardino valley, and east views to revegetated hillsides.

Potential Future Actions

- Retire trail as it lies within designated critical habitat
- Add interpretive signage

Additional Uses

- Habitat mitigation/banking access



3.2.2. Demonstration Garden Opportunities

With the 2024 adoption of the “Making Conservation a California Way of Life” regulation, education on efficient irrigation and water-wise landscaping has become more important than ever. Many community members are looking for inspiration and practical guidance on how to create beautiful, drought-tolerant yards and gardens that thrive in the Inland Empire climate.

An educational demonstration garden at Sunrise Ranch could serve as a living classroom—showcasing a variety of planting styles, native plant species, and suitable landscaping techniques suited to the region. Interpretive signage and pathways would help visitors learn about plant communities, irrigation practices, and design approaches that promote water efficiency and conservation.



Based on consideration of the site history and community needs, five Demonstration Garden Opportunities were identified:

- **California Native Garden** – Highlighting plants naturally adapted to the local environment.
- **Ethnobotanical Garden** – Featuring plants with traditional uses by Indigenous peoples and early settlers.
- **Lush Low-Water Garden** – Showing that vibrant, green landscapes are possible with minimal irrigation.
- **Desert Garden** – Displaying hardy, low-maintenance plants ideal for arid conditions.
- **Fire-Safe Garden** – Demonstrating landscaping approaches that reduce wildfire risk while maintaining beauty.

For maximum visibility and ease of access, the demonstration gardens would be located near future public facilities, described in the Facilities Opportunities chapter. **Figure 27** illustrates potential locations for these gardens within the site.



Figure 27. Prospective Demonstration Garden Locations



Demonstration GARDENS

California Native Garden

The California Native Garden would feature some of the most beautiful and resilient native plants from Southern California, demonstrating how they can be used to create attractive, low-maintenance landscapes that thrive in the region's climate.

This plant palette could be incorporated throughout the property—around buildings, outdoor gathering areas, parking lots, and even behind-the-scenes service areas—to unify the site with a natural, water-efficient aesthetic.

A special highlight of this garden could be a designated Monarch Butterfly Habitat, featuring milkweed and nectar plants to support pollinator health and provide educational opportunities about native wildlife.

Example plants: Desert Willow (*Chilopsis linearis*), Manzanita (*Arctostaphylos 'Howard McMinn'*), Cleveland Sage (*Salvia clevelandii*), Prostrate Chamise (*Adenostoma 'Nicolas'*), *Asclepias eriocarpa*



Desert Willow

Ethnobotanical Garden

The Ethnobotanical Garden would highlight plants that hold cultural, medicinal, and practical importance to the Indigenous tribes of Southern California, particularly the Serrano and Gabrieliño-Tongva peoples.

This garden would feature plants such as buffalo gourd and other unique species that are not commonly seen in modern landscapes but were historically used for food, medicine, tools, and ceremonial purposes. Informational signage and interpretive displays would help visitors understand how these plants were traditionally used and their significance within local Indigenous cultures.

To ensure authenticity and cultural sensitivity, the plant selection and garden design should be developed in collaboration with an ethnobotanist and local tribal representatives.

Example plants: Black Oak (*Quercus kelloggii*), Deergrass (*Muhlenbergia rigens*), White Sage (*Salvia apiana*), Chaparral Yucca (*Hesperoyucca whipplei*), Buffalo Gourd (*Cucurbita foetidissima*)

Lush Low-Water Garden

The Lush Low-Water Garden would showcase how a vibrant, green, and inviting landscape can be achieved while using minimal water. This garden would feature a wide variety of drought-tolerant plants that stay colorful and full even during the hottest months of the year.

The goal is to demonstrate that homeowners and gardeners in the Inland Empire can create beautiful, pollinator-friendly landscapes that save water and incorporate native species.

Example plants: Chitalpa (*Chitalpa x tashkentensis*), Cedros Island Verbena (*Verbena lilacina*), Island Pink Yarrow (*Achillea 'Island Pink'*), Foothill Penstemon (*Penstemon 'Margarita BOP'*), UC Verde Buffalograss (*Bouteloua dactyloides*)



Chaparral Yucca



Foothill Penstemon



Demonstration GARDENS



Desert Garden



Tree Aloe

The Desert Garden would highlight the striking beauty and resilience of desert plants, showcasing a variety of cacti, succulents, and drought-tolerant species. Designed in the style of a traditional desert landscape, it would feature boulders, crushed stone mulch, and open space between plants to emphasize each specimen's unique form and texture.

This garden would primarily include California and North American native desert plants, many of which bloom seasonally to attract pollinators such as bees and hummingbirds. It would serve as both an educational and visual example of how desert-adapted plants can create stunning, low-maintenance landscapes.

Example plants: Palo Verde (Parkinsonia x 'Desert Museum'), Tree Aloe (Aloe x 'Hercules'), Beaked Yucca (Yucca rostrata), Beavertail (Opuntia basilaris), Golden Barrel Cactus (Echinocactus grusonii)



Golden Barrel Cactus

Fire-Safe Garden

The Fire-Safe Garden would demonstrate how beautiful, sustainable landscaping can also help protect homes and communities from wildfire risk. This garden would feature primarily California native plants that are recommended for fire-resistant landscaping—selected for their low flammability, high moisture content, and ability to slow the spread of fire.

The plant palette is based on guidance from the Counties of San Diego and Los Angeles, as well as the Theodore Payne Foundation, which specializes in fire-wise native landscaping for Southern California.

By showcasing these plants in a real-world setting, the Fire-Safe Garden would help visitors learn practical ways to design attractive, defensible landscapes that support both safety and sustainability.



Hardy Aloe

Example plants: Toyon (Heteromeles arbutifolia), Hardy Aloe (Aloiampelos striatula), Saltbush (Atriplex lentiformis), Bladderpod (Peritomea arborea), Hybrid Coyotebrush (Baccharis x 'Starn')

3.2.3. Recreational Amenity Opportunities

Beyond dedicated trails and demonstration gardens, several recreational amenities could be developed to enhance the visitor experience at Sunrise Ranch. These features would be carefully designed to provide educational and recreational value while minimizing impacts to local wildlife and native habitat. **Table 11** outlines the recommended amenities for the Board to consider.

Table 11. *Recreational Amenity Opportunities*

Site Amenity/Activity	General Benefit	Potential Location
Seating	Benches and picnic areas for visitors to use	Viewpoints and other designated areas throughout publicly accessible areas
Interpretive Signage	Directional and educational signs can help visitors navigate the site and provide visible geographical features, historical facts, or ecological information to enhance visitor experience by providing context to what they are observing Interpretive signage could be fixed, web-based QR codes, and/or digital kiosks, depending on the location, need, and site security	Throughout the site, see Figure 28 for examples
Watershed Model	Educate visitors on the scale and complexity of the Santa Ana River watershed, the Santa Ana River and its tributaries, and the functions of the system	Designated strategic viewpoint at or near Headquarters building or Education Center that overlooks the headwaters and valley floor
Binoculars or Viewing Scopes	Allow visitors to view distant details and geographic markers across the San Bernardino Valley	Key lookout points
Trash and Recycling Receptacles	Provide designated waste disposal locations to minimize littering	Throughout the site
Bike Racks	A sustainable way to encourage cycling and outdoor activities	Key locations near buildings
Amphitheater	Create new event space with seating and small stage area to complement educational and informative events	Designated space; see Figure 29 for example
Beekeeping	Authorize an approved entity to locate beehives on site	Designated space(s)
Unmanned Aircraft System	Authorize approved organizations, like the Inland Valley Development Agency, to operate on-site	Designated space(s)

Many of the proposed recreational amenities are designed to offer a passive and reflective experience with the natural environment. Through positive, self-guided interactions—such as walking, observing nature, or enjoying scenic views—visitors can build a stronger connection to the landscape and the watershed as a whole while also gaining a deeper understanding of the work that San Bernardino Valley does to protect and manage public resources. Open spaces at Sunrise Ranch provide meaningful opportunities for visitors with an opportunity to connect directly with nature and the Agency, fostering community pride and awareness of the region’s water stewardship efforts. The recommended Recreational Amenity Opportunities encourage visitors to learn about the benefits of public programs, relax and recharge, and enjoy the beauty of the natural surroundings in a safe, calm, and sustainable setting.

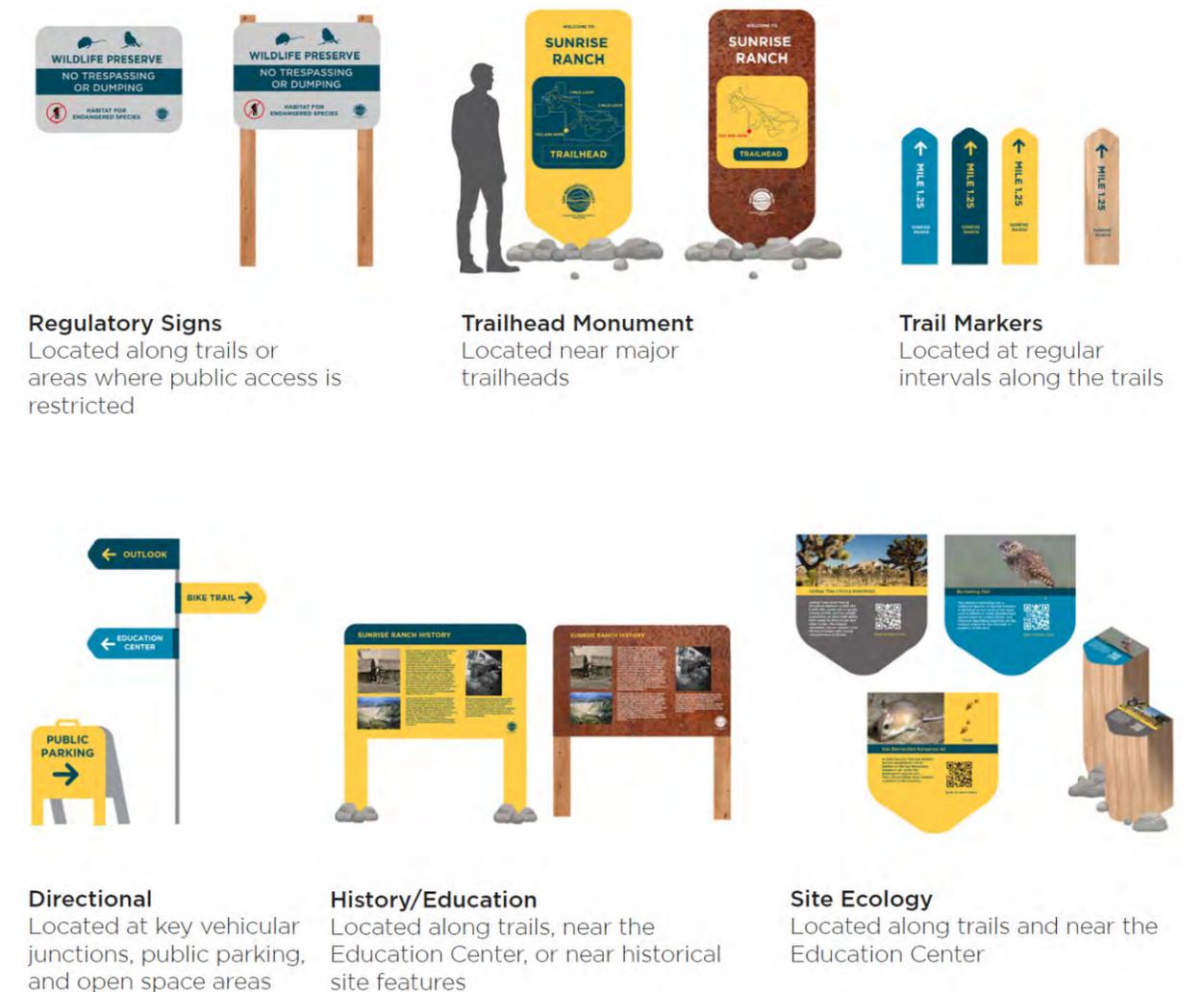


Figure 28. *Example Sunrise Ranch Signage*



Figure 29. Example Natural Amphitheater: Sunrise Circle Amphitheater in Boulder, Colorado

In addition to hiking and bicycle trails and the passive amenities listed in **Table 11**, several other ideas were suggested by community members during the public input phase. Each of these suggestions was carefully evaluated and resulted in an initial recommendation—either to pursue further study or not to proceed at this time—based on reasons outlined in **Table 12**. If the Board of Directors chooses, San Bernardino Valley may revisit and further explore these potential uses in the future as site conditions, community needs, and priorities evolve.

Table 12. Additional Activities Discussed

Proposed Activity	Use Considerations
Activities Requiring Additional Analysis	
Native Plant Nursery	Strategic community partnerships could be pursued to fund this activity. If a viable partner was identified, this activity could benefit native planting and restoration activities in the long run by supplying San Bernardino Valley's own plant stock. Potential partners could include the local Universities or Resource Conservation Districts.
Equestrian	Many open space areas would support equestrian use, which can also include partnerships with community groups for trails maintenance and clearing. Potential negative interactions with hikers and cyclists are possible if they share trails with equestrian recreation. This use would require a dedicated staging area for horse trailers and potentially additional site security. There may be potential impacts to sensitive species and habitats, including transmission of invasive weeds into the site once restored. <i>This option could be considered pending further analysis and research of similar uses.</i>
Camping	Low impact recreation, like small group camping, provides opportunities for increased engagement with the site. Full-scale public campgrounds, including both tents and cabins, pose wildfire risk, safety and site security challenges, potential impacts to sensitive habitats, and negative impact to open space areas (and other uses). <i>However, opportunities for limited small group campouts (i.e., Scouts or school groups) at select locations with required significant safety protocols could be explored to determine if it is feasible.</i>
Passive Fitness Equipment	The addition of passive fitness equipment to facilitate pull ups, bar dips, crunches, and balance, could increase community engagement with the site in conjunction with the trails system. The use of passive fitness equipment poses some risks associated with injury and accident, as well as increased maintenance obligations. <i>This activity would require further analysis and research of similar uses.</i>
Activities Not Recommended At This Time	
Motorcycle	Motorcycle activity poses significant wildfire and accident risks. Motorcycles also pose a risk to sensitive habitat and people on site. <i>This activity is recommended to be eliminated from future consideration.</i>
Fishing	The introduction of game species into the future reservoir(s) for recreational fishing would likely result in inadvertent transmission of exotic fishes into the watershed downstream. <i>This activity is recommended to be eliminated from future consideration.</i>
Hunting	Hunting activities pose significant wildfire and accident risks. Hunting also poses a risk to sensitive habitat and people on site. <i>This activity is recommended to be eliminated from future consideration.</i>
Boating	Motorized and non-motorized boating pose significant safety concerns, potential to introduce invasive species into the water system, and water quality implications. <i>This activity is recommended to be eliminated from future consideration.</i>
Swimming	Swimming poses significant safety concerns, potential to introduce invasive species, and water quality implications. <i>This activity is recommended to be eliminated from future consideration.</i>



PUBLIC RECREATION *Summary*

3.3. Summary Findings

In the short term, several actions are recommended to help move the Public Recreation Opportunities at Sunrise Ranch forward.

Begin long-term trail system design.

Based on the findings of this study, initiate the next phase of trail planning and design. This should include updating select existing trails, adding new ones, and retiring those that are less compatible with the overall site plan. The design should also incorporate features such as educational signage, viewpoints with seating, and other enhancements that enrich the visitor experience.

- **Integrate demonstration gardens into facility planning.** Include a Demonstration Garden Plan as part of future facility design efforts to showcase sustainable landscaping and water-efficient planting concepts.
- **Explore additional activities.** Continue researching and documenting potential recreational or educational activities that could be incorporated into the site in the future for further evaluation.
- **Develop community partnerships and potential outside funding sources.** Identify and engage potential partners—such as schools, nonprofits, or community organizations—that could help support educational and recreational programs through funding, volunteer efforts, or collaborative initiatives. Findings from this effort should be compiled into a summary report for Board review and direction.

While this plan presents a focused set of Public Recreation Opportunities for initial consideration, many more possibilities may emerge over time as Sunrise Ranch continues to evolve as a regional resource for education, recreation, and water stewardship.



CHAPTER 4. FACILITIES OPPORTUNITIES

The conceptual facilities in the Sunrise Ranch Master Plan support the functionality and experience of the water supply infrastructure, habitat mitigation, and recreation opportunities identified by the Board of Directors for San Bernardino Valley and the community at large.

Facilities Opportunities are presented in three categories:

1. **Building Opportunities**
2. **Utilities Opportunities**
3. **Access and Transportation Opportunities**

The facilities enable the operation, education, and experience of the natural resources of the site while demonstrating how water resources benefit the region. They are tied together by a conceptual Site Plan that describes the facility locations in relation to each other.



Facilities OPPORTUNITIES



4.1. Existing Conditions

There are currently no buildings or utility connections located on the Sunrise Ranch property. The nearest utility services are approximately one to two miles away.

Existing roads within the property include Tres Lagos Drive and Newport Avenue (see **Figure 30**). Emerald Avenue, which runs just outside and parallel to the property boundary, also provides access to the site. Other on-site roads are limited-use maintenance roads that support operational needs but are not open for public access.

4.2. Evaluation and Assessment

Given the 1,685-acre size of the Sunrise Ranch property, there are multiple potential locations for future facilities. To identify the most suitable areas, a Siting Study was conducted to evaluate each location based on key planning drivers (outlined in **Table 13**) identified as priorities for San Bernardino Valley.

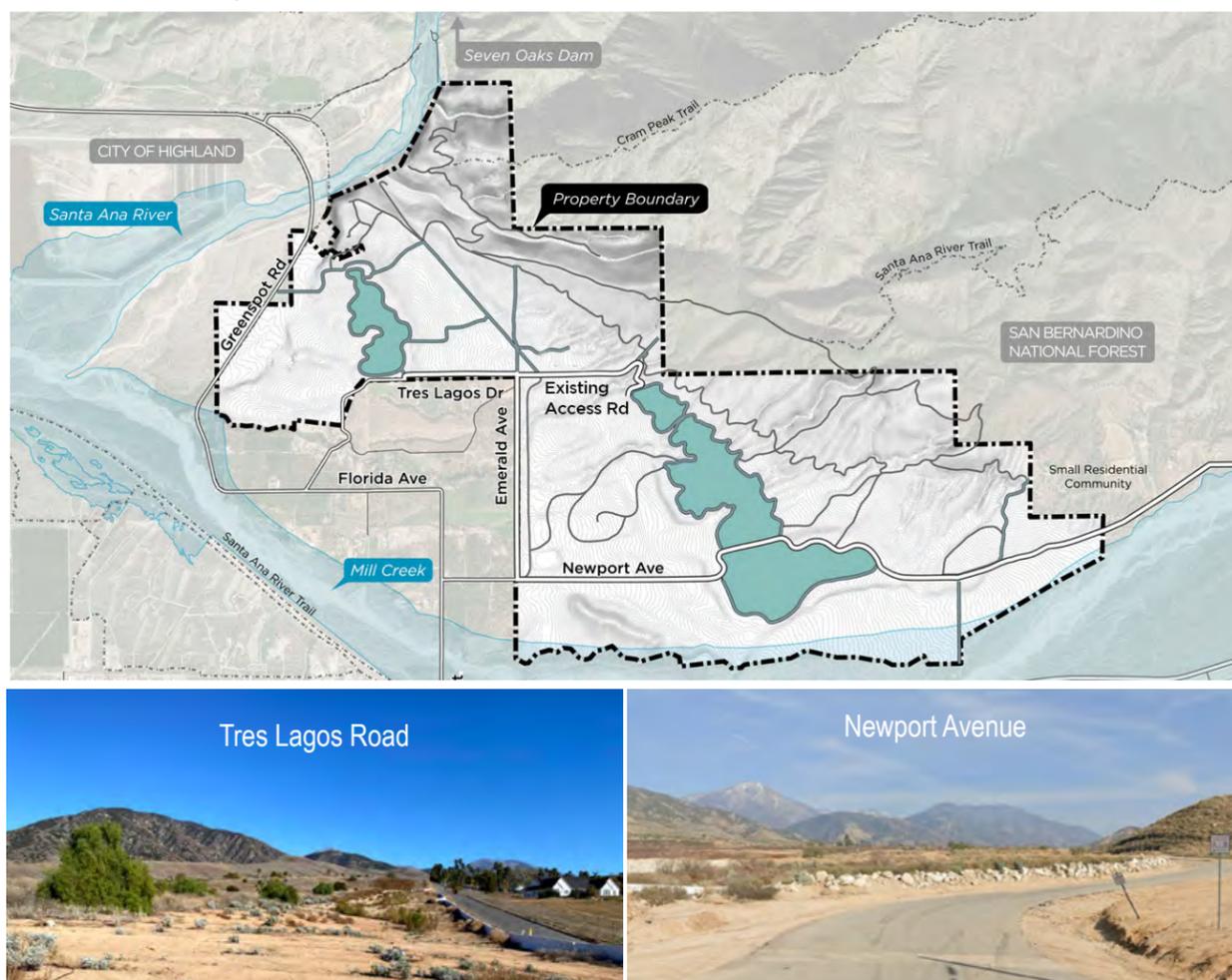


Figure 30. Major roads at Sunrise Ranch

After evaluating these locations, several potential facility layout options were developed and compared. The preferred site plan—based on the various opportunities and constraints—is shown in **Figure 31** and is referred to as the “Campus Layout” in the Siting Study. This option was found to best meet the planning objectives. This layout groups all buildings together near the conceptual Reservoir 2310, allowing for efficient operations, shared infrastructure, and cohesive design. A Siting Matrix with the complete results, including alternative layout concepts and advantages and disadvantages for each potential facility, is provided in the Appendix.

Table 13. Site Assessment Planning Drivers

Driver	Desirable	Less Desirable
Access Access is measured by distance to nearest vehicular road, nearby recreation amenities, and potential parking.	<ul style="list-style-type: none"> Clear access for San Bernardino Valley employees, emergency services, and visitors 	<ul style="list-style-type: none"> Infrastructure far from road and/or recreation amenities
Cost Implications Associated cost implications include those just beyond the construction cost that would impact siting including road construction.	<ul style="list-style-type: none"> Minimizes necessary road improvements 	<ul style="list-style-type: none"> Additional road improvements required
Habitat Impacts Habitat impacts relate to land disturbed from construction and the quality of habitat it could potentially displace.	<ul style="list-style-type: none"> No impact or low impact to high-quality habitat that would not require extensive mitigation 	<ul style="list-style-type: none"> High impact to high-quality/ designated habitat preservation
Reservoir Connection The relationship of the facility site to the reservoirs is measured by construction phasing, distance from conceptual infrastructure to reservoir, and the potential of the reservoir to act as a fire break.	<ul style="list-style-type: none"> Near the reservoir(s) and firebreak 	<ul style="list-style-type: none"> Distant from reservoir(s)
Topography / Views For the Headquarters and Education Center, views are measured by landmarks and vistas that users would experience from that site. For the Fire Training Facility, views consider user experience as well as the visibility of the building from the headquarters or areas above/below the property.	<ul style="list-style-type: none"> Views of the mountain, landmarks, vistas, and the valley Fire Training Facility not visible from Headquarters Ability to blend with the foothills to minimize the visual impact to the community 	<ul style="list-style-type: none"> Obscured views across the site Fire Training Facility visible from Headquarters Creating a highly visible facility from the valley floor.





Once locations were assessed, facilities were studied together in various layouts. The preferred site plan (Figure 31), referred to as the “Campus Layout” in the Siting Study, best fulfills the planning drivers by co-locating all buildings next to a conceptual Reservoir 2310.



Figure 31. Facilities Opportunities Site Plan

Table 14 provides a summary of the preferred plan’s characteristics as they relate to the planning drivers.

Table 14. Preferred Site Plan Drivers Characteristics Summary

Driver	Preferred Site Plan Characteristics
Topography / Views	<ul style="list-style-type: none"> Using topography to optimize views to the valley and San Bernardino National Forest Using topography to integrate facilities into the landscape and preserving scenic views of the property from below
Habitat Impacts	<ul style="list-style-type: none"> Located within the grading area of Reservoir 2310, avoiding impact to other site areas Consolidates development in one primary location on the site Habitat enhancement is recommended with access to campus for educational opportunities
Access	<ul style="list-style-type: none"> Access from Tres Lagos Dr. / Newport Ave. Access to trail and recreational network Pedestrian access between buildings on the campus Easier to connect with community members The campus layout enhances safety and access Parking can be shared between Headquarters and Education Center
Reservoir Connection	<ul style="list-style-type: none"> Body of water as a fire break Source of water for fire suppression Body of water providing evaporative cooling for the surrounding environment, creating a cooler microclimate
Cost Implications	<ul style="list-style-type: none"> Minimizes necessary road improvements



4.2.1. Building Opportunities

The proposed Building Opportunities at Sunrise Ranch are designed to play a key role in San Bernardino Valley's future, creating spaces where policymakers, community leaders, technical professionals, academia, educators, and residents can come together to develop innovative solutions that advance water resiliency across the region.

The main building opportunities include:

- **New Headquarters:** A facility centrally located within our area of operations, that brings all San Bernardino Valley employees together under one roof, fostering collaboration, efficiency, and a strong sense of unity as a regional water agency.
- **Education Center:** A community-focused and partnership-based facility that provides educational programs, training, workshops, and interactive exhibits, helping to build awareness, partnerships, and stewardship among students, residents, and local organizations.
- **Fire Training Facility:** A specialized space, built and maintained by one or more local firefighting agencies as part of a long-term partnership-based effort, to support on-site fire prevention and suppression, as well as collaborative wildland and urban interface firefighting training to improve regional safety and preparedness.





NEW HEADQUARTERS GUIDING PRINCIPLES

- Embody the San Bernardino Valley identity at every level
- Celebrate water, habitat, and land
- Serve San Bernardino Valley’s growing needs
- Ensure resiliency

Figure 32. Conceptual San Bernardino Valley Headquarters

Together, the Headquarters, Education Center, Fire Training Facility, and other future partnership opportunities would form a shared campus environment, strengthening collaboration, promoting innovation, and enhancing the community’s connection to local water resources.

New Headquarters

A new San Bernardino Valley Headquarters represents an opportunity to create a forward-looking space that will guide the Agency into its next generation of service to the community. The envisioned campus would be a collaborative and innovative workplace for the Agency staff and Board, designed to connect seamlessly with the surrounding landscape—featuring indoor-outdoor work and meeting spaces, views of the reservoirs and the valley as a daily reminder of the entire region served, and a design that celebrates water as a vital, protected resource.

Constructing a new headquarters at Sunrise Ranch could bring numerous long-term benefits, including:

- **Uniting the Organization:** Bringing all of San Bernardino Valley’s departments—currently spread across four geographically disconnected facilities—together on a single campus to foster collaboration, efficiency, teamwork, and a strong sense of connection between the employees, Board of Directors, and the public.
- **Creating Functional, Centralized Space:** Providing modern, purpose-built facilities where staff and the Board of Directors can effectively carry out their work, advancing San Bernardino Valley’s mission and values from a central location.
- **Encouraging Collaboration and Partnerships:** Offering flexible meeting and event spaces where regional partners, community organizations, and educational groups can gather for conferences, workshops, and collaborative initiatives.
- **Connecting People to Water and the Landscape:** Designing a campus that physically and visually connects employees and visitors to the water resources and natural environment that sustain the region.
- **Demonstrating Climate Resilience:** Showcasing a state-of-the-art, sustainable campus that reflects San Bernardino Valley’s ongoing commitment to climate resiliency, innovation, and natural resource stewardship.



To help shape the headquarters concept, San Bernardino Valley reviewed its existing administrative offices along with several comparable water district facilities across Southern California. These facilities differ in size, layout, and function but each offers valuable insights relevant to the future headquarters design.

The following locations were included in the study:

- *San Bernardino Valley– Existing Administrative Office*
- *East Valley Water District Headquarters*
- *Moulton Niguel Water District Headquarters*
- *Water Wise Community Center & Chino Basin Water Conservation District Headquarters*

The new headquarters concept draws inspiration from the unique strengths and design elements of each facility, helping to inform how the Sunrise Ranch campus can best serve staff, partners, and the community. Additional study details and comparisons are provided in the Appendix.

A benchmark analysis of the existing San Bernardino Valley headquarters was conducted to compare current conditions against standard space benchmarks for modern commercial office facilities. The review found that the existing building provides approximately 14,000 sf with much of the space dedicated to private offices, conference rooms, and the Board Room.

While functional, the current headquarters lacks collaborative work areas and sufficient conference room space for meetings, especially large regional meetings or conferences that are regularly hosted by San Bernardino Valley as the regional wholesale water agency. The current space also lacks connections to the outdoors and faces several operational limitations, including safety and security challenges due to the proximity to the Santa Ana River. The facility's approximately 10,000 square feet of usable space is insufficient to accommodate the agency's 38 staff members and offers no capacity for future growth. As a result, staff workstations are currently spread across multiple locations throughout the service area including the operations warehouse, pump stations, and other remote locations creating inefficiencies and limiting opportunities for teamwork.

Both Board members and staff have expressed a clear vision for a new headquarters—one that better supports Agency operations, provides a welcoming space for public engagement and board meetings, and allows for industry and community events of up to 150 attendees. The new facility should also enhance workspace efficiency for both staff and the Board, foster collaboration, and strengthen the Agency's connection to the community and the surrounding environment.

Concept drawings (Figures 33 and 34) illustrate the potential of a two-story headquarters design that meets these goals and reflects San Bernardino Valley's commitment to innovation and long-term sustainability.





Headquarters L1

LEVEL 1: The first level is envisioned as a collaborative space with a large multi-purpose room seating up to 150 people, several conference rooms, staff work space, Board suite, staff lounge, kitchenette, and reception area. This is a preliminary concept and there are a wide range of possibilities to consider in future design stages.

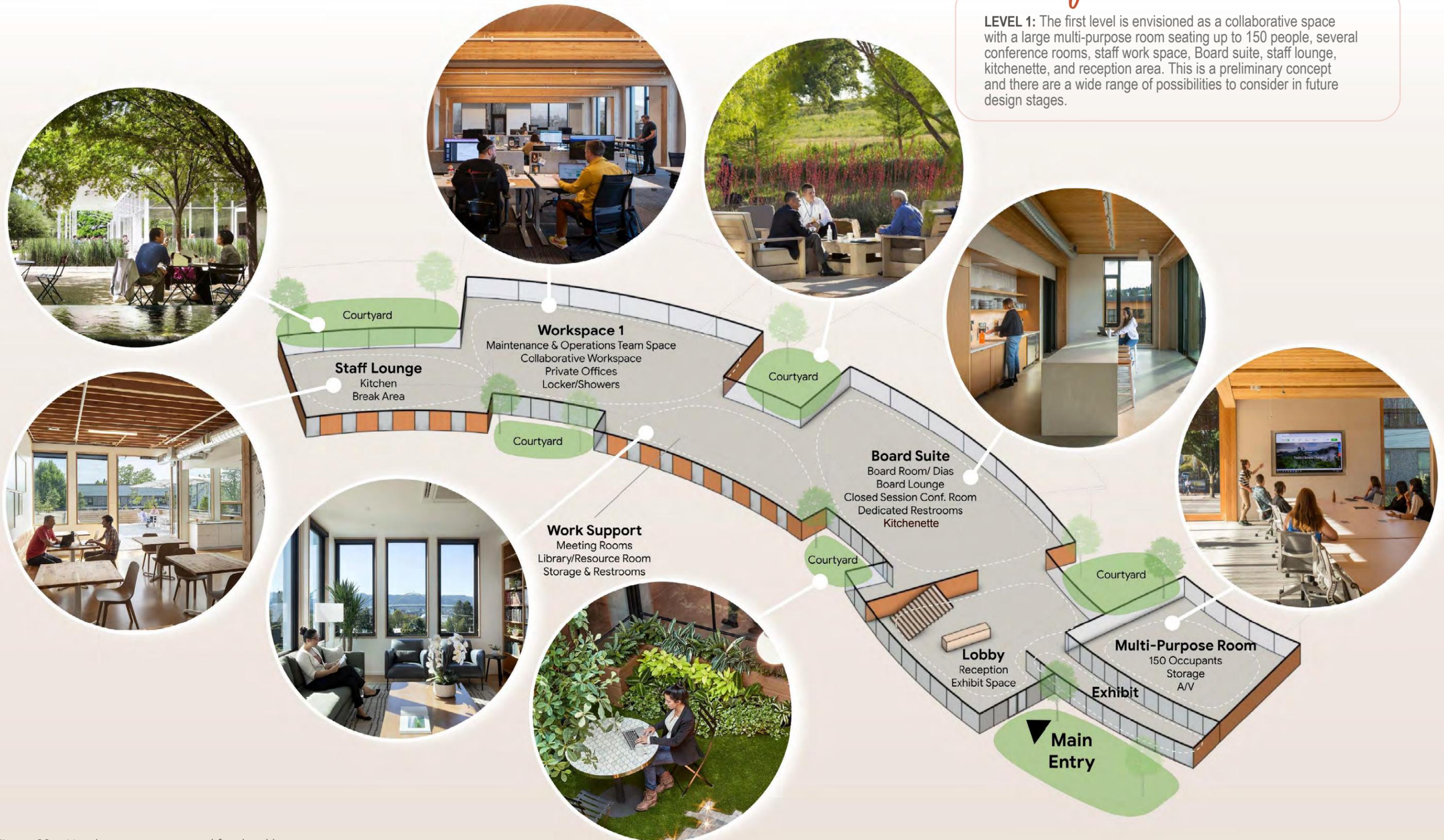


Figure 33. Headquarters conceptual first level layout



Headquarters L2

LEVEL 2: The second level of the building is primarily office space with a centralized informal meeting area. Access to the second level is provided by elevator or a staircase from the lobby space. A mezzanine level offers views out to the valley, with an opportunity for the mezzanine to also connect to the multi-purpose room below.



Figure 34. Headquarters conceptual second level



Table 15 outlines the functional spaces and approximate square footage breakdown that will guide the next stage of the headquarters design process. Specific elements such as Board of Directors preparation areas, public picnic spaces, and indoor special event areas—will require further evaluation and refinement based on the Board’s direction in future planning phases.

Table 15. Headquarters Square Footage Estimates

Level	Space	Net Square Feet	Notes
1	Lobby	1,800	Reception, exhibition gallery, waiting area
1	Maintenance & Operations	2,250	Offices, collaborative work space, locker room, shower room
1	Workspace Support	1,500	8-person conference rooms (2), 4-person huddle rooms (4), library/resource room, storage room
1	Multi-purpose Room	3,000	Multi-layout configuration including 150-seat lecture, storage/AV support area
1	Board Suite	3,000	Board room with curved dais and 55 seated occupants, Board lounge, closed session conference room, dedicated restroom, kitchenette
1	Common Space	1,000	Kitchen, wellness room, etc
1	Support	850	Restrooms, elevator
Subtotal Level 1		13,400	
2	Workspace	9,600	Private offices (40), collaborative work space, coffee/lunch area, production room
Subtotal Level 2		9,600	
Net Square Feet		23,000	
		8,050	35% Gross Up (Circulation, Back of House)
Gross Square Feet		31,050 to 32,000	Approximately doubling existing Administration building work space

Education Center

The Education Center is envisioned as a welcoming space that connects the public, including local school children, civic groups, scouting entities, and other interested parties with San Bernardino Valley’s mission, offering hands-on learning and community engagement opportunities. It would serve as a hub for educational programs, interactive exhibits, and partnership initiatives. The Education Center is an opportunity to develop and expand partnerships with local and regional entities, non-profit groups, universities, retail water agencies, cities, and nearby park agencies to share and inspire the community about water resources, natural habitat and cultural heritage. The Education Center would be completed with the partnership of outside funding entities and grant opportunities.





A partnership-based education center at Sunrise Ranch would provide a range of community benefits including:

Educational Opportunities:

Offering educational programs for schools, community groups and visitors that explore the site’s local history and heritage, water infrastructure, habitat, recreational trails, and environmental stewardship.

Community Engagement:

Encouraging residents and organizations to connect with the property through public programming, events, and volunteer activities that promote shared responsibility for water and the environment.

Collaborative Partnerships:

Creating opportunities to partner with local and regional organizations, including non-profits, universities, cities, park agencies, and retail water providers, to develop and operate the Center collaboratively.

Educational Installations and Exhibits:

Featuring interactive displays and outdoor exhibits that tell the region’s water story, highlighting the importance of conservation, innovation, and sustainability.

The design and scale of the Education Center could evolve over time based on available funding and partnerships. It could begin as a simple open-air structure like a trail rest stop or shelter programmed with outdoor exhibits and interpretive signage. Over time and with potential sponsorships from outside funding sources, it could expand into a partially staffed pavilion and eventually grow into a fully equipped building with dedicated staff and regular operating hours. This phased approach allows the Center to develop flexibly and sustainably, adapting to partnerships, community needs, and funding resources over time.



500–1,000 square feet

- Open-air Structure
- Shaded Rest Area
- Outdoor Exhibits & Learning Gardens
- Water Fountains & Restrooms
- No Staff

Shelter Concept



1,000–2,000 square feet

- Open-air & Enclosed Structure
- Shaded Rest Area
- Outdoor Exhibits & Learning Gardens
- Water Fountains & Restrooms
- Enclosed Exhibit and Multi-Purpose Rooms
- Part-time Staff, Scheduled Programming

Pavilion Concept



6,000 square feet

- Open-air & Enclosed Structure
- Shaded Rest Area
- Outdoor Exhibits & Learning Gardens
- Water Fountains & Restrooms
- Enclosed Exhibit and Multi-Purpose Rooms
- Enclosed Offices & Support Spaces
- Dedicated Staff with Operating Hours & Scheduled Programming
- Audio Visual Equipment (e.g., projection, sound)

Building Concept

Educational Programming

Depending on the funding partners involved in development of the education center structure(s), the opportunity for program types and spaces is wide-ranging. At the basic level, education about the watershed, habitat, and site history are key components of the education center.

Initial concepts for education program opportunities include the following:

Habitat and Water Learning Experiences

Installations or exhibits can be located near any of the buildings or outdoors to help educate the community on the site's habitat and water story. These can vary in size and location and can be a part of a future partnership.

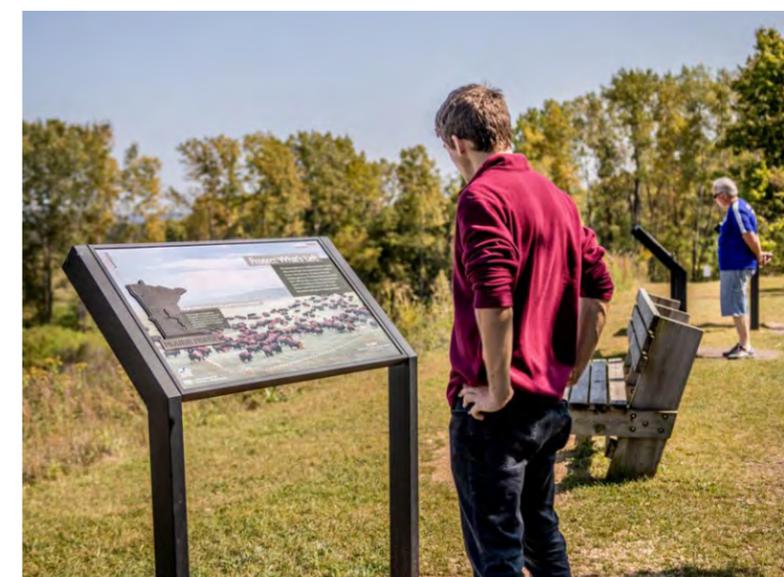
Science-Based Learning

A space could be developed to offer a laboratory learning space where scientific techniques used within the region could be modeled, including water sampling, species measurements, geologic analysis, and pipeline engineering.



Outdoor Learning Spaces

The vast open space at the property allows for outdoor learning spaces near the headquarters or the education center. These can be more natural, surrounded by vegetation and create spaces for presentations or informal gatherings. This can also include the demonstration garden described in Chapter 3.



Outdoor Historic Spaces

The property benefits from many historical irrigation and agricultural relics and is home to the Mill Creek Power House. These historic spaces can be used as educational opportunities for the community.





Fire Training Facilities

Sunrise Ranch is located within the Wildland–Urban Interface (WUI)—the transition area between developed communities and wildland vegetation—adjacent to the San Bernardino National Forest. This setting presents a valuable opportunity for local fire agencies to use the area for training exercises and to access the proposed reservoir as a potential water source for firefighting operations.

Although San Bernardino Valley is not a fire suppression agency, collaborating with regional fire partners are goals of the Headwater Resiliency Partnership, which focuses on protecting local water supplies through proactive forest and watershed management.

Establishing a fire training facility on-site could provide several important benefits:

- **Educational Outreach:** Hosting public education and outreach programs focused on fire safety, emergency preparedness, and community resilience, particularly for rural and suburban neighborhoods.
- **Training and Employment:** Providing a dedicated location for wildland fire training and related workforce development opportunities, supporting both professional training and regional employment in fire management fields.
- **Safety and Security:** Increasing organized activity near the future headquarters and education center to enhance site safety, discourage trespassing, and deter illegal activity.
- **Resource Staging:** Serving as a staging area during large-scale emergencies or natural disasters, accommodating equipment, supplies, and personnel needed for extended operations.

It is envisioned that San Bernardino Valley could form partnerships with regional fire agencies such as the US Forest Service, CalFire, San Bernardino County Fire, and Yuhaaviatam of San Manuel Nation to develop a joint training facility at Sunrise Ranch.

Potential Opportunities

At this stage, no conceptual design has been developed for the fire training facility. Further discussion with potential partners will be necessary to determine the needs for the facility's location, design requirements, access needs, and operational parameters. Potential funding sources—including agency contribution and grant opportunities would also need to be identified as part of the next phase of planning.

Promoting Sustainability

The Sunrise Ranch campus offers a unique opportunity to demonstrate environmental leadership by designing facilities that meet—or even exceed—current sustainability standards. As new buildings are developed, San Bernardino Valley may consider pursuing one or more recognized green building certifications, such as LEED (Leadership in Energy and Environmental Design), WELL Building Standard, or the Living Building Challenge.

These frameworks would help ensure that the campus prioritizes energy efficiency, water conservation, healthy indoor environments, and the responsible use of materials.

Table 16 outlines a range of strategies that can be applied to future facilities to reduce both embodied carbon (emissions from construction materials and processes) and operational carbon (emissions from building energy use). Together, these strategies will support San Bernardino Valley's commitment to sustainability, climate resiliency, and environmental stewardship.

Table 16. Strategies to lower embodied and operational carbon

Focus	Strategies
Lower Embodied Carbon Materials	<ul style="list-style-type: none"> • Local sourced timber in lieu of steel and concrete, where practical • Minimize concrete as possible, or low-carbon concrete • Minimal use of foams and plastics • As little steel as possible, specify domestic steel with high recycled content • Local or recycled materials, as practical
Water	<ul style="list-style-type: none"> • Collection and treatment of water on site, reuse for irrigation purposes • Consider using water direct from reservoir(s) for fire protection
Wellbeing	<ul style="list-style-type: none"> • Natural light • Natural ventilation • Visual access to the outdoors • Healthy indoor air



Sustainability

Strategies can support San Bernardino Valley's commitment to sustainability, climate resiliency, and environmental stewardship.



4.2.2. Utilities Opportunities

Sunrise Ranch has the potential to become a state-of-the-art, self-sustaining campus that embodies San Bernardino Valley's commitment to climate resiliency and environmental innovation. By strategically integrating new utility systems and renewable technologies, the site could serve as a model for sustainable water and energy management.

Utilities Opportunities include the following:

1. Water Utilities and Hydropower
2. Alternative Energy

Water Utilities and Hydropower

The Sunrise Ranch property lies within the City of Highland and the East Valley Water District retail water and wastewater services area. However, East Valley Water District does not currently have potable water distribution or sewer collection pipelines within one to two miles of the site. As a result, future development—such as the proposed headquarters and other facilities—would require off-site infrastructure improvements to connect to existing systems or the development of self-contained potable water and wastewater treatment systems on-site.

Water Demand

Projected water demand for the Sunrise Ranch campus has been estimated based on anticipated staff and visitor use of the concept buildings, including the headquarters, education center, and a trail restroom.

Landscape irrigation demand was also calculated in accordance with the Modified Water Efficient Landscape Ordinance (MWELO) to ensure compliance with water conservation standards.

Table 17 provides an overview of the estimated total water use for the campus. Detailed calculations and assumptions are available in the Appendix.

Table 17. Total Estimated Water Usage

	Yearly Usage (AFY)	Average Day Flow (GPD)
Indoor Water Use	2.8	2,484
Outdoor Water Use	3.8	3,411
Total Water Use	6.6	5,895



On-Site Water and Wastewater Systems

Because no potable water service currently exists at the Sunrise Ranch property, a standalone on-site potable water system will need to be designed. Several existing wells on the property could potentially be rehabilitated to meet projected water demand. If additional supply is required, a new well could be constructed to supplement the system.

Wastewater would be generated in the new headquarters, the education center, the fire training facility, trail restroom, and any additional future buildings at the site. A feasible solution for managing wastewater is to install a “package plant”—a prefabricated, self-contained treatment system brought to the site for local installation. These systems are widely used and can be configured to meet a variety of treatment needs based on the wastewater characteristics and desired quality of the treated water.

For Sunrise Ranch, the treated water would achieve Title 22 disinfected tertiary effluent quality, suitable for non-potable uses such as landscape irrigation (purple pipe systems) and toilet flushing.

Additionally, on-site stormwater could be managed through demonstration gardens and a demonstration parking lot with permeable substrate, offering an opportunity to educate visitors about sustainable water management practices while supporting on-site infiltration and groundwater recharge.

Alternative Energy

Construction of the proposed water reservoir system offers a unique opportunity to generate renewable energy on-site by using the movement and cycling of water between reservoirs to produce hydroelectric power for campus operations.

In addition, installing photovoltaic (solar) panels on shade structures, parking areas, and other suitable locations across the property would provide clean, on-site energy while also reducing the urban heat island effect and improving overall site comfort.

As the Sunrise Ranch campus continues to develop, there may be additional opportunities to explore emerging renewable energy technologies—furthering San Bernardino Valley’s commitment to sustainability, energy efficiency, and climate resiliency.

4.2.3. Access and Transportation Opportunities

Vehicular circulation improvements are opportunities to improve access to the property and any future buildings.

The scale of future development at Sunrise Ranch—including the number of site occupants and visitors—will ultimately determine the level of road and access improvements required. In keeping with San Bernardino Valley’s sustainability and habitat conservation goals, vehicular circulation planning will emphasize environmentally responsible road design, safety best practices, and the creation of buffers to safely separate vehicle traffic from pedestrian pathways.

Key Access and Transportation Opportunities identified for further consideration include:

- Vehicular Access
- Maintenance Roads
- Parking Opportunities
- Pedestrian Opportunities

Vehicular Access

Major vehicular roads—including Emerald Avenue, Newport Avenue, and the existing access road— may require improvements to support future development at Sunrise Ranch. To help minimize construction impacts and preserve the site’s natural character, interior roads within the property that are not needed for daily access could be constructed of compacted soil or other low impact materials rather than full paving.

As the site development progresses, San Bernardino Valley would coordinate with the City of Highland and the County of San Bernardino to determine requirements for street design and off-site improvements, which may include final road alignment, street lighting, curbs, gutters, sidewalks, and potential public transportation connections.





The three main vehicular entrances to the site may include:

1. Emerald Avenue and Existing Access Road
2. Emerald Avenue and Newport Avenue
3. Existing Access Road and Emerald Avenue

The above-listed entrances are circled on **Figure 35** and could be designed in a way that made them accessible on foot and bicycle.

Entrances located near major roads could feature prominent signage identifying the Sunrise Ranch site and San Bernardino Valley's ownership. These access points would serve not only as gateways into the property but also as a welcoming and informative entry experience that sets the tone for visitors' time on site. Thoughtfully designed entry signage—or a distinctive gateway feature—would help orient visitors, promote safety, and enhance their understanding and appreciation of the site's natural, educational, and operational significance.

Maintenance Roads

Access to remaining on-site roads would be restricted to vehicles used for operations, maintenance, and emergency response. The existing maintenance roads vary in condition,

width, and slope but most are constructed of compacted natural soil—a surface type that should be preserved to minimize the need for heavy equipment and asphalt paving.

Because many of these roads also serve as multi-use trails, a vegetated buffer along their edges could help reduce maintenance needs and enhance the visitor experience. Potential features for this buffer include:

- Native tree plantings to provide shade for hikers and bikers,
- Bioswales to manage stormwater runoff naturally, and
- Re-purposed boulders that double as informal seating areas.

New maintenance roads constructed around the proposed reservoirs would also use compacted natural soil surfaces and could be shared with hikers and cyclists where appropriate. The edge conditions along the reservoirs and surrounding hillsides would intentionally vary—both to create diverse experiences for visitors and to support local habitat needs.

Parking Opportunities

Parking for the proposed headquarters building is envisioned to be located underground, directly beneath the facility, if feasible. This approach would reduce the visual impact of surface parking, provide added security to Agency fleet vehicles, preserve open space, and help maintain the site's natural character.

An underground parking structure could be partially naturally ventilated and designed with direct connections to the main building and surrounding landscape for ease of access. Architectural screening, specialty materials, or vegetation could also be used to visually soften the structure and blend it into the environment.

Public parking areas would be strategically incorporated on the site in close proximity to facilities approved by the Board of Directors, ensuring convenient access for visitors while maintaining consistency with the overall site design and sustainability goals.

Pedestrian Access Opportunities

Within the envisioned campus layout, pedestrian access across the Sunrise Ranch site could be enhanced through the creation of special outdoor spaces such as learning gardens, employee gathering areas, and pathways along the reservoir edge. These spaces would encourage walking, interaction, and connection with the surrounding landscape.

The Education Center could serve as a key hub, linking walking paths to both the trail network and the reservoir, allowing visitors to move seamlessly between educational, recreational, and scenic areas of the property.

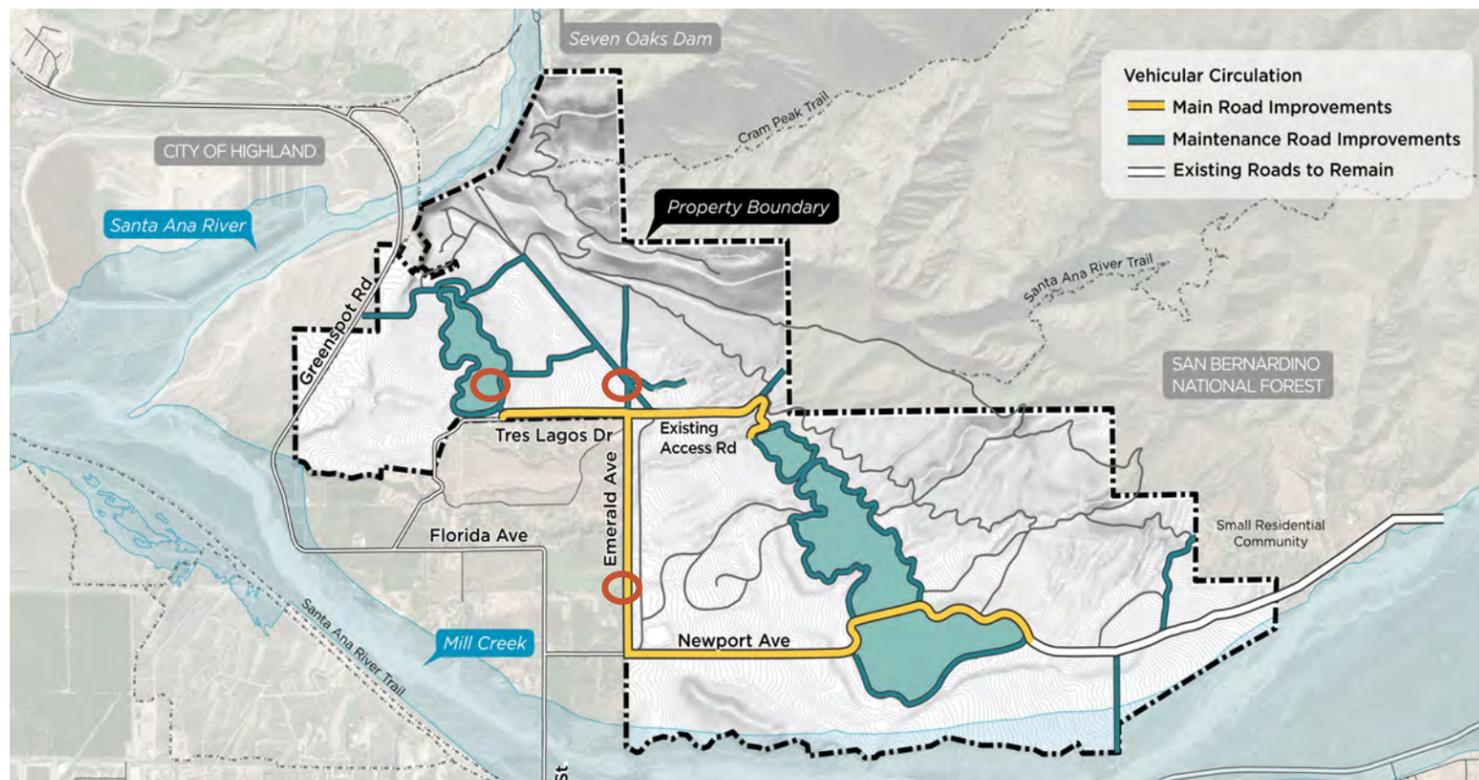


Figure 35. Conceptual vehicular entry and circulation

State-of-the-art facilities such as a new Headquarters, Education Center, and Fire Training Facility would support the functionality and experience of the water supply infrastructure, habitat mitigation, and recreation at Sunrise Ranch.

FACILITIES Summary

4.3. Summary Findings

The study of potential site configurations identified strong benefits of a Sunrise Ranch Campus concept that clusters all buildings in one area—adjacent to a proposed reservoir(s)—and takes advantage of scenic views of the valley, surrounding mountains, and water features.

The campus approach positions Sunrise Ranch to become a state-of-the-art facility that reflects San Bernardino Valley’s commitment to regional water resiliency, sustainability, and collaboration. By co-locating key facilities, the campus can strengthen partnerships with regional organizations while serving as a convening space for water management, education, scientific, and community engagement.

Headquarters: The new San Bernardino Valley Headquarters would be designed to foster collaboration, provide room for growth, and offer flexible spaces for events, seminars, and conferences. This facility would bring all employees together under one roof, addressing the current limitations of workspace spread across multiple locations throughout the service area.

Education Center: A new Education Center at Sunrise Ranch would create opportunities for community learning and engagement through partnerships with local agencies, schools, and organizations. Visitors could learn about the watershed, habitat, and cultural history of the site in an immersive setting that combines indoor and outdoor learning spaces, enhanced with shade structures, seating, and interpretive exhibits.

Fire Training Facility: The inclusion of a fire training facility on site presents an opportunity to align shared missions focused on community safety, watershed protection, and emergency preparedness. However, realizing this vision would depend on establishing partnerships with local fire agencies to develop and operate the facility.



