

Silver Lake Wetland Observatory

LANDSCAPE DESIGN 4 • WINTER 2020 • MATTHEW SHIMER, INSTRUCTOR
RACHAEL DWORK • ETHAN FISHER • TERRI LARRONDE • THEO VUDURIS

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Concept Development



Site Development



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Vision Statement

Our vision for The Silver Lake Reservoir is to rejuvenate safe opportunities for wildlife habitat in our city landscape. Our mission is to design a sustainable park that offers Angelenos respite from the concrete jungle to an immersive experience showcasing the current state of our unique, urban biodiversity.



Project Description

Redesign and Repurpose

The key driver behind the redesign of the Silver Lake Reservoir is the decommissioning of the reservoir as a potable water source. An empty, concrete-lined reservoir would be a scar upon the landscape which creates an opportunity for thoughtful redevelopment. Through our designs we identify and mitigate several key constraints with the project site. As designers the goal is to present novel and thoughtful ideas to the community that creates prosperity for the region, revitalizes biodiversity, facilitates responsible watershed management, and builds community.



Goals & Purpose

Programmatic Elements

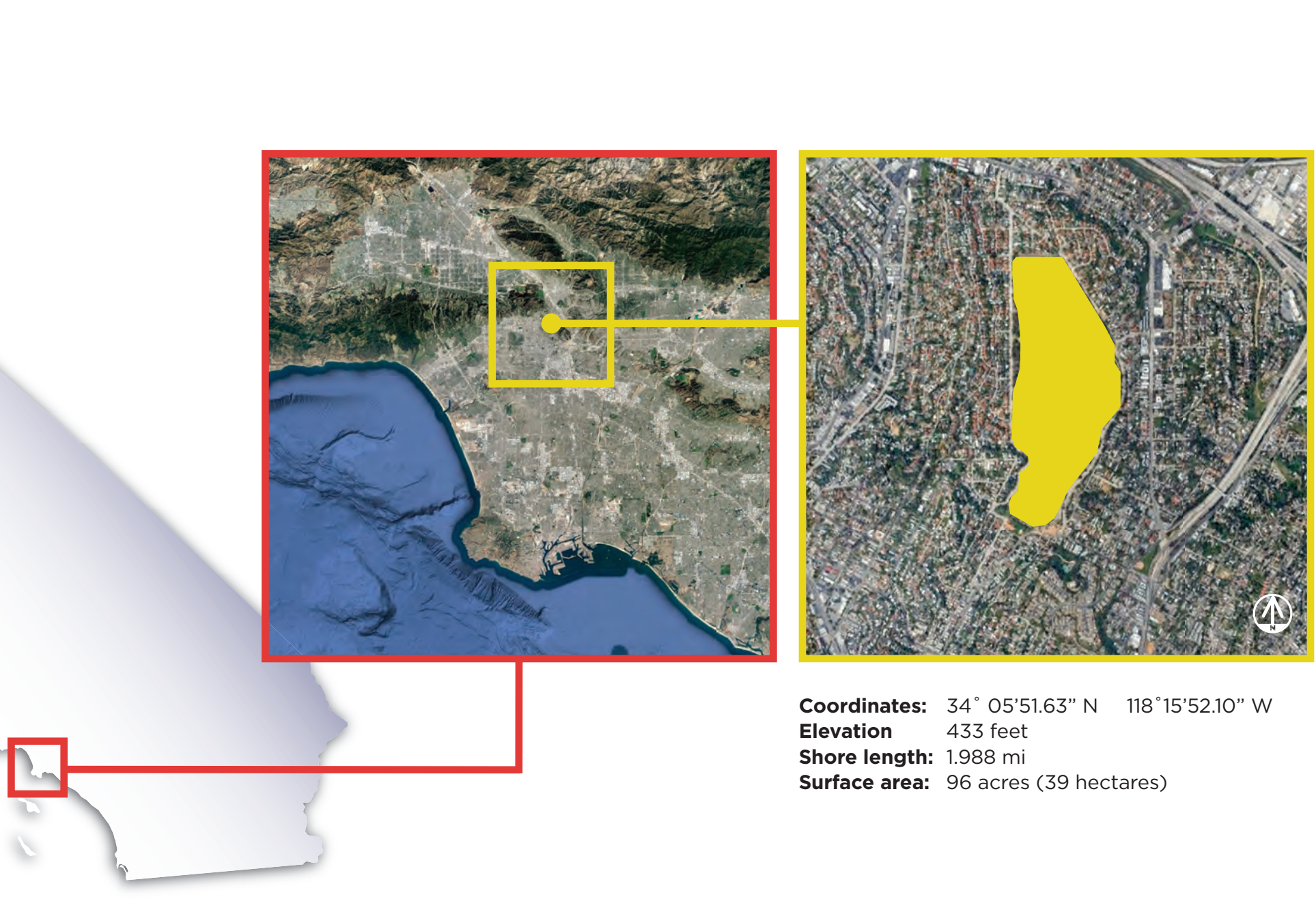
The Master Plan for the Silver Lake Wetland Observatory is conceptualized as an environmentally sensitive design strategy for a decommissioned, historic reservoir that reinforces the identity of the Silver Lake community and its native ecosystem. Expansive, rapid development in the Los Angeles Metropolitan area has revealed our vulnerabilities to climate change and hindered opportunities to react to rising temperatures, pollution, and changes in rainfall. Wetlands play a critical role in the exchange and regulation of water vapor and greenhouse gases.

Our design seeks to reestablish and enhance the valuable wetland habitat endemic to our indigenous biosphere and weave it into our bustling urban setting. Addition of tasteful, modern structures frame views within as well as from outside of the park. Relocation of amenities will elevate public safety while enriching the internal experience. Utilization of green architecture, creative stormwater capture methods, and renewable energies will minimize the site's carbon footprint and preserve environmental stewardship. Green spaces offer shade and respite from the urban commotion of Los Angeles.

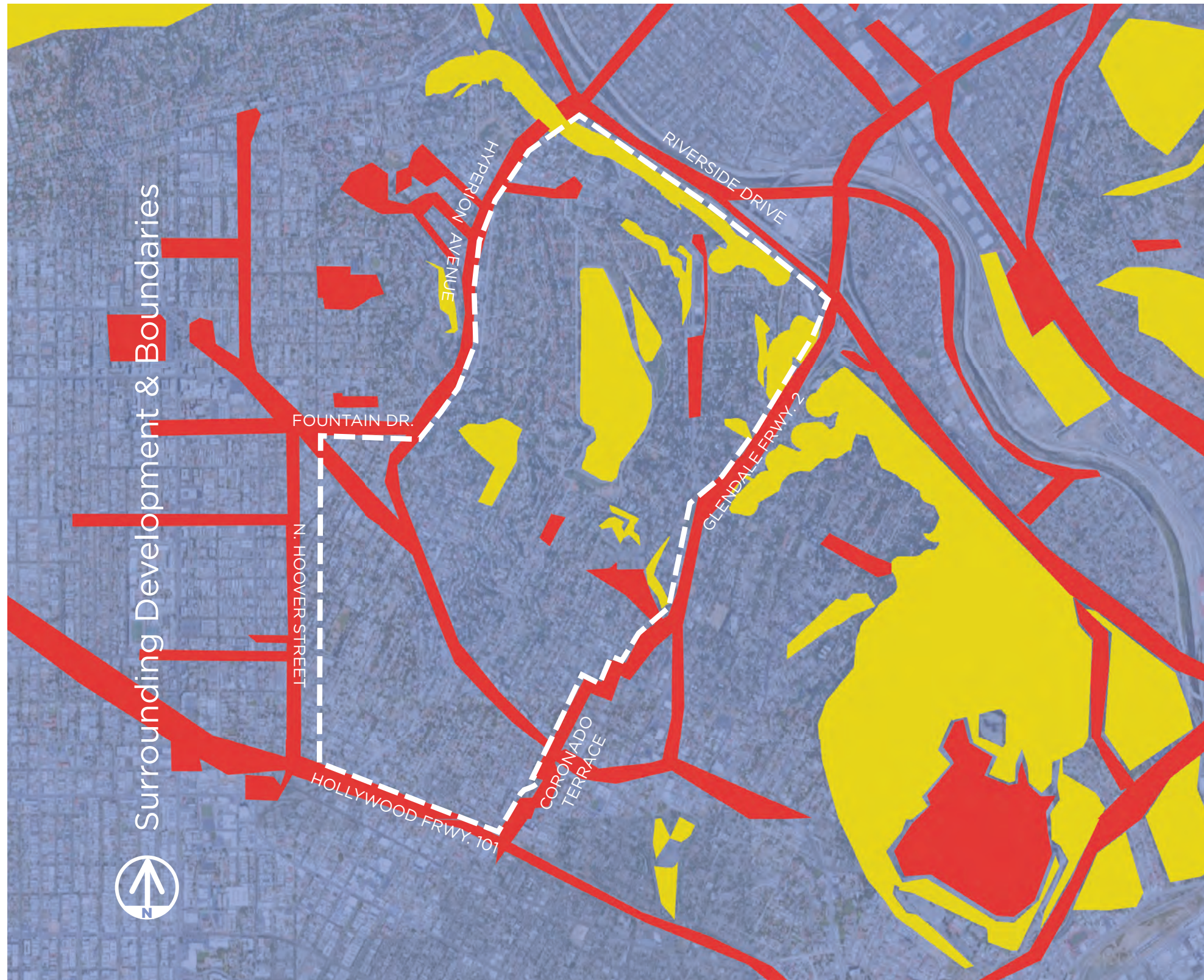
Location of the Project

The Silver Lake Reservoir is comprised of two concrete-lined basins, Ivanhoe Reservoir and Silver Lake, divided by a spillway, in the Silver Lake community of Los Angeles, California.

“Silver Lake is an Eastside neighborhood that fully embraces the hipster lifestyle. Funky blocks with street art are lined with artisanal coffee shops, vegan cafes and creative Asian eateries, as well as indie music venues, trendy bars and boutiques. The area also includes fine examples of modernist architecture and a namesake reservoir that’s ringed by a popular walking trail with a dog park and a grassy meadow.”



Coordinates: 34° 05'51.63" N 118° 15'52.10" W
Elevation 433 feet
Shore length: 1.988 mi
Surface area: 96 acres (39 hectares)



Located North of downtown Los Angeles, and Southeast of Hollywood, Silver Lake Reservoir is predominately surrounded by residential neighborhoods, and smaller commercial businesses. Silver Lake is encompassed by Atwater Village and Elysian Valley on the Northeast, on the Southeast by Echo Park, on the Southwest by Westlake, on the West by East Hollywood and on the Northwest by Los Feliz.

Boundaries are defined by: the Los Angeles River between Glendale Blvd. and Fletcher Dr. and Riverside Dr. on the Northeast, the Glendale Frwy. on the East, Effie St., Coronado St., Berkeley Ave. and Fletcher Dr. on the Southeast, the Hollywood Frwy. on the South, Virgil Ave. on the West and Fountain Ave. and Hyperion Ave. on the Northwest. The prime real estate around the lake is known by realtors as the “Moreno Highlands.”

The largest open spaces in proximity include: Griffith Park to the North, Elysian Park/Dodger Stadium to the Southeast, and Echo Park directly South. These spaces are valuable for their wildlife and recreation; with hiking trails, picnic areas, and diverse ecosystems. In the busy metropolis of Los Angeles, they provide wild life corridors and green spaces to a biodiverse population that struggles to coexist with the typical urban influences.

- Residential
- Commercial
- Open Space

Quenching a Growing City's Thirst

History



Owens Valley

1905

In 1905, the city of Los Angeles filed for water rights on the Owens River in the eastern Sierra Nevada, 250 miles away. Municipal crews began work on a 233-mile aqueduct capable of delivering four times more water than the city then required. The Owens Valley helped transform distant Los Angeles into today's sprawling megalopolis.



1906



Ivanhoe Reservoir

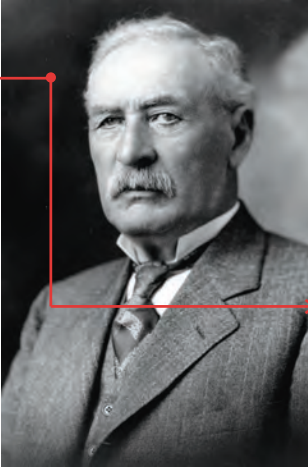


Built by community developer **Hugo Reid**, a Scottish-Mexican immigrant, the area he named 'Ivanhoe' was said to have reminded him of the verdant Scottish Highlands. Completed in 1906, this smaller reservoir originally had a wooden cover on it to prevent evaporation.

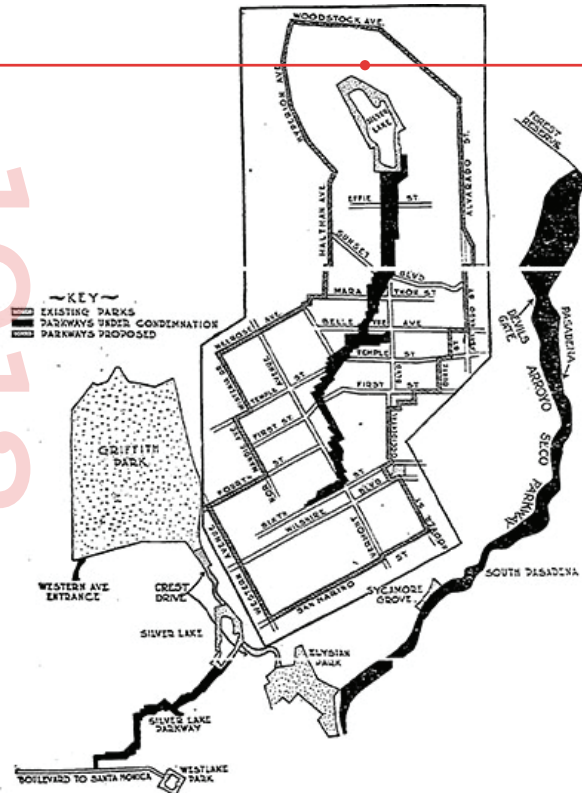


1907

With his stalwart dam of concrete, steel, and earth in place, **William Mulholland** began flooding the meadowlands of Los Angeles' Ivanhoe Canyon in November 1907. The waters rose, sedges drowned, and red-winged blackbirds fluttered away in search of undisturbed wetlands. Within a few months, Mulholland had created Silver Lake.



1913



Map of proposed Silver Lake Parkway from the Dec. 21, 1913, edition of the LA Times. The parkway would have swept south along a natural arroyo toward Wilshire Boulevard. Other parkways would have linked Silver Lake with Griffith Park, Elysian Park, and the Angeles National Forest. A similar (and much more expansive) proposal was at the heart of the 1930 Olmsted-Bartholomew plan, "Parks, Playgrounds, and Beaches for the Los Angeles Region."



The Los Angeles Aqueduct was completed in 1913, and with this firm water supply the city grew.



A hand-colored lantern slide of the Silver Lake reservoir. Courtesy of the Braun Research Library Collection at the Autry Museum of the American West.

Silver Lake Reservoir

1908



The reservoir was planned and constructed alongside the city-shaping aqueduct that brought water flowing into Los Angeles from the Owens Valley in 1913. Completed in 1908, Silver Lake was built to ensure the city had access to a three-week supply of water in case the aqueduct should at any point fail. The body of water was named in honor of former water commissioner **Herman Silver**, who had advocated for a city-owned water provider.

The lake was constructed using innovative methods



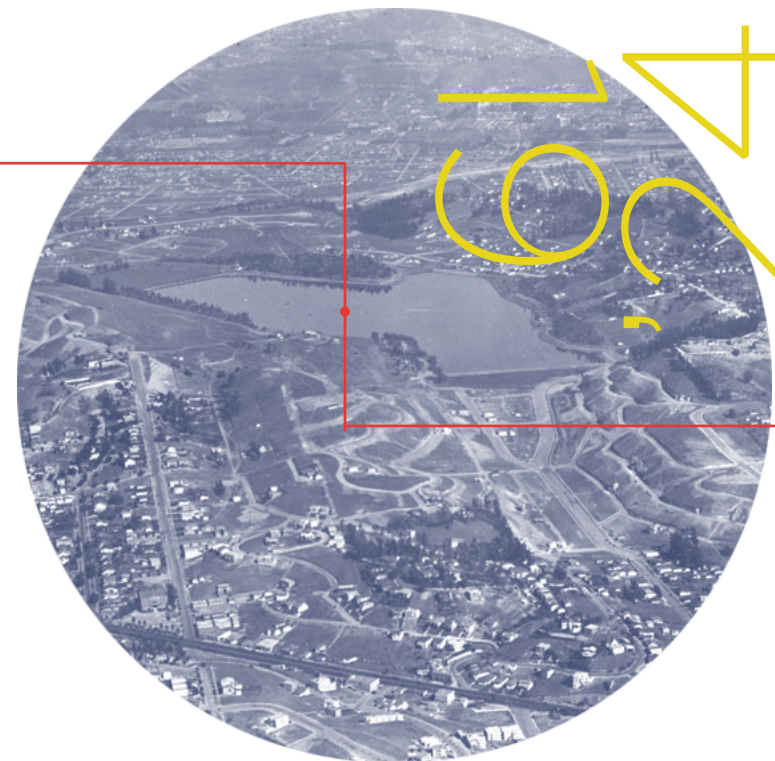
that were later incorporated into the construction of the Panama Canal. These involved blasting the floor of what was at that time known as Ivanhoe Canyon with high pressure water cannons — sending 94,000 cubic yards of mud uphill to reinforce a dam made of concrete and steel.

