

Callie Ham
Landscape Design 7
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14 June 2026

An aerial photograph of a suburban area with a master plan overlay for Hole Lake Discovery Park. The plan features a central lake with a winding path along its edge, several small buildings, and various landscaping elements like trees and shrubs. The surrounding area is a mix of residential streets and open spaces.

master plan
**Hole Lake
Discovery Park**

1

RESTORE

OBJECTIVES

- Implement regenerative strategies to restore soil and water health and improve ecosystem health
- Restore riparian and wetland ecologies to improve habitat for native flora and fauna along the river corridor
- Integrate stormwater and earthworks strategies to improve infiltration and prevent erosion

2

RECONNECT

OBJECTIVES

- Reconnect surrounding neighborhoods to the river through safe pedestrian and bicycle access
- Create continuous trail systems linking ecological, recreational, and community spaces
- Educate community members about native ecology, restoration work, and regenerative practices

3

RECREATE

OBJECTIVES

- Develop hiking and multi-use trails that support active outdoor recreation
- Develop climbing walls, kayak runs, and bike courses as destination recreational features
- Create flexible event spaces for community gatherings, markets, and cultural programming
- Encourage outdoor exploration, wellness, and environmental education through recreation-based programming

01 case studies

Arroyo Seco Water Reuse Project (San Rafael Site)

Liberty Canyon, CA



The Arroyo Seco Water Reuse Project focuses on improving water quality and increasing water reuse within a highly engineered urban watershed. Located within a flood-controlled channel, the project integrates stormwater capture, filtration, and reuse while maintaining flood control requirements. It also sits within a fragmented urban context, where infrastructure and development limit ecological connectivity.

The design combines water infrastructure with landscape strategies like infiltration basins, swales, and riparian planting. A major challenge is balancing technical systems with public access, as well as working within regulatory constraints. This project shows how water can become a visible and functional part of the landscape. For my site, it reinforces the idea of using the creek and proposed lake as part of a larger system that captures, filters, and reuses water rather than just moving it through.

Location: Liberty Canyon, Agoura Hills, California

Adoption: 2003, as part of the Arroyo Seco Master Plan

Jurisdiction: City of Pasadena, Arroyo Seco corridor

Focus areas: Recreation, habitat restoration, stream corridor, public structures, circulation, signage

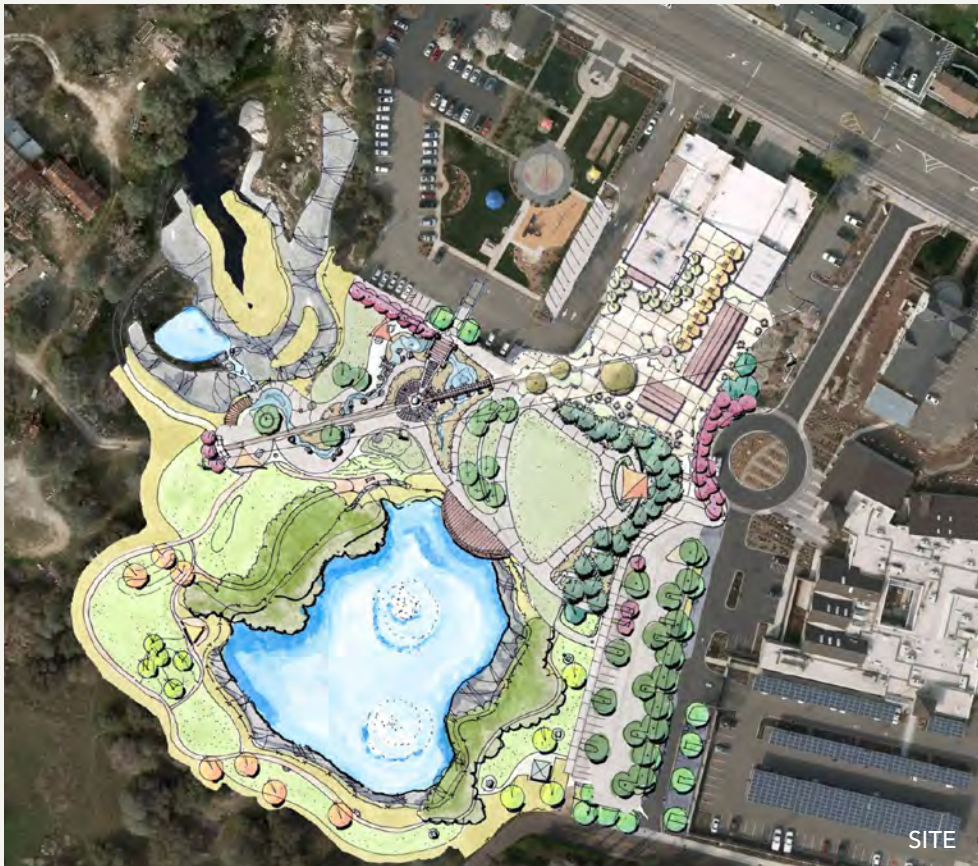
- Similar ecosystem to class site; draws from broader Arroyo Seco watershed strategies
- Provides water treatment and infiltration solutions
- Restores native habitat corridors
- Deals with road crossings



case studies

Quarry Park

Rocklin, CA



Location: Rocklin, California, USA

Landscape architect: Fuhrman Leamy Land Group

Opened: 2016 (adaptive reuse completion)

Operated by: City of Rocklin

Historic element: Big Gun Quarry, a 19th-century granite site

- Dealt with extreme grading, used slope-stabilizing, deep-rooted vegetation; designed drainage to slow runoff and prevent erosion.
- Income-generating recreational activities: aerial adventure course built into the quarry walls (zip lines, climbing routes, and rappelling experiences).
- Seasonal events, concerts, and farmers' markets draw residents and tourists to the amphitheater and park grounds
- Design integrates remnants of quarry machinery, sheer rock walls, and water features to interpret Rocklin's mining history

Quarry Park transforms a former granite quarry into a public park by working with its existing topography rather than trying to erase it. The site is defined by steep slopes, exposed rock, and disturbed soils, which become the framework for trails, overlooks, and recreational spaces. Instead of fully remediating the site, the design focuses on stabilizing slopes, managing drainage, and making the landscape safe and accessible.

One of the biggest challenges was dealing with unstable ground and erosion while working within a limited budget. The project uses grading, planting, and drainage systems to improve site performance over time. A key takeaway is that degraded sites don't need to be fully "fixed" to be successful—existing conditions can be reused and adapted. For my project, this is especially relevant in thinking about how to work with dumped soils and contour changes as design opportunities rather than constraints.

Brooklyn Bridge Park



Location: Brooklyn, NY

Landscape architect: Michael Van Valkenburgh Associates

Opened: 2010 (first sections)

Operator: Brooklyn Bridge Park Corporation

- Designed to be financially self-sustaining, while still providing free core park space
- Food vendors, restaurants, and recreational rentals (kayaks, roller skating, etc.)
- Event programming and space rentals: film shoots, and cultural programming, outdoor movies, festivals
- Revitalized abandoned port facilities into vibrant urban ecology

Brooklyn Bridge Park is a waterfront park built on former industrial piers, reconnecting surrounding neighborhoods to the East River. The project transforms a heavily altered site into a multi-use public space that includes recreation, habitat, and open space, while also addressing flooding and sea level rise.

One of the main challenges was balancing ecological restoration with heavy public use, as well as developing a long-term funding strategy. The park uses a mix of programming and revenue-generating development to support maintenance. For my project, this highlights the importance of designing for both ecological performance and long-term viability. It also suggests that incorporating flexible programming and potential revenue sources could help support maintenance over time.



Wallis Annenberg Wildlife Crossing

Rocklin, CA



Supported wildlife



Crossing in construction

The Wallis Annenberg Wildlife Crossing is designed to reconnect fragmented habitats across the 101 Freeway by creating a vegetated bridge for wildlife. The project responds to habitat loss and wildlife mortality caused by major infrastructure, and aims to restore ecological connectivity at a regional scale.

The design uses native planting and landforms to create a continuous habitat corridor over the freeway, while minimizing human disturbance. One of the main challenges is building over active infrastructure and coordinating across multiple agencies. For my project, this reinforces the importance of connectivity, especially at crossings. While my site is smaller, the idea of designing crossings that support both people and wildlife is directly applicable.

Location: Liberty Canyon, Agoura Hills, California

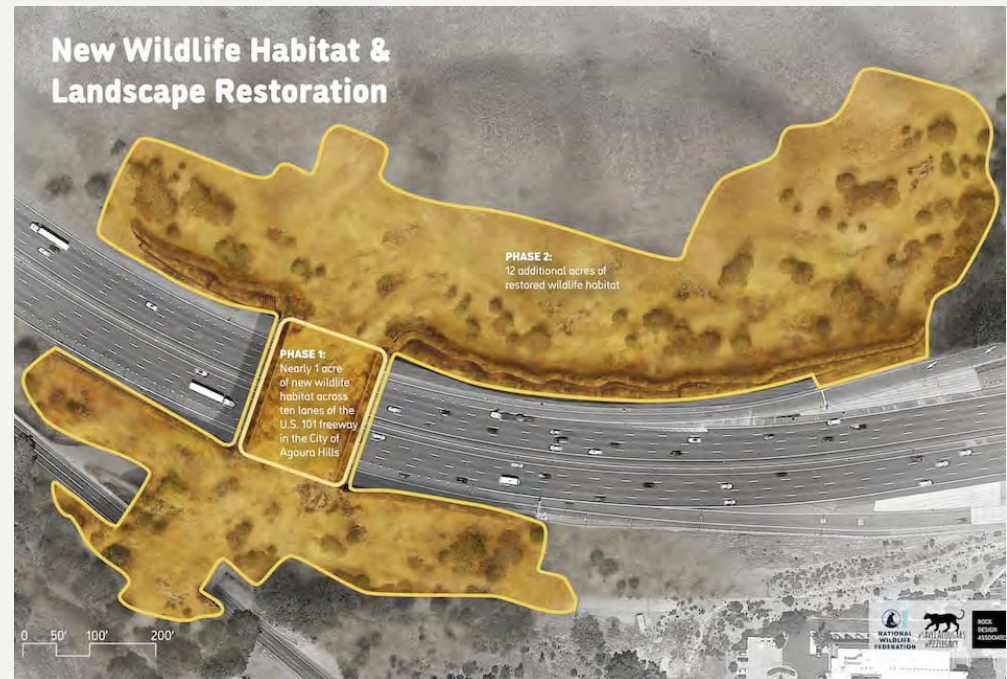
Architect: Architect Robert Rock and engineering firm, Biohabitats

Purpose: Connect fragmented wildlife habitats across US 101

Construction: 2022 - 2026

Lead partner: National Wildlife Federation with Caltrans and Annenberg Foundation

- Addresses habitat fragmentation
- Model for urban ecological infrastructure
- Materials and grading also for wind buffering, noise dampening, shade, and microclimates
- While much larger than the class site, it offers a design and engineering solution to safe passage over busy roads
- Challenges: coordination, expensive, temporarily diverting traffic



Chorro Creek Ecological Reserve

San Luis Obispo County, CA



Chorro Creek Ecological Reserve focuses on restoring a degraded creek system that was impacted by agriculture and altered hydrology. The project works to reestablish natural processes by reconnecting the floodplain, improving water quality, and restoring riparian habitat.