Next STEPS

CHAPTER 5. NEXT STEPS

Sunrise Ranch offers San Bernardino Valley an exciting opportunity to advance its mission of providing a reliable and sustainable water supply for the region. Through future projects—such as a potential new water storage reservoir(s), habitat mitigation credit areas and new campus facilities—the site can play a key role in supporting water resiliency, environmental stewardship, and community benefits.

The research conducted throughout this process revealed a range of promising opportunities for the Board to consider as it determines next steps. These opportunities are designed to align closely with the Agency’s mission and advance its long-term goals. **Figure 36** represents potential pathways for continued growth, innovation and community benefit.

SUNRISE RANCH OPPORTUNITIES



Water Supply Infrastructure Opportunities

(e.g., reservoirs and conveyance)



Habitat and Mitigation Opportunities

(e.g., restoration, preservation, conservation and mitigation, HCP environmental obligations, and revenue for other projects)



Public Recreation Opportunities

(e.g., hiking, bicycling, and equestrian)



Facilities Opportunities

(e.g., buildings and utilities)





Figure 36. Geographic visualization of opportunities

PHASED IMPLEMENTATION PLAN

To ensure thoughtful, efficient, and coordinated progress at Sunrise Ranch, the project should advance through a series of structured phases. This phased approach will help maximize the site's long-term potential, align with San Bernardino Valley's strategic goals, and ensure that all efforts deliver multi-beneficial outcomes for water resiliency, habitat, and the community.

5.1. Phase I – Foundational Planning and Integration

The first phase focuses on creating a strong foundation for future development by coordinating all aspects of the Master Plan and establishing key partnerships.

— Element One —

Develop an Integrated Design that brings together all Master Plan elements desired by the Board for inclusion into a cohesive site vision.

The Integrated Design Plan will serve as a comprehensive framework that brings together all elements of the Sunrise Ranch Master Plan (Figure 37)—including water infrastructure, habitat conservation, recreation, education, and administrative facilities—into a cohesive, functional, and sustainable site vision.

The Integrated Design Plan will transform the Master Plan's concepts into a comprehensive, actionable, and visually cohesive site strategy including preliminary engineering and planning elements - ensuring that Sunrise Ranch evolves as a sustainable, multi-benefit campus that meets operational needs while delivering lasting community and environmental value.

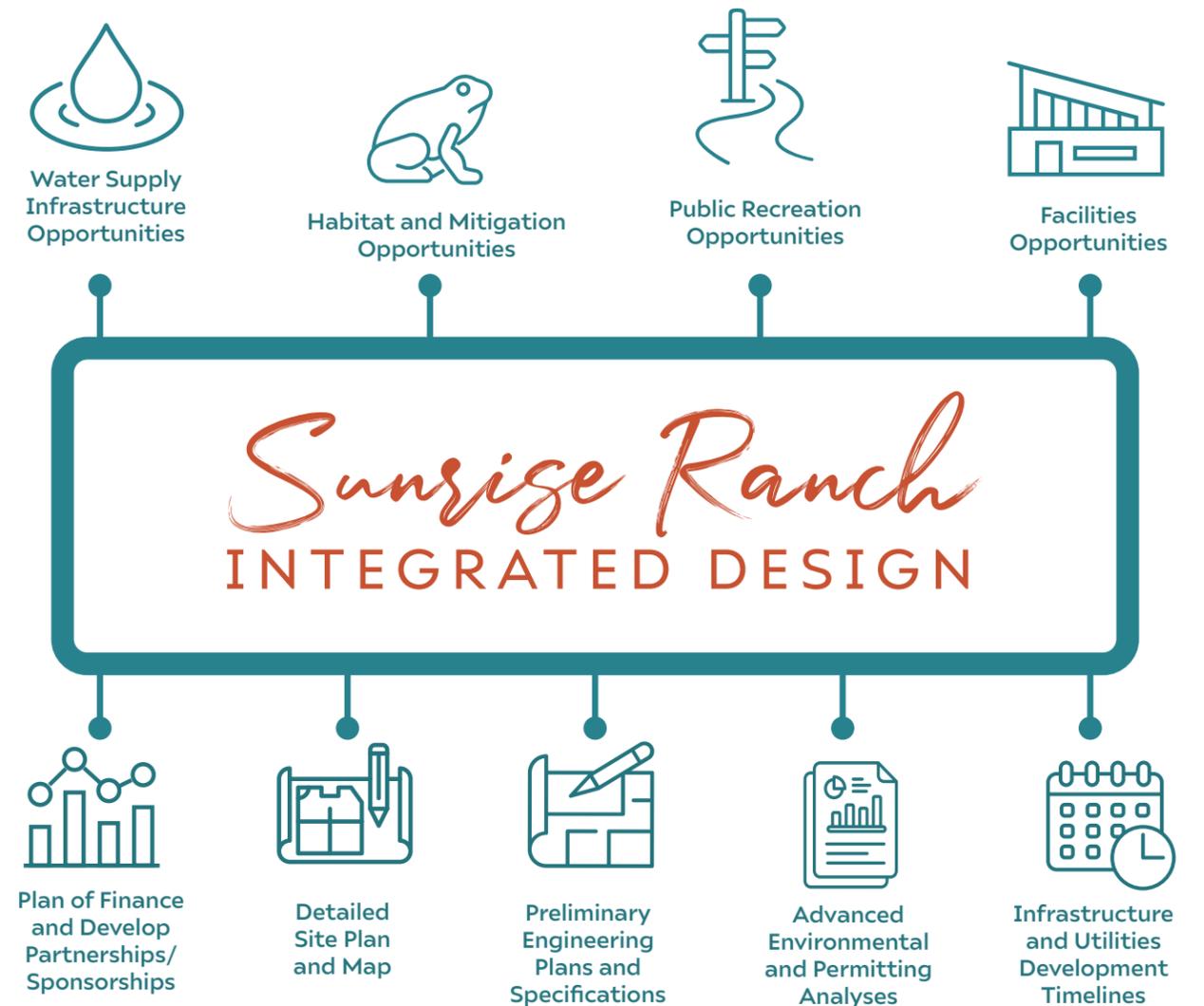


Figure 37. Sunrise Ranch Integrated Design and Elements



Key Goals and Outcomes of an Integrated Design Plan are:

- Unify All Site Components
 - ◊ Coordinate the design of reservoirs, buildings, trails, habitat areas, and utilities into one harmonized plan.
 - ◊ Ensure that physical layouts, aesthetics, and operations function together efficiently.
- Maximize Multi-Benefit Outcomes
 - ◊ Balance water storage, environmental restoration, recreation, and education opportunities.
 - ◊ Create synergies between infrastructure and natural systems—for example, using habitat buffers around reservoirs or educational trails that align with mitigation areas.
- Support Sustainability and Climate Resiliency
 - ◊ Integrate renewable energy, low-impact development practices, and water-efficient landscaping.
 - ◊ Design systems that minimize environmental impact while improving long-term adaptability to changing climate conditions.
- Guide Phased Implementation
 - ◊ Establish a clear roadmap for future design, permitting, and construction phases.
 - ◊ Identify logical project sequencing, cost efficiencies, and potential funding opportunities.
- Strengthen Partnerships and Collaboration
 - ◊ Provide a common visual and technical reference for partner agencies, community stakeholders, and funding partners.
 - ◊ Facilitate collaboration through shared design principles and project goals.
- Enhance the Visitor and Community Experience
 - ◊ Create a cohesive campus identity that connects the Headquarters, Education Center, Fire Training Facility, and public spaces through trails, signage, and landscape design.
 - ◊ Celebrate the site's natural beauty, water heritage, and ecological function.

Element Two

Establish and Engage a Partnership/Sponsorship Network

Develop a partnership and sponsorship network to foster collaboration with our public agencies, private entities, educational institutions, nonprofit organizations, and community groups that share San Bernardino Valley's goals of water resiliency, education, and sustainability. There are several governmental agencies, tribal nations, institutional organizations, community groups, and public utilities identified in the Master Plan whose goals and missions align with San Bernardino Valley. Strong partnerships and coordination with these like-minded organizations, and reaching out to new potential partners, could help advance the Sunrise Ranch vision. This network will:

- Identify potential partners for program development, funding potential, and facility operations (e.g., Education Center exhibits, research projects, or habitat management).
- Explore sponsorship opportunities to offset project costs through corporate, institutional, or foundation support.
- Build long-term relationships with local schools, universities, and regional agencies to develop shared programs, internships, and public engagement activities.
- Encourage shared use of facilities and coordination of events that connect the community to the mission of San Bernardino Valley.

Ultimately, this effort will create a foundation for collaboration and investment, ensuring that Sunrise Ranch serves as a regional hub for education, innovation, and environmental stewardship.



Partnership Network

While the Master Plan recognizes several partnership opportunities below, the Sunrise Ranch Partnership Network is expected to grow and change as the needs of the community and San Bernardino Valley evolve.

Successful partnerships can help advance the opportunities forward. This process begins with thorough research to identify partners whose goals and missions align with San Bernardino Valley. **Table 18** offers insight into the initial interests, influence, and involvement of potential partners, particularly those with a vested interest in the Plan’s implementation.

Table 18. Partnership Network Opportunities

Governmental Agencies/Tribal Nations	
City of Highland	The City’s Community Trails Committee helps organize an adopt-a-trail program called “Eyes on the Trail,” which allows community groups and businesses to take care of maintenance responsibilities. San Bernardino Valley could collaborate with the city to incorporate designated trails into their existing program.
Fire Suppression Agencies	U.S. Forest Service, CalFire, San Bernardino County Fire Department, and Yuhaaviatam of San Manuel Nations have expressed interest in developing a fire facility on the property. The facility could be used for training purposes and provide a strategic position within the wildland-urban interface to respond to wildfires.
San Bernardino County Regional Parks	The County is dedicated to finishing the Santa Ana River Trail, which is shown in plans to cross through the property. They could be a key joint participant in planning, and connecting the SAR trail with the Sunrise Ranch trails.
United States Geological Survey (USGS)	USGS is an agency of the United States government whose work spans the disciplines of biology, geography, geology, and hydrology. There may be potential for them to partner or operate on the property.
Yuhaaviatam of San Manuel Nations	Engaging with the nearby Yuhaaviatam of San Manuel Nations is an important step to honoring the site’s cultural diversity and history. Tribal members could be involved in the development of the ethnobotanical garden and in future education endeavors.
Other Tribes	The Gabrieliño-Tongva San Gabriel Band of Mission Indians also have historical claims in the region and could be involved in education opportunities.
Community Groups/ Public Utilities	
Scout Guides	Scouting America (Former Boy Scouts of America) and Girl Scouts of the USA are youth organizations with a long history in the outdoors, including trail building, wilderness preparedness, and environmental awareness. San Bernardino Valley could partner with scout troops in the San Bernardino region to help with trail building, open space maintenance, community engagement, and educational efforts. This could occur through regular volunteer days or workdays organized by the participating troops.

Boys and Girls Clubs	Boys and Girls clubs set out to enable young people to reach their full potential as productive, caring, responsible citizens. Partnered activities on-site could facilitate education and hands-on outdoor experiences.
Southern California Edison	SCE is a subsidiary of Edison International and one of the largest electric utilities in the United States. It has been providing electricity to Central, Coastal, and Southern California. There may be potential for them to partner or operate on the property.
Institutional Organizations	
Educational Institutions	Local elementary, middle, and high schools could utilize the proposed education center for field trips to learn about California flora and fauna. Higher education institutions like the University of California at Riverside, University of Redlands, California State University (CSU) San Bernardino, and Loma Linda University could participate in outdoor and agriculture-related programs on site, such as beekeeping and habitat restoration.
Conservation Organizations	Local organizations involved in conservation work, including Rivers and Lands Conservancy, Endangered Habitats League, San Gorgonio Wilderness Association, Audubon Society, and Wildlands Conservancy, could become partners in the education and maintenance of habitat areas and gardens on the site. The rare bird species and critical habitats on site may serve as the basis for organized passive recreation activities or community workdays.
Santa Ana River Conservancy (SARCON)	SARCON developed the Santa Ana River Parkway and Open Space Plan in 2018 to guide the development and management of future projects within the Santa Ana River corridor. As a portion of the Santa Ana River Trail touches the property, SARCON could be a resource for trail development and applying for grant funding if the Santa Ana River Trail extends through the site as currently planned.
Redlands Conservancy	Redlands Conservancy is a non-profit organization that protects and preserves the City of Redlands’ built, agricultural, and natural environment. Some of their projects include leading a citrus preservation group, maintaining city trails, and restoring habitat at the San Timoteo Nature Sanctuary. They could be an informational resource for maintaining regional open space and habitat resources. If San Bernardino Valley explores developing a working orchard on site, the Redlands Conservancy citrus group could participate in the planning and education process.
Crafton Hills Open Space Conservancy	The Crafton Hills Open Space Conservancy maintains the Crafton Hills Open Space and the trails in Yucaipa Regional Park. Crafton Hills offers hiking, biking, and equestrian trails. In contrast, Yucaipa Regional Park, built by San Bernardino Valley and leased by San Bernardino County Regional Parks, offers amenities for fishing, swimming, picnicking, camping, hiking, biking, and general passive recreation. Due to their location just south of Mill Creek, the Conservancy is well-suited to provide suggestions and collaborate on maintaining public open space areas.
Other Organizations	
Various organizations	Private development partnerships require careful planning, transparent communication, and a commitment to shared goals. Various opportunities like public sector collaboration, land rents, and developer-led opportunities can be explored with private organizations.



Element Three

Prepare a Comprehensive Plan of Finance

Develop a Comprehensive Plan of Finance to guide and support the phased implementation of the Sunrise Ranch project, incorporating a variety of funding mechanisms to ensure financial sustainability and long term project success.

Sunrise Ranch was originally acquired for its potential to support water infrastructure development and to offset mitigation requirements associated with projects identified in the Upper Santa Ana River Habitat Conservation Plan (HCP). Most of the projects proposed in this Master Plan including the reservoir(s) and headquarters remain conceptual. At this stage, detailed cost estimates and defined funding sources have not yet been established. To advance the most promising concepts, additional financial analysis will be required. This could be accomplished through a Plan of Finance, which would refine project-specific funding needs, identify potential funding sources, and align future investments with the Board's priorities and implementation schedule.

This plan will outline the financial framework, funding sources, and cost strategies needed to move each project component—from design through construction—forward in a coordinated and sustainable manner. Key objectives of the financing plan include:

- Identifying funding sources, such as agency capital reserves, existing assets, state and federal grants, partnerships, sponsorships, and potential revenue from mitigation credit sales.
- Developing cost estimates for planning, design, permitting, construction, and long-term operations and maintenance.
- Establishing funding priorities that align with the project's phased approach and Board direction.
- Exploring creative funding mechanisms, including public-private partnerships, grant matching, and potential philanthropic or community contributions.
- Ensuring long-term financial sustainability to support ongoing maintenance, educational programming, and site operations.

This Comprehensive Plan of Finance will serve as a strategic roadmap for responsible investment, ensuring that each phase of the Sunrise Ranch Master Plan is financially feasible, transparent, and aligned with San Bernardino Valley's fiscal policies and goals.



Potential Funding Sources

There are many promising funding opportunities available for a project of this scale—especially one that delivers such wide-reaching benefits. With multiple pathways for support, we have a strong foundation for bringing this transformative vision to life. **Table 19** highlights several initial examples of funding sources that could support the implementation of the Opportunities outlined in the Master Plan.

This includes potential grants for open space, recreation, and habitat conservation projects, which could complement revenue from mitigation credit sales. The funding sources are only a starting point—many additional opportunities can and should be explored to fully leverage available resources and align with the Board’s priorities.

Federal and state grants, in particular, offer tremendous potential due to the multi-benefit nature of this vision. Beyond providing financial support, they help expand programs, strengthen partnerships, and build long-term capacity. By prioritizing grant funding, the Agency can maximize regional benefits while reducing overall project costs.

Table 19. Potential Water and Site Related Funding Sources

Water Related	
Drinking Water State Revolving Fund (DWSRF)	The DWSRF program assists with financing water infrastructure projects to maintain or achieve compliance with the Safe Drinking Water Act. Eligible infrastructure construction costs include treatment facilities, water sources, storage, and distribution systems.
Proposition 4	The 2024 voter approved Proposition 4 to safeguard communities, natural resources and the future in the face of climate change. From wildfire prevention and safe drinking water, to protecting biodiversity and increasing access to nature, these funds will support projects that make a real, lasting difference in the lives of people and communities across California in phases.
Public-Private Partnership (PPP)	Long-term contract where a private partner designs, builds, and finances a public asset in exchange for availability payments or user fees with defined risk transfer. This would be a mutual benefit: a public agency gets predictable costs sooner, performance guarantees, and the private partner gets a long-term contracted revenue stream and returns for supplying capital and expertise tied to meeting targets.

Site Related	
Land and Water Conservation Fund (LWCF)	The LWCF grants provide funding for the acquisition or development of land to create new outdoor recreation opportunities for Californians’ health and wellness. Since 1965, more than 1,000 parks have been created or improved with LWCF assistance throughout California.
Proposition 68	The California Drought, Water, Parks, Climate, Coastal Protection, and Outdoor Access for All Act of 2018 (Prop 68) provides grant funding for projects that improve wildlife corridors or habitats and develop future recreational opportunities. The funding could be used for the planning or implementation phases of projects. The California Department of Fish and Wildlife updated evaluation guidelines in January 2024.
Recreational Trails Program	The Recreational Trails Program (RTP) provides funding for the development and maintenance of recreational trails and trail-related facilities for non-motorized and motorized trail use. At least 40% of the total funds are set aside for diversified trail use, such as trails open for hiking and biking. The program is administered by State Parks and the Department of Transportation’s Active Transportation Program.
Habitat Conservation Fund	Administered by the Office of Grants and Local Services of State Parks, the Habitat Conservation Fund protects, restores, and enhances wildlife habitat. The fund allocates approximately \$2 million annually to seven categories, including riparian habitat, rare, endangered, threatened, or fully protected species habitat, and trails.
Public Access Program	The Public Access Program is one of the original Wildlife Conservation Board programs and funds projects that facilitate public access to natural and wild areas. While initially focused on promoting hunting and fishing opportunities, the use of funds has grown to include trails, interpretive signs, and bird observation shelters.
Mitigation Credit Agreement	San Bernardino Valley is in the process of entering into a Mitigation Credit Agreement with the California Department of Fish and Wildlife. Acreage within Sunrise Ranch can be incorporated into the agreement to benefit water projects identified within the Upper Santa Ana River Habitat Conservation Plan and remaining acres can be made available as credits for other project permitting needs. The pricing for mitigation credits is market driven, with extensive demand in this region today for transportation, housing, and infrastructure projects. While there are costs associated with restoring and maintaining mitigation habitat, the potential revenue received from credit sales is anticipated to surpass those needs. Revenue in excess of mitigation needs could be used to fund local projects.
Communications and Engagement	The future of Sunrise Ranch is of interest to the community and regional stakeholders. Based on direction from the Board, it will be important to engage with the public throughout the process so that they understand the intention of the Board, the value being brought to the property for the public good, the timeline for implementation, and provide opportunities to gather feedback. Stakeholders participated in the community feedback process during the research for this document, with continuing communication moving forward. Communication could include materials like website content, events on site, listening workshops, and presentations to community groups.



Element Four

Finalize Mitigation Acreage Identification and Incorporate into the Mitigation Credit Agreement

Confirm and document the specific acreage on the Sunrise Ranch property that will be designated for habitat mitigation and conservation purposes. This process will ensure that the identified areas align with regulatory requirements, environmental priorities, and San Bernardino Valley long-term mitigation strategy. Key objectives include:

- Verifying the boundaries and total acreage of land suitable for mitigation based on biological studies, habitat value, and compatibility with proposed infrastructure.
- Coordinating with regulatory agencies (such as the U.S. Fish and Wildlife Service, California Department of Fish and Wildlife, and U.S. Army Corps of Engineers) to confirm eligibility and compliance with mitigation standards.
- Integrating the identified acreage into the existing or proposed Mitigation Credit Agreement to enable credit generation, tracking, and sales.
- Establishing management and monitoring guidelines for the mitigation areas to ensure long-term ecological success and regulatory compliance.

This step will provide the foundation for a self-sustaining mitigation program, allowing San Bernardino Valley to both offset environmental impacts from future projects and generate revenue through credit sales, supporting continued investment in water resiliency and habitat protection.

Element Five

Enhance Communication and Engagement with Neighboring Communities and Stakeholders

Strengthen communication and collaboration with neighboring communities, partner agencies, and key stakeholders to promote transparency, trust, and shared understanding throughout the planning and implementation of the Sunrise Ranch project. Key objectives include:

- Developing a comprehensive Communication and Outreach Plan that provides regular updates on project milestones, environmental progress, and community benefits.
- Hosting informational meetings, workshops, and open houses to gather feedback and answer questions from local residents and interested organizations as the project progresses.
- Creating accessible communication tools, such as a project website, newsletters, and visual materials, to ensure information is easy to understand and widely available.
- Building partnerships with local schools, civic groups, local tribal leaders, and regional agencies to support education, volunteer opportunities, and stewardship programs tied to the project.
- Maintaining open dialogue with neighbors to proactively address concerns about construction, access, and environmental protection. This ongoing engagement effort will ensure that the Sunrise Ranch project reflects community values, enhances regional collaboration, and demonstrates San Bernardino Valley's commitment to transparency and public partnership.



5.2. Phase II – Design, Environmental Review, and Early Implementation

Building on the foundational work completed in Phase I, this phase focuses on advancing the technical design, environmental review, and initial implementation of key project components. The goal is to translate the Integrated Design into actionable steps that prepare the project for construction while maintaining environmental stewardship and regulatory compliance. This phase would require future Board approval to move forward. Key actions include:

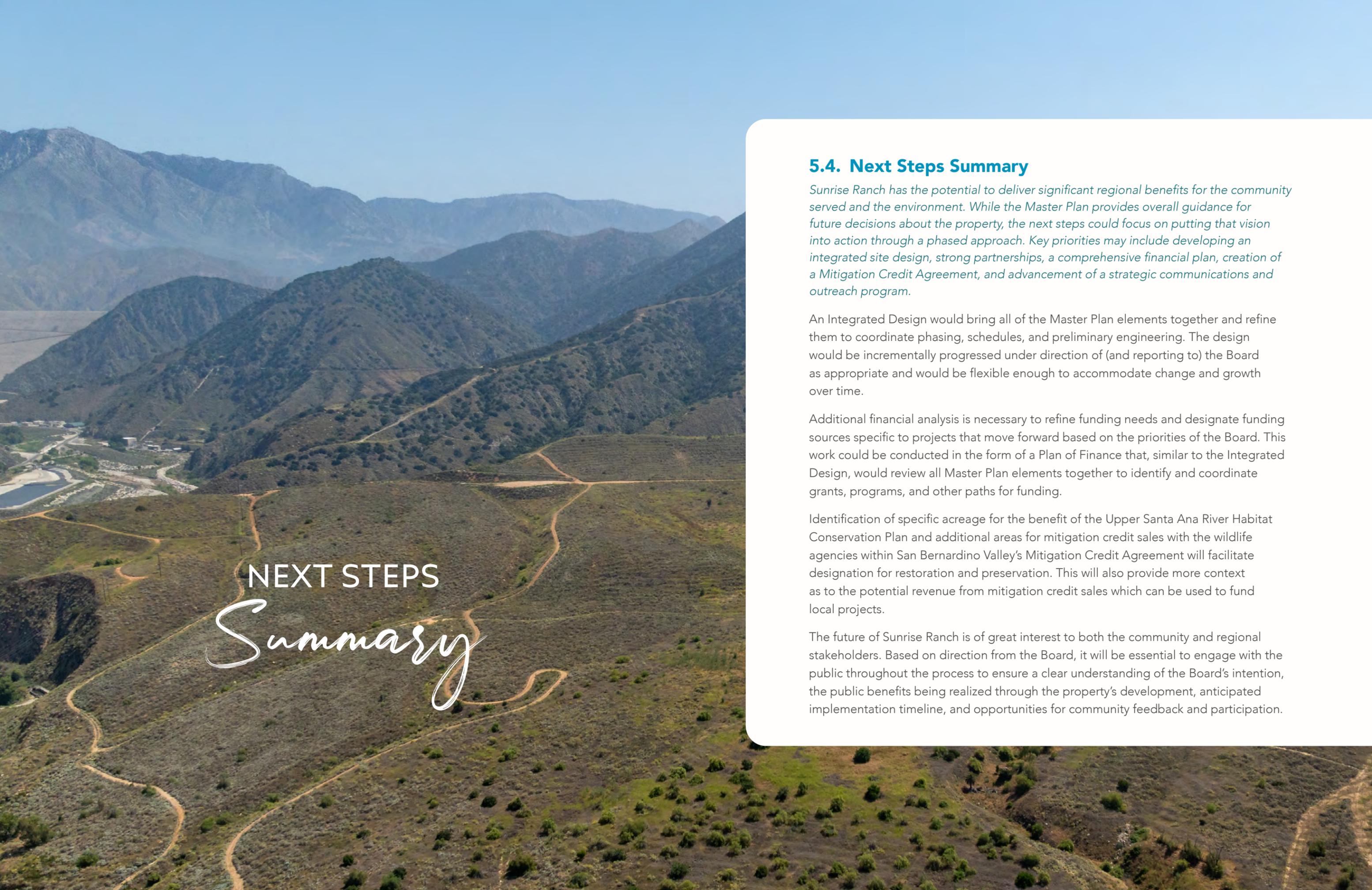
- **Conduct CEQA Review:** Complete the California Environmental Quality Act (CEQA) process based on the integrated site design to evaluate potential environmental impacts and develop mitigation measures.
- **Initiate Mitigation Credit Sales:** Begin the sale of mitigation credits to generate funding that can support future design, permitting, and construction activities.
- **Finalize Reservoir and Pipeline Design:** Complete detailed engineering and design work for the proposed reservoir system and associated pipelines, ensuring functionality, safety, and integration with regional water infrastructure.
- **Obtain Required Permits:** Secure construction, environmental, and operational permits from applicable local, state, and federal agencies to move forward with development.
- **Formalize Partnerships:** Establish and finalize partnership and sponsorship agreements with collaborating agencies, educational institutions, and organizations to coordinate shared resources, programs, and funding.
- **Begin Early Construction Activities Where Possible:** Implement initial trail segments, recreational features, and other low-impact improvements that enhance community access and visibility of project progress.

5.3. Phase III – Construction and Implementation

The third phase marks the transition from planning and design to full-scale construction and implementation of the Sunrise Ranch project, approved by the Board. This stage will focus on building the approved facilities and infrastructure while maintaining a strong emphasis on safety, environmental stewardship, and long-term performance. This phase would require future Board approval to move forward. Key actions include:

- **Construct Approved Facilities and Infrastructure:** Complete the construction of all project components identified and refined during Phases I and II—the reservoir system, pipelines, administrative and educational buildings, trails, and related site improvements. Construction efforts will be coordinated to minimize environmental impact and maintain access for operations and public safety.
- **Implement Monitoring and Adaptive Management:** Establish and maintain an ongoing monitoring and adaptive management program to evaluate project performance, ensuring that operational, environmental, and community objectives are consistently met. Findings from this monitoring will guide adjustments and improvements over time to ensure continued success.





NEXT STEPS *Summary*

5.4. Next Steps Summary

Sunrise Ranch has the potential to deliver significant regional benefits for the community served and the environment. While the Master Plan provides overall guidance for future decisions about the property, the next steps could focus on putting that vision into action through a phased approach. Key priorities may include developing an integrated site design, strong partnerships, a comprehensive financial plan, creation of a Mitigation Credit Agreement, and advancement of a strategic communications and outreach program.

An Integrated Design would bring all of the Master Plan elements together and refine them to coordinate phasing, schedules, and preliminary engineering. The design would be incrementally progressed under direction of (and reporting to) the Board as appropriate and would be flexible enough to accommodate change and growth over time.

Additional financial analysis is necessary to refine funding needs and designate funding sources specific to projects that move forward based on the priorities of the Board. This work could be conducted in the form of a Plan of Finance that, similar to the Integrated Design, would review all Master Plan elements together to identify and coordinate grants, programs, and other paths for funding.

Identification of specific acreage for the benefit of the Upper Santa Ana River Habitat Conservation Plan and additional areas for mitigation credit sales with the wildlife agencies within San Bernardino Valley's Mitigation Credit Agreement will facilitate designation for restoration and preservation. This will also provide more context as to the potential revenue from mitigation credit sales which can be used to fund local projects.

The future of Sunrise Ranch is of great interest to both the community and regional stakeholders. Based on direction from the Board, it will be essential to engage with the public throughout the process to ensure a clear understanding of the Board's intention, the public benefits being realized through the property's development, anticipated implementation timeline, and opportunities for community feedback and participation.

Summary of Appendix

The Appendix provides the foundational research, documentation, and supporting materials that informed the development of the Sunrise Ranch Master Plan. It consolidates a wide range of background information, technical data, and community input used to identify opportunities and constraints for the property. The following sections outline the key components of the Appendix:

Overview of the Sunrise Ranch Property

This section presents a comprehensive overview of the property, including its historical context and cultural significance to the San Manuel people, agricultural legacy, evolution of local water bodies, and the site's topographic characteristics. These elements provide important context for understanding the land's physical and cultural setting.

Existing Conditions

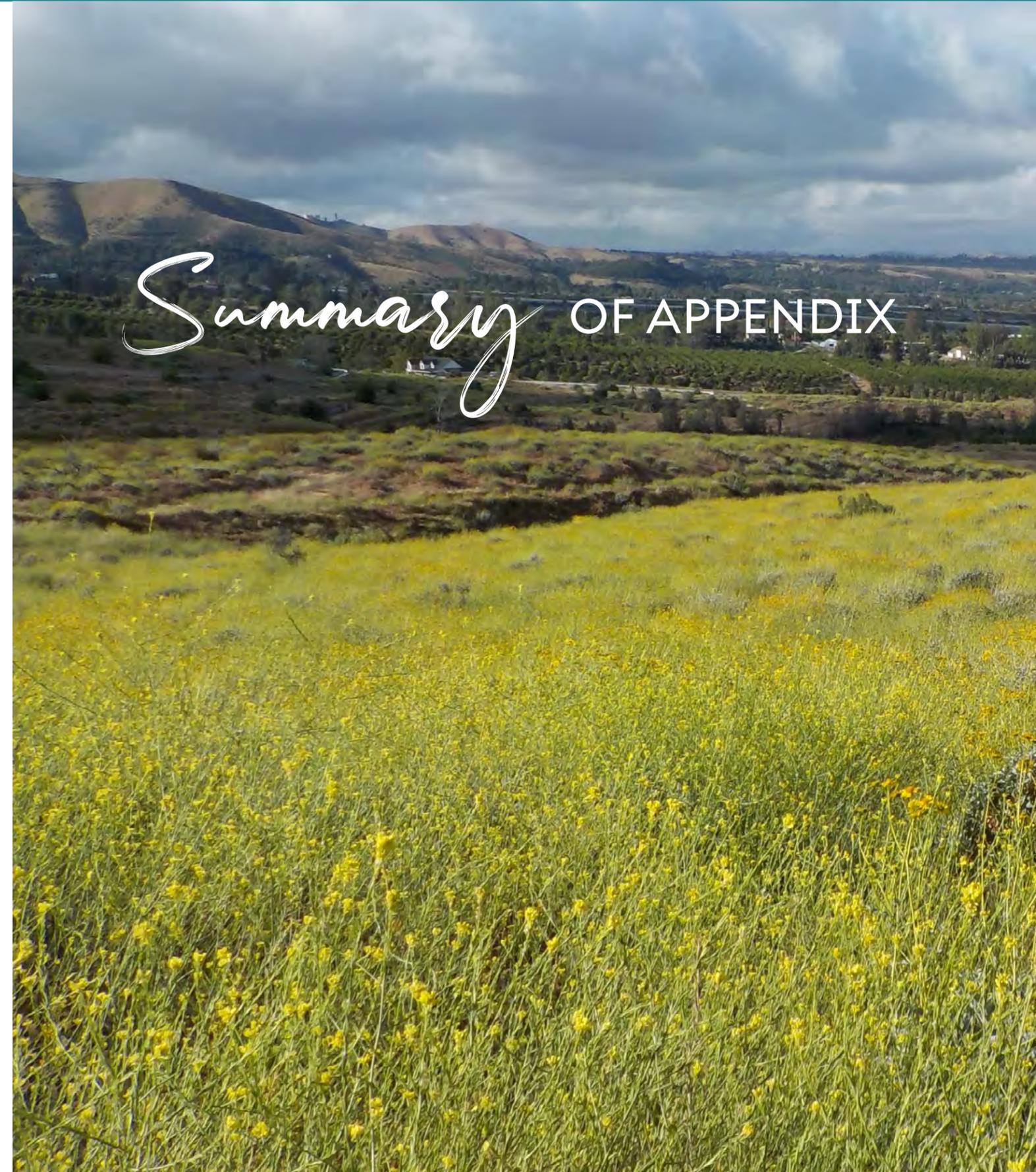
A detailed assessment of the current conditions on the property, including trail networks, regional climate, water resources, and hydrologic systems. This information establishes a baseline for evaluating future design and management strategies.

Community Engagement

Documentation of public engagement activities, including workshops, events, and community programs such as Trails Day. This section summarizes the feedback and insights gathered from participants, which were instrumental in shaping the planning vision and priorities.

Summary of Historical Studies

A compilation and summary of relevant historical documents, technical studies, and previous planning efforts. Organized chronologically, this section provides a clear record of the research and planning history that has informed the current Master Plan.





A REGIONAL WATER AGENCY
SINCE 1954



APPENDIX



A REGIONAL WATER AGENCY
SINCE 1954



Chapter 6

SITE HISTORY

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Image Source The Redlands Area Historical Society



Figure 6-1 San Manuel territory

6.0 SITE HISTORY OVERVIEW

While the area is linked to the Gabrieliño (Tongva) people of the Los Angeles Basin, San Gabriel Valley, and San Bernardino Valley, as well as the Serrano and potentially the Cahuilla from adjacent desert regions, artifacts from the Serrano have been the only ones uncovered in the area. This group is currently recognized as the Yuhaaviatam of San Manuel Nation.

A. Yuhaaviatam People

The original ancestors of the area were known as the Yuhaaviatam or “People of the Pines”, a clan of the Maara’yam (renamed Serrano in Spanish). Their modern name is derived from “Santos Manuel”, the Spanish name of a historical Yuhaaviatam leader. Their historical range covered the San Bernardino Mountains, San Gabriel Mountains, and Mojave Desert.

During the California Mission System of the 1700s, many were forced to live in missions or rancho outposts called estancias, effectively forcing them to give up traditional lifeways. Indigenous groups at the estancia in Redlands built the Mill Creek Zanja which is still visible in Redlands. Skirmishes between the Yuhaaviatam, settlers,



Figure 6-2 Farming on the tribal reservation, established 1891

Source Yuhaaviatam of San Manuel Nation

and other Indigenous groups in the 1800s forced the tribe to move around the modern day city of San Bernardino. They were inevitably moved to the Yuhaaviatam Reservation, where they remain today, and given the right to self-govern as a sovereign nation through the 1891 Act of Relief for Mission Indians.

There is a rich history of basket weaving using juncus, sumac, deergrass, and yucca. The yucca plant was used extensively for quivers, arrows, soap, fibers, and food. The Yucca Harvest is still an important festival for the Yuhaaviatam people in the area today.



Figure 6-3 Sunrise Ranch Orchard cover in 2007; Source Google Earth

B. Agricultural History

Agriculture began in the region in the 1850’s with crops like apricots, peaches, grapes, and grains. In the 1890s, Orange groves started to dominate regional agriculture, aided by the arrival of the railroad which eased transportation. The area became known for its Washington navel & Valencia oranges.

The Roberts Ranch was established before 1895, which makes up a significant portion of the present-day Sunrise Ranch property. In 1907 the property was sold to the Mentone Heights Orange Company and eventually consolidated with other properties to the west and became known as Sunrise Ranch.

Following the destruction of the Sunrise Ranch by fire and the orchards removed, few remnants remain of the 1,000-acre operation except limited building foundations and irrigation features.

Extensive terracing and orchards can be seen on the site in aerial images dating back to 1938. Agriculture continued until approximately 1968 and the fields were abandoned around the 1980’s and 1990’s. The irrigation channels and smudge pots, used to deter frost from spoiling the fruit, can still be found on site. A former retention pond in the south center of the property and water wells along the western perimeter are also remnants of the orchard.

Mill Creek Canyon was named for the first sawmill in the San Bernardino Mountains. While the exact location of the mill - referred to as Vignes-Sexton Mill, Aliso Mill, or Chino Mill - is unknown, it was likely near the canyon mouth. It operated for over 30 years, providing a constant flow of lumber as summer water was plentiful and it never froze during the winter. Lumbering began in the 1890’s in the mountains with the founding of Highland Lumber Company, later Brookings Lumber Company.



Figure 6-4 Orange picking in Redlands, CA
Source San Bernardino County Museum



Figure 6-7 Mill Creek in the summer

C. Modern Day History

Fish Hatchery Road got its name from a fish hatchery which opened in 1913 but was flooded out by storms in 1965. Space is rented out to beekeepers to keep apiaries on a small portion of the site.

The site is a combination of two different properties:

- Braemar Property: northwest 600-700 acres (mix of former orchard, undeveloped land, and steep terrain)
- Sunrise Ranch Property: southeast 1,000 acres of site (former orchard and undeveloped land)

To the northwest of the site is Greenspot Bridge. The bridge was constructed in 1912 in Illinois at Joliet Iron & Steel Works, the second largest steel mill in the country at the time. Originally it was meant to span the Mojave River in Victorville but was moved to the Santa Ana River in 1933. It was used primarily for horse-drawn wagons full of fruit, and later for commuters (one-way traffic). Now it is a multi-use trail that could provide access to the site.



Figure 6-8 Greenspot Bridge



Figure 6-5 Smudge pots in San Bernardino
Source Mark Landis, 1948



Figure 6-6 Postcard showing the orchards in Redlands, CA
Source The Redlands Area Historical Society



Figure 6-9 Seven Oaks Dam; Source Steve Schumaker, 2007

D. Water Body History

Santa Ana River - The Tongva (Gabrielino) people, who were among the first to live near the river, referred to it as Wanaawna. Villages were established within sight of the willows and sycamore that lined the riverbed. Oral history relays that the Santa Ana would flood once a generation and combine with the San Gabriel and Los Angeles rivers to become an ephemeral lake. The Santa Ana River watershed is the largest in the South Coast region of California, covering parts of San Bernardino, Riverside, Orange, and Los Angeles counties. The river runs to the north of the property.

Santa Ana Canal - In the 1890s, the Santa Ana Canal was built to bring water from the Santa Ana River and its main tributary Bear Creek to Crafton, Highland, Redlands, and Old San Bernardino. It was built to provide water for agricultural and household uses as the population began to grow in the region.

Seven Oaks Dam - The dam was built to regulate the Upper Santa Ana River for flood protection. Construction began in 1993 and was completed seven years later. Approximately six million cubic yards of material was excavated from the site for the dam. Stripping the soil created erosion and drainage issues, leading to road flooding and property damage for neighboring farms.

Mill Creek - Mill Creek is a 17 mile stream flowing from the San Bernardino Mountains into the Santa Ana River. The water quality is slightly better compared to lower portions of the Santa Ana River as the headwaters and drainage areas are less urbanized.

Mill Creek Powerhouse (Redlands Power Plant)

In 1892, the Redlands Electric Power Company captured Mill Creek in a 6,000 foot pipeline. A year later, it became the site of the first commercial alternating current power plant in the US. It intended to help expand the cultivation potential of the surrounding hills as the orange groves took over Southern California.

Mill Creek Levee - The levee was constructed by the US Army Corps of Engineers (USACE) and is constructed with a mix of masonry wall and earth. It is located in Redlands and maintained by the San Bernardino County Flood Control District. In 2013, a USACE inspection report found the condition of the levee to be minimally acceptable and recommended upgrades.

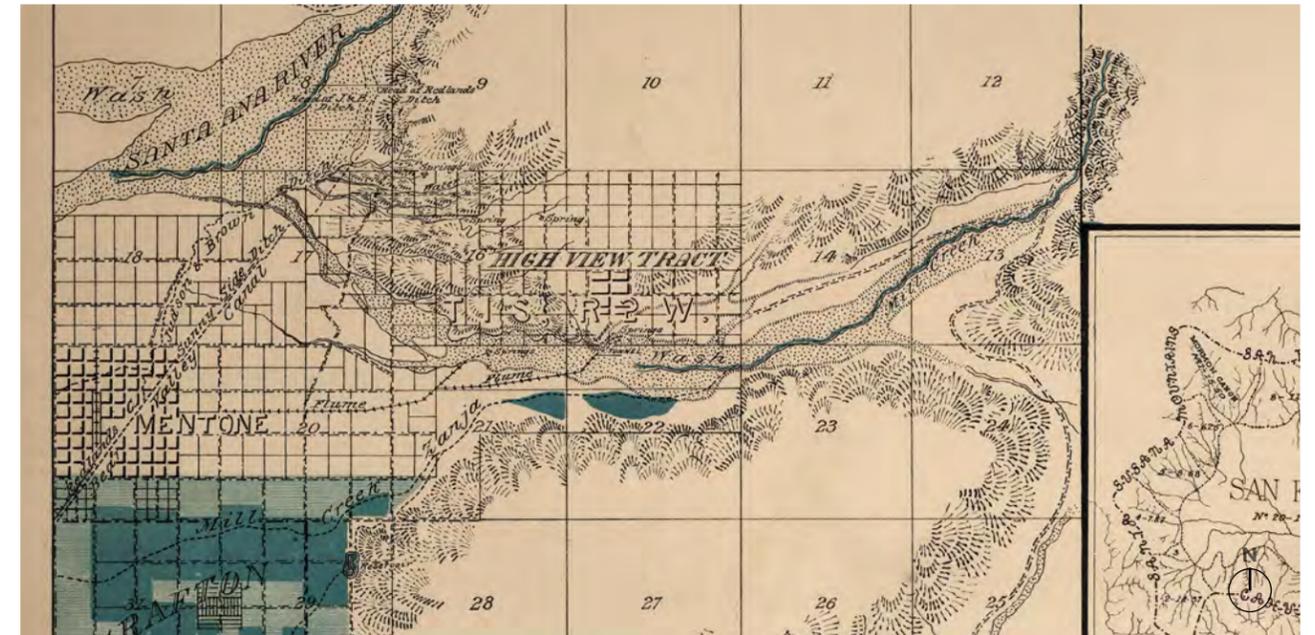


Figure 6-10 Crafton inset from a 1888 map of Irrigation Region of Los Angeles and San Bernardino counties
Source Calisphere, University of California

6.1 TOPOGRAPHIC CONDITIONS

A. Topographic Overview

The property sits at the foothills of the rugged San Bernardino mountains, rising over 1,100 feet from west to east towards the entry of the San Bernardino National Forest. The San Andreas Fault runs through the upper portion of the site. The 2011 EIR shows there are five small secondary faults that run through the property, though there is not evidence of recent activity on the faults.

The elevation of the site varies greatly. From the western boundary, the site is approximately 1,800 feet above sea level; from the foothills on the northeast side of the property, the site is approximately 2,700 feet above sea level.

Given the vast changes in topography, there is an opportunity for the community to connect with the natural topography of adjacent mountains and the site's drainage features along multipurpose trails.

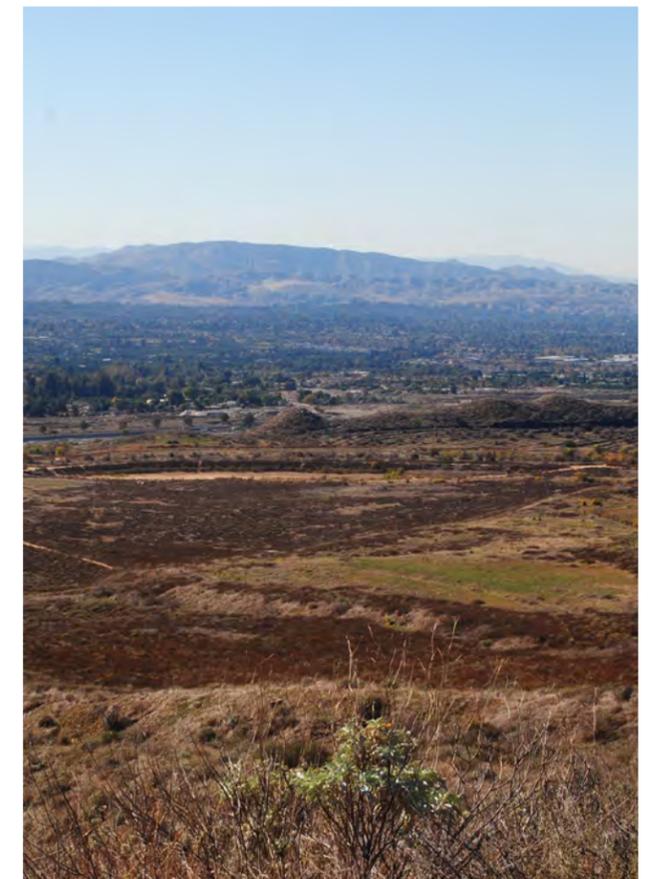


Figure 6-11 Existing mounds at the southern end of the Sunrise Ranch property

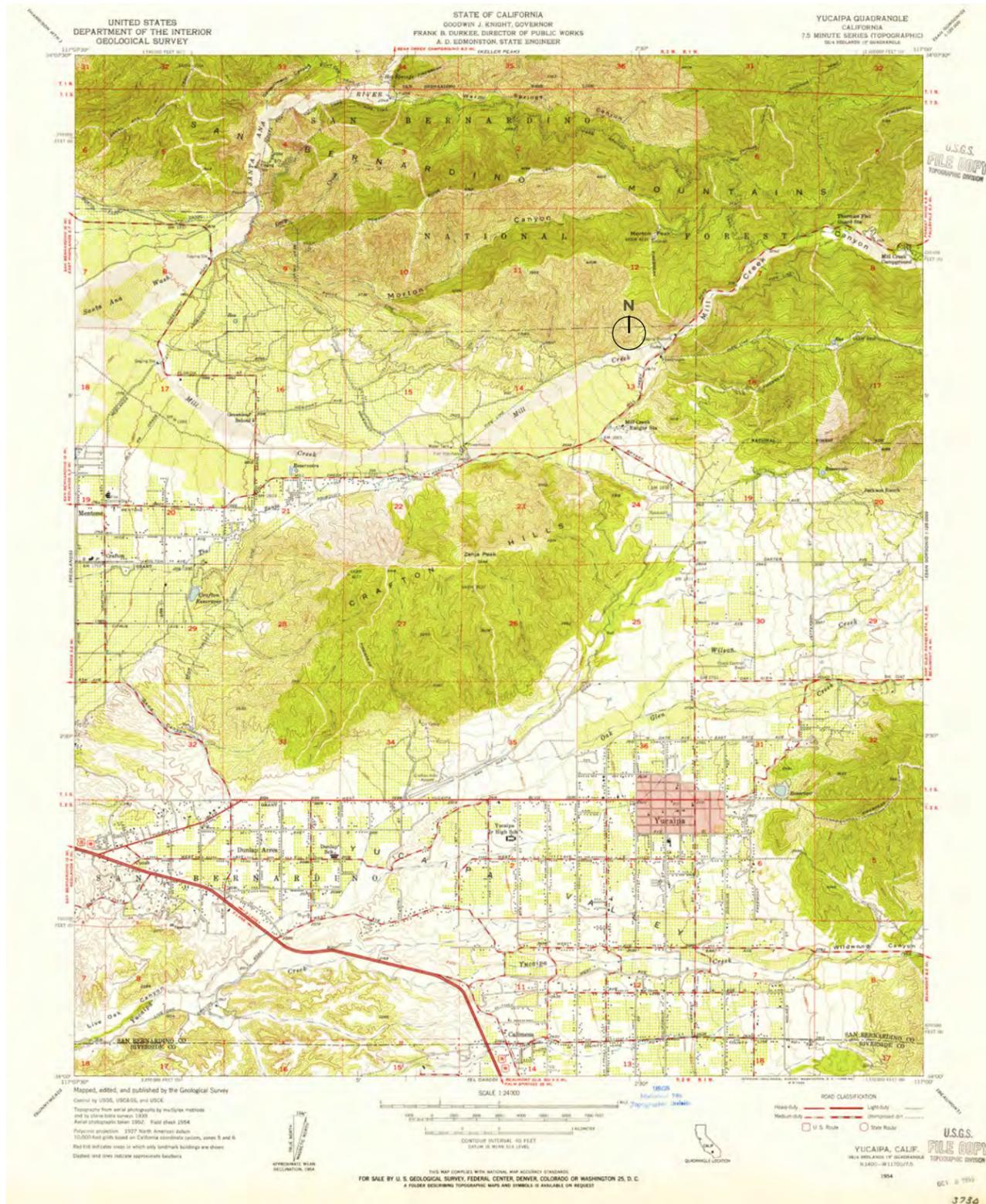


Figure 6-12 USGS topographic map from 1954
 Source State of California Public Works

B. The Site Over Time

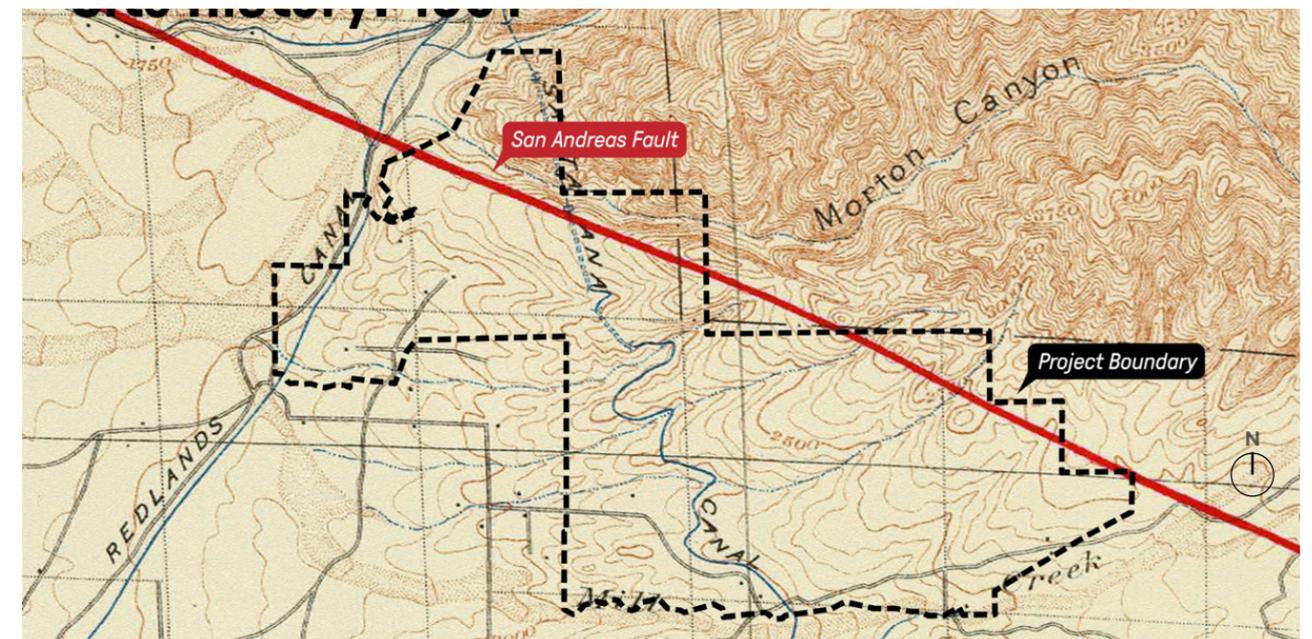


Figure 6-13 1901 map showing the untouched topography and drainages of the site; in the early 1990's the site's character, topography, and drainage features were impacted when it became a borrow site for materials used to construct the Seven Oaks Dam

Source USGS Redlands Quadrangle Map 13

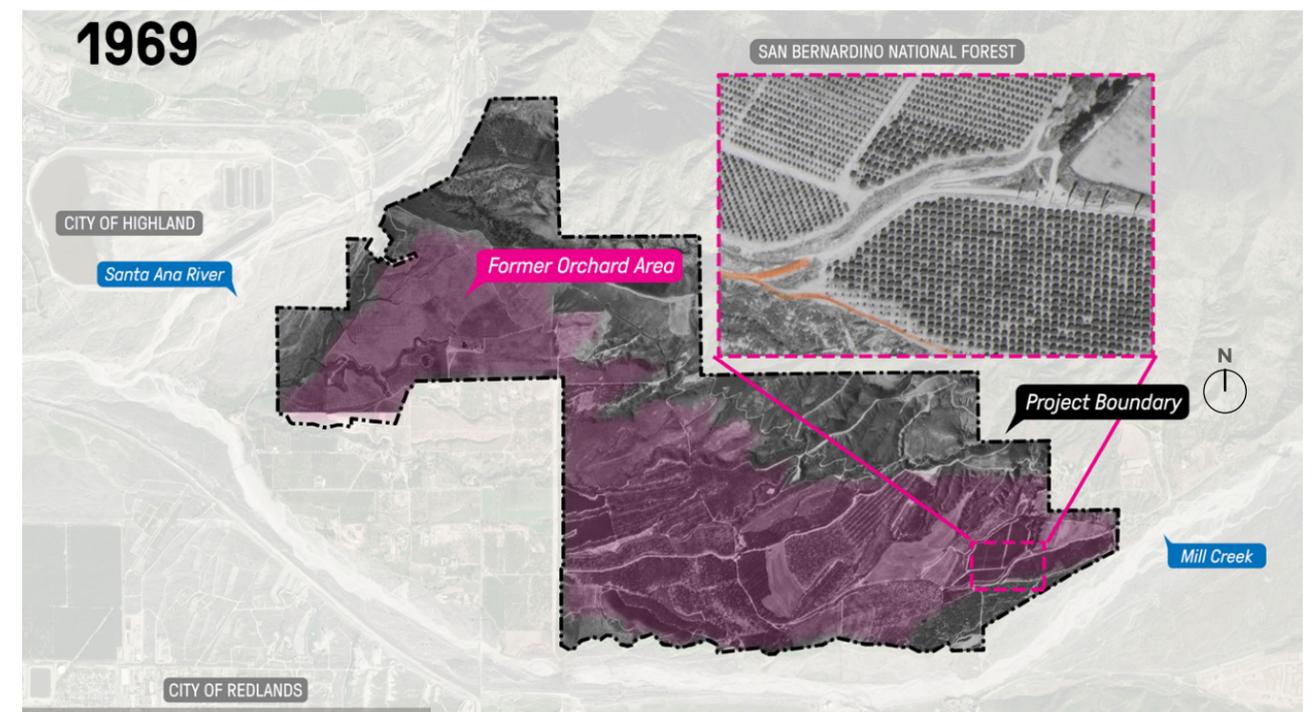


Figure 6-14 An aerial from 1938 shows the beginning of the orchard development on the property

Chapter 7

EXISTING CONDITIONS

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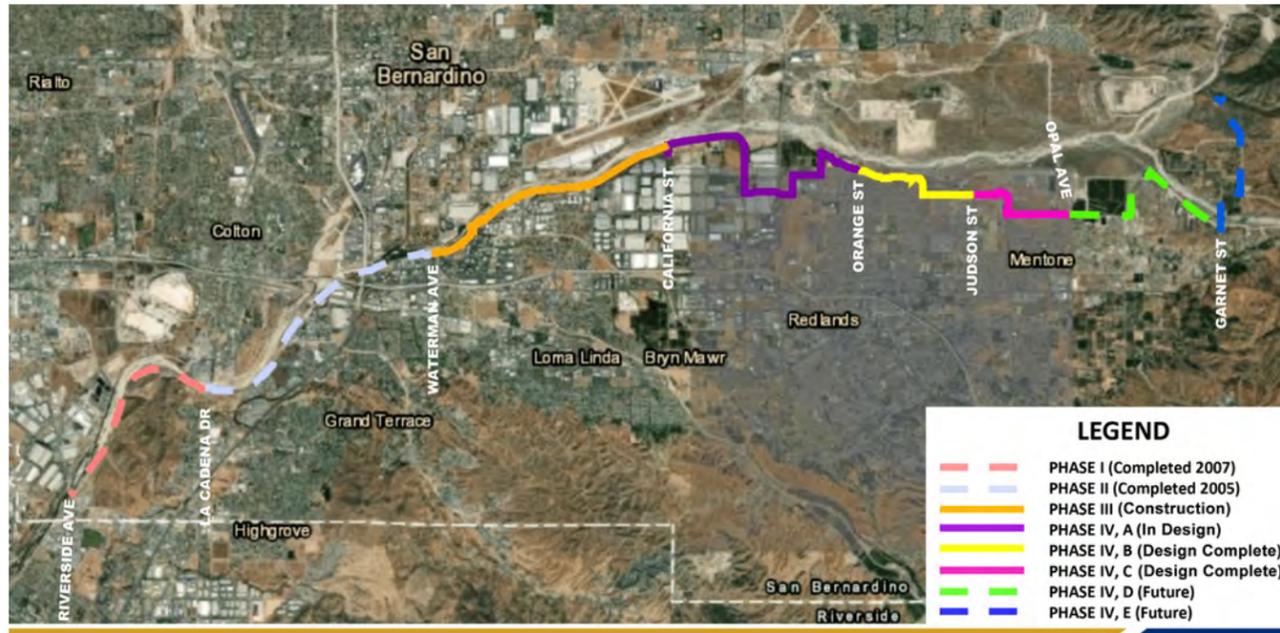


Figure 7-1 Phases for the Santa Ana River Trail; Source San Bernardino County

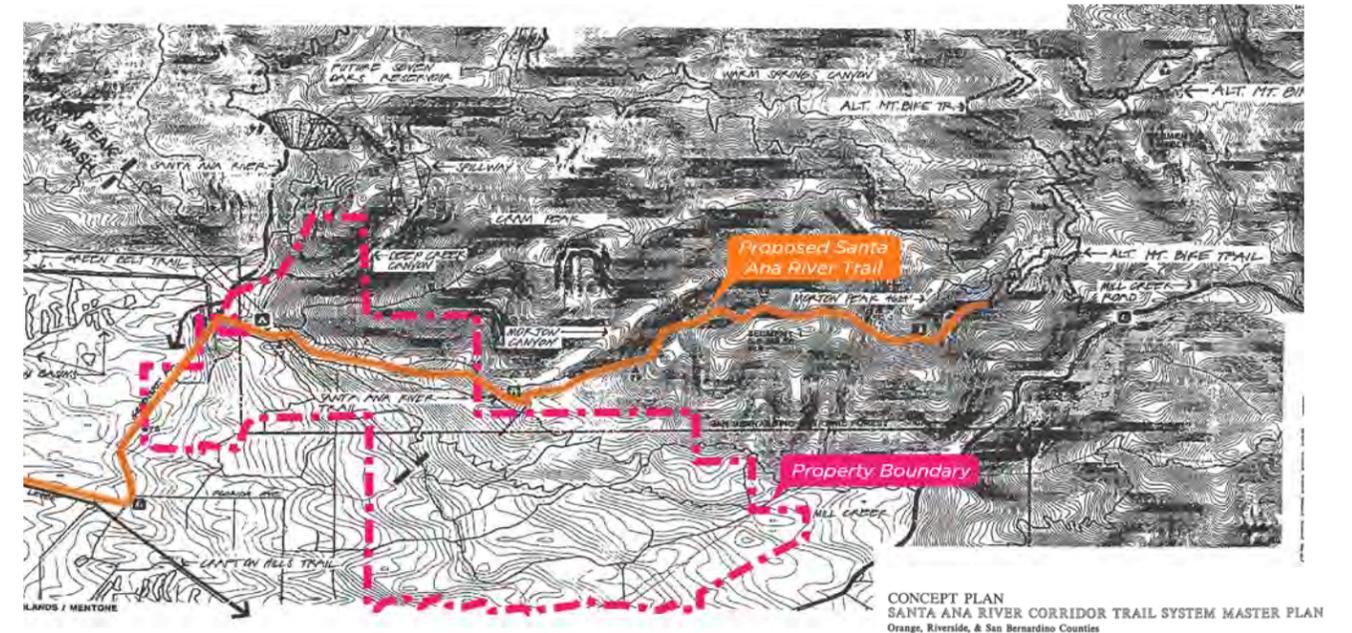


Figure 7-2 Master Plan 1990
Source Santa Ana River Corridor Trail System, EDAW Inc

7.0 TRAILS AND RECREATION

A. Santa Ana River Trail

The site is located in the planned path of the Santa Ana River Trail (SART), which is poised to be a regional trail that runs from the mountains to the sea. It was designated as a National Recreation Trail in 1977 and is planned to extend 100 miles across Southern California. The trail, like the river, begins in the San Bernardino Mountains, winding its way through the semiarid basin of the Inland Empire and coastal plain of Orange County past cities, agriculture, and open space before reaching the coast at Huntington Beach. The trail is a collaboration between many public and private agencies and non-governmental organizations.

