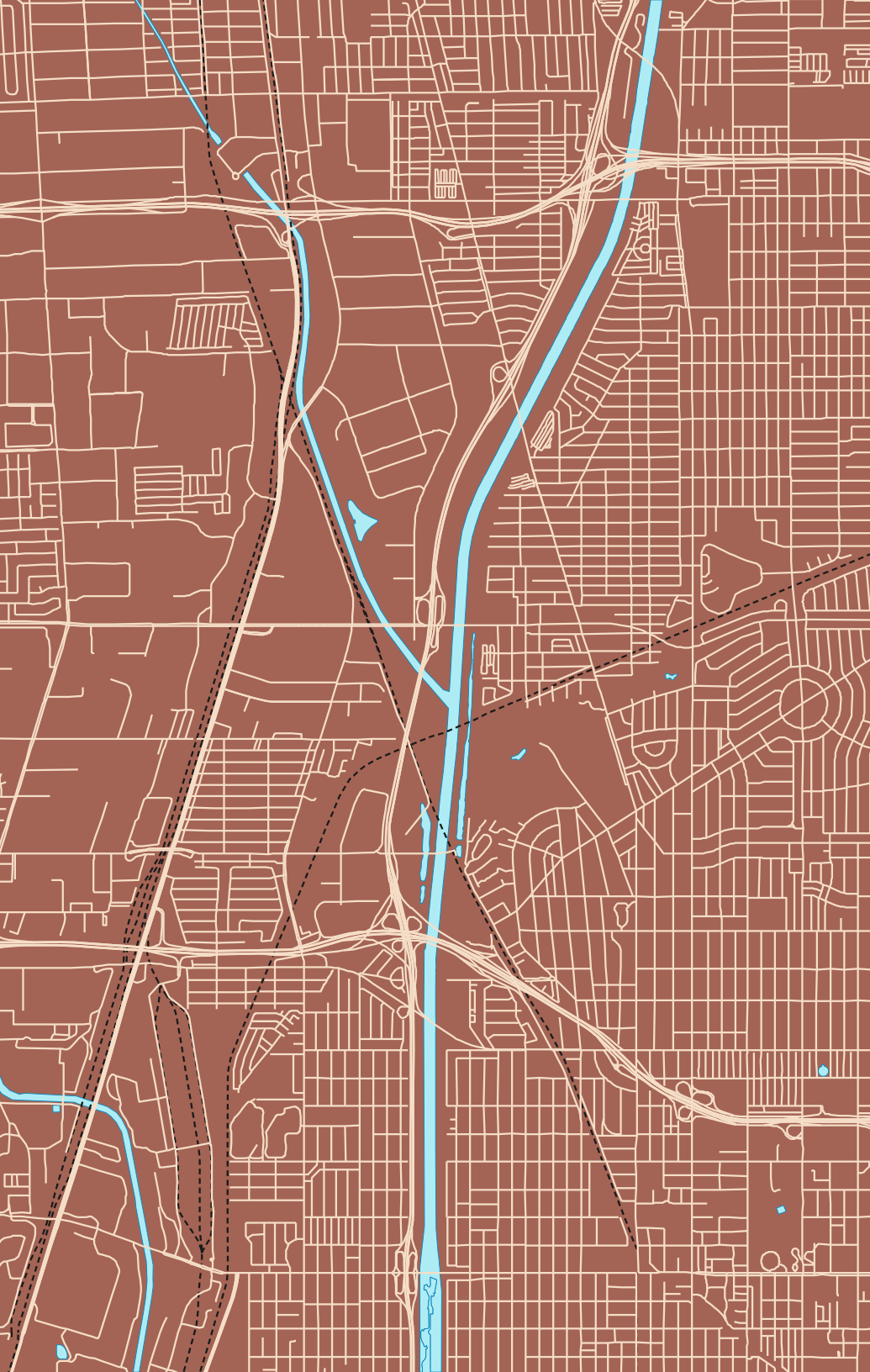




# A **REGENERATIVE** CONFLUENCE

Reimagining Urban Flood Infrastructure at the Compton Creek and Los Angeles River



My path to landscape architecture began with a longstanding interest in the relationship between people, natural systems, and the decisions we make about how land is used. Before studying landscape architecture, I worked in environmental policy and international development, where I saw how environmental challenges are shaped not only by ecological systems, but by infrastructure, institutions, and the communities that interact with them.

Landscape architecture has given me a way to work with those systems more directly—to translate broad environmental challenges into physical places. I am particularly drawn to landscapes where ecological restoration, public space, and infrastructure overlap, and where design can help make environmental processes more visible and accessible.

This project reflects that way of thinking. It is an exploration of how a highly engineered piece of the Los Angeles watershed might become something more than infrastructure: a functioning ecological system, a public landscape, and a place that helps people understand their relationship to water.

-Callie Ham



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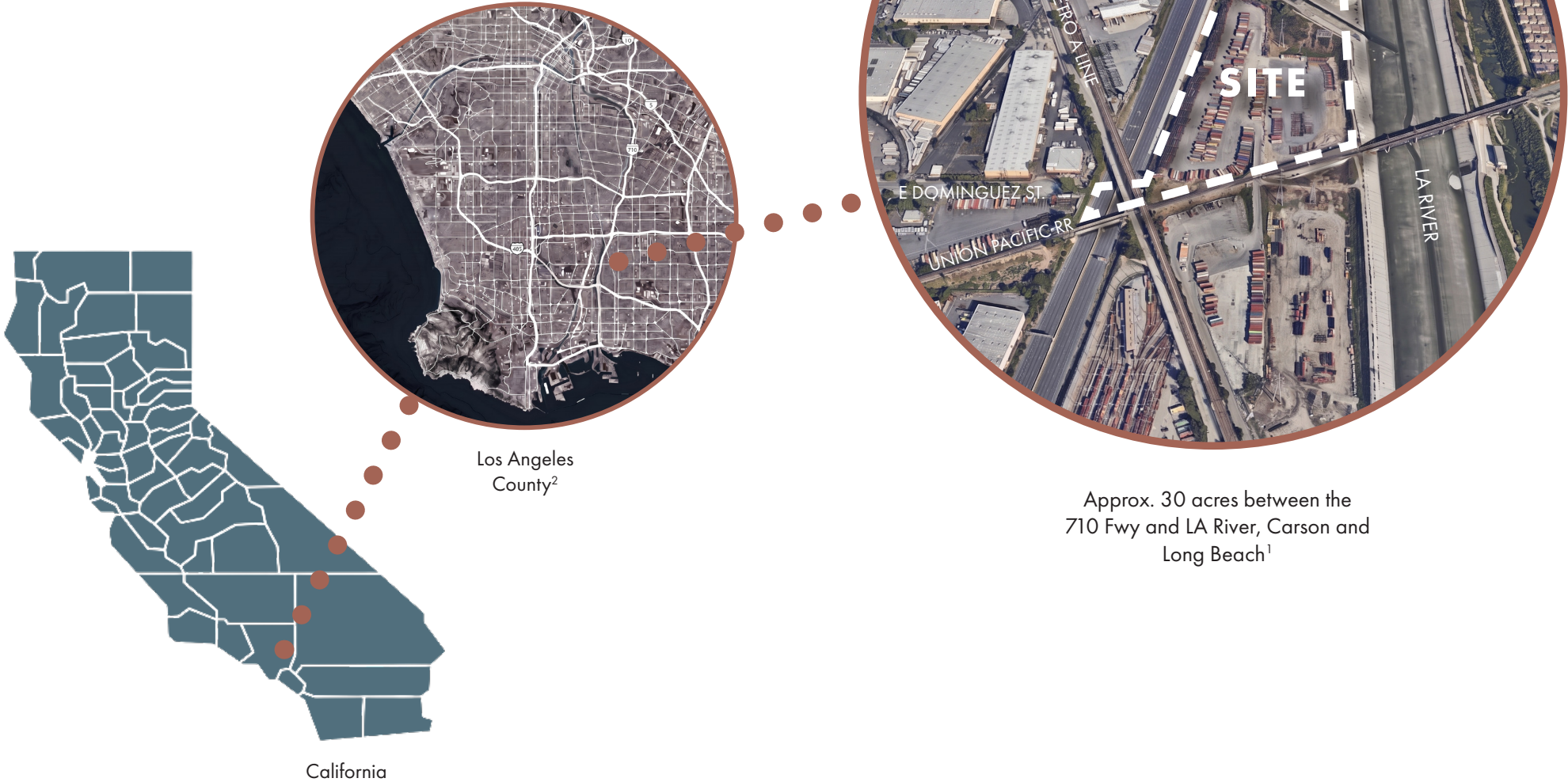
# PROJECT **OVERVIEW**

## PROJECT STATEMENT

This project reimagines the confluence of Compton Creek and the Los Angeles River as a **regenerative watershed infrastructure** that simultaneously **manages flood conveyance, restores natural systems, and expands equitable public access to green space.**

It investigates how landscape architecture can work within rigid flood-control constraints to transform a fragmented, infrastructure-dominated site into a performative landscape system—one that captures, cleans, and stores water while transforming conventional flood infrastructure into a multifunctional landscape that restores ecological function, improves habitat continuity, and reconnects surrounding communities to the watershed.