The design relies on process-based strategies like regrading, native planting, and allowing the creek to meander and slow down during storm events. One of the main challenges was managing sediment and restoring ecological function without relying on heavy infrastructure. A key takeaway is the value of working with natural systems over time. For my project, this supports designing the creek and lake as dynamic systems that manage water, reduce erosion, and support habitat rather than relying on rigid solutions.

Location: Near Morro Bay, San Luis Obispo County, California

Architect: Architect Robert Rock and engineering firm, Biohabitats

Size: 580 acres

Purpose: Floodplain restoration and habitat conservation

Established: 2000s

Managed by: California Department of Fish and Wildlife

- Restored floodplain, natural hydrology, and riparian habitat
- Provides critical habitat for sensitive species such as the steelhead trout, California red-legged frog, and various migratory birds
- Reserve occupies a key section of the lower Chorro Creek, a major tributary to Morro Bay
- Challenges: Public access limited for protection purposes



Erosion control strategies

EROSION CONTROL STRATEGIES

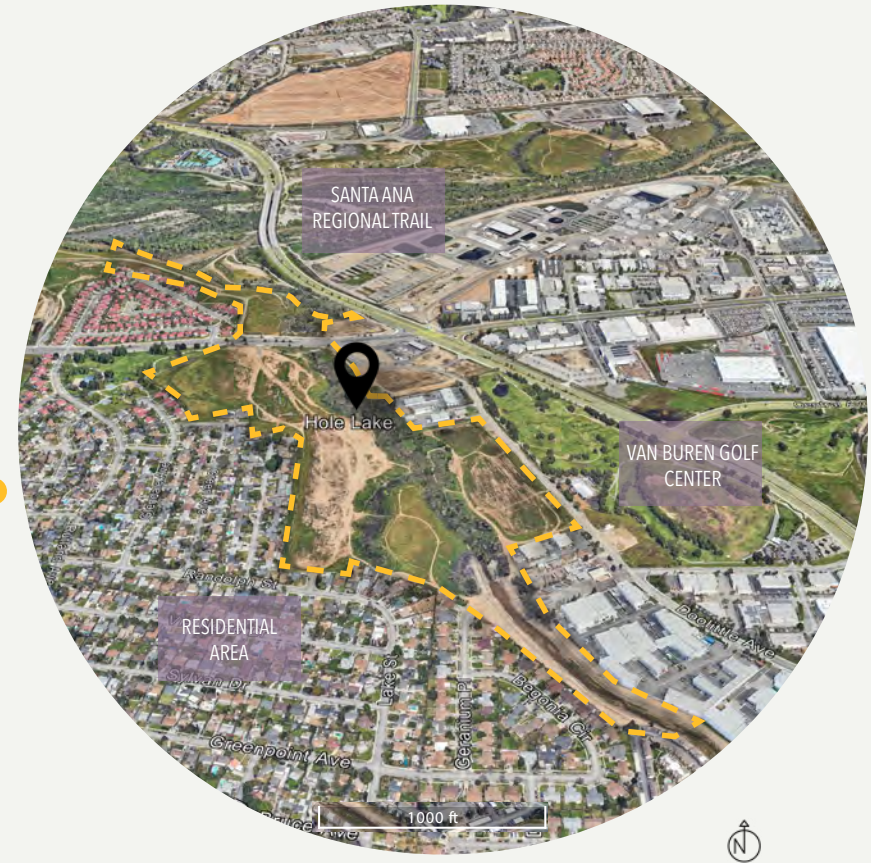
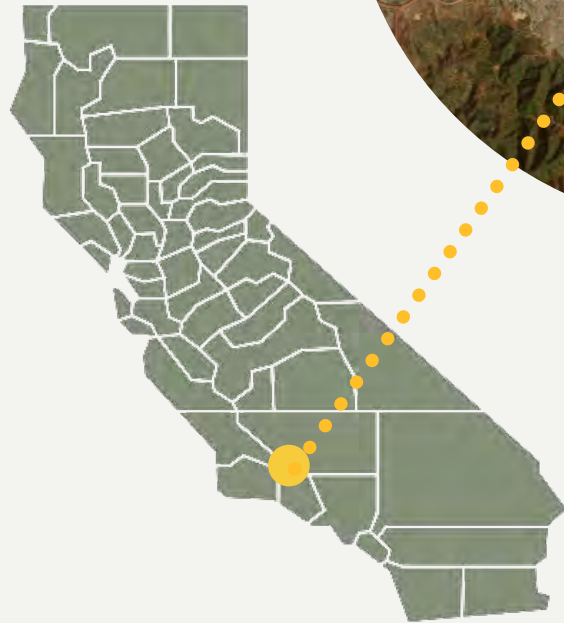
- Coir fabric staking
- Coir log
- Straw wattles
- Brush mattresses
- Rock slope protection
- Grade control structures
- Reseeding



After development

02 site inventory & analysis

Site Location



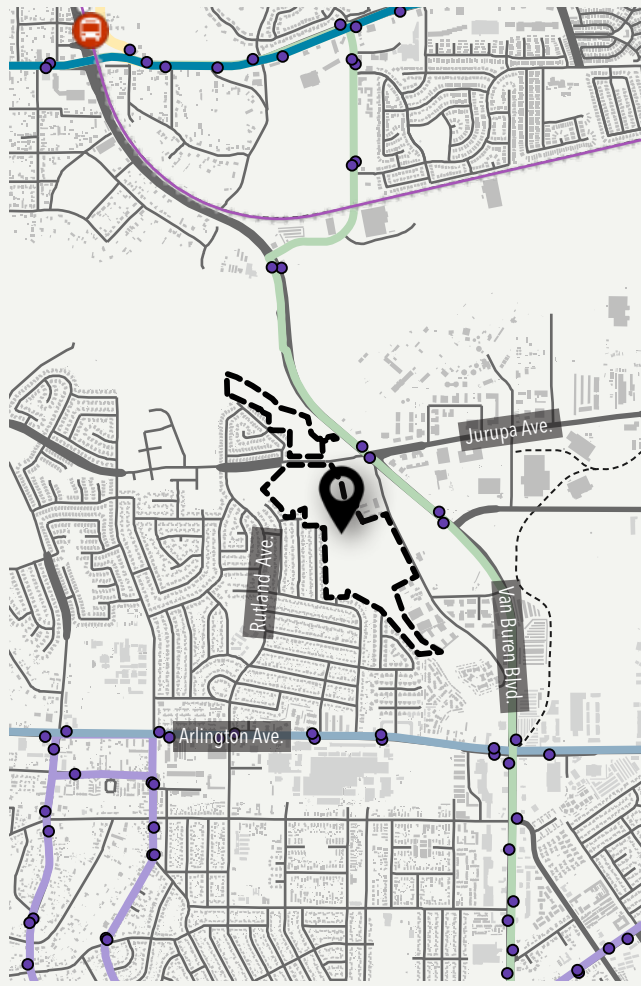
Location: Hole Lake, Riverside, California

The Hole Lake Project site is a 53-acre undeveloped open space in Riverside, located adjacent to established residential neighborhoods, Rutland Park, Van Buren Golf Center, and Riverside Municipal Airport. The site is also connected to the regional hydrological system of the Santa Ana River corridor and nearby trail infrastructure.

The site sits within a transitional zone between residential, recreational, and infrastructural land uses, and is influenced by airport land use constraints, flood infrastructure, and regional open space networks.