In the 1990 Master Plan for the Santa Ana River Corridor Trail System, the proposed trail ran through the northern portion of the property as a multi-use segment. In 2014, the Santa Ana River Conservation Program was created within the State Coastal Conservancy to develop an open space plan to connect the parkway to regional recreation resources. They spearheaded the development of the Santa Ana River Parkway and Open Space Plan (SARCON) in 2018. The plan similarly shows the SART running through the site. As of 2023, the trail was roughly 60% complete.

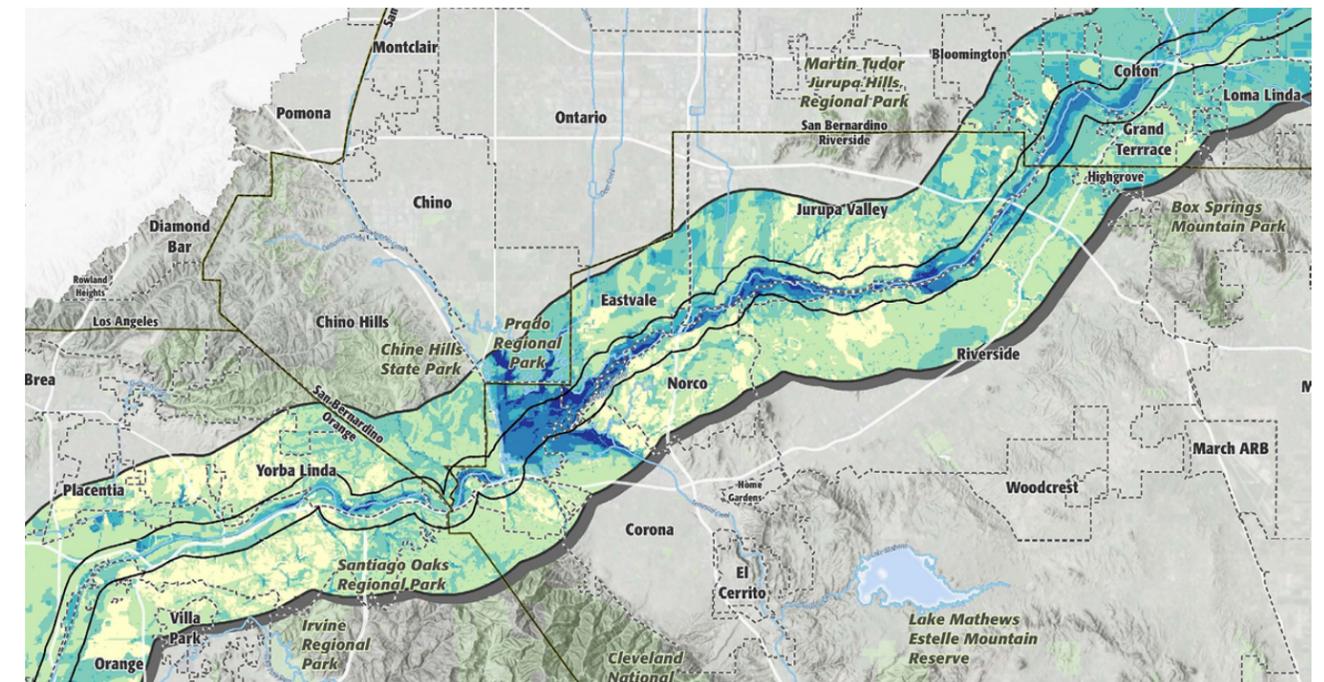


Figure 7-3 SARCON 2018 Plan
Source Placeworks

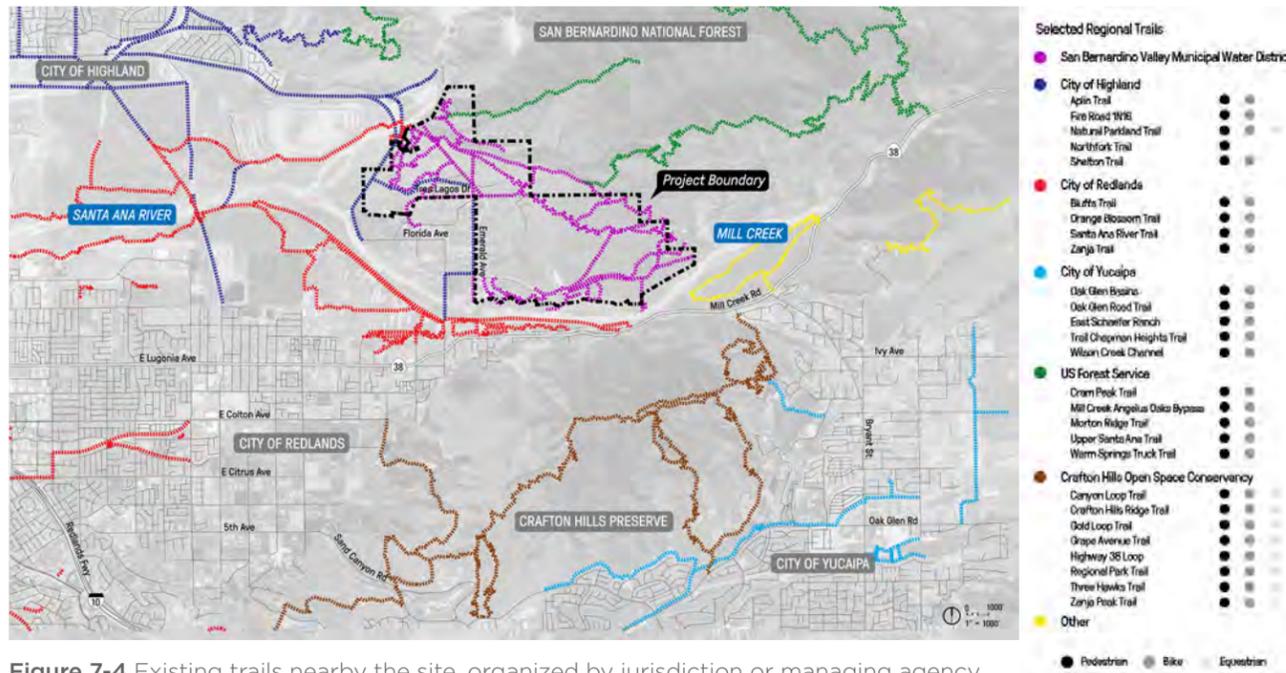


Figure 7-4 Existing trails nearby the site, organized by jurisdiction or managing agency

B. Regional Agency Trails

City of Highland - The City of Highland Community Trails Map lists 12 trails in the city. All of them are multi-use. Most of the trail connections into the Project site originate in Highland, coming down Greenspot Road. Ownership of trails that cross the Santa Ana Wash is shared between the City of Highland and City of Redlands, as established in the 2020 Upper Santa Ana River Wash Habitat Conservation Plan.

City of Redlands - There are more than 28 miles of trails and 560 acres of conserved natural open space in the City of Redlands managed by the Redlands Conservancy. The Emerald Necklace Trail and Scenic Route, open to cars and bicycles, wraps around the city past conserved citrus groves, natural open space, and the Santa Ana River Wash. All of the remaining public trails are open to pedestrians and bikers, while a few in the south are designated multi-use.

City of Yucaipa - The City of Yucaipa lists over 27 miles of multi-use, designated trails. Many of the trails follow the natural waterways and drainage canals that meander through the community. Yucaipa Regional Park sits at the base of the Crafton Hills, acting as a transition to the preserve.

Crafton Hills Open Space Conservancy - The Crafton Hills Preserve offers 3,400 acres of open space accessible through a myriad of multi-use trails. Equestrians are allowed on all hikes in the Preserve, but not the adjacent Yucaipa Regional Park.



Figure 7-5 Crafton Hills Ridge Trail
Source MTB Project



Figure 7-6 Yucaipa Regional Park picnic area and lawn; Source San Bernardino County

C. Regional Recreation

United States Forest Service - The Project sits below a portion of the San Bernardino National Forest. All of the trails and fire roads are open to hikers and bikers. Cram Peak and the Upper Santa Ana River Trail are the only two official trails that lead into the Project site. However, they provide connections to other trails and amenities within the USFS network.

Other - There are a few other trails that were logged on the app AllTrails. The app is used for outdoor activities like hiking, climbing, and biking and includes crowd-sourced information about trail conditions and photos. These trails are not necessarily managed by an agency, but are frequented by hikers and were added to show additional recreation opportunities.

Yucaipa Regional Park - In addition to hiking and biking, Yucaipa Regional Park offers camping, fishing, swimming, water recreation, and disc golf.

Crafton Hills Regional Park - Crafton Hills Regional Park is adjacent to Yucaipa Regional Park.



Figure 7-7 Campsite in San Bernardino National Forest
Source US Forest Service

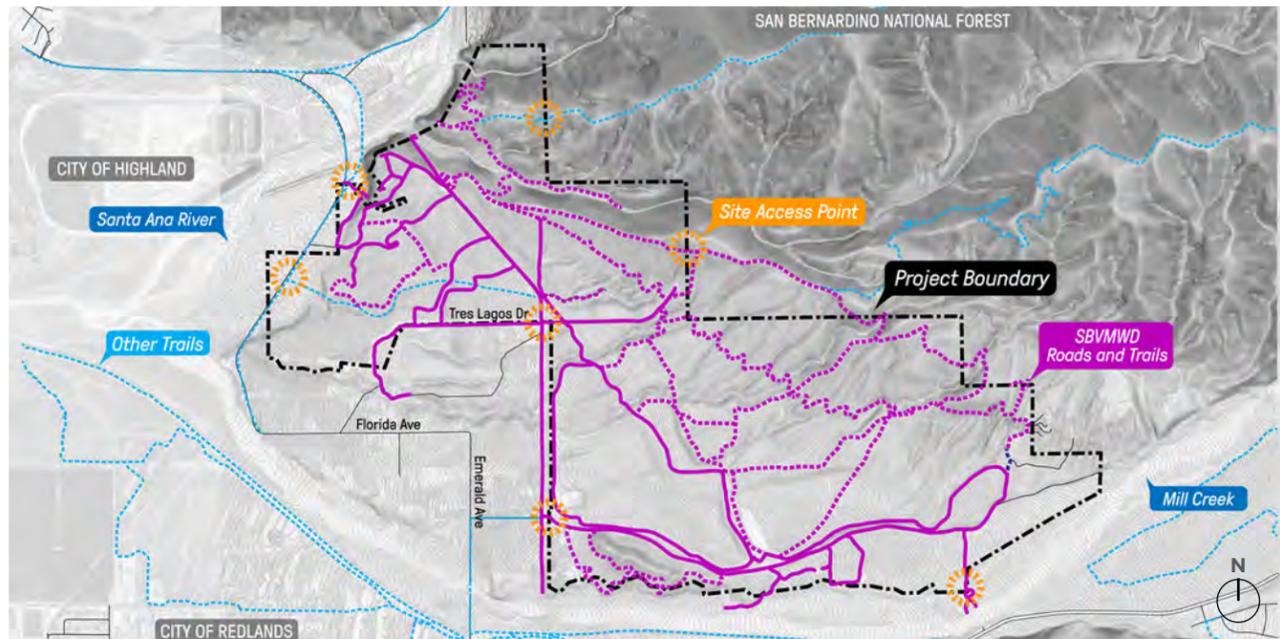


Figure 7-8 Existing trails around the site

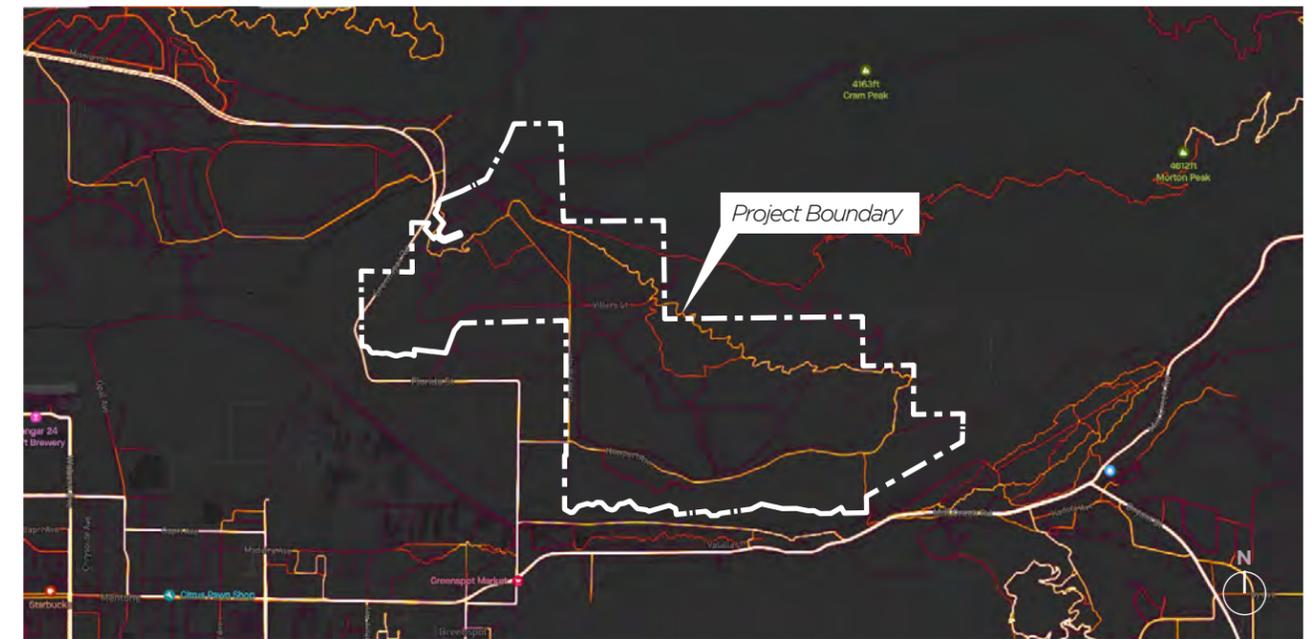


Figure 7-11 Heat map showing the popularity of trails on site by mountain bikers; Source Strava

D. Site Trails

There are over 18 miles of existing trails, dirt roads, and unofficial paths on the site. Newport Ave. runs through the southern portion of the site, leading to a small community of houses on the eastern edge of the property. Dirt roads run across the site, providing access to the Historic Mill Creek Powerhouse, take site for the Seven Oaks Dam, old water infrastructure, and the Greenspot Power Station. There are currently four access points connected to vehicular roads and two trails that provide entry into the site. There is an additional entry point near the Mill Creek Powerhouse, but requires cars to illegally cross over Mill Creek when it is dry.



Figure 7-9 Backcountry trail with wildlife present

The trails range in difficulty and traverse almost 1,000 feet of elevation gain across the site. While the site is not open to the public, there is evidence that many of the trails in the foothills of the San Bernardino National Forest are used by hikers looking for a challenge. All trails are compacted soil and vary in width. Much of the surrounding vegetation is over grown and the trails in the backcountry are slightly difficult to use due to the density of vegetation.



Figure 7-10 Maintenance road that doubles as a trail

E. Bike Usage

The crowd-sourced website MTB Project, which offers trail route ideas for mountain biking, indicates that many trails in the surrounding mountains.

The website Strava, which allows users to post bike routes, suggests a few trails in the eastern part of the site are frequently used by mountain bikers. Local nonprofit biking organizations often use one trail as route for a charity event called Hell Ride. The route follows the Upper Santa Ana River trail within the San Bernardino National Forest and utilizes a trail in the northeast part of the site before following Tres Lagos Dr. towards Emerald Ave.

While the property is not currently open to the public, cyclists currently trespass to use the trails. Based on site visits, they tend to stick to the paved trail without disturbing the habitat adjacent to them.

Figure 7-11 features roads/trails based on frequency of use.

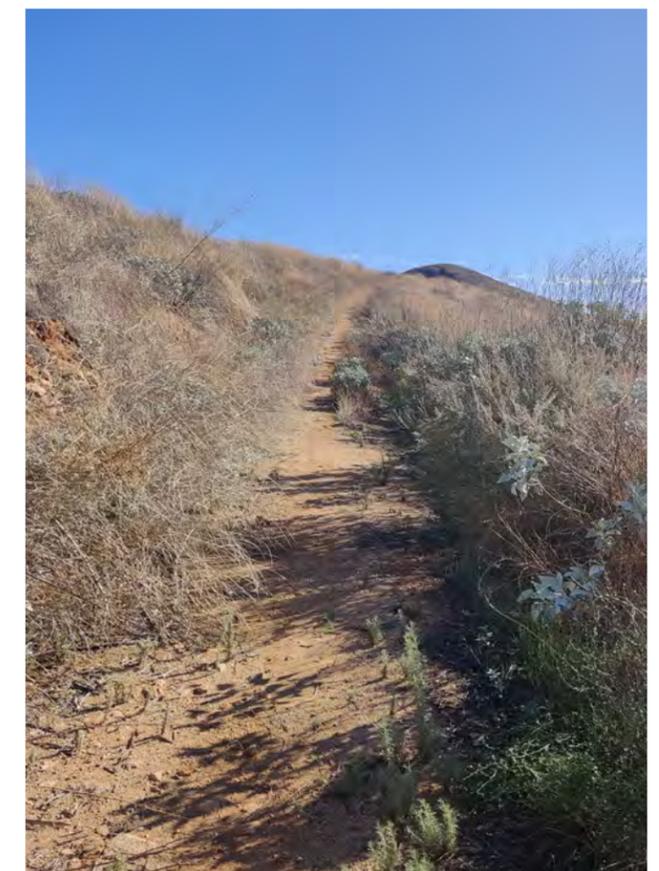


Figure 7-12 Front Line Ridge Trail, one of the trails illegally used by cyclists

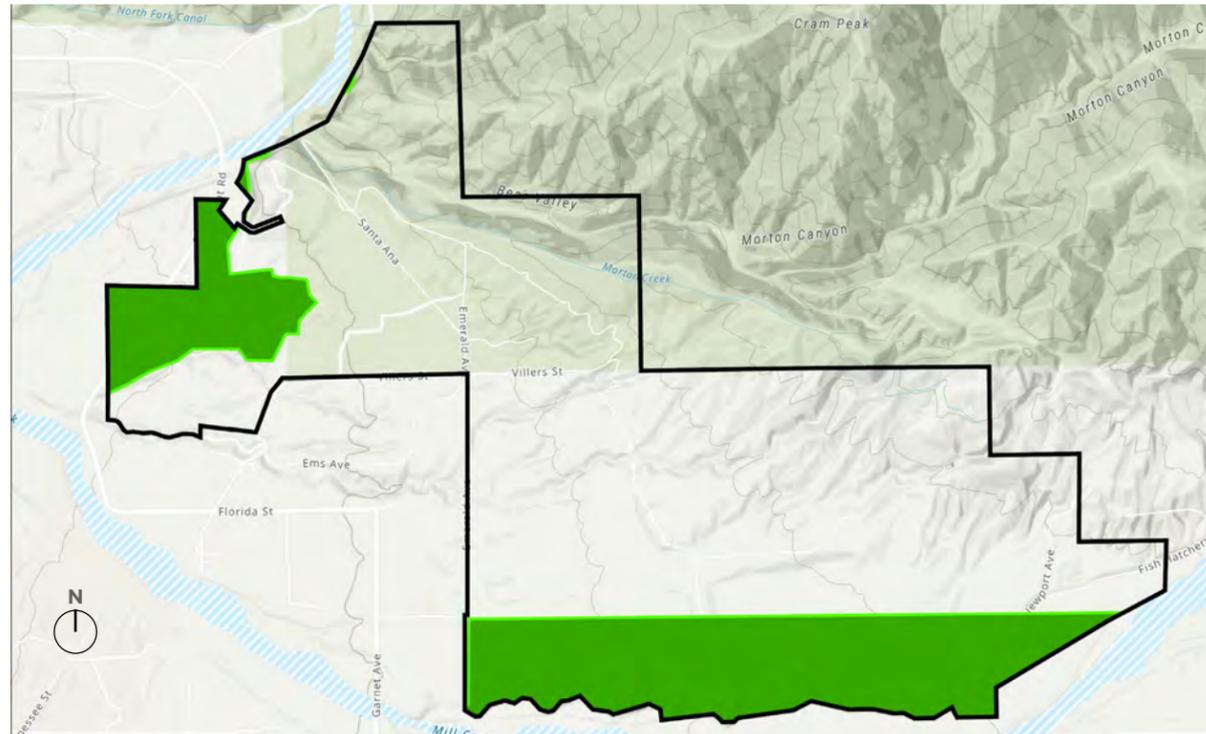


Figure 7-20 SBKR designated habitat (noted in green) on the site

C. Critical Habitat

In 2002 the U.S. Fish and Wildlife Service designated critical habitat for the San Bernardino kangaroo rat (SBKR) under the Endangered Species Act. Figure 7-20 depicts where USFWS designated critical habitat overlaps the property. Floodplains associated with Mill Creek and the Santa Ana River are listed as critical habitat and provide potentially suitable habitat. Critical habitat also occurs in foothill areas located immediately adjacent to Mill Creek and the Santa

Ana River. Though these areas do not provide the necessary constituent elements for SBKR that are described in the critical habitat designated, the areas do provide a buffer that may afford benefit to areas of potentially suitable habitat.

Regardless of suitability, a federal nexus for any proposed project that overlaps critical habitat triggers a consultation between the federal agency and U.S. Fish and Wildlife Service (USFWS) before any federal permits can be issued.



Figure 7-21 Potential enhancement opportunity areas for SBKR; downstream of pilot channel



Figure 7-22 Potential enhancement opportunity areas for SBKR; sand piles

7.2 WATER RESOURCES

A. Surface Water Hydrology/Drainage

Surface flows through the site emanate from local tributary watersheds draining through the property. Two large regional conveyances, Mill Creek and the SAR, flank the south and west borders of the property. Some details about the regional and local watersheds are shown in Figure 7-23.

The hydrologic processes that generate runoff in these watersheds, and the nature of the flows from these watersheds, play a tremendous role in the subsurface hydrology, topography, physical characteristics, and types of habitat that exist and that can be fostered on the Sunrise Ranch property area. Surface flows on the property originate from a combination of local and regional watersheds.

1. Regional Watersheds and Floodplains

The Mill Creek watershed and the SAR watershed above Seven Oaks Dam, which border the Sunrise Ranch property to the south and west, are both environmentally significant, and have

been affected by anthropogenic impoundments created for water use and distribution, power generation, and flood control. These two regional watersheds generate consistent perennial stream flows from regular runoff that provide nearly continuous flows in the SAR and Mill Creek.

Regional flows and associated periodic peak flow rate surges are essential components in the creation cycle and maintenance of the SBKR habitat that exists on the property. They also provide ongoing feed to local aquifers that supply groundwater to the Bunker Hill Subbasin. As a fundamental defining element of the Sunrise Ranch property, these flows create a location that is significant to the regional water cycle and an ideal setting for the planned project goals. Detailed flow rates for the regional watersheds are provided in Figure 7-29.

Both watersheds are fundamentally similar in that they are large, arid mountain watersheds in the transverse range. However, the nature of the SAR and Mill Creek channels is quite different, owing to the differences in the geology of the watersheds and the channels and the debris-capturing effects of Seven Oaks Dam.

A. Santa Ana River Watershed and Floodplain

The SAR watershed above Seven Oaks Dam is

approximately 210 square miles, draining portions of both the San Gabriel and San Bernardino Mountains. The SAR drainages tributary to the project site include Big Bear Lake and the San Bernardino Mountains north of Big Bear. The SAR watershed extends from Big Bear Lake through portions of San Bernardino, Riverside, and Orange County on its way to the Pacific Ocean at Huntington Beach. The ecological significance of the watershed includes areas of high importance at the estuary and in the river channel along the Sunrise Ranch property. There are small amounts of SAR floodplain on the property, with much of the broader channel overbanks forming the western extents of the property and associated habitat areas.

The river itself flows nearly 100 miles from its northernmost reaches at the crest of the San Bernardino Mountains, south of Big Bear, out to the coast near Huntington Beach. The man-made installations of Prado Dam and Seven Oaks Dam have significantly altered the flow patterns and geomorphic behavior of the SAR. Seven Oaks Dam is immediately upstream of the Sunrise Ranch property and bears complete control over the possible flows in the SAR along and downstream of the property.

The upper SAR system can be broadly described using the Rosgen classification system. The slope

is moderately steep past the Sunrise Ranch property, but the valley opens up to become Type VIII, a wide valley, with a gentle longitudinal slope downstream of the project, well developed floodplains, and terraces adjacent to the river. Soils are developed over predominantly alluvial depositions. The resultant stream is Type C, with moderate meandering, slightly entrenched and defined channels, and broad valleys associated with floodplains.

The SAR traverses several large groundwater basins that are recharged along its path. The strong flow to groundwater is a fortuitous result of the channel bed composition and subsurface geology. The channel bed material along the length of the river is predominantly sand composition.

The SAR floodplain is relatively confined upstream of the confluence with Mill Creek, particularly along the north-westernmost border of the project property where the SAR channel is still steeply descending downstream from Seven Oaks Dam. The USACE and Federal Emergency Management Agency (FEMA) hydraulic modeling both show a moderately narrow floodplain, considering the flowrates in the SAR, with some widening as the channel approaches the Mill Creek confluence.

Watershed Name & Location	Watershed Area		% of Total Watershed
	(sq. miles)	(Acres)	
Santa Ana River (at Seven Oaks Dam)	210	134,122	79%
Mill Creek (above SAR Confluence)	49	31,323	19%
Sunrise Project Local Watersheds (upstream of project boundary)	3.4	2,191	1%
Sunrise Project (on site Watershed)	2.6	1,657	1%

Figure 7-23 Watershed area summary

Watershed Name & Location	Area (sq miles)	Area > 6,000 Elev.		Elevation	
		(%)	(sq. miles)	High Point	Low Point
Santa Ana River (at Seven Oaks Dam)	210	76%	160	11,400	1,890
Mill Creek (above SAR Confluence)	49	53%	26	11,200	2,050
Sunrise Project Local Watersheds (upstream of project boundary)	3.4	NA	NA	4,624	2,073
Sunrise Project (on site Watershed)	2.6	NA	NA	2,909	1,746

Figure 7-24 Watershed area and elevation details

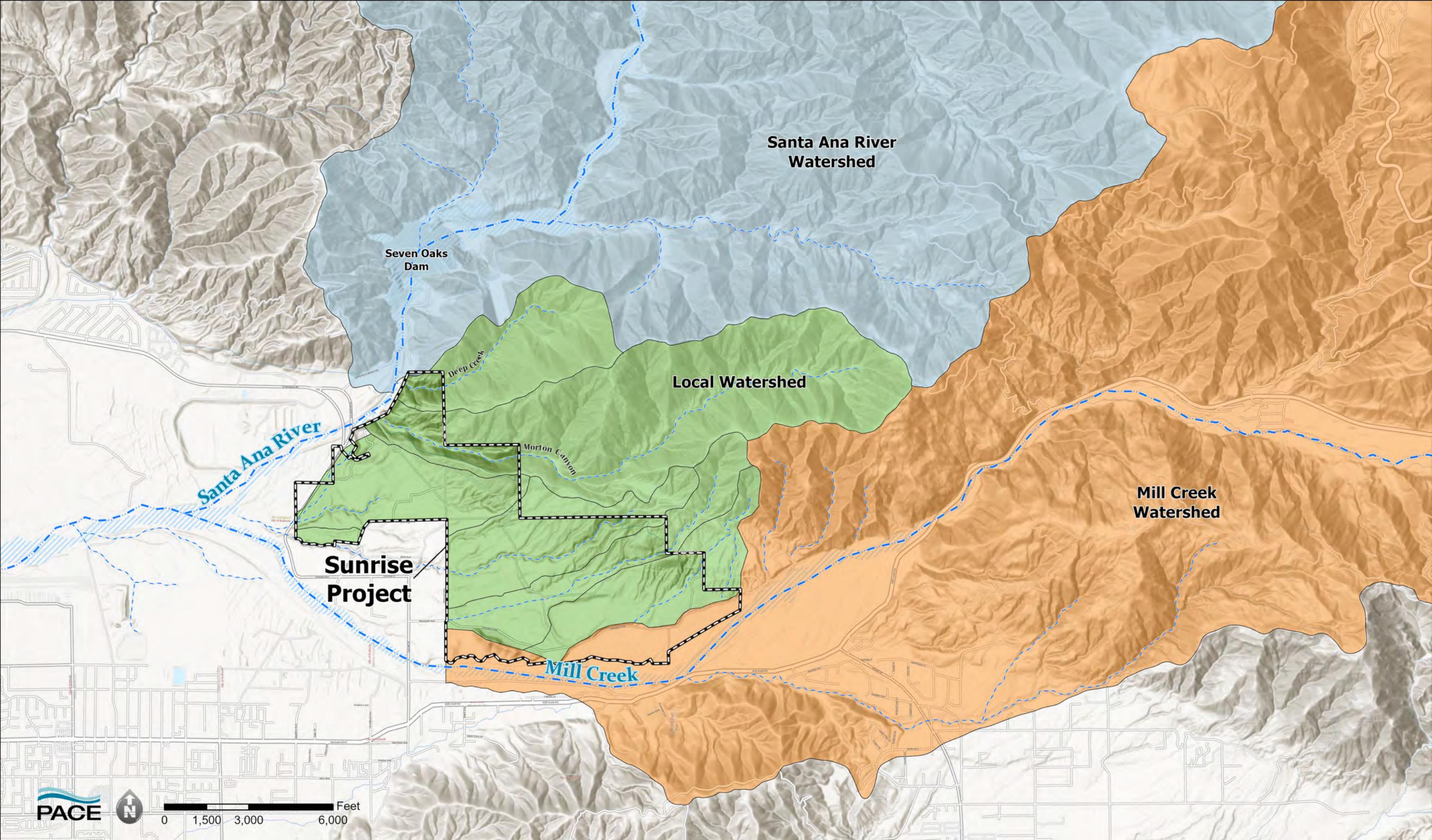


Figure 7-25 Sunrise project with the Mill Creek and Santa Ana River watersheds

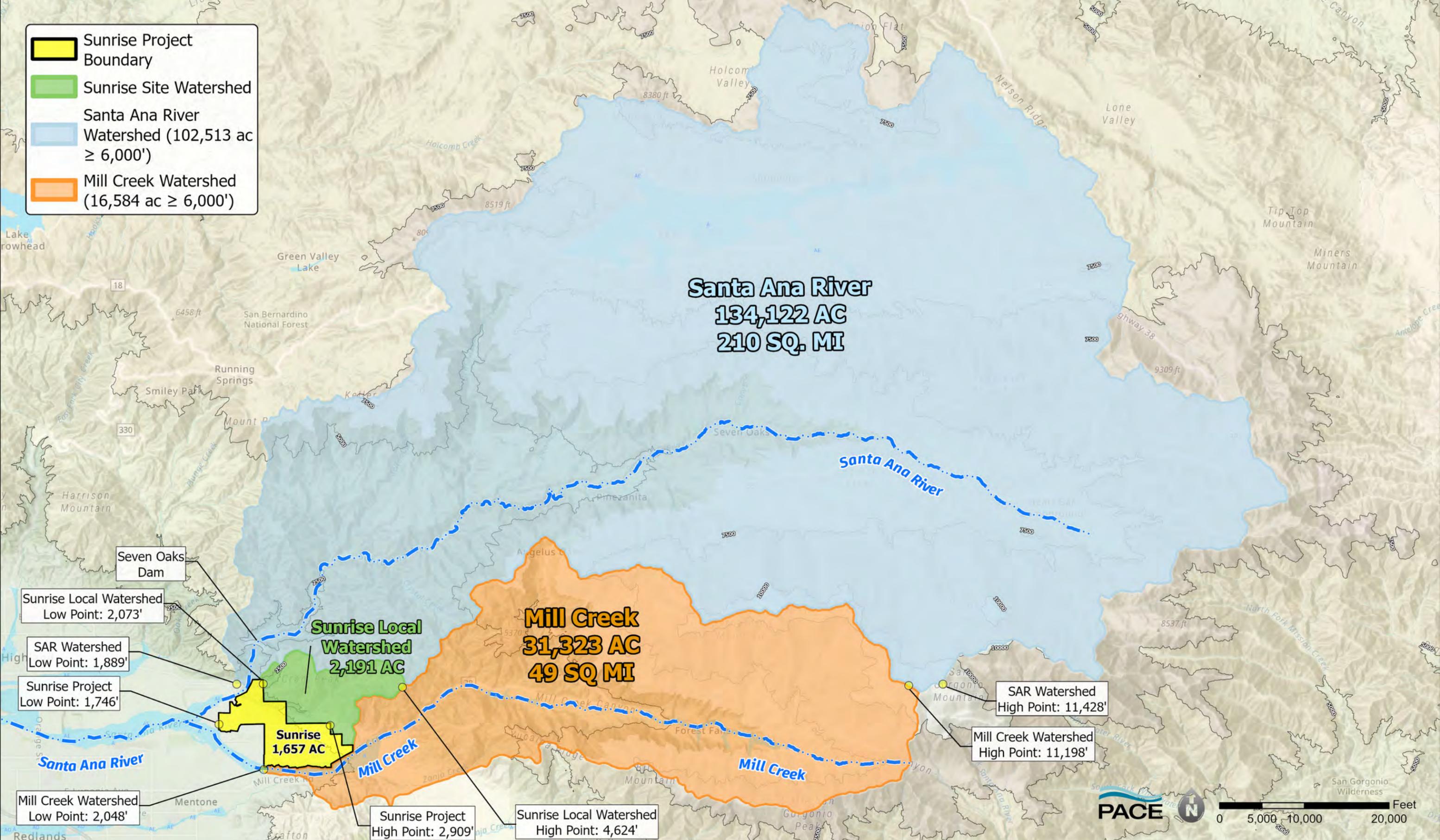


Figure 7-26 Sunrise project regional and local watersheds



Figure 7-27 Santa Ana River at Greenspot Road Bridge: view of Santa Ana River Enhanced Recharge in the distance

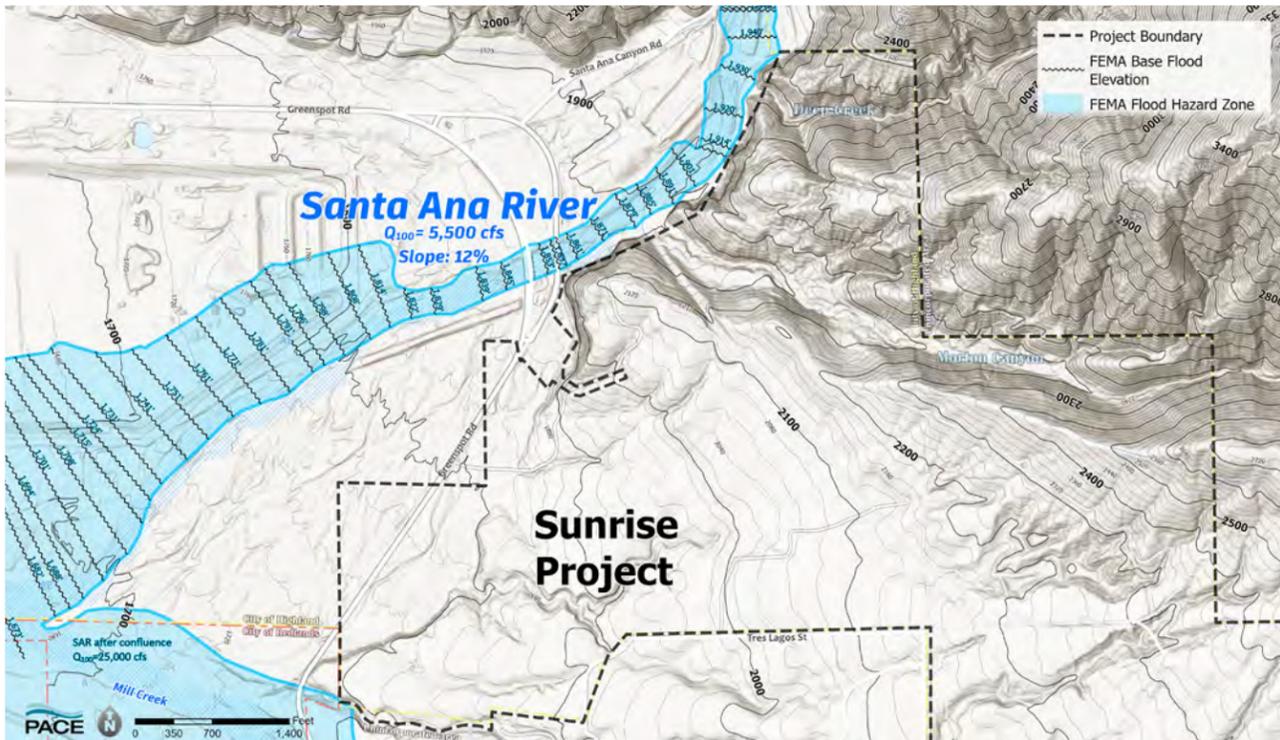


Figure 7-28 Santa Ana River Floodplain adjacent to Sunrise Ranch Property

Watershed Name & Location	Area (sq miles)	Area > 6,000 Elev. Elevation						
		2-yr 50%	5-yr 20%	10-yr 10%	25-yr 4%	50-yr 2%	100-yr 1%	200-yr 0.5%
Santa Ana River (Above Seven Oaks Dam)	210	1,100	4,300	8,800	20,500	34,000	58,000	88,000
Santa Ana River (Below Seven Oaks Dam)	210	500	2,000	2,150	3,150	4,200	5,500	6,900
Santa Ana River (Below Mill Creek Confluence)	259	760	2,050	4,300	9,300	15,500	25,000	37,000
Mill Creek (Above SAR Confluence)	49	225	1,250	2,900	7,700	13,000	22,000	33,000

Figure 7-29 SAR and Mill Creek flow rates

The SAR hydraulics and floodplain have been analyzed by both the USACE and FEMA. FEMA has a detailed Hydrologic Engineering Center – River Analysis System (HEC-RAS) model that was used to develop 100-year base flood elevations and floodplain extents. The effective FEMA floodplain is shown on Figure 7-28. The depicted floodplain limits are Flood Insurance Rate Map (FIRM) panel boundaries based on regional level hydraulic modeling and do not necessarily reflect the actual floodplain boundaries adjacent to the project property at a detail level.

B. Mill Creek Watershed and Floodplain

The Mill Creek watershed is a smaller regional watershed, approximately 65 square miles, draining a region of the San Bernardino Mountains immediately south of the SAR watershed, including Angeles Oaks and Forest Falls. The Mill Creek watershed is a significant component of the overall SAR tributary, flowing into the SAR at the western apex of the jut of land between the SAR and Mill Creek, west of the Sunrise Ranch property. There is significant habitat and habitat opportunity in the broader Mill Creek channel along the Sunrise Ranch property.

There are no flood control impoundments along Mill Creek; however, there are stream diversions for non-consumptive use through Southern

California Edison’s (SCE’s) Mill Creek Power House (PH) 1 and 3, located upstream of the project property, followed by the Cooley Hat diversion into consumptive uses downstream.

Emanating from the mountainous area south of the upper SAR watershed, the creek plunges along the south border of the Sunrise Ranch property to the confluence with the SAR. The valley, which can be classified as Type II, is steep and cuts across the bottom parts of transverse ridges of tributary catchments. The colluvial slopes are composed of mainly rocky material with bedrock exposures. The creek is classified as Type B, which is relatively straight. The creek is dominated by rapids with occasional scour pools. The main channel creek bed material is predominantly cobble and rounded river rock, with a relatively low sediment supply.

Mill Creek flanks several thousand feet of the southern property boundary. The Mill Creek floodplain extends across a large part of the south part of the property, with 63 acres of FEMA 100-year Mill Creek floodplain within the property limits.

The Mill Creek hydraulics have been analyzed by the USACE in support of a federal floodwall project upstream of Sunrise Ranch. The model

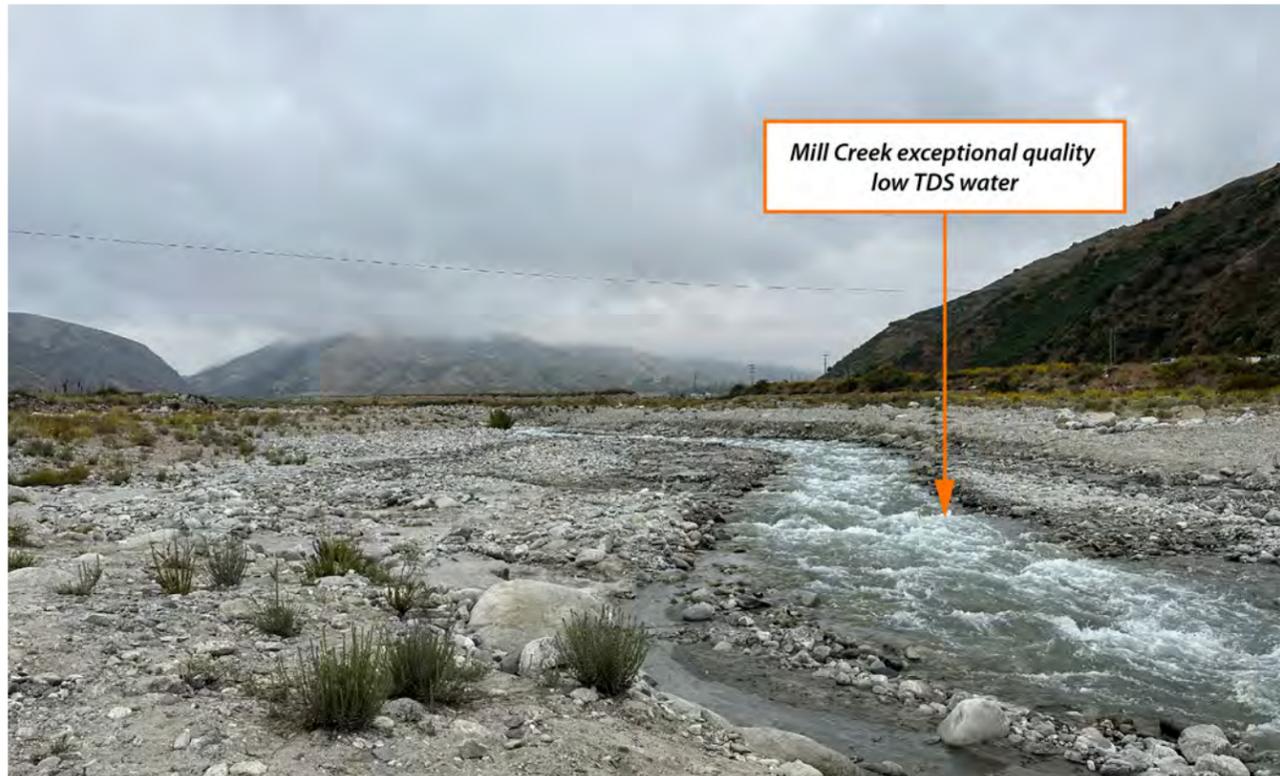


Figure 7-30 Mill Creek: Looking Upstream from Powerhouse 1

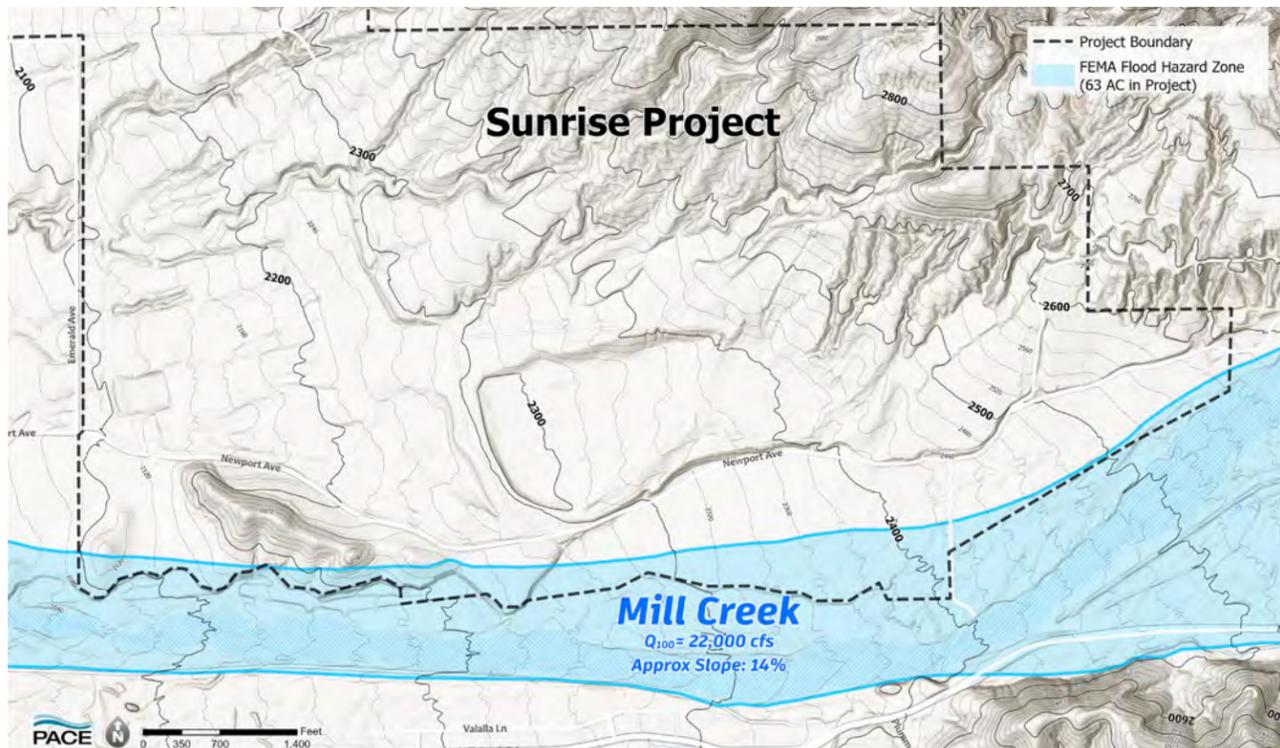


Figure 7-31 Mill Creek Floodplain Within Sunrise Project

was not available for project consideration in this document. FEMA has a published 100-year floodplain on Mill Creek, shown on Figure 7-31, which is based on approximation methods and does not provide any flood elevation data. The FEMA floodplain should, however, approximately represent the floodplain boundary expected from appropriate regional hydraulic analysis.

Much of the floodplain, based on assessment of topography and terrain, is on broader overbank terraces composed of sand and finer materials along the Sunrise Ranch property. These terraced overbanks support vegetation and are subject to periodic flushing and reset during high flow events in Mill Creek. The geologic and hydrologic conditions contribute to an environment that may be suitable for SBKR and other species.

2. Local Watersheds / Drainages

Surface flows at Sunrise Ranch also include ephemeral pulse-type flows from the local watersheds, which are tributary to, and drain through, the property. They comprise the “local watershed” drainage area shown in green on Figure 7-25. The watersheds range in size from less than 200 acres to approximately 1,500 acres, as shown on Figure 7-32, and provide occasional runoff when local precipitation is significant enough to generate surface excess. All of the local watersheds have similar hydrology and physiographic features.

Each of the local watersheds exhibits arid region hydrology with flows dominated entirely by local precipitation events. The local watersheds are generally dry and lack base flows, except for the Morton Canyon watershed, which has spring activity and attendant vegetation.