As water filled Silver Lake in 1907-08, Angelenos discovered that their city had built for them — in addition to a critical piece of water-supply infrastructure — a recreational asset. Unlike the smaller, adjacent Ivanhoe Reservoir — constructed a few years earlier and covered in ugly wooden boards to prevent evaporation — the new 94-acre lake lay bare to the world, offering itself up as scenery. Its then unfenced lakeshore invited Angelenos to stroll around their emergency water supply, and a stock of black bass brought fishermen to its banks.



1911-1918

Plans to turn the reservoir into a park have been proposed since shortly after its completion. Between 1911 and 1918, the parks department planted thousands of eucalyptus trees in the area around the lake. Funding for the park eventually dried up and it was never completed, but the reservoir has remained a popular recreational spot since then.



1950

1950
The reservoir was drained, the sides resloped and then paved over to keep back vegetation.

1988
The nonprofit Silver Lake Reservoirs Conservancy was formed by Silver Lake community members in response to LADWP's proposal to build a large, industrial-style filtration plant where the current Meadow Park is.



1989
The city of Los Angeles proposes that all small reservoirs should be covered for water quality, which was heavily opposed by residents for aesthetic reasons. In 1989, Silver Lake and Ivanhoe Reservoirs were designated LA Historic-Cultural Monument No. 422.

2000
A Master Plan to create an improved site was developed; a dog park, a meadow and pedestrian pathways were added.



2007

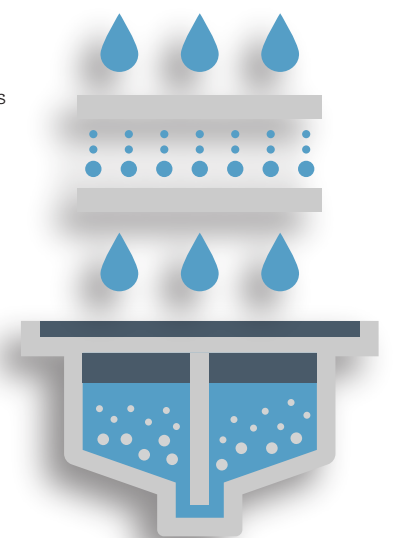
Water from the reservoirs was found to contain toxic, cancer-causing bromate, a combination of naturally occurring bromides, chlorine and sunlight. Both reservoirs were drained; the Ivanhoe reservoir was filled with shade balls to prevent sunlight from interacting with water; Silver Lake Reservoir was closed off from the water system and decommissioned.

2011
On a piece of land adjacent to the reservoir, previously filled-in due to stagnant water issues, a 1.2 hectare park is opened to the public. Silver Lake Meadow was designed by Mia Lehrer & Associates.

2015
By the 2010's both reservoirs were decommissioned, being unfit to supply water to the public, and were essentially man-made lakes. In 2015, the water was drained so a new pipeline for alternative water sources to the reservoirs could be installed. The new sources for water to keep the reservoirs full will be made up of mostly groundwater from surrounding areas. Water was turned back on in 2017.

2018
LADWP and BOE (Bureau of Engineering) sign off on SLCMP Master Plan updates to the original Master Plan from 2000. In May of 2018, work on the Silver Lake Reservoir Complex Master Plan continues.

Future
DWP will install aeration and filtration systems. These projects are expected to be completed by 2021.



Seen from the air is the reservoir and the surrounding housing and development of the Moreno Heights-Silver Lake subdivision.

Case Study

The Historic Fourth Ward Park
Atlanta, Georgia

The Historic Fourth Ward Park, located in Atlanta, Georgia, is a former brownfield industrial site that was transformed into a public park and stormwater management facility. After decades of rapid over-development, open space for stormwater runoff in this urban neighborhood was nonexistent ...



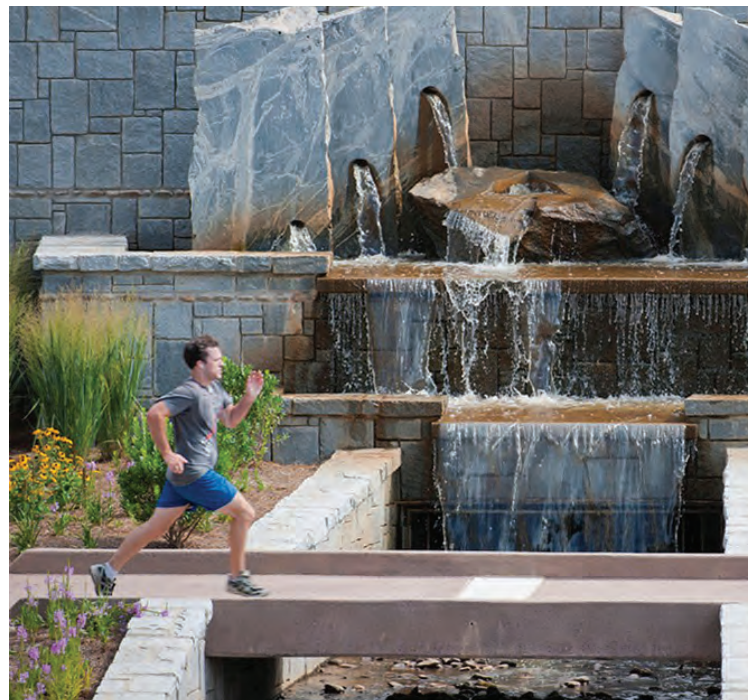
As a result, the area faced combined sewer overflow and heavy flooding. The City of Atlanta awarded the project to HDR Architects with a budget of \$23 million. Phase 1, beginning in 2010, consisted of a 5-acre stormwater detention area and 17-acre park. In 2013, a children's play area and recreation facilities were added as Phase 2.

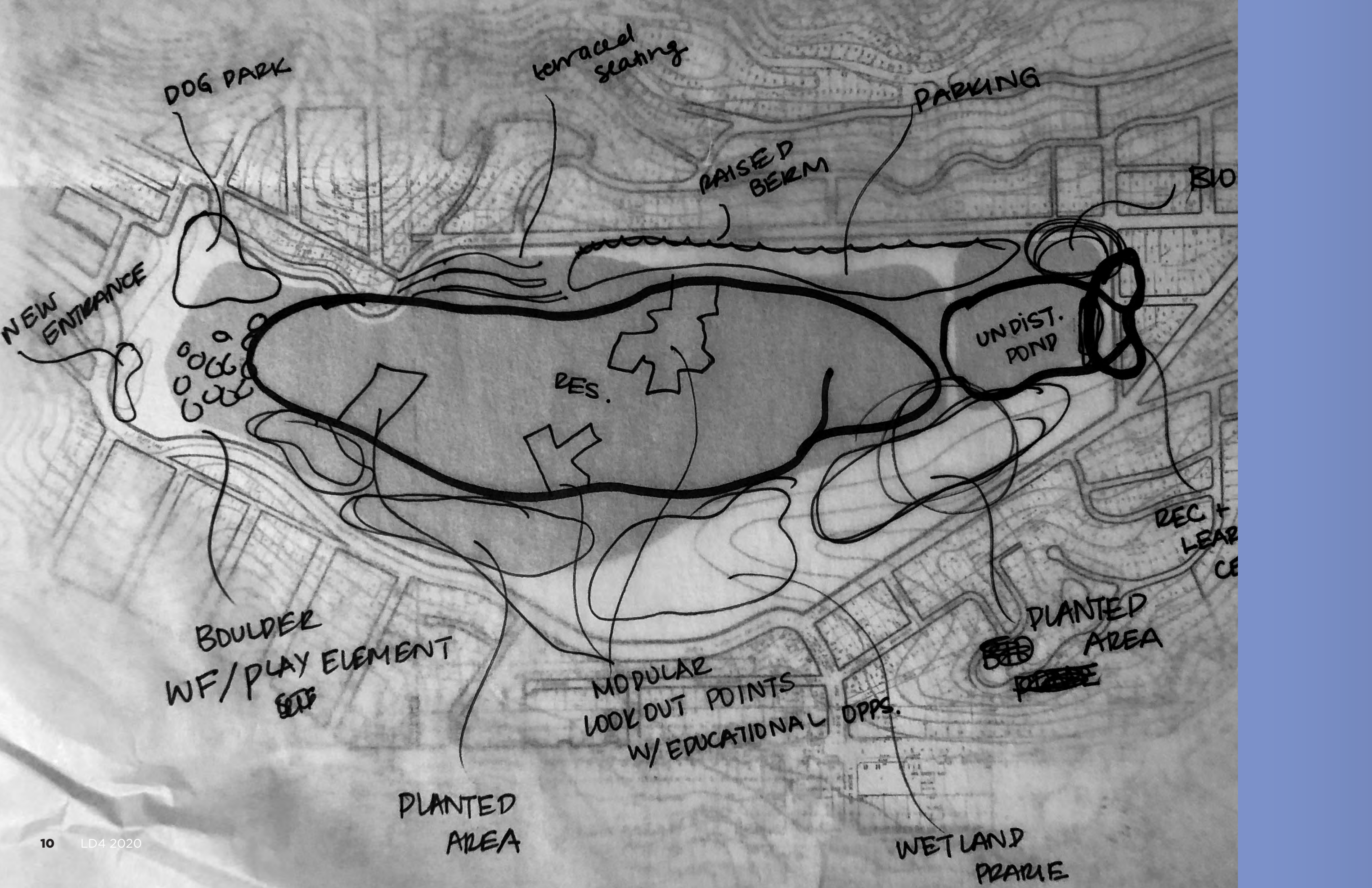
Interesting elements of the design include:

- Utilization of floating fountains over a higher-cost underwater aeration system. These fountains help reduce unpleasant odors, algae growth, and mosquitoes.
- Four distinct planting areas: aquatic, wetland, drought-tolerant, and natives. Each serving purpose for habitat and ecosystem vitality.

- Detention basin was designed to accommodate "typical," one-year, and 100-year storm levels with flexible pedestrian path systems that conform to inconsistent rainfall.

Upon completion, the new park successfully remediated an abandoned brownfield in a park poor area and aligned the city's stormwater management with flood protection goals. It also established a precedent for future green spaces in the Southeastern United States. A survey of local users found 88% visit the park more than twice per week and 94% reported feeling safe in the park. The project also catalyzed \$2 billion in investments to the adjacent areas and contributed to an average 118% increase in residential real estate values.





DOG PARK

terraced seating

PARKING

RAISED BERM

BIO

NEW ENTRANCE

BOULDER

RES.

UNDIST. POND

BOULDER
WF/PLAY ELEMENT

MODULAR
LOOK OUT POINTS
W/ EDUCATIONAL
OPPS.

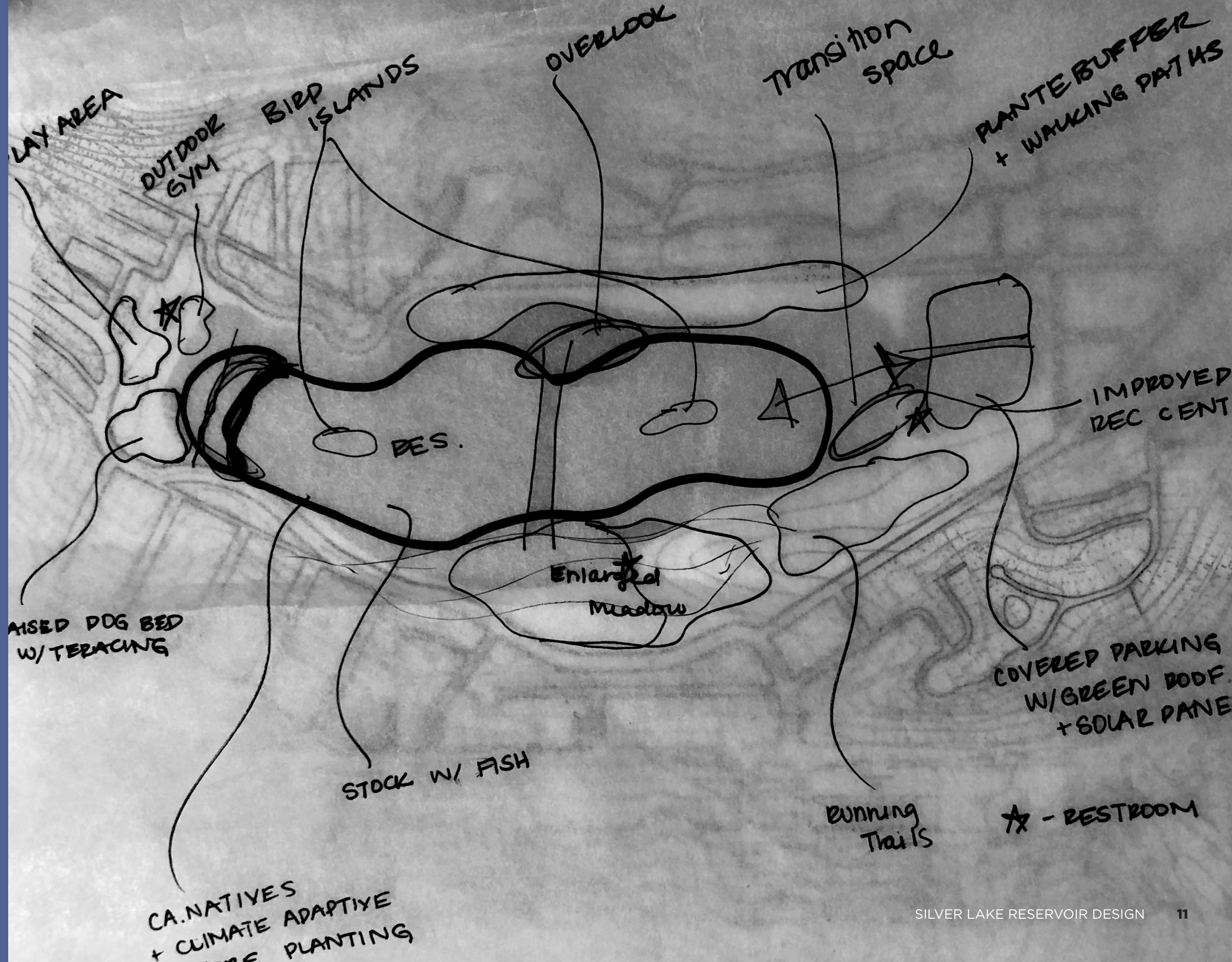
PLANTED
AREA

REC +
LEARN
CE

PLANTED
AREA

WETLAND
PRAIRIE

Concept Development



1

Concept One

Seizing Intuitive Dynamics



For our first concept of The Silver Lake Reservoir, we strived to give back to our native landscape and recreate an authentic wetland. We were apprehensive to disturb the valuable, existing habitat and wished to avoid making a spectacle out of one of the few remaining migratory hotspots available to wildlife in Los Angeles. This design is intended to offer a quiet, passive experience.

Our first thought was to often and drastically reduce the shoreline of the reservoir. The Ivanhoe Reservoir on the North end would be removed and replaced by a new and improved recreation center with subterranean parking and a green roof. Buildings would be clustered on this end to minimize the structural footprint in the park.

The installation of The Meadow feature completed by Studio MLA in 2011 has proved successful, therefore we decided to retain the concept but generously enlarge the area and develop an intricate trail system. With the inclusion of the

native forested area, we'd intend to substantially improve the quality of the habitat conditions. This would offer more opportunities for exercise or a meditative stroll. On the South end, we envisioned a retaining wall to stabilize the corner near Van Pelt Place and serve as the primary entrance to the site. We believe this would help create safer crossing conditions towards the dog park and play structure located just beyond the entry. The space also has potential for an outdoor gym that could be utilized by the neighborhood residents.

The tree canopy of the Eucalyptus Grove provides beneficial habitat for the Blue Herons and raptor species living under its umbrella. Most of the trees are nearing the end of their lifespan, for this reason we felt it was important to revive the area with younger trees that sustain the habitat. More curvilinear paths would weave among plated berms under the shade. A lookout tower could be stationed on the shoreline and provide a destination on the trail.

Finally, we decided to connect the East and West shoreline with a bridge and place an observation island at its midpoint. Fish could be stocked to serve as an additional food source to water fowl. Biofiltration habitat islands would be tethered and float on the surface to treat stormwater. The concrete lining was also removed.