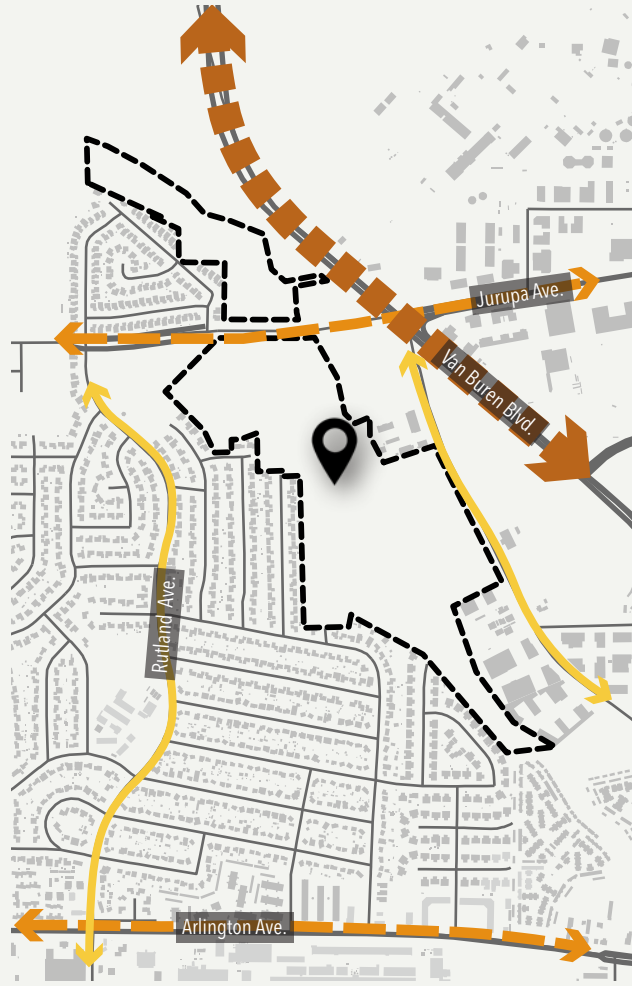
site inventory & analysis

Circulation

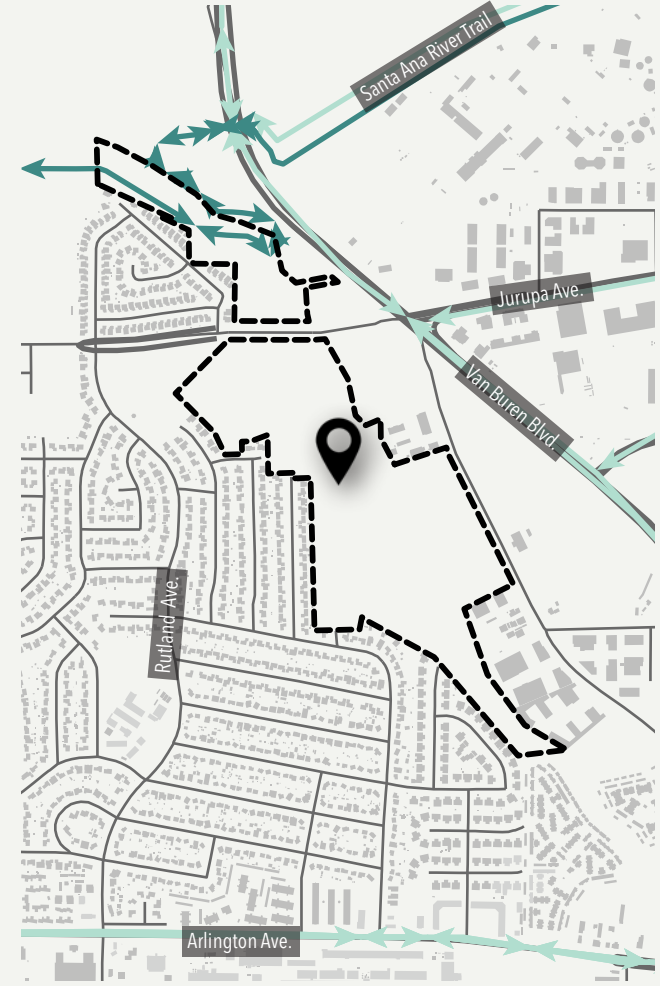


PUBLIC TRANSPORT

- Route 13
- Route 15
- Route 21
- Route 29
- 🚌 Metrolink_Stations
- RTA_Bus Stops
- Amtrak/Metrolink Lines



AUTO

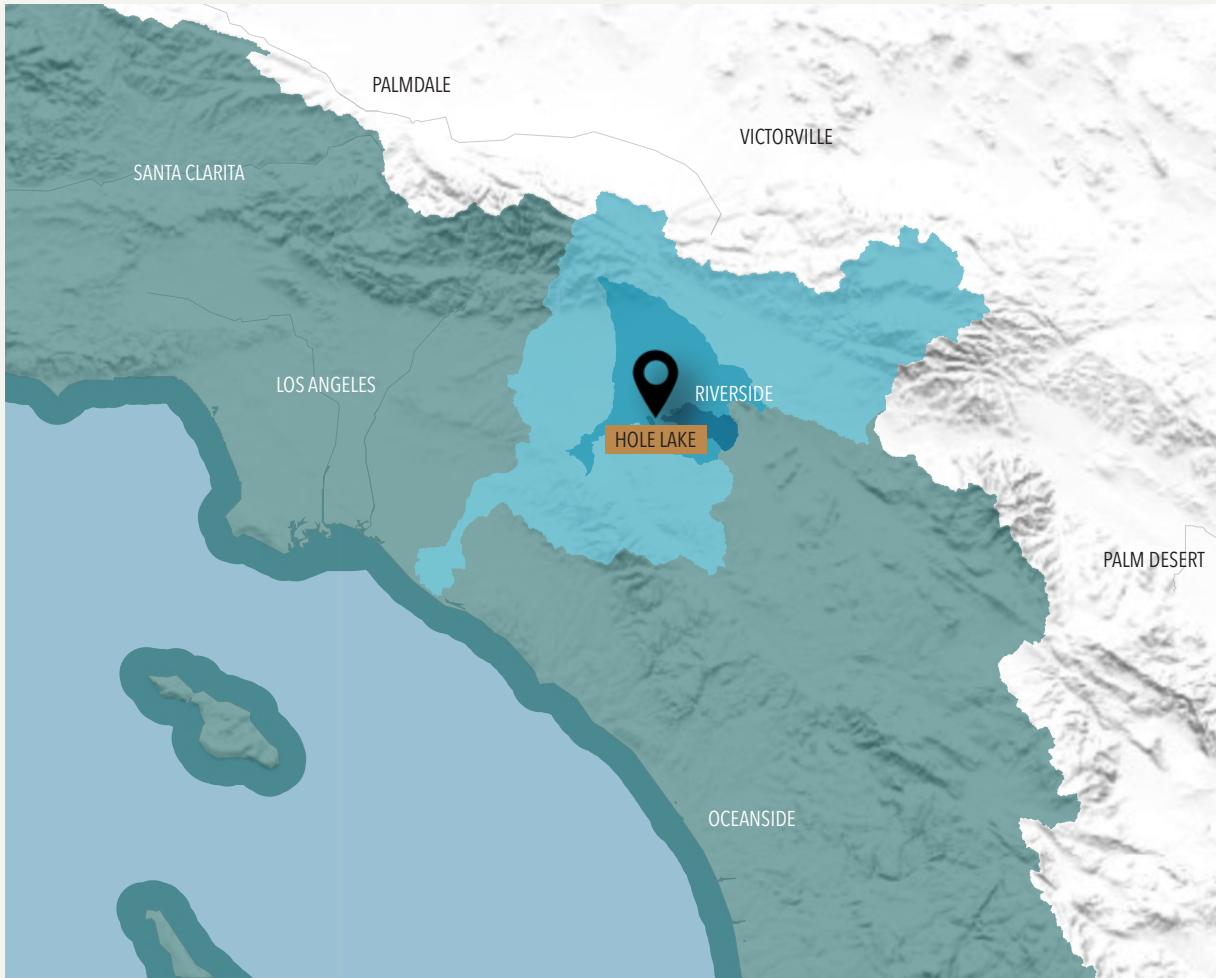


BIKE

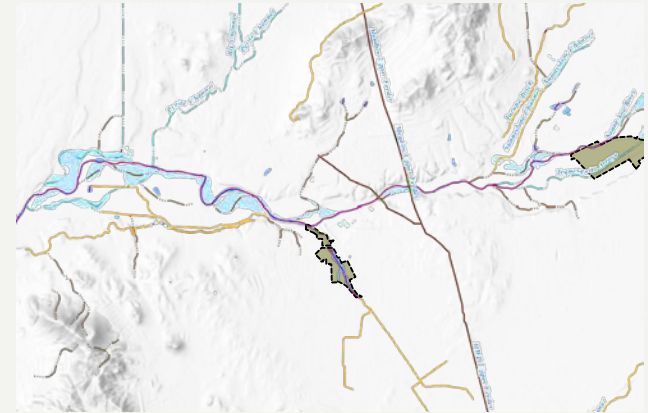
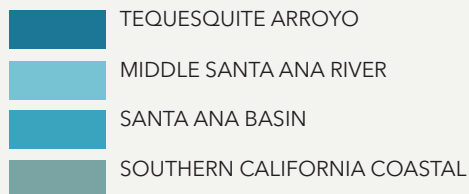
Hole Lake sits within a well-connected regional road and transit network, but its relationship to surrounding pedestrian and bicycle infrastructure is less direct. Jurupa Avenue and Van Buren Boulevard provide strong vehicular access, while the Santa Ana River Trail offers an important regional recreational connection to the north. The site's internal circulation can build on these existing systems to improve access while prioritizing walking and biking within the park.

site inventory & analysis

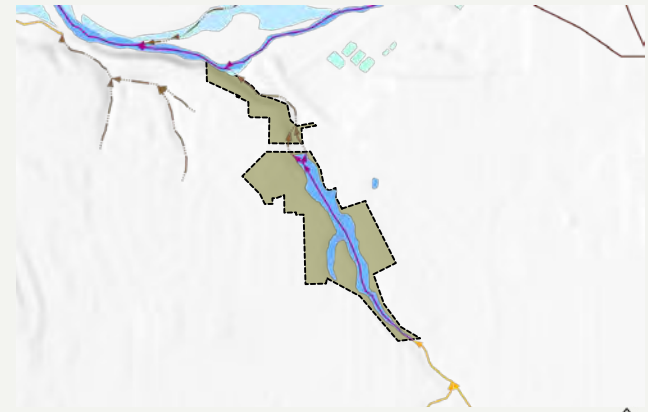
Environmental



REGIONAL WATERSHEDS



SITE IN RELATION TO SANTA ANA RIVER



FLOW LINES THROUGH SITE TO SANTA ANA RIVER

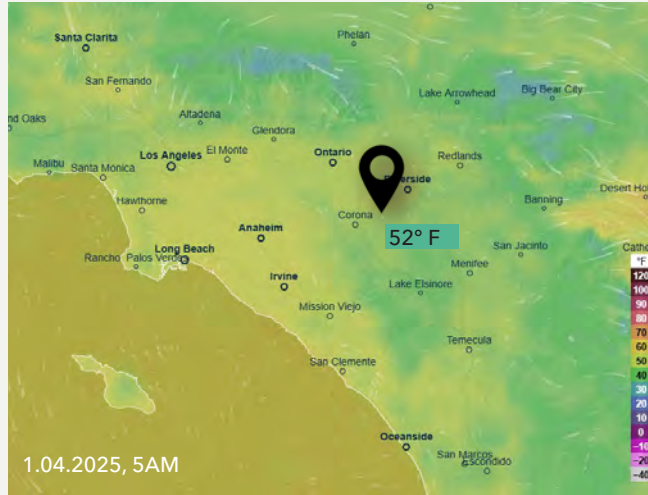
Hole Lake sits within the **Santa Ana River watershed**, with the site positioned along a network of tributaries that ultimately drain to the Santa Ana River. Its location makes the site **part of a larger hydrological system** rather than an isolated landscape. Existing flow lines suggest an opportunity to use the site to slow, collect, and filter water while strengthening its ecological connection to the river corridor.