SITE **LOCATION**



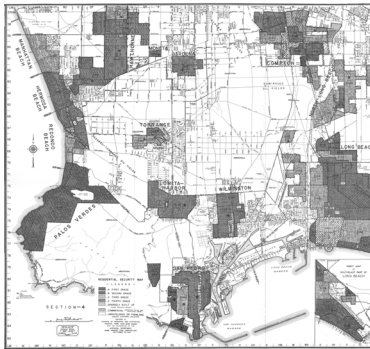
# SITE HISTORY



Pre-1850s  
Braided Riparian Wetland  
*(AI-generated)*



1938–1960  
Concrete Channelization<sup>6</sup>



1960s–1980s  
Spatial Entrapment and  
Environmental Inequity<sup>8</sup>



2016–Present  
Ecological Recovery, Persistent  
Access Gaps<sup>5</sup>



1914 · 1934 · 1938  
Catastrophic Floods<sup>4</sup>



1940s–1970s  
Industrial Pollution Peak<sup>7</sup>

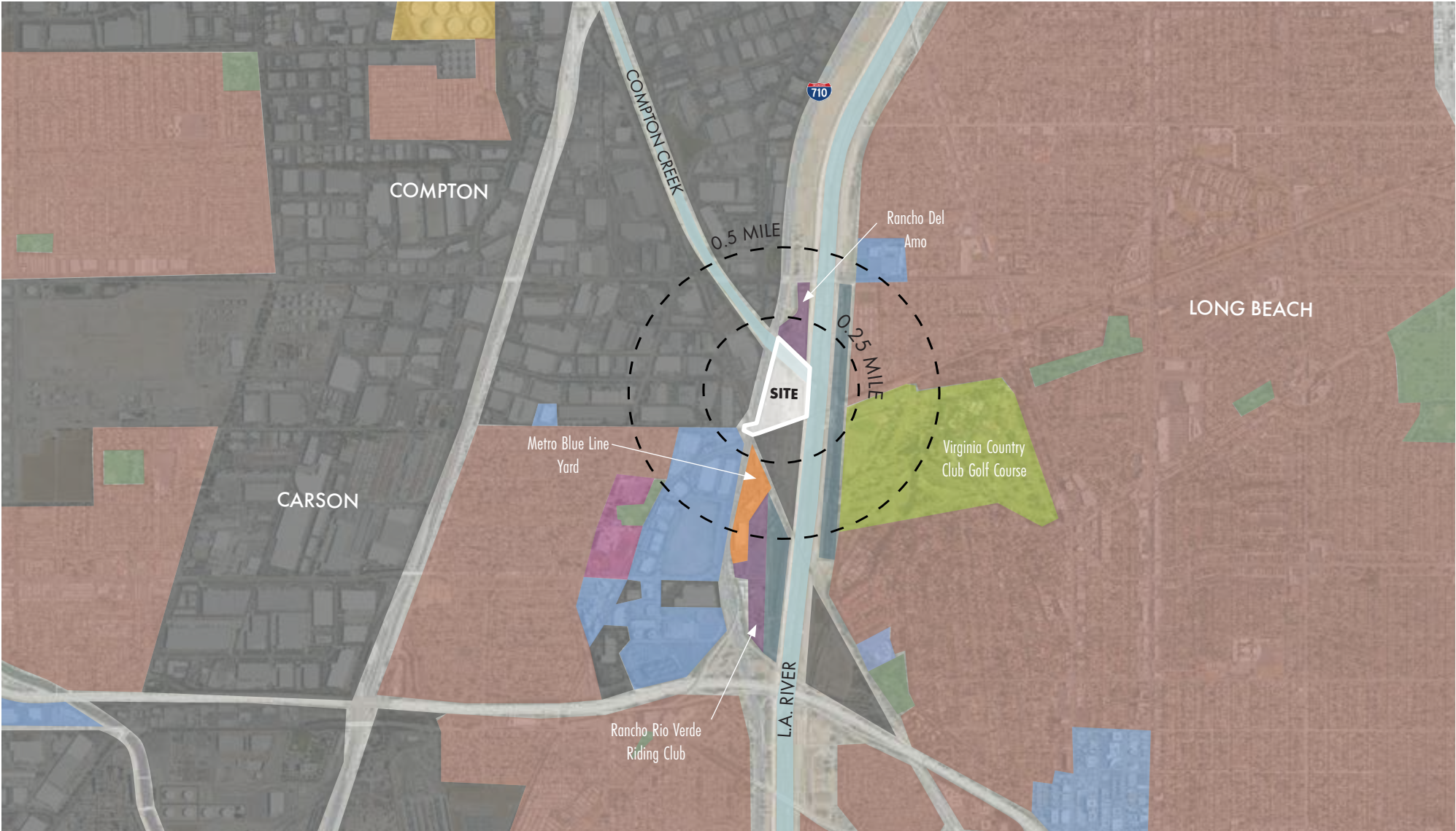


1997–2007  
Watershed Planning Begins<sup>3</sup>





# SITE ZONING



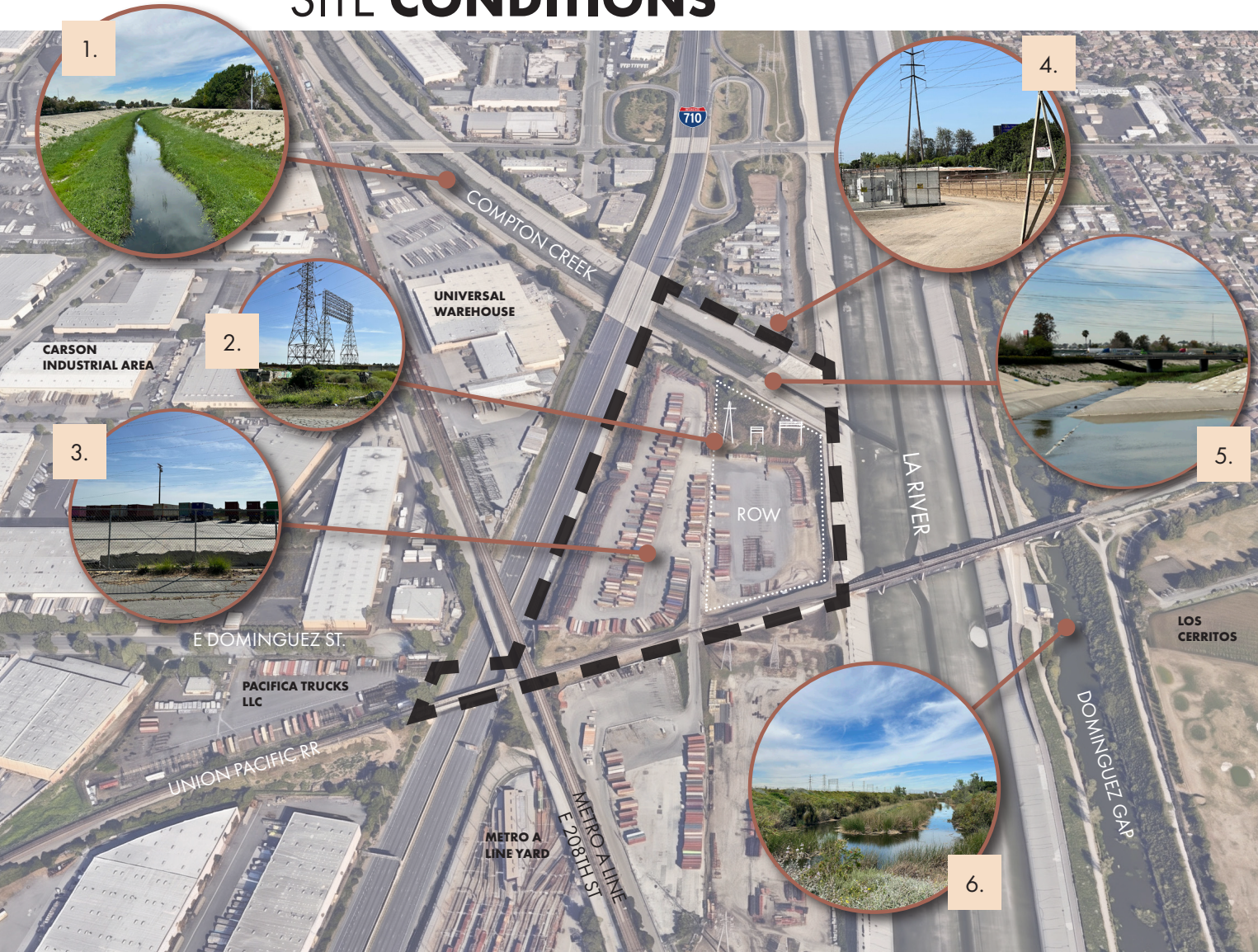
LEGEND

|             |              |            |             |                    |
|-------------|--------------|------------|-------------|--------------------|
| Industrial  | Agricultural | Commercial | Golf Course | Transportation     |
| Residential | Equestrian   | Education  | Parks       | Waterway / channel |





# SITE CONDITIONS



## EXISTING CONDITIONS

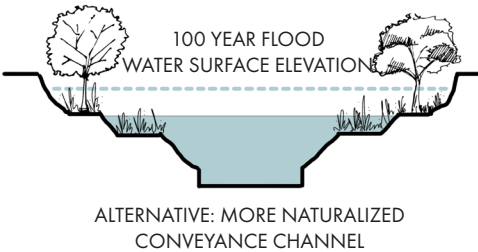
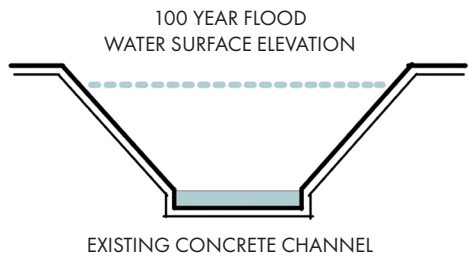
1. Vegetated low flow channel in Compton Creek
2. Transmission tower lines
3. Site currently leased by YUSIN logistics / houses shipping containers
4. Rancho Del Amo Equestrian Facility
5. Dam at Compton Creek confluence with L.A. river
6. Dominguez Gap Wetlands

0 750' 1,500' 3,000'

SCALE 1" = 1,500'



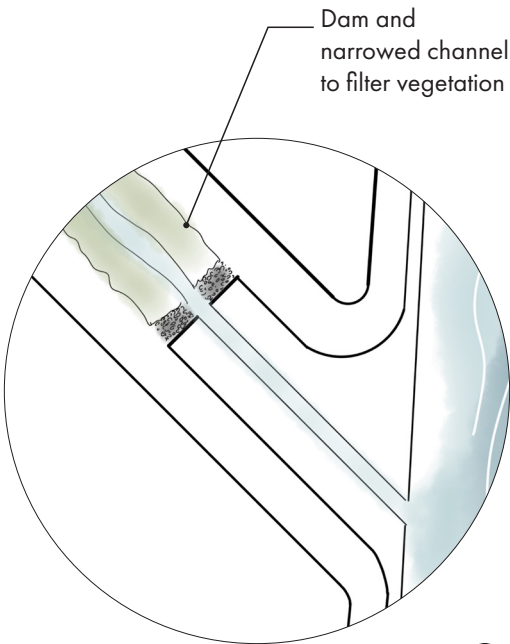
# FLOOD CONTROL



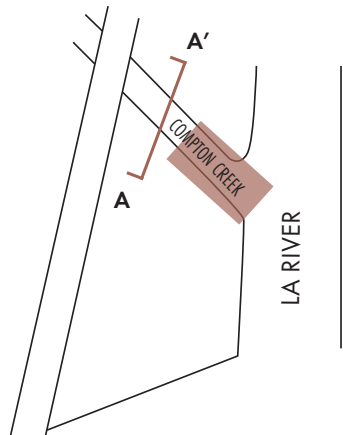
Compton Creek functions primarily as a **flood-conveyance system**, designed to move stormwater as quickly as possible and reduce the risk of flooding in surrounding communities.