Programmatic Elements

1 Structures

- Green roof covered parking garage
- Clustered buildings
- Utilization of green architecture

2 The Meadow

- Meadow installed by MLA is expanded
- Installation of running trails in areas with dramatic changes in elevation
- Native forest habitat zone enhanced

3 Improved South End

- Retaining wall installed on Silver Lake Blvd. to elevate dog parks and create safer crossing conditions
- Improved play structure
- Installation of Outdoor Gym

4 Eucalyptus Grove

- Serene paths that wind along undulating planted berms
- Lookout Tower
- Habitat in tree grove enhanced

5 The Water

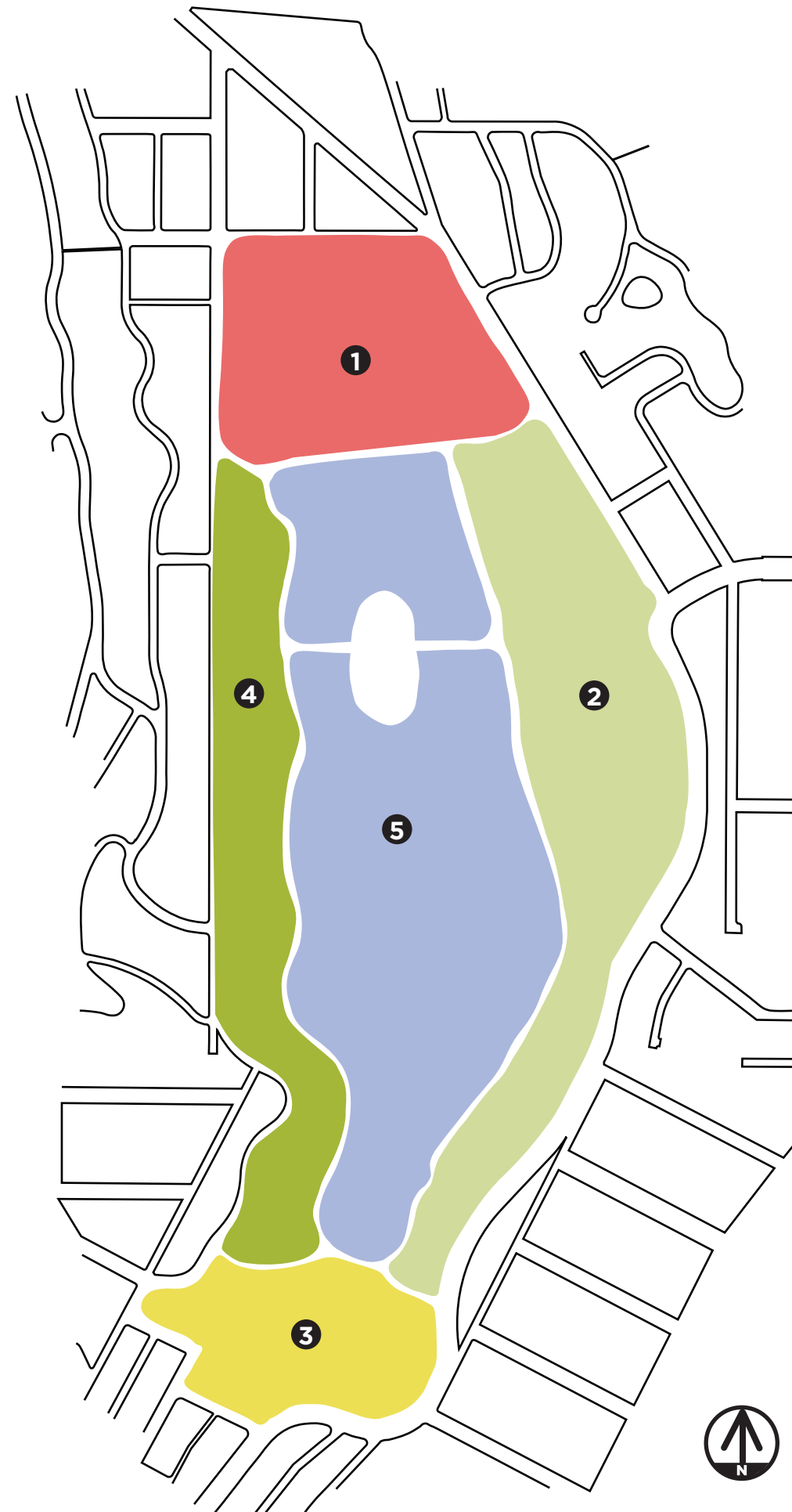
- Reduction of shoreline
- Habitat Islands for stormwater treatment
- Central bridge with an observation island at its midway point
- Stock water with fish

Pros

- Significant reduction of shoreline & connection bridge
- Relocation of buildings & parking structure
- Habitat Islands and additional planted areas
- Elevated Walking Paths

Cons

- Amenities too far apart
- Toxicity of stormwater could pose threat to fish and other wildlife



Our second concept for The Silver Lake Reservoir proposes a more active and educational experience. We replaced the aging tree groves with demonstration gardens and offer an immersive learning opportunity. The concrete lining is also removed.

In this design, we chose to retain a portion of the Ivanhoe Reservoir and utilize the water as a learning pond. Attached to the pond would be a Science Center and Biodome. We believe this has the potential to become a field trip destination for the city's youth and generate funds to upkeep the park. The Recreation Center would be enveloped inside this structure to reduce the building footprint.

On the East edge of the park along Armstrong Ave and Silverlake Blvd (currently occupied by LADWP buildings) we explored transforming the planting scheme into demonstrative habitat zones. We believed informative trails that identify wildlife among native aquatic, wetland, prairie, and forested regions would

provide an interesting and aesthetically pleasing learning environment.

The South end contains a steep drop in grade that supports the basin of the reservoir. This was perceived as an eyesore so we suggested that an sculptural, interactive water feature be constructed over the slope to camouflage the bland hillside. An elevated pedestrian entrance would be added to mitigate traffic crossing concerns for parents and dog owners. The dog parks would be relocated down the hill in a quieter area of the park and alleviate undesirable runoff.

Due to the decline of the Eucalyptus Grove, we experimented with a thin parking lot along W Silver Lake Dr. This location would ease entry and exit into the park. A safe drop-off zone would also be incorporated for school bus and rideshare transportation. Planted berms would disguise the parking lot from the single-family housing located across the street.

South of the parking lot, we pictured a stadium-like, terraced seating area that presents a beautiful view of the reservoir with downtown Los Angeles as its backdrop. The location is intended to serve as a popular meeting point and sunset appreciation.

Lastly, we reduced the shoreline and inserted modular observation docks. These docks would cascade over portions of the wetland and aquatic planted areas. This would allow visitors to study and consider the health of the ecosystem or appreciate the wildlife.



Concept Two

Embracing Aleatoric Armatures



Programmatic Elements

1 Science Center & Learning Pond

- Constructed Biodome and Science Center for public learning
- Combined Recreation Center with structures
- Undisturbed pond for observation and education opportunities

2 The Meadow

- Planted zones consisting of native aquatic, wetland, prairie, and forested plant species
- Informative walking trails that identify wildlife

3 Interactive Water Feature

- Sculptural play element with water features incorporated in the design

4 Primary Entrance & Dog Park

- Elevated entrance for safer crossing conditions
- Dog park relocated to protect dogs and owners from traffic incidents

5 Terraced Lookout Point

- Stadium terraced seating area located on the shoreline to provide views towards downtown LA, Southeast of the reservoir

6 Parking Area

- Flat area desirable for easy parking
- Location desirable for ease of entry/exit
- Raised, planted berm would buffer the view along West Silver Lake Drive

7 Water Treatment

- Reduction of shoreline
- Modular observation docks would traverse over planted wetland areas towards the water for tranquil views of the water

Pros

- Elevated entrance
- Biodome & Science Center
- Concentrated buildings
- Play/Water Feature
- Vista point

Cons

- Design is invasive and destructive of habitat
- Observation docks too large
- Parking location is unpleasant to neighbors
- Too much open green space is removed
- Design not cohesive



1 Community Center & Green Roof Parking Garage

- Ivanhoe Reservoir repurposed to combine the old recreation center with a subterranean parking garage
- Structure was designed with a green roof to conserve energy and preserve views from Tesla Dr.
- New motorist entrance located off Armstrong Ave.
- Relocation and increased size of children's activity space with new jungle gym

2 Meadow & Trail Networks

- Enlarged the meadow introduced by Studio MLA
- Improved and expanded trail networks to perimeter of the shoreline
- Enhanced venerable habitat areas and California native gardens
- Installed restrooms
- Established bike lanes with planted buffers between roadways and sidewalks
- Heavy shoreline planting that discourages human desire to enter the water

3 Silver Lake Blvd. Entrance

- Pedestrian entry revamped with upgraded crosswalk conditions
- Basketball court artfully redesigned with additional second court
- Neighborhood Nursery School location changed for safer drop-off

4 Eucalyptus Grove & Panorama Platform

- Habitat zones rejuvenated with more trees and shrubs
- Panorama Platform installed for a calming vista over the water with a downtown LA backdrop
- Additional picnic areas

5 Biodome & Education Center

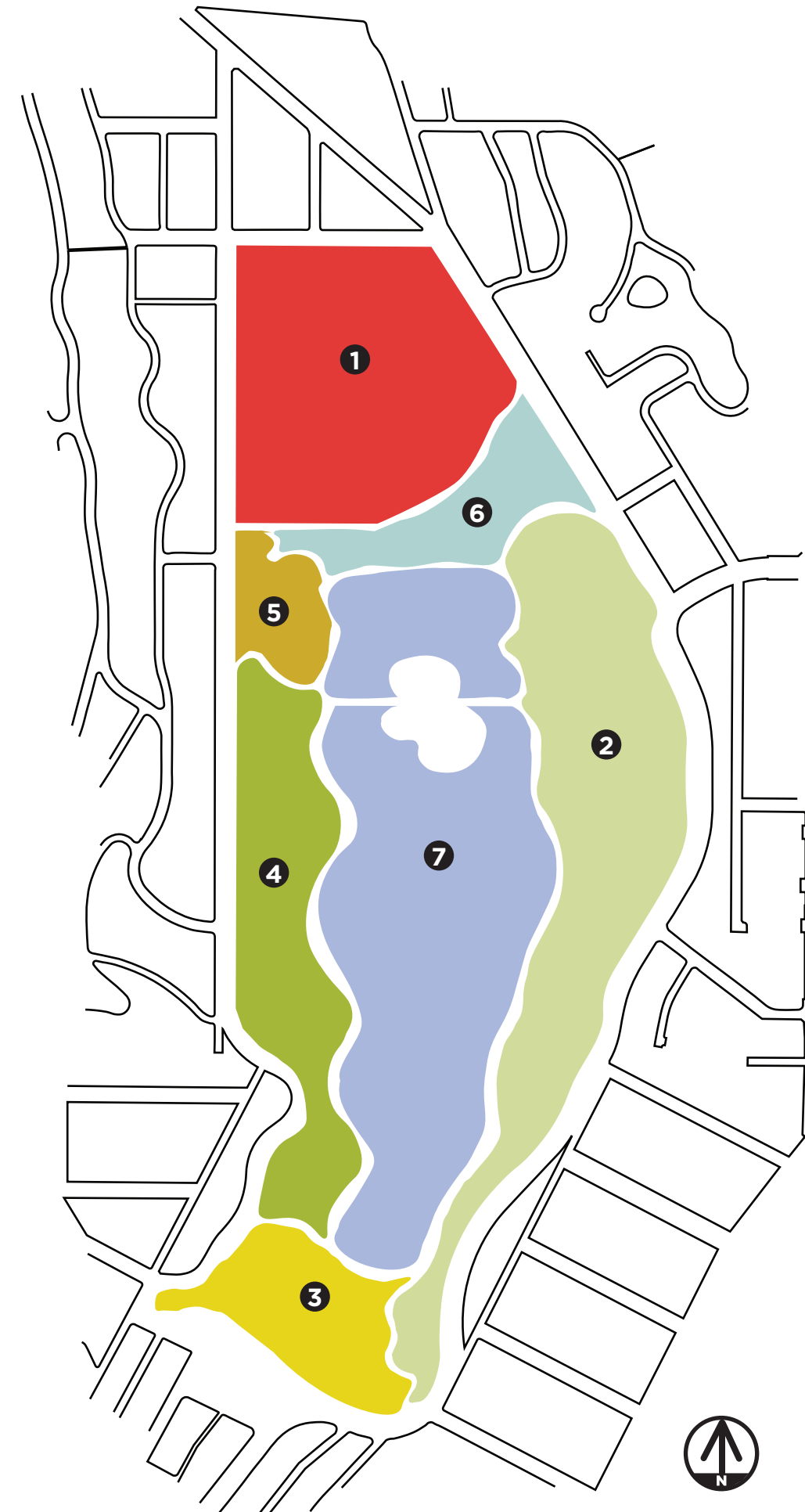
- Interactive science museum focused on the biodiversity of Southern California
- Serves as a center for environmental research, outreach, teaching, and lifelong learning
- Offers tours of unique ecosystems and habitat zones

6 Dog Parks & Event Space

- Elevated entry and bus stops off W. Silver Lake Dr
- Relocation of both dog parks with devoted parking lot
- Dedicated area for small, multi-functional events

7 Water & Habitat Islands

- Shoreline reduction and concrete lining replaced with compacted soil
- Installation of water traversing, overlook pathways
- A connection bridge links the East and West shores with an observable nesting island midway
- Inclusion of habitat biofiltration islands and floating fountains for water treatment
- Direct access to water permitted only from the Polliwog Play Pond located next to the Silver Lake Blvd entry
- Northern pond serves as undisturbed wildlife habitat



Respect for the ecosystem through observation and participation.

Our final design solution emerged as The Silver Lake Wetland Observatory. Deeper analysis of the local residents revealed a desire for more opportunities to be intimate with nature that respect the livelihood of our struggling ecosystem. Our design team sought to thoughtfully deliver that sensory experience and aesthetically improve the neighborhood namesake for all living inhabitants.

Although the water is not potable, we believed it was irresponsible to maintain the water line of both basins, therefore we decided to drastically reduce the shoreline. The fence, and concrete lining are to be removed and the remaining soil compacted into an impermeable basin. A free surface wetland planting structure will also be introduced. Tall grasses and marshy plant material (mostly California native) will heavily line the shore to discourage human entry that might disrupt valuable nesting areas. The Polliwog Play Pond will be the only access point to the water. Floating fountains and tethered biofiltration islands will aerate the water and amplify the habitat quality for migratory birds. Overlook boardwalks and a bridge with an observable nesting island that segue the East and West shore present a more visceral experience for a meditative walk or avian admiration. The Northern pond will be prioritized as an undisturbed habitat zone, however most of the shoreline will remain inaccessible.

The Ivanhoe Reservoir presently on the North end of the park would be repurposed as a combined Community Center with a subterranean parking garage. This structure would be topped by a green roof for energy conservation and view preservation from Tesla Dr. A new motorist entrance would connect Armstrong Ave. to the Community Center. The childrens' activity space and both dog parks will also be relocated to the Northeast corner with dedicated parking lots for safer access.

Along the East border the meadow installed by Studio MLA in 2011 would be greatly enlarged to encourage more visitors. Trail networks currently skirting the edges will be improved with numerous, tranquil, tertiary paths that lead to a new trail

around the perimeter of the shoreline. Gardens and venerable habitat areas behind the fence revitalized and lushly replanted with California natives.

On the Western side of the park, we propose the construction of a Biodome and Education Center. With unique tours and rotating exhibits, this interactive science museum would focus primarily on the ecosystem and biodiversity of Southern California. The exterior architecture is envisioned as an ultra-modern conservatory that inspires curiosity and attracts every bystander. It is intended to serve as a center for environmental research, outreach, teaching, and lifelong learning.

Substantial bus stop improvements will occur along W. Silver Lake Dr. The stop closest to the Biodome and Education Center will see the most significant change to denote it's entrance and encourage public transportation. A wide walkway extends beyond this entrance to serve as event space, food truck parking, or an emergency vehicle access point.

An absence of bike lanes and traffic conditions are a cause of concern for many residents and park users. Our design establishes a clear separation of pedestrian, cyclist, and vehicle traffic by installing separational planted buffers. It also revamps the pedestrian entry at the corner of Silver Lake Blvd and Van Pelt Place. Upgraded crosswalks and better lighting are intended to raise driver awareness and reduce vehicle speeds. This creates safer drop-offs for small children therefore, the Neighborhood Nursery School will be relocated to the South end. The athletic area would also be artfully redesigned with the addition of a second basketball court and more lights.

Because the Eucalyptus Grove on the Western shore is so valuable to the migratory bird population, our design greatly rejuvenates this area with more trees and shrubs that create opportunities for shelter. A portion of this edge fortuitously offers a spectacular view of downtown Los Angeles behind the water. The Panorama Platform we propose along this bank capitalizes on this backdrop welcoming visitors to appreciate LA's beautiful skyline.