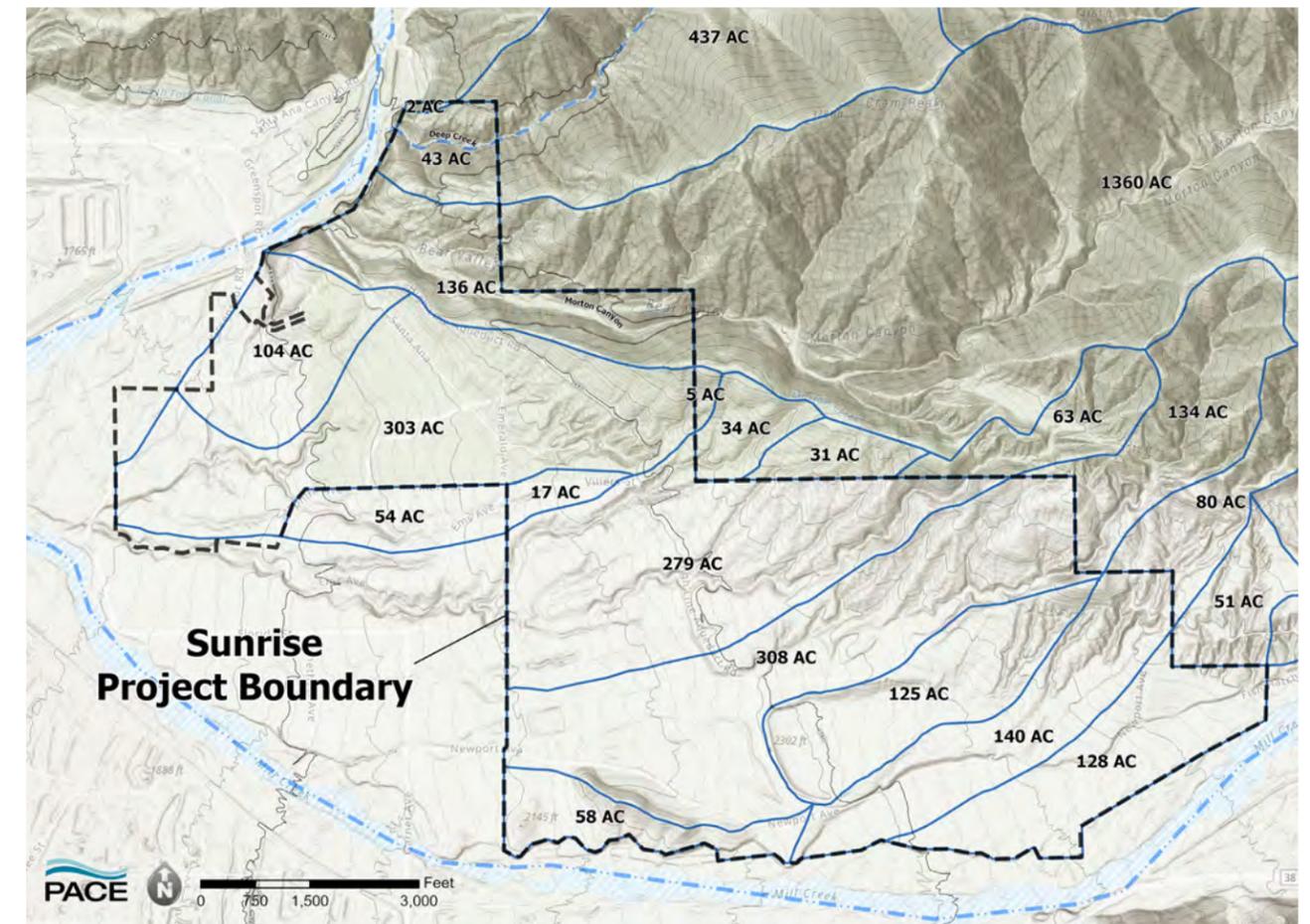


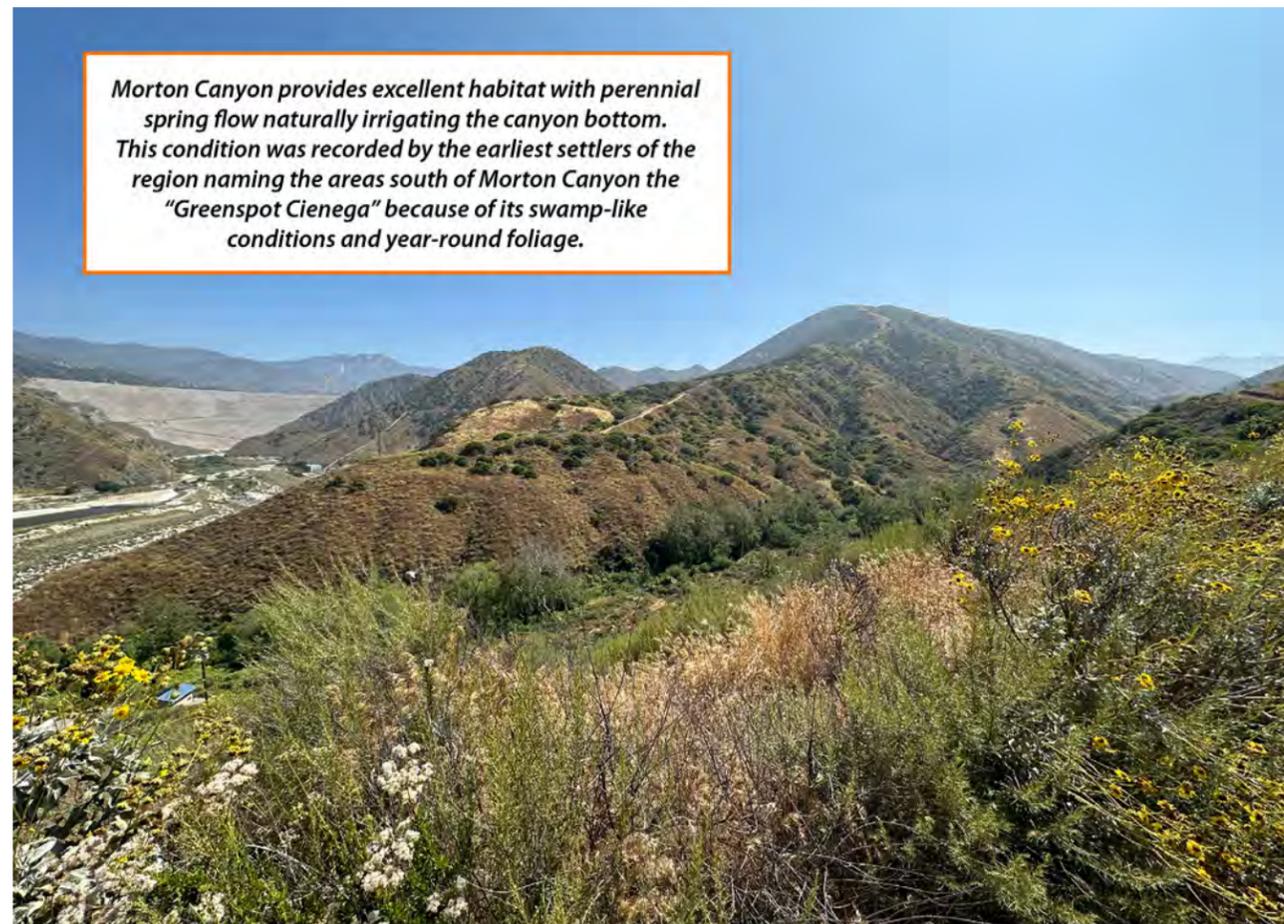
Figure 7-32 Existing local hydrology map

The occasional flows through the project area created by local rain events have established the site geography, which is dominated by rolling hillside and ridges with incisions, formed over time by flashy runoff through the ancient soil on the project surface. Although local runoff only occurs during local storms, it may be useful to consider when accounting for future water demand and usage.

Hydrologic calculations were performed for the local watersheds to calculate the peak flowrates and flow volumes tributary to points along the project border and at certain locations within the Sunrise Ranch property.

Hydrographic analysis was performed for 2-, 5-, 10-, 25-, 50-, and 100-year, 24-hour storms to calculate runoff peak flow rates and volumes. The San Bernardino County storm pattern is

constructed from nested blocks of intensity, built outward from the peak period of intensity. The storm pattern captures the high intensity peaks characteristic of short storms and the larger runoff volumes characteristic of long storms. Calculations used San Bernardino County Hydrology Manual loss rates and storm patterns and National Oceanic and Atmospheric Administration (NOAA) Atlas 14 precipitation data. The calculations used a short-form calculation, without convoluting with a unit hydrograph. Thus, the calculated peaks are slightly conservative, and the volumes are exact. The local hydrology results are summarized in Figure 7-34.



Morton Canyon provides excellent habitat with perennial spring flow naturally irrigating the canyon bottom. This condition was recorded by the earliest settlers of the region naming the areas south of Morton Canyon the "Greenspot Cienega" because of its swamp-like conditions and year-round foliage.

Figure 7-33 Morton Canyon

B. Groundwater / Hydrogeology and Faults

Groundwater basins in the San Bernardino Valley service area include the following:

- San Bernardino (Bunker Hill)
- Rialto-Colton
- Chino
- Riverside-Arlington
- Yucaipa
- San Timoteo

Of these, the San Bernardino Basin Area (historically known as the "Bunker Hill Subbasin") is a primary aquifer used for pumping, storage, and recharge in the San Bernardino Valley. As

shown in Figure 7-37, the Sunrise Ranch property lies atop the northeast corner of the Bunker Hill Subbasin. Any groundwater extracted or recharged from the Sunrise Ranch property must be in conformance with the groundwater adjudications and management strategies associated with this subbasin.

"California's Groundwater" (Bulletin 118) is the State's official publication on the occurrence and nature of groundwater in California. The publication defines the groundwater basin boundaries and summarizes groundwater information for each of the State's 10 hydrologic regions. Information about the Santa Ana River watershed groundwater basins from this publication is presented in Figure 7-35.

Node	Area (ac)	100-Year		50-Year		25-Year		10-Year		5-Year		2-Year		Area (ac)	Node
		Q (cfs)	V (ac-ft)	Q (cfs)	V (ac-ft)	Q (cfs)	V (ac-ft)	Q (cfs)	V (ac-ft)	Q (cfs)	V (ac-ft)	Q (cfs)	V (ac-ft)		
1	2	6	1.1	5	1.0	5	0.8	4	0.7	3	0.5	2	0.3	2	1
2	437	1288	158.8	1135	121.9	981	100.3	788	80.7	645	64.5	470	43.6	437	2
3	480	1416	174.6	1248	134.1	1078	110.3	866	88.7	709	71.0	516	47.9	480	3
4	1360	4010	494.5	3533	379.7	3053	312.4	2452	251.2	2008	201.0	1462	135.6	1360	4
5	1496	4555	827.9	4042	725.2	3529	621.0	2889	488.3	2418	387.6	1844	258.2	1496	5
6	5	16	2.8	15	2.4	13	2.0	10	1.5	9	1.1	6	0.7	5	6
7	104	313	49.4	277	41.4	241	33.1	195	22.2	162	17.2	120	14.0	104	7
8	373	1124	182.0	995	153.8	865	124.7	703	86.5	583	59.3	436	50.6	373	8
9	17	50	7.6	44	6.3	38	5.0	31	3.2	26	2.8	19	2.2	17	9
10	71	213	35.7	189	30.5	164	25.1	134	18.1	111	12.6	84	9.5	71	10
11	34	103	17.9	91	15.5	80	13.0	65	9.7	54	7.2	41	4.2	34	11
12	51	154	28.1	137	24.6	120	21.1	98	16.6	82	13.2	62	8.8	51	12
13	20	60	10.9	53	9.5	46	8.2	38	6.4	32	5.1	24	3.4	20	13
14	63	191	34.7	170	30.4	148	26.1	121	20.5	101	16.3	77	10.9	63	14
15	11	35	6.3	31	5.5	27	4.7	22	3.7	18	3.0	14	2.0	11	15
16	134	407	74.0	361	64.8	315	55.5	258	43.7	216	34.7	165	23.2	134	16
17	403	1203	174.7	1063	142.4	921	108.8	745	77.7	614	67.0	453	49.8	403	17
18	134	407	72.7	361	63.4	315	53.9	258	41.6	215	32.3	164	20.1	134	18
19	271	821	142.0	728	122.6	634	102.6	517	76.8	431	56.8	326	34.0	271	19
20	590	1786	305.4	1582	262.6	1378	218.6	1123	161.6	936	117.2	705	76.9	590	20
21	75	223	31.5	197	25.4	171	19.0	138	14.5	113	12.3	83	9.0	75	21
22	80	242	48.1	215	37.5	187	31.8	153	24.5	128	18.9	97	11.6	80	22
23	220	658	96.6	581	79.1	504	60.8	408	42.2	336	36.8	248	27.7	220	23
24	58	174	25.9	154	21.2	134	16.4	108	11.1	89	9.8	66	7.4	58	24
25	51	156	26.9	138	23.3	120	19.5	98	14.6	82	10.8	62	6.4	51	25
26	179	531	70.6	469	55.8	406	40.7	327	34.3	268	28.0	196	20.1	179	26
27	220	670	120.2	594	105.0	518	89.4	424	69.5	354	54.3	270	34.6	220	27
28	190	577	104.6	512	91.6	447	78.3	366	61.5	306	48.6	233	32.1	190	28
29	186	566	103	503	90.1	439	77.2	359	60.6	301	48.1	229	32.0	186	29

Figure 7-34 Sunrise project local hydrology runoff peak flow & volume table

	Basin	Storage
Upper Watershed	Bunker Hill Basin	5.90 Million AF
	Riverside/Arlington Sub basin	0.25 Million AF
	Chino Basin	5.00 Million AF
Lower Watershed	Orange County Basin	38.00 Million AF

Figure 7-35 Major Santa Ana River Groundwater Basins

Source DWR, Bulletin 18; https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Groundwater-Management/Bulletin-118/Files/2003-Basin-Descriptions/8_002_06_BunkerHillSubbasin.pdf

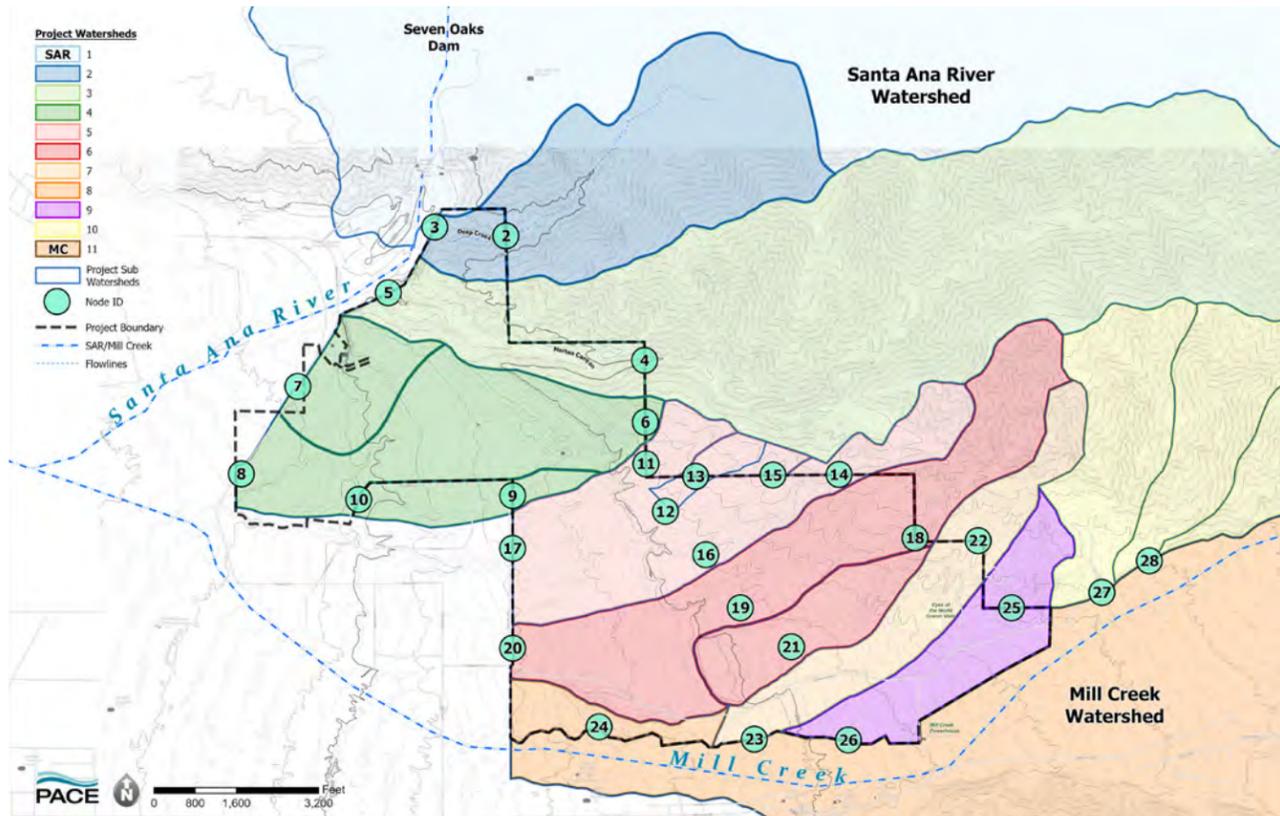


Figure 7-36 Existing local hydrology map

1. Regional Groundwater Basins – Bunker Hill (aka San Bernardino Basin Area SBBA or SBB)

The Bunker Hill Subbasin, also known as the San Bernardino Basin Area (SBBA), is the most relevant regional groundwater basin to the Sunrise Ranch property. From “California’s Groundwater” (Bulletin 118), last updated in November 2021:

Basin Boundaries and Hydrology

The Bunker Hill Subbasin consists of the alluvial materials that underlie the San Bernardino Valley. This subbasin is bounded by contact with consolidated rocks of the San Gabriel Mountains, San Bernardino Mountains, and Crafton Hills, and by several faults. The southern boundary is the Banning fault, the east boundary is the Redlands fault, the San Andreas fault is roughly the northern boundary, the Glen Helen fault abuts the northwest boundary, and the southwest boundary is the San Jacinto fault. The SAR, Mill Creek, and Lytle Creek are the main

tributary streams in the subbasin (SBVWCD 2000). The range in annual precipitation is 13 to 31 inches.

Hydrogeologic Information

Water Bearing Formations – The water-bearing material in the subbasin consists of Holocene and Pleistocene age alluvial deposits of sand, gravel, and boulders interspersed with deposits of silt and clay. The water-bearing material has been divided into upper and lower aquifers (Hardt and Hutchinson 1980). In the central part of the subbasin, a poorly permeable clay layer separates the aquifers, creating confined conditions in the lower aquifer under about 25 square miles of the valley. Maximum thickness of the upper aquifer is approximately 350 feet, and maximum thickness of the lower aquifer is approximately 650 feet. Groundwater generally converges toward the SAR in the southwestern part of the subbasin and discharges over the San Jacinto fault at Colton Narrows (USGS 1989). Wells yield up to 5,000 gallons per minute (gpm) and

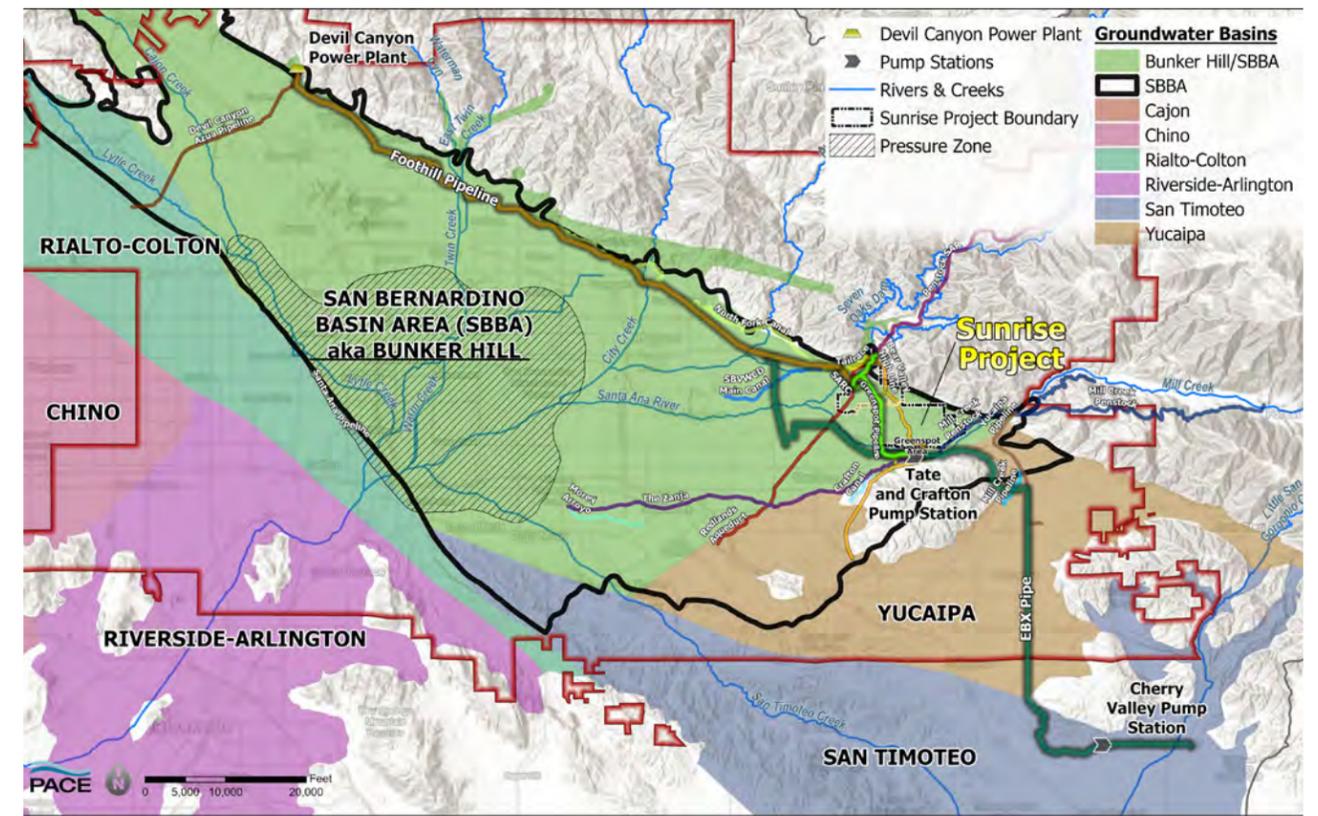


Figure 7-37 Groundwater basins located within Sunrise Project property

average about 1,245 gpm. Specific yield of these deposits ranges from 7 – 21 percent and average 13 percent.

Restrictive Structures – The San Andreas fault zone impedes movement of ground water, producing springs and a groundwater level change that marks the fault trace along the northern boundary of the subbasin. The San Jacinto fault forms a strong barrier to groundwater that raises the water table nearly to the surface below the course of the SAR. The combination of alluvial material with a high water-table in a seismically active area creates a hazard for liquefaction. The Redlands and Banning faults also impede ground water movement along the borders of the subbasin.

Recharge Areas – Recharge to the Bunker Hill Subbasin historically has resulted from infiltration of runoff from the San Gabriel and San Bernardino Mountains. The SAR, Mill Creek, and Lytle Creek contribute more than 60 percent of the total recharge to the

ground-water system. Lesser contributors include Cajon Creek, San Timoteo Creek, and most of the creeks flowing southward out of the San Bernardino Mountains. The subbasin is also replenished by deep percolation of water from precipitation and resulting runoff, percolation from delivered water, and water spread in streambeds and spreading grounds.

Groundwater Level Trends – In general, the far eastern and northwestern portions of the Bunker Hill Subbasin show the largest decreases while the rest of the subbasin shows mostly stable or increasing ground water elevations. Average changes in ground water level elevations between Fall 1998 and Fall 1999 ranged up to an increase of about three feet.

Groundwater Storage – Groundwater Storage Capacity. Total groundwater storage of the subbasin is 5,976,000 (DWR 1986). The San Bernardino Valley has been calculating the change in groundwater storage for the San Bernardino Basin (SBB) since 1970.

Groundwater Budget (Type A) – Pumping data indicate 164,319 AF of urban extraction and 23,977 AF for water year 1998 (SBVWCD 2000). Natural recharge for 1998 is reported at 23,861 AF (SBVWCD 2000) and artificial recharge is reported at 15,835 AF (Crowly 2000). DWR (1986) determined an average subsurface inflow to be about 22,500 AF.

2. Local Groundwater Basin – Greenspot Area

The Sunrise Ranch property is located in an area of sloping terrain at the foothills of the San Bernardino National Forest, directly atop a local groundwater basin known as the Greenspot Area.

Faults sometimes form underground barriers to flow, trapping groundwater in local areas, depending on the nature of the faulting. A “fault gouge” can form a clay-like material between the displaced rocks, acting as a type of low permeability curtain. More often, barriers form when the stratigraphy on either side of the fault is displaced, interrupting the horizontal sandy layer flow paths by juxtaposing them against layers of clay, thus impeding the flow across the fault. Because the fault offset is buried beneath a blanket of recent alluvium, faults and barriers

are usually mapped indirectly by mapping the elevation of groundwater in shallow wells on either side of the buried fault traces. A break in water surface elevations with a linear alignment is indicative of a flow barrier.

The Greenspot Fault is an example of a fault mapped by this method. Groundwater on the east side of the barrier is at or near ground surface, and on the west is much deeper. The written history and United States Geological Survey (USGS) studies performed in the past suggest that the area under the land constitutes a saturated “box” of groundwater up to 1,000 feet deep, 1 mile wide, and 2 miles long. What is not known is the hydraulic conductivity of the sediments. Normally, one would expect loose “high-energy” deposits this close to the eroding mountain fronts, but in this instance, with the presence of the Greenspot flow barrier and the known formation of the Greenspot Cienega within the graben, it might be that the depositional environment allowed for regular accumulation of a conglomerate of clayey material along with the sand, gravel, and rock. Drilling logs and past mining of “low permeability” material for construction of Seven Oaks Dam seem to suggest this.



Figure 7-38 Santa Ana River Greenspot Road: Historic and new bridges

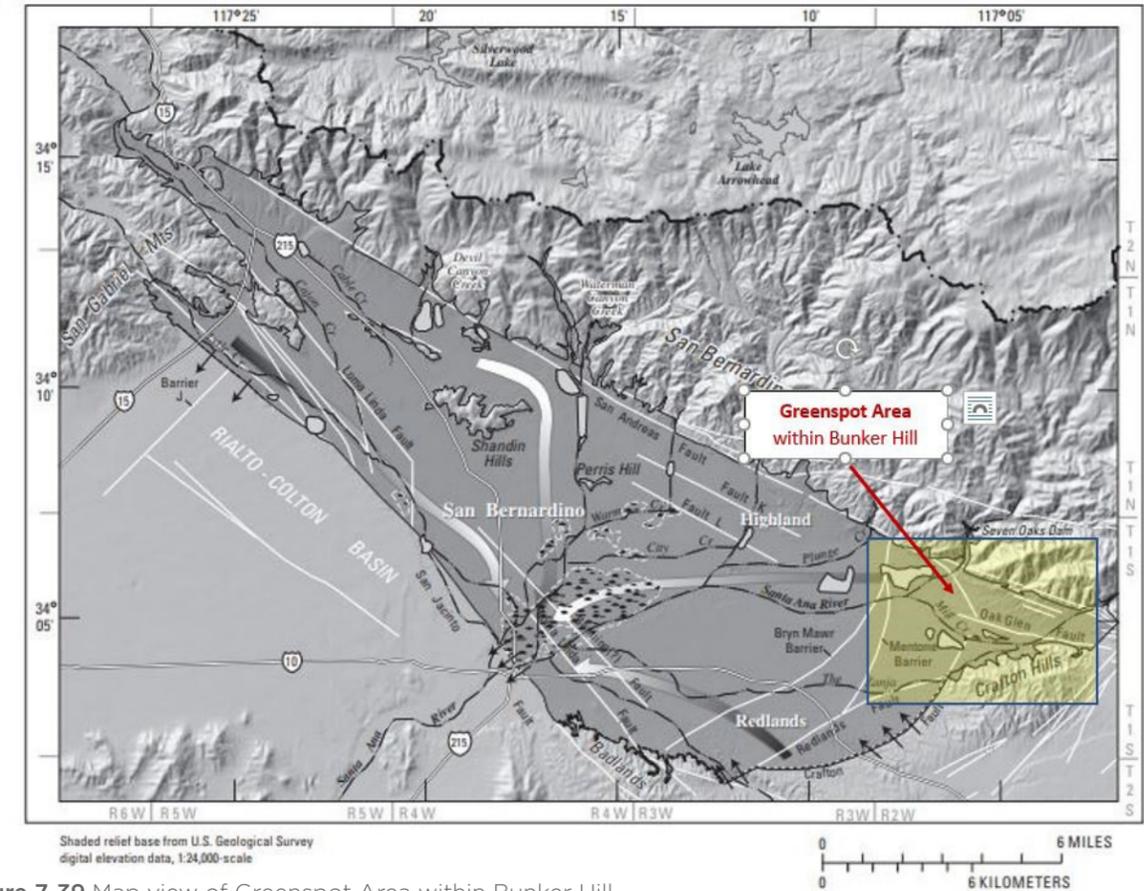


Figure 7-39 Map view of Greenspot Area within Bunker Hill
Source USGS 1959

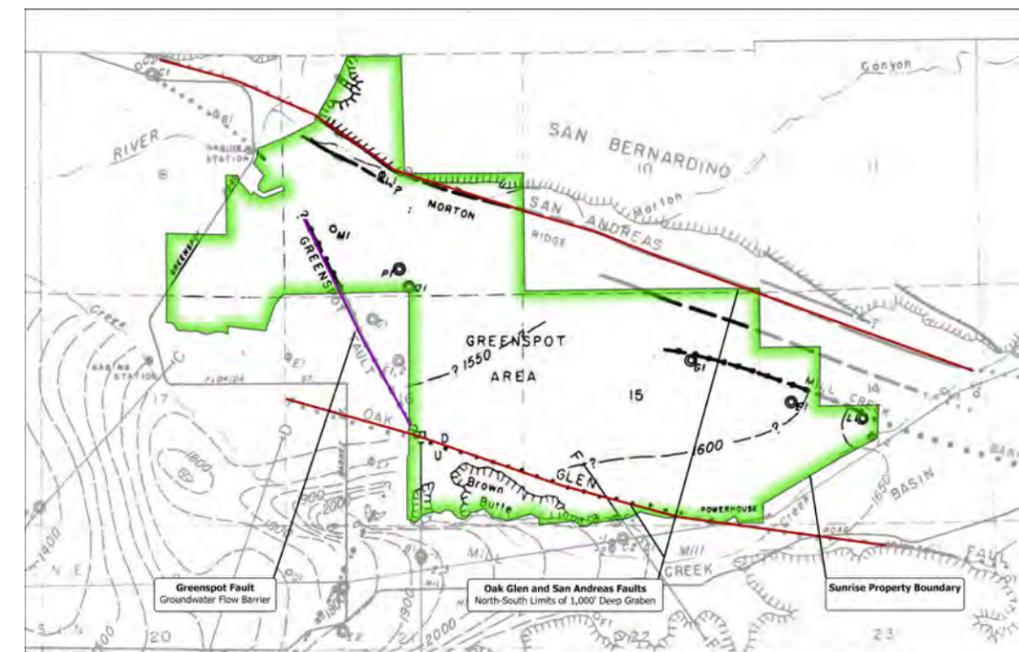


Figure 7-40 Map view of Local Faults that bound the Greenspot Area Aquifer
Source USGS 1959 - Plate 3 with Sunrise Property Boundary Overlay & Greenspot Area Faults Identified



Figure 7-41, 42 Historic pictures of flowing Artesian Well in the area
Source City of San Bernardino

The USGS mapped the geology of the area and described the north-easternmost tip of the Bunker Hill Subbasin as the “Greenspot Area,” as shown in Figure 7-39 (USGS 1959). The Greenspot Area is bounded by faults, including the San Andreas Fault to the north, the Crafton Hills Fault to the east, the Oak Glen Fault to the south, and the Greenspot Fault to the west, shown in Figure 7-40.

The Greenspot name came from early migrants to the area who observed the area as green year-round with marshy soils (Greenspot Cienega). The condition was caused by westerly flowing groundwater encountering the Greenspot fault, causing it to upwell and overflow the fault barrier onto the surface, thus forming a type of oasis or swamp. In the early years, new wells placed upgradient of the fault produced water without pumping known as “flowing artesian” wells.

This is best described in an early account of the area titled “History of Water Rights in Mill Creek and the Zanja.” A section in that account reads:

The advent of hydro-electric power generation brought another problem to the zanja owners, this time in the form of a suit brought by the Mentone Irrigation Company. This company, organized in 1887 as the owner of a tunnel and a system of cuts and ditches together with two springs about 3,800 feet below the Zanja intake, from which the company tapped the underground water in the Mill Creek channel. The tunnel had been started in 1885 and by 1886 had been extended a distance of 1,300 feet eastward. Before 1893 the flow from the

tunnel varied from 30 to 125 inches. However, in 1899 and 1900 the Mentone Irrigation Company drilled a well about 1,000 feet south of the tunnel. When the well was pumped there was no water at the tunnel.
 -SBVWCD 1937

Agricultural pumping drew down the groundwater levels (potentiometric heads), and the historically marshy conditions dried up. Historical records state that early citrus farmers in the Greenspot Area excavated horizontal water tunnels from a location downslope of the Greenspot Fault extending horizontally eastward through the fault zone, thus liberating the water trapped behind the low permeability fault. The water flowed freely out of the tunnel portal toward the west and downslope into the orchards. The tunnels reportedly worked for a while, but later collapsed, sealed themselves up, and were abandoned. The historical artesian conditions creating the Greenspot Area might also be responsible for the similar naturally wet condition encountered today in the Morton Canyon section of the property. The historical presence of the Greenspot Cienega also explains the presence of the low permeability soils that were mined for Seven Oaks Dam construction, typical of swamp deposits.

The Greenspot Area and the Sunrise Ranch property overlie the northeast corner of the Bunker Hill Subbasin, the largest groundwater basin in the upper SAR watershed. The site is less than 1 mile south of the San Andreas Fault, with some maps plotting the fault inside the property line. Early studies of the area show that

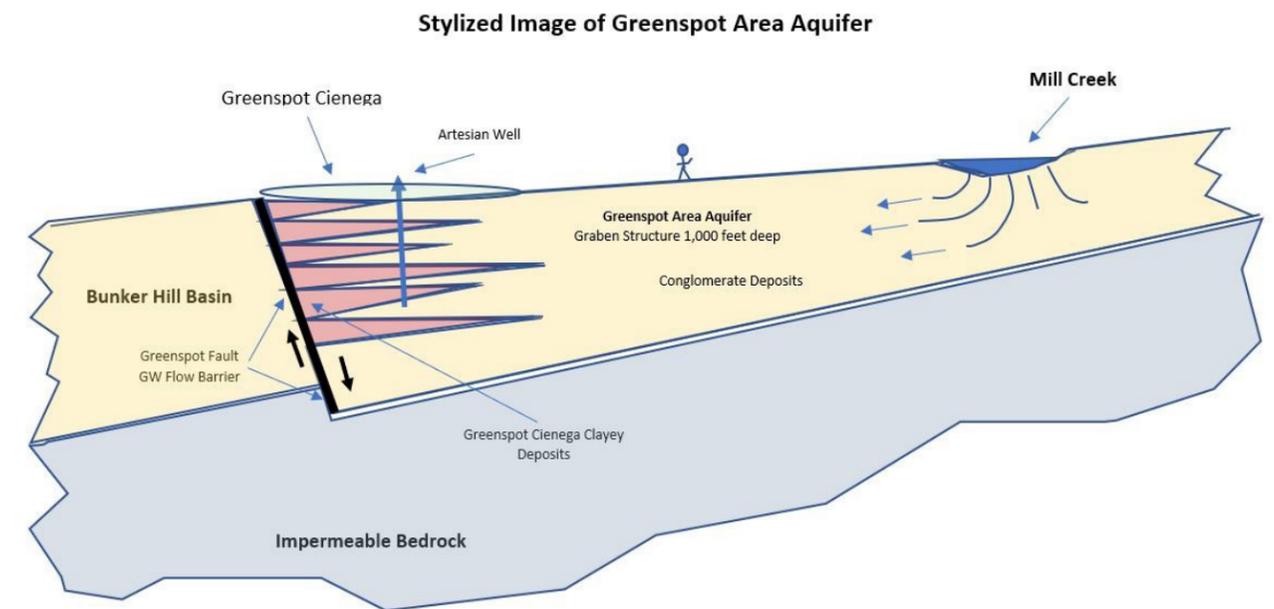


Figure 7-43 Stylized cross-section of Greenspot Area Aquifer

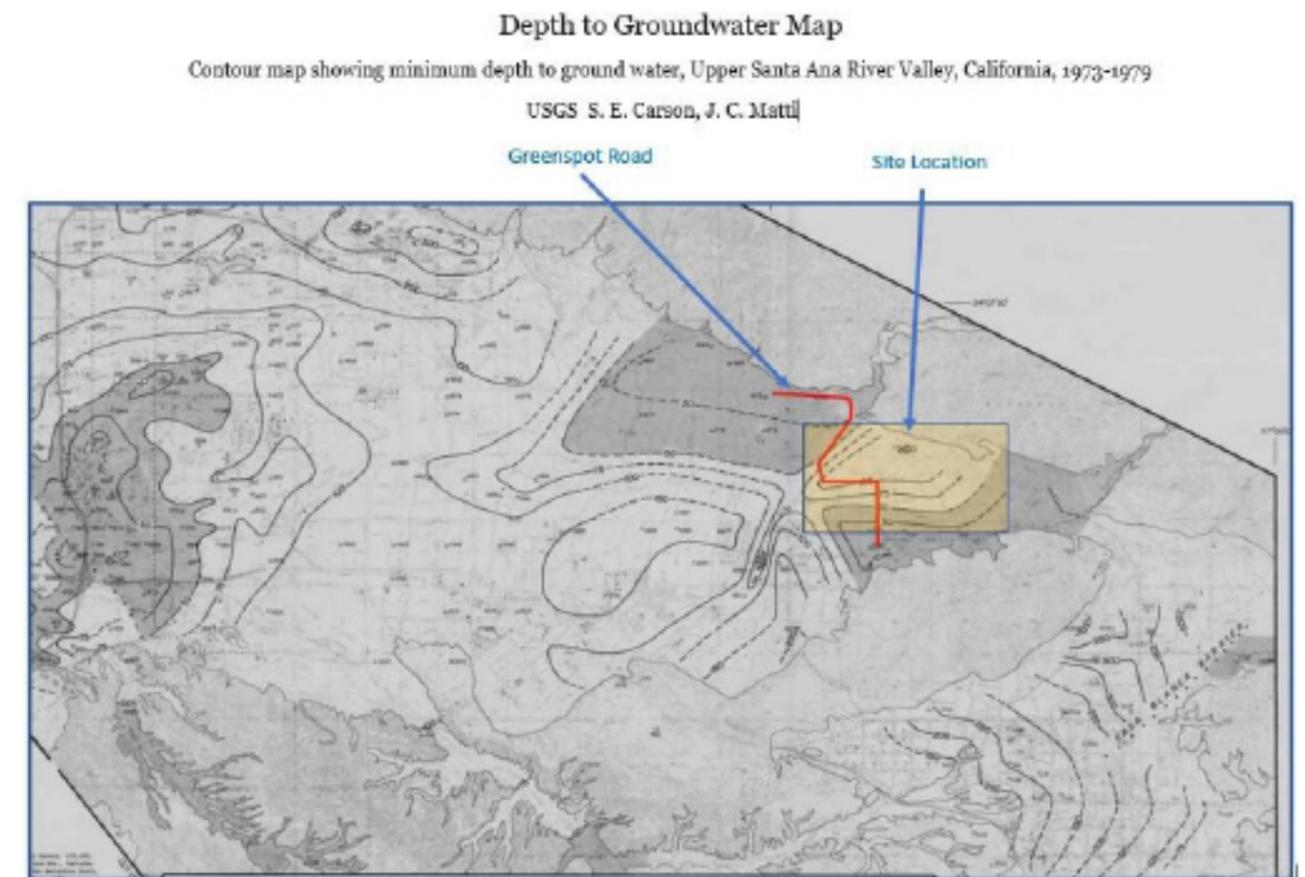


Figure 7-44 Depth to first Groundwater Map

the San Andreas Fault and the Oak Glen Fault, which run parallel to each other approximately 1 mile apart as shown on Figure 7-43, are spreading apart (north-south) and dropping the bedrock between the faults down about 1,000 feet. Geologically, this is known as a “horst and graben” structure, with the Greenspot Area being the now filled in graben (see Figure 7-45). The southern property line coincides with the “normal” Oak Glen Fault, the southern boundary of the graben structure. This is evidenced by the hard rock outcrop on the southern property line north of Mill Creek. This tertiary age granodiorite outcrop, described in the USGS publication as the “Brown Butte,” is the on-property southern horst of this structure. This is an important consideration for the Sunrise Ranch property. If verified, then the property is underlain by sedimentary alluvial deposits down to a depth of 1,000 feet, which would make excavating large water reservoirs feasible without the possibility of encountering crystalline or cemented sedimentary bedrock. It also means there is likely to be an aquifer (aquitar) up to 1,000 feet thick capable of supporting the property and the Tres Lagos Mutual Water Company (TLMWC).

Underflow out of the Greenspot Area toward the larger aquifers such as Bunker Hill Subbasin is reported by the USGS to be “minimal,” probably

as a result of the Greenspot Fault and other unseen flow barriers (USGS 1959). The only challenge to this interpretation of the property as overlying a deeply dropped graben structure is the presence of “weathered granitic rock” detected by the previously proposed Harmony property developer’s geologist in their Boring BH-3. The location of this boring is well within the graben and therefore should not be a location where shallow bedrock could be found. The geologist’s report did, however, describe it as “probable nested boulders,” suggesting that it is not in-place bedrock. None of their additional 23 borings encountered similar weathered granitic rock. The investigation by the proponent of the Harmony development was limited to shallow depths because all borings hit “refusal” without getting very deep. The shallow depth of drilling was due to the fact that the property is a boulder field not suitable for hollow stem auger drilling equipment.

Review of a 996 feet deep well, log 1S/2W-14E01, drilled in 1932 indicates alluvial deposits to the maximum depth of the well. However, the rock descriptions indicate a large fraction of clay mixed in with sand and gravel for the entire depth. The geologist logging the well wrote, “no clean water bearing material in the well.” Pump testing of the well, if it can be found, and possibly additional

drilling would be needed to verify the ability to produce water from this property for use by the Agency or others.

Based on this hydrogeological description, the Greenspot Area can be thought of as a small subbasin of the larger Bunker Hill Subbasin. Although small in comparison to its neighboring basins, the Greenspot Area might hold 350,000 AF of water (2.5 miles x 0.8 miles x 900 feet deep x 30% porosity). This mini subbasin is hydrogeologically constrained from underflowing into the Mentone and Bunker Hill Sub-basins, and therefore does not currently play a significant role in the area’s groundwater supply. Although abundant with water, the underlying sediments might constitute a slowly producing “aquitar” based on the presence of a significant fraction of clay intermixed within granular material. Well yield analysis and a water rights determination would be needed to determine the potential of this source.

C. Water Supply Managers, Wholesalers and Retailers

Water supply in the area is managed through a collaboration of agencies and water authorities, including:

- Wholesale water agencies
- Watermaster collaboration that oversees and regulates the extraction of groundwater
- Retail water agencies
- Mutual water companies

The region is rich with local and imported groundwater and surface water supply sources and a wide range of infrastructure to convey water to retail users and groundwater basins for storage and recharge.

Within the SAR watershed, water management activities are subdivided between the upper SAR and lower SAR watersheds, covering a combined total of 2,840 square miles. The subwatersheds are divided just upstream of Prado Dam along the east to west ridgeline of the San Gabriel and San Bernardino Mountains. The upper SAR watershed is approximately 2,213 square miles located primarily in San Bernardino and Riverside Counties. The lower SAR watershed is approximately 585 square miles located in Orange County.

The following sections describe the delineations

of watershed and groundwater providers that support the region.

1. Wholesale Water Agencies

The SAR watershed is served by five wholesale water agencies, including:

1. San Bernardino Valley Municipal Water District (Agency)
2. Eastern Municipal Water District (EMWD)
3. Inland Empire Utilities Agency (IEUA)
4. Western Municipal Water District (WMWD)
5. Orange County Water District (OCWD)

These agencies are responsible for groundwater and imported water supply and cooperate in the management of the large areas that are tributary to the SAR.

Of these SAR watershed wholesale agencies, only the Agency is an SWP contractor. Those agencies west of San Bernardino receive imported water primarily from the Metropolitan Water District of Southern California (MWD).

The participation of these agencies in water supply management resources varies based on their involvement in groundwater and import sources and is summarized in Figure 7-47.

2. Watermaster – SAR Surface Water and Watershed Groundwater Basins

The 1969 Orange County and Western Judgments established Watermaster committees to administer both judgments. The Agency, WMWD, IEUA, and OCWD make up the SAR Watermaster committee and represent the interests of the upper and lower areas of the SAR with the responsibility to oversee the watershed. The Agency also participates in other Watermaster committees to ensure compliance with the following court determinations:

- Chino Groundwater Basin – 1978 groundwater adjudication
- Santa Ana River – 1969 surface water rights
- San Bernardino Basin Area – 1969 groundwater adjudication
- Santa Margarita River – 1964 surface and groundwater adjudication

3. State Water Project – Imported Water

The SWP (Figure 7-52) is planned, built, operated, and maintained by the California DWR and consists of approximately 700 miles of canals,

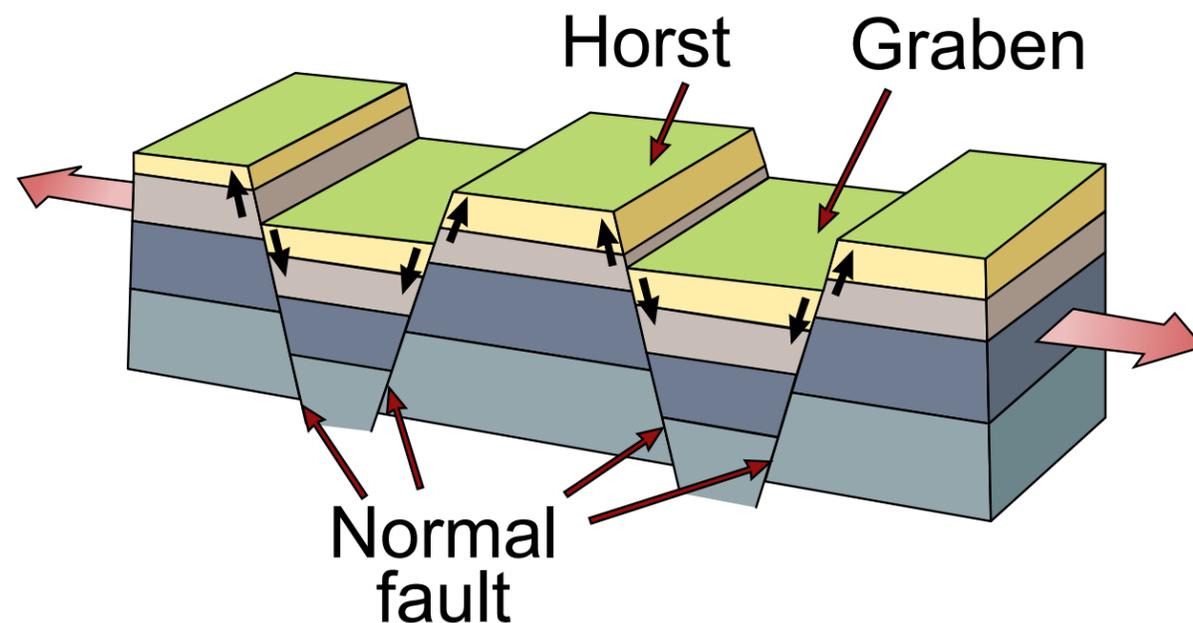


Figure 7-45 Stylized picture of Horst & Graben Structure
Source Wikipedia



Figure 7-46 Santa Ana River Upper and Lower Watersheds
 Source SAWPA

pipelines, and tunnels that span two-thirds the length of California. There are 36 storage facilities, 21 pumping plants, five hydroelectric power plants, and four pumping-generating plants included in the multi-purpose water storage and delivery system. As the nation’s largest state-owned water and power generator, the SWP delivers water to 27 million people and 750,000 acres of farmland in California.

The California DWR administers long-term water supply contracts to 29 State Water Contractors (SWCs) for SWP deliveries. The Agency is the contract operator of the EBX and is the fifth largest SWC. The Inland Empire receives 28% of its average annual water supply from the SWP (SWC 2023). The Agency is allocated a “maximum take” of 102,600 acre-feet per year (AFY). That allocation is continually adjusted based on statewide hydrology and other factors and is regularly updated through the “Table A Allocation” as a percentage of the maximum allowed for each member.

The Sunrise Ranch property is located adjacent to the EBX. The EBX delivers water to San Bernardino County communities beginning at the Devil Canyon Power Plant in San Bernardino and ending on Noble Street, just south of Orchard Street in Cherry Valley. The EBX consists of two reservoirs, four pump stations, and 18.5 miles of pipeline (Figure 7-50).

4. San Gorgonio Pass Water Agency

The San Gorgonio Pass Water Agency is a SWP contractor connected to the eastern end of the EBX pipeline. However, they are not tributary to the SAR and operate independently of the others in the river basin.

From USARW IRUWMP:

San Gorgonio Pass Water Agency (SGPWA) was established in 1961 by the California State Legislature. The service area includes the incorporated cities of Calimesa, Beaumont, and Banning, and the communities of Cherry Valley, Cabazon, Poppet Flat, San Timoteo Canyon, Live Oak Canyon, and the Banning Bench.

San Gorgonio Pass Water Agency, a State Water Contractor, purchases water from the State of California and sells it to local retail water agencies in their service area

in Riverside County, which use the water either for direct deliveries or for groundwater recharge. Water is imported into the service area by the East Branch of the California Aqueduct.

5. Retail Water Agencies

The retail water agencies in the area derive their supply from local groundwater, SAR and Mill Creek surface water, and/or imported water via the Agency. These agencies serve a blended mix of waters acquired from these sources to their retail customers in compliance with State policies and health department regulations. Private mutual water companies also serve isolated areas at a small scale. TLMWC, located adjacent the Sunrise Ranch property, is one such example. The larger retail water agencies adjacent to the site include:

- a. East Valley Water District
- b. Yucaipa Valley Water District
- c. City of Redlands

There are a total of 18 retail water agencies within the local region as noted in Figure 7-54.

A. East Valley Water District

The property falls within the East Valley Water District (EVWD) retail service area, but currently there are no potable water or sewer utilities in or near the Sunrise Ranch property. EVWD is a California Special District established in 1954 that provides water and wastewater services to 103,000 residents within the cities of Highland, San Bernardino, and portions of San Bernardino County and encompasses 30.1 square miles.

D. Imported Water Supply and Demand

Forecasts of increasing demand are presenting a challenge for water managers. For the Agency, water demands primarily involve the wholesale supply to groundwater producers and municipal customers. For the purposes of this Plan, the delivery of imported water through the SWP is the most relevant consideration to meet this demand.

Water supply demands were studied as part of the 2020 Upper Santa Ana River Watershed Integrated Regional Urban Water Management Plan (WSC 2021). That plan and an associated study estimating future water demand growth for

Water Agency	SAR		Watermaster SAR	SWP Contractor	Water Wholesale	MWD Member
	Upper	Lower				
San Bernardino Valley Municipal Water District	X		X	X	X	
Eastern Municipal Water District	X		X		X	
Inland Empire Utilities Agency	X		X		X	X
Western Municipal Water District	X		X		X	X
Orange County Water District		X	X		X	
San Gorgonio Pass Water Authority (outside of the SAR watershed)				X	X	

Figure 7-47 Regional Wholesale Water Agencies roles in water supply management

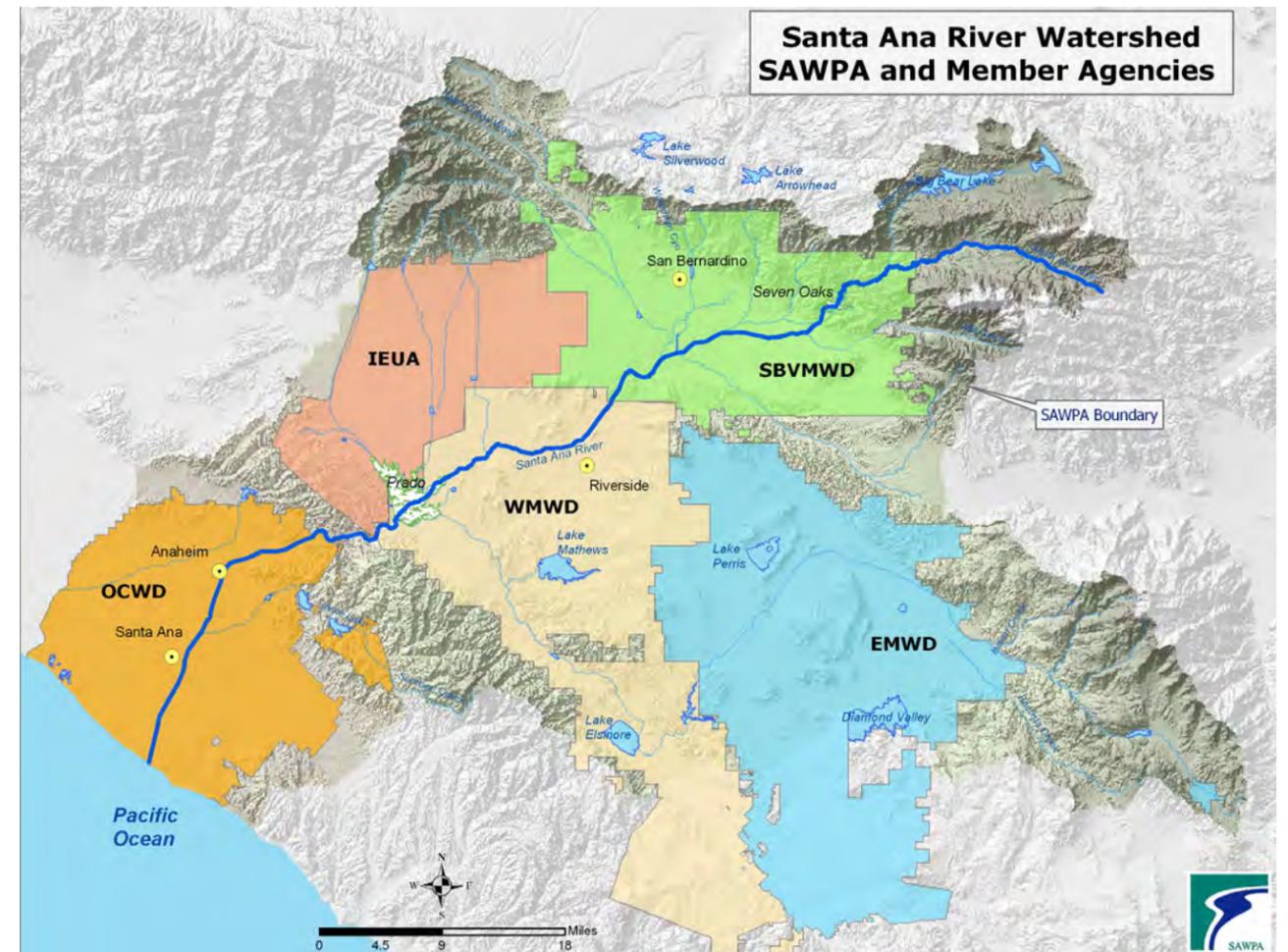


Figure 7-48 Wholesale Water Agencies serving Santa Ana River Basin Source SAWPA

the Agency (RAND 2018) produced the following estimated growth (baseline), bounded by a range of uncertainty.

As can be seen in Figure 7-56, continued demand growth in the Agency service area is expected to be from 255,000 to 290,000 AFY (baseline) by 2040, a 14% increase over the next 17 years. It is reasonable to assume that the demands on EBX deliveries will be, at minimum, of similar proportions and probably higher. The current demand is met by full use of local water with imported water used as a supplemental supply. With current supplies fully accounted for, any growth in the region could only depend on increased importation via the SWP.