Its engineered channel is designed to accommodate the high flows associated with major storm events, including the approximately 100-year flood, estimated at roughly 16,500 cubic feet per second.

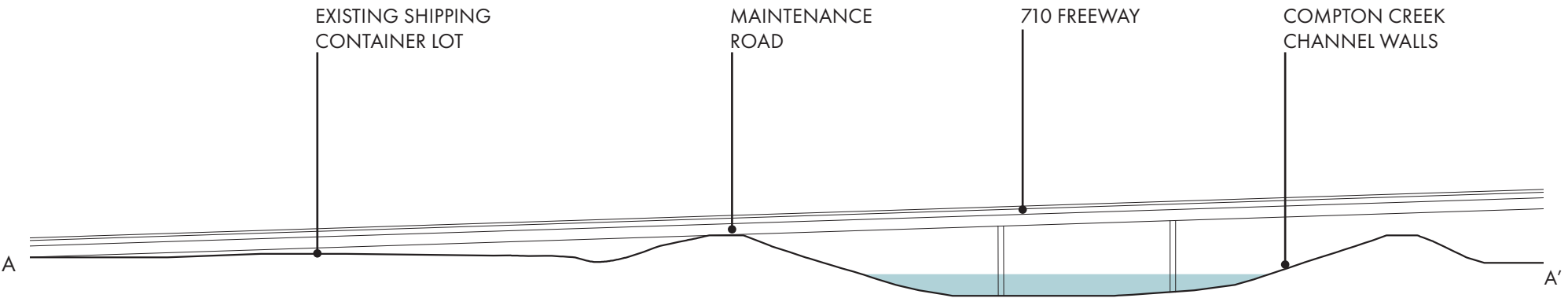
This emphasis on moving large volumes of water quickly has historically prioritized flood protection and hydraulic capacity over opportunities for water storage, infiltration, and ecological function.



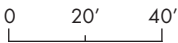
EXISTING DAM AT CONFLUENCE



KEY MAP

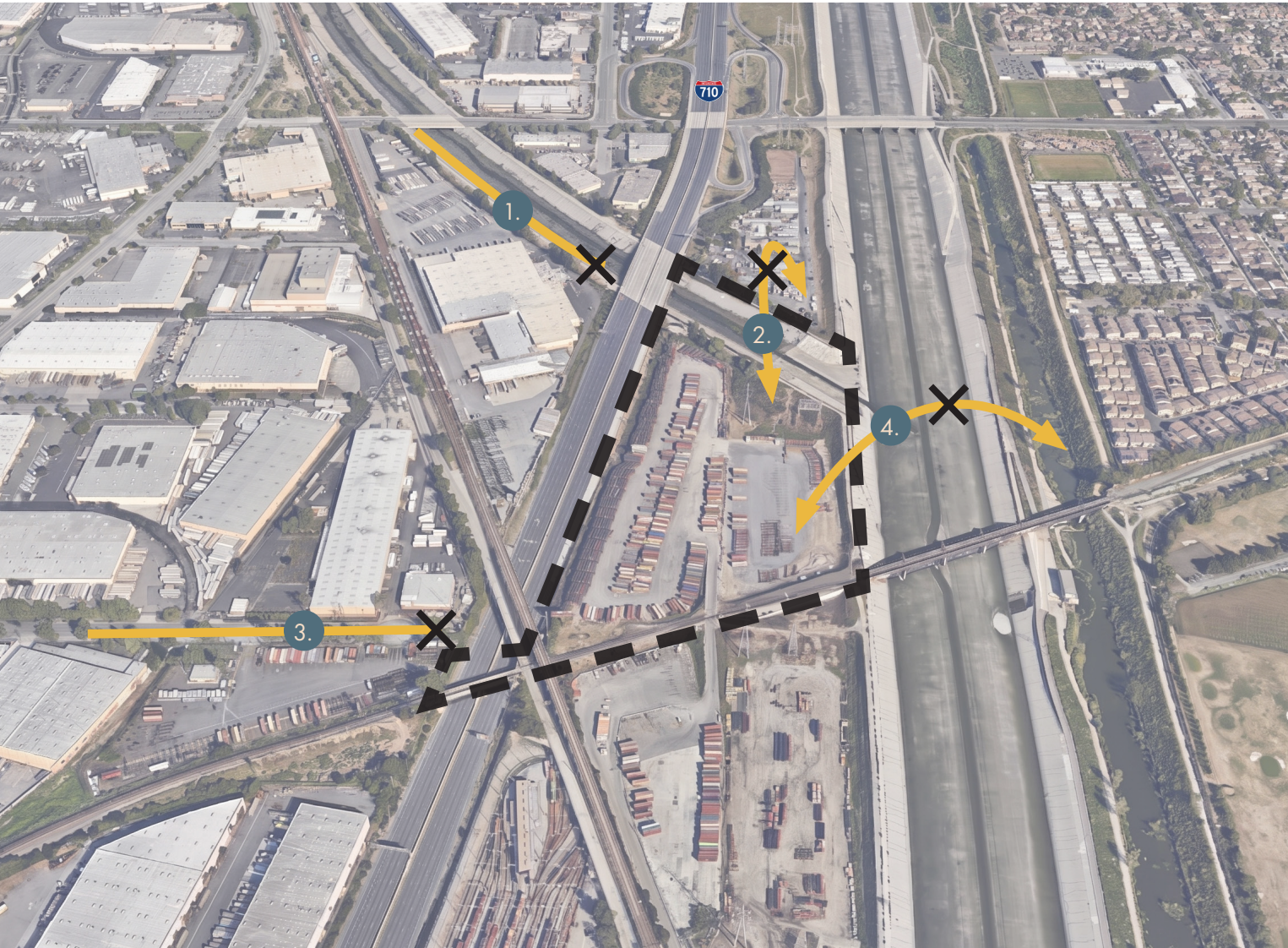


SECTION ELEVATION OF EXISTING COMPTON CREEK FLOOD CONTROL CHANNEL





# ACCESS **BARRIERS**



## BARRIERS TO ACCESS

1. Bike paths along Compton Creek stop at 710 Freeway and do not connect to L.A. River bike paths
2. There is no path over Compton Creek that would connect the equestrian centers north (Rancho Del Amo) and south (Rancho Rio Verde Riding Club) of the site. There is only a continuous multi-use trail on the east side of the LA River.
3. E Dominguez St. dead ends at the 710 Freeway, while the Metro A line, E 208th St., and the Union Pacific Railroad cross over it.
4. There is no connection for pedestrians, bikes, or horseback riders over the LA River, inhibiting access to Dominguez Gap Wetland trails.

0 750' 1,500' 3,000'  
SCALE 1" = 1,500'







# PROJECT JUSTIFICATION

At the confluence of Compton Creek and the Los Angeles River, two urban waterways converge to form a **critical hydrological and ecological artery within the greater Los Angeles basin**. Historically, this meeting point functioned as a dynamic zone of exchange where water, sediment, nutrients, and habitat systems sustained rich wetland ecologies. Today, it has been transformed into hardened flood-control infrastructure that prioritizes conveyance efficiency, while limiting ecological function and public access. Any future intervention must maintain flood conveyance capacity while expanding ecological performance and equitable access within the system.

Compton Creek, extending approximately 8.5 miles through a 42.1-square-mile watershed, functions as a conduit for urban runoff from residential, commercial, transportation, and industrial land uses. With only 3.3% of the watershed remaining as open space, opportunities for infiltration, filtration, and habitat regeneration are severely constrained. Stormwater is rapidly conveyed through the channelized system and discharged at the confluence, concentrating pollutants such as trash, oil, nutrients, bacteria, and heavy metals.

Despite these conditions, the confluence remains a strategic **opportunity for rethinking urban watershed infrastructure**. As a key junction in the system, it offers the potential to integrate flood conveyance with ecological restoration, improving water quality processes and supporting habitat formation while maintaining hydraulic performance.

The site is also shaped by **spatial and social fragmentation**. It is encircled by transportation infrastructure—including Interstate 710, rail lines, and arterial roads—that disrupt ecological continuity and limit access for surrounding communities. Although adjacent neighborhoods, particularly in Carson, are nearby, they remain **disconnected from safe access to the river corridor**, reflecting broader environmental inequities across Los Angeles where infrastructure-heavy landscapes concentrate burdens while limiting access to ecological resources.

This project responds by maintaining flood conveyance capacity while reconfiguring urban flood infrastructure to restore ecological processes and expand public access within a park-poor, infrastructure-dominated landscape. Rather than treating flood protection, water quality, habitat, and recreation as separate functions, the project integrates them within a single regenerative watershed system. At the confluence, infrastructure is no longer limited to moving water through the landscape; it becomes a **framework for capturing and cleaning stormwater, creating habitat, providing public space, and reconnecting communities to the watershed**.