Final Concept

Enhancing Communal Action

Final Concept Site Plan



Site Plan Legend

- 1** Green Roof Underground Parking and Community Center
- 2** Meadow Forest Nature Pathways Play Fields
- 3** Silver Lake Boulevard Entrance
- 4** Eucalyptus Grove and Panorama Platform
- 5** Biodome Education Center
- 6** Dog Park and Event Space
- 7** The Water and Habitat Islands



1" = 300' 



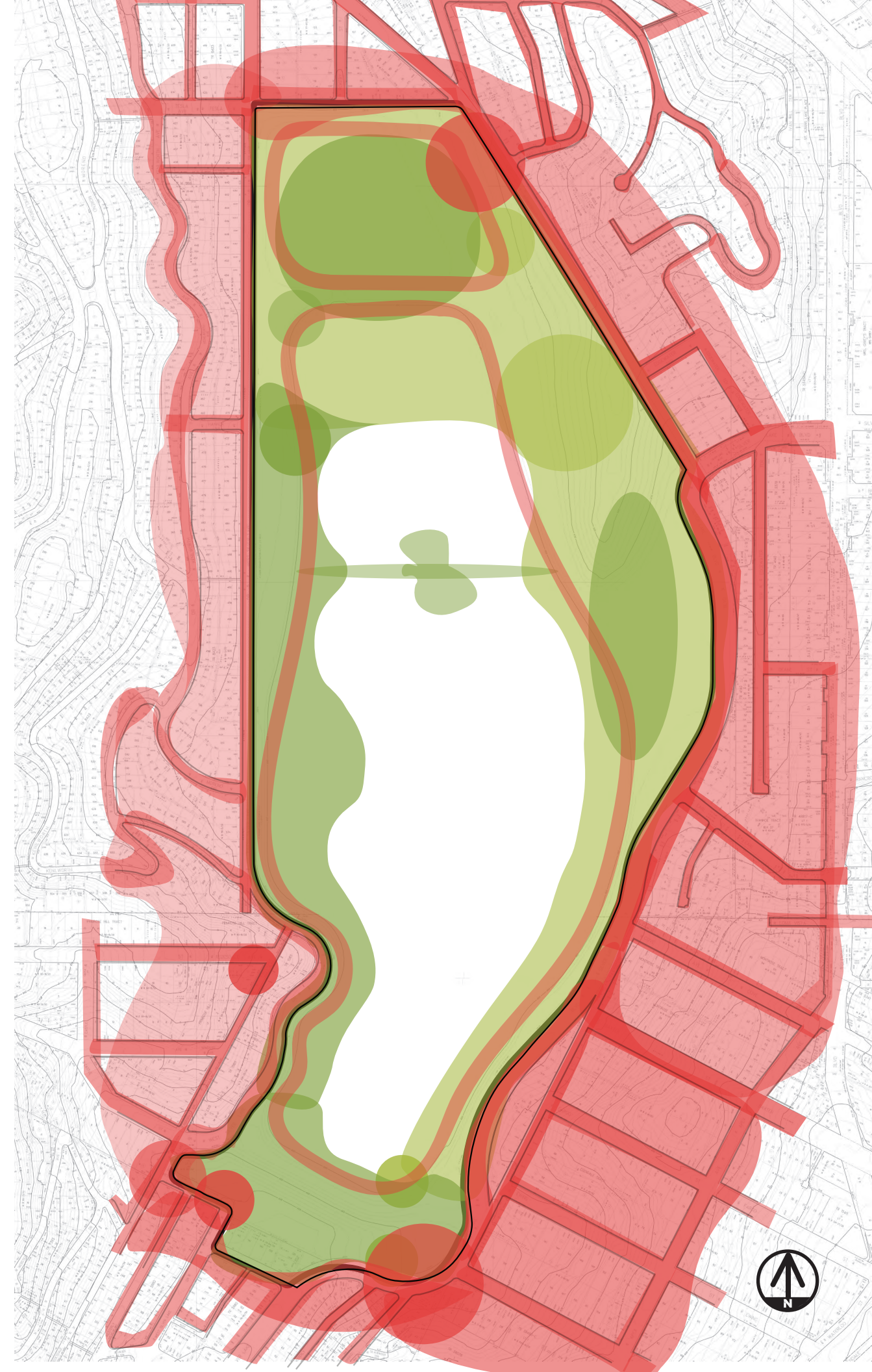
Site Development



Edge Condition Problems and Solutions

Details of constraints and opportunities of the Park's edge to the surrounding neighborhood and the internal area of the park.

The key driver behind the redesign of the Silver Lake Reservoir is the decommissioning of the reservoir as a potable water source. An empty, concrete-lined reservoir would be a scar upon the landscape which creates an opportunity for thoughtful redevelopment. Through our designs we identify and mitigate several key constraints with the project site. As designers the goal is to present novel and thoughtful ideas to the community that creates prosperity for the region, revitalizes biodiversity, facilitates responsible watershed management, and builds community.



Circulation Problems and Solutions

Details of constraints
and opportunities
of the Park's circulation
and pedestrian access

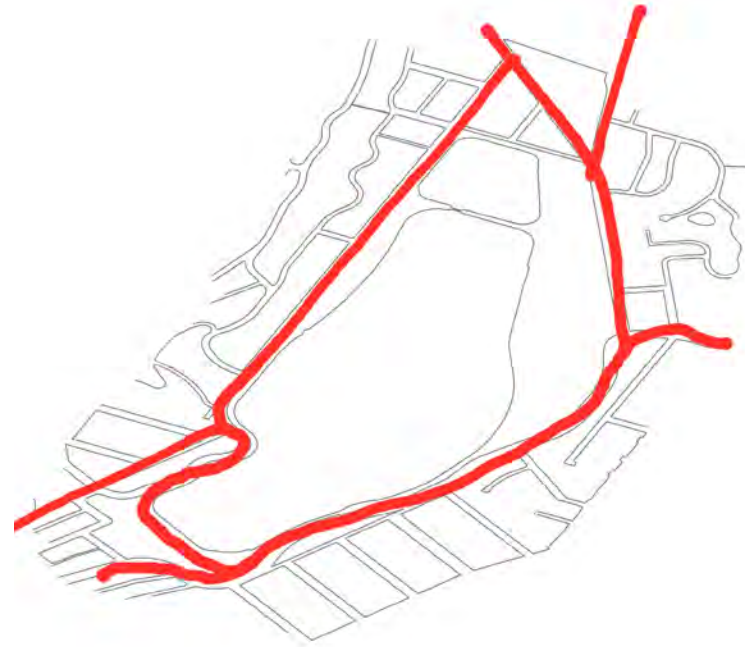
A key constraint and opportunity with the Silver Lake Reservoir redesign is addressing the major circulation issues that exist at the site both in terms of vehicular and pedestrian circulation. As shown in these diagrams there are issues with blind corners, congested streets, unsafe pedestrian situations, and an overall lack of a cohesive circulation system. With our improvements the site is now safer and more accessible, providing overall quality of life enhancements for residents and visitors.



Edge Conditions & Circulation Problems



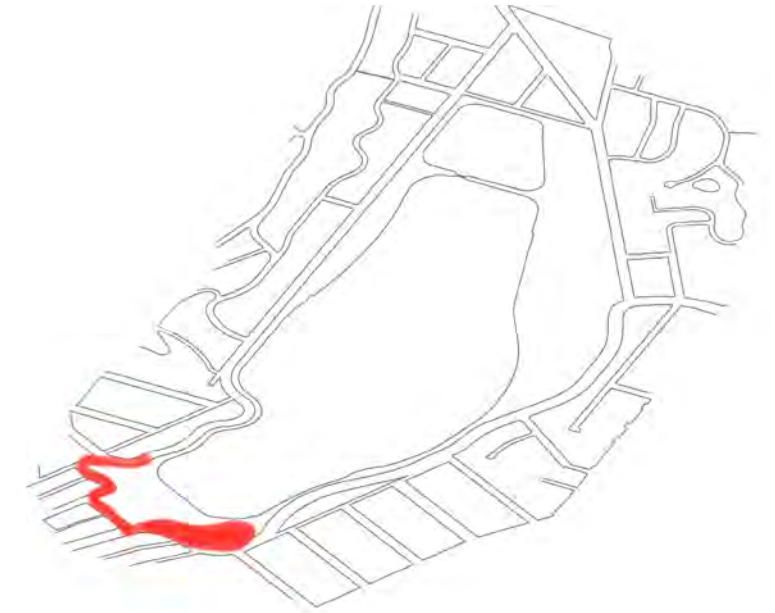
Blind Corners
Curving pathways and topography create areas with blind corners.



Perimeter Traffic
A small concrete barricade is the only pedestrian protection from an arterial roadway.

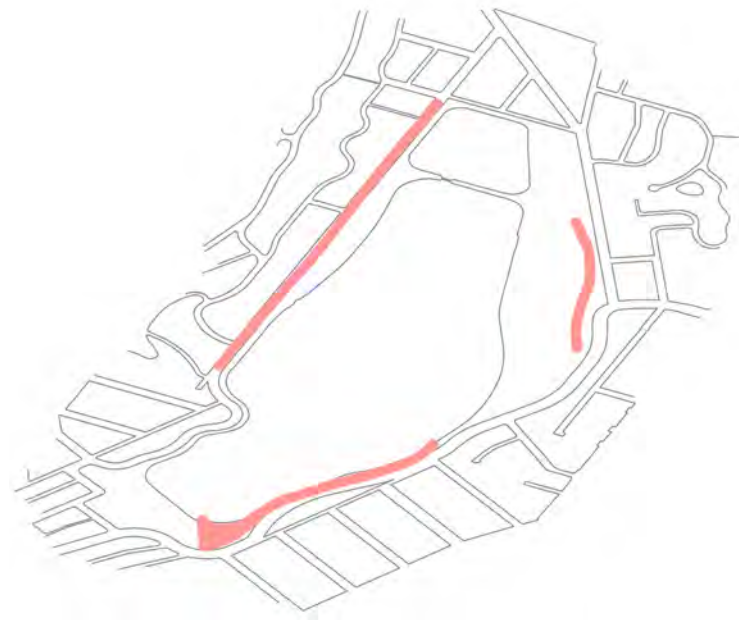


Limited Access to Water
Throughout the perimeter large fencing prevents access to the water and are not aesthetically pleasing for the neighborhood.



Limited Views
On the north side of the site a large mound blocks views of the reservoir.





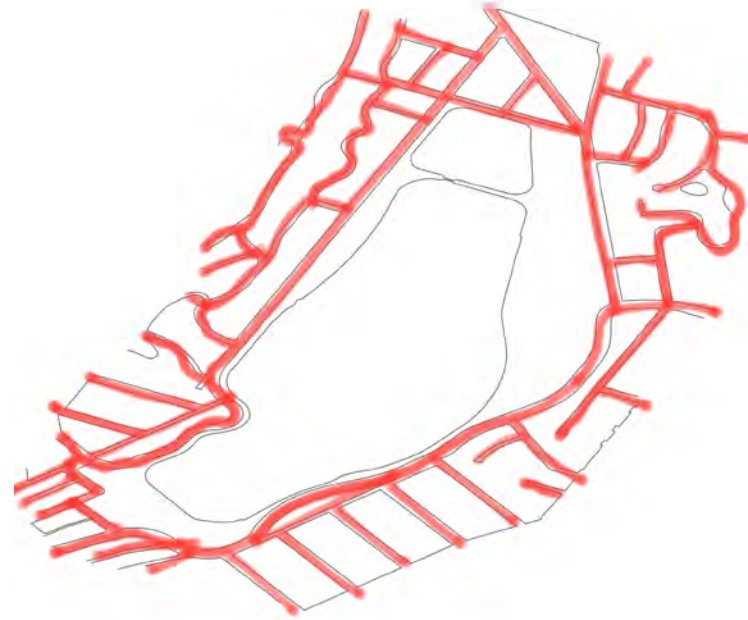
Erosion

Eroded walkways limit accessibility and contribute to trip and fall hazards.



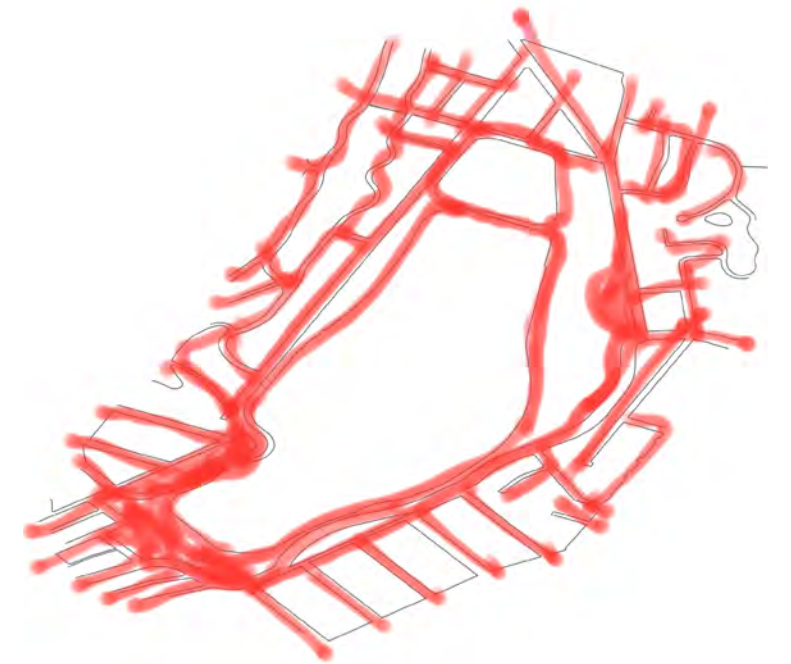
Narrow Congested Walkways

Congested perimeter walkways create conflict between multiple user groups including runners and walkers.



Parking Issues

Limited street parking prevents accessibility and lowers the quality of life for residents.



Unsafe Play Areas

There are limited barriers between vehicular traffic and community park areas.



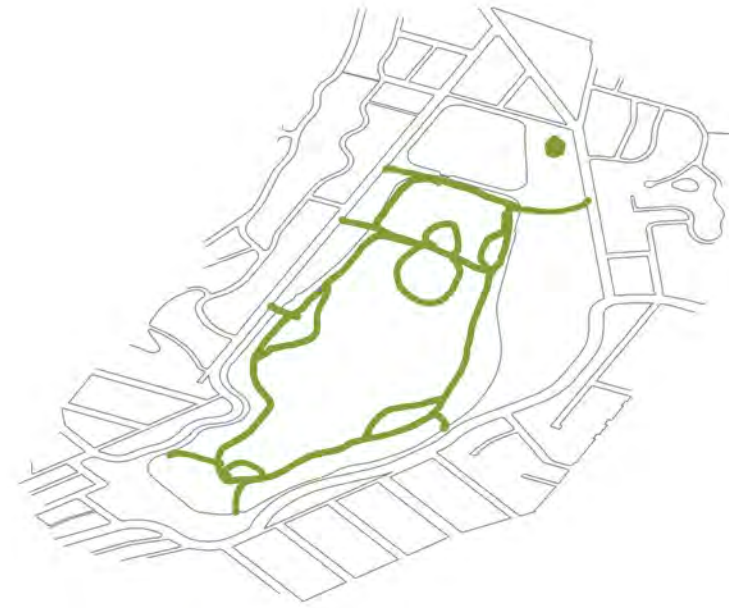
Edge Conditions & Circulation Solutions



Blind Corners
Crosswalks revamped with upgraded lighting. Planted buffers and increase in tree lining should encourage slower driving speeds.



Perimeter Traffic
Previously absent bike paths were established. Planted buffers clearly define pedestrian, cyclist, and vehicle avenues.



Limited Access to Water
Immersion into the water is still highly discouraged, but the inclusion of the overview boardwalks and Polliwog Play Pond provide a closer interaction with the water.



Limited Views
Previously hidden views of the water from the site were amended with raised walkways and paths that skirt the shoreline.





Erosion

Sidewalks were re-graded/repaved with a permeable hardscape. Water will be redirected to stormwater “bump outs” and “green gutters”. These collect and filter runoff, allowing it to permeate back into the soil.



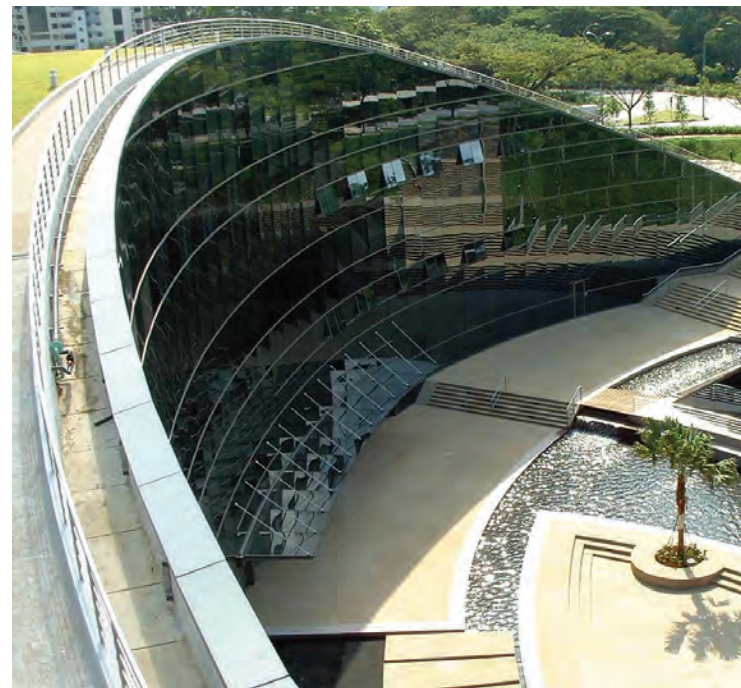
Narrow Congested Walkways

Complex trail networks and enlarged green spaces should attract more visitors inside the park. Sidewalks will also be widened from 4' to 6' or slightly greater.



Parking Issues

Difficult street parking remedied with an on-site, subterranean parking garage and two additional lots dedicated to the children’s play area and dog parks.



Unsafe Play Areas

Preschool play area was relocated on a new terrace space and additional sports facilities were installed. The facilities have better lighting, fencing, and more logical placement for a safer environment.