site inventory & analysis

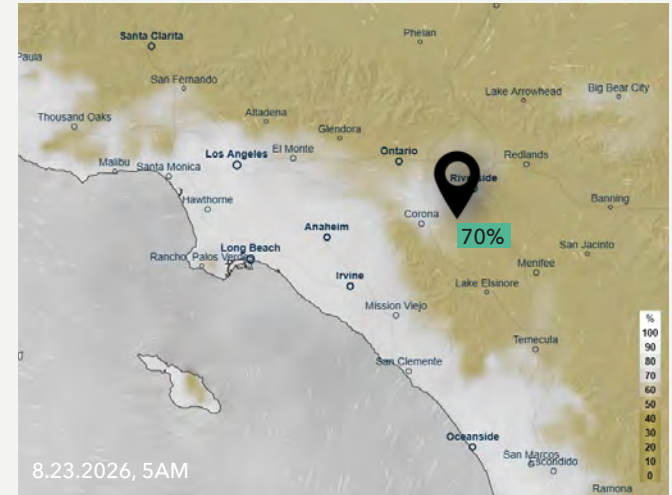
Environmental



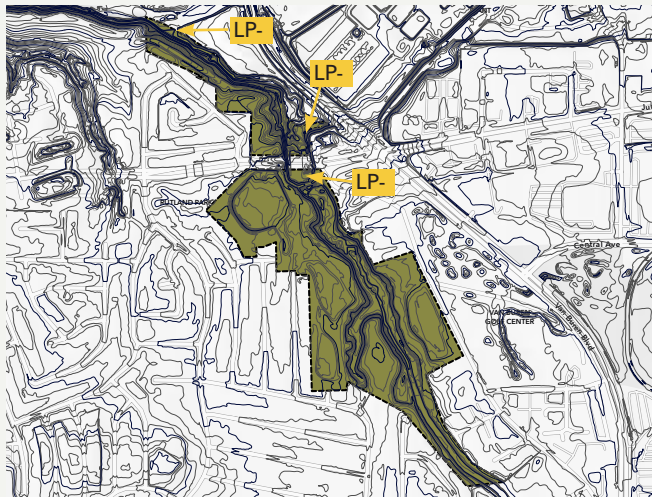
ELEVATION CHANGE



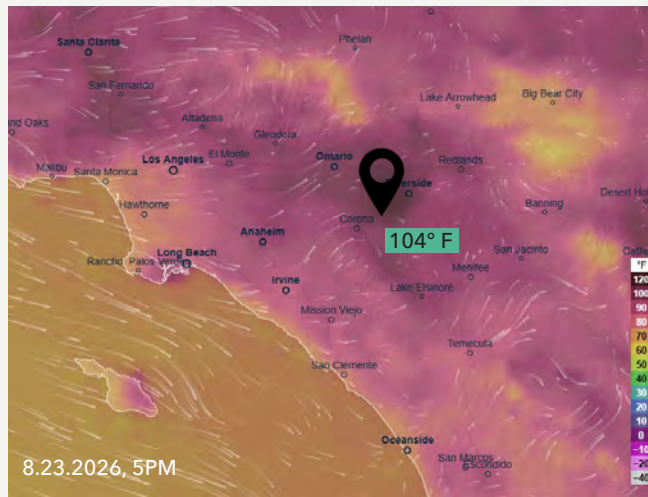
TEMPERATURE - WINTER, MORNING



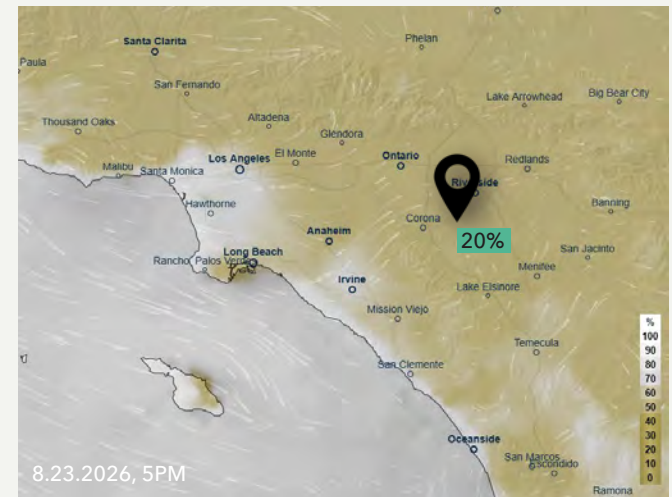
MORNING HUMIDITY



TOPOGRAPHY



TEMPERATURE - SUMMER, AFTERNOON

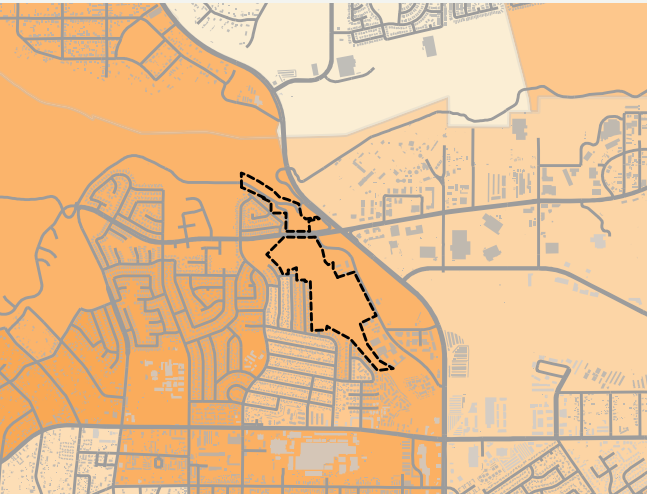


EVENING HUMIDITY

Source: Ventusky

site inventory & analysis

Social



POPULATION DENSITY

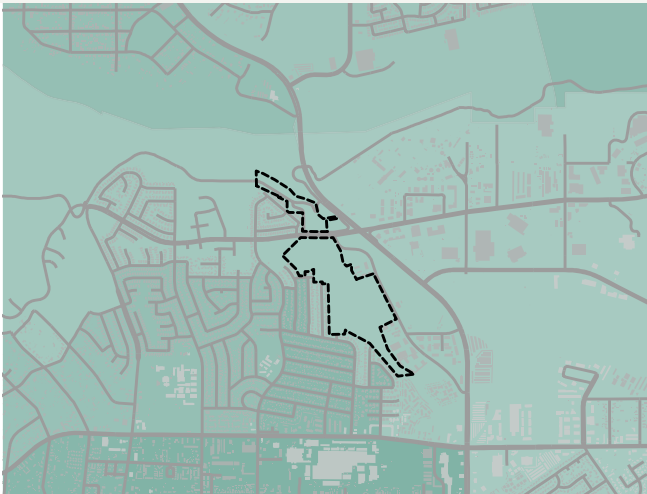
0 .25 .5 miles

<30%

<48%

2025 POPULATION ESTIMATES

City of Riverside: 323,757
Riverside County: 2,529,933



ETHNICITY

0 .25 .5 miles

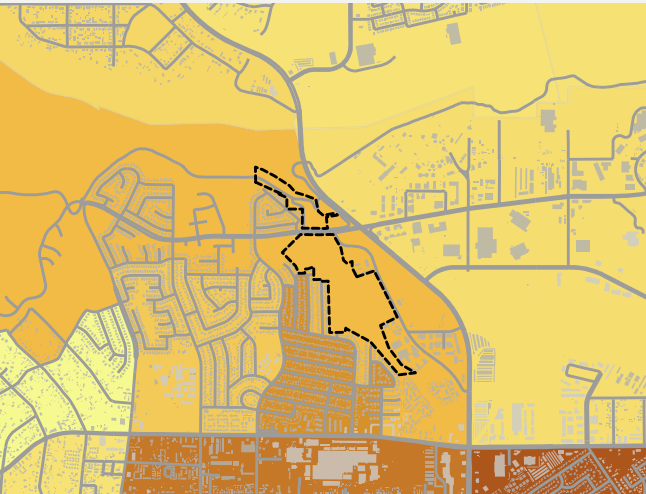
Hispanic or Latino

Strength of Predominance

0-13

13-97

97-100



MEDIAN HOUSEHOLD INCOME

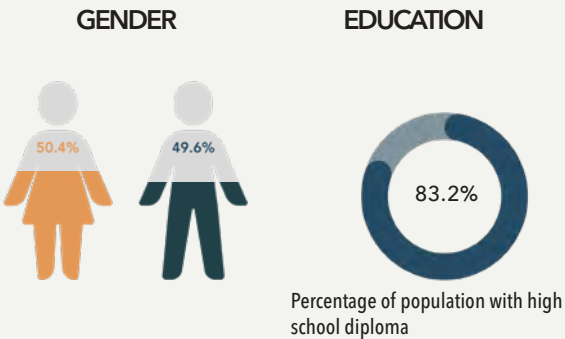
0 .25 .5 miles

>\$122,200

<\$39,300

Median Household Income (2020-2024)

\$91,045



The communities surrounding Hole Lake vary in population density, ethnicity, household income, gender, and educational attainment. The surrounding population is predominantly Hispanic or Latino, while household incomes vary considerably across the study area. Approximately 83.2% of the population has a high school diploma or equivalent.

Source: Ventusky

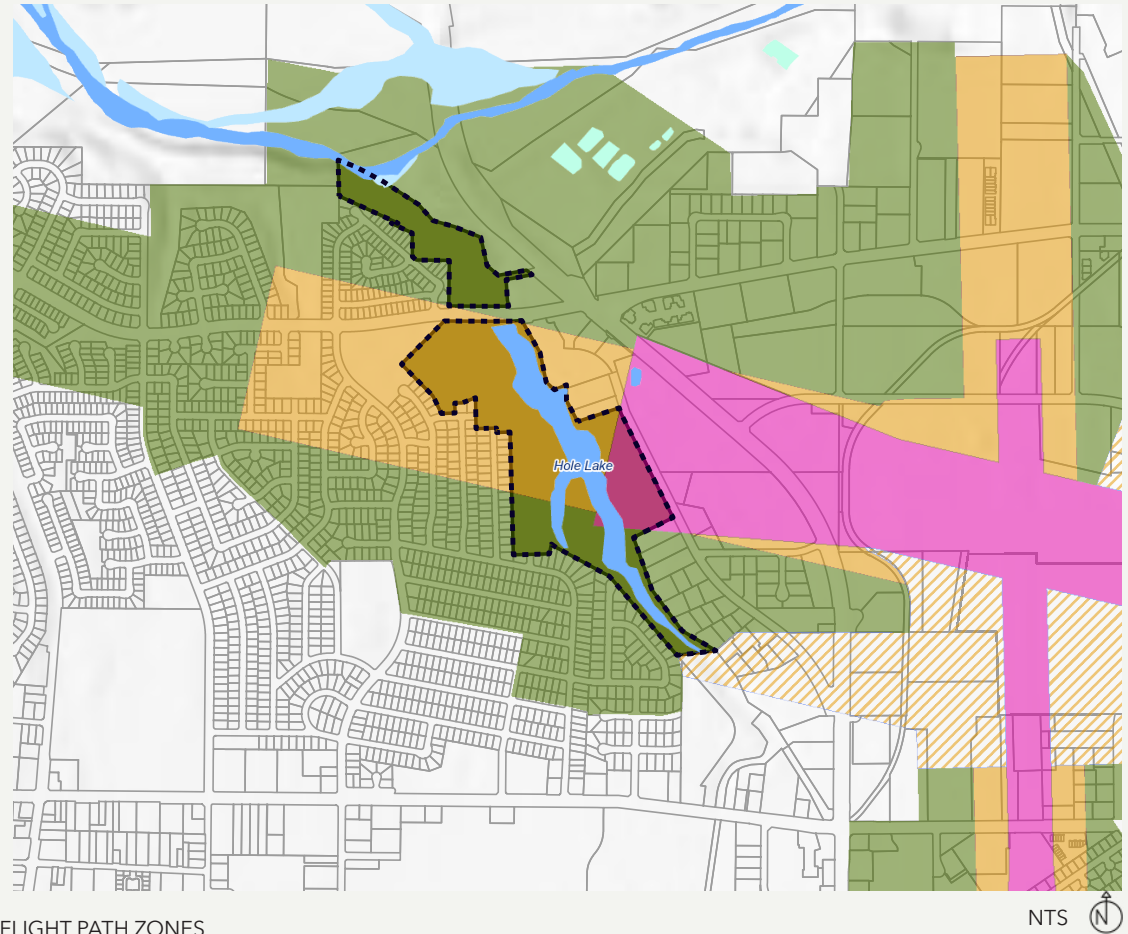
Air space

Hole Lake's main constraint is its proximity to the Riverside Municipal Airport, where the key issue is bird strike risk. Open water, wetlands, and certain habitat types can attract birds, so the proposed lake and ecological systems must be carefully designed to avoid increasing wildlife activity within airport influence zones and flight paths.