## GOALS & OBJECTIVES

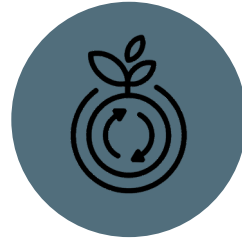


1

### Reform Urban Flood Infrastructure

#### OBJECTIVES

1. Maintain flood conveyance while reconfiguring urban flood infrastructure
2. Increase stormwater and groundwater recharge
3. Slow and disperse stormwater flows
4. Transform flood infrastructure into public landscape
5. Reconnect people to urban water systems
6. Demonstrate visible water-cleaning processes within the landscape



2

### Restore Ecological Function

#### OBJECTIVES

1. Restore ecological function within a constrained watershed
2. Improve soil health and reduce contamination through phytoremediation and regenerative practices
3. Construct continuous habitat corridors linking upland, floodplain, and channel edge that support the recolonization of native bird, pollinator, and aquatic species
4. Generate best practices in the application of regenerative principles to an urban context involving flood infrastructure.
5. Educate visitors on regenerative principles, ecological restoration, and native species



3

### Create Equitable Public Access

#### OBJECTIVES

1. Connect adjacent neighborhoods to the river through distributed entry nodes and pathways
2. Provide safe and legible pedestrian access to the site
3. Connect bike pathways to the site from the LA River and Compton Creek
4. Connect equestrian communities north and south of the site
5. Provide open green space for recreation and community events
6. Provide space for communities to celebrate art and culture

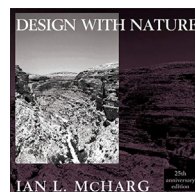
## DESIGN **METHODOLOGIES**

This project develops design strategies for the Compton Creek Confluence by reinterpreting urban flood infrastructure as a coupled ecological and civic system. It operates at the intersection of hydrology, soil systems, habitat restoration, and public access within a highly urbanized watershed context.

The methodology is structured through four primary frameworks that collectively guide analysis, site strategy, and design development:

- Ian McHarg's *Design with Nature* (1969), which provides a foundation for ecological suitability analysis through layered mapping of hydrology, soils, topography, vegetation, and disturbance;
- Pierre Bélanger's landscape-as-infrastructure framework, which reframes ecological systems as performative urban infrastructure that structures flood control, ecology, and public space;
- The Lower Los Angeles River Revitalization Plan, which establishes regional goals for flood management, habitat restoration, and public access within the watershed;
- John Tillman Lyle's *Regenerative Design for Sustainable Development*, which advocates for designing landscapes as self-renewing systems that restore ecological processes and enhance a site's capacity to regenerate water, habitat, and other natural resources over time.

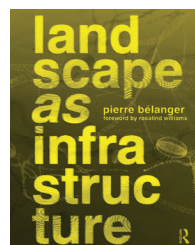
Together, these frameworks inform a design process grounded in ecological analysis, infrastructure performance, and regenerative systems thinking. The project further draws from precedent studies in river restoration, constructed wetlands, and post-industrial landscape reclamation to inform strategies such as channel reconfiguration, floodplain expansion, delta formation, and water-slowng landforms. These interventions are tested through hydrologic mapping, sectional analysis, and overlay studies to evaluate their capacity to increase infiltration, reduce flood velocity, improve habitat continuity, and expand equitable public access.



### **Ecological analysis and mapping**

*Design with Nature* - McHarg, Ian, 1969.

- » Mapping / layering environmental systems



### **Landscape design for ecological performance**

*Landscape as Infrastructure* - Bélanger, P., 2016.

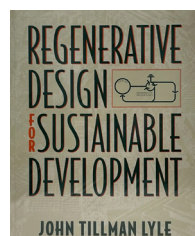
- » Landscape is a working system, not a decorative surface
- » Ecologies should be judged by performance, not appearance. A landscape is successful if it cleans water, reduces flood risk, builds soil, supports biodiversity



### **LA River development guidelines**

*Lower LA River Revitalization Plan* - City of Los Angeles

- » Framework for implementing development projects along the lower LA River



### **Regenerative landscape design strategies**

*Regenerative Design for Sustainable Development* - John Tillman Lyle, 1994.

- » Regenerative systems based on self-renewing processes
- » Cultural, social, and economic implications of regenerative systems

### **Other notable resources**

- Lancaster, B. (2020). *Rainwater Harvesting for Drylands and Beyond*. Vol. 2.
- Swyngedouw, E. (2004). "Social Power and the Urbanization of Water"
- Heynen, N. et al. (2006). *In the Nature of Cities*.
- Spirn, Anne Whiston Spirn (1984). *The Granite Garden: Urban Nature and Human Design*.
- Mostafavi, M. (2010). *Ecological Urbanism*.



POTENTIAL **USERS**



**FAMILIES**

- Families from Carson, Compton, Long Beach, and Los Cerritos



**RUNNERS & WALKERS**

- Users of existing bike / running paths along L.A. River, and Compton Creek



**CYCLISTS**

- Users of existing bike paths along L.A. River and Compton Creek



**DOG WALKERS**

- Dogs and their caretakers in Carson, Compton, Long Beach, and Long Beach



**HORSEBACK RIDERS**

- Rancho Del Amo
- Rancho Rio Verde



**STUDENTS**

- Dominguez Elementary School
- Rancho Dominguez Preparatory School



**COMMUNITY GROUPS & ORGANIZERS**

- Friends of the Los Angeles River
- The River Project
- LA River X



**RESEARCHERS & STEWARDS**

- Bird watchers
- Photographers
- Naturalists

**Carson population:** 17.39% white, 22.47% are Black or African American, 0.88% American Indian and Alaska Native, 26.94% Asian, 1.36% Native Hawaiian and other Pacific Islander, 16.09% other, and 14.88% multiracial. Median age: 41.7

**Long Beach population:** 38.29% White, 18.24% other race, 13.11% Asian, 11.75% Black or African American, and smaller percentages for Native American, Native Hawaiian or Pacific Islander and multiracial populations. Median age: 38



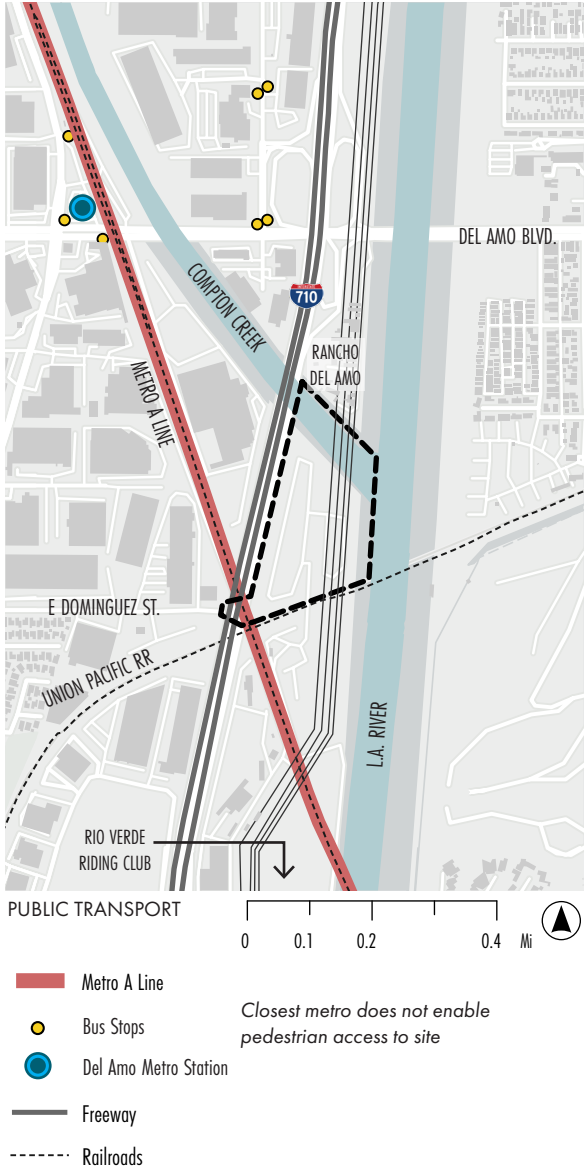
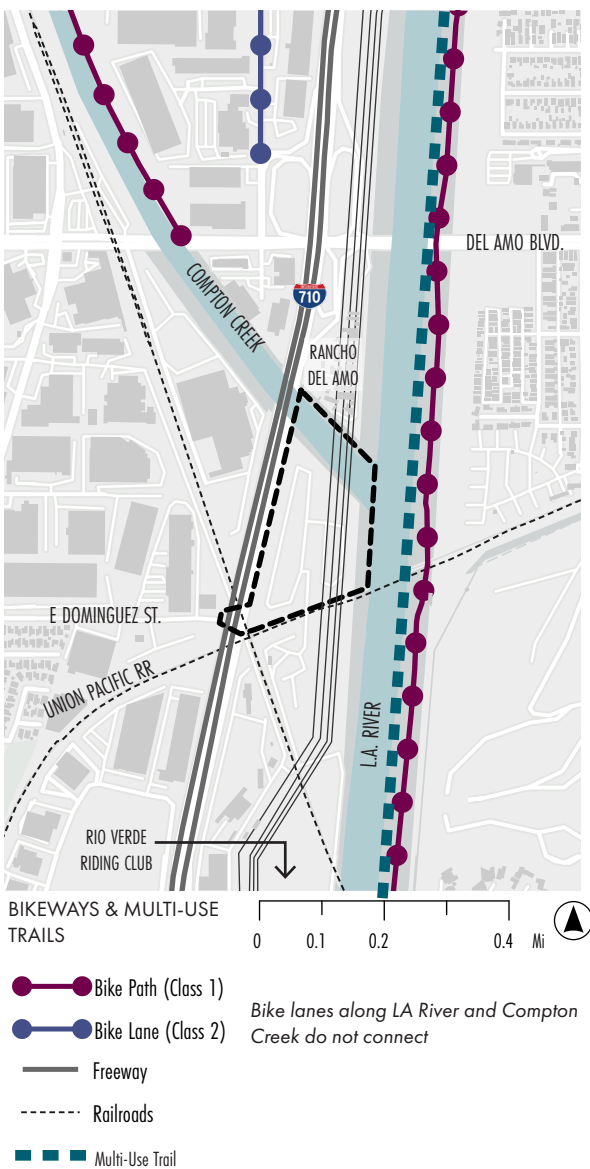
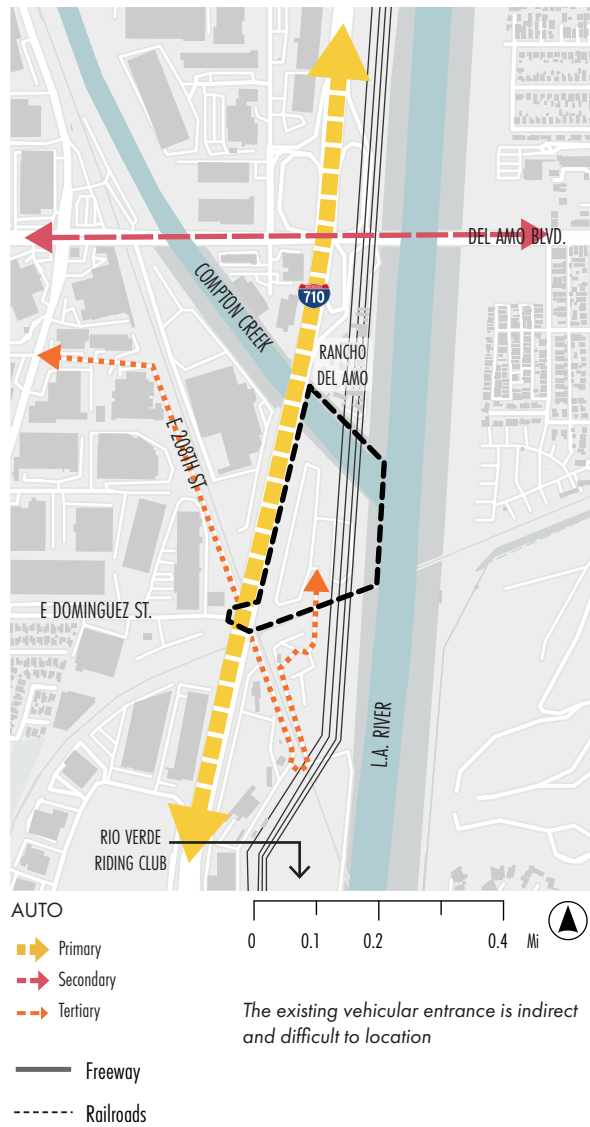