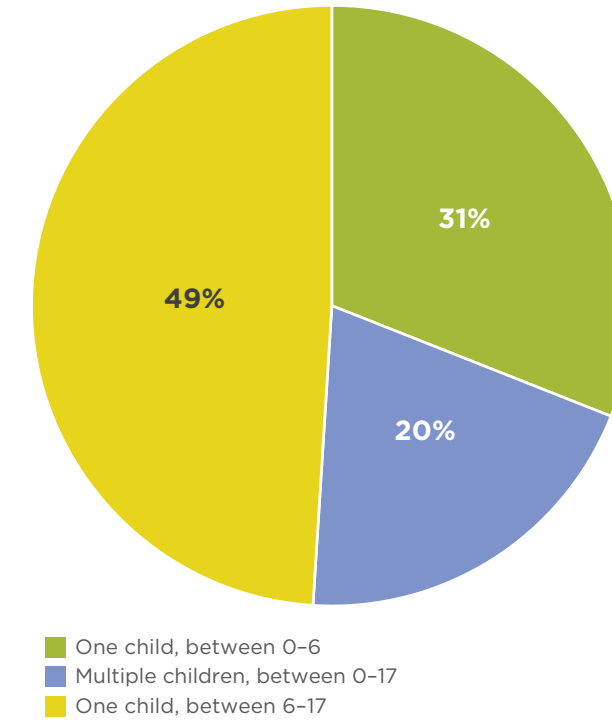


Demographics

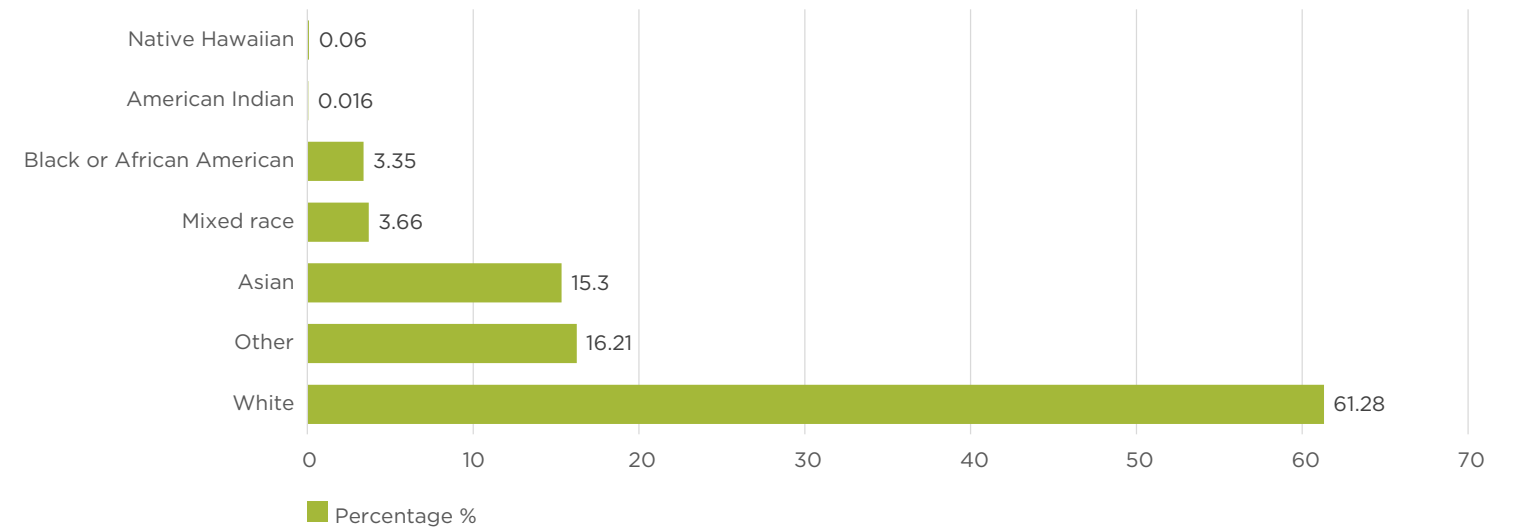
Evaluating the demographic data for Silver Lake Reservoir for 2016 Census, we founded that the majority groups were 48% Hispanic or Latino origin (Hispanics may be of any race, so also are included in any/all of the applicable race categories), white, single, ages 25-34 and one child 6-17 years-old in married couples. This is a working-class neighborhood, with some of the older residents in higher income brackets. We focused park amenities on activities for families with children to give them a place to learn, play and engage in sports activities off the busy Silver Lake area streets.