The SWP, like most California regional water systems, has high variability. Southern California is neither the driest nor the wettest hydrological climate, but it is the most variable in all of the United States. Precipitation not only changes seasonally but also exhibits dramatic swings from year to year. Figure 7-57 presents the past 93 years of rainfall statistics for the San Bernardino Valley area.

The SWP provides water to 29 public water agencies that serve 27 million Californians. Rainfall is only one of the many factors that influence import water availability to the area. The available water supply depends on how much precipitation occurs, where in the statewide system and at what elevation it occurs, and what the available storage capacity was before the rain/snowfall occurred. Other factors include maintenance needs and environmental requirements within the Bay Delta system, where conveyance is controlled to protect water ecology and endangered species, especially in dry years. All of these factors and others are distilled down to what is referred to by the SWP as a Table A Allocation. That allocation represents the percentage of available water for delivery to each SWP contractor.

Regional SWP Contractor	SWP Annual Allocation (AF/Year)
Metropolitan Water District of Southern California	1,911,500
San Bernardino Valley Municipal Water District	102,600
San Geronio Pass Water Agency	17,300

Figure 7-49 The SWP Final Delivery Report, 2021
Source DWR

As shown in Figure 7-58, the SWP Table A Allocation varies each year, with some years reaching nearly full allocation and others constrained to only 5% of the maximum take for each member agency.

Citrus Pump Station pumps imported water from the EBX to points to the east. Figure 7-59 shows the pump station's flow rates in the six years since startup, which is the best measure of the amount of imported water that has reached the area. As can be seen, the SWP deliveries are sometimes interrupted, which can be attributed to supply constraints resulting from both seasonal hydrology and the needs of the Bay Delta ecosystem.

The operating data from the Citrus Pump Station since its startup indicates several prominent delivery interruptions. Figure 7-60 and 7-61 identify those times when the pump station was shut down for more than seven consecutive days. The longest interruption occurred in late 2019 and continued for 154 days until May 31, 2020. All but three of these shutdowns could have been covered if continuous deliveries of 30 cfs or less were available for up to 50 days at a time.

In wet years, the San Bernardino Valley's water community is faced with oversupply from local drainages and ample availability of imported water. During dry years, the local drainages are committed to those with unmet water rights allocations, and the SWP source reservoirs are sometimes too low to continue their deliveries to the EBX.



Figure 7-50 State Water Project Map
Source DWR



Figure 7-51 Bear Valley Highline Pipeline



Figure 7-52 California Department of Water Resources State Water Project Infrastructure Map
 Source California DWR <https://water.ca.gov/-/media/DWR-Images/Maps/230726SWPPipelinesFacilitiesaav57.jpg>

E. Existing Water Infrastructure

As shown in Figure 7-62, the Sunrise Ranch property is located in the center of a complex network of water distribution conveyances supplied by local sources such as the SAR, Mill Creek, and groundwater, along with imported supplies from the SWP. Since the early 1800's, this complex system of pipelines and canals has evolved to support the agricultural and urban developments of the area, and without it, the region would have remained dry and sparsely inhabited/utilized.

1. Seven Oaks Dam (USACE)

Seven Oaks Dam is a 550 feet high earth and rock fill embankment dam across the SAR at the narrowing of the upper SAR Canyon, where it impounds Seven Oaks Reservoir. The dam was constructed between 1994 and 1999 with flood control as its primary purpose. One of the largest embankment dams in the United States, the dam was built under contract from the USACE and is now owned by the County of San Bernardino Department of Public Works. Multiple local flood control districts share operation, including the

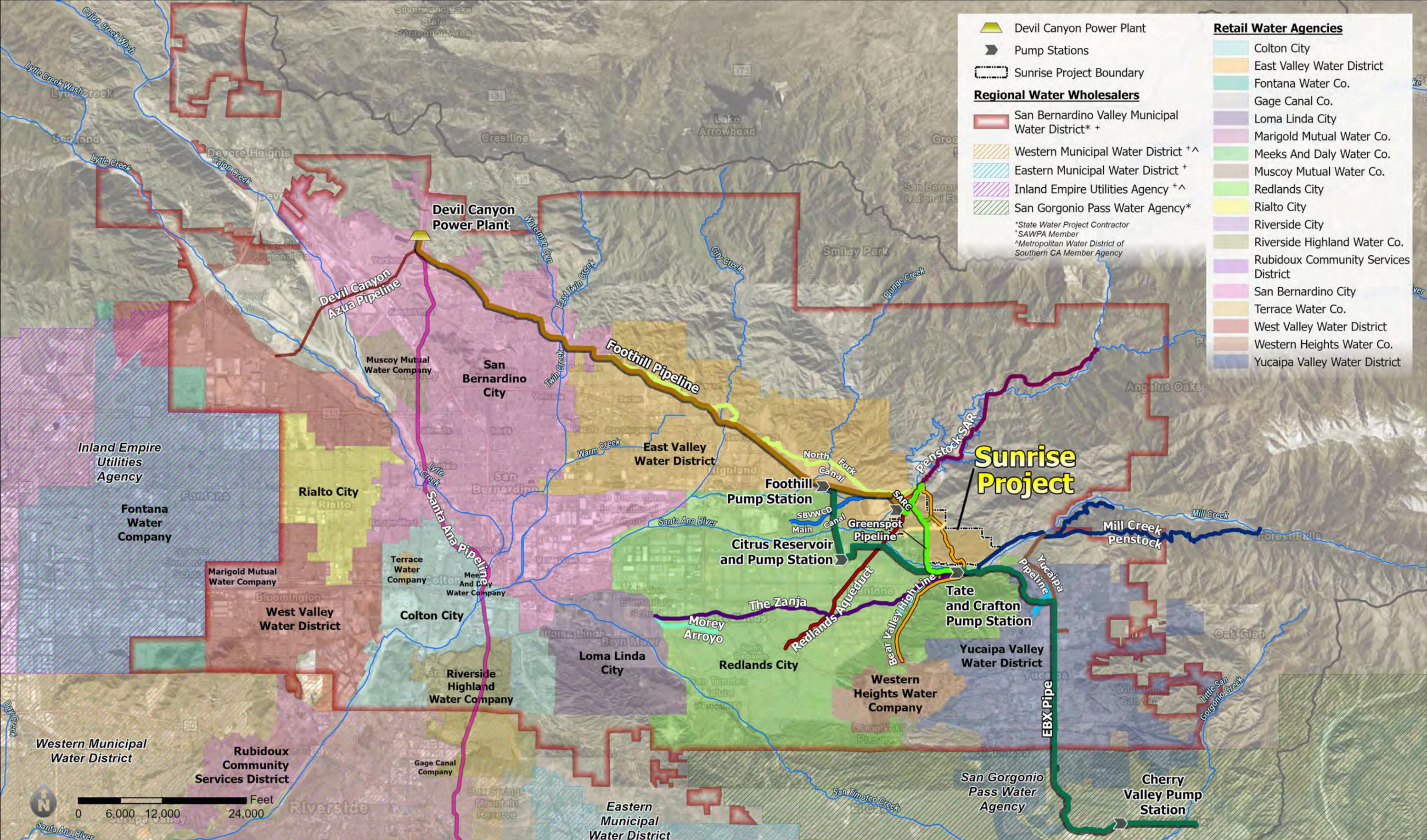
Orange County, San Bernardino County, and Riverside County. The reservoir has a gross storage capacity of 145,600 AF, with 113,600 AF reserved for flood control and the remainder for sediment accumulation. At full pool, the reservoir lies at an elevation of 2,604.4 feet and has an area of 780 acres. Water releases are controlled by a 1,623 foot long gated tunnel outlet that runs through the base of the structure and a 500 feet wide ungated overflow spillway located on the southeast edge of the reservoir. The dam controls runoff from an area of 177 square miles, or 209 square miles including the drainage area of Baldwin Lake, which overflows into the SAR system during periods of heavy runoff.

2. Greenspot Pump Station and Pipeline

The Greenspot Pump Station (PS) was renovated in 2014 and is owned by the Department of Water Resources. The Greenspot PS and pipeline system supports flexibility in other aspects of the two- and three-way water transfers called for in the Exchange Plan. The pipeline and PS are reportedly in good condition and capable of conveying at least 60 cubic feet per second (cfs) from sources including the SWP and SAR to delivery points



Figure 7-53 Tate & Crafton Pump Station on south side of Mill Creek



7-54 Valley and other water wholesale and retail service areas

such as the Tate and Crafton Hills PSs and Zanja-Tate Turnout.

As a result of the completion of the EBX Phase II in 2018, pumping of SAR water through the Greenspot PS has been limited and intermittent for many years because its primary use was replaced by the larger Citrus PS. The newer Citrus PS, built as part of the EBX project, is integrated into the newly aligned EBX pipeline. Figure 7-66 indicates the available capacity of the pipeline for water conveyance. Figure 7-67 indicates that the DWR frequently uses the line for deliveries of imported water from the SWP to the Greenspot Area.

There are turnouts along the Greenspot pipeline, notably at Newport, San Bernardino County Flood Control District, and TLMWC. Any modification of the conveyances through the property must accommodate the needs currently served by these turnout facilities.

3. State Water Project Infrastructure

SWP infrastructure is important to the regional and local water supply in the Sunrise Ranch property vicinity. There are on-site infrastructure components that connect directly or indirectly to the SWP. The locations of the following components are shown in Figure 7-69.

A. East Branch Extension

The EBX was developed as a partnership between DWR, the Agency, and the San Geronio Pass Water Agency, providing the capacity to supply over 2.6 million AF of water annually. The EBX was constructed over two phases between 1999 and 2018 and includes two reservoirs, four pump stations, and 18.5 miles of pipeline to supply water to the communities of San Bernardino, Mentone, Redlands, Cherry Valley, Beaumont, and San Geronio. The first phase included the Crafton Hill

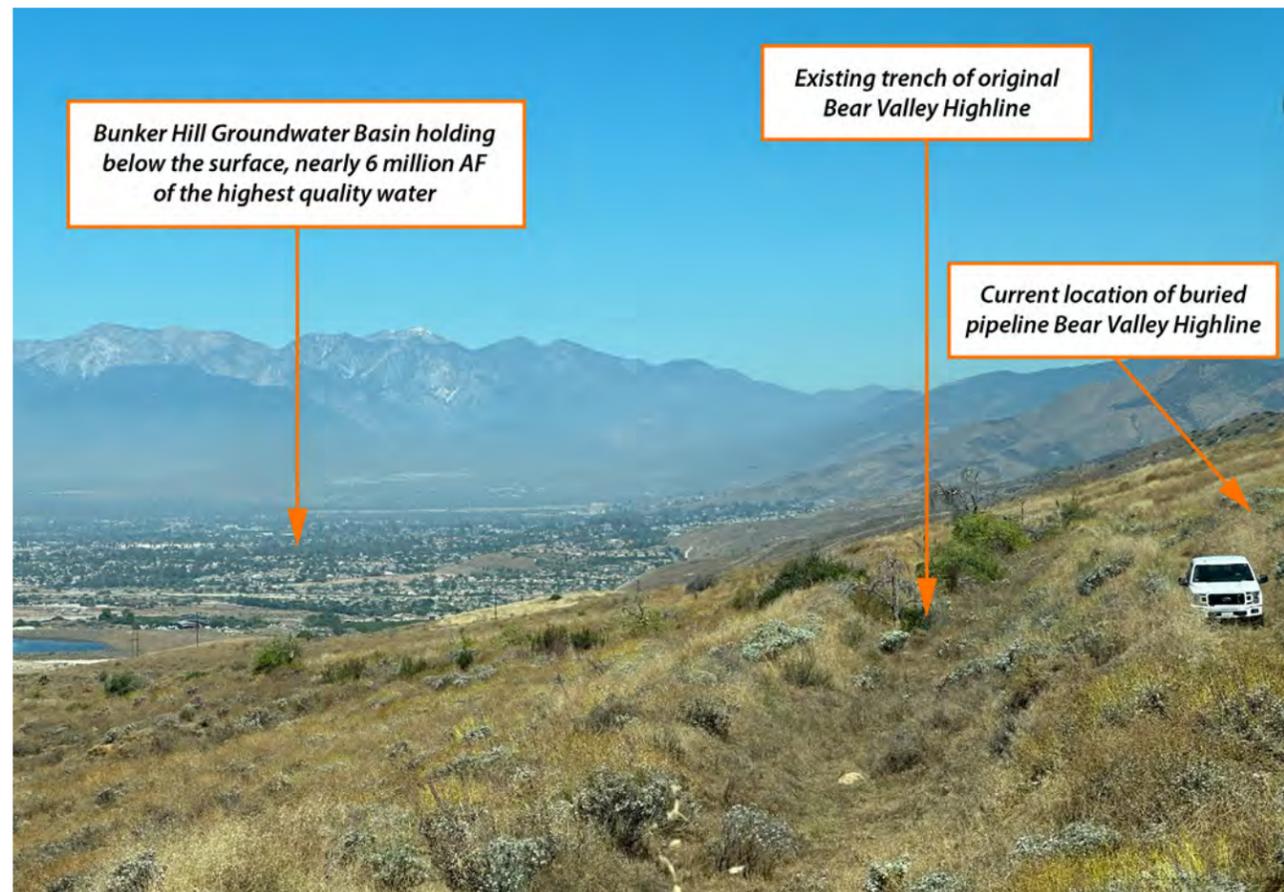


Figure 7-55 Bunker Hill Groundwater Basin and Bear Valley Highline Location

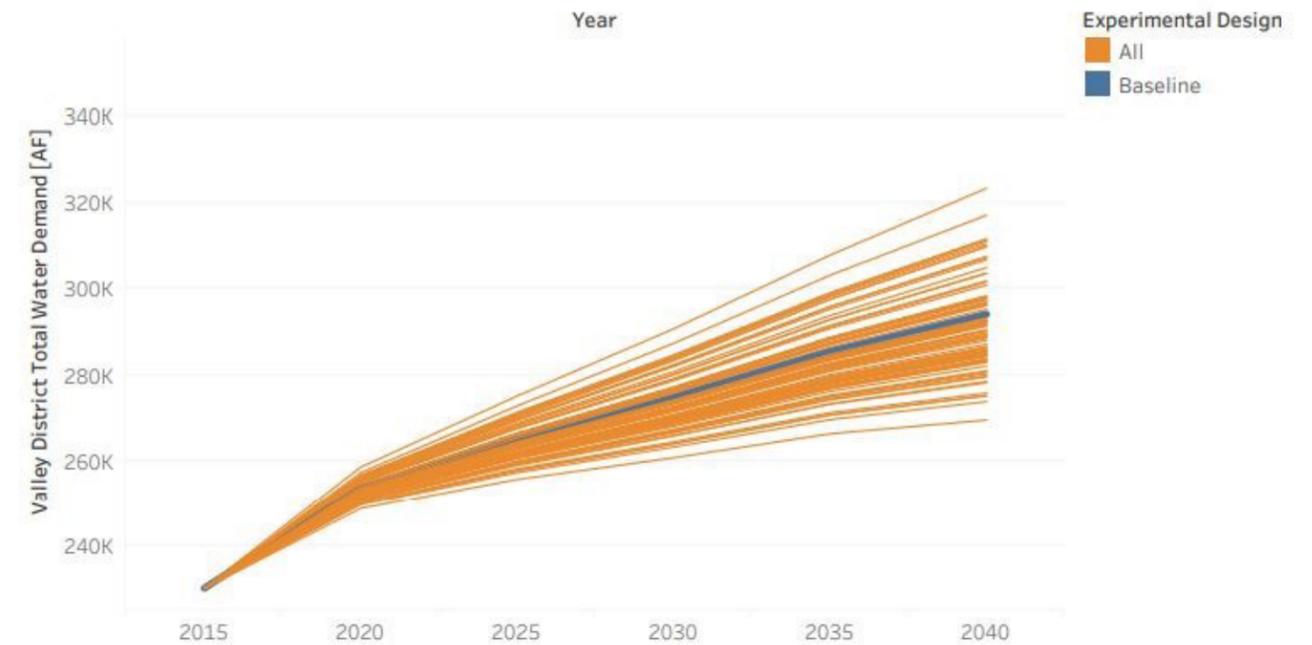


Figure 7-56 Plausible Range of Future Demand Growth Due to Uncertainty in Climate, Efficiency, & Population Growth
Source Estimating Future Water Demand Growth for Valley District, Rand 2018

Reservoir, Greenspot PS, Crafton Hills PS, Cherry Valley PS, and 13 miles of pipeline. The second phase consisted of the Citrus Reservoir, Citrus PS, expansion of the Crafton Hills PS, and 5.5 miles of the Mentone pipeline.

B. Citrus Reservoir

Citrus Reservoir provides approximately 400 AF of storage. The reservoir, with dimensions of approximately 1,000 feet by 900 feet, covers an area of approximately 21 acres. The reservoir has a maximum water surface elevation of 1,638 feet above mean sea level. The reservoir bottom is about 40 feet below the existing ground surface elevation on the western edge (approximately 70 feet below ground surface on the eastern edge). The reservoir increases storage capacity within the SWP EBX system, providing more operational flexibility and capacity.

C. Citrus Pump Station

The Citrus PS, located adjacent to Citrus Reservoir, pumps water from Citrus Reservoir through the 66 inch diameter EBX Mentone eastern pipeline to the Crafton Hills PS. Consisting of pumping units, motors, emergency generator, valve and flow meter vault, masonry building,

connecting pipeline, and related equipment, the PS is housed in an approximately 20,000 square-foot, single-story structure. The building includes ten pumping units: two pumps each with 10 cfs capacity, four pumps each with 20 cfs capacity, and four pumps each with 25 cfs capacity, totaling 200 cfs pumping capacity.

D. Crafton Hills Reservoir and Pump Station

The Crafton Hills Reservoir storage capacity is 290 AF. The existing pump station currently has a total capacity of 135 cfs (with no pumps reserved as backup).

E. Cherry Valley Pump Station

The Cherry Valley PS is located within the San Geronio Pass Water Agency service area. Following a recent expansion, the PS has a total capacity of 56 cfs.

4. Onsite/Local Water Infrastructure

The existing water infrastructure described herein is located within either the Sunrise Ranch property boundary or the local region.

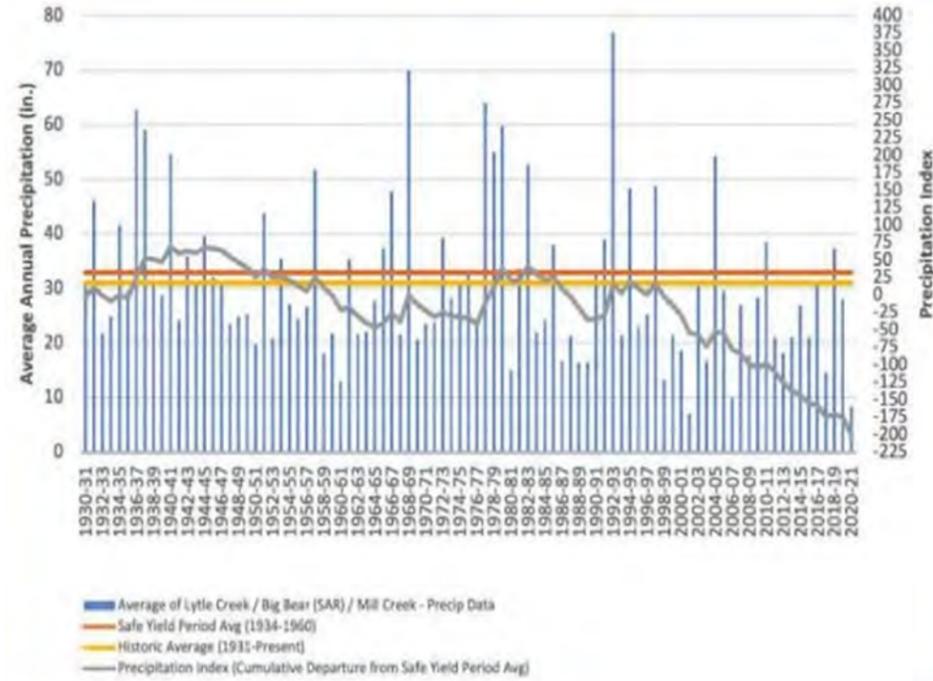


Figure 7-57 Chart showing historic rainfall variability in San Bernardino Valley Service Area

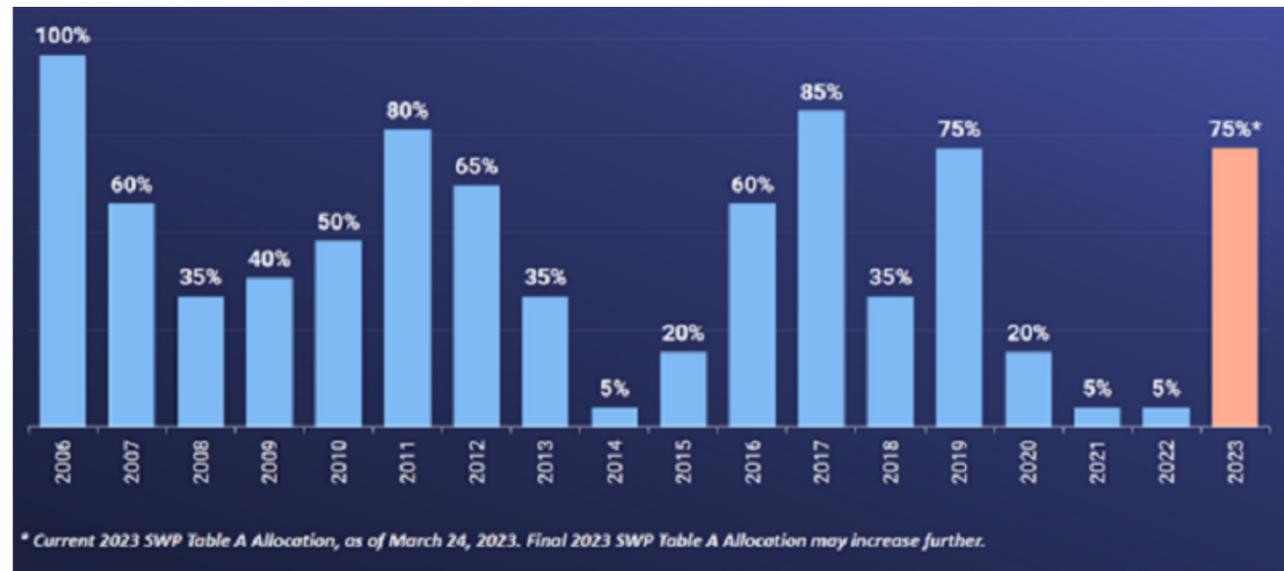


Figure 7-58 Chart showing annual variability in State Water Project - Table A Delivery Allocations

SWP Citrus Pump Station 6 years (from DWR)

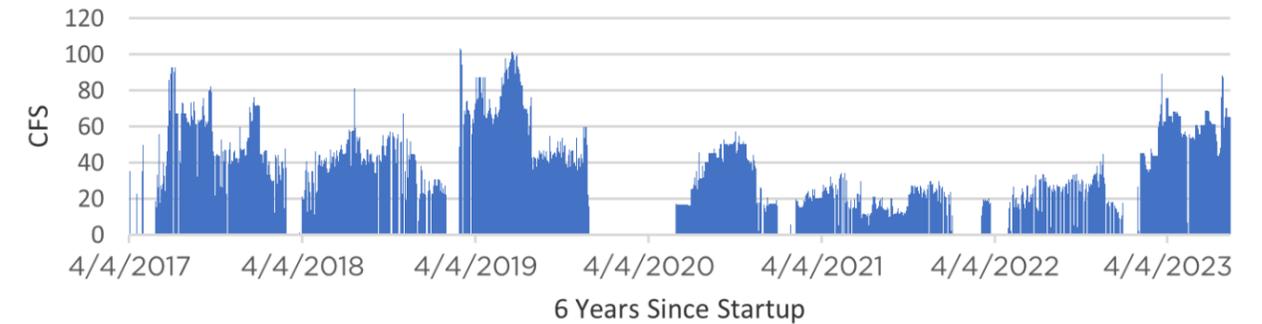


Figure 7-59 State Water Project Citrus Pump Station Flow Since Startup; Source DWR Public Records Request

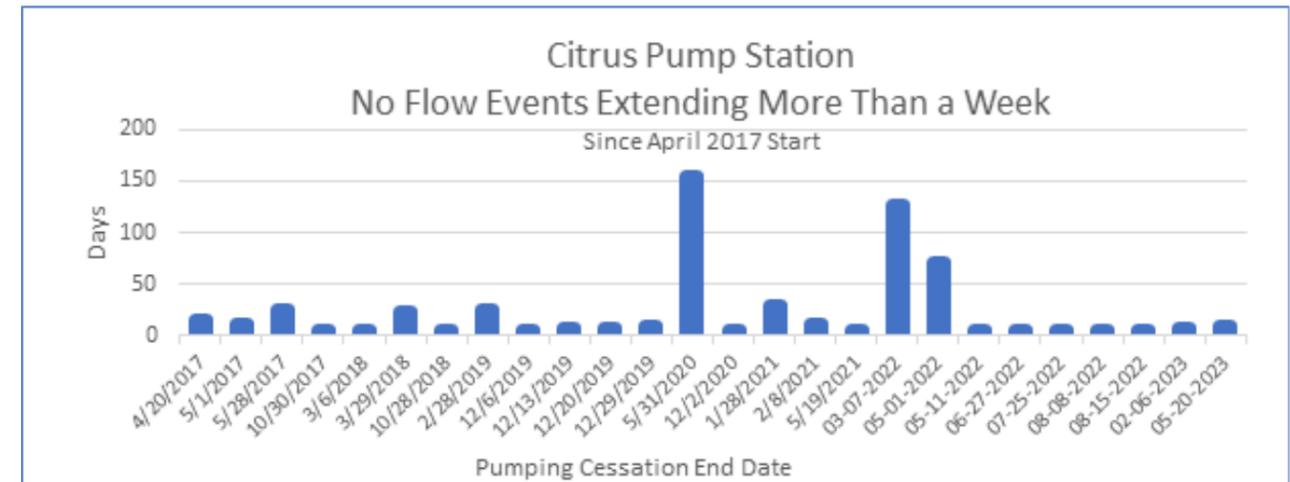


Figure 7-60 State Water Project Citrus Pump Station showing no-flow events

A. Bear Valley Highline

The Bear Valley Highline (BVHL) is a pipeline 10,350 feet in length owned and operated by the BVMWC. The Agency owns 1,180 shares of stock in BVMWC which owns the BVHL. The BVHL gathers water from the SAR SCE PH 3 forebay and sends it along the approximately 2,310 feet elevation topographic contour until it arrives at the Bullion Box, and from there onto the Zanja and other irrigation end uses. The line traverses the Sunrise Ranch property along most of its path. Additionally, there is a 1,400 feet long line that connects the BVHL to the Greenspot pipeline.

B. Redlands Aqueduct

The Redlands Aqueduct is operated by the BVMWC for the conveyance of SAR and SWP

water, primarily serving end users such as the City of Redlands. The aqueduct is operated by the BVMWC for the conveyance of SAR water picked up near the SCE Phase 2-3 afterbay at an elevation of 1,950 feet to the Mentone Reservoir and the Mill Creek spreading grounds.

C. Mill Creek Zanja

The Mill Creek Zanja (Zanja) is approximately 12 miles in length with the intake located just over 1 mile below the mouth of Mill Creek Canyon, 4 miles east of Mentone (SBVWCD 1937). The Zanja was originally constructed in 1820 and is considered a historic waterway as the oldest irrigation ditch in San Bernardino County. The Zanja is still in operation, with its sources of water including the East Weir, the Bullion Box, the Tate PS, the West Weir, and the Zanja-Tate Metering Station.

Citrus Pump Station Consecutive Days of No Flow Exceeding One Week					
End Date	Days	End Date	Days	End Date	Days
4/20/17	15	12/13/19	7	05/01/22	72
5/1/17	11	12/20/19	7	05/11/22	6
5/28/17	26	12/29/19	9	06/27/22	6
10/30/17	5	5/31/20	154	07/25/22	6
3/6/18	6	12/2/20	5	08/08/22	6
3/29/18	23	1/28/21	29	08/15/22	5
10/28/18	5	2/8/21	11	02/06/23	8
2/28/19	26	5/19/21	5	05/20/23	10
12/6/19	6	03/07/22	126		

Figure 7-61 Citrus Pump Station - consecutive days of no flow exceeding one week

D. Southern California Edison (SCE)

SCE currently operates four hydropower plants near the Sunrise Ranch property. Two plants are located on the SAR and two on Mill Creek. These plants and their associated conveyance pipelines are important to local water operations.

When completed in 1898, Mill Creek PH 1 had the longest transmission line in existence and was the nation's first alternating current generator. Innovative features that became industry standards include the individual tailraces, internal revolving field alternators, and transposition of wires. When Mill Creek PH 3 was added, the system became the prototype for the larger hydroelectric systems of the twentieth century. PH 1 was nominated to the National Register of Historic Places and was named an American Society of Civil Engineers Historic Civil Engineering Landmark in 1985.

These plants and the ones on the SAR operate by use of stream diversions, forebays, penstocks, hydropower generator turbines, afterbays, and tailraces. While SCE has the right to divert and use the water for power generation, their rights are "non-consumptive." SCE's obligation after using the water is to deliver it to those holding rights to use the water consumptively. The SAR hydroelectric facilities provide elevation heads at two important elevations. The 2,310 feet

SCE PH 3 forebay is at an elevation designed not only to feed its penstock, but also to feed the BVHL without the need for pumping. The afterbay of this hydroelectric system also serves as a source for those facilities that depend on water at the 1,938 feet elevation head, including the Redlands Aqueduct.

The Mill Creek diversion is at an approximate elevation of 5,000 feet. From there, the water travels through penstock piping to SCE Mill Creek PH 3. Water from that facility enters another penstock to feed the lower elevation SCE Mill Creek PH 1 located near the southeast portion of the Sunrise Ranch property.

E. Santa Ana River and Mill Creek Water Pipeline Crossing

The Sunrise Ranch property sits between the confluence of the SAR and Mill Creek. As such, all the major water conveyances that traverse the property must cross one drainage or the other.

F. Tres Lagos Mutual Water Company

Two groundwater wells are operated by the TLMWC for a group of homeowners and citrus growers. In addition to these wells, the TLMWC also includes distribution pipelines and a hillside reservoir. The reservoir is located at 2,400 feet elevation on a steep hillside along the northern boundary of the Sunrise Ranch property. The



Figure 7-62 Existing regional water Infrastructure



Figure 7-63 Seven Oaks Dam viewed from the south

Seven Oaks Dam Release to SAR



Figure 7-64 Seven Oaks Dam release to SAR, 2023 rainy season
Source Mentone Gauging Station, US ACOE

Greenspot Pipeline N1 (SAR from 2,310' Forebay)

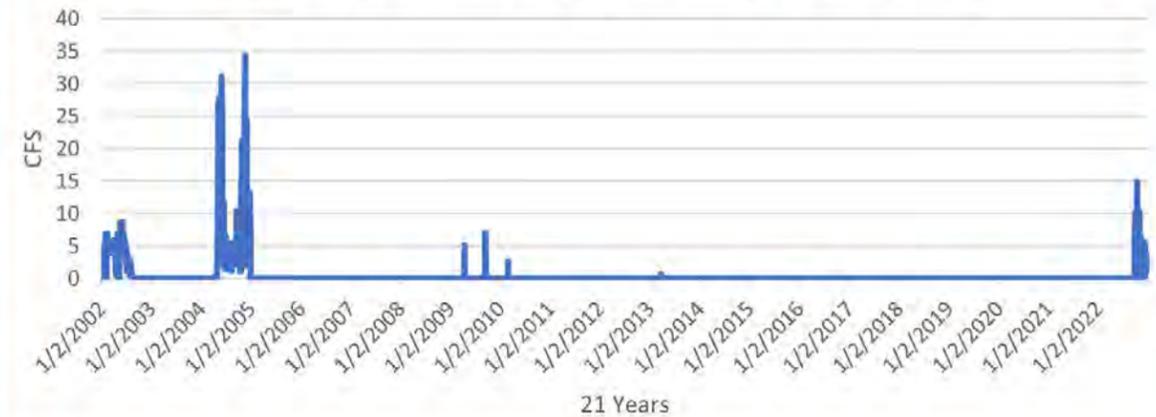


Figure 7-66 History of Greenspot Pipeline Conveyance of SAR Water
Source San Bernardino Valley District

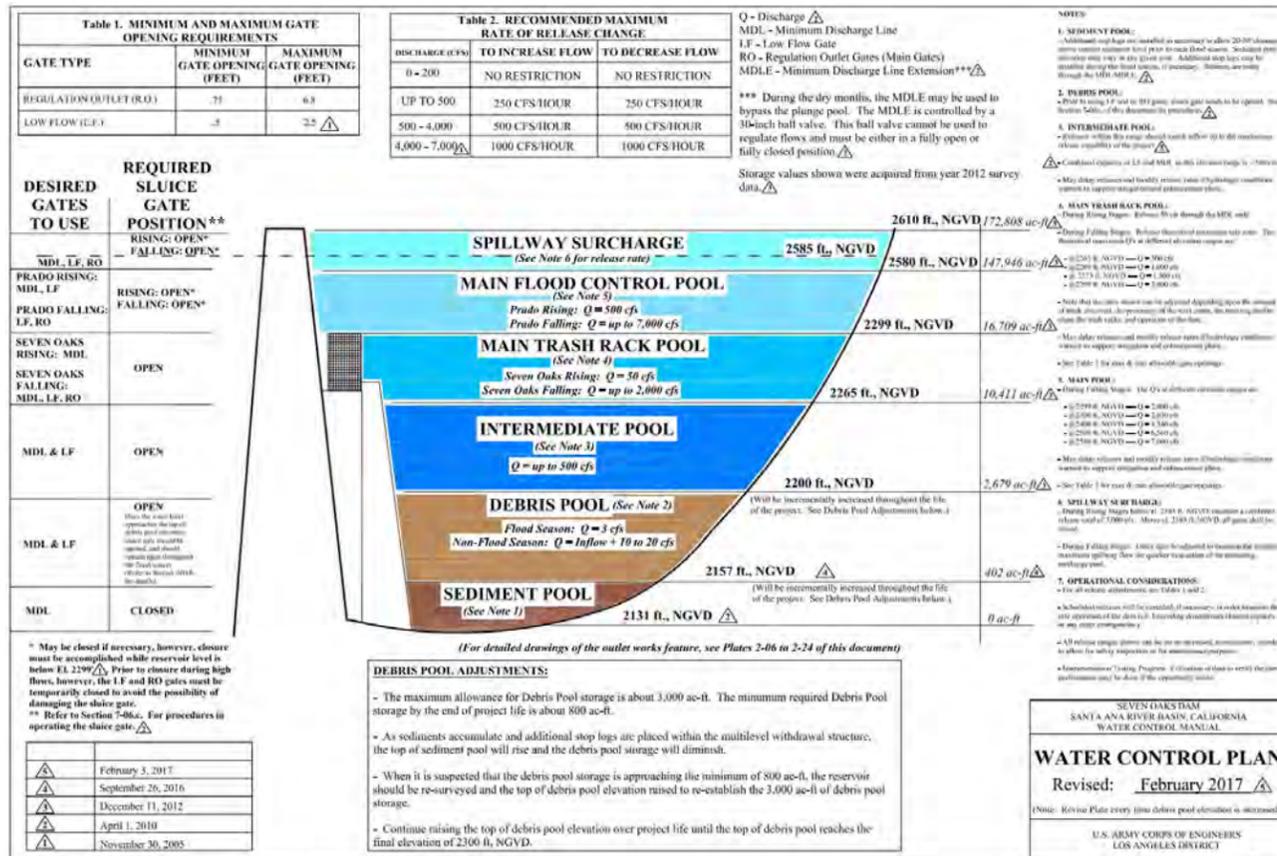


Figure 7-65 Seven Oaks Dam Water Control Plan
Source USACE

SWP Deliveries to Greenspot Area
20 years (from DWR)

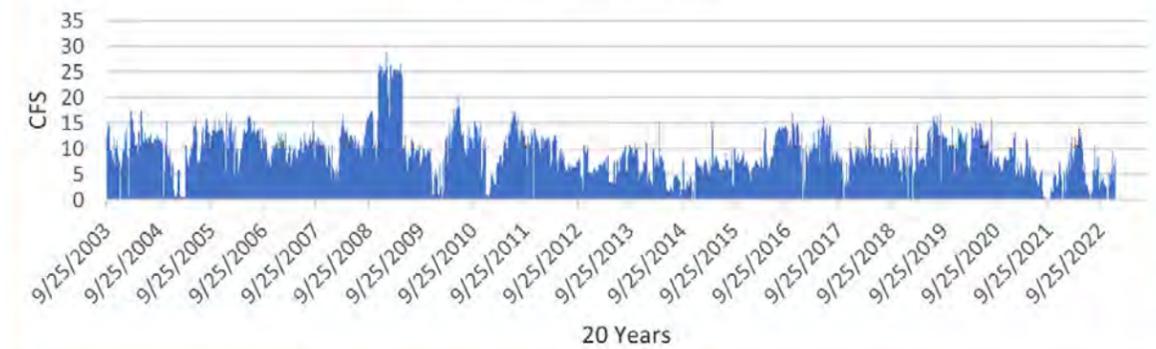


Figure 7-67 History of Greenspot Pipeline Conveyance of SWP Imported Water
Source DWR

reservoir is functional, but in a condition calling for inspection and possibly upgrade. The capacity is also reported to be lower than what is needed for optimal system reliability.

5. Groundwater Resources

California DWR records indicate dozens of wells drilled in the area over more than 100 years. Most of these wells have long since been lost or destroyed, but some have driller's logs that might be useful when considering the installation of new wells on the property. The local Watermaster report indicates seven non-functioning wells without any production records. Only those wells listed by the Watermaster are located with confidence, and these are therefore the only ones shown on Figure 7-79.

A. On-Site Wells

The only on-site wells still operating are the Tres Lagos wells discussed above. Many other wellheads can be seen, but the condition of the wells beneath the sealed caps is unknown.

B. Nearby Wells

The Watermaster recorded well locations for the surrounding area, which are shown in Figure 7-79. The databases accessed to identify the many additional wells recorded for the area are not kept following a standard protocol, nor are they held by a single entity. Locations of wells identified via modern GPS technology are given with resolutions of a few feet, while others are identified merely with the "centroid of a township

and range section." Many of the records are old enough to be unreliable, especially given that most of the wells have been abandoned for decades and some for more than 100 years. An accurate inventory and description of the existing wells will require a focused study outside of this planning effort.

There are up to fourteen wells visible or reported on or near the property. The official Watermaster well location map provided by Agency staff is assumed to be more accurate than other location

maps for the area. However, precise locations will require visiting the wells in person to GPS locate each one by hand.

Because accurate documentation of the construction and locations of properties and nearby wells could not be verified, a separate water well study should be conducted according to the following steps:

4. GPS locate all existing wells at and near San Bernardino Valley property, including the Tres Lagos Wells (assumed to be at least ten), and

East Branch of the SWP	
Alamo Power Plant	Devil Canyon Afterbay 1 and Afterbay 2
Pearblossom Pumping Plant	Greenspot Pump Station (Backup)
Mojave Siphon	Citrus Reservoir
Mojave Siphon Power Plant	Citrus Pump Station
Cedar Springs Dam	Crafton Hills Reservoir
Silverwood Lake	Crafton Hills Pump Station
San Bernardino Intake Structure	Cherry Valley Pump Station
San Bernardino Tunnel	Perris Lake and Dam
Devil Canyon Power Plant	

Figure 7-68 SWP East Branch Facilities



Figure 7-69 EBX facility locations

Source DWR, <https://water.ca.gov/-/media/DWR-Images/Maps/230726SWPPipelinesFacilitiesaav57.jpg>

Facilities	Pipe Length (ft)	Diameter/Description
Bear Valley Highline	10,350	36-in diameter concrete pipe, installation in the late 1800's Size varies in diameter
Connector to Bear Valley Highline	1,400	30-inch CMLC, installed in 1985
Redlands Aqueduct	7,750	Size varies in diameter and shape (some portions are a canal), installation in the late 1800's
Greenspot Pipeline	9,900	48-inch CMLC, installed in 1980
Tres Lagos System	7,050	4-inch PVC, age unknown

Figure 7-70 Onsite Water Pipeline summary

5. Open the existing wells using construction equipment if necessary. Some wells might require metal cutting of a welded cap or excavation by backhoe (as is the case in the flowing artesian well near the Greenspot Fault).
6. Monitor the elevation and total depth of each well and collect water samples for preliminary field screening analysis, such as total dissolved solids (TDS) and turbidity. Collect samples for laboratory analysis.
7. Attempt to determine if well is filled with soil, rock, or debris.
8. Obtain laboratory analysis for general minerals on collected samples.
9. Prepare a report of findings that lists next steps.

C. Groundwater Recharge

Enhanced aquifer recharge in the area is currently being performed by the SBVWCD west of the property with waters originating from both the SAR and Mill Creek. Additional facilities are currently under construction as part of the Santa Ana River Enhanced Recharge (SARER) Phase 1-B spreading basins project. The SARER project will divert up to 500 cfs. The project is estimated to recharge an average of 15,500 AFY, or up to approximately 80,000 AFY, of stormwater during a wet year.

The Upper Santa Ana River Watershed IRWMP identifies water storage in local groundwater basins for later use during droughts as one of

the primary management strategies (WSC 2021). Water conservation and groundwater activities have been conducted in the SBBA since 1912, with the Agency involved in these activities since 1972. The SBVWCD was created to recharge the Bunker Hill Subbasin with native water diverted from the SAR and Mill Creek and is also responsible for monitoring, operating, and reporting activities in compliance with the Exchange Plan.

D. San Bernardino Valley Water Conservation District

SBVWCD was created to recharge the Bunker Hill Groundwater Basin with native water diverted from the SAR and Mill Creek.

Source: USARW IRWMP

The San Bernardino Valley Water Conservation District (SBVWCD) was created to recharge the Bunker Hill Subbasin in an environmentally and economically responsible way using local native surface water to the maximum extent practicable. The SBVWCD and its predecessors have conducted water conservation (groundwater recharge) activities for more than 100 years. SBVWCD operates two areas that overlie the Bunker Hill Subbasin in the San Bernardino Valley. These areas are at the upper end of the SAR wash area below Seven Oaks Dam and adjacent to Mill Creek just upstream of the confluence with the SAR. The SBVWCD diverts surface water flows during both storm and normal runoff from the SAR and Mill Creek and channels the flows into two separate systems of recharge basins where it is percolated into the groundwater basin for later pumping and use by local entities and private producers.



Figure 7-71 SCE Forebay Pipeline to Bear Valley Highline



Figure 7-72 Mill Creek: Bear Valley Highline

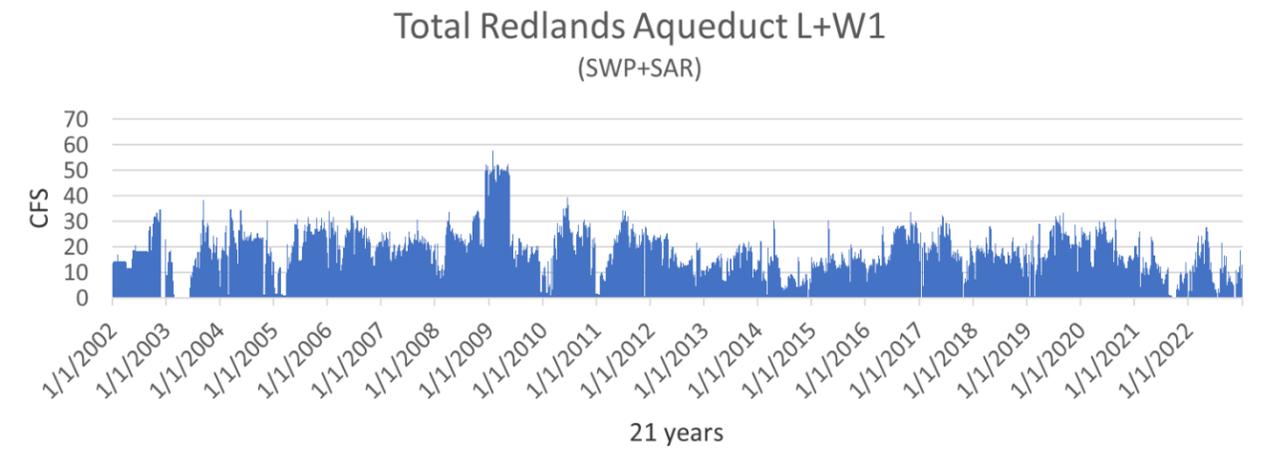


Figure 7-73 Redlands aqueduct flows, showing blended flows from both the SWP and SAR
Source SBVWCD

Santa Ana River and Mill Creek Crossings Near Sunrise Project			
Crossing	Conveyance	Length	Comments
Santa Ana River	Redlands Aqueduct	260'	SCE PH 3 tailrace crossing over the SAR with 260' elevated pipeline. Delivers water to aqueduct near the Redlands tunnel.
	Santa Ana River Crossing (SARC)	Est. 500'	SWP Foothill pipeline's buried undercrossing of the SAR near Morton Canyon.
Mill Creek	Redlands Aqueduct	400'	400-foot elevated crossing of the Mill Creek on two abutments and 5 piers. Reportedly in good condition.
	Bear Valley Highline	370'	Mill Creek crossing that has the potential to deliver flows from the Sunrise Ranch property to destinations south of the property.
	Mill Creek SCE Powerhouse Tailrace, also known as Tate Pipeline	360'	30" steel pipeline traverses a 360' pipeline bridge crossing the creek to feed the City of Redlands Tate WTP.
	Greenspot	560'	Greenspot crossing of Mill Creek is reportedly in need of repair due to persistent "scouring" problems in the creek bottom.

Figure 7-74 Santa Ana River & Mill Creek crossings near Sunrise Property

SBVWCD also recharges The SBVWCD's boundaries encompass more than 78 square miles and include portions of the communities of San Bernardino, Loma Linda, Redlands, Highland and Colton, as well as the

unincorporated county area of Mentone and other unincorporated county "islands" within the incorporated cities.

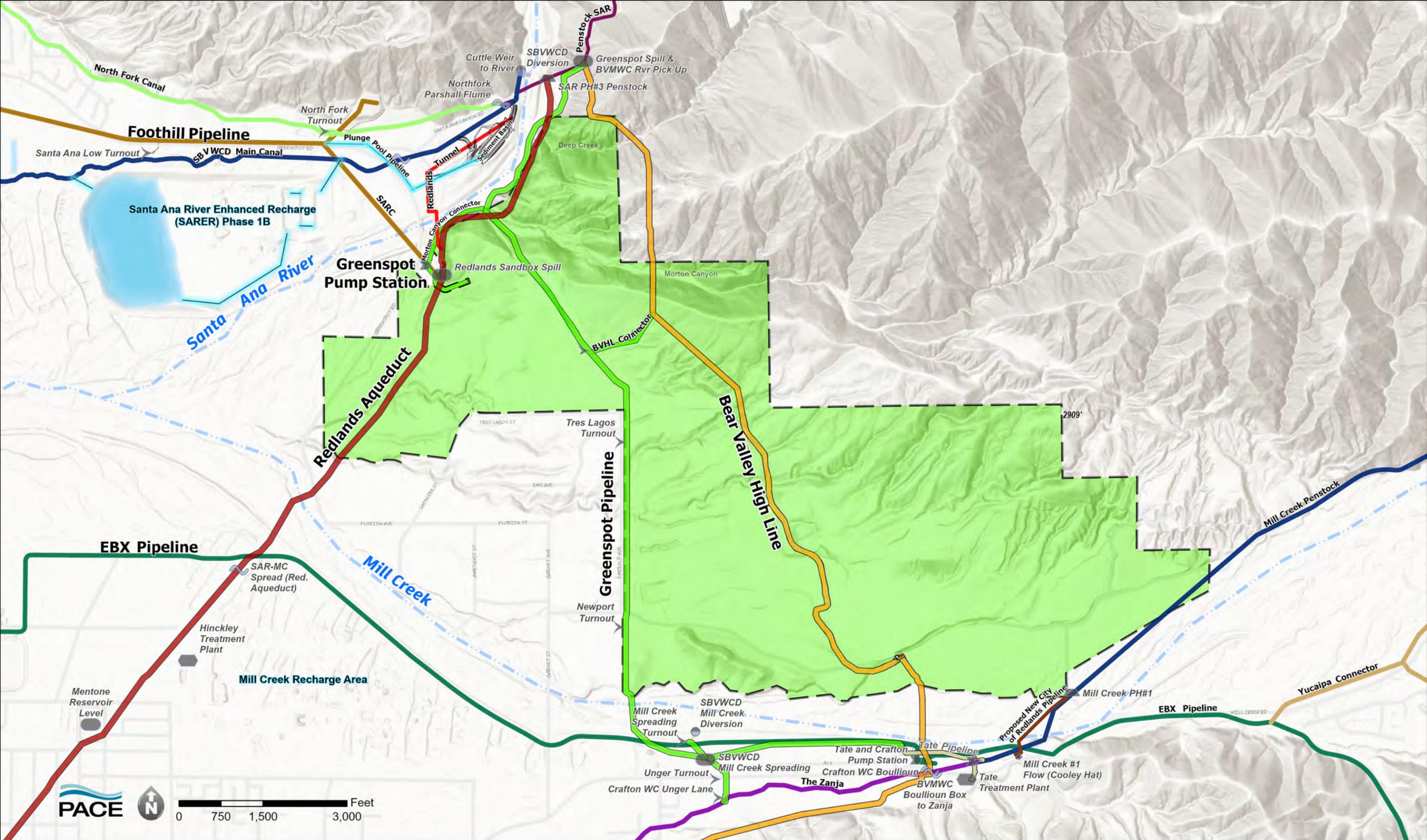


Figure 7-75 Local water pipelines and Infrastructure located within or near the Sunrise Property



Figure 7-76 Mill Creek: View Looking Downstream from SCE Powerhouse #1



Figure 7-78 Existing agricultural well and structure



Figure 7-77 Tres Lagos Wells - Local Municipal Water District within Sunrise Ranch Property

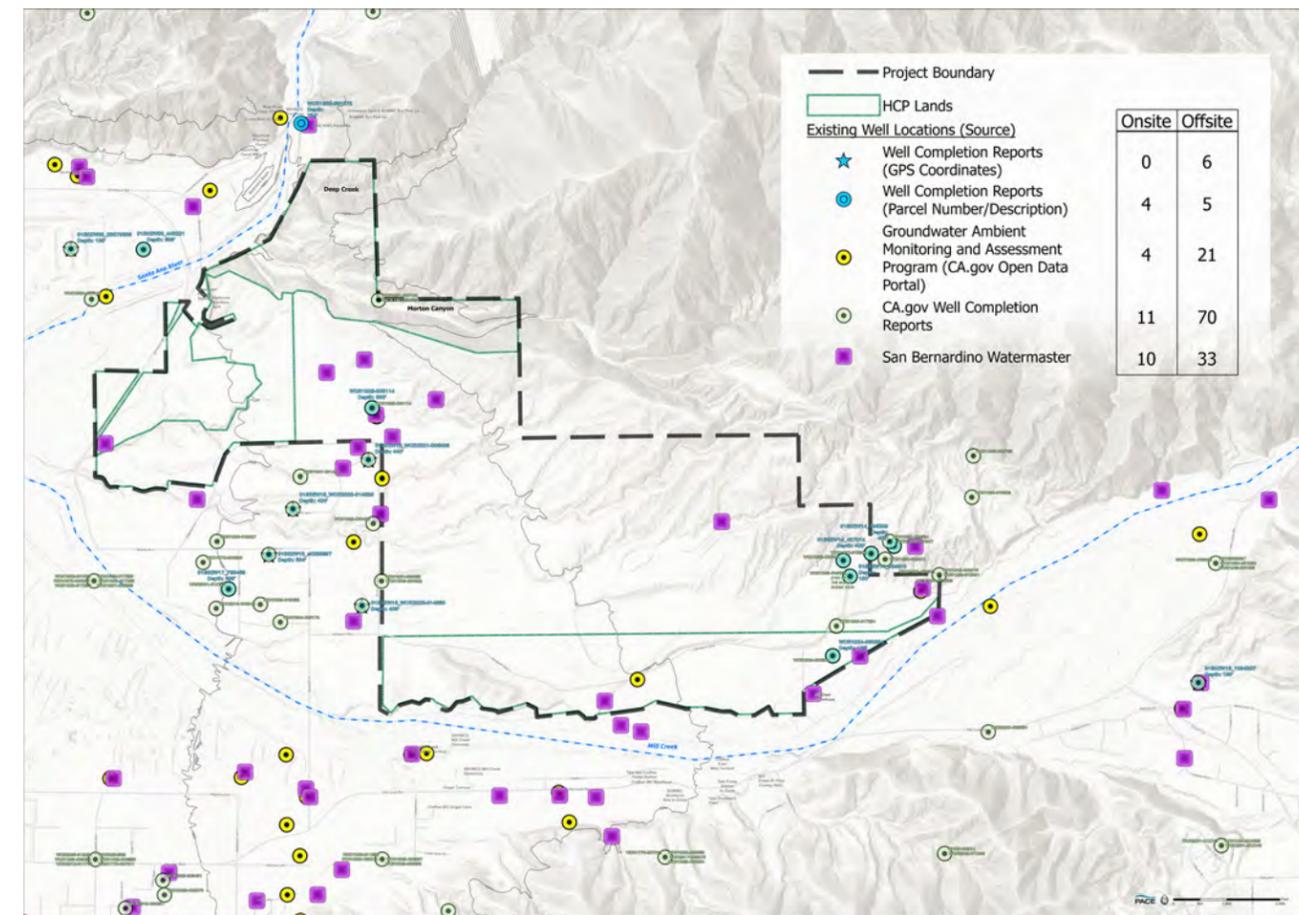


Figure 7-79 Map showing water well locations on and near the Sunrise Property



One of several unnamed water wells built by citrus growers in years past.