The second issue is airport compatibility zoning, which can restrict land uses, vegetation types, and potentially built elements depending on safety and airspace regulations.



RIVERSIDE MUNICIPAL AIRPORT



FLIGHT PATH ZONES

Plant Communities

The Riverside region contains a range of Southern California plant communities, including alluvial scrub, grasslands, oak woodland, riparian woodland, chaparral, coastal sage scrub, and conifer woodland. Together, these communities reflect the region's varied environmental conditions, from low-lying river corridors and alluvial landscapes to drier upland and higher-elevation environments.

Riparian woodland is associated with waterways and areas with greater access to water, while alluvial scrub occurs in landscapes shaped by the movement and deposition of sediment. Grasslands and oak woodlands occupy different combinations of soils, topography, and moisture conditions, while coastal sage scrub and chaparral are adapted to drier conditions. Conifer woodland represents the higher-elevation end of the regional ecological spectrum.



ALLUVIAL
SCRUB



CHAPARRAL



COASTAL
SAGE SCRUB



CONIFER
WOODLAND



GRASSLANDS



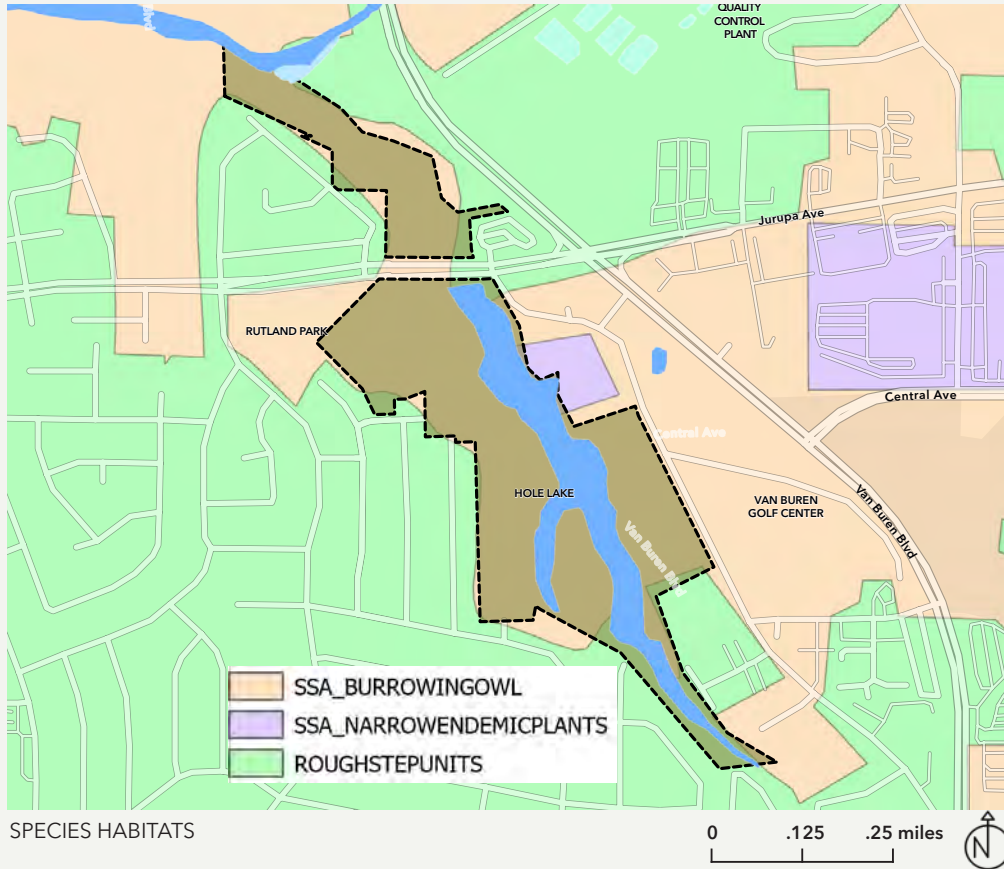
OAK
WOODLAND



RIPARIAN
WOODLAND

site inventory & analysis

Habitat & Sensitive Bird Species



The Hole Lake Project site is located within an area identified as potential habitat for the Burrowing Owl, a ground-nesting species commonly associated with open grasslands, disturbed fields, and sparsely vegetated landscapes in Southern California. The presence of mapped habitat near the site indicates the area may provide suitable foraging and nesting conditions, particularly within undeveloped or low-height vegetated areas.

Because the species is protected under California environmental regulations, its potential presence is an important ecological and planning consideration for future site development.



BURROWING OWL



SOUTHWESTERN WILLOW
FLYCATCHER



BELL'S VIREO

Sources: National Audubon Society, <https://www.audubon.org/magazine/listen-burrowing-owls-hiss-rattlesnakes>; <https://www.audubon.org/field-guide/bird/bells-vireo>; <https://ar.inspiredpencil.com/pictures-2023/southwestern-willow-flycatcher-audubon>

Constraints



SITE CONSTRAINTS

1. Erosion on north side of Jurupa Ave.
2. Inaccessibility around entire southern part of Jurupa Ave.
3. Site used as dumping ground: contaminated soils, unclean water, and trash
4. No safe crossing over Jurupa Ave.
5. Maintenance costs exceed need
6. Underneath main flight runway path for Riverside Municipal Airport

opportunities & constraints

Opportunities



SITE OPPORTUNITIES

1. Potential to regrade eroded slopes with water-harvesting capacity and plant deep-rooted shrubs
2. Potential for native planting to restore ecosystems
3. Opportunities for regenerative practices to clean soil & water
4. Potential for tunnel to run under Jurupa Ave. alongside culvert
5. Potential for revenue-generating recreational and social activities

04 conceptual design

A Climbing Experience

THE CRAG



The Crag is where people go to climb, but it provides many different experiences. It can be individual, for partnership, or communal. Here, the landscape allows for **active participation or quiet observation, social engagement or personal reflection**. There are place to warm up, cool down, play, seek refuge, learn, and teach.

THE ROUTE



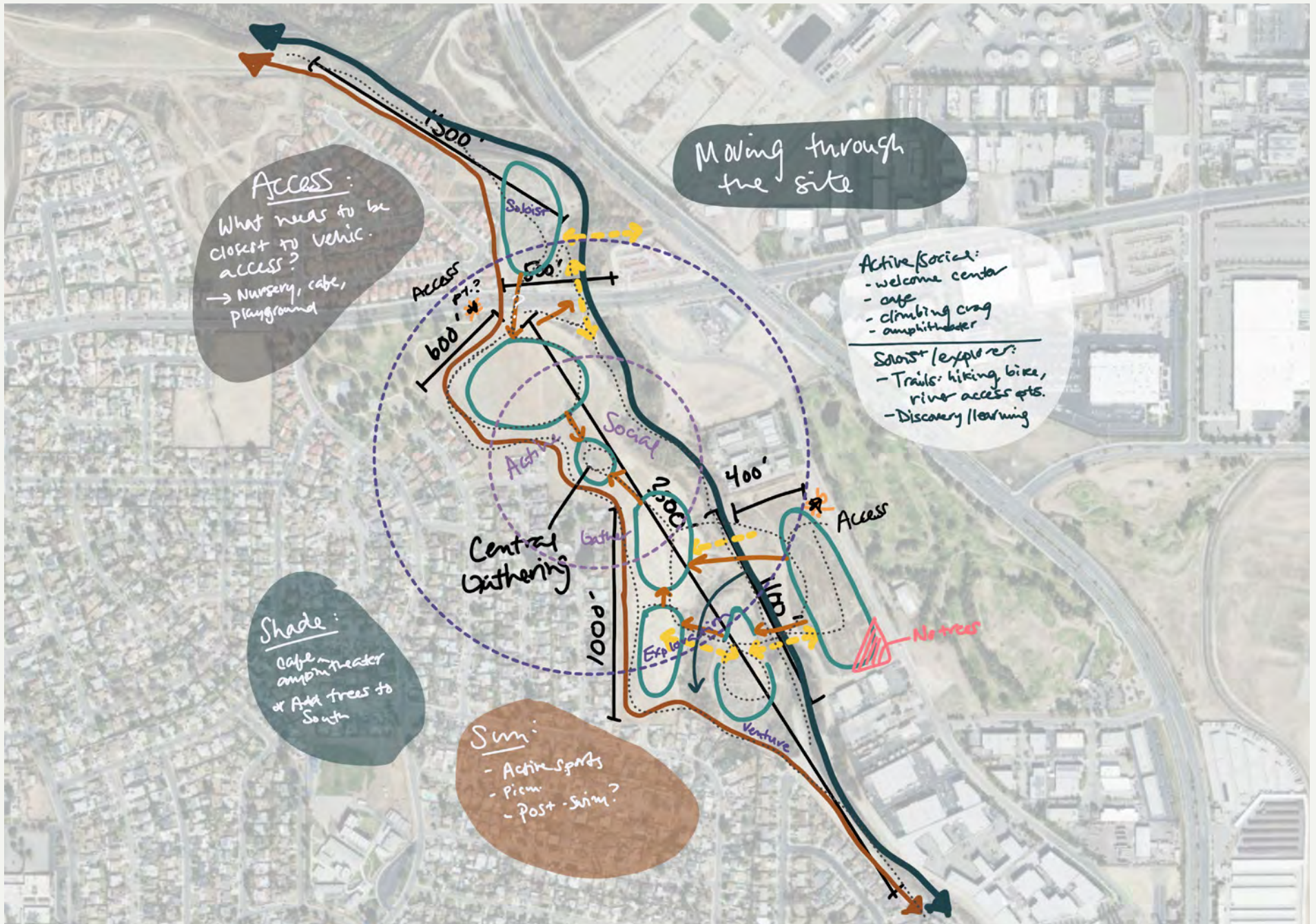
The route is about choosing your own adventure. Here, the landscape is framed as a system of interconnected choices. Rather than prescribing a single experience, the design encourages visitors to choose their own path through a **network of routes leading to distinct destinations and activities** – from climbing and trails to river access and moments of retreat and personal discovery.