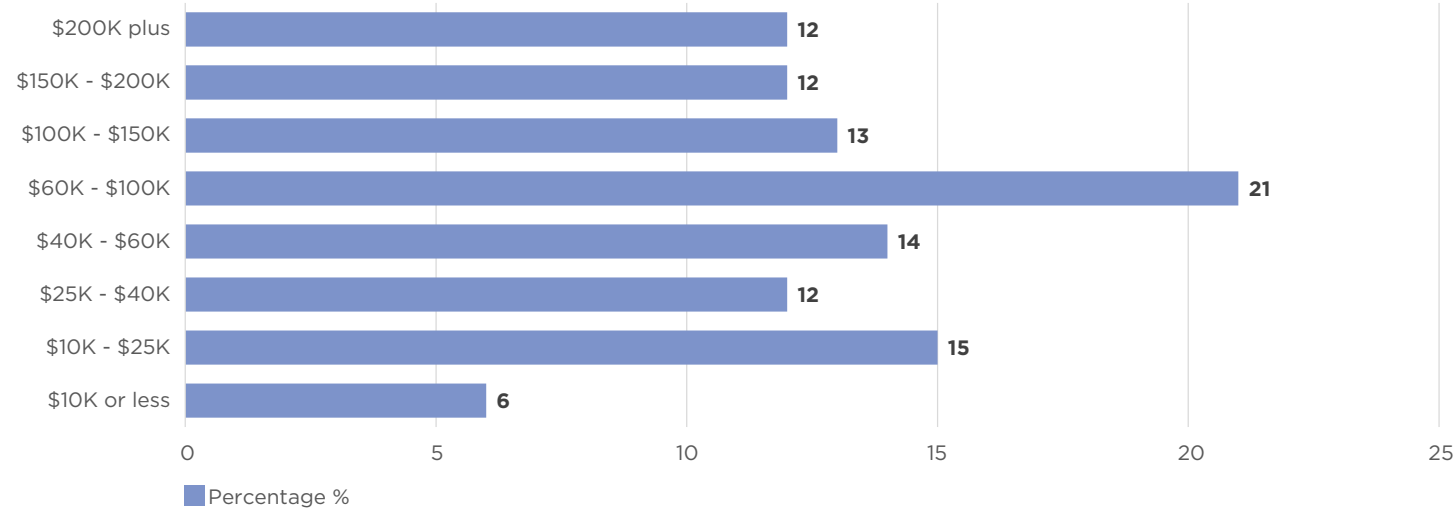
Age of Children in Married Couples



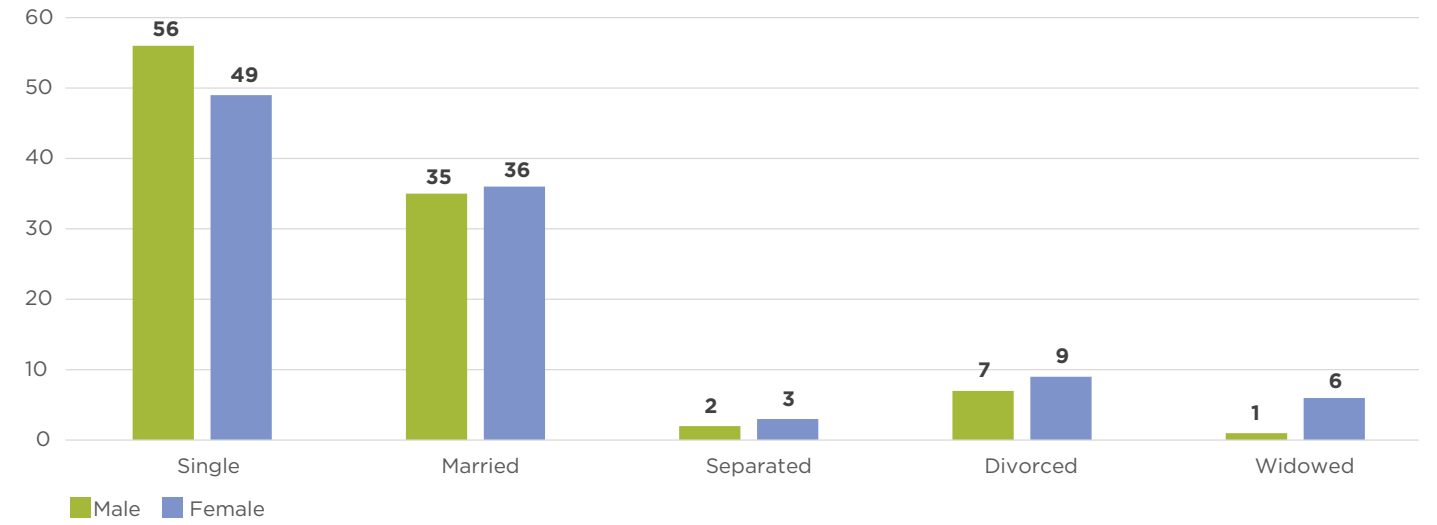
Population Breakdown by Race



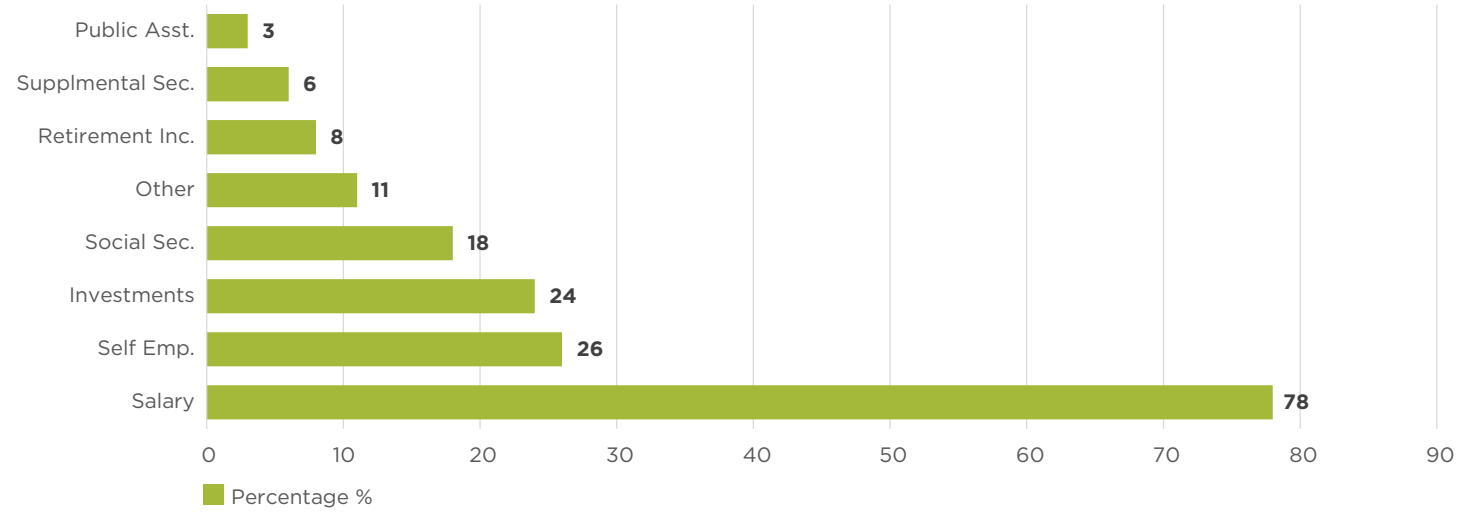
Household Income Distribution



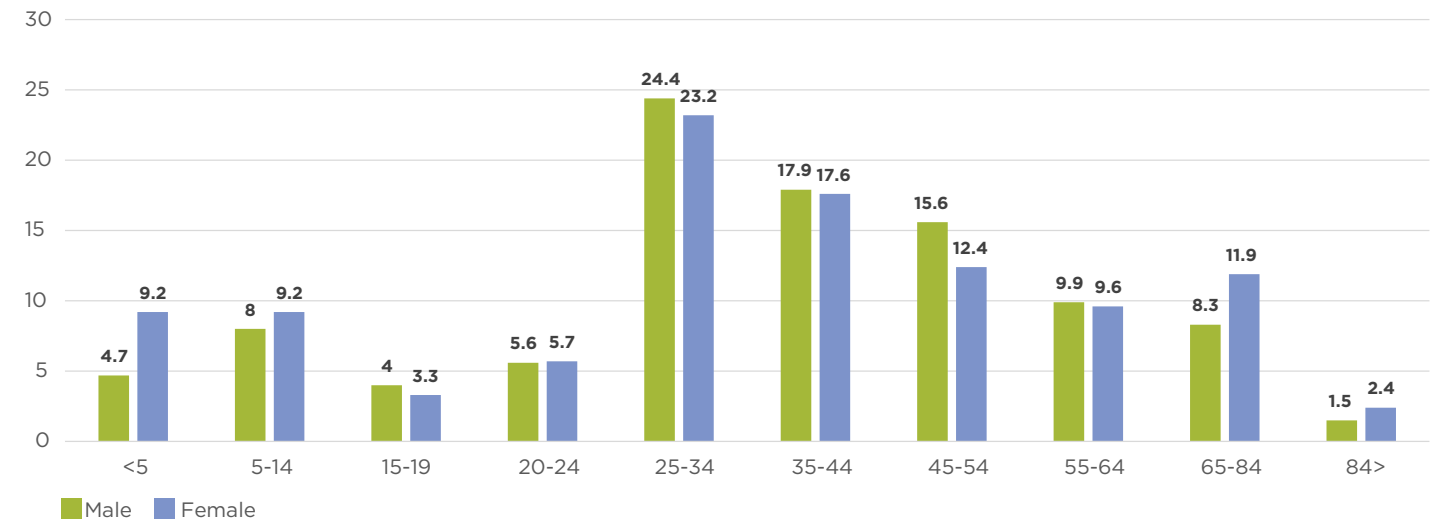
Marital Status



Source of Income

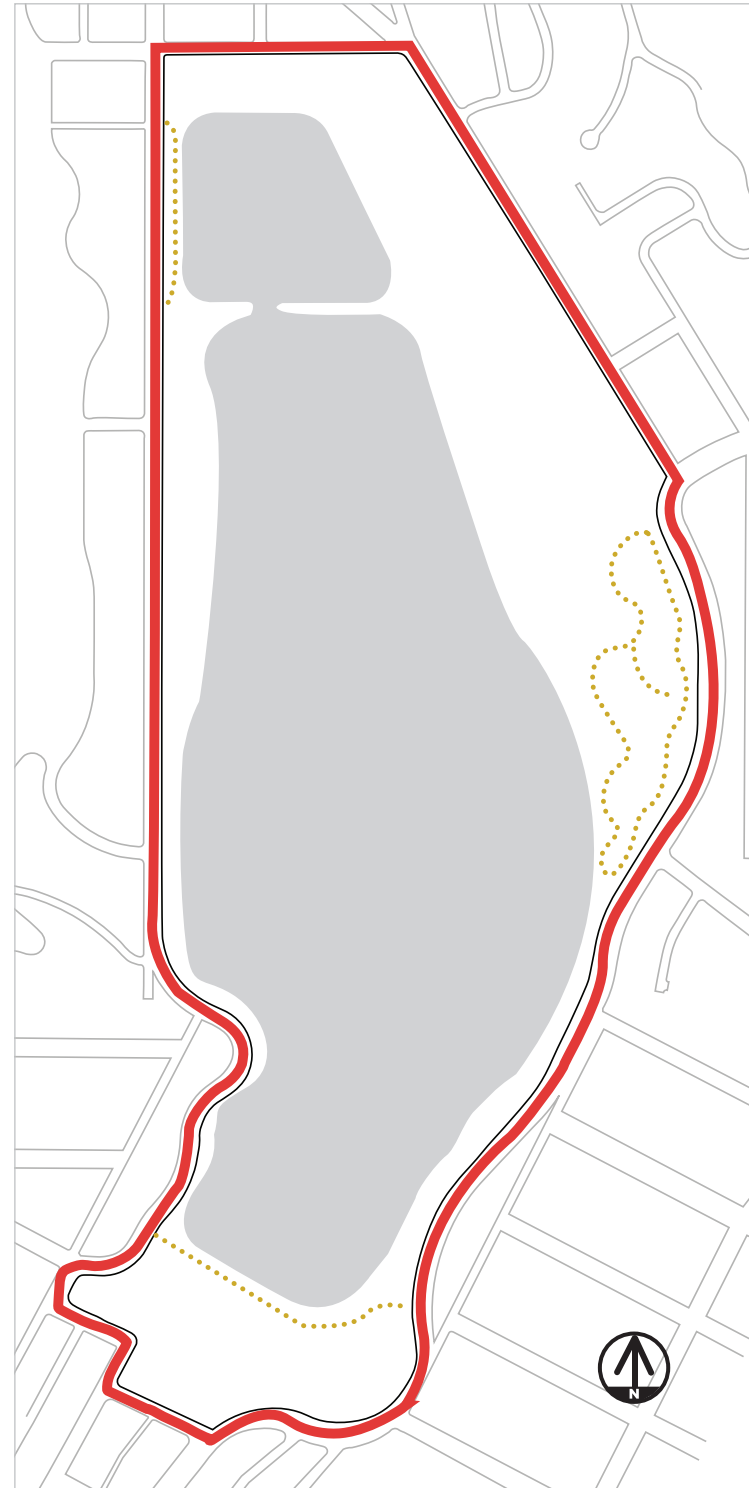


Age Breakdown



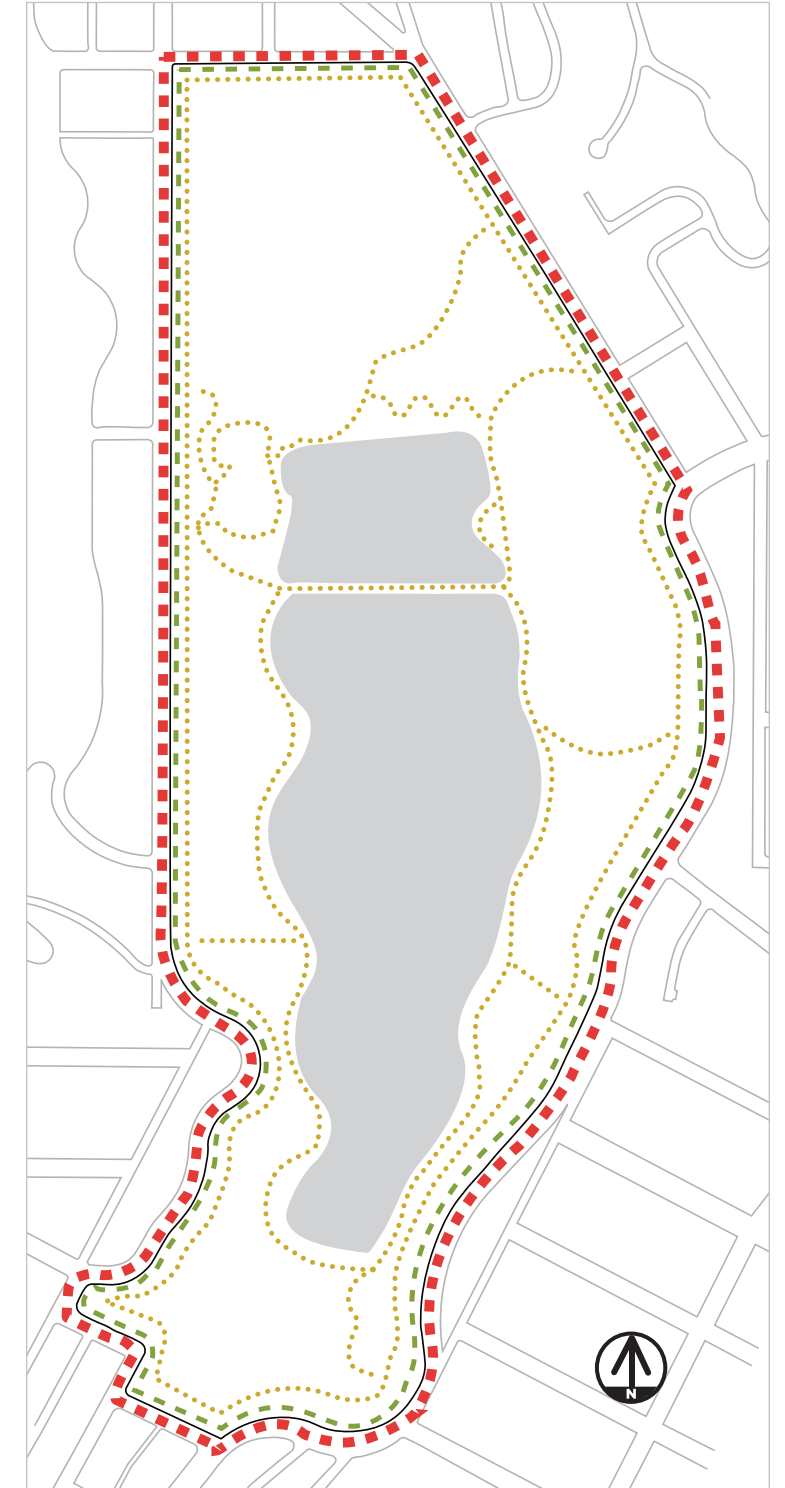
Circulation

Existing Circulation



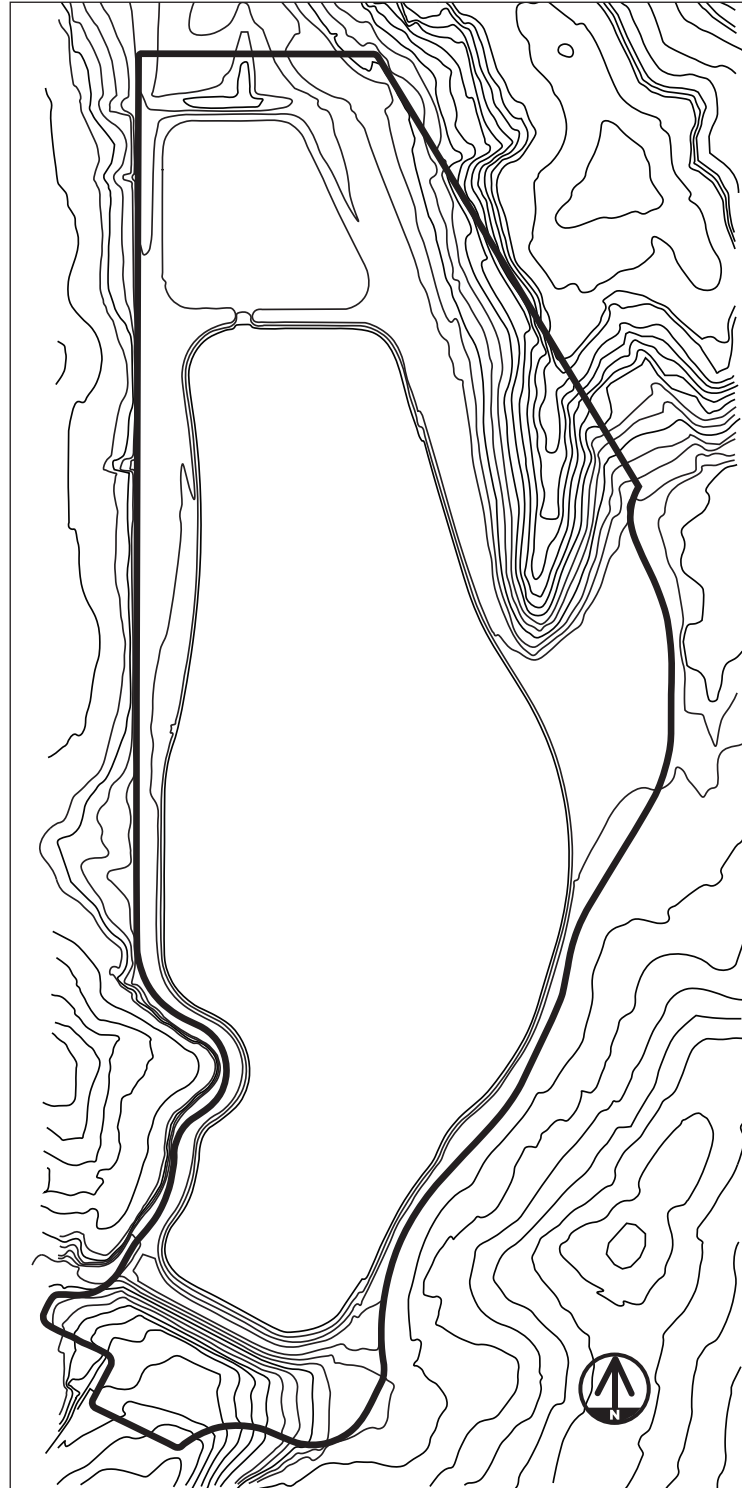
Vehicle/Bike/Pedestrian ———
Pedestrian Only ·····

Improved Circulation

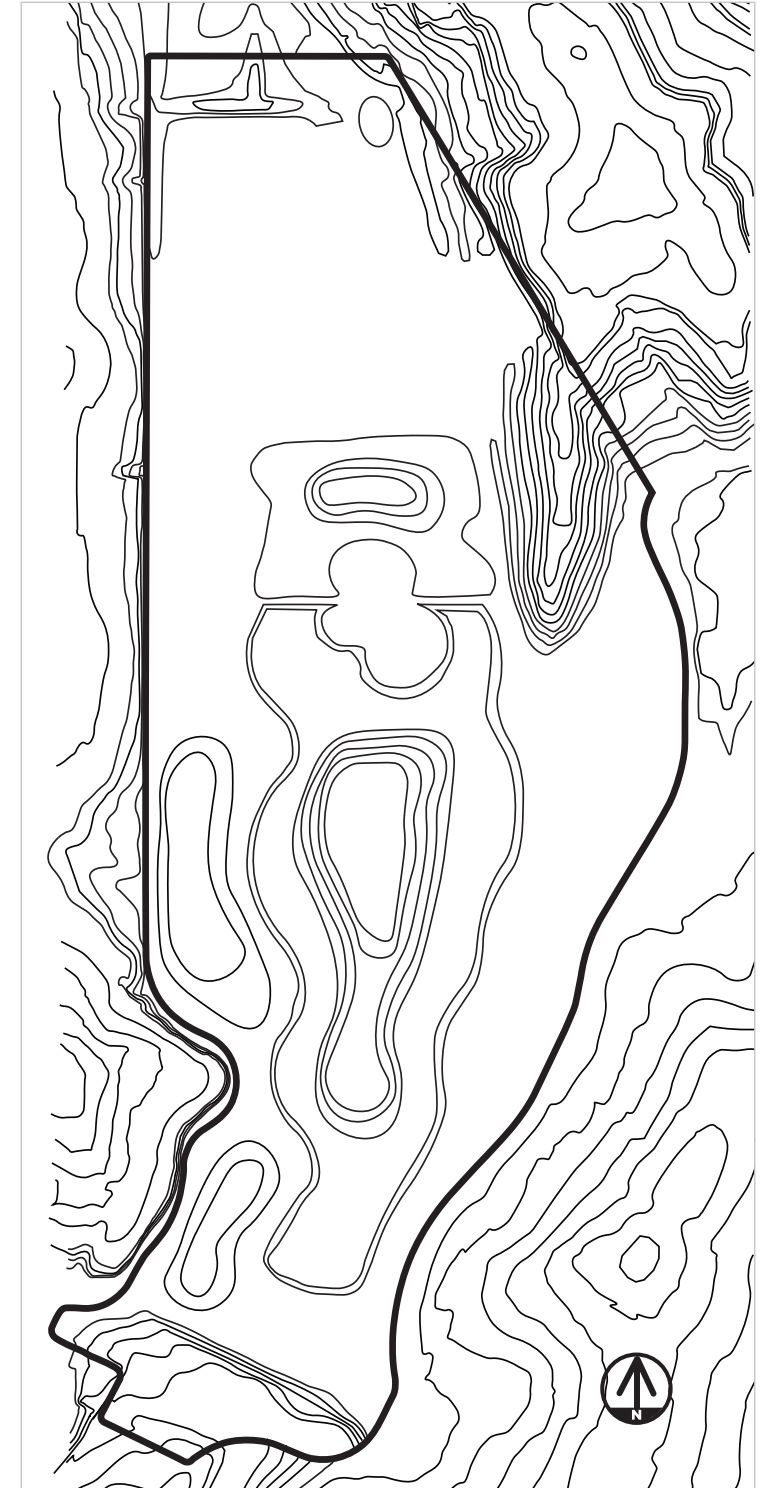


Vehicle ■■■■
Bike ———
Pedestrian ·····

Existing Contours



Proposed Contours



Southern California Wildlife

Silver Lake Reservoir is uniquely situated to create new and improved habitat for the many imperiled species of Southern California. Most of the state of California lies within a biodiversity hotspot called the California Floristic Province, an area of diverse vegetation. Designated a hotspot in 1996, it shares this distinction with 33 other places in the world. Biodiversity hotspots are home to the highest diversity of endemics, plants and animals that are found nowhere else in the world. Of nearly 3,500 species of plants in the California hotspot, more than 61% are endemics. The highest

levels of endemism are found among amphibians. Part of what makes California a hotspot is that its spectacular biodiversity is seriously threatened. At least 75% of the original habitat has already been lost. Over the last several decades, however, California has dedicated more effort than any other state to protecting its precious habitat and species that remain. Represented on this page are some of the many unique species that share our California home. From butterflies to bears, California has it all.