Figure 7-80 Typical unnamed wells on the Property



Irrigation channels built by citrus growers in years past

Figure 7-81 Existing orchard irrigation channel



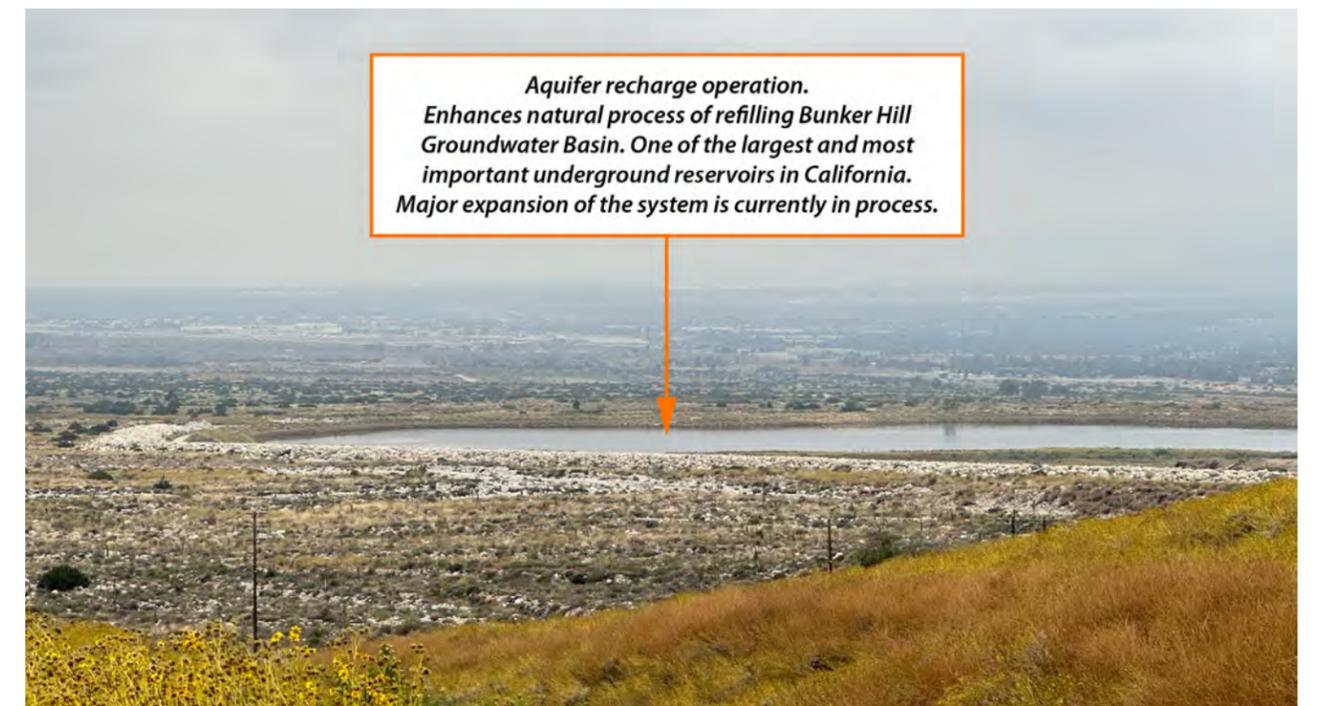
Desilting basin for enhanced groundwater recharge system

Figure 7-83 Desilting Basin below Seven Oaks Dam



One of many hydraulic structures built by citrus growers in years past

Figure 7-82 Bear Valley Highline Pipeline



Aquifer recharge operation. Enhances natural process of refilling Bunker Hill Groundwater Basin. One of the largest and most important underground reservoirs in California. Major expansion of the system is currently in process.

Figure 7-84 Aquifer Recharge Operation of Bunker Hill Groundwater Basin



Figure 7-85 Groundwater recharge existing and proposed facilities below Seven Oaks Dam
Source San Bernardino Valley

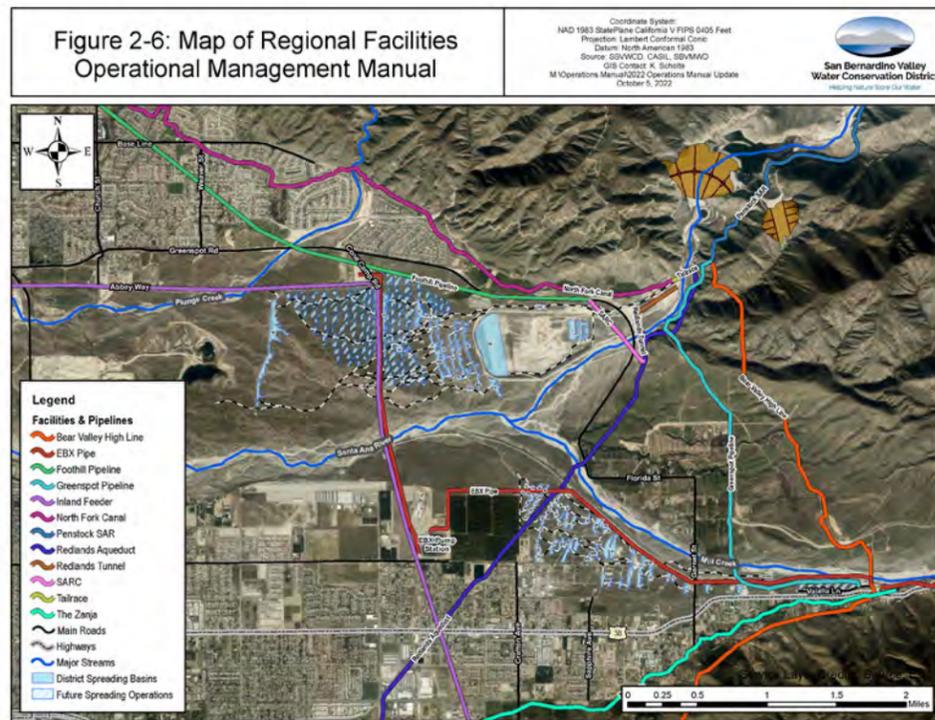


Figure 7-86 SBVWCD map of regional groundwater recharge facilities
Source SBVWCD 1992

7.3 EXISTING ENVIRONMENTAL CONDITIONS

A. Plant and Wildlife Species Observed or Likely to Occur

A search of special-status species that may occur within the property was conducted by:

- California Natural Diversity Database (CNDDDB)
- California Native Plant Society (CNPS)
- Carlsbad U.S. Fish and Wildlife Service (USFWS) database
- Reviewing previous biological reports with the EIR
- Other incidental species observations (such as in eBird or iNaturalist)

The literature/database search identified 84 species that have been recorded within a U.S. Geological Survey Quadrangle search. Of these, 25 species have been previously observed or likely to occur on the property. Another ten species were determined to have a moderate potential to occur on the property. Listed or proposed listed species that were observed on the property during field work in 2023, their listing status, and their associated habitats include:

- Santa Ana River woolly-star (*Eriastrum densifolium* ssp. *sanctorum*), federally and state endangered – present in sandy soils on river floodplains or terraced fluvial deposits in coastal scrub and chaparral
 - Western spadefoot (*Spea hammondi*), federally proposed as threatened – present in open treeless grasslands, scrub, or mixed woodland and grassland with aquatic breeding habitat
- Coastal California gnatcatcher (*Poliptila californica californica*), federally threatened – present in low, coastal sage scrub in arid washes and on mesas and slopes

Listed or proposed listed species that have been previously observed or are likely to occur on the property, their listing status, and their associated habitats include:

- Least Bell's vireo (*Vireo bellii pusillus*), federally and state endangered – present in low riparian forest, scrub, and woodland in vicinity of water or in dry river bottoms
- San Bernardino kangaroo rat (*Dipodomys merriami parvus*), federally and state endangered – present in early to intermediate seral stages of alluvial scrub on sandy loam substrates characteristic of alluvial fans and flood plains

Non-listed species that have been previously observed on the property or are likely to occur, their regulatory status, their potential to occur, and associated habitats include:

- Parry's spineflower (*Chorizanthe parryi* var. *parryi*), CNPS California Rare Plant Rank 1B.1 - present in alluvial habitat associated with the Santa Ana River and Mill Creek, dry slopes and flats in coastal scrub, chaparral, cismontane woodland, valley and foothill grassland
- California glossy snake (*Arizona elegans occidentalis*), CDFW Species of Special Concern – likely occurs within alluvial sage scrub habitat on the property but may also occur in more open foothills of the property
- Red-diamond rattlesnake (*Crotalus ruber*), CDFW Species of Special Concern - likely occurs within alluvial sage scrub habitat on the property but may also occur in more open foothills of the property
- Two-striped garter snake (*Thamnophis hammondi*), CDFW Species of Special Concern – high potential to occur within riparian habitat of Morton Canyon
- Loggerhead shrike (*Lanius ludovicianus*), Species of Special Concern – moderate potential to breed in suitable sage scrub and chaparral habitat within the property; was recorded on the property during 2013-2014 surveys
- Yellow warbler (*Setophaga petechia*), Species of Special Concern – high potential to occur in suitable habitat within Morton Canyon and other riparian areas on the property; was recorded on the property in 2014 and 2023
- Coastal cactus wren (*Campylorhynchus brunneicapillus sandiegensis*), CDFW Species of Special Concern – Tall opuntia cactus present in coastal sage scrub, nests in cholla

have been recorded on the property west of Greenspot Road; unlikely elsewhere due to low abundance of cactus patches (primarily cholla)

- Cooper's hawk (*Accipiter cooperii*), CDFW Watch List – chiefly present in open, interrupted or marginal woodlands; nests mainly in riparian growths of deciduous trees in canyon bottoms on river flood plains and live oaks; observed during 2013-2014; likely uses property for foraging, dispersal, and nesting
- Sharp-shinned hawk (*Accipiter striatus*), CDFW Watch List – present in north-facing slopes with plucking perches in ponderous pine, black oak, riparian deciduous, mixed conifer, and Jeffrey pine habitats; nests usually within 275 feet of water; observed during 2013-2014; likely uses property for wintering, foraging, and/or dispersal
- Golden eagle (*Aquila chrysaetos*), CDFW Fully Protected/Watch List, Watch List – present in woodlands and forests on rolling foothills, mountain areas, sage-juniper flats, and desert; nests in cliff-walled canyons and large trees in open areas; observed during 2013-2014. Likely uses property for wintering, foraging, and/or dispersal
- Short-eared owl (*Asio flammeus*), CDFW Species of Special Concern – present in swamp lands, lowland meadows, irrigated alfalfa fields; tule patches/tall grass needed for nesting/daytime seclusion; nests on dry ground in depression concealed in vegetation; observed during 2013-2014; likely uses property for wintering, foraging, and/or dispersal
- Long-eared owl (*Asio otus*), CDFW Species of Special Concern – present in riparian bottom lands grown to tall willows and cottonwoods and belts of live oak paralleling stream courses; observed during 2013-2014; likely uses property for wintering, foraging, and/or dispersal
- Burrowing owl (*Athene cunicularia*), CDFW Species of Special Concern – present in open, dry annual or perennial grasslands, deserts, and scrub lands characterized by low-growing vegetation; subterranean nester, dependent upon burrowing mammals, notably California ground squirrel; a wintering burrowing owl was recorded on the property near the basins in 2013-2014

- Ferruginous hawk (*Buteo regalis*), CDFW Watch List – present in open grasslands, sagebrush flats, desert scrub, low foothills and fringes of pinyon and juniper habitats; observed during 2013-2014, likely uses property for wintering, foraging, and/or dispersal
- Northern harrier (*Circus hudsonius*), CDFW Species of Special Concern – present in coastal salt and freshwater marsh; nests and forages in grasslands, from salt grass in desert sink to mountains; observed during 2013-2014; likely uses property for wintering, foraging, and/or dispersal; low potential for nesting
- White-tailed kite (*Elanus leucurus*), CDFW Fully Protected – present in rolling foothills and valley margins with scattered oaks and river bottom lands or marshes next to deciduous woodland; observed during 2013-2014; likely uses property occasionally for foraging and/or dispersal; low potential for nesting
- Merlin (*Falco columbarius*), CDFW Watch List – present in seacoast, tidal estuaries, savannas, edges of grasslands and deserts, farms and ranches; clumps of trees or windbreaks are required for roosting in open county; observed during 2013-2014; likely uses property for wintering, foraging, and/or dispersal
- Northwestern San Diego pocket mouse (*Chaetodipus fallax*) – Global ranking (G5) and State ranking (S3) - present in sandy, herbaceous areas in coastal scrub, chaparral, grasslands, sagebrush, etc.; usually in association with rocks or coarse gravel; likely present on the property
- San Diego black-tailed jackrabbit (*Lepus californicus bennettii*) – G5 Global ranking and S3 State ranking - present in intermediate canopy stages of shrub habitats and open shrub/herbaceous and tree/herbaceous edges; known from alluvial sage scrub habitat in the Santa Ana River downstream of the property; has a low potential to occur within the property west of Greenspot Road and possibly alluvial habitat of Mill Creek
- San Diego desert woodrat (*Neotoma lepida* intermedia) CDFW Species of Special Concern – prefers moderate to dense canopies in coastal scrub; abundant in rock outcrops, rocky cliffs, slopes; likely present on the property

7.4 EVALUATION AND ASSESSMENT FINDINGS FOR SBKR ON SUNRISE RANCH

A. Identification Areas of SBKR Habitat

1. SAR West of Greenspot Road

The areas west of Greenspot Road consist of sandy terraces with the potential to provide a moderate-quality SBKR habitat. These areas have yet to experience overbank flows in decades. Management actions incorporating a disturbance regime would enhance habitat suitability for SBKR and establish open areas to facilitate movement. A 1938 aerial of the area shows that this was once a braid of the Santa Ana River (SAR). A large flood control structure (levee) is currently blocked by flows south of the SAR mainstem.

Approximately 4.4 acres of enhancement/preservation credit could be gained through managing the vegetation to reduce overall nonnative plant cover and thinning shrubs to create the more open canopy conditions preferred by the species.

A potential constraint to management actions in this location is CAGN: this area was occupied by CAGN in 2023. However, habitat management for the benefit of SBKR can also benefit CAGN.



SAR West of Greenspot Road (Polygon 1)
SAR East of Greenspot Road (Polygon 1)



The Terraces East of Greenspot Road (Polygons 2, 3, 4, 5)

Also west of Greenspot Road are sandy terraces that are fairly heavily vegetated and ranges in quality from low to unsuitable for SBKR. Approximately 3.5 acres of creation/enhancement/preservation credit could be gained by managing the vegetation here to reduce overall invasive cover and thinning shrubs. In addition, the mechanical clearing of swaths would connect adjacent areas.

2. SAR East of Greenspot Road

The area east of Greenspot Road has a drainage channel that feeds from the Greenspot Pump Station and has some periodic flows that have created an unsuitable SBKR habitat due to dense fountain grass. This feature presents a land management opportunity; the drainage could be used to convey flows (if feasible) to mimic natural scour events. Sediment may also be added to nearby elevated terrace benches where the substrate conditions are unfavorable for SBKR. If periodic or consistent low flows are required, it could be feasible to construct a narrow, low-flow channel flanked by elevated sandy terrace benches that could support SBKR.

Initial grading may be required to remove or excavate the fountain grass. One limitation is that SBKR are unlikely to occur east of Greenspot Road, suggesting they would not naturally colonize the areas created. To facilitate movement by SBKR, a wildlife corridor (e.g., a wildlife tunnel) could potentially be constructed to connect the west and east sides of Greenspot Road.

3. The Terraces East of Greenspot Road

The terraces east of Greenspot Road have been long absent of fluvial processes and periodic disturbances, thus creating an area that is mostly unsuitable to SBKR. Most areas are covered by dense vegetation, but there are some small, remnant open areas. The suitable areas are not likely to be occupied by SBKR because they are isolated from other suitable occupied areas by unsuitable habitat and Greenspot Road. Some mechanical clearing of swaths may be the most efficient in this area. If feasible, the addition of sand would be beneficial to SBKR.

Because of the barrier posed by Greenspot Road, the efficacy of management actions for the benefit of SBKR in this area should be investigated further. One constraint is that SBKR would not naturally colonize such created areas at this location because it is isolated and fragmented; therefore, movement corridors across Greenspot Road would need to be established. This could include placing culverts underneath the roadway to facilitate wildlife movement. Alternatively (or in addition), the large existing concrete box culvert, located just outside of the southwest corner of the property, could be retrofitted to also accommodate wildlife movement.

An additional potential constraint to consider is the current suitability of habitat for California Gnatcatcher (CAGN). This area was occupied by CAGN in 2023. While habitat management for Greenspot Road would generate 20.4 acres

of creation credit, it is important to note that the primary mitigation bank for San Bernardino Kangaroo Rat (SBKR) is located in Cajon Wash (Vulcan Bank). This bank offers credits that may comprise a mix of banking types: suitable habitat (preservation), habitat requiring enhancement, and currently unsuitable habitat (creation). These credits are not tracked individually and are not available for the Santa Ana River population. As a result, a credit specifically for SBKR creation would hold greater value than the equivalent credit currently offered at Vulcan Bank.

4. SAR West of Greenspot Road - Low to Unsuitable for SBKR

To the west of Greenspot Road, there are sandy terraces that are somewhat vegetated, with quality varying from low to unsuitable for SBKR. By managing the vegetation to reduce overall invasive cover and thinning shrubs, approximately 3.5 acres of creation/enhancement/preservation credit could be achieved. Mechanically clearing swaths to connect adjacent areas with more suitable conditions would also be beneficial for SBKR.

5. Mill Creek West

A historical terrace located north of Mill Creek currently exhibits vegetation cover that exceeds optimal levels and suggests the presence of a high water table. This elevated water table may be contributing to potential leaks in a nearby structure. As a result, this area is not currently suitable for SBKR implementation. SBKR creation credits could be achieved through vegetation

management, which would involve reducing invasive cover, thinning or removing shrubs, and addressing the water source that is fostering riparian habitat. However, challenges may arise due to the existing riparian habitat, and eliminating the water source could prove difficult. Additionally, effective management may require actions outside the property boundary to connect with other suitable habitats, which is essential for viability. SBKR populations in this section of Mill Creek are not well-documented, so it has not been confirmed whether they are present nearby. Considering these constraints and the fact that only 1.4 acres would be created, this initiative is likely to be a low priority.

6. Mill Creek Central-existing Disturbed

An area north of Mill Creek has experienced significant disturbance; it previously supported citrus cultivation. Although the agricultural activities were cleared, the area has not recuperated and is now predominantly populated by dense, non-native vegetation, including grasses and mustards. Aerial imagery from 1938 indicates the presence of citrus, suggesting that some northern terraces of Mill Creek were cleared to facilitate this. There is a recent breakout channel of Mill Creek located approximately 130 feet to the south at its nearest point.

This presents an opportunity for creation of alluvial fan sage scrub (14.4 acres) that could be used by SBKR. The soils should be tested to determine if sand lenses from Mill Creek's historical scour lay below the surface, which

would make this a viable opportunity. If so, a scrape can remove the existing non-native vegetation and reveal the sandy substrates below. Seeding and planting of natives would be required, as well as invasive control. If the scrape is deep enough and reveals sandy soils, there could be little remnant seed bank, which would be an advantage to creating native habitats.

At this location, the southern extent of the property is very close to more suitable SBKR habitat that would allow it to be connected, although some management may be needed just outside and south of the property boundary to accomplish this. A fire in 2020, just south of the property, has reduced vegetation cover possibly making it more suitable for SBKR. SBKR in this section of Mill Creek are not well-documented, and it is unclear if the upstream is a limit to their current range. If sand import is needed, this creation opportunity may be cost prohibitive.

7. Mill Creek East-existing Disturbed

This area, located north of Mill Creek on the eastern part of the property, was also the site of a citrus grove established in 1938. Although the grove has since been cleared, the area is now primarily characterized by dense, non-native vegetation, including grasses and mustards. Historical aerial imagery suggests that some portions of this site may have originally been alluvial fan sage scrub prior to its conversion for citrus production. This area is positioned directly adjacent to mature alluvial fan sage scrub



SAR West of Greenspot Road - Low to Unsuitable for SBKR (Polygon 7)



Mill Creek West (Polygon 8)



Mill Creek Central and East-existing Disturbed (Polygons 9a-9b)



Mill Creek Central-existing Sand Lens (Polygon 10)

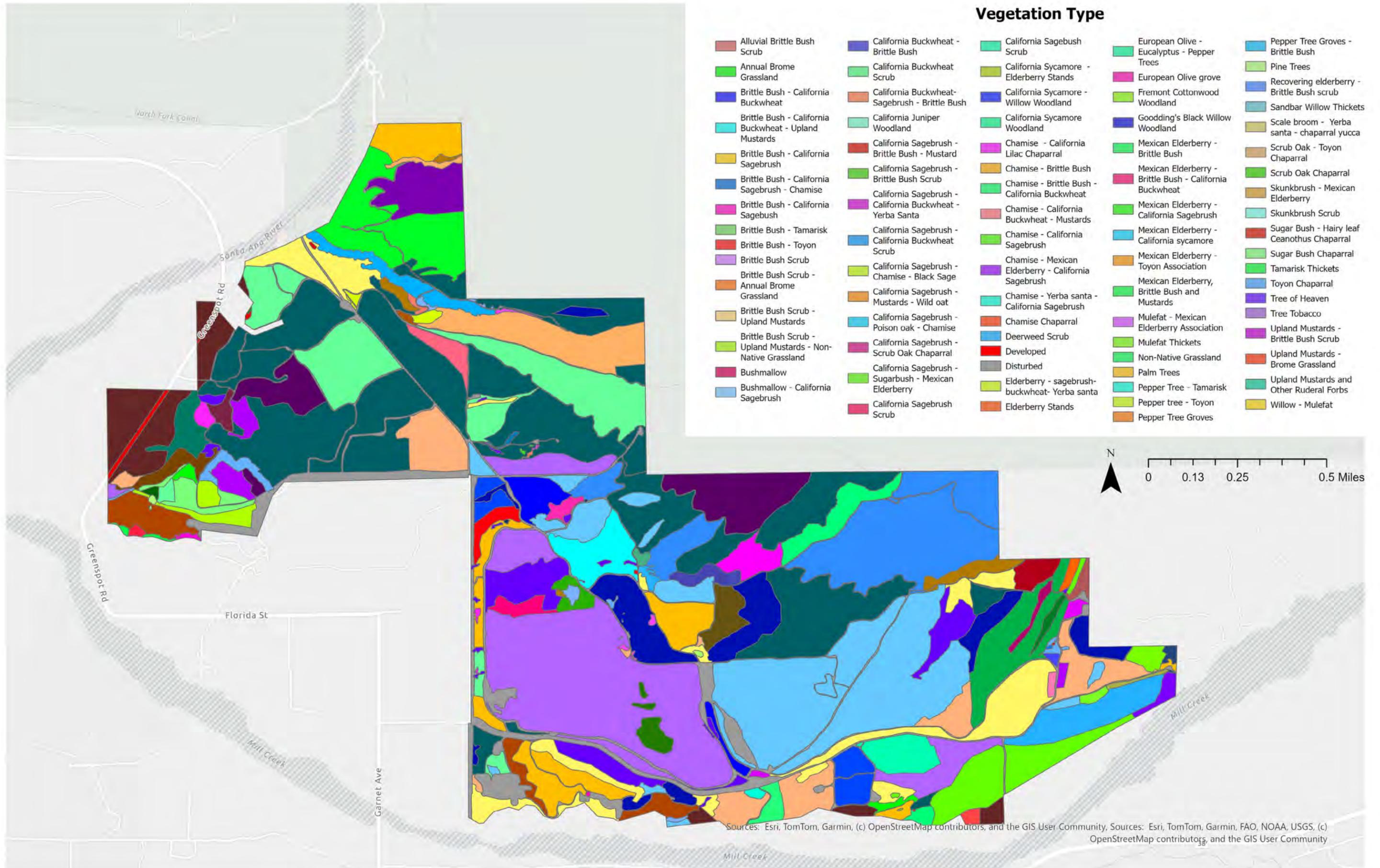


Figure 7-87 Vegetation types on Sunrise Ranch

associated with Mill Creek, which lies within a boundary predominantly marked by chamise chaparral, although some historical sandy breakouts remain visible.

This presents an opportunity for creation of alluvial fan sage scrub (13.7 acres) that could be used by SBKR. The soils should be tested to determine if sand lenses from Mill Creek's historical scour lay below the surface, which would make this a viable opportunity. If so, a scrape can remove the existing non-native vegetation and reveal the sandy substrates below. Seeding and planting of natives would be required, as well as invasive control. If the scrape is deep enough and reveals sandy soils, there could be little remnant seed bank, which would be an advantage to creating native habitats.

At this location, this created area could be directly connected to existing sandy areas within the boundary. Further evaluation would be needed beyond the property boundary to determine where SBKR suitable habitat occurs and whether there are corridors for colonizers. The distribution of SBKR in this section of Mill Creek are not well-documented, and it is unclear if the upstream is a limit to their current range. If sand import is needed, this creation opportunity may be cost prohibitive.

8. Mill Creek Central-existing Sand Lens

There is a small area (1.8 acres) on the southern limit of the property boundary adjacent to Mill Creek that appears as a historical terrace. It is currently fairly open due to a fire that burned the area in 2020. Some potential kangaroo rat

burrows were observed inside this area, although they could belong to *Delzura kangaroo rat*.

This alluvial fan sage scrub area would benefit from enhancement activities, such as removing invasive vegetation. It occurs adjacent to burned areas that could support SBKR, so it appears well-connected to other suitable SBKR habitat to the south. One constraint is that the SBKR population in this section of Mill Creek is not well-documented so it is difficult to assess the upstream limit of their current range and whether they would colonize or inhabit enhanced areas.

9. Mill Creek Central-mature Terrace

To the east of the previously described area lies the mature, historical terraces of Mill Creek. This is characterized by a grassy understory and primarily a chamise overstory, which has largely remained un-flooded since prior to 1938. This location is deemed unsuitable for SBKR. An aerial photograph from 1938 indicates that it overlaps with the northern terraces of Mill Creek and contains some historical breakout channels. This area presents an opportunity for the creation of alluvial fan sage scrub through the removal of invasive vegetation and the exposure of underlying sandy substrates. However, there are surface rocky areas that may suggest limited soil suitability for SBKR at certain locations; thus, thorough testing should be conducted prior to initiating large-scale restoration efforts.

At a minimum, specific swaths could be identified for potential creation or enhancement opportunities based on field assessments that

avoid areas with rocky surface soils and target sandy sections. This area encompasses a total of 28.5 acres. Similar to the other locations discussed, the SBKR population along this segment of Mill Creek is not well-documented. While CAGN have been observed in this area, they could benefit from focused restoration activities.

10. Historical Terrace of Mill Creek

Located east of the SCE powerhouse access road, this area consists of a mature, historical terrace of Mill Creek characterized by a relatively grassy understory and a predominance of chamise in the overstory. It appears less rocky than the adjacent areas to the west of the access road and shows more signs of sandy terraces formed by historical small breakout channels of Mill Creek. The likelihood of future breakout events is reduced due to a 15- to 20-foot-tall boulder berm constructed upstream. These small sandy areas present moderate suitability for SBKR, though the likelihood of their occurrence remains uncertain, as the SBKR population in this segment of Mill Creek is not well documented. There is potential to enhance the alluvial fan sage scrub for SBKR by removing invasive species and thinning shrubs where sand lenses exist.

The creation of new sand lenses could be feasible by clearing invasives and selective shrubs, which would significantly increase the amount of suitable habitat for SBKR. This area encompasses a total of 12.2 acres and is situated adjacent to a more scoured and less densely vegetated region comprised of a mix of sandy and rocky soils that may also support SBKR. There may be opportunities for natural colonization of the enhanced and newly created areas if they are developed nearby.

11. Mill Creek Central-rocky Alluvial Fan Sage Scrub

A historical braid of Mill Creek, which is currently disconnected from water flows due to an upstream flood control structure (large rock berm), is located in the southern part of the property, just west of the historical SCE powerhouse. While some small sand lenses are present, the majority of the area is characterized by boulders and rocky substrates, creating largely unsuitable living conditions for the SBKR. It is possible that SBKR could utilize this area for movement. Aerial photographs from 1938 and 1969 indicate that Mill Creek flooded this area, likely washing away much of the sand and exposing the boulders, resulting in limited sand deposits. There is potential to enhance SBKR habitat by importing sands, although this approach may be cost prohibitive.

12. Mill Creek Historical Braid

To the east of the SCE powerhouse access road is a historical braid of Mill Creek that is no longer connected to flows. This is due to an upstream flood control structure (large rock berm). There are some small, higher quality sand lenses present here that provide low-moderate suitability for SBKR. The likelihood for SBKR to occur is difficult to assess as their distribution in this part of Mill Creek is not well-documented. These two small areas (1.8 acres) could benefit from enhancement activities, particularly by removing invasive vegetation and thinning shrub cover in places. In addition, the eastern polygon is very close to the current low flow channel of Mill Creek.



Mill Creek Central-mature terrace (Polygons 11-12)



Mill Creek Central-rocky alluvial fan sage scrub (Polygon 13)



Historical Terrace of Mill Creek (Polygon 14)



Mill Creek historical braid (Polygons 15-16)



Figure 7-88 View of the San Bernardino Mountains and Valley

7.5 CONSERVATION AND MITIGATION BANKING PROGRAM OVERVIEW

Importance of Mitigation

Compensatory mitigation, through mitigation banking or a mitigation credit agreement, ensures impacts on environmental resources are offset by enhancing, restoring, and/or creating, and preserving resources at a different location, so that there is no net loss in ecological function.

Ensures/supports legal compliance. Multiple laws, including California Environmental Quality Act (CEQA), Clean Water Act (Section 401, Section 404), Endangered Species Act of 1973, California Endangered Species Act, California Fish and Game Code section 1600 et seq., and Porter-Cologne Water Quality Control Act, require mitigation when impacts cannot be avoided or minimized.

Compensatory mitigation is the final step in the regulatory process hierarchy:

1. Avoid
2. Minimize
3. Restore (on-site)
4. Compensate (off-site or through mitigation credits)

Without compensatory mitigation, incremental project-by-project impacts would gradually degrade ecosystems.

California Fish and Wildlife describes mitigation banking activities as:

“A conservation or mitigation bank is permanently protected land that is conserved and managed for its natural resource values. In exchange for permanently protecting, managing, and monitoring the land, the bank sponsor may sell or transfer aquatic resources and/or species/habitat credits to permittees/project proponents that need to meet compensatory requirements for the environmental impacts of projects. Use of mitigation bank credits must occur in advance of project impacts when the compensation cannot be achieved at the project site or would not be as environmentally beneficial.”

Conservation Banking

A conservation bank generally protects important habitat including habitat for threatened, endangered, or other special status species that exists, has been, or will be created. Credits are established for the specific sensitive species and habitat. Agencies that typically participate in the regulation and approval of conservation banks are California Department of Fish Wildlife, the U.S. Fish and Wildlife Service and National Oceanic and Atmospheric Administration-National Marine Fisheries Service.

Mitigation Banking

A mitigation bank is created to compensate for activities authorized pursuant to Section 404 of the federal Clean Water Act (33 U.S.C. Sec. 1344 et seq.) and protects, restores, creates, or enhances wetland habitats. Additionally, mitigation banks may also include the conservation and protection of state and/or federally listed threatened, endangered species and/or habitat. Credits are established to compensate for unavoidable impacts to aquatic resources and/or special status species and/or habitat. Mitigation banks are approved by the U.S. Army Corps of Engineers and may also be approved by the U.S. Environmental Protection Agency, California Department of Fish and Wildlife, U.S. Fish and Wildlife Service, National Oceanic and Atmospheric Administration-National Marine Fisheries Service, and State Water Resources Control Board.

Benefits of Conservation and Mitigation Banking

For the buyer or user of credits...

- Cost reductions over per project Permittee Responsible Mitigation, due to the economies of scale, a larger habitat bank generates and passes on to credit buyers/users together with cost certainty.
- “One-stop” permit compliance including habitat protection, long-term management, maintenance, and monitoring.
- More efficient. This means a permittee can likely satisfy mitigation requirements faster buying a credit than creating Permittee Responsible Mitigation.
- For the ecosystem...
- Protection and restoration of larger, more functional and longer-lasting ecological systems.
- No temporal loss of ecological function because protection/restoration is completed before the impacts occur.
- Management of the property for aquatic resources, sensitive species and/or their habitats in perpetuity.
- “No Net Loss” in wetland acres at minimum, often with a gain of wetland acres.
- Permanent protection in the form of a conservation easement or fee title held by a qualified conservation entity, enforced by a qualified third party.”

<https://wildlife.ca.gov/Conservation/Planning/Banking/Overview>

Projects Benefiting from Sunrise Ranch Mitigation Acreage

San Bernardino Valley Water Conservation District

- Mill Creek Diversion Maintenance

East Valley Water District

- Operations & Maintenance of wells and pipelines

Inland Empire Utilities Agency

- Impacts associated with groundwater recharge projects

Metropolitan Water District of Southern California

- Impacts associated with right-of-way and patrol road maintenance

Riverside Public Utilities

- Construction of wells and pipelines in Bunker Hill Basin area, and O&M of these areas in the future
- Impacts associated with construction of new treatment plant
- Impacts associated with property maintenance
- Impacts associated with repair/

replacement of supply transmission mains, and O&M of supply transmission mains

San Bernardino Valley Municipal Water District

- Impacts associated with O&M of existing pipelines and pipeline crossings
- Mill Creek diversion stormwater capture project
- Oak Creek Basins/Plunge Creek diversion stormwater capture project

San Bernardino Municipal Water Department

- Maintenance, repair, replacement of pipelines under the Santa Ana River
- Impacts associated with Kenwood well field and pipelines
- Impacts associated with existing facilities maintenance

Covered Species

Plants

Slender-horned spineflower
Santa Ana River woolly-star

Fishes

Santa Ana sucker
Arroyo chub
Santa Ana speckled dace

Amphibians and Reptiles

Western spadefoot
Mountain yellow-legged frog
Western pond turtle
South coast garter snake
California glossy snake

Mammals

San Bernardino kangaroo rat
Los Angeles pocket mouse

Birds

Least Bell's vireo
Southwestern willow flycatcher
Yellow-breasted chat
Western yellow-billed cuckoo
Tricolored blackbird
Burrowing owl
Coastal California gnatcatcher
Cactus wren

Insect

Delhi Sands flower-loving fly

Fully Avoided Species

Arroyo toad



Figure 7-90 Annual Santa Ana River Fish Survey

Mitigation Strategy

In order to continue projects as stand alone efforts, to the rolled into the HCP upon approval, mitigation must occur prior to the impacts. By incorporating a multi-project mitigation strategy there are significant cost savings to the participating agencies. Additionally, the effort has been successful at receiving grant funds.

Chapter 8

COMMUNITY ENGAGEMENT



CHAPTER 8 CONTENTS

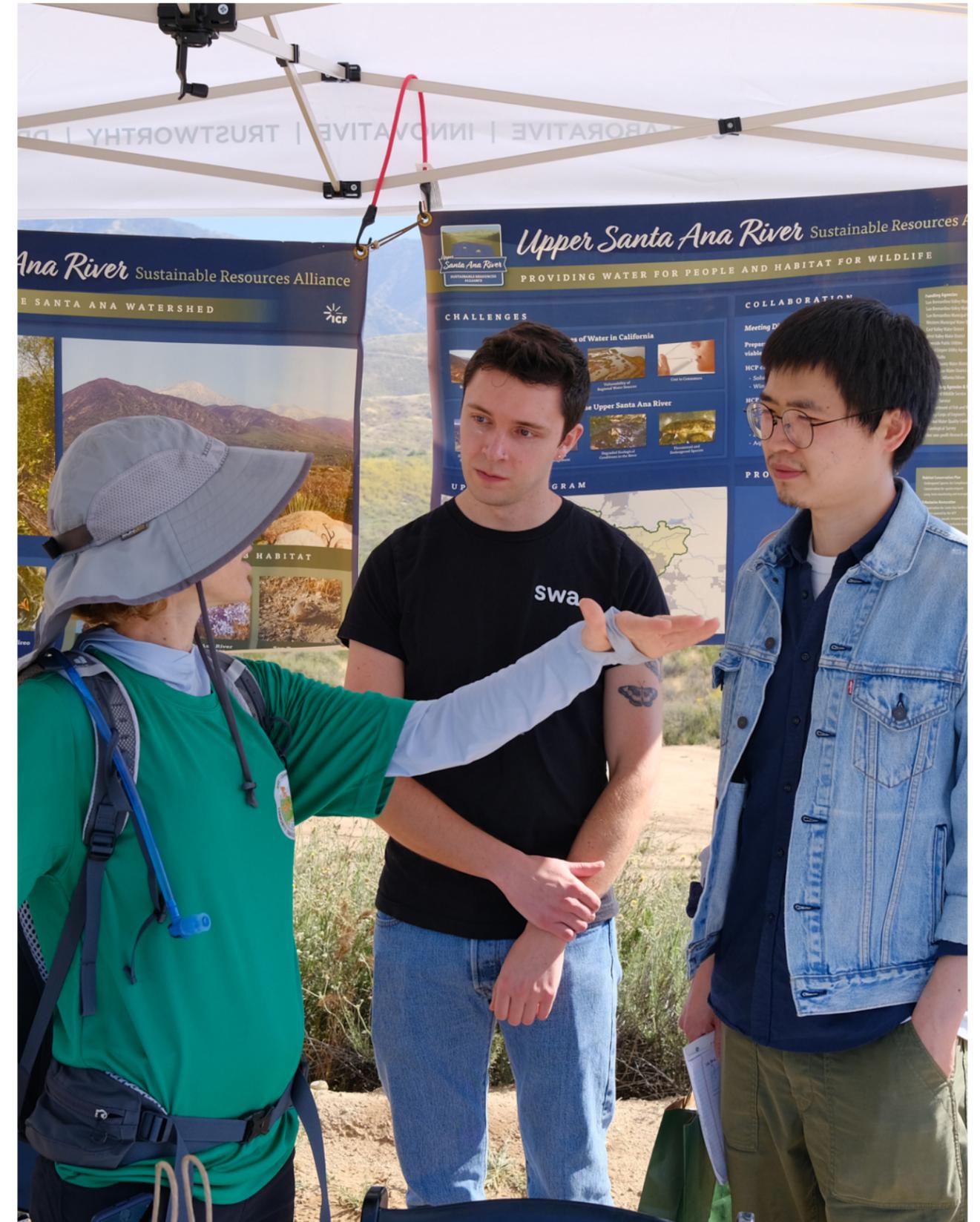
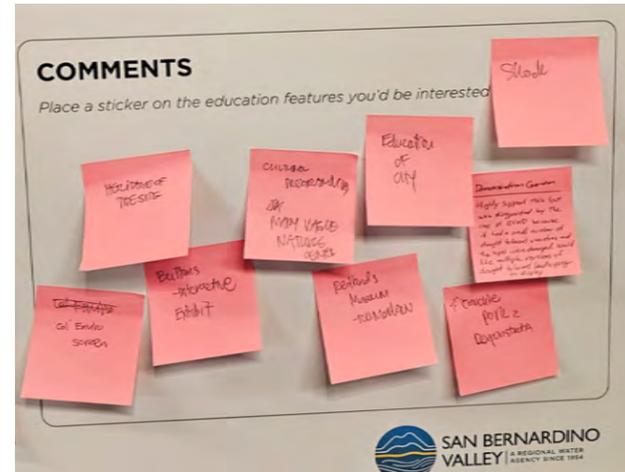
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8.0 COMMUNITY ENGAGEMENT OVERVIEW

A. Approach

A thorough community engagement process ensured that local residents and other agencies near Sunrise Ranch Property could share their opinions on the future development and planning effort. The outreach was conducted in four phases. The first phase focused on introducing the Plan to the community and stakeholders. The second phase was to collect input to guide ideas for the Plan. The third phase served as a way for participants to weigh in on the current direction of the plan. The fourth and final phase was an open house to present the final Plan document.

There were two events in the first phase, during the summer of 2023, and one in each consecutive phase. The events were held in a variety of locations and at a variety of times to include a broad spectrum of participants. Community Workshops were public and open for all to attend.



8.1 PHASE 1 COMMUNITY EVENTS



A. Trails Day

Location: Newport Rd & Fish Hatchery Rd
Estimated attendance: 96

San Bernardino Valley hosted a Trails day with activities, hiking, and a vendor event on the Sunrise Ranch Property. San Bernardino Valley had an information table to introduce the Plan, answer questions, generate a community list, and solicit initial ideas.



B. Community Workshop #1

Location: Mentone Senior Center
Estimated attendance: 14

The first community workshop consisted of a presentation, a question and answer session, and tables for comment cards. The purpose of the first phase was to introduce the project and its goals to the community. The team delivered a high-level view of the Sunrise Ranch Property and spoke to all of the key interest areas.

C. Summary of Comments

PHASE I COMMENTS

Trails & Public Access

"Any public access with hiking, biking, or walking trails would be such a benefit to our community."

"I would love to see public access trails (hiking, equestrian, etc.) & habitat restoration/species conservation most!"

"Redlands is a wonderful place to live and we would love more places to enjoy the land and be outside with our kids."

Education

"Allow for educational opportunities regarding preservation, species, history, and importance of the area for the community, particularly regarding water conservation and development."

"Considerations for something such as the development of a nature center could help draw people and families in from all surrounding areas."

Preservation

"The ability to conserve and preserve additional land is an exciting development for this city and surrounding communities."

Non-Residential

"Thank you for purchasing the land! The benefits for our community seem on the horizon. We're excited to see the future of this land!"

"Open space, trees, trails, protection of land, park site. No home development!"

8.2 PHASE 2 COMMUNITY EVENTS



A. Community Workshop #2

Location: San Bernardino Valley Municipal Water District HQ
 Estimated attendance: 28

After the team met with the community during Phase 1, Workshop #2 was more interactive. The workshop included a presentation followed by activity tables and discussions. The goal was to understand the community's views.



B. Summary of Comments

PHASE 2 COMMENTS

Habitat

Which conservation and restoration activities should be prioritized?

- Annual forbs / bare ground preservation
- Vernal ponds
- Preservation of existing vegetation

Considerations

- Birdwatching
- Wetland experience
- When feasible, habitat access
- Wildlife cameras

Water Supply

What would you like to learn about:

- Interpretive signage
- Mill Creek Power House
- The water system
- Relationship between up and down stream
- Educational value
- Signage for infrastructure

Considerations

- Bear Valley High Line alternative
- Overflowing of Seven Oaks Dam
- Value of water on site
- Hydrology maintained in dry years

Site Trails and Program

What trails would you like to see?

- Loops within two hours
- Balance of easy, medium, and hard

Considerations

- Viewpoints near water and mountains
- Interpretive signage
- SAR Trail Connection
- Accessible trails
- Security
- Amenities like Exercise equipment, bikes facilities
- demonstration gardens

Buildings/Community Program

What features should be considered?

- Mixed-use space
- Shade
- Natural views
- University programs
- Field trips/summer camp

What would you like to learn about?

- Wildlife
- Tribal culture
- Mill Creek Powerhouse
- Orange Groves

C. Activity Tables Summary

1. Habitat

Additional Thoughts

- Conservation
 - Mention of other property bidder conserving their land in East Valley
 - This land is closed to public and strict about mitigation
 - Concerns that "critical habitat" area will be closed for public use
 - Preference towards preservation/enhancement of existing native vegetation, as opposed to restoration
 - Mention that Wildlands Conservancy could acquire back this land
 - Annual foreland/bare ground typically important for ground nesting arthropod species, reptiles, diminutive plant species, etc.; should be emphasized
- Wildflower blooms
 - Trespassing problems with neighboring properties during bloom season
 - Security concerns and habitat concerns
- Fauna
 - Interpret past radio collared deer study near site to analyze corridors

RINCON Habitat



Write Your Response

What conservation and restoration activities should be prioritized on the property?

- Annual forbs / bare ground preservation
- Vernal ponds
- Preservation of existing vegetation



2. Site Trails

Additional Thoughts

- Recreation
 - Non-motorized water recreation in reservoir (kayak, fishing)
 - Potential to connect to Crafton Regional Park campgrounds
 - Outdoor workout area
- Trails
 - Mention of Seven Oaks area trail being backcountry rugged and indistinct
 - Separation of trails for mountain bikers vs. hikers
 - Clear delineation of bike, pedestrian, and other modalities desirable for safety
 - Viewpoints are important
 - Trail safety and erosion concern
- Accessibility is a priority
 - Boardwalk, paved parts of path, and sections of path with handrails
 - Clear wayfinding for differently-abled bodies
- Orchard
 - Should be at least half an acre to simulate "orchard"
 - Narrow road leading to Newport Ave. is currently Marquez brother's property on both sides, would need to discuss changes with them

SWA Site Trails



Table Dot Exercise

What type(s) of hiking trails would you most likely utilize?

Easy



Suitable for beginners and children < 3 miles

Moderate



Requires some skill and challenge to travel 3-5 miles

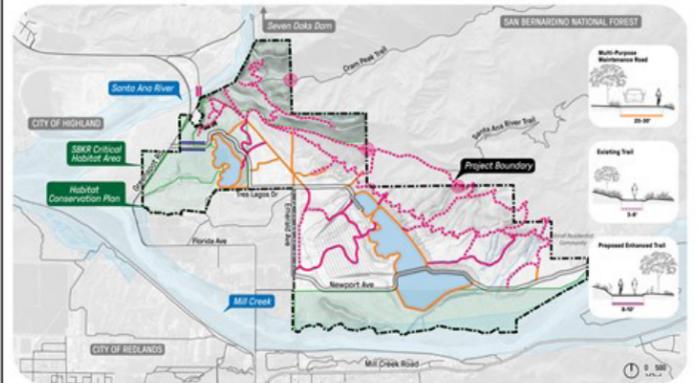
Hard



Requires a high degree of skill >5 miles

• Ideal hike for elderly, two hour hike out and turn around to come back

Potential Site Trails



Which type(s) of hiking trails would you be most likely to use?



3. Water Supply

Additional Thoughts

- Bear Valley High Line alternative
 - Getting the Board to agree with alternative; what is the business case?
 - Parallel pipe for East Valley and San Bernardino Valley
 - Joint facility potential
- Overflooding of Seven Oaks Dam
 - People often swim in river downstream; this can be very dangerous
- Consider water on site
 - San Bernardino Lakes and Streams project with clay soil
 - Foothills have a lot of quartz, small sand is good for percolation
- Flood over Hanson Canyon history
 - Address if we introduce hydrology to the site, how will it be maintained in dry years?

PACE
Water Supply

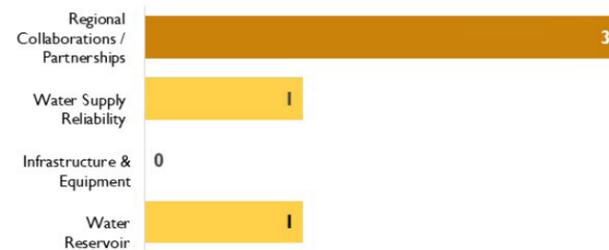
Table Dot Exercise
Which water supply infrastructure components would you like to learn more about?

<p><i>Water Reservoir</i></p> <p style="text-align: center;">●</p>	<p><i>Infrastructure & Equipment</i></p>
<p><i>Water Supply Reliability</i></p> <p style="text-align: center;">●</p>	<p><i>Regional Collaborations/Partnerships</i></p> <p style="text-align: center;">● ● ●</p>

Other:

- Interpretive signage
- Mill Creek Power House
- Recognize that this is just part of the system
- Relationship between up and down stream
- Educational value
- Signage for infrastructure

Which water supply infrastructure components would you like to learn more about?



4. Site Program

Additional Thoughts

- Road
 - Request to widen road
- Security Concerns
 - Homeless encampments problematic; i.e. partiers, trash dumpers
 - How to prevent barbeques
 - Understand who manages and maintains security on site
- Amenities
 - Permanent toilets
 - Water bottle fill stations, drinking water/fountains
 - Interpretive signage
 - Mill Creek Power House
 - Talk about pipeline, BVHL, aqueduct and built hydroelectric power

SWA
Site Program

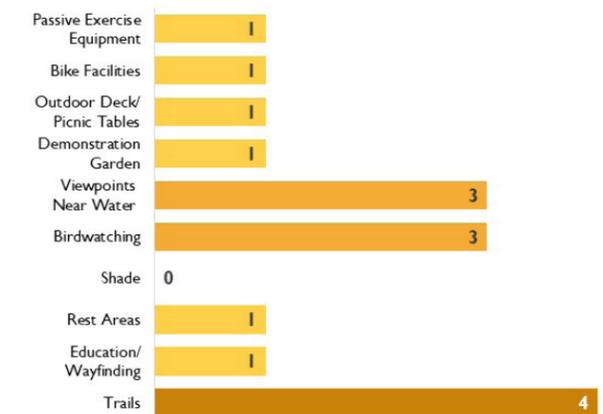
Table Dot Exercise
As a site visitor, which of these would appeal to you the most?

<p><i>Trails</i></p> <p style="text-align: center;">● ● ● ●</p>	<p><i>Educational Wayfinding</i></p>
<p><i>Rest Areas</i></p> <p style="text-align: center;">●</p>	<p><i>Shade</i></p> <p style="text-align: center;">●</p>
<p><i>Birdwatching</i></p> <p style="text-align: center;">● ● ●</p>	<p><i>Viewpoints near the water</i></p> <p style="text-align: center;">● ● ●</p>
<p><i>Demonstration Garden (Community garden)</i></p> <p style="text-align: center;">●</p>	<p><i>Outdoor Deck with Picnic Tables</i></p> <p style="text-align: center;">●</p>
<p><i>Bike Facilities (bike repair, e-bike charging)</i></p> <p style="text-align: center;">●</p>	<p><i>Passive Exercise Equipment</i></p> <p style="text-align: center;">●</p>

Other:

- Security cameras
- Non-monetized water recreation
- Wildlife cameras
- Wetland
- Non-motorized water recreation
- Look at Bluff Lake, between Big Bear and Santa Ana River Valley
- Interpretive signage
- SAR Trail Connection
- Campgrounds
- Hard surface, accessible trails
- When feasible, habitat access
- Landings, steps and handrails

As a site visitor, which of these would appeal to you the most?



5. Architecture Features

Additional Thoughts: Education Center

- Interior spaces
 - Meeting space for nonprofits to convene and provide lectures
 - Support programming for University/ Higher education
 - Space for interns working at SBVMWD to also work
 - Flexible multiple use spaces
- Amenities
 - Shade
 - Integrate Mill Creek Powerhouse
 - Maintain viewshed
 - Wildlife viewing blinds/ glass bird blinds
- Activities
 - Education center and activities opportunity for San Bernardino residents to stay and recreate
 - Other cities (Redlands, Rancho Cucamonga) have fancy developments (malls) that bring people in from neighboring cities and increase revenue; work to keep people here

Additional Thoughts: Headquarters

- Transportation to site
 - Headquarters would be in the middle of nowhere
 - Can't easily access site via public transportation
 - East Valley HQ nearby and public can't get to easily

Additional Thoughts: Fire Training Center

- In coordination with San Bernardino Fire Department
- Educational component
 - Collaboration with education center; learn fire safety, prescribed burns

LEVER Architecture Features



Table Dot Exercise

The potential Education Center could have some sustainability features. What features could be considered on site?

- Get people outside
- Mixed-use space
- Shade
- Blinds / glass bird blinds

Are there nature centers, park visitor centers that you like visiting? Please describe your experience. What activities did you engage in? What made it memorable?

- Maintain natural views
- Wildlife viewing
- Oak Glen Preserve



6. Community Program

LEVER Community Program



Table Dot Exercise

As a site visitor, which of these would appeal to you the most?

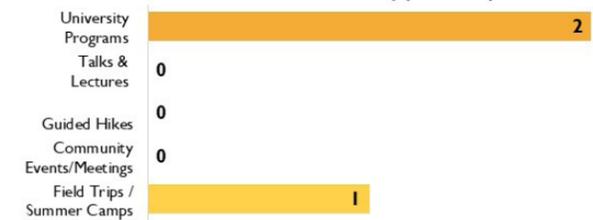
Field Trips/Summer Camps <small>(Children & Teens K-12)</small> <div style="text-align: center;">●</div>	Community Events and Meetings <small>(like Trails Day)</small>
Guided Hikes	Talks & Lectures
University Education Programs <div style="text-align: center;">● ●</div>	Other: <div style="text-align: center;">💡</div>

Which items are you interested in learning about through educational signage and workshops?

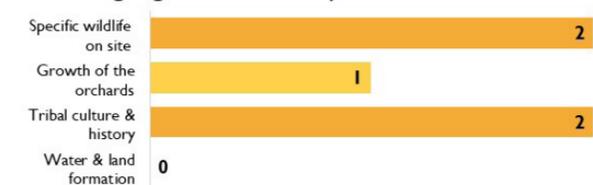
Water movement and land formation over time	Tribal culture and history, garden "local native peoples" <div style="text-align: center;">● ●</div>
Growth of the orchards <div style="text-align: center;">●</div> <div style="background-color: #f9c94d; padding: 2px; margin-top: 5px;">Orange groves</div>	Specific wildlife on site <div style="text-align: center;">● ●</div>
Other: <div style="text-align: center;">💡</div>	<div style="background-color: #f9c94d; padding: 2px; margin-top: 5px;"> <ul style="list-style-type: none"> Mill Creek Power House Trails Many activities dedicated to hikers & bikers </div>



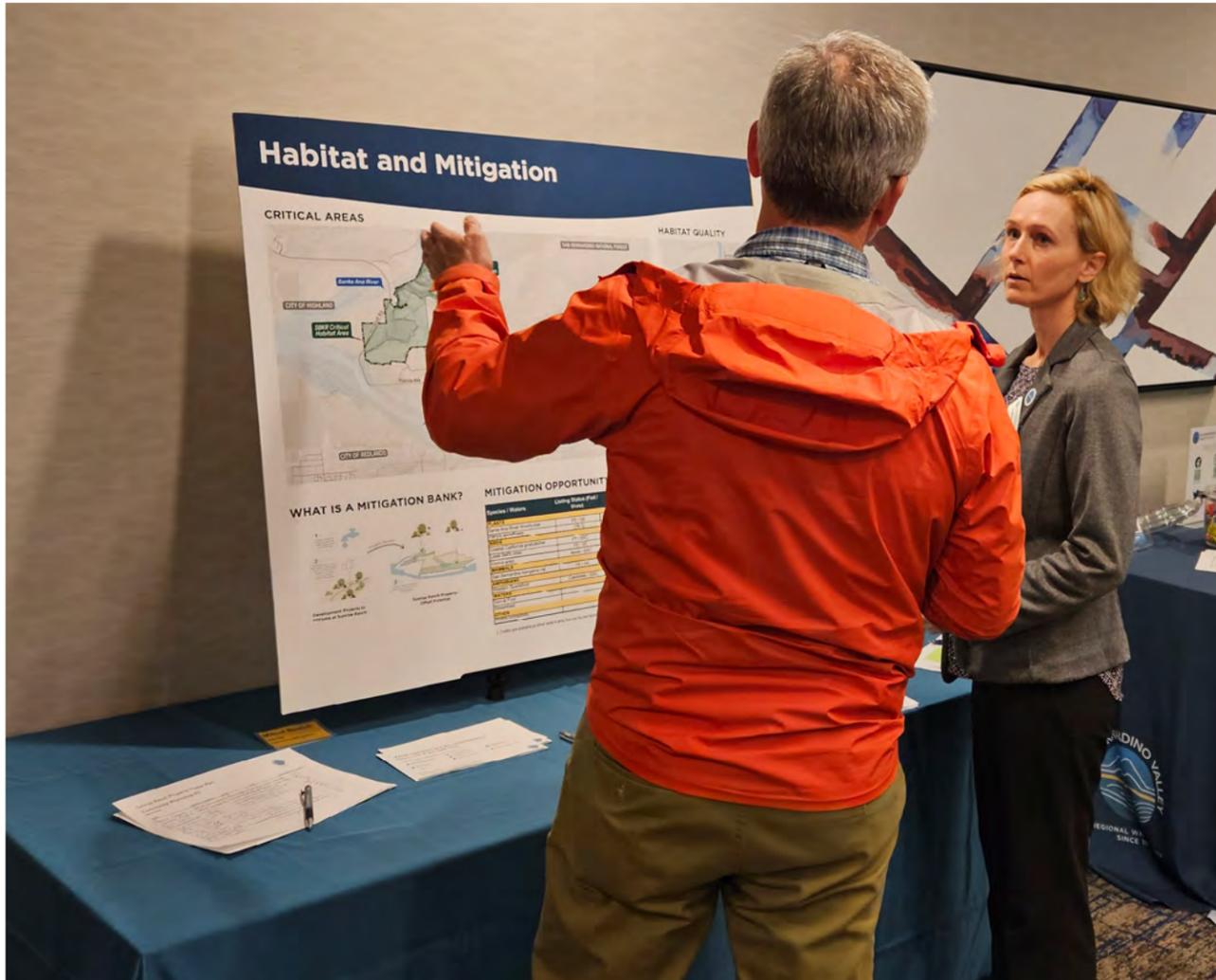
As a site visitor, which of these would appeal to you the most?