# RESEARCH & **ANALYSIS**

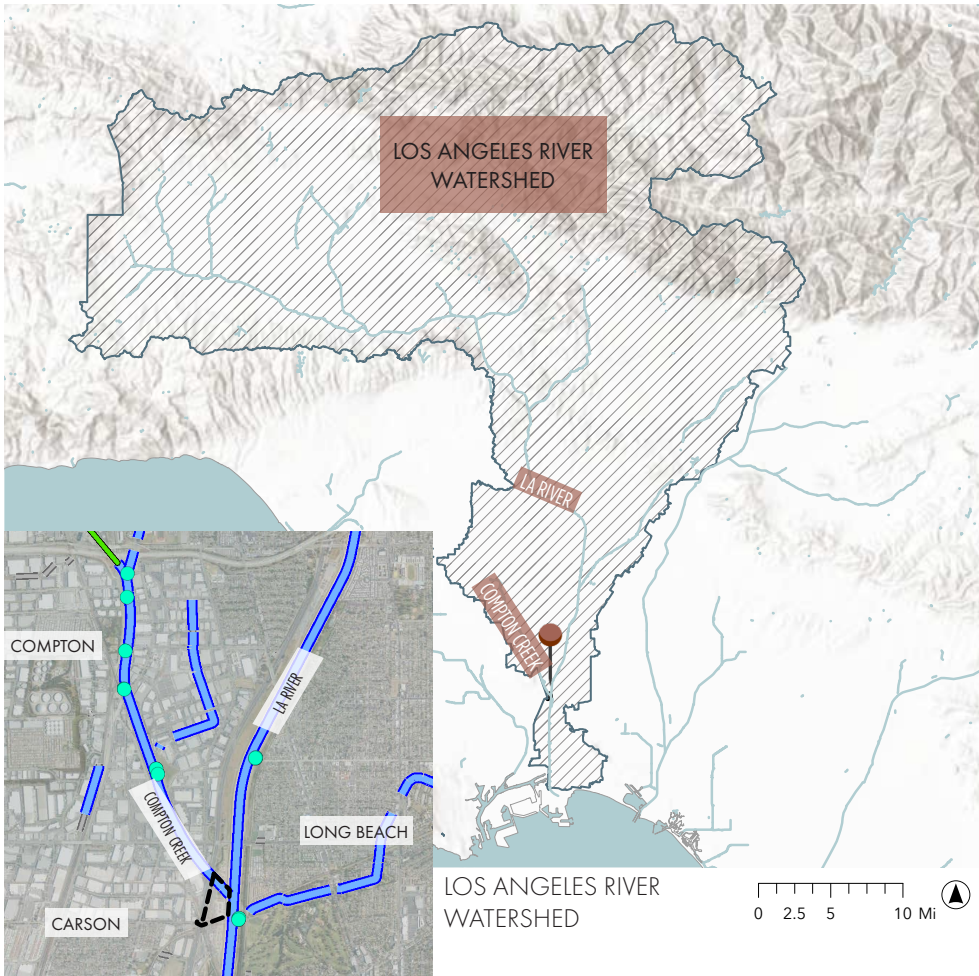


CIRCULATION



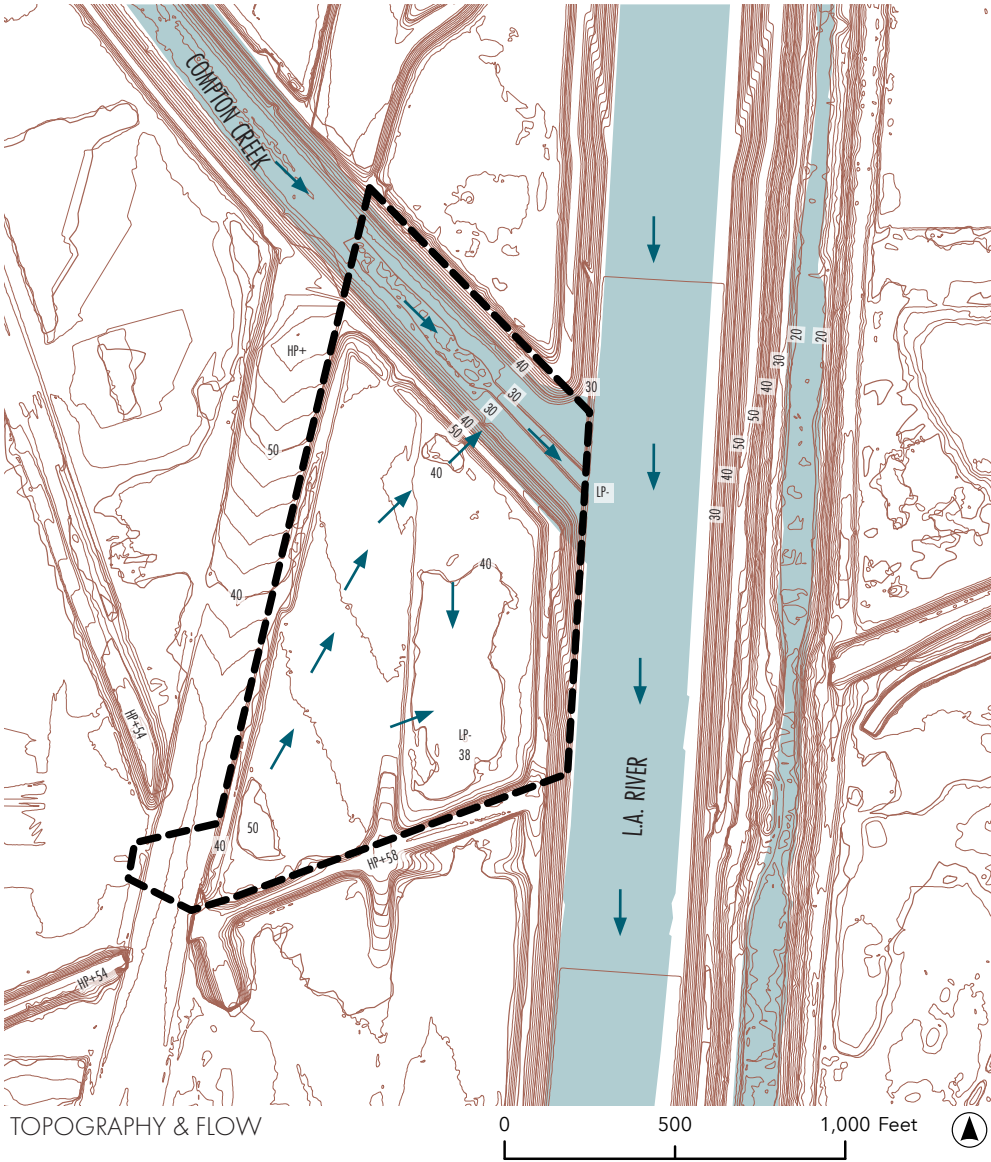


# WATERSHED & STORMWATER



- STORMDRAIN NETWORK
- Site Boundary
  - MS4 Outfalls
  - Owned by US Army Corps of Engineers
  - Channels Completed

Compton Creek discharges **8,200 acre-feet of water per year** with a **peak discharge of 16,500 cfs** (LACFCD 2013).



- TOPOGRAPHY & FLOW
- Site Boundary
  - LARIAC Contours 10ft
  - LARIAC Contours 2ft

Topography on the western half of the site gently slopes down to the northeast, eventually leading to a drainage outflow connecting to Compton Creek.





# HABITAT & ENDANGERED SPECIES

According to the California State Coastal Conservancy, nearly all of the original wetlands and approximately 90–95% of the in-stream riparian habitat in the Los Angeles River watershed have disappeared due to urban development and the channelization of rivers and creeks.

The Los Angeles Audubon Society, Friends of the Los Angeles River, and The River Project have identified numerous species of birds, amphibians, and fish throughout the Lower LA River region. Of these, the U.S. Fish and Wildlife Service recognized 55 plant and animal species as threatened, endangered, or under recovery protection.