Barn Owl



Raccoon



Western Toad



Great Horned Owl



Bobcat



Fox Squirrel



Western Fence Lizard



Quail



Pacific Tree Frog



Cooper's Hawk



Rosy Boa



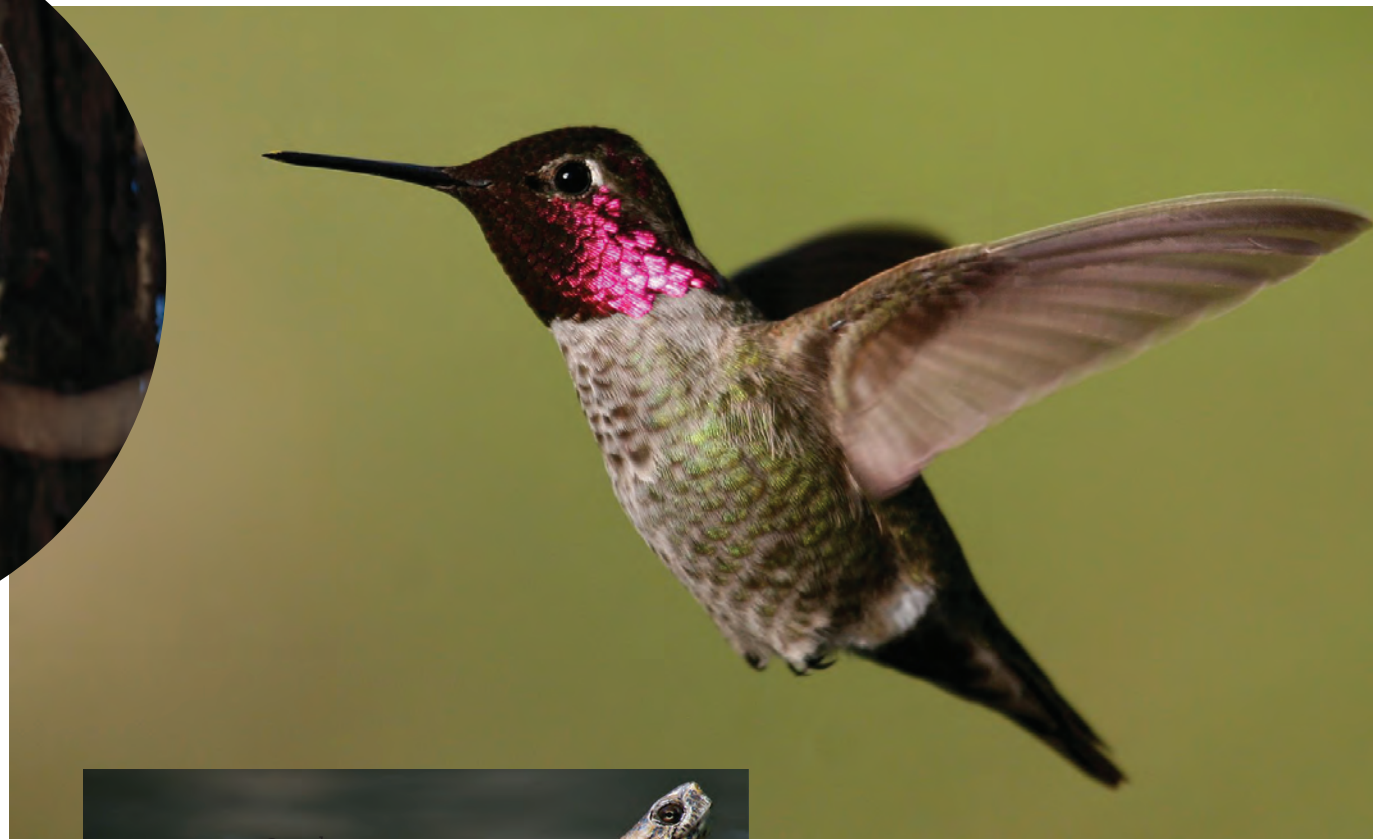
Night Heron



Eastern Fence Lizard



Red Tailed Hawk



Anna's Hummingbird



Blue Heron



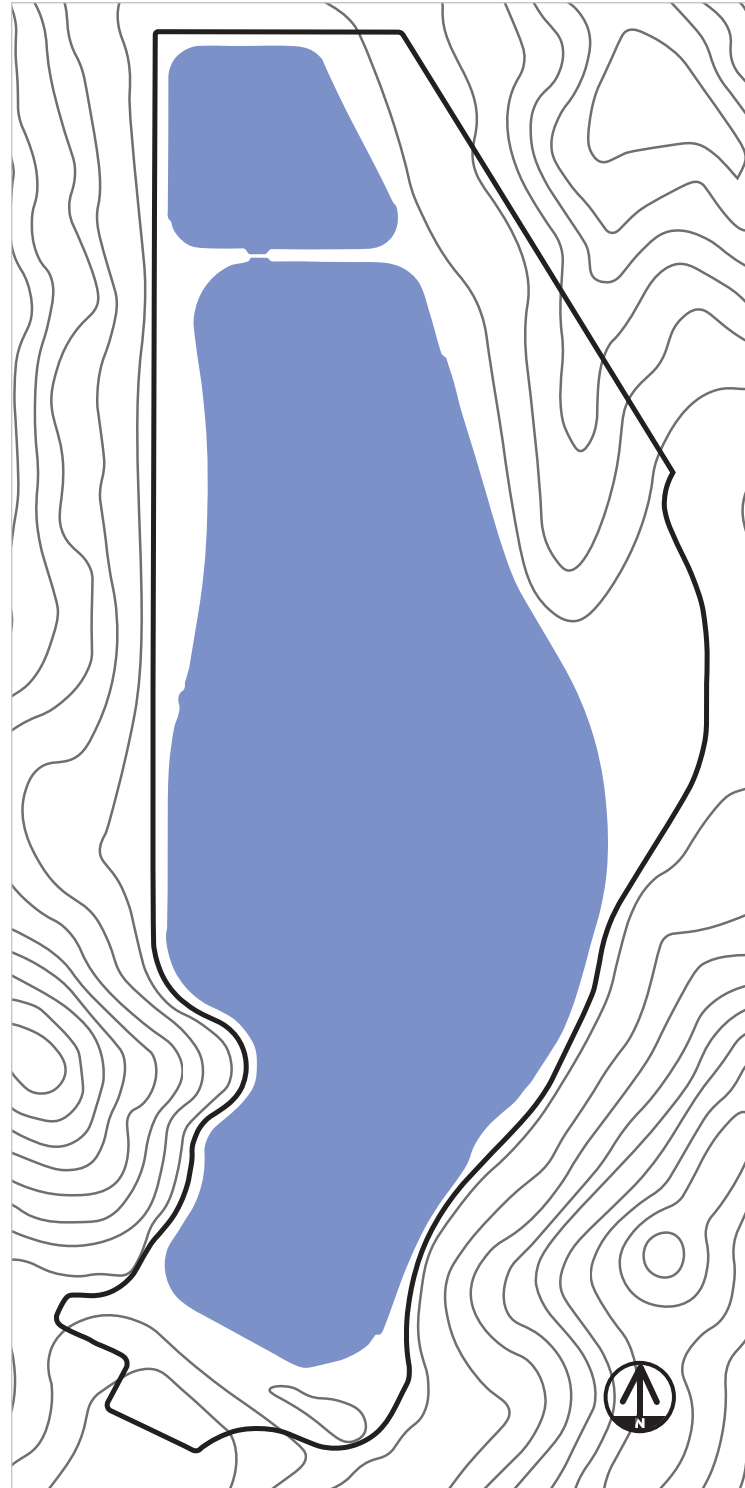
Western Pond Turtle



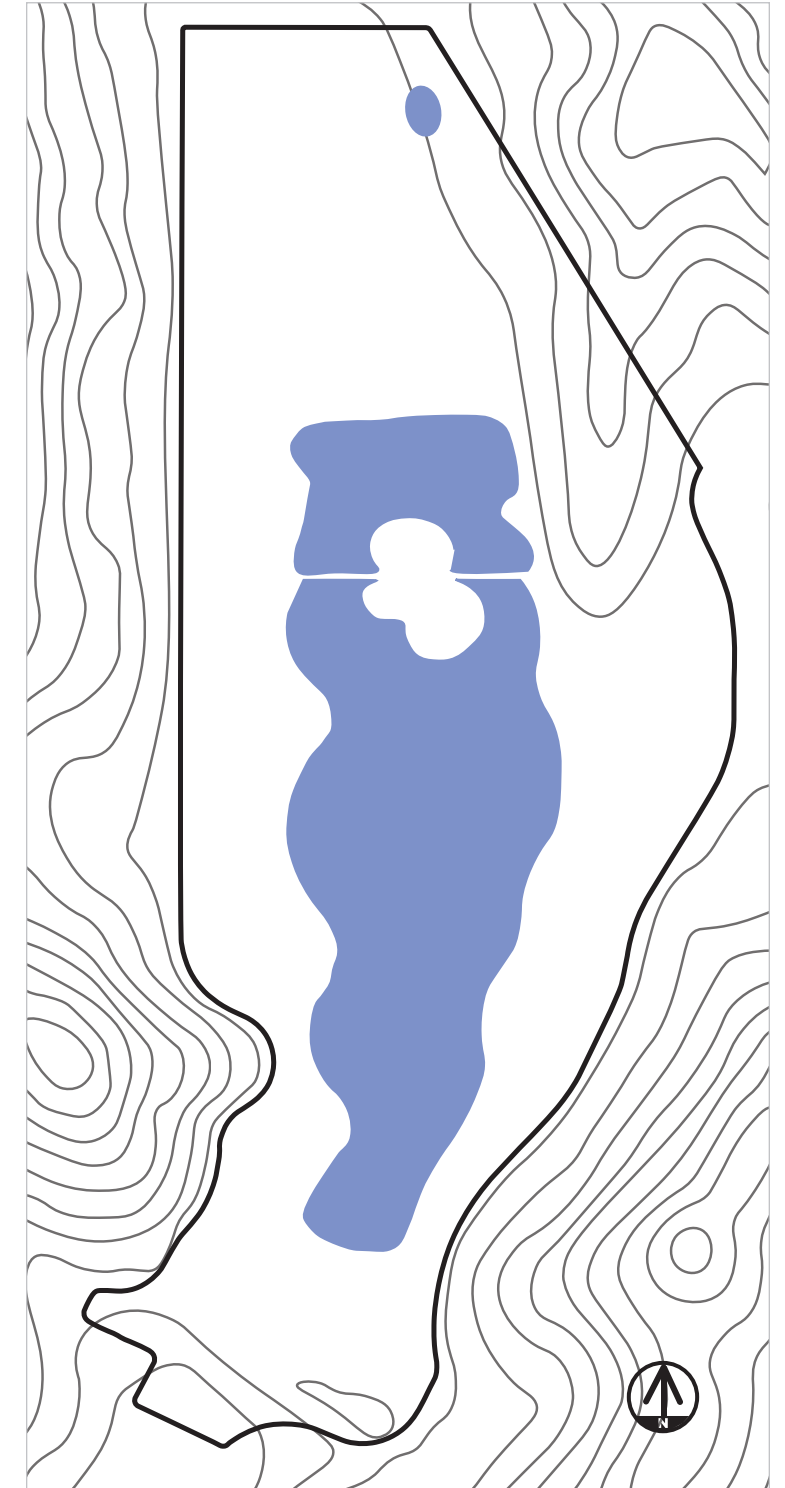
Western Diamond-Back Rattlesnake

Water

Existing Water



Proposed Water



Site Details



Free water surface wetlands absorb more CO₂ from the atmosphere than an equivalent sized area of forest.

RIPARIAN

WETLAND

MACROPHYTES

AQUATIC



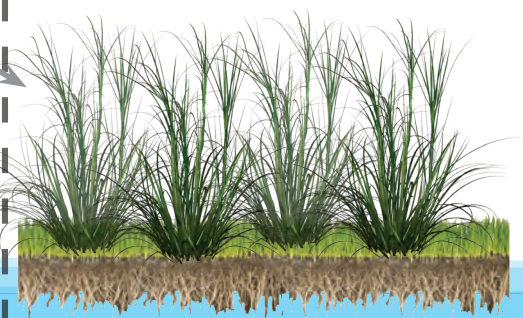
WET MEADOW

EMERGENT PLANTS

FLOATING PLANTS

SUBMERGED PLANTS

BIOHAVEN ISLAND

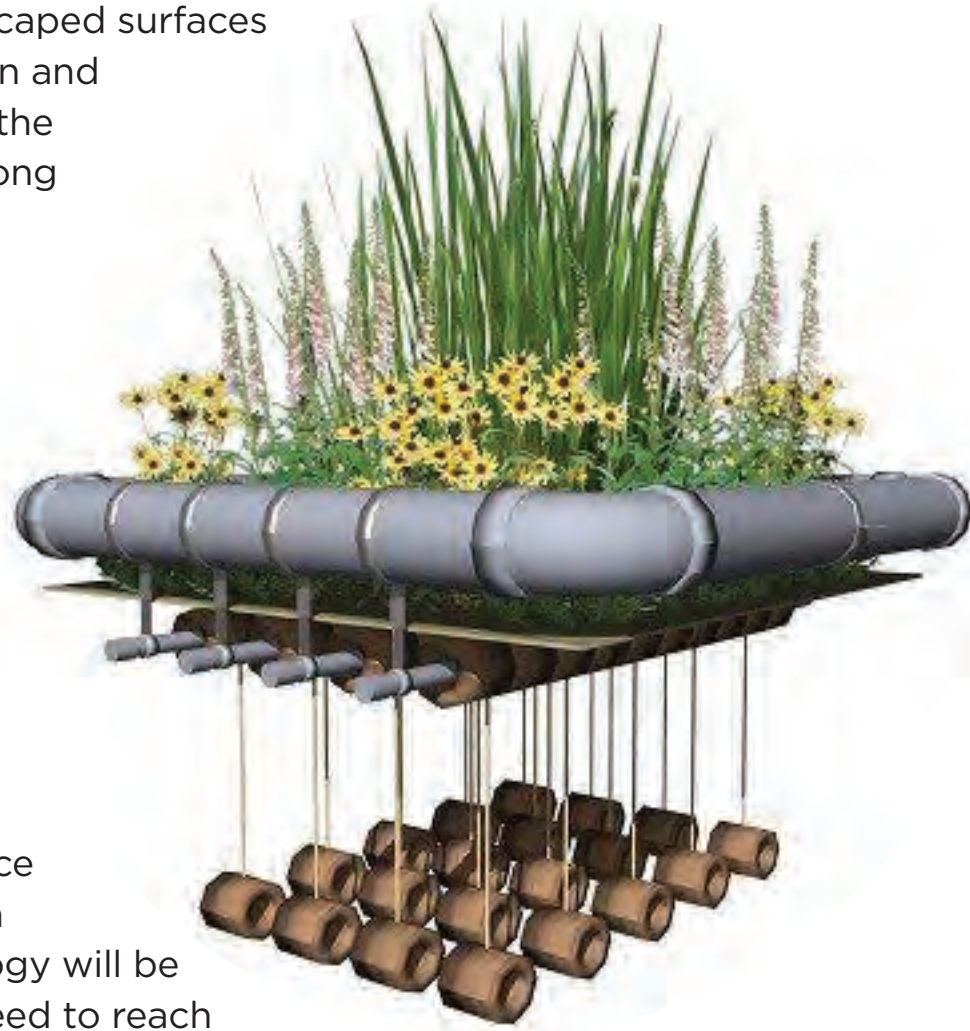


Treatment of storm runoff occurs in the plant root zone acts as a bio-film mesh, filtering pollutants and accelerate plant growth.

Remediated Planting

During the rainy season, water will flow from hardscaped surfaces and carry pollutants to the wetland. Excess nitrogen and phosphorus from fertilizers would be absorbed by the plants and prevent algae blooms. Plants located along the shoreline will intercept and slow the runoff particles before reaching deeper water.

Submerged plant roots and emerging macrophytes provide a substrate for the microbial process. This involves transmitting from their leaves to their roots where removal of metals and other chemical pollutants occurs. Nitrate extraction via biological denitrification is very effective since the anoxic conditions and carbon sources required are sufficient under water. Aeration generated by floating fountains tethered to the floor bottom will help remove ammonia, prevent mosquitoes, and improve the overall quality of the water. Maintenance costs are expected to be low. Removing vegetation debris and harmful species that disrupt the hydrology will be included in routine upkeep. Floating islands may need to reach via motorless boat. Overall, constructed wetlands serve as an inexpensive and environmentally responsible method for treating effluent water.



RIPARIAN

Cornus glabrata, Achillea millefolium, Juncus effusus, Asclepias fascicularis, Crataegus douglasii, Phyla nodiflora, Platanus racemosa

WETLAND

Malvella leprosa, Carex barbarae, Juncus dubius, Anemopsis californica, Bidens laevis, Artemesia douglasiana, Elymus condensatus

MACROPHYTES

Typha latifolia, Scirpus californicus, Scirpus acutus, Phragmites australis, Ludwigia peploides, Polygonum hydropiperoides, Sagittaria latifolia

AQUATIC

Hydrocotyle verticillata, Lemina minor, Nasturtium officinale, Mimulus cardinalis, Veronica americana, Hippuris vulgaris, Scirpus microcarpus



Typha latifolia



Phragmites australis



Sagittaria latifolia



Ludwigia peploides



Polygonum hydropiperoides



Hydrocotyle verticillata

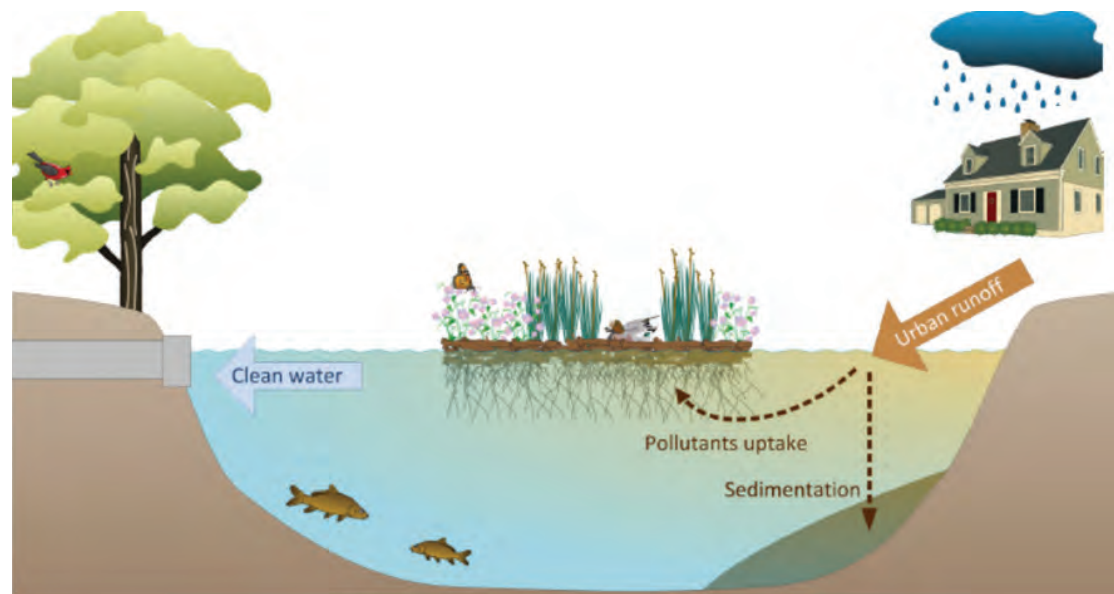
Biofiltration Islands

Biohavens are man-made floating gardens that are used as water treatment solutions. According to the makers of these floating islands (also known as floating treatment wetlands or FTWs) are a new and powerful tool in water stewardship. They

imitate natural floating islands to create a “concentrated” wetland effect. Independent laboratory tests showed removal rates far in excess of previously published data: 20 times more nitrate, 10 times more phosphate and 11 times more ammonia,

using unplanted islands. They are also extremely effective at reducing total suspended solids and dissolved organic carbon in waterways. The new park design would utilize this technology for the increased stormwater runoff that is expected.

Benefits are seen quickly. This method results in cleaner water, protection for fish from predators, habitat for geese and ducks, and it moves with the fluctuating pond level.



Floating Treatment Wetland

After a storm, the urban run-off from buildings, houses and city streets enters the lake from various storm drains throughout the system causing pollutants and sedimentation to accumulate in the lake’s water ecosystem.



Removing Nitrogen from the Water

Vegetation (in particular the submerged root mat) provides a carbon source and a surface for biofilms to undertake denitrification.



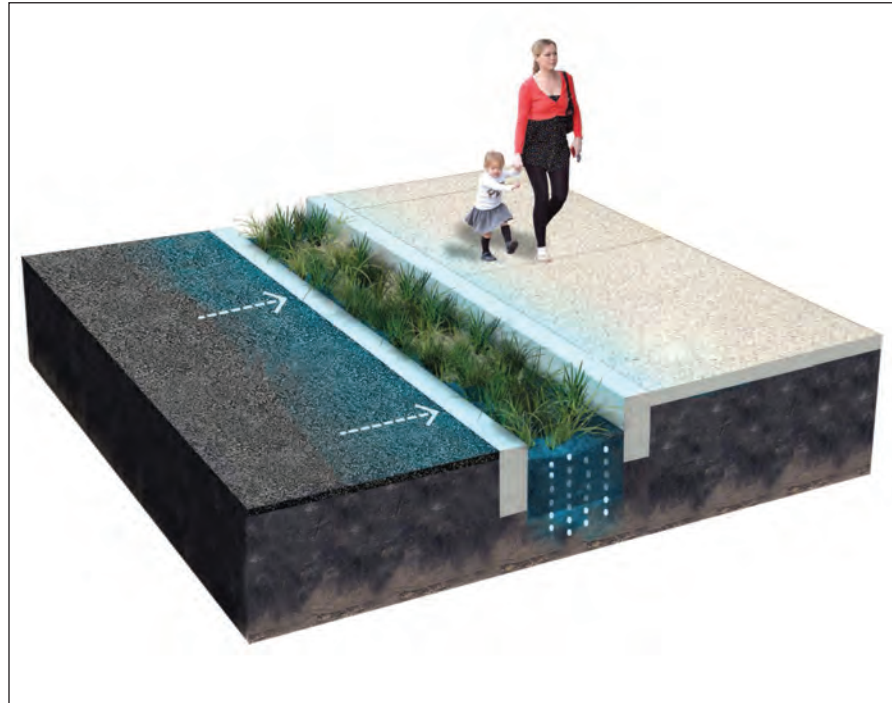
Bio-Film Formation

The longer the root system, the more area for micro bacteria to attach themselves to (forming an algae-cleaning biofilm).