Which items are you interested in learning about through educational signage and workshops?



8.3 PHASE 3 COMMUNITY EVENTS



A. Community Workshop #3

Location: Ayres Hotel
 Estimated attendance: 20

For Workshop #3, the team was able to share more detailed vision plans for the Plan. Key topic areas were developed further and the community participated in table discussions.



B. Summary of Comments

WORKSHOP 3 COMMENTS

Education Center

- EDUCATION TOPICS**
- City history
 - "What am I looking at?"
 - Local culture
 - Information and programs
 - Site history
 - Demonstration gardens

- Considerations**
- Interactive elements
 - California natives
 - Shade
 - Examples: Mary Vagle Nature Center, Caroline Park

Site Trails & Amenities

- SITE ACTIVITIES**
- Stargazing
 - Overnight camping
 - Mountain biking
 - Hiking
 - Scouts
 - Water recreation
 - Picnics

- Considerations**
- Local examples: Redlands Conservancy, Crafton Hills Conservancy
 - Reduce/eliminate motorized vehicles
 - Minimize light pollution
 - Connect to SAR Trail

Water Supply & Infrastructure

- QUESTIONS & CONCERNS**
- How do we keep the water level consistent?
 - Is there a concern with PFAS?
 - Will Mill Creek be integrated into this project?
 - Where will the water come from?
 - How will this affect the service areas of local water districts?
 - How does this connect to SWP?
 - How will you collaborate with local water districts and cities?

Habitat & Mitigation

- QUESTIONS & CONCERNS**
- Concerns with Greenspot, Road
 - Impact of draining to downstream landowners
 - Need for mitigation lands

C. Activity Tables Summary

1. Water Supply Infrastructure

Additional Thoughts

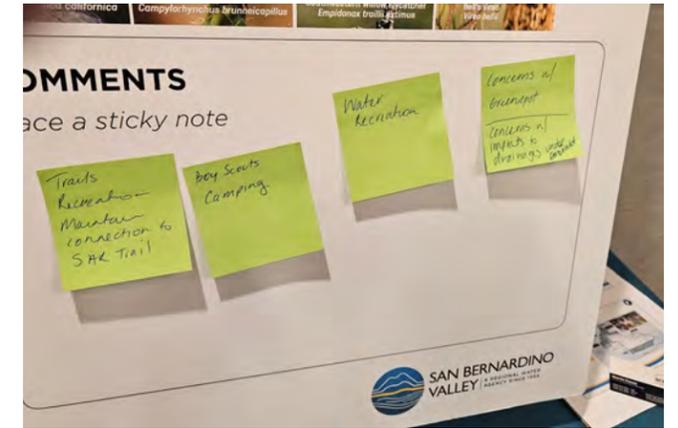
- How do we keep the water level consistent?
- Is there an issue with PFAS from the watershed due to recent firefighting activities?
- Is Mill Creek a part of the project?



2. Habitat and Mitigation

Additional Thoughts

- Concerns with Greenspot Road
- Concerns with impacts to drainages under Emerald Ave.
- Trails and recreation; maintain connection to SAR Trail
- Boy scouts and camping opportunity
- Water recreation



Water Supply and Infrastructure

MAXIMUM POTENTIAL OPTION

MINIMUM POTENTIAL OPTION

HYBRID POTENTIAL OPTION

COMMENTS

Place a sticky note

Reservoir Alternative	Storage Capacity (AF)	Water Surface Area (AC)	Estimated Cost (\$M)	Reservoir Production (AF/yr)	Reservoir Evaporation (AF/yr)	Net Reservoir Production (AF/yr)	Water Surface Area (AC)	Water Surface Area (AC)	Water Surface Area (AC)
Maximum All	3,200	18	18,500,000	1,000,000	25	975,000	18	18	18
Hybrid Maximum	1,300	12	8,000,000	1,000,000	0	1,000,000	12	12	12
Minimum All	1,300	12	8,000,000	1,000,000	0	1,000,000	12	12	12

Reservoir Alternative	Storage Capacity (AF)	Water Surface Area (AC)	Estimated Cost (\$M)	Reservoir Production (AF/yr)	Reservoir Evaporation (AF/yr)	Net Reservoir Production (AF/yr)	Water Surface Area (AC)	Water Surface Area (AC)	Water Surface Area (AC)
Maximum All	450	24	1,500,000	1,000,000	0	1,000,000	24	24	24
Hybrid Maximum	200	15	1,000,000	1,000,000	0	1,000,000	15	15	15
Minimum All	200	15	1,000,000	1,000,000	0	1,000,000	15	15	15

Habitat and Mitigation

CRITICAL AREAS

HABITAT QUALITY

WHAT IS A MITIGATION BANK?

MITIGATION OPPORTUNITY SUMMARY

Species / Waters	Listing Status (Fed / State)	Present	Other Banks Offering This Credit Type
PLANTS			
Santa Ana River Floodplain	FE / SE	Y	N
Parry's Sparrowhawk	FIS / SI	Y	N
BIRDS			
Coastal California gnatcatcher	FT / SSC	Y	N
Least Bell's vireo	FE / SE	Y	N
Cactus wren	None / SSC	Y	N
MAMMALS			
San Bernardino kangaroo rat	FE / SE	Likely	N
AMPHIBIANS			
Vernal Pool Specialist	Candidate / SSC	Y	N
WATERS			
Vernal Pool		Y	N
Shadedwood		Y	Y
OTHER			
Wildlife connectivity		Y	N

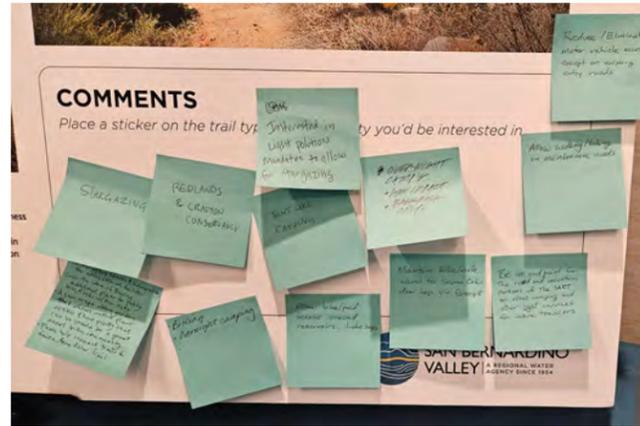
COMMENTS

Place a sticky note

3. Site Experience

Additional Thoughts

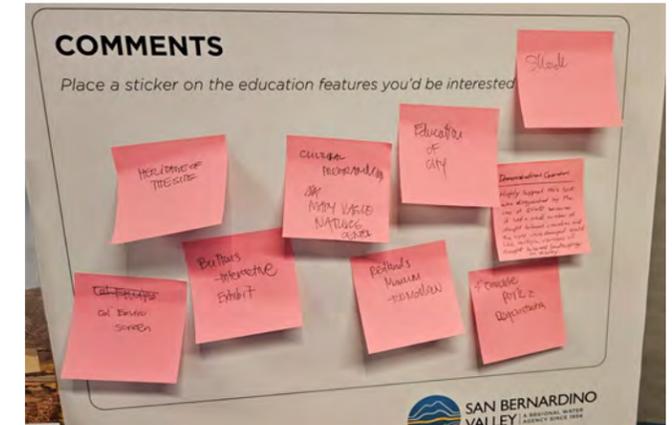
- Reduce/ eliminate motor vehicle access except on existing entry roads
- Allow walking/biking on maintenance roads
- Overnight camping; low impact backpacking only
- Be an endpoint for the road and mountain portions of the SART to allow camping and other light services for travelers
- Maintain bike/walk access to Seven Oaks Dam Loop via Greenspot Road
- Interested in light pollution mandates to allow stargazing
- Tent-like camping
- Allow bike/pedestrian access around the reservoirs
- Redlands and Crafton Conservancy partnerships
- Boy scout and university partnerships
- Xeriscape demo garden that shows native plants and how pretty they can be
- Connect trails to SART



4. Architecture Facilities

Additional Thoughts

- Provide shade
- Demonstration garden; disappointed by the garden at EVWD because it had a small number of drought tolerant varieties and the signs were damaged; would like multiple versions of drought tolerant landscaping on display
- Education of the site
- Cal Environ-screen
- Interactive exhibits
- Cultural priority
- Mary Nagle Nature Center example
- Redlands Museum, too modern
- Education for the city



Site Experience

SUNRISE RANCH TRAIL LOOPS

VIEW FROM MAINTENANCE ROAD

VIEW FROM EYES OF THE WORLD LOOP

SIGNAGE/EDUCATIONAL TOOLS

TRAIL DIFFICULTY

Easy	Moderate	Strenuous
<ul style="list-style-type: none"> • Suitable for anyone who enjoys walking • Flat • Easily accessible • Path well maintained 	<ul style="list-style-type: none"> • Suitable for more physically active people • Slight slope for short distances • Path relatively clear 	<ul style="list-style-type: none"> • Suitable for more adventurous people with good cardiovascular ability • Steep slope, uneven terrain • Path dense with vegetation

COMMENTS

Place a sticker on the trail types and difficulty you'd be interested in

Architecture Facilities

BUILDING FACILITIES CAMPUS LAYOUT

ALTERNATIVE BUILDING LAYOUT

HEADQUARTERS CONCEPT

POTENTIAL PROGRAM AT EDUCATION CENTER

COMMENTS

Place a sticker on the education features you'd be interested in

8.4 PHASE 4 COMMUNITY EVENTS



A. Community Workshop #4

Location: Ayres Hotel
Estimated attendance: 50

The final phase of the project was an opportunity for the team to share the Plan draft and solicit final input on the deliverable.



B. Summary of Comments

WORKSHOP 4 COMMENTS

Building Facilities

QUESTIONS & COMMENTS

- Location of the headquarters in a rural area
- Benefit to having all Valley District buildings on one site
- Having all buildings on one site creates less vehicular use, keeps the land in good condition
- Having the headquarters in San Bernardino allows for more partnerships and workforce opportunities
- Public wanting access to the headquarters
- Crafton Hills community college could be good partners for the fire facility
- East Valley District is a good example of a sustainable building

Site Trails & Amenities

QUESTIONS & COMMENTS

- Mountain biking is allowed while still being mindful of habitat species
- Star-gazing as a potential activity
- Equestrian use as a potential activity

GENERAL

- The property was annexed into the city of Highland

Water Supply & Infrastructure

QUESTIONS & COMMENTS

- Addressing how the reservoir is filled i.e. State Water project, mountain runoff, and capture from Mill Creek
- Addressing hydropower; because of the elevation at the property, water can move when electricity is low, when it is high, power is used
- Potential for wastewater treatment for the gardens

Habitat & Mitigation

QUESTIONS & COMMENTS

- Agree with pursuing developer-led credits
- With mitigation credits, Valley District would still manage the land in perpetuity
- General attitude is the community is happy to see no residential development and that habitat is preserved

Chapter 9

LEGACY OF PLANS AND PROJECTS

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Image Source San Bernardino County DPW

9.0 SUMMARY OF EXISTING DOCUMENTS

Reviewing existing documents and other research material is the first step in the planning process. Planning documents, technical studies, and relevant materials are reviewed and analyzed to generate summaries and key issues. They are organized chronologically to illustrate how the development of the site has evolved over time and showcase today's priorities. The documents allowed the team to review the history, progress, and current status of the Sunrise Ranch Property in greater detail.

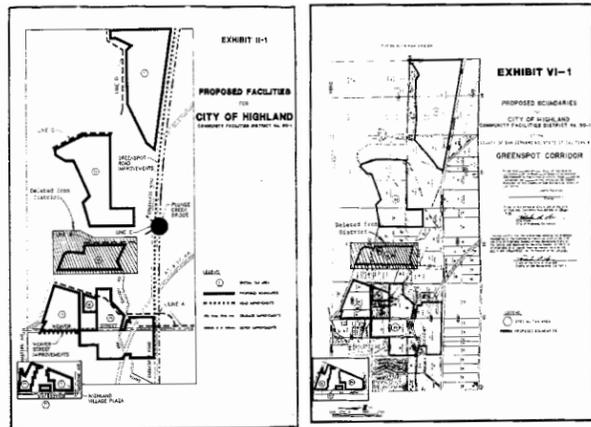


Figure 9-1 Proposed community facilities

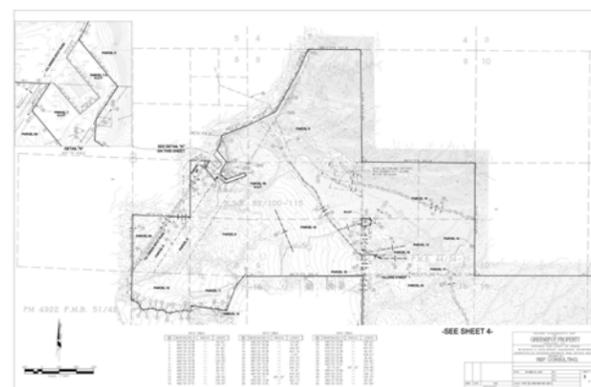


Figure 9-2 Topographic map from 2007 showing easements for title report

A. April 1990- Engineers Report for City of Highland CFD 90-1 Greenspot Corridor

This report was prepared by J. F. Davidson Associates, Inc. and finalized in April 1990. The document summarizes the development of the City of Highland Community Facilities District No. 90-1, Greenspot Corridor. It includes a description of facilities, cost estimate, financial analysis, rate and method of apportionment, and district boundary. The development was proposed to the west of Greenspot Road near the Plunge Creek Bridge. It includes a description of facilities, cost estimate, financial analysis, rate and method of apportionment, and district boundary. The development was proposed to the west of Greenspot Road near the Plunge Creek Bridge.

B. October 2007- Record Constraints Mapping and Title Exception Investigation Report and Maps

The report was prepared by RBF Consulting for the County of Orange Resources & Development Management Department Geomatics/LIS Division/Corporate Real Estate Division. It describes the source information used to compile the record constraints exhibits and provides a summary of title encumbrances. It is accompanied by two topographic maps that show the various easements, which were used to determine the exterior boundary for the project.

C. December 2011- Phase 1 Environmental Site Assessment Report

The report was prepared by Converse consultants to LCD Greenspot LLC for Greenspot Property Project. The environmental site assessment was conducted during the period of August 15, 2011 to September 12, 2011. Converse compiled and reviewed information that was obtained from interviews, document research, and on-site and area reconnaissance to identify potential environmental conditions at the property. Main conclusions and recommendations from Converse includes:

- The potential presence of agricultural chemical residues in the surface and subsurface soils at the property, since the property was historically used for agriculture from at least 1938 until the present. Converse recommends further assessment.
- The oil-filled smudge pots located on the property should be removed according to applicable local and/or state regulations. Converse recommends that the stained soil be removed and transported to an offsite treatment and disposal facility according to applicable state and/or federal regulations.
- Several debris piles containing various building materials were observed across the property.
- Converse recommends that the debris be removed from the property according to applicable local/state regulations. Converse further recommends that the ground surface beneath the debris piles be monitored for discoloration, staining and malodors.
- The shipping containers and dilapidated construction equipment located near the northeast corner of the Property should be removed according to applicable local and/or state regulations.
- The above ground storage tank located near the caretakers residence on the northwest portion of the Property should be removed and disposed of according to applicable local/state regulations.
- The earthen dams located near the southeast corner of the northwest portion of the Property should be monitored during redevelopment and grading activities for buried debris, hazardous materials, malodors and staining.



Figure 9-3 View of debris and tire pile on northwest portion of property



Figure 9-4 View of smudge pots on northwest portion of property



Figure 9-5 View of smudge pots on southeast portion of property

Table G: 2015 (Phase I) Without Project Traffic Noise Levels

Roadway Segment	Centerline to 70' CNEL (ft)	Centerline to 65' CNEL (ft)	Centerline to 60' CNEL (ft)	CNEL (dBA) 50 ft from Outermost Lane	
Baseline Rd west of Boulder Ave	22,700	64	130	277	68.9
Baseline Rd between Boulder Ave. and Highland Ave/Weaver St	9,900	< 50	76	156	65.2
Baseline Rd east of Highland Ave/Weaver St	2,300	< 50	< 50	68	59.4
Boulder Ave north of Baseline Rd	13,600	< 50	94	198	66.7
Boulder Ave between Baseline Rd and Greenspot Rd	7,400	< 50	65	133	64.1
Orange St between Greenspot Rd and SR-38	12,300	< 50	< 50	95	63.5
Orange St between SR-38 and Colton Ave	11,400	< 50	< 50	91	63.2
Orange St south of Colton Ave	11,800	< 50	< 50	93	63.3
Highland Ave north of Baseline Rd	2,700	< 50	< 50	< 50	56.9
Weaver St between Baseline Rd and Water St	3,100	< 50	< 50	< 50	57.5
Weaver St between Water St and Greenspot Rd	4,300	< 50	< 50	< 50	58.8
5th St west of Palm Ave	11,700	< 50	< 50	92	63.3
5th St/Greenspot Rd between Palm Ave. and Boulder Ave	20,200	60	121	256	68.4
Greenspot Rd between Boulder Ave. and Church St	23,500	65	133	283	69.1

Figure 9-6 Noise levels without project traffic

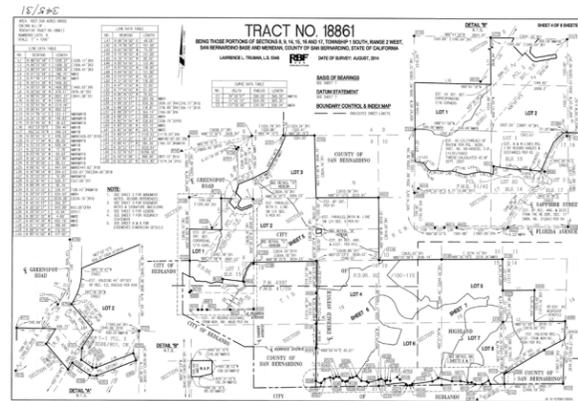


Figure 9-7 Proposed tract map

- Several irrigation standpipes and lines were observed across the Property. The irrigation lines appeared to be partially buried. There is a potential that underground transite (asbestos concrete) water pipes associated with the irrigation systems may be present on the Property.
- Converse recommends trenching along the irrigation lines to determine if transit pipes are present.

D. March 2014- Draft Noise Impact Analysis

This report was prepared by LSA Associates Inc for the LCD Greenspot Property Project. The updated draft describes the anticipated construction and traffic noise levels affected by the project during the five different phases. LSA Associates describes the short-term construction noise impacts on adjacent land uses and occupied residences constructed in early phases and potential long-term impacts on adjacent land uses. Mitigation measures are recommended to reduce traffic and stationary source noises to bring potential short- and long-term impacts to below a level of significance.

E. August 2014- Land Tract Map No. 18861

This set of survey maps was prepared for the Orange County Flood Control District in August 2014. It maps the various easements on the project site and is used for finance and conveyance purposes only.

F. September 2014- Letter Report for Oversight of Petroleum Impacted Soil Removal

The letter report summarized observations of the removal of petroleum impacted soil from beneath former smudge pots at the property site. The excavation was completed by Ocean Blue Environmental Services, and onsite mobile laboratory analyses were completed by Jones Environmental.

G. September 2014- Harmony Development Preliminary Budget

A collection of spreadsheets was prepared for LCD Greenspot LLC and accompanied the Draft EIR. The tables summarize the cost estimates for the five phases of development including fees and credits. The initial estimate in 2011 did not include credits, but the 2014 estimates do. There is a significant increase in total cost between the July 2014 sheet and September 2014.

H. May 2025- East Valley Water District Capital Improvements

This spreadsheet is provided by the East Valley Water District (EVWD) and was prepared in May 2015. The table summarizes the cost to develop infrastructure on site for potable and non-potable water and sewer lines. The cost is split between the Harmony development and EVWD with the latter paying \$10 million more.

I. February 2026- Harmony Specific Plan Final Environmental Assessment, Volume 1

The report is prepared by Albert A. Webb Associates for LCD Greenspot LLC for Greenspot Property Project. Webb compiled comments on the Draft EIR and provides responses citing provisions in the Revised DEIR. The document ends with the proposed mitigation monitoring and program to address how the project will mitigate proposed impacts as required by CEQA. Main concerns acknowledged by community members include:

- Proximity of the Project to the San Bernardino National Forest and potential wildfire impacts as the development is sited in the wildland-urban interface. Comments note the proposed fuel management zones may also conflict with habitat for critical species.
- Traffic impacts, especially to SR-38 and local and regional transportation facilities. The bridges over the Santa Ana River and Mill Creek would need updates for increased traffic and the potential for a new bridge over Mill Creek may pose critical habitat concerns.
- Aesthetic impacts to rural and natural hillsides with landscaping that is antithetical to native



Figure 9-8 Examples of letters submitted in response to the Draft Environmental Impact Report from concerned agencies and citizens living near the Project

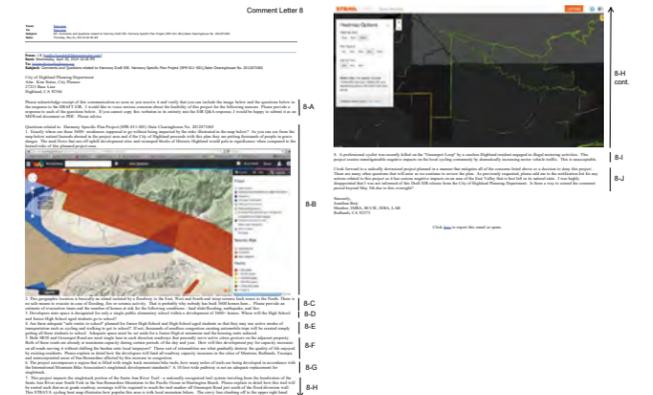


Figure 9-9 Examples of letters submitted in response to the Draft Environmental Impact Report from concerned agencies and citizens living near the Project



Figure 9-15 Study location for San Bernardino Kangaroo Rat, from Attachment D

This memo was prepared by the US Fish and Wildlife Service (USFWS) in February 2015. It contains the findings of a January 2015 survey focused on the San Bernardino Kangaroo Rat (SBKR) and assessing potentially suitable habitat. On the soil surface, signs of kangaroo rat species, such as scat, tracks, burrows, and sand bath sites, were present. However, no SBKR were captured within the 45 acres survey area. The biologist notes that many dulzura kangaroo rat were captured where few have been previously found. Since SBKR presence has been detected in other areas in the project site near Mill Creek, USFWS consultation is required if there is loss or modification of critical habitat.



Figure 9-16 Traplines for San Bernardino Kangaroo Rat study, from Attachment D

N. Attachment E Harmony Specific Plan: Circulation Memorandum

This memo was prepared by Translutions Inc. for the Greenspot Project. The memo discusses roadway capacities for Greenspot Rd, Newport Ave, and Garnet St. It also evaluates the intersection of SR-38/Garnet St to verify if the intersection could provide adequate level of service until the Harmony residential units are constructed. It concludes that the proposed road network would allow for emergency evacuation in a timely manner and that a traffic signal at the intersection of SR-38/Garnet St would be sufficient mitigation to accommodate 500 residential units.

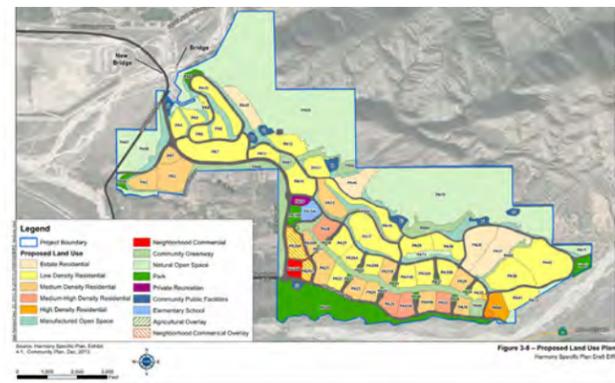


Figure 9-17 Proposed Land Use Plan from the Final Environmental Impact Report

O. February 2016-Harmony Specific Plan Final Environmental Impact Report, Volume 2

This document was prepared by Albert A. Webb Associates for LCD Greenspot LLC for Greenspot Property Project. The revised DEIR describes the project, associated environmental effects found not significant, and anticipated environmental impacts. Mitigation measures which could minimize significant adverse impacts are addressed as well as the significant and unavoidable cumulative impact to air quality and transportation/traffic. CEQA topics considered less than significant with mitigation include: biological resources, cultural resources, hydrology/water quality, and noise.

P. August 2016- The Harmony Specific Plan

This document is prepared by PlaceWorks in association with nine other firms in August 2016 for LCD Greenspot. It is a comprehensive plan for the development of a new community of traditional residential neighborhoods with public amenities in 1,650 acres in Harmony, CA. The plan outlines the developer's goals to combine housing opportunities with environmental stewardship. In addition to a brief site description and history, the plan includes recommendations for:

- Overall community design
- Infrastructure needs
- Circulation concept and public transit options
- Residential design guidelines
- Neighborhood commercial design guidelines
- Landscape design guidelines, park and amenities
- Development regulations
- Implementation

Q. 2016-Related Resolutions and Ordinances

The City Council of the City of Highland and Planning Commission passed multiple ordinances and resolutions to approve the development of the Greenspot Property Project.

R. May 2016-City of Highland Planning Commission

- PC Resolution No. 2016-005- Recommending the approval of the above City Council Resolutions.

S. August 2016-City of Highland City Council Resolution

- CC Resolution No. 2016-046- Certifying an environmental impact report including the findings of fact, mitigation monitoring reporting program and statement of overriding considerations for the Harmony Specific Plan

- CC Resolution No. 2016-047- Approving General Plan Amendment GPA-011-003 to amend density table in Land Use Element and roadway network map in Circulation Element to not conflict with the Harmony Specific Plan
- CC Resolution No. 2016-048- Approving tentative Tract Map No. 18861, a finance and conveyance map for the Harmony Specific Plan
- CC Resolution No. 2016-049- Approving tentative Tract Map No. 18871 which will serve as Harmony Specific Plan master tract map

T. August 2016 City of Highland City Council Ordinance

- Ordinance No. 48- Amending the City's official zoning map to change the existing zoning designation from "Planned Development" to "Harmony Specific Plan SPR-0111-001"
- CC Ordinance No. 409- Approving the Harmony Specific Plan and establishing it as the legal document to implement the development
- CC Ordinance No. 410- Approving a development agreement between LCD Greenspot LLC and the City of Highland

U. August 2016-Development Agreement between the City of Highland and LCD Greenspot, LLC

A development agreement between the City and LCD Greenspot, LLC was entered into on August 23, 2016. It establishes provisions for the phasing of development and methods of financing of construction, operation, and maintenance of public facilities, infrastructure improvements, and services for the Specific Plan area. Exhibits attached to the Agreement include maps of the Property, estoppel certificate, development impact fees, additional agreements concerning development, financing plan, and description of a public works facility.

- Ordinance No. 408 (August 23, 2016)- Amending the City's official zoning map to change the existing zoning designation

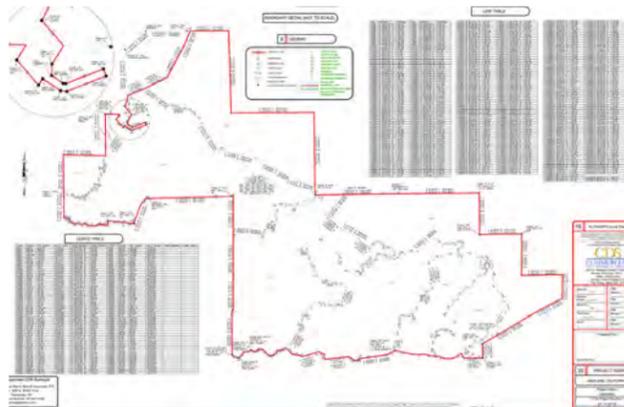


Figure 9-18 ALTA/NSPS Land Title Survey, boundary detail

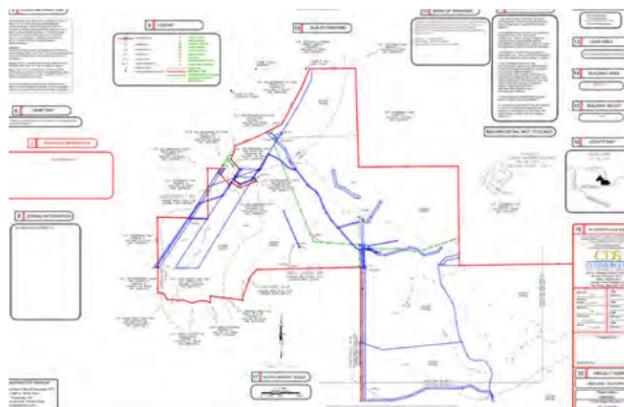


Figure 9-19 ALTA/NSPS Land Title Survey, survey details

from “Planned Development” to “Harmony Specific Plan SPR-0111-001”

- CC Ordinance No. 409 (August 23, 2016)- Approving the Harmony Specific Plan and establishing it as the legal document to implement the development
- CC Ordinance No. 410 (August 23, 2016)- Approving a development agreement between LCD Greenspot LLC and the City of Highland
- CC Resolution No. 2016-046- Certifying an environmental impact report including the findings of fact, mitigation monitoring reporting program and statement of overriding considerations for the Harmony Specific Plan
- CC Resolution No. 2016-047- Approving General Plan Amendment GPA-011-003 to amend density table in Land Use Element and roadway network map in Circulation Element to not conflict with the Harmony Specific Plan
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- CC Resolution No. 2016-049- Approving tentative Tract Map No. 18871 which will serve as Harmony Specific Plan master tract map
- PC Resolution No. 2016-005- Recommending the approval of the above City Council Resolutions.

V. January 2021-ALTA/NSPS Land Title Survey

This survey is prepared by CDS Commercial for the San Bernardino Valley Municipal Water District. The survey was completed in January 2021 and contains information about utility easements, existing infrastructure, and adjacent property owner information.

W. July 2022-Tres Lagos Property Vision - Board of Directors Workshop Summary

San Bernardino Valley had a board meeting to explore a vision for the Tres Lagos property in preparation for the upcoming Master Plan Request for Proposals. Participants included board members and staff as well as members of the public in-person and online. This summary document explains the meeting format, agenda and lists the summary of the discussions/key takeaways, which includes:

- The need for a greater vision for the Tres Lagos property
- Opportunities on site for dedicated recreation, conservation, and recreation areas
- Opportunities for a new headquarters, education center, and co-location with state and regional facilities
- Safety concerns related to wildfire planning, prevention strategies, and emergency access connectivity
- Importance of awareness, communication, and engagement (with the organization and the public) for successful property development

X. Tres Lagos Property Vision - Board of Directors Workshop Presentation

To facilitate the workshop discussion, slides listed key bullet points about the Project site and presented several site analysis maps. Topics included:

- History of the Property
- Constraints and opportunities related to open space, habitat, and existing water infrastructure
- Partnerships and funding opportunities

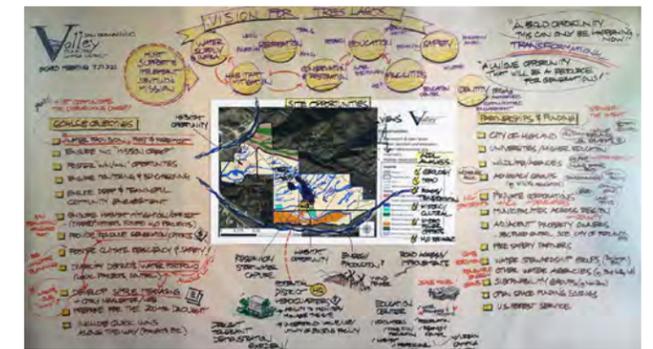


Figure 9-20 Wall graphic from the workshop

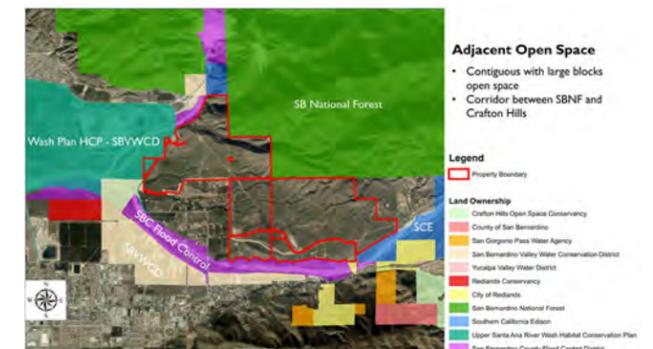


Figure 9-21 Adjacent open space mapping

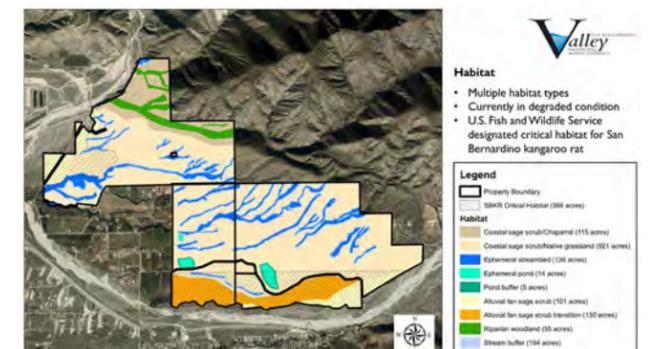


Figure 9-22 Habitat mapping

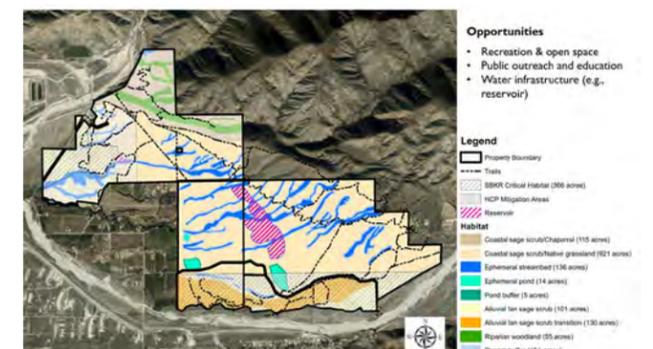


Figure 9-23 Opportunities mapping

Chapter 10

FACILITIES STUDIES

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10.0 FACILITIES STUDIES

Different areas on the site were considered to host the conceptualized new buildings. These locations informed the building layout options. Recommendations regarding the location for new infrastructure on site are influenced by a variety of factors, described below, and are summarized in the following tables.



	Desirable	Less Desirable
Topography / Views For the Headquarters and Education center, views are measured by landmarks and vistas that users would experience from that site For the Fire Training Facility, views consider user experience as well as the visibility of the building from the headquarters	- Views of the mountain, landmarks, vistas, and the valley - Fire Training Facility not visible from Headquarters	- Obscured views across the site - Fire Training Facility visible from Headquarters
Impact to Habitat Impact to habitat relates to land disturbed from the reservoir construction and the quality of habitat it could potentially displace	- Poor quality/ designated as habitat enhancement or creation	- High quality/ designated at habitat preservation
Access Access is measured by distance to nearest vehicular road, nearby recreation amenities, and potential parking	- Clear access for San Bernardino Valley employees and visitors	- Infrastructure far from road and/or recreation amenities
Water Infrastructure Connection The relationship to the reservoirs is measured by construction phasing, distance from conceptual infrastructure to reservoir, and the potential of the reservoir to act as a fire break	- Near the reservoir and firebreak	- Distant from reservoir
Cost Implications Associated cost implications include those just beyond the construction cost that would impact siting such as road construction and habitat mitigation credits	-Minimizes necessary road improvements	- Additional road improvements required -High impact to high quality habitat

A. Building Siting Matrix: Headquarters

	Topography / Views	Impact to Habitat	Access	Water Infrastructure	Cost Implications
A	<ul style="list-style-type: none"> • Most scenic view within the valley • Mountains of San Bernardino Forest visible but Constance Peak mostly hidden • Gradual slope 	<ul style="list-style-type: none"> • Within reservoir cut/fill area • Habitat enhancement recommended 	<ul style="list-style-type: none"> • Access from Emerald Ave/Tres Lagos Rd • Uses existing road and new reservoir maintenance road (-0.55 mi) • Near road and trails; easy pedestrian access 	<ul style="list-style-type: none"> • Could be built before reservoir • Near wetland reservoir • Reservoir act as a firebreak 	<ul style="list-style-type: none"> • Less road improvements compared to Opt. C and D
B	<ul style="list-style-type: none"> • Good view of valley • View of San Bernardino Forest • Relatively flat • Potential view to valley blocked by fill 	<ul style="list-style-type: none"> • Within reservoir cut/fill area • Near CAGN observation • Habitat creation recommended 	<ul style="list-style-type: none"> • Access from Newport Ave • New main and maintenance road (-0.9 mi) • Near the main road • Easy pedestrian access, near relics 	<ul style="list-style-type: none"> • Could be built before reservoir • Reservoir act as a firebreak 	<ul style="list-style-type: none"> • Additional road extension
C	<ul style="list-style-type: none"> • View of valley and reservoirs • View of San Bernardino Forest in the distance, mostly view of site ridges • Potential to add more fill to total if built here 	<ul style="list-style-type: none"> • Outside reservoir cut/fill, would require more construction • Located in preserve habitat area 	<ul style="list-style-type: none"> • Access from Emerald Ave/Tres Lagos Rd • Existing road and new reservoir maintenance road (-0.6 mi) 	<ul style="list-style-type: none"> • Could be built before reservoir • Near wetland reservoir 	<ul style="list-style-type: none"> • Less road improvements compared to Opt. B and D • Would require more mitigation credits
D	<ul style="list-style-type: none"> • View of valley slightly lower, Santa Ana Wash foreground • Obscured view to San Bernardino Forest since at much lower elevation • Potential to be elevated on fill 	<ul style="list-style-type: none"> • Outside reservoir cut/fill • Would require more construction • Habitat enhancement recommended 	<ul style="list-style-type: none"> • Access from Emerald Ave • New road parallel to Tres Lagos and above reservoir (-0.7 mi) • Walkable to other relics and trails 	<ul style="list-style-type: none"> • Could be built before reservoir • Lose connection to water if reservoir not built 	<ul style="list-style-type: none"> • Most road improvements

Headquarters - Views of Site

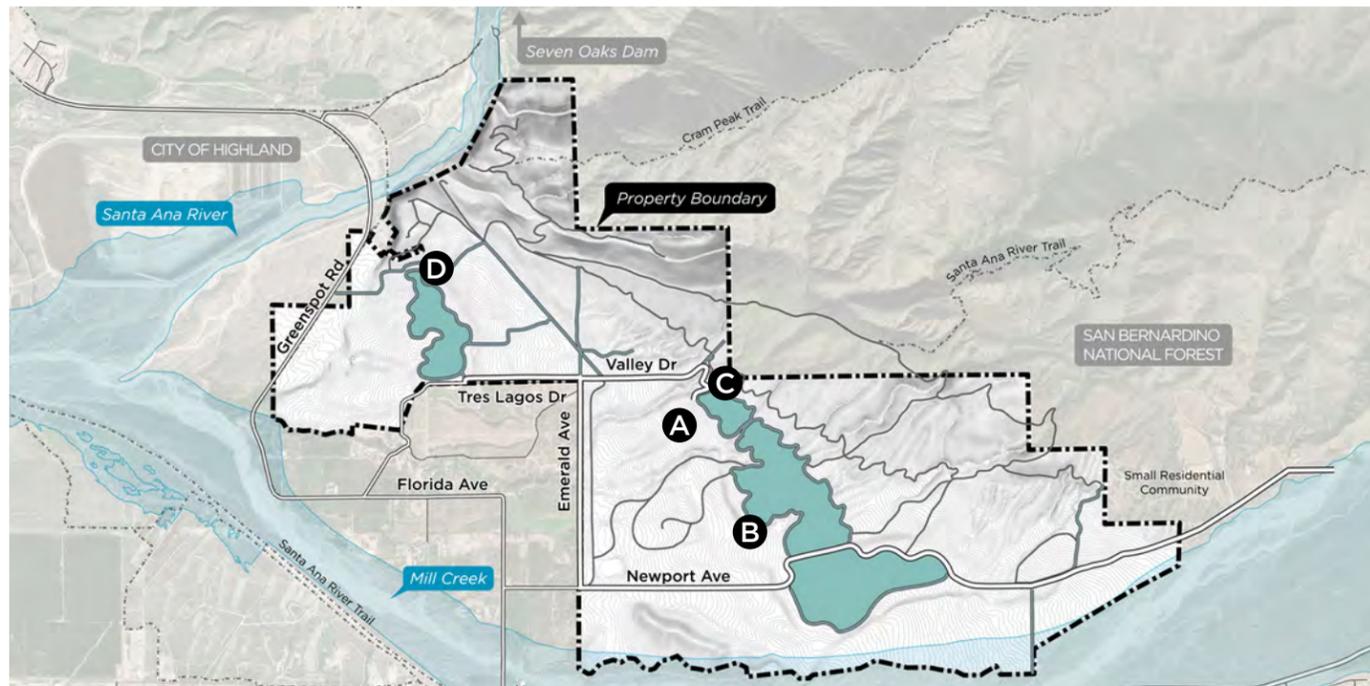
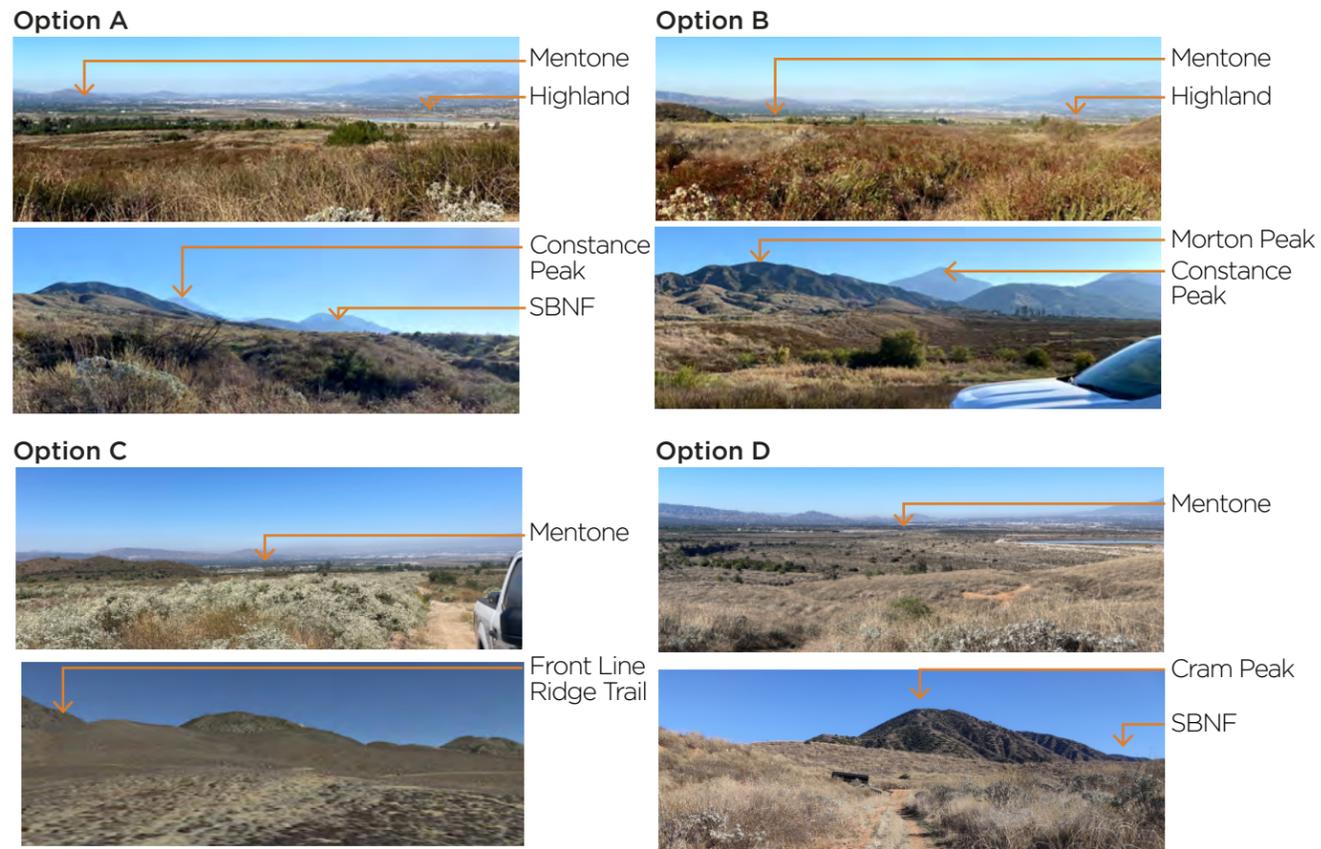


Figure 10-1 Siting studies for the headquarters

B. Building Siting Matrix: Education Center

	Topography / Views	Impact to Habitat	Access	Water Infrastructure	Cost Implications
A	<ul style="list-style-type: none"> • Most scenic view within the valley • Mountains of San Bernardino Forest visible but Constance Peak mostly hidden • Gradual slope 	<ul style="list-style-type: none"> • Within reservoir cut/fill area • Habitat enhancement recommended 	<ul style="list-style-type: none"> • Access from Emerald Ave/Tres Lagos Rd • Uses existing road and new reservoir maintenance road (-0.55 mi) • Near road and trails; easy pedestrian access 	<ul style="list-style-type: none"> • Could be built before reservoir • Near wetland reservoir • Reservoir acts as a firebreak 	<ul style="list-style-type: none"> • Less road improvements compared to Opt. B and C
B	<ul style="list-style-type: none"> • View of valley • Slightly obscured view of San Bernardino Forest • Relatively large flat area • Surrounded by steeper slopes 	<ul style="list-style-type: none"> • Outside reservoir cut/fill • Disturbed area, habitat creation • Need grading for gardens 	<ul style="list-style-type: none"> • Access from Emerald Ave and existing road (-0.6 mi) • Shares route with SART so need protected pedestrian trail • Near trailheads 	<ul style="list-style-type: none"> • Slightly distant from 1938' reservoir (-0.2 mi) 	<ul style="list-style-type: none"> • Additional cost dependent on parking • Enhanced trail to protect pedestrians
C	<ul style="list-style-type: none"> • View of ravines and Crafton Hills • Obscured view of San Bernardino Forest since up against ridge • Relatively flat, near Eyes of the World parking 	<ul style="list-style-type: none"> • Outside reservoir cut/fill • Disturbed, habitat creation • Good open space for gardens 	<ul style="list-style-type: none"> • Access from Newport Ave • New road and existing spur at end (-2.2 mi) • Uses existing parking lot • Near trailheads • Far from entrance, but is walkable by pedestrian 	<ul style="list-style-type: none"> • Little connection to reservoirs (-0.8 mi) • Near orchard relics like irrigation channels 	<ul style="list-style-type: none"> • May need to widen road
D	<ul style="list-style-type: none"> • View of valley slightly lower • Obscured view to San Bernardino Forest • Gentle slope, good for gardens or orchard 	<ul style="list-style-type: none"> • Outside reservoir cut/fill • Habitat creation • Opportunity for gardens and orchards next to center 	<ul style="list-style-type: none"> • Access from Emerald Ave • Existing road (-0.05 mi) • Immediate access SART, walkable to other trailheads • Near main road and relics along Orchard Trail 	<ul style="list-style-type: none"> • Distant from 1938' reservoir, but walkable (-0.4 mi) 	<ul style="list-style-type: none"> • Additional cost dependent on parking

Education Center - Views of Site

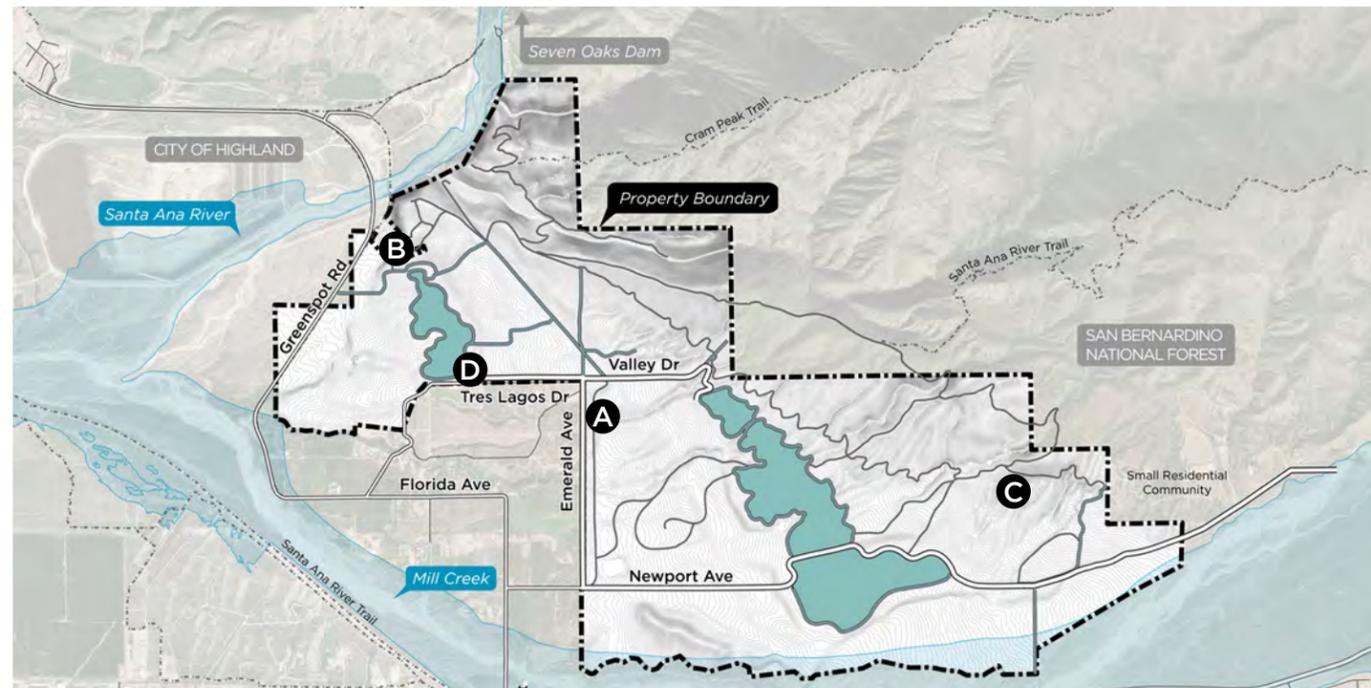
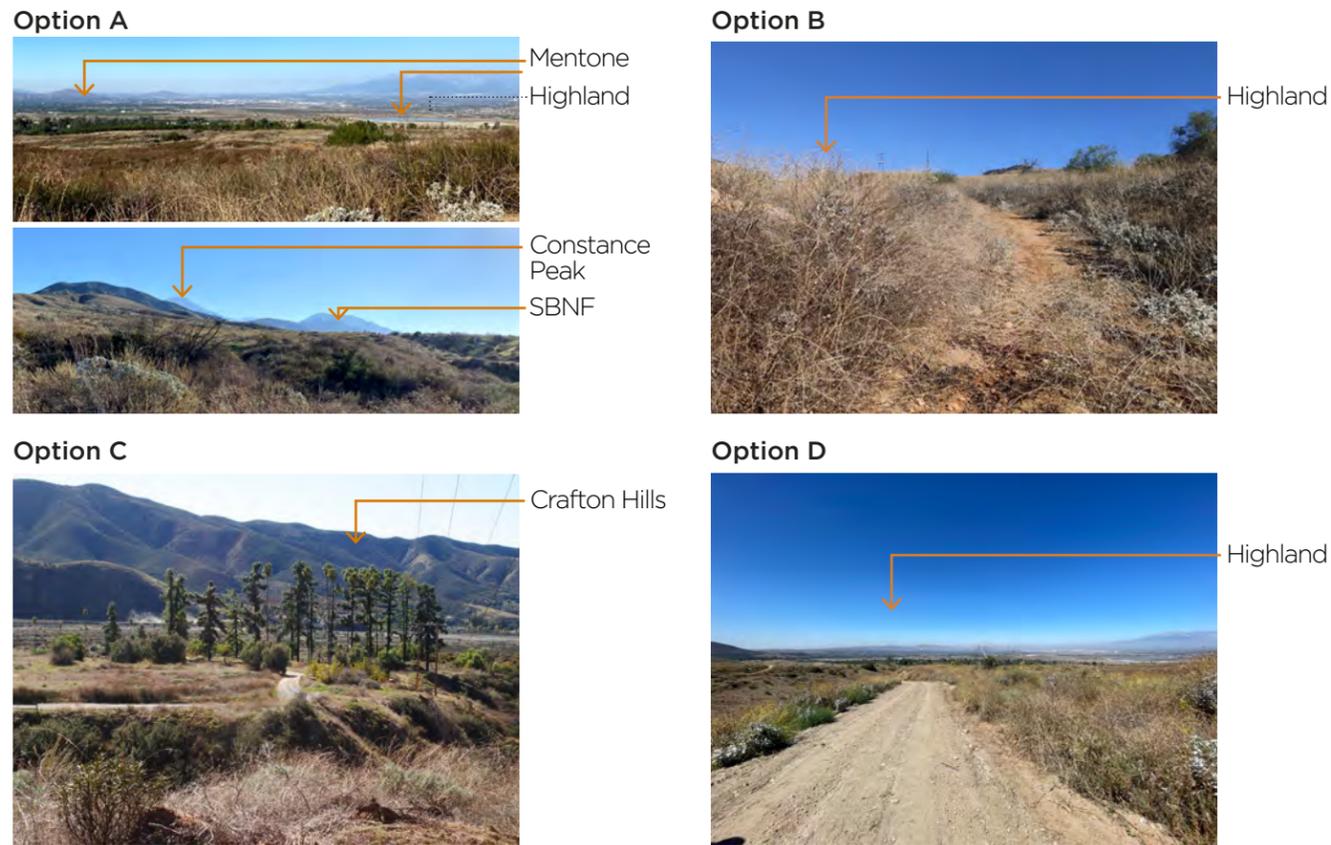