Arroyo Toad<sup>9</sup>



California Least Tern <sup>10</sup>



Marsh Sanwort <sup>11</sup>



San Joaquin Kit Fox<sup>12</sup>



Blunt-nosed Leopard Lizard <sup>13</sup>

**THREATENED, ENDANGERED, & RECOVERING SPECIES WITH NOTABLE OCCURRENCES IN THE LOWER LA RIVER**

| GROUP            | COMMON                     | SCIENTIFIC                      | STATUS     |
|------------------|----------------------------|---------------------------------|------------|
| Amphibians       | Arroyo Toad                | Anaxyrus californicus           | Endangered |
| Birds            | California least tern      | Sterna antillarum browni        | Endangered |
|                  | Western snowy plover       | Charadrius alexandrinus nivosus | Threatened |
| Flowering Plants | Marsh Sandwort             | Arenaria paludicola             | Endangered |
| Mammals          | San Joaquin kit fox        | Vulpes macrotis mutica          | Endangered |
| Reptiles         | Blunt-nosed leopard lizard | Gambelia silus                  | Endangered |
|                  | Leatherback sea turtle     | Dermochelys coriacea            | Endangered |
|                  | Olive ridley sea turtle    | Lepidochelys olivacea           | Threatened |
|                  | Island night lizard        | Xantusia riversiana             | Recovery   |

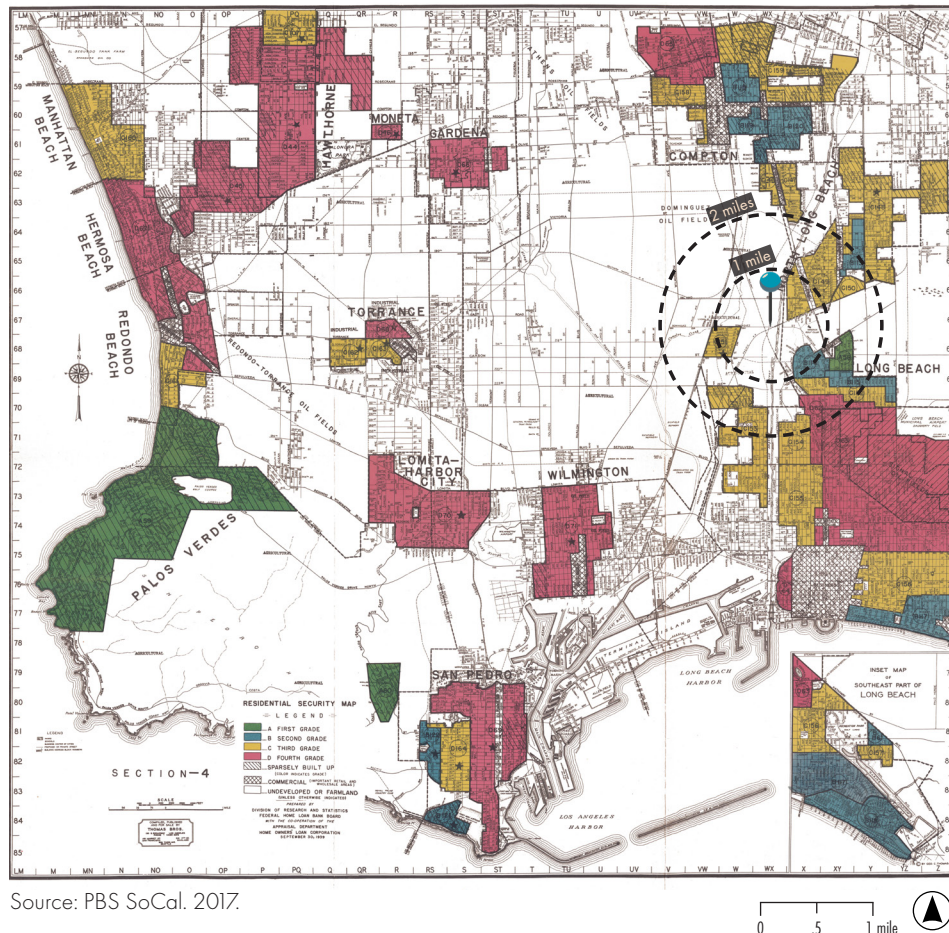
Source: USFWS, 2017; LRRP Vol. 2 Chap. 1, 2017





# ENVIRONMENTAL JUSTICE

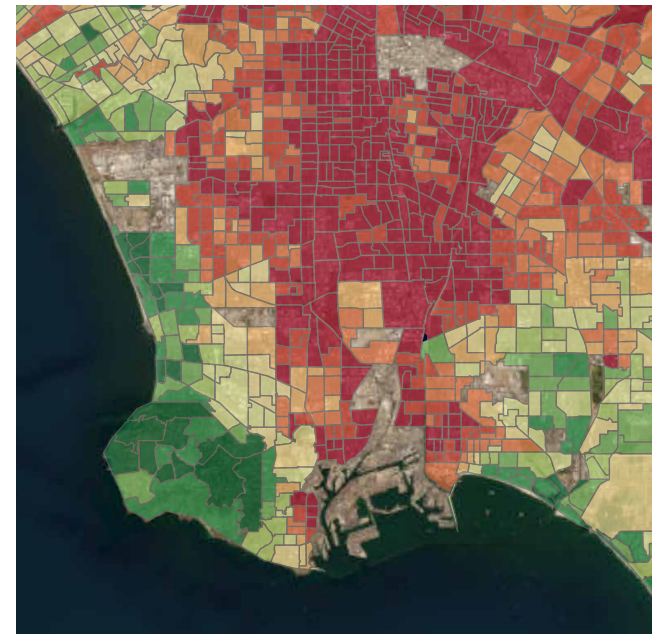
## 1930s HOLC 'redlining' survey of Los Angeles



### LEGEND

|                                                                                                                         |                                |
|-------------------------------------------------------------------------------------------------------------------------|--------------------------------|
| <span style="display:inline-block; width:15px; height:15px; background-color: #4CAF50; border:1px solid black;"></span> | GRADE A (LOW INVESTMENT RISK)  |
| <span style="display:inline-block; width:15px; height:15px; background-color: #2196F3; border:1px solid black;"></span> | GRADE B                        |
| <span style="display:inline-block; width:15px; height:15px; background-color: #FFEB3B; border:1px solid black;"></span> | GRADE C                        |
| <span style="display:inline-block; width:15px; height:15px; background-color: #F44336; border:1px solid black;"></span> | GRADE D (HIGH INVESTMENT RISK) |

The 1930s HOLC 'redlining' survey of Los Angeles ranked neighborhoods by mortgage 'risk', which ultimately based on ethnic composition of residents. Over time, these **ratings shaped where wealth, infrastructure, and environmental investment were concentrated.**



Environmental Justice Index based on  
CalEnviroScreen 4.0

NTS

### LEGEND

|                                                                                                                         |                           |
|-------------------------------------------------------------------------------------------------------------------------|---------------------------|
| <span style="display:inline-block; width:15px; height:15px; background-color: #C0392B; border:1px solid black;"></span> | 90 - 100 (Highest burden) |
| <span style="display:inline-block; width:15px; height:15px; background-color: #E74C3C; border:1px solid black;"></span> | 80 - 90                   |
| <span style="display:inline-block; width:15px; height:15px; background-color: #F08080; border:1px solid black;"></span> | 70 - 80                   |
| <span style="display:inline-block; width:15px; height:15px; background-color: #FFDAB9; border:1px solid black;"></span> | 60 - 70                   |
| <span style="display:inline-block; width:15px; height:15px; background-color: #FFFFE0; border:1px solid black;"></span> | 50 - 60                   |
| <span style="display:inline-block; width:15px; height:15px; background-color: #FFFF00; border:1px solid black;"></span> | 40 - 50                   |
| <span style="display:inline-block; width:15px; height:15px; background-color: #FFD700; border:1px solid black;"></span> | 30 - 40                   |
| <span style="display:inline-block; width:15px; height:15px; background-color: #FFA500; border:1px solid black;"></span> | 20 - 30                   |
| <span style="display:inline-block; width:15px; height:15px; background-color: #FF4500; border:1px solid black;"></span> | 10 - 20                   |
| <span style="display:inline-block; width:15px; height:15px; background-color: #FF0000; border:1px solid black;"></span> | 0 - 10 (Lowest burden)    |

Communities along Compton Creek experience some of the highest cumulative burdens in California--in the **90-100 percentile**. These conditions are closely linked to historic disinvestment and environmental racism. East of the LA River, south of the confluence, there is a staunch difference, with communities in the Los Cerritos area ranking in the 10-20 percentile.

### Indicators include:

#### Pollution burden

- Ozone
- PM2.5
- Diesel particulate matter
- Toxic releases
- Traffic density
- Drinking water contaminants
- Lead from housing

#### Population characteristics

- Asthma
- Low birth weight
- Cardiovascular disease
- Education
- Unemployment
- Poverty
- Linguistic isolation
- Housing burden