THE TRAVERSE



The Traverse is meandering, lateral movement along an edge rather than toward a single destination. While open to all, it may be more inviting to the soloist seeking **individual exploration**. The journey moves through varying ecological and spatial conditions, allowing the user to move between passive and active recreational zones and varying habitats and ecosystems.

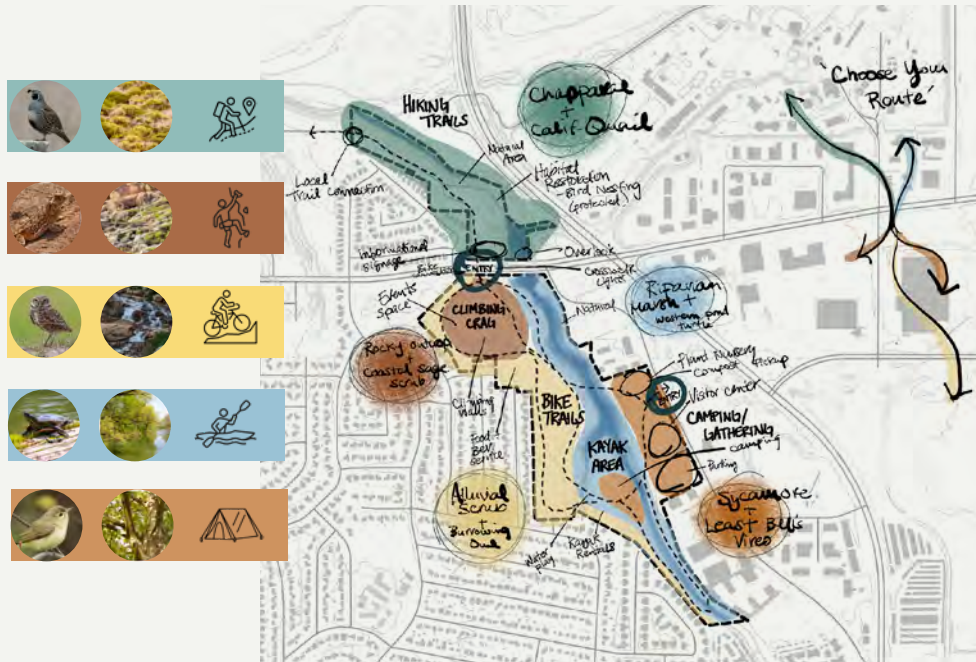
Exploring movement and sequential experiences



conceptual design

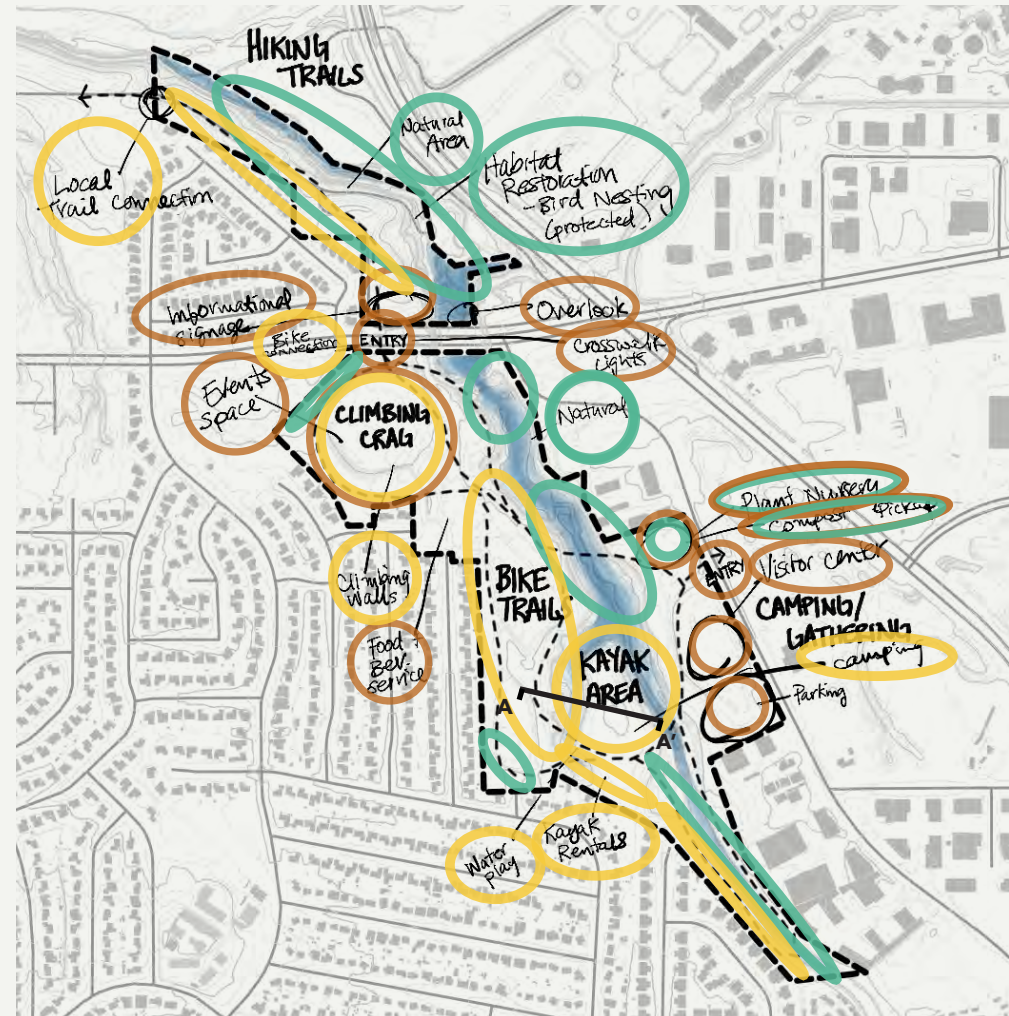
Exploring spatial relationships

'CHOOSE YOUR ROUTE'



SECTION

GOALS OVERLAY



- RESTORE
- RECONNECT
- RECREATE

05 design Inspiration



design Materials



BENCHES INTEGRATED INTO BOULDERS



SYNTHETIC OUTDOOR BOULDER STRUCTURE



SOLAR-POWERED PATH LIGHTS



SHADE SAILS OVER OUTDOOR SEATING



CORTEN STEEL INFORMATIONAL SIGNAGE



ANIMAL CUTOUTS FOR ORIENTATION



BIKE TRACK TERRAIN



BIKE TRACK TERRAIN

master plan

Hole Lake Discovery Park

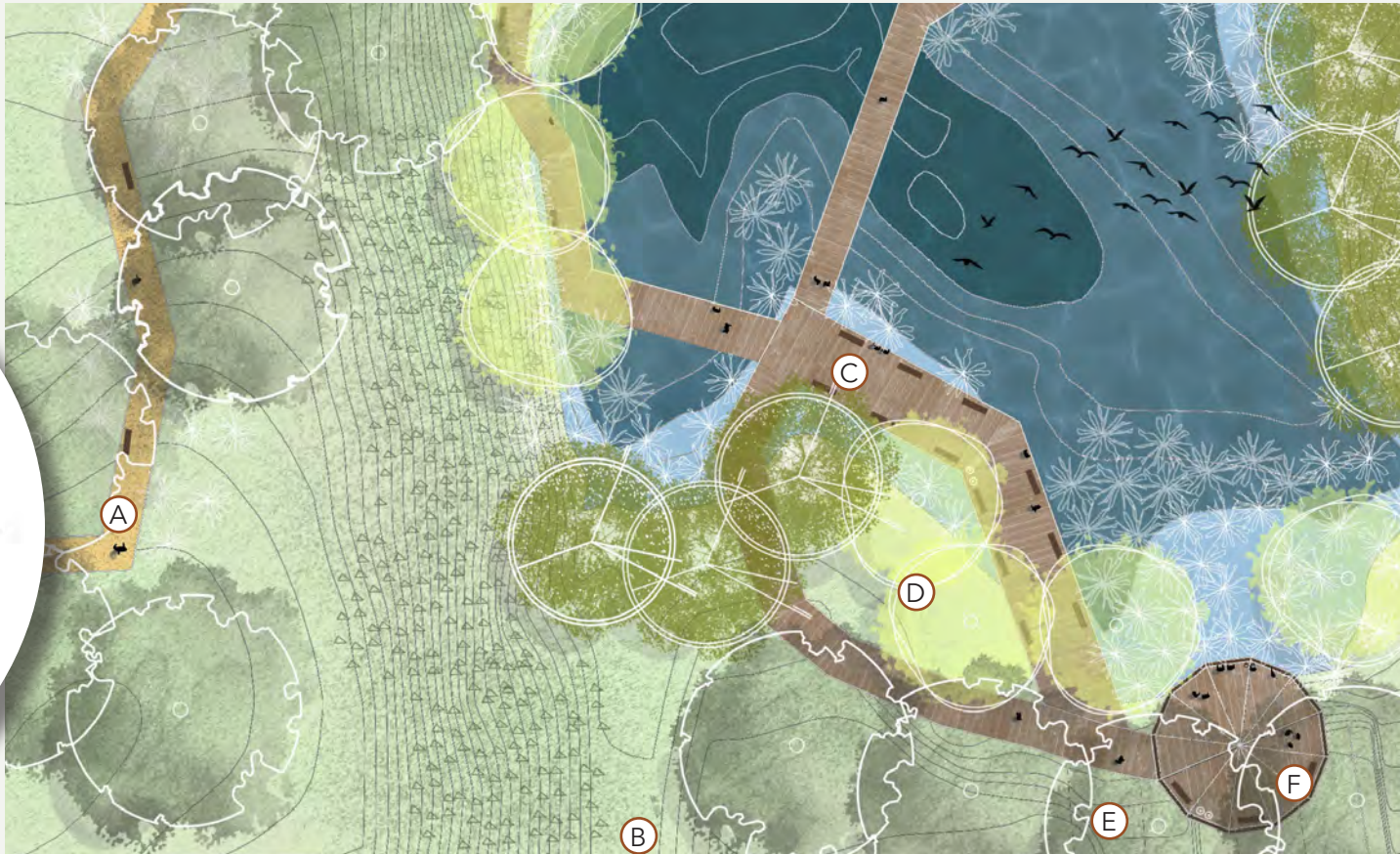
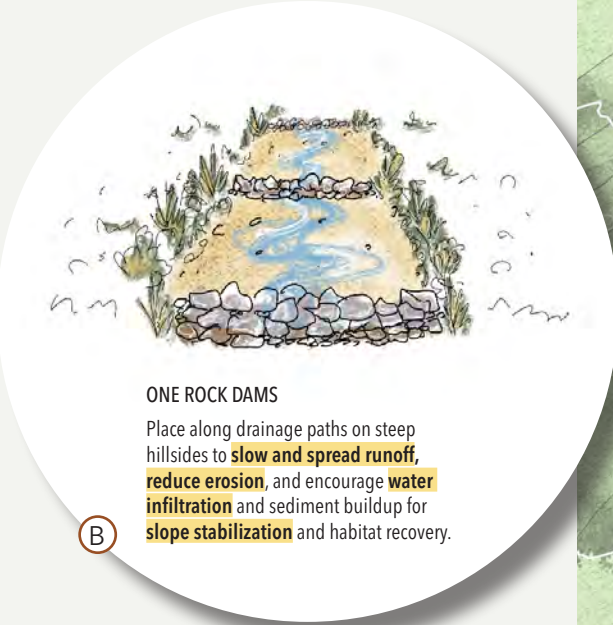
LEGEND