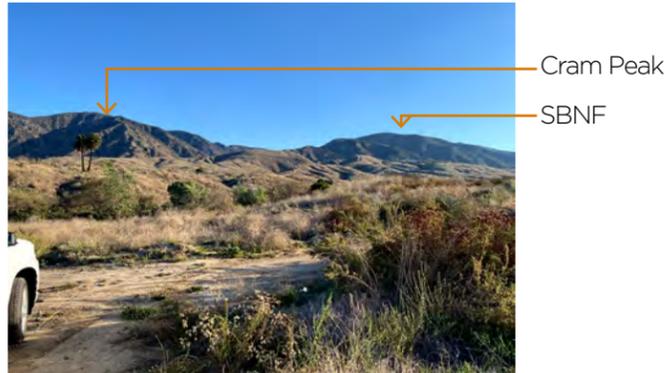
Figure 10-2 Siting studies for the education center

C. Building Siting Matrix: Fire Training Facility

	Topography / Views	Impact to Habitat	Access	Water Infrastructure	Cost Implications
A	<ul style="list-style-type: none"> View to San Bernardino Forest Potential to partially hide with fill, but might impact HQ view towards Crafton Hills 	<ul style="list-style-type: none"> Within reservoir cut/fill Near CAGN observation 	<ul style="list-style-type: none"> Access from Newport Ave (~-0.95 mi) New road plus extension; parking 	<ul style="list-style-type: none"> Reservoir acts as a firebreak 	<ul style="list-style-type: none"> Potentially take away credits from habitat creation
B	<ul style="list-style-type: none"> View of mounds on site, ravines, and Mentone/Crafton Potential to hide from HQ at back of property and behind southern edges of ridges Gentle slope 	<ul style="list-style-type: none"> Outside reservoir cut/fill Habitat creation and enhancement 	<ul style="list-style-type: none"> Access from Newport Ave (~-1.9-2.2 mi) New and existing road Existing parking lot Near to previous burns and easy access to WUI areas 	<ul style="list-style-type: none"> Little connection to water 	<ul style="list-style-type: none"> Potentially take away credits from habitat creation New road
C	<ul style="list-style-type: none"> View towards mounds on site and Crafton Reservoir fill and positioning further east can hide the building Avoids sloping ravines 	<ul style="list-style-type: none"> Outside reservoir cut/fill Preserve habitat Would disturb more good habitat than necessary 	<ul style="list-style-type: none"> Access from Newport Ave (~-1.4 mi) New road; parking 	<ul style="list-style-type: none"> Overlook 2310' reservoir 	<ul style="list-style-type: none"> Would require more mitigation credits
D	<ul style="list-style-type: none"> View to Front Line Ridge Trail and Morton Peak Would directly be in sight line of HQ, might be slightly obscured by nearby orchards Disturbed area relatively flat 	<ul style="list-style-type: none"> Outside reservoir cut/fill Area disturbed, habitat creation 	<ul style="list-style-type: none"> Access from Emerald Ave (~-0.55 mi) New road; parking 	<ul style="list-style-type: none"> Reservoir acts as a firebreak 	<ul style="list-style-type: none"> Potentially take away credits from habitat creation New road

Fire Training Facility - Views of Site

Option A



Option B



Option C



Option D

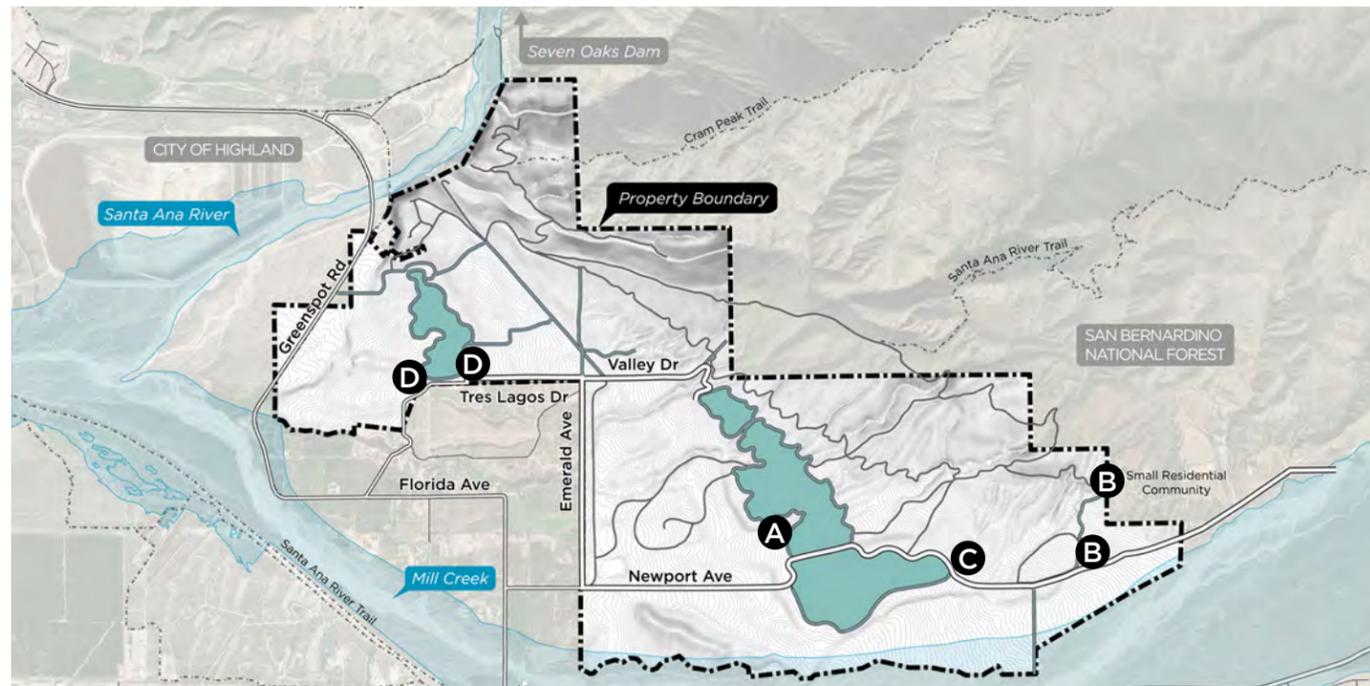


Figure 10-3 Siting studies for the fire training facility

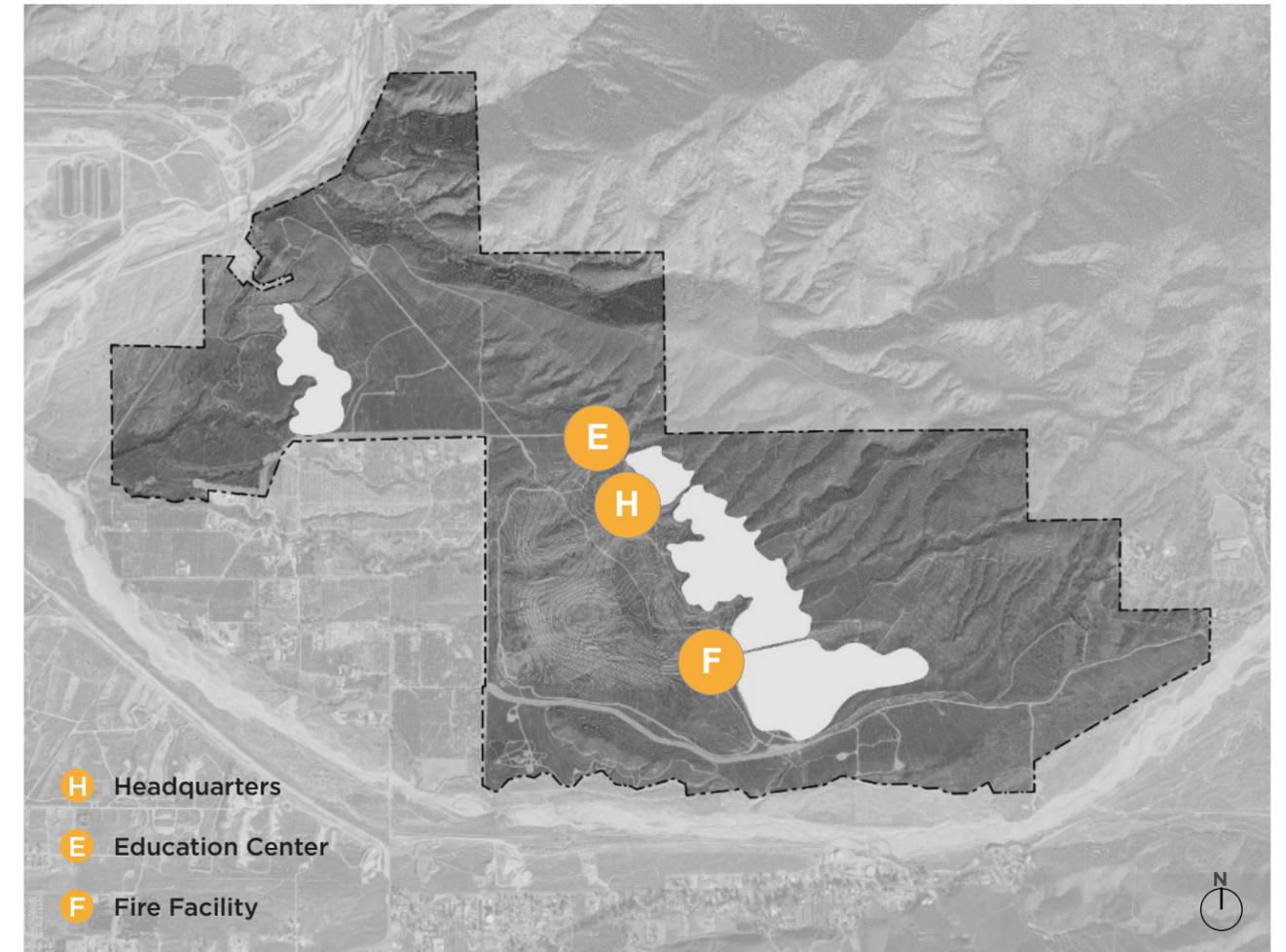


Figure 10-4 Preferred Campus Layout

D. Building Location Options

Once all site locations were reviewed, the buildings were studied together in two different layouts, Campus Layout and Alternative Satellite Layout. The description, advantages, and disadvantages are as follows:

A. Preferred Campus Layout: clustering buildings in one area

Potential Advantages

- + Parking can be shared between Headquarters and Education Center
- + Fewer roads and infrastructure needed
- + All construction occurring in cut/fill area
- + Easier to connect with community members
- + Less impact to habitat

Potential Disadvantages

- Views of the Education center may be seen from the Headquarters
- Less privacy
- More congestion with access road

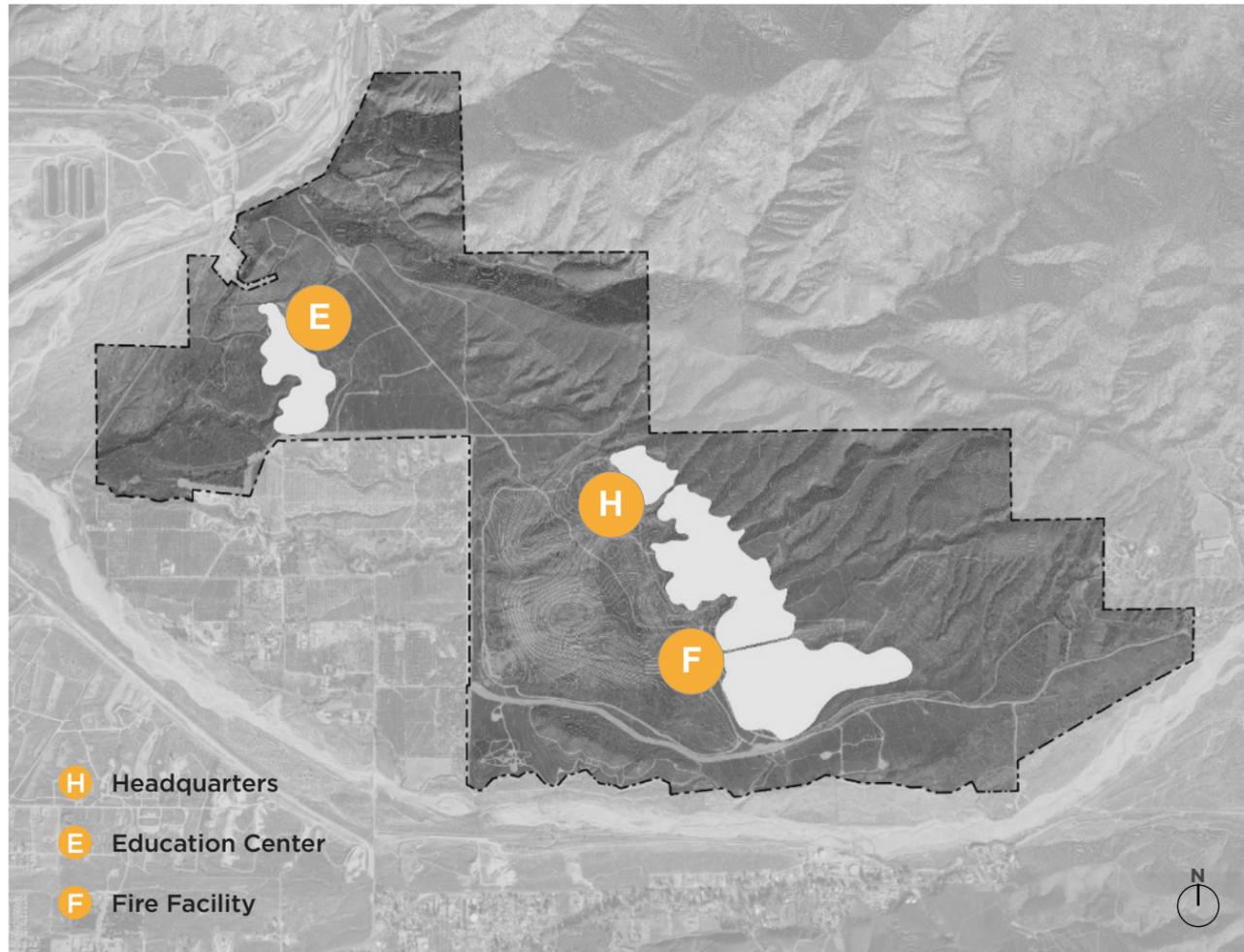


Figure 10-5 Alternative Satellite Layout

**B. Alternative Satellite Layout:
distributing the buildings throughout
the property**

Potential Advantages

- + More expansive experience across the site
- + More privacy
- + Less congestion on roads
- + Preserved views

Potential Disadvantages

- More roads/infrastructure needed
- Greater construction footprint
- Greater impact to the habitat
- More difficult to connect with community members

**10.1 BUILDINGS
ASSESSMENT AND
FINDINGS**

A. Preferred Site Plan

1. Campus for Community, Collaboration and Innovation

The building facilities of this Plan each contributes a critical role in San Bernardino Valley's Plan by creating places for engineers, biologists, educators, leaders, policy makers, community representatives and citizens to engage and collaborate on innovative solutions for water resiliency. Together, the Headquarters, Education Center, Fire Facility and other future development sites co-located on a single campus plan strengthens their value in an environment to share ideas, dream and deliver to the needs of the community served.

2. Planning Drivers

On a 1,685 acre site, there are many options to locate buildings. As described earlier in the chapter, several options were assessed against planning drivers to evaluate implications of each location. The preferred site plan co-locates all buildings at the center of the building site next to the conceptual 2310' Reservoir with the following opportunities:

Water Infrastructure

- Body of water as a fire break
- Source of water for use by fire facility for use for fire suppression
- Body of water providing evaporative cooling for the surrounding environment, creating a cooler microclimates

Topography and Views

- Shaping topography to optimize views to the valley and San Bernardino Forest
- Shaping of topography to conceal fire facility

Impact to Habitat

- Located within the grading area of the 2310' Reservoir, avoiding impact of other site areas
- Consolidates development in one primary location on the site.
- Habitat enhancement is recommended with access to campus for educational opportunities

Access

- Access from Tres Lagos Dr. / Newport Ave.
- Access to trail and recreational network
- Pedestrian access between buildings on a campus
- Easier to manage security and access

Cost

- Shared site development costs for infrastructure such as roads, utilities, power, water and site grading
- Shared parking
- Shared resources between buildings for events, meeting rooms, etc.

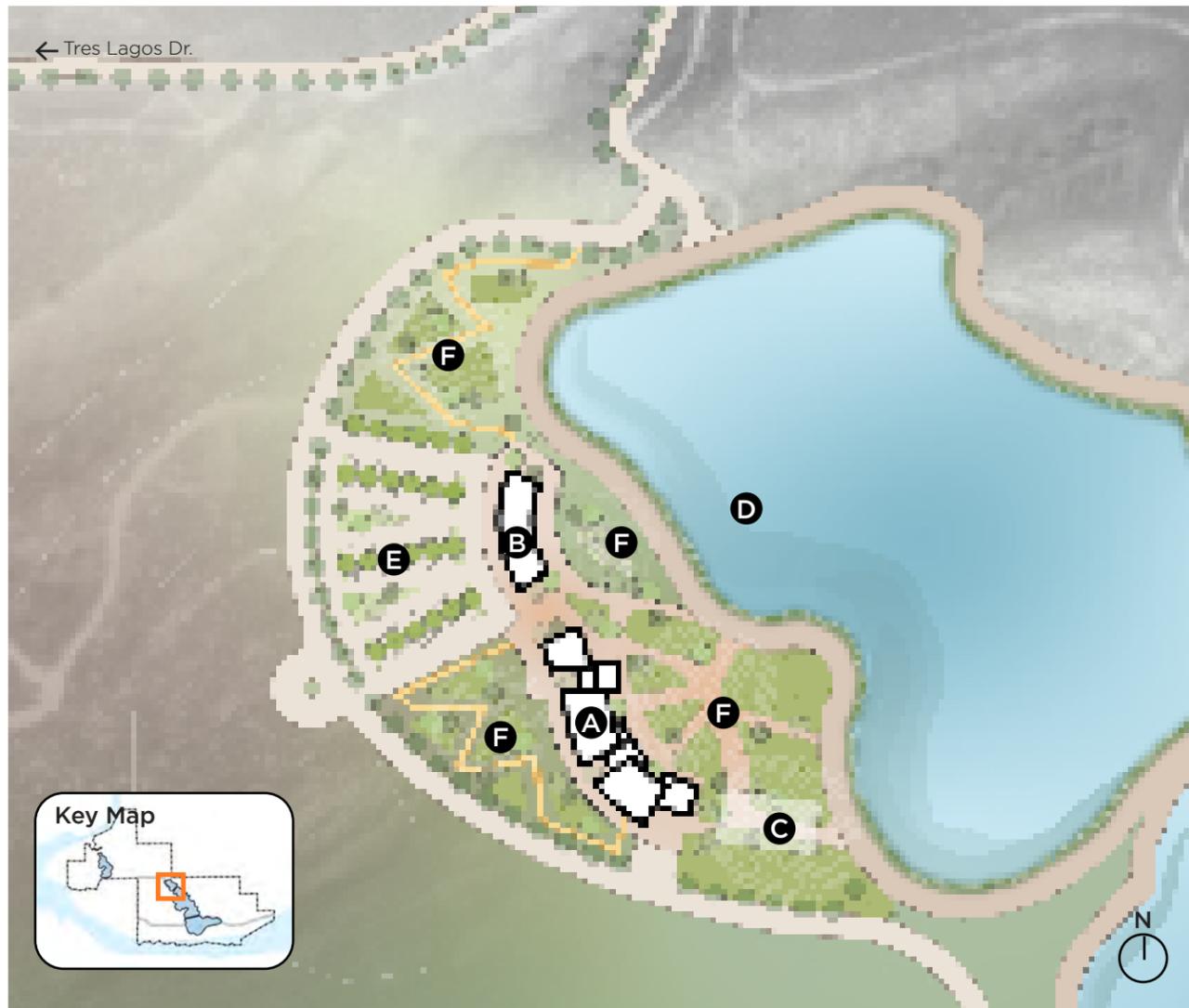


Figure 10-6 Potential Site Plan

Potential Site Plan

- A** Headquarters
- B** Education Center
- C** Future Building Site
- D** 2310' Reservoir
- E** Visitor Parking
- F** Learning Gardens

3. Views

Views outward towards the Valley and San Bernardino Forest are a key driver in locating the buildings, outdoor spaces and crafting the organization of the road and parking network.

- 1** Creating a First Impression
Eastward views of the San Bernardino Forest upon entry at Tres Lagos Dr. / Emerald Ave. immerse the entry experience. The first impression at the first right turn is the education center and reservoir within a landscaped entry edge.
- 2** The Heart of the Campus
The center of campus is defined by a 360 view of the salient components of the campus. The headquarters foregrounded by the learning gardens, views of the San Bernardino Forest foregrounded by the reservoir, and expansive views towards the valley.
- 3** Preserving Views of the Valley
The southerly portion of the plan orients the headquarters, expansion site and future buildings and parking to the east of the primary access road. This preserves unobstructed views of the Valley.

Leverage Views of Valley and Mountains

The below diagrams indicate optimal views of the valley and mountains on each side of the building.



Valley Views



Mountain & Reservoir Views

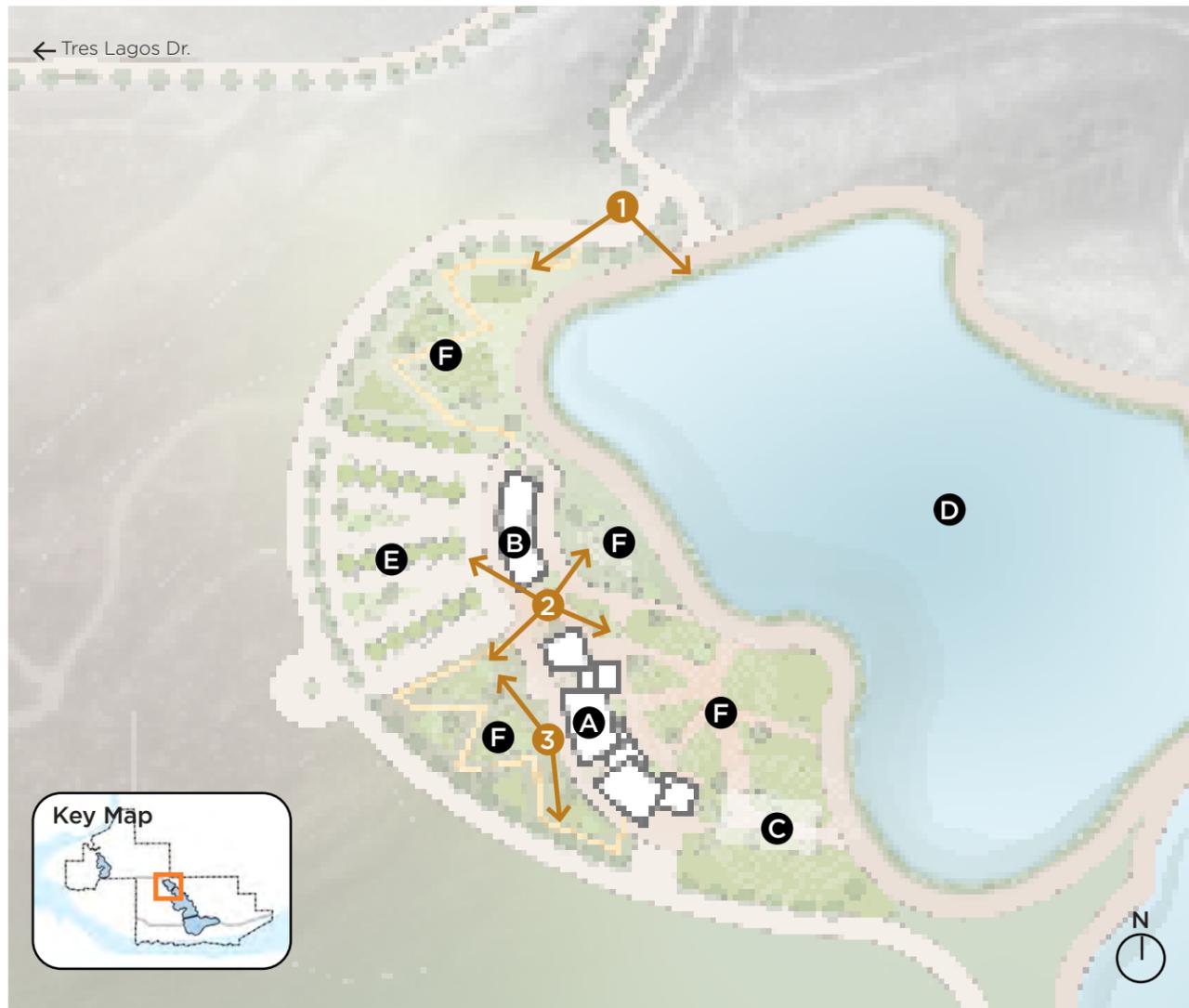


Figure 10-7 Viewpoints of potential Site Plan

Viewpoints

- A** Headquarters
- B** Education Center
- C** Future Building Site
- D** 2310' Reservoir
- E** Visitor Parking
- F** Learning Gardens

Valley Views

The buildings are sited to maximize views out to the valley, in particular the headquarters public spaces such as the lobby, multi-purpose room and board room. With the construction of the 2310' reservoir, the campus will be located higher than the existing grade, offering even more panoramic views of key elements of elements of the watershed such as the sediment pits, confluence and Citrus Pump Station.



Figure 10-8 Valley views from the conceptual headquarters

Mountain Views

The buildings are also oriented to maximize views of the mountains and future 2310' reservoir. With the construction of the reservoir, the additional grade may offer new views of the San Bernardino Forest Beyond.



Figure 10-9 Mountain views from the conceptual headquarters

B. Sustainability

The building facilities and supporting site development has a significant opportunity to be a state-of-the-art campus that exemplifies San Bernardino Valley's commitment to climate resiliency. At the time of this Plan document, several goals were identified and fall under current code requirements, whereas others are exceeding code. As these buildings become developed, San Bernardino Valley may consider selecting one or several sustainability certification systems such as LEED, WELL, or ILIFI.

1. Campus Sustainability

The site has several opportunities to demonstrate the use of water to build a sustainable campus. It has a unique opportunity to construct and demonstrate use of hydroelectric power leveraging the cycling of reservoir(s) to generate electricity for the site. Treating of onsite stormwater through a series of demonstration gardens and demonstration parking lot is an opportunity to provide education of sustainability on display.

Use of onsite PV through shade structures on parking lots and other site elements would provide on-site renewables as well as reduce urban heat island effect.

2. On-Site Potable Water and Sewer Utilities

A. Water Demand

Water demand on the property has been estimated based on anticipated numbers of staff and visitors for the concept buildings, including the headquarters building, the education center, and one trail restroom. It was assumed that the auditorium within the headquarters building would be used at full capacity once per week.

The estimated indoor water demand for these conceptual development opportunities is summarized in Figure 10-10. Landscape irrigation water demand was estimated based on the requirements set forth by the Modified Water Efficient Landscape Ordinance (MWELO). Estimated Total Water Use (ETWU) was determined using the following calculation:

$$ETWU = (ET_o) (0.62) (PF/IE) (LA)$$

Where:

ET_o = Reference Evapotranspiration
 PF = Plant Factor
 IE = Irrigation Efficiency
 LA = Landscape Area
 0.62 = Conversion Factor

In this equation, the reference evapotranspiration value is fixed based on the location. For Highland, CA, evapotranspiration is assumed to be 55.1" per year according to the California Irrigation Management Information System (CIMIS) for Zone 9 (South Coast Marine to Desert Transition Zone). Factors that will affect the irrigation demand include plant factor, irrigation efficiency, and landscape area. The estimate shown in Figure 10-11 on the following page assumes that the demonstration gardens will have a plant factor of 0.2 and the orchard will have a plant factor of 0.4. Irrigation efficiency is assumed to be 0.75 for both landscape areas, which allows for spray irrigation.

The total water demand will be the indoor water demand combined with the irrigation demand. Figure 10-12 includes the following total demand estimates:

Average Day Flow (ADF): yearly flow divided by 365 days

- Used to determine sufficient water supply

Max Month Average Day Flow (MMADF): highest average daily flow over the course of 1 month

- For indoor water usage, assumed to be 1.5 times ADF based on the size of the system
- Irrigation water usage based on the month with the highest evapotranspiration rate

Max Day Flow (MDF): highest daily flow over the year

- Used in determining storage facilities and well pumping capacity
- For indoor water usage, assumed to be 2.5 times ADF based on the size of the system and likelihood of events increasing the demand
- Irrigation water usage assumed to be the same as MMADF

Peak Hour Flow (PHF): highest hourly flow over the year

- Used in determining booster pump stations

- and distribution pipelines
- For indoor water usage, typically assumed to be 3.5 times ADF, but due to the high variability expected on the Sunrise Ranch property, a peaking factor of 10 times ADF was used
- For irrigation water usage, assumed to be 3 times MDF, based on an 8-hour irrigation window at night

Fire Flow based on the requirements of California Fire Code Table B105.1(2)

- If automatic sprinklers are used in the building, fire flow can be reduced to 25%, to a minimum of 1,000 gpm
- Dependent upon square footage of the building and construction type
- Storage for fire flow is required on-site if off-site fire flow is not available
- Duration of 2 hours for construction types IA, IB, IIA, IIB, IIIA, IIIB, IV, and V-A
- Duration of 3 hours for construction type V-B

Wastewater generation rates are assumed to be 90% of the indoor potable water use, as shown in Figure 10-13.

B. Water System Elements

As stated previously, there are no potable water services available from the City of Highland or EVWD. Tres Lagos (Figure 10-14) is a very small municipal water district on the property that does not have capacity to provide water to the potential facilities. Therefore, a concept design for the potable water system will need to provide a complete, standalone on-site system made up of the following:

- A new well (and possibly a second well for redundancy) with a flow rate between 10 and 50 gpm
- Wellhead treatment (if necessary)
- Potable water storage tank (between 140,000 and 250,000 gallons based on the estimated demand)
- Distribution pumps and hydropneumatic tank
- Fire suppression pumps and backup power supply

C. Wastewater System

Wastewater would be generated in the new headquarters, the education center, the fire facility, the trail restroom, and other buildings that

might be built on the Sunrise Ranch property in the future. Site and regional considerations for water management and civil infrastructure should consider:

- The relatively low wastewater flow rates expected and the variability of flows over the weekends and holidays. This issue is particularly important when considering the education center, where service demands might be both weekly and seasonal.
- Because of the sensitivity and necessity of groundwater in the area, a septic system with leach field effluent disposal would not be recommended and may not be allowable.
- Construction costs associated with the distance and steep terrain to extend a new sewer line to the EVWD (City of Highland) collection system.
- The desire to reuse the effluent for sustainable irrigation of the on-site native and active landscape areas and potential demonstration garden/orchard.

A viable option for wastewater management on the property would consist of using a “package plant,” wherein a prefabricated treatment plant with a capacity of 10,000 gallons per day would be brought to the site and installed locally. These facilities are common in the marketplace and use a variety of different water treatment technologies depending on the nature of the wastewater being generated and the water quality needs for its effluent. In this case, the end use of the water will be “purple pipe” and will meet Title 22 disinfected tertiary effluent quality, allowing for unrestricted spray irrigation use or greywater toilet flushing. The treated effluent could not realistically be placed into the new on-

site reservoirs considering the direct potable use of the reservoirs during emergency supplemental supply to the EBX.

Wastewater treatment technology worthy of further consideration includes an off-the-shelf membrane bioreactor (MBR) plant that includes screening, biological nutrient removal (BNR) with nitrification/de-nitrification using activated sludge, membrane filtration, and disinfection. An example of one such system is the Johkasou system shown in Figure 10-16. The challenge for any aerobic biological treatment system is the need to feed the bacterial culture on a continuous basis. When occupancy of the served buildings drops off and water flows reduce to de minimis flowrates, the bacteria can starve, cannibalize each other, and be reduced so thin that when flows return, their populations are not adequate to meet the demands of the resumed organic loading. To accommodate irregular feeding rates, a larger than normal flow equalization tank would be needed which could store several days’ worth of raw sewage for steady and measured treatment over a holiday or long weekend.

A likely location for this facility would be near the west side of the 2,310’ reservoir near the headquarters or other buildings. The facility will require an enclosed space roughly 20’ by 20’, similar to a garage with roll-up doors on two sides in order to access the equipment for maintenance. Locating the wastewater facility near the potential buildings would reduce the length of sewer line construction and would be at a high enough elevation to allow for gravity distribution of treated effluent for use as irrigation water.

Land Use	Bldg. Area (SF) ¹	People	Water Use Demand Factor	Avg. Day Demand (GPD)	Max Day Demand (GPD) ²	Yearly Usage (AFY)
Headquarters	15,000	256		2,034	8,300	2.3
Staff (existing)		40	20 gpcd	800	2,000	0.9
Staff (growth)		20	20 gpcd	400	1,000	0.4
Staff (part time)		20	15 gpcd	300	750	0.3
Staff (night shift)		6	20 gpcd	120	300	0.1
Visitors		20	10 gpcd	200	500	0.2
Auditorium (1x per week)		150	10 gpcd	214	3,750	0.2
Education Center	6,000	40		400	1,000	0.4
Visitors		40	10 gpcd	400	1,000	0.4
Trail Restroom		10		50	375	0.1
Visitors		10	5 gpcd	50	375	0.1
Total Indoor Water Use		306		2,484	9,675	2.8

Figure 10-10 Estimated Indoor Water Usage

- Notes
- Auditorium is assumed to be used to capacity once per week for determining average day demand.
 - Maximum day demand is assumed to be 2.5 times the average day demand when the facility is at full capacity.

Land Use	Area (Acres)	PF/IE	Yearly Usage (AFY) ¹	Daily Usage (GPD) ²
Headquarters			3.8	3,411
Demonstration Gardens	1.5	0.27	1.8	1,631
Orchard	1.0	0.53	2.0	1,780
Total Landscape Irrigation Water Use			3.8	3,411

Figure 10-11 Estimated Irrigation Water Usage

- Notes
- Daily usage shown is average over the year and does not consider seasonal fluctuations.
 - Calculated using the average annual evapotranspiration (ET_o) of 55.1”.

San Bernardino Valley may want to consider a “next level” wastewater recycling facility and piloting a State of California “direct potable reuse” system to place the treated effluent into either of the potential on-site reservoirs. This would require an independent analysis and program development requiring multiple additional high-level filtration steps, such as reverse osmosis. The

permitting for this type of system would likely take 2 years or more and the cost would be 2-3 times the typical recycled water equipment and installation costs estimated herein. Additionally, there are substantial permitting requirements and full-time use testing/reporting requirements that are extensive for both indirect potable reuse and direct potable reuse systems.

	AFY	ADF (GPD)	MMADF (GPD)	MDF (GPD)	PHF (gpm)	Fire Flow (gpm)
Indoor Water Use	2.8	2,484	3,726	9,675	17	1,000
Outdoor Water Use	3.8	3,411	5,422	5,422	11	
Total Water Use	6.6	5,895	9,149	15,097	29	

Figure 10-12 Total estimated water usage

	ADF (GPD)	MMADF (GPD)	MDF (GPD)	PHF (gpm)
Total Water Use	2,236	3,354	8,708	16

Figure 10-13 Estimated wastewater generation



Figure 10-14 Tres Lagos Wells, access road, and power line

Parameter	Value
On-Site Well	
Flow Rate (gpm)	>211*
Potable Water Storage	
Fire Storage (gallons)	120,000**
Potable Storage (gallons)	20,000***
Total Storage Volume (gallons)	140,000
Potable Booster Pump Station	
Potable Peak Hour Flow (gpm)	29
Fire Flow (gpm)	1,000

Figure 10-15 Major water infrastructure sizing

Notes

- *Delivers Max Day Demand in 12 hours.
- **Fire storage based on values found in California Fire Code (CFC) Table 105.1(2). Assumes buildings will have automatic fire sprinklers, allowing for fire flow to be a minimum of 1,000 gpm. Duration of fire flow is 2 hours.
- ***Potable storage is set at 125% of Max Day Flow.

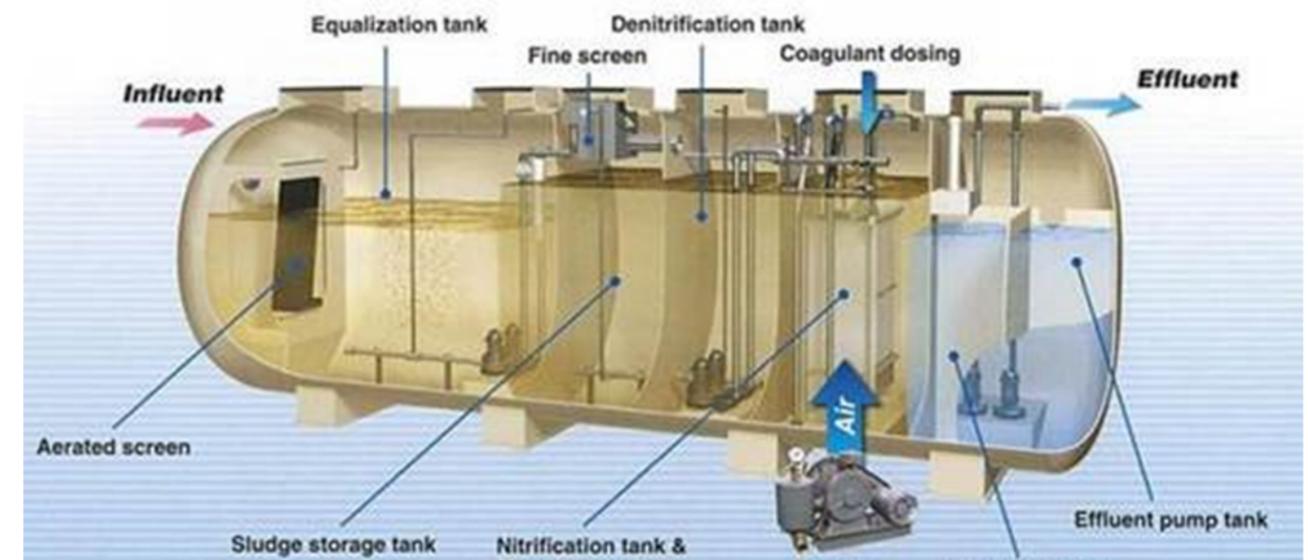


Figure 10-16 Johkasou MBR Schematic

C. Scaled Studies

To aid development of the headquarters program and size, several similar existing water district facilities were studied along with the existing headquarters. Each of the examples studied vary in size and function when compared to the existing facility. Some are retail agencies with more maintenance needs and public facing spaces such as the Moulton Niguel Water District. Others have developed outdoor spaces and programs with learning gardens such as the Chino Basin Water Conservation District. When developing the San Bernardino Valley conceptual headquarters, unique elements from each example were taken into consideration.

1. San Bernardino Valley Existing Location



Two levels of building - 14,260 SF Total
Other staff in multiple locations / buildings

2. East Valley Water District Headquarters



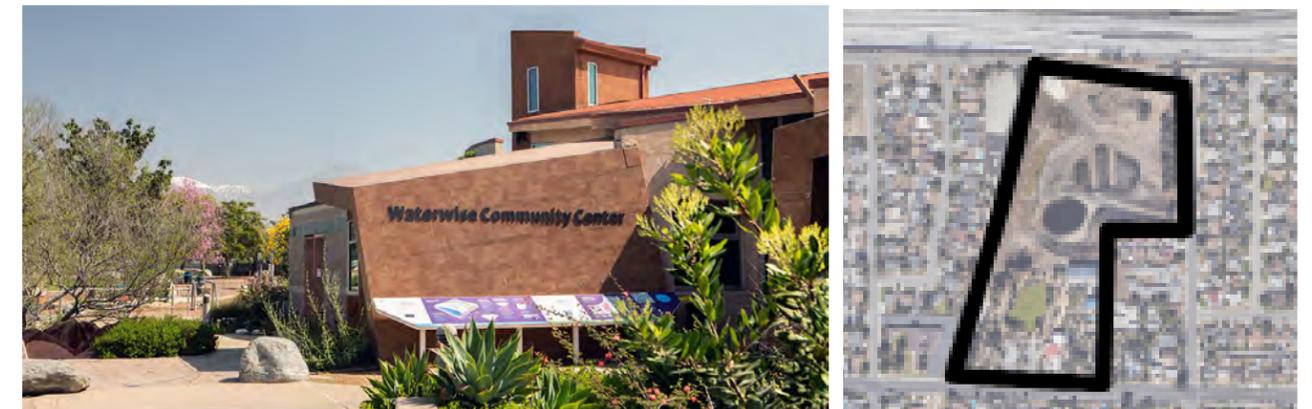
Two Buildings - 35,250 SF Total
Admin Building - 30,000 SF
Ops Building - 5,250 SF
Surface Parking with demonstration garden

3. Moulton Niguel Water District



Five Buildings - 85,575 SF Total
Operations Building - 2 story, 45,500 SF
Lockers & Maintenance - 1 story, 12,500 SF
Fleet Maintenance - 1 story, 5,840 SF
Existing warehouses , 330 surface parking stalls

4. Water Wise Community Center & Chino Basin Water Conservation District



Three Buildings (Water Conservation Center, Education, Multi-Fleet and Maintenance Building)
4.5 Acre Campus
Demonstration Gardens with public programs

D. Headquarters Program Benchmarking

In addition to the precedent scale studies, a basic analysis of the existing Headquarters space was benchmarked against typical programming benchmarks for commercial office spaces.

1. Benchmarking Program

Benchmarking Program

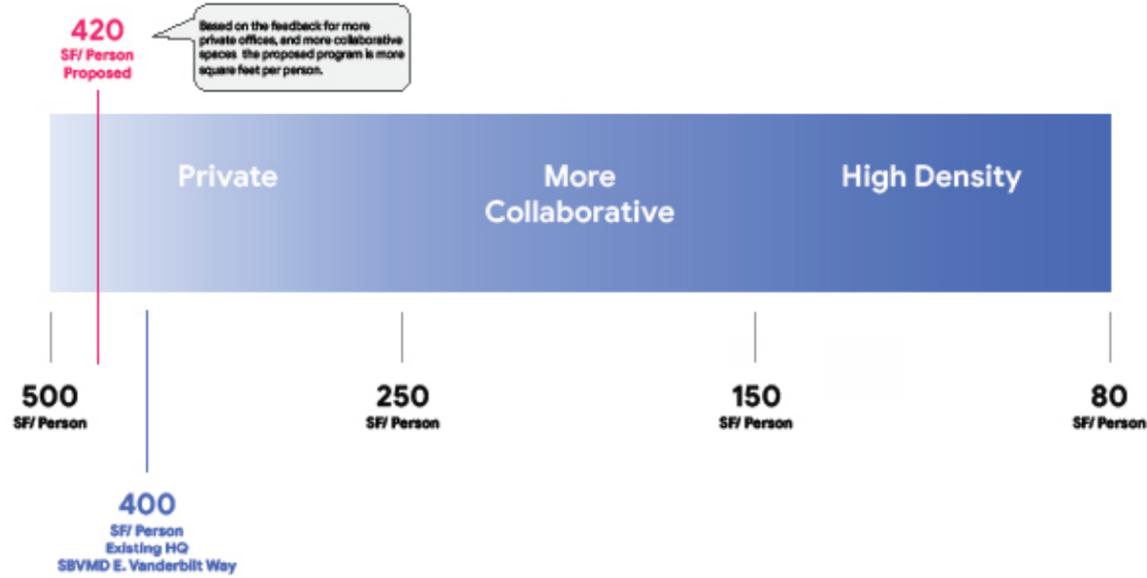
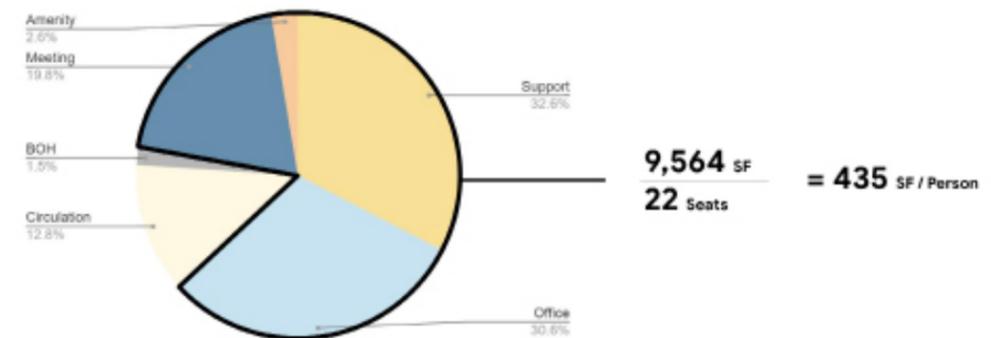


Figure 10-17 Benchmarking and spatial programming analysis at the current San Bernardino Valley headquarters

SBVMWD E. Vanderbilt Way (Existing Space)



SBVMWD E. Vanderbilt Way (Existing Space) Space Program Analysis

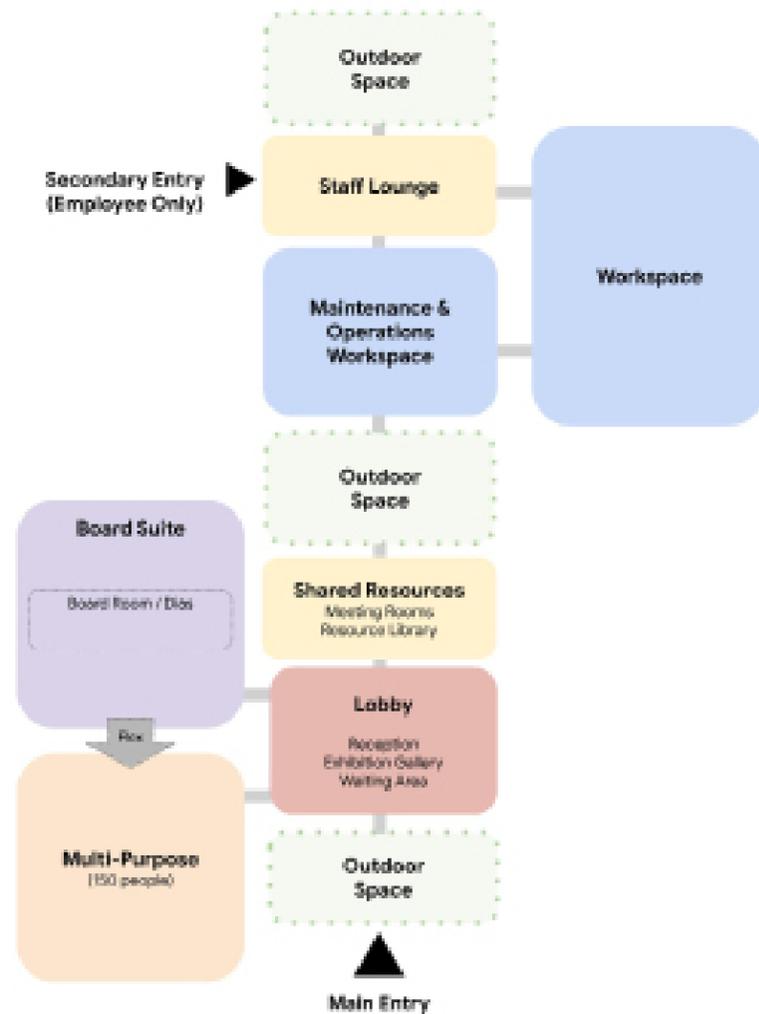


2. Program, All Under One Roof

The headquarters building on the Sunrise Ranch Property could be an opportunity to provide a space for all employees under one roof to continue to collaborate and serve as a regional water agency. The primary office currently sized at approximately 10,000 square feet of usable space is insufficient for their current needs for 40 staff with no room for future growth. The space lacks sufficient collaborative working spaces and connections to the outdoors and is functionally challenged.

The following concept program has been developed to identify functional requirements and approximate gross square footage of the building.

Program Adjacencies



Concept Program

	<u>Space</u>	<u>NSF</u>	<u>Notes</u>
Level 2	Workspace	9,600	
	(35) Private Offices	5,250	150 sf each
	(5) Large Private Offices	1,250	250 sf each
	Collaborative Work Space	2,000	No cubicles, open desks and chairs
	Coffee Bar	100	
	Print / Plotter Room / Plan Drawing Room	1,000	(2) Plotters, (1) Print/Fax, Plan Drawing Table, Office Supply Storage
Level 1	Maintenance & Operations	2,250	
	(6) Private Offices	900	150 sf each
	(2) Stand-In Offices	300	150 sf each, unassigned, doubles as a phone room
	Collaborative Work Space	800	No cubicles open workspace
	Locker Room	150	Access from employee dedicated entry
	Shower Room	100	(1) Shower, Sink, Toilet
	Staff Lounge	1,000	
	Kitchen		Can also support events
	Wellness Room		Sink, Fridge for Lactation Requirements
	Workspace Support	1,500	
	(2) 8- Person Conference Room	500	Internal or External Meetings
	(2) 4- Person Huddle Room	300	Internal or External Meetings
	Library/ Resource Room	300	
	Storage Room	400	
	Multi-Purpose Room	3,000	
Multi-Purpose Room	2,500	Multiple layouts, 150 seated lecture, Storage, AV	
Support	500		
Board Suite	3,000		
Board Room / Dias	2,000	Sized For a Curved Dias, 55 seated occupants	
Board Lounge	500	Kitchenette, Seating, Personal Storage Lockers	
Closed Session Conference Room	400		
Dedicated Restroom	100		
Lobby*	1,800		
			Reception, Exhibition Gallery, Small Waiting
Support	850		
			Restrooms, Elevator

● ●	Workspace	14,350 sf
●	Board Suite	3,000 sf
● ●	Public Functions	4,800 sf

Totals	
Level 1	9,600
Level 2	13,400
Net Square Feet	23,000
35% Gross Up (Circulation, BOH)	8,050
Gross SF	31,050 to 32,000

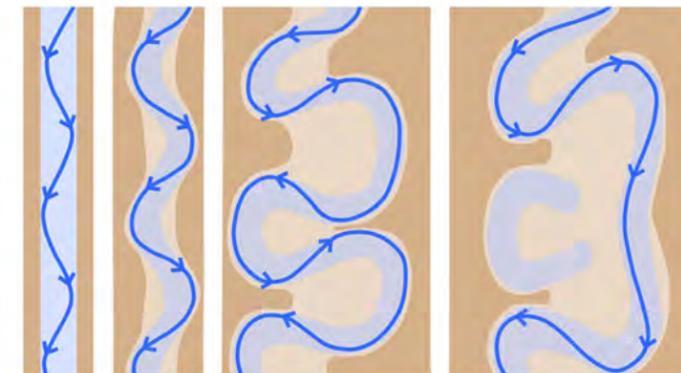
High-Level Concept sizing to inform the general size of the building. Does not include below grade parking

E. Concept

The site organization, building organization and form is inspired by the watershed, and the power of water to shape space. This concept maximizes views and creates courtyards that offer intimate outdoor spaces, united by a roof form which blends into the landscape. There is a wide range of architectural styles to consider in the future design stages.



Santa Ana Watershed



Power to Shape the Future

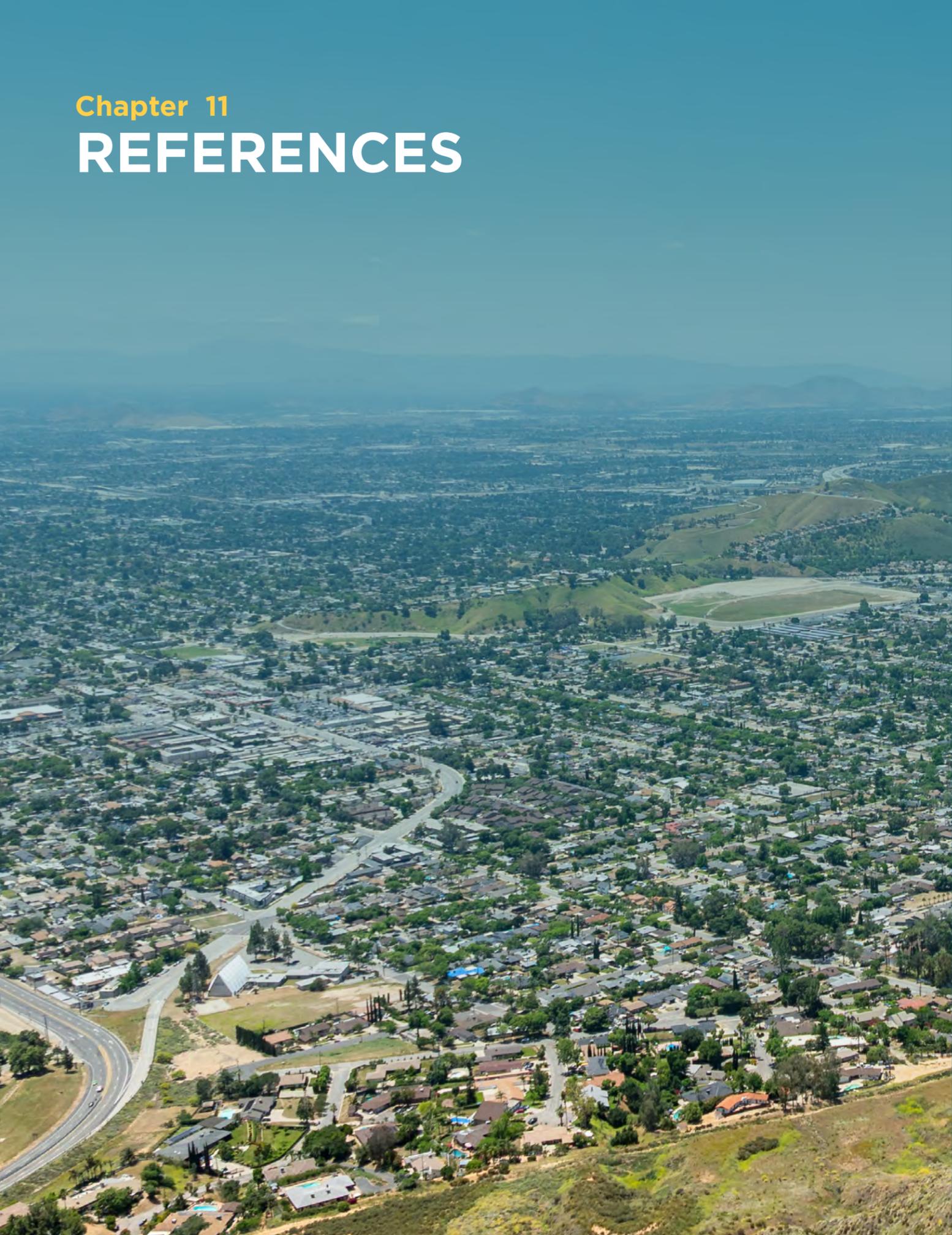


Inspiration to Organize Space

Figure 10-18 Headquarters conceptual studies

Chapter 11

REFERENCES



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11.0 REFERENCES

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A REGIONAL WATER AGENCY
SINCE 1954