Stormwater Capture

Stormwater capture is integral to modern landscape designs in Southern California. The Silver Lake Reservoir Master Plan will utilize a number of BMPs to responsibly manage the local watershed.



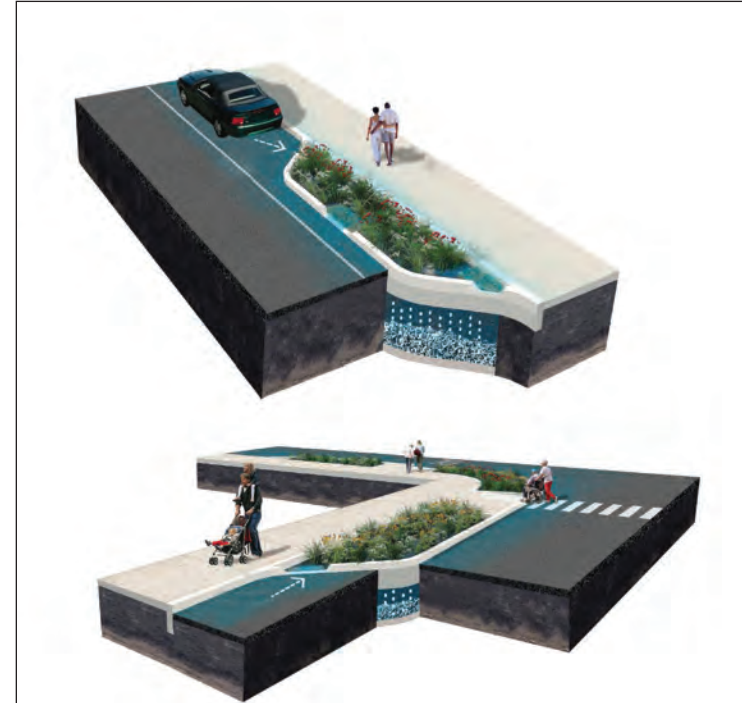
Green Gutter

Plants filter and transpire water while enhancing the streetscape. Stormwater flows into the gutter and infiltrates through the soil.



Permeable Pavement

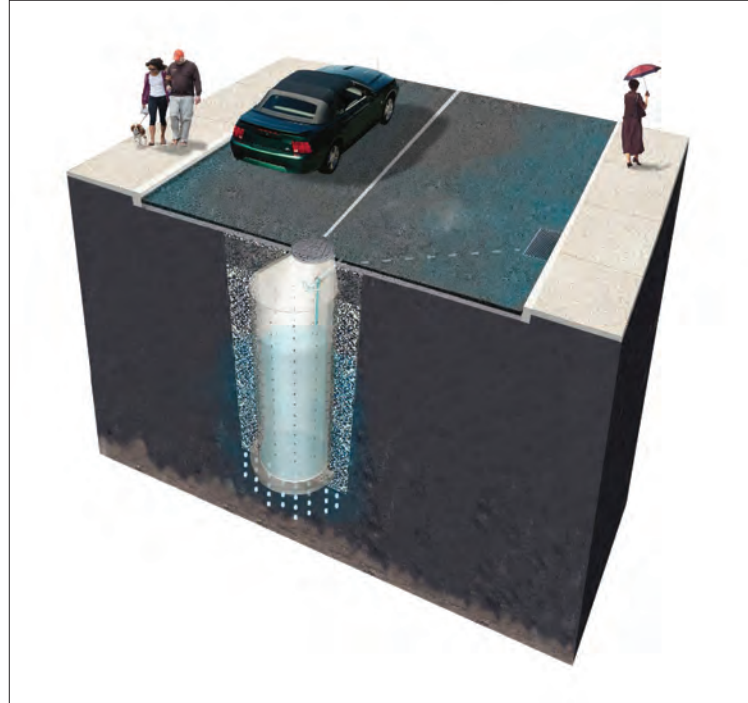
Stormwater on the surface seeps through the permeable walking surface into a layer of stone or storage media providing structural support and stormwater storage space.



Stormwater Bump-Out

Stormwater from the street flows into the roadway bump-out and infiltrates through the soil. Stone or other media may be layered below the planting zone to provide additional stormwater capacity.





Stormwater Drainage Well

Subterranean wells collect stormwater from the landscape through pipes and slowly release water into the surrounding soils through weep holes.

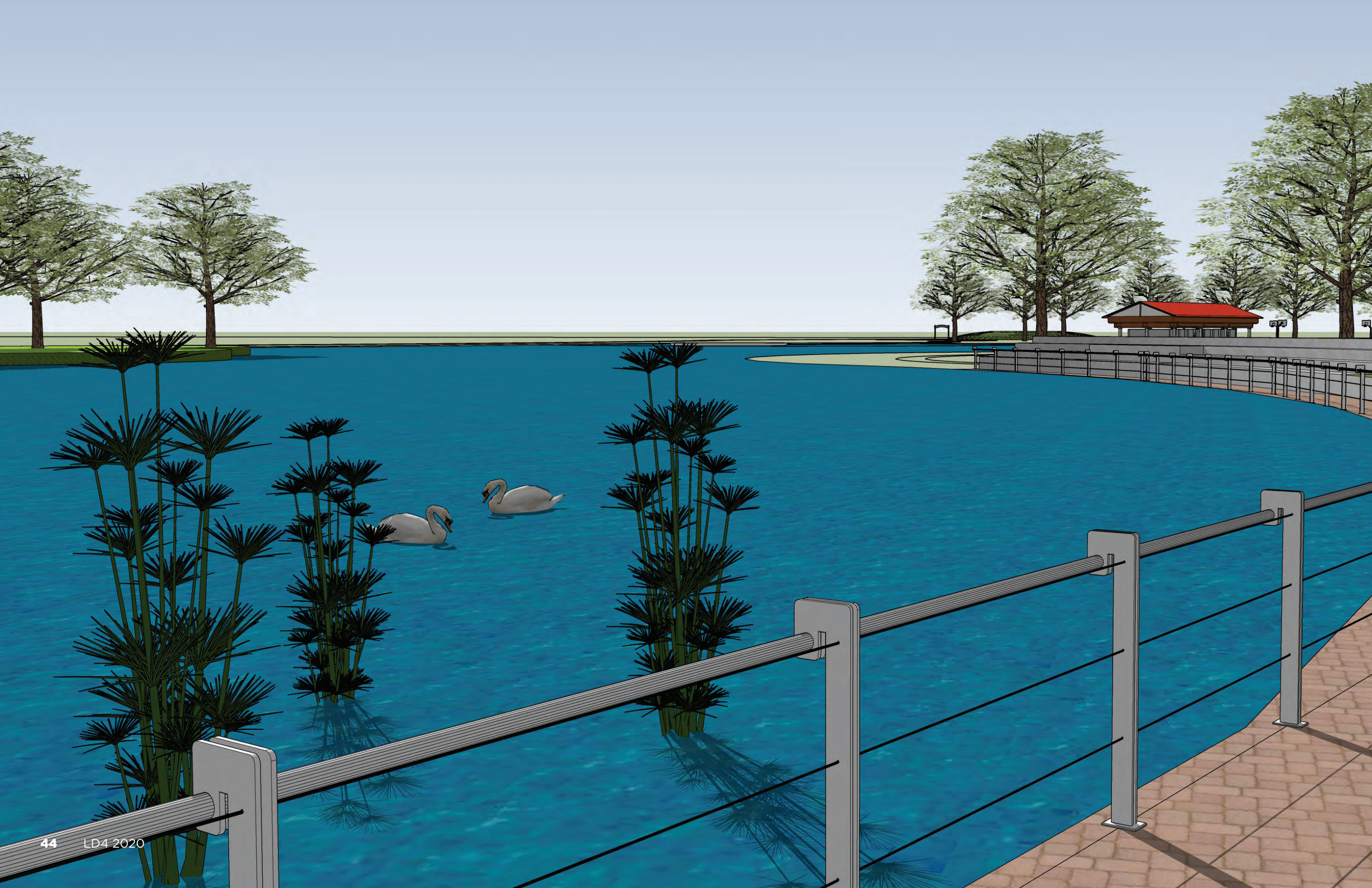


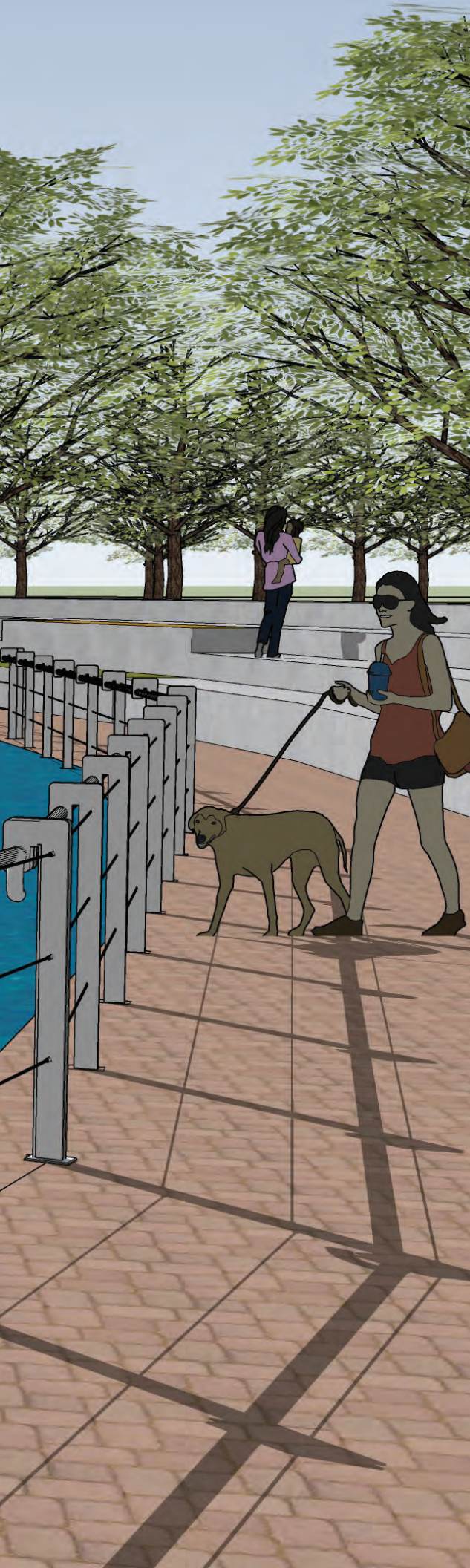


Looking Northwest towards the underground Green Roof Parking Lot which houses the new Community Center on the street level.



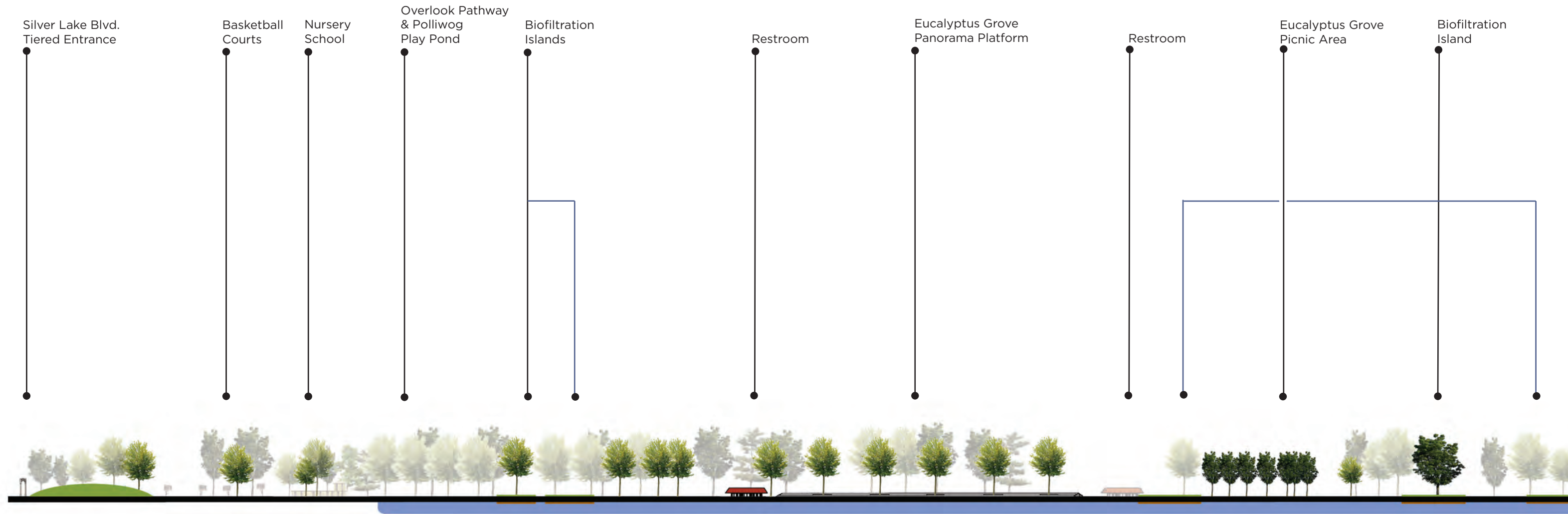
Looking East towards the entrance of the Biodome and Education Center off West Silver Lake Drive

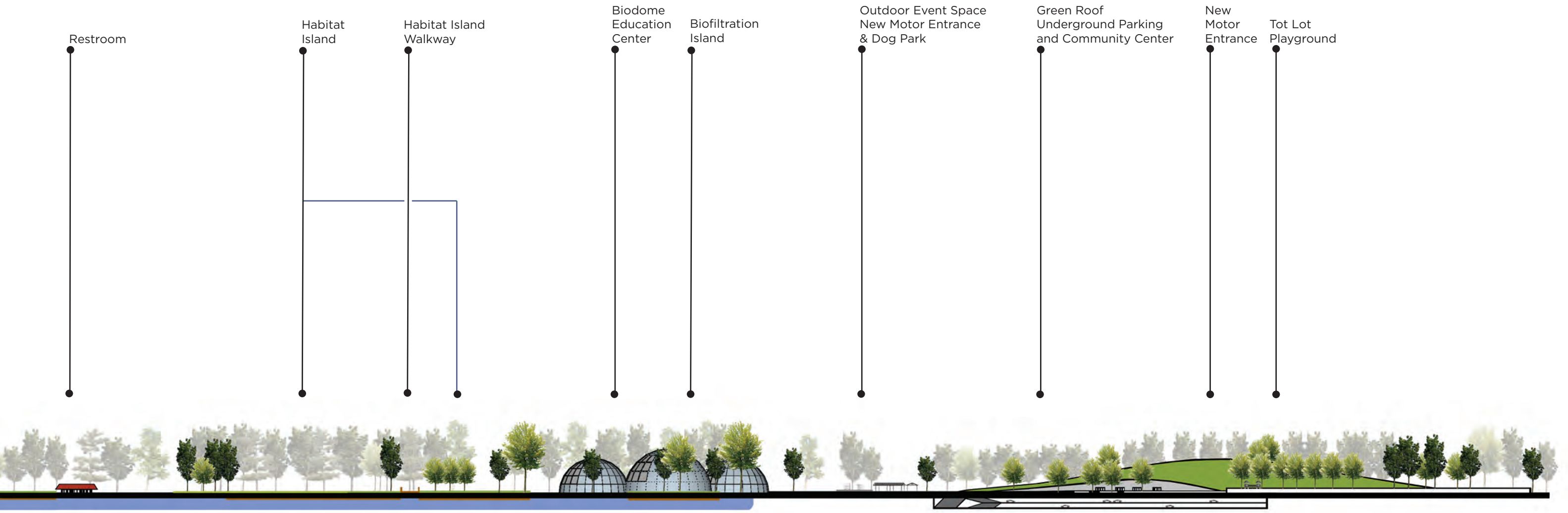




Looking South towards the Eucalyptus Grove Panorama Platform. This area provides a spot for quiet contemplation, small gatherings, and a beautiful view of the water.

Elevation





Restroom

Habitat Island

Habitat Island Walkway

Biodome Education Center

Biofiltration Island

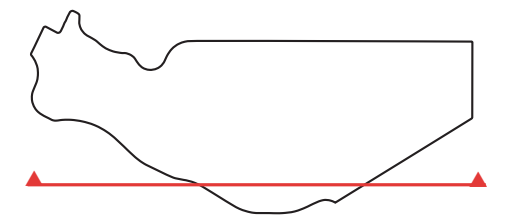
Outdoor Event Space
New Motor Entrance
& Dog Park

Green Roof
Underground Parking
and Community Center

New Motor Entrance

Tot Lot Playground

1" = 142'



References

Cover

Photographs from The Silver Lake Conservancy website <http://www.silverlakereservoirs.org/>

Location Page 4

Quote from Google

Site Context Page 5

Wikipedia and Google maps

History Pages 6-7

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Demographics Pages 26-27

The Silver Lake, Los Angeles, CA demographics data displayed above is derived from the 2016 United States Census Bureau American Community Survey (ACS)

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