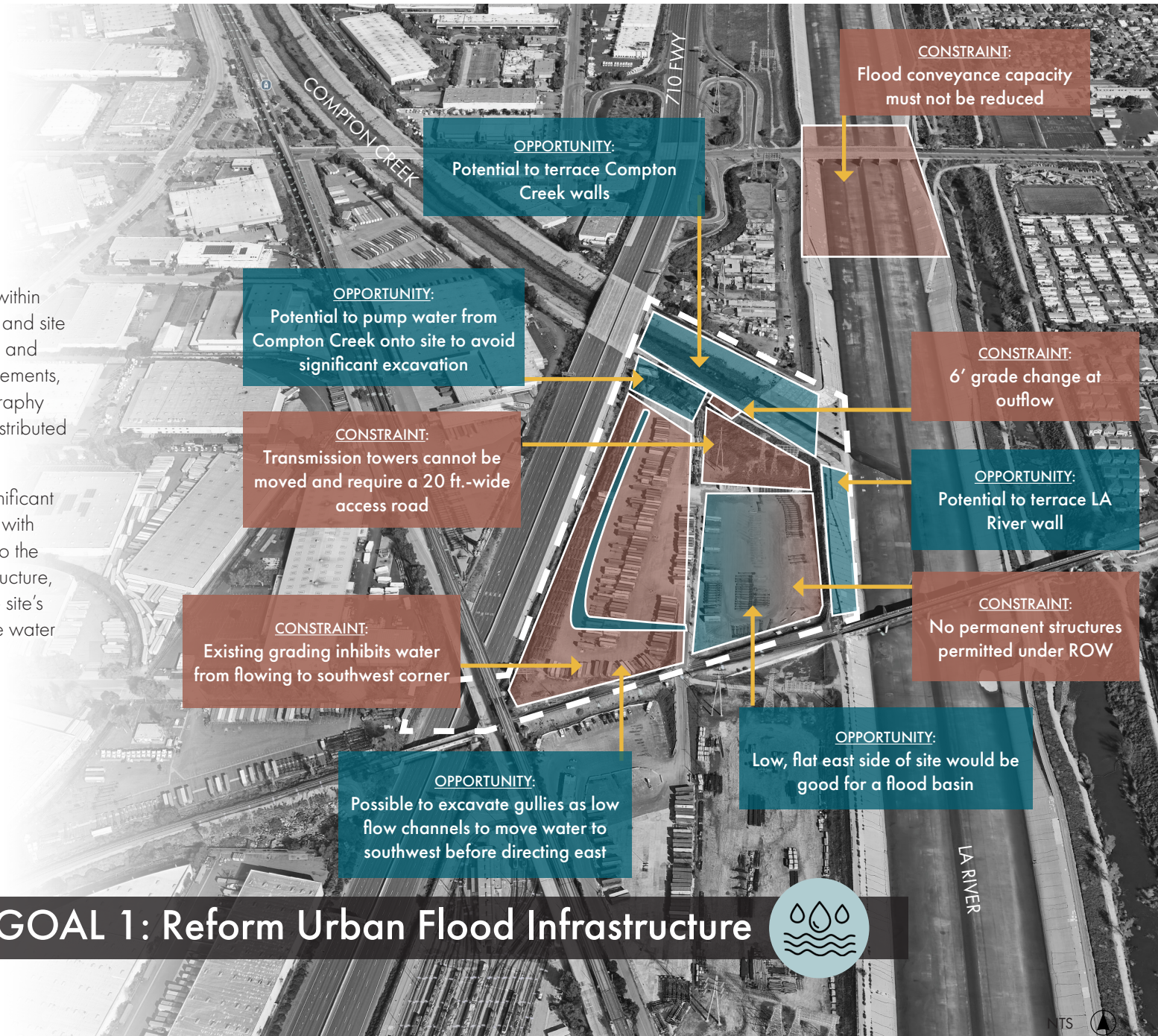
# OPPORTUNITIES & CONSTRAINTS

## Goal 1: Reform Urban Flood Infrastructure

Flood infrastructure improvements must work within the constraints of existing flood-control, utility, and site systems. While channelization limits infiltration and ecological function, flood conveyance requirements, transmission infrastructure, and existing topography restrict how water can be managed and redistributed across the site.

Despite these constraints, the site presents significant opportunities to integrate flood management with ecological restoration. Its size and proximity to the river create space for terracing, green infrastructure, and expanded floodplain functions, while the site's topography offers opportunities to redistribute water and increase stormwater storage capacity.

## GOAL 1: Reform Urban Flood Infrastructure





# OPPORTUNITIES & CONSTRAINTS

## Goal 2: Restore Ecological Function

Ecological restoration is challenged by pollution from adjacent infrastructure, degraded water quality, and compacted industrial soils that limit habitat function and require remediation.

These conditions present an opportunity to apply regenerative practices that work with natural systems, using landforms and planting to mitigate noise and air pollution while phytoremediating vegetation restores soil health, improves water quality, and supports long-term ecological resilience.

As a living laboratory, the site can also generate knowledge on the implementation of regenerative practices within an urban flood-infrastructure context through ongoing monitoring, documentation, and adaptive management.





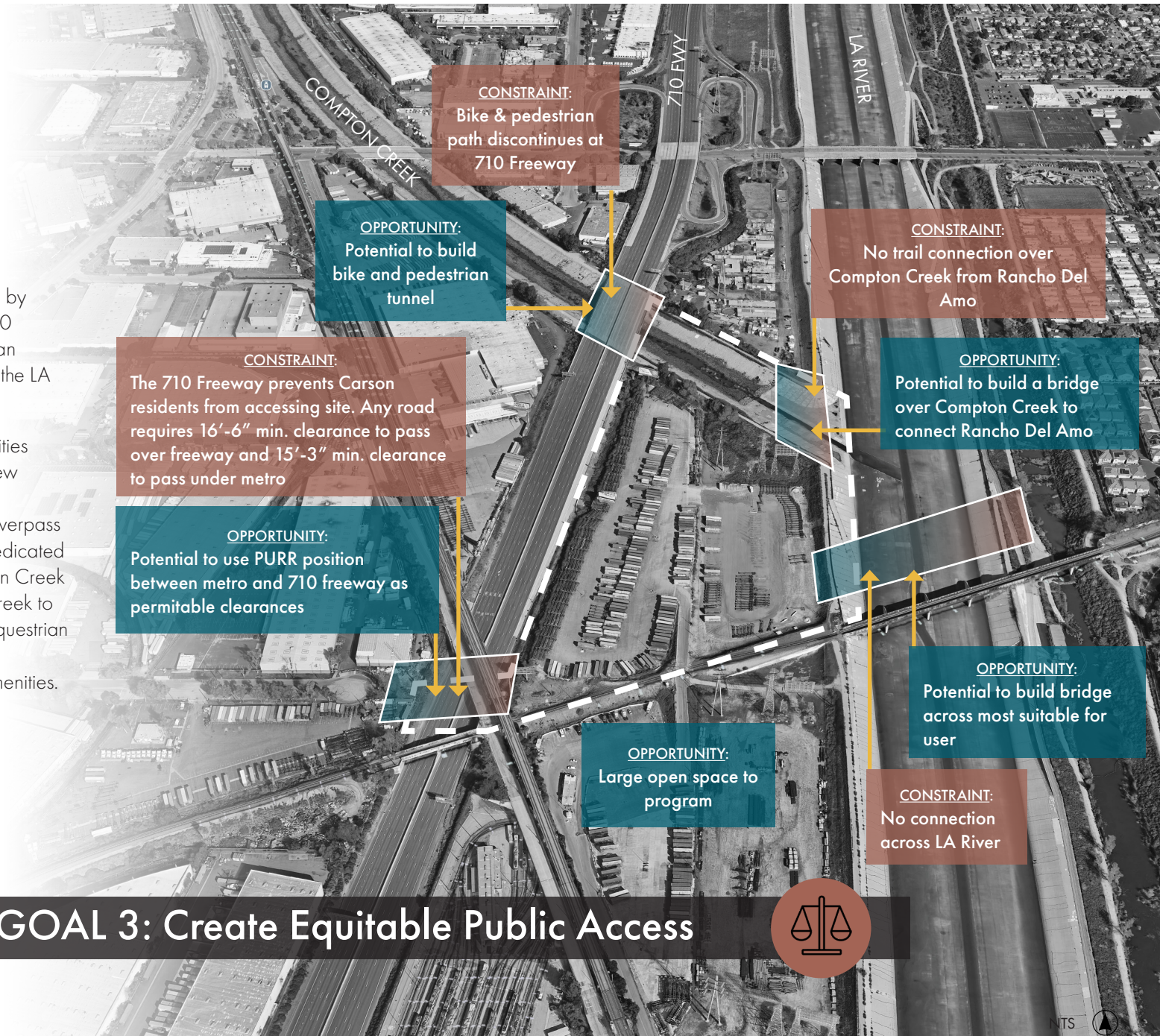
# OPPORTUNITIES & CONSTRAINTS

## Goal 3: Create Equitable Public Access

Equitable access to the site is currently limited by major transportation barriers, including the 710 Freeway, discontinuous bicycle and pedestrian infrastructure, and the lack of a crossing over the LA River.

However, these challenges present opportunities to strengthen regional connectivity through new multimodal access improvements, including replacing the 208th Street corridor with an overpass connecting E. Dominguez St. to the site, a dedicated bicycle and pedestrian tunnel along Compton Creek below the 710 Freeway, a bridge over the Creek to connect Rancho Del Amo and facilitate an equestrian trail, and a new river crossing that connects surrounding communities to the site and its amenities.

## GOAL 3: Create Equitable Public Access





# PROJECT PRECEDENT

## DOMINGUEZ GAP WETLAND

The Dominguez Gap Wetland Project was a LA River Master Plan demonstration project. It pairs riverside bike and nature trails with a groundwater treatment and stormwater management system. Stormwater from urban areas is directed to wetlands via a culvert midway up the eastern side. The wetlands store as much water as possible before a massive pump station draws it down, sending excess water directly to the Los Angeles River. It is full of native plants and birds, offering refuge for both people and animals in the middle of an urban area.

- **Plants:**
  - » 50,000 plants planted along slopes, with other areas covered by hydroseeding
  - » Plants needed for nutrient removal were selected for the bottom of the trapezoid, while the embankments and islands addressed animal needs.
- **Birds:** Plants that encourage nesting were chosen for the islands, while bank vegetation wither served as food or attracted insects as food for birds
- **Contaminants remediation:**
  - » Bacteria and fungi in sediments break down nitrogen and biodegradable organics.
  - » Phosphorus and metals are adsorbed by wetland plants and sediments.
  - » LAC-PW estimated
    - Total nitrogen: 40% to 90%
    - Total phosphorus: 10% to 90%
    - Total suspended solids: 50% to 90%
    - Biological oxygen demand: 50% to 90%
    - Heavy metals: 50% to 90%
    - Fecal coliform: up to 99%

Sources: McDilda (2009); WCA (n.d.)

**Location:** Long Beach, CA

**Developer:** LA County of Public Works

**Area:** 50 acres

**Year:** 2008

**Funding:** Los Angeles County Flood Control District paid \$4 million, the State Water Resources Control Board paid \$2.3 million, the California Coastal Conservancy paid \$400,000, and the River and Mountains Conservancy paid \$200,000.