- (A) UPPER OUTLOOK TRAIL
- (B) NATIVE PLANT NURSERY
- (C) NATURE CENTER
- (D) FLYCATCHER OVERLOOK
- (E) WELCOME CENTER
- (F) ROADRUNNER RIDE HUB
- (G) LIZARD LEDGE CLIMBING CRAG
- (H) HERON HOLLOW AMPHITHEATER
- (I) BACKWATER KAYAK RUNS
- (J) WARBLER WELCOME CENTER
- (K) ARROYO CAMPGROUNDS
- (L) KINGFISHER LANDING REC CENTER
- (M) ROADRUNNER TRACKS
- (N) SUCKER RUN OUTFITTERS (WATER SPORT RENTALS)
- (O) COTTONWOOD COMMONS COMMUNITY GARDEN



1" = 550' 0 225' 550' 

enlargement & section FLYCATCHER OVERLOOK



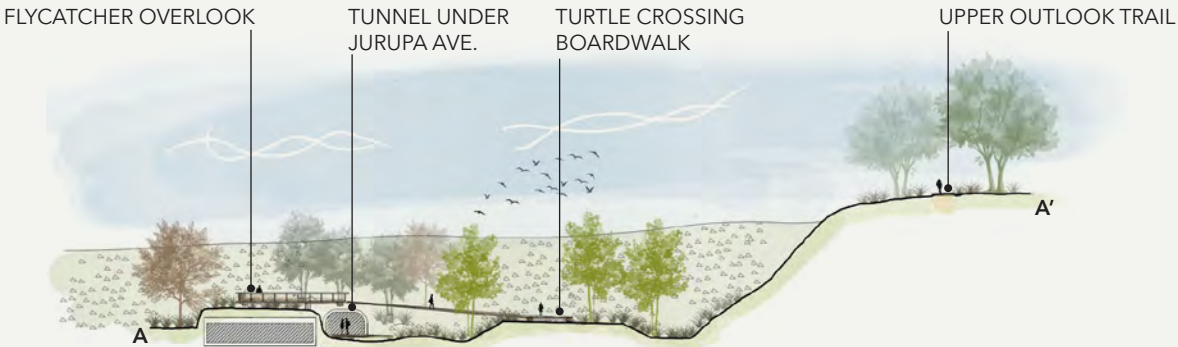
ENLARGEMENT OF FLYCATCHER OUTLOOK OVER OUTFLOW

LEGEND

- (A) UPPER OUTLOOK TRAIL
- (B) ONE ROCK DAMS
- (C) TURTLE CROSSING BOARDWALK
- (D) NATIVE RIPARIAN PLANTS
- (E) BURROWING OWL PASSAGE (TUNNEL)
- (F) FLYCATCHER OVERLOOK



KEY MAP



SECTION OF FLYCATCHER OVERLOOK ABOVE CULVERT & BURROWING OWL TUNNEL

perspective

FLYCATCHER OVERLOOK



PERSPECTIVE OF FLYCATCHER OVERLOOK

NTS

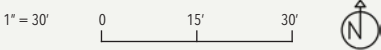
enlargement & section
LIZARD LEDGE

LEGEND

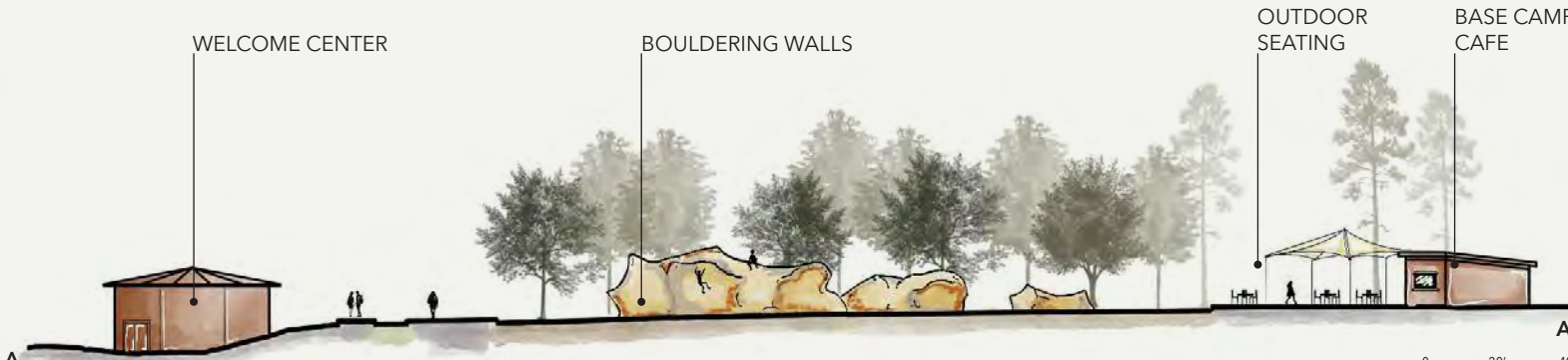
- (A) COASTAL SAGE SCRUB
- (B) CLIMBING WALLS
- (C) BOULDERING WALLS
- (D) MAIN PATH FROM WELCOME CENTER / JURUPA AVE.



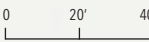
ENLARGEMENT OF 'LIZARD LEDGE' CLIMBING CRAG



KEY MAP NTS



SECTION OF WELCOME CENTER, BOULDERING AREA, & CAFE



perspective
LIZARD LEDGE



PERSPECTIVE OF 'LIZARD LEDGE' CLIMBING CRAG

1" = 550'
0 225' 550'
N

enlargement & section

CAMP N' KAYAK

SOUTHERN CATTAIL
(*Typha domingensis*)

Remediates heavy metals, nitrates, & phosphates

HARDSTEM BULRUSH
(*Schoenoplectus acutus*)

Remediates heavy metals; supports microbial breakdown of contaminants

MULEFAT
(*Baccharis salicifolia*)

Remediates heavy metals, urban runoff, & contaminants; stabilizes soil

CALIFORNIA BULRUSH
(*Schoenoplectus californicus*)

Remediates copper, Zinc, Nitrogen, & Hydrocarbons

COMMON SPIKE RUSH
(*Eleocharis macrostachya*)

Remediates nitrogen, phosphorus, trace metals; traps sediments

SANDBAR WILLOW
(*Salix exigua*)