Dominguez Gap Wetland from South end<sup>15</sup>



Dominguez Gap Wetland Pump Station<sup>14</sup>

### Key takeaways:

- phytoremediation strategies,
- habitat strategies,
- infrastructural relationship with LA River;
- potential funding sources

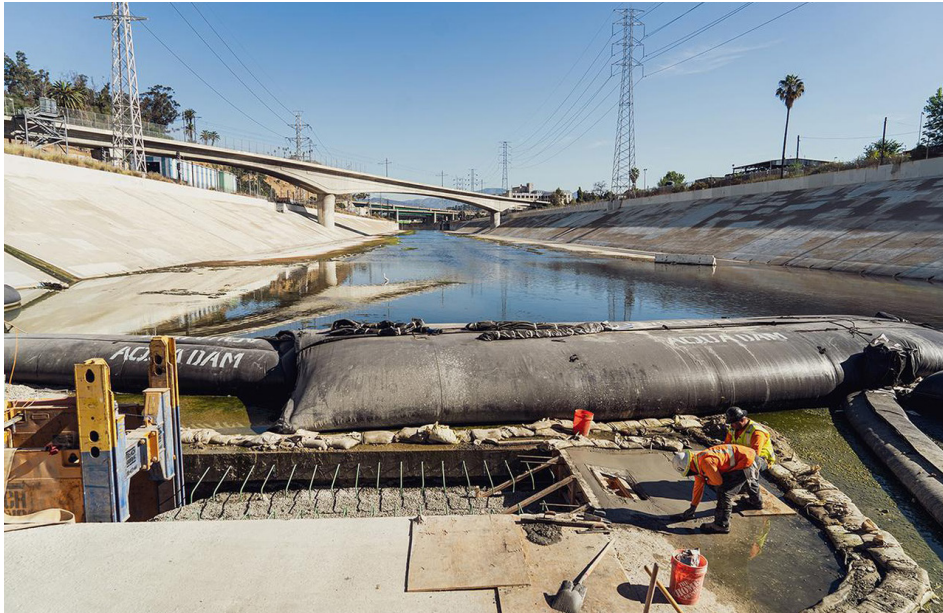


## PROJECT PRECEDENT

# BENDING THE RIVER

Bending the River by Metabolic Studio diverts water from the Los Angeles River and carries it nearly a mile inland to a former industrial rail yard, where it is circulated through a visible, gravity-fed system at the Los Angeles State Historic Park. The project transforms the site into a functioning ecological landscape, using that water to support soil remediation, planting, and closed-loop cycles. It operates as both infrastructure and public artwork, making urban water systems tangible while testing decentralized, regenerative design strategies.

- Diverted approximately 20,000 gallons/day of water from the Los Angeles River via a permitted pipeline system
- Moved water ~1 mile inland using gravity-fed infrastructure, eliminating the need for mechanical pumping
- Daylighted a continuous surface flow across an otherwise dry industrial parcel, making hydrology visible and experiential



Architects: Lauren Bon and Metabolic Studio

Area: 1-2-acre core infrastructural art site with a broader linear and hydrological influence along the Los Angeles River corridor

Year: 2012



### Key takeaways:

- Flood infrastructure is multi-functional
- Performative flood infrastructure
- Edge conditions as intervention zone



# PROJECT PRECEDENT

## SHANGHAI HOUTAN PARK

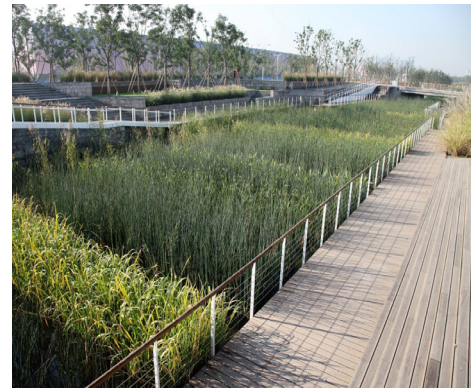
Architects: Turenscape

Area: 140,000 m<sup>2</sup> (≈34.5 acres)

Year: 2010

Houtan Park was built on a Brownfield, industrial park site and is considered a “regenerative living landscape” on Shanghai’s Huangpu riverfront. The design strategy includes a constructed wetland, ecological flood control, reclaimed industrial structures and materials, and urban agriculture, while aiming to treat polluted river water and recover a degraded waterfront.

- Transforms polluted river water into clean water using a 1.7 km constructed wetland system
- Treats ~2,400 m<sup>3</sup> (≈634,000 gallons) of water per day through ecological processes.
- Improved water quality from Grade V (heavily polluted) to Grade III (usable for irrigation/landscape).
- Provides effective flood control while replacing conventional concrete floodwalls
- It used post-industrial design and integrated modern art to reflect on the history around the site.



### Key takeaways:

- Comparable size and context (industrial site along river, similar size, similar objectives)
- Strategies for cleaning water and soil using plants through design
- Strategies for enabling users to circulate among the park while accounting for flood control
- Not comparable: policies and regulations that would guide implementation, monitoring, etc.

Images: ArchDaily, 2011.<sup>17</sup>



## PROJECT PRECEDENT

# VERDUGO WASH CONFLUENCE

- The confluence was identified as a major opportunity node for reconnecting habitat corridors between the LA River, Verdugo Mountains, Griffith Park, and surrounding tributaries.
- The area was considered more feasible for restoration than many other portions of the LA River because parts of the ARBOR (Area with Restoration Benefits and Opportunities for Revitalization) reach already contain soft-bottom conditions and remnant riparian habitat.
- The study specifically highlighted “extensive ecological restoration at Verdugo Wash” under Alternative 20, the most ambitious restoration scenario.
- Restoration feasibility was tied to maintaining flood-control performance. The study did not support fully removing flood infrastructure; instead it proposed widening, terracing, side channels, habitat benches, and tributary restoration while preserving flood capacity.
- Industrial land ownership and infrastructure constraints around the confluence were acknowledged as major limiting factors. Later feasibility work by the Trust for Public Land emphasized that the site remains an active industrial/jobs area, so future restoration would likely need to coexist with logistics and industrial operations rather than fully replace them.
- Verdugo Wash Master Plan project team is now studying geomorphology, hydrology, bioengineering, and flood modeling specifically to determine where the channel could be reconfigured while preserving flood capacity

Sources: ARBOR Study (2013), PBS SoCal (2013)

Location: Glendale, CA

Architects: Michael Van Valkenburgh Associates

Hydrology: LimnoTech

Civil, structural, mobility engineering + CEQA: Kimley-Horn

Area: 60 acres along a 9.4-mile flood-control corridor through Glendale

Year: 2012, 2025

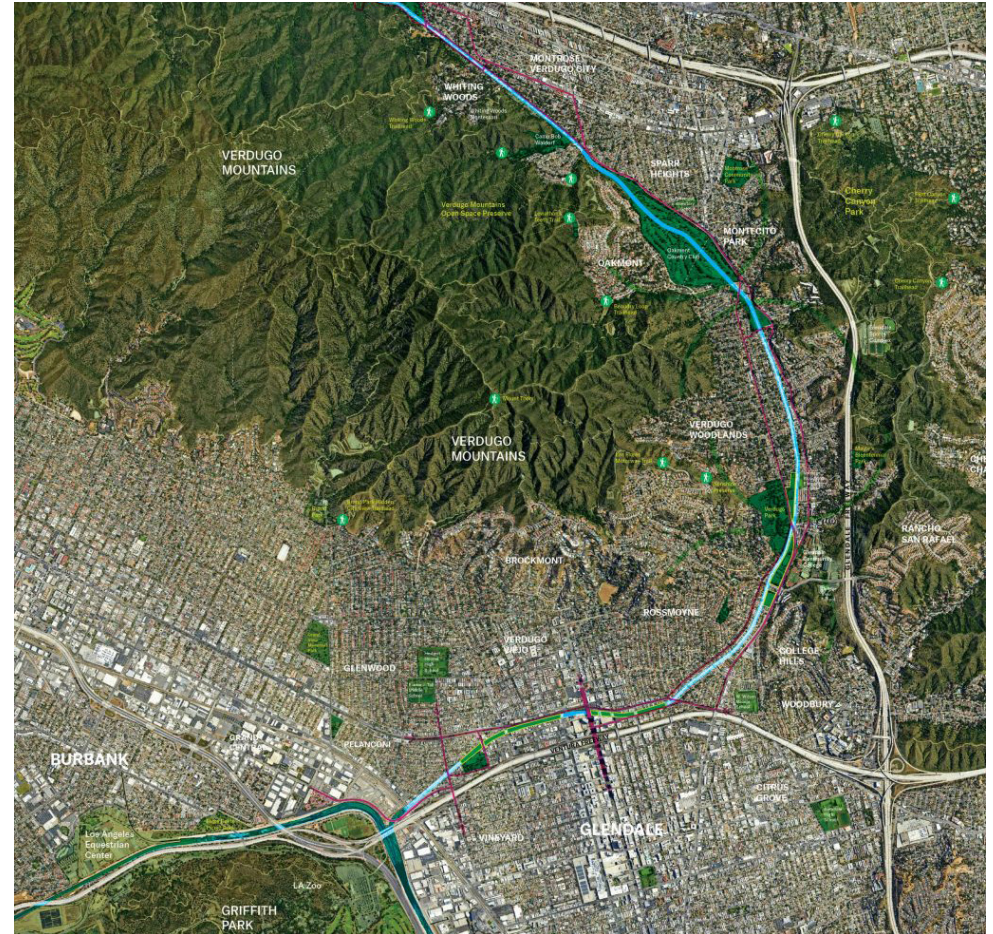


Image: mwainc.com, n.d.<sup>18</sup>

### Key takeaways:

- NOT built yet, but example of studies and strategies moving forward for LA River expansion while maintaining flood conveyance capacity

# GOAL 1: Reform Urban Flood Infrastructure

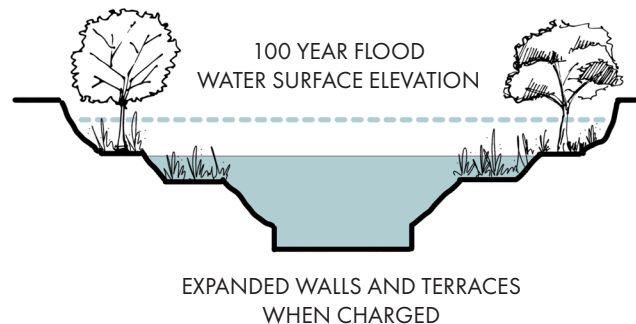