Remediates lead, cadmium, arsenic, & excess nutrients



ENLARGEMENT OF ARROYO CAMP GROUND & KAYAK RUNS

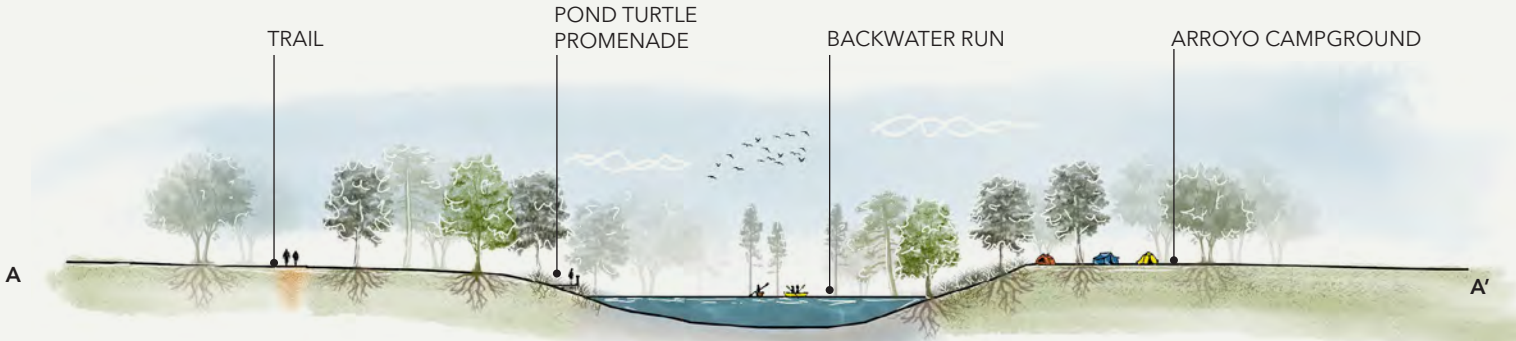
LEGEND

- (A) PHYTOREMEDIATING PLANT MATERIAL

(C) KAYAKERS IN BACKWATER RUN

(E) RIPARIAN HABITAT
- (B) POND TURTLE PROMENADE

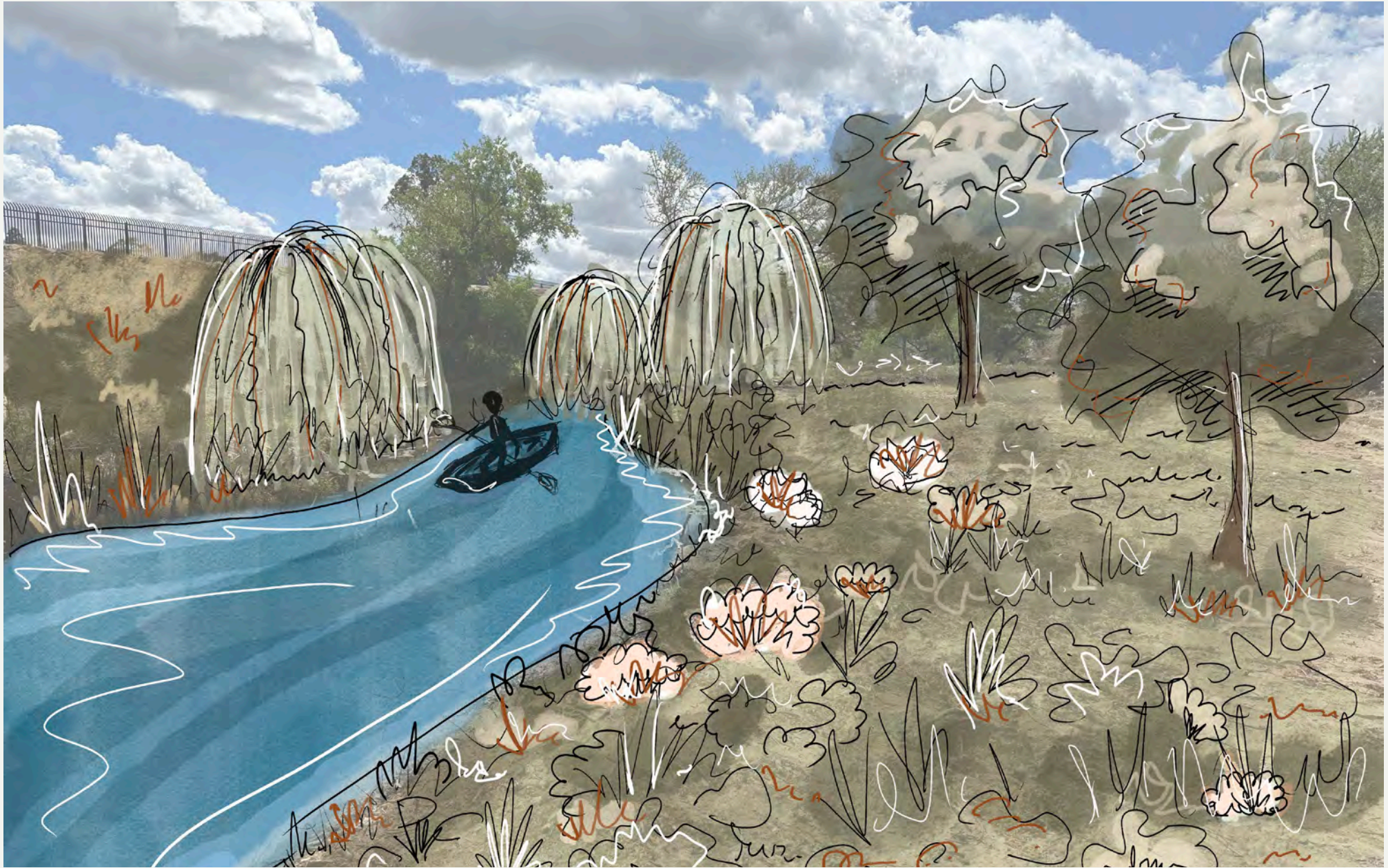
(D) ARROYO CAMPGROUND



SECTION OF WELCOME CENTER, BOULDERING AREA, & CAFE

KEY MAP NTS

perspective & details
BACKWATER RUN



PERSPECTIVE: RIPARIAN EDGE

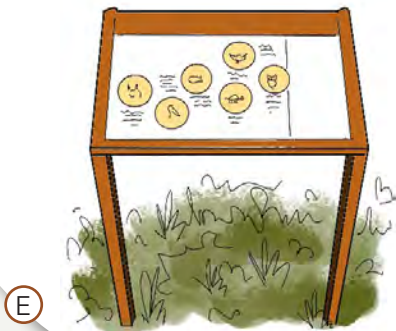
NTS

enlargement & section

HIKE N' BIKE

ECOLOGICAL SIGNAGE

Informational signs throughout the park describe the local ecosystem, helping visitors to learn about their **native ecology** and the importance of **environmental stewardship, restoration, & sustainability.**



ENLARGEMENT OF ROADRUNNER TRACKS & DISCOVERY TRAILS & NOOKS

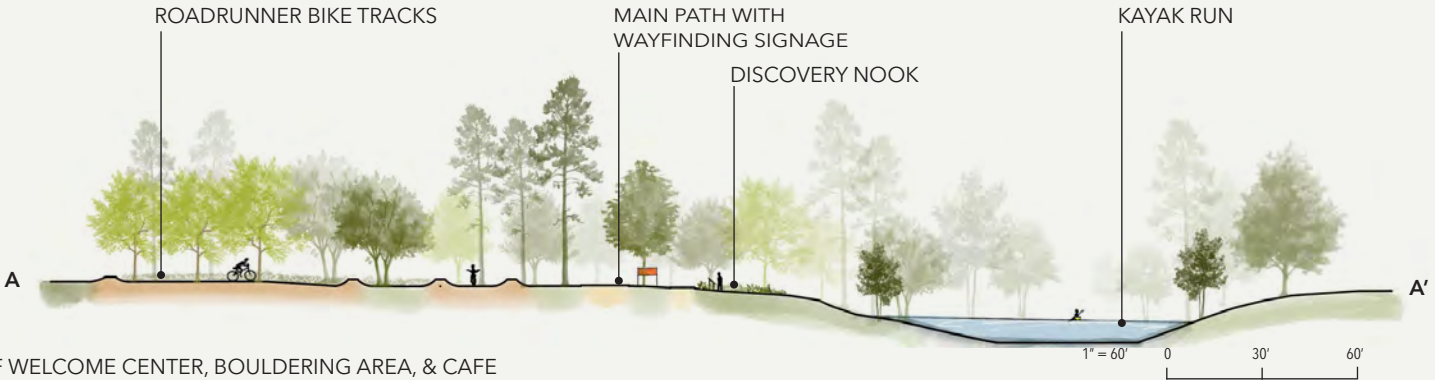
LEGEND

- (A) ROADRUNNER BIKE TRACKS
- (B) NATIVE SHRUBS & WILDFLOWERS
- (C) MAIN WALKING PATH
- (D) GRASS MEADOWS
- (E) INFORMATIONAL SIGNAGE
- (F) DISCOVERY TRAILS & NOOKS



KEY MAP

SECTION OF WELCOME CENTER, BOULDERING AREA, & CAFE



perspective

DISCOVERY TRAIL NOOK

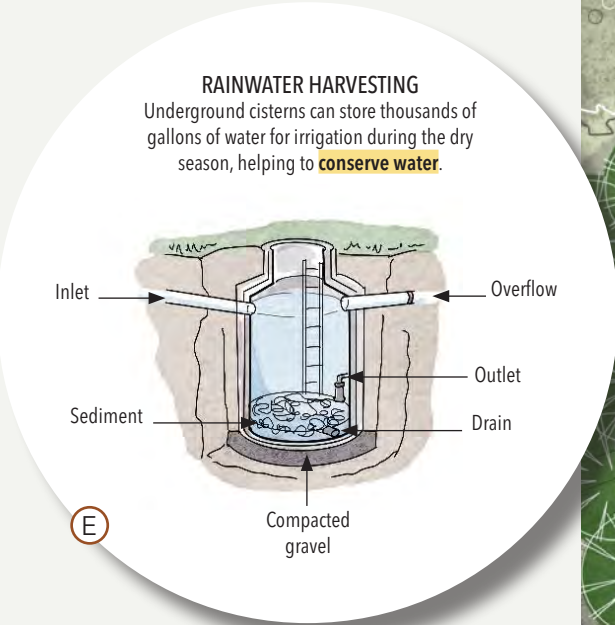


PERSPECTIVE OF DISCOVERY TRAIL NOOK

NTS

enlargement & section

GATHERING GROUNDS



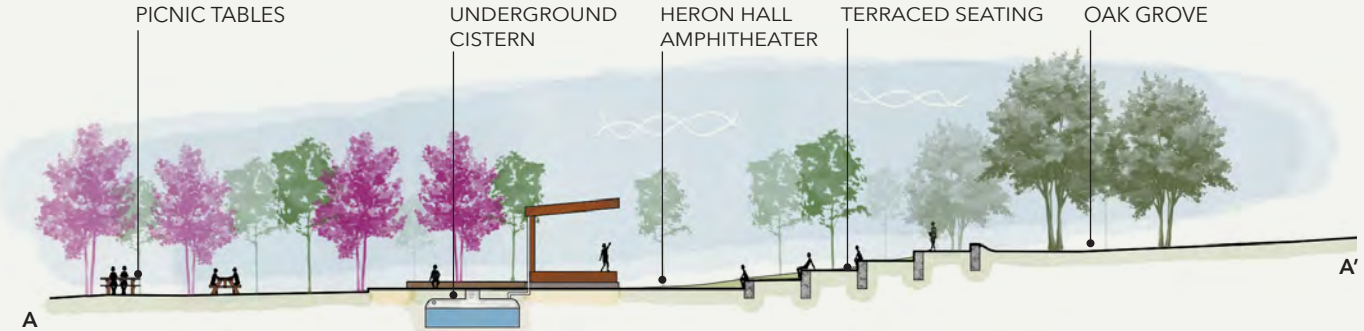
ENLARGEMENT OF HERON HALL AMPHITHEATER

LEGEND

- (A) OAK GROVE
- (B) CANTILEVERED BENCHES
- (C) REDBUD RENDEZVOUS
- (D) HERON HALL AMPHITHEATER
- (E) UNDERGROUND CISTERN
- (F) PICNIC AREA



KEY MAP



SECTION OF HERON HALL AMPHITHEATER, REDBUD RENDEZVOUS, AND PICNIC AREA

perspective

HERON HALL AMPHITHEATER



PERSPECTIVE OF HERON HALL AMPHITHEATER

NTS

Meeting Project Goals



- **Soil and water cleaned** using phytoremediating plant material
- **Riparian and wetland ecologies established** along the river corridor, improving habitat for native flora and fauna
- **Infiltration improved, rainwater stored for irrigation, and erosion reduced** through stormwater harvesting and earthworks strategies



- Continuous **trail systems connect ecological, recreational, and community spaces**
- **Understanding of native ecology, restoration strategies, and regenerative practices enhanced** with educational signage
- **Safe crossing provided** between north and south sides of the site with a tunnel connection under Jurupa Ave.



- Climbing walls, kayak runs, and bike courses provide **active recreational experiences, while generating revenue for use in park maintenance**
- Discovery Park established as a **destination for recreation and ecological education**
- Flexible event spaces provide **community gatherings, markets, and cultural programming**
- Recreation-based programming **encourages outdoor exploration, wellness, and environmental education**



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Find your way.

thank you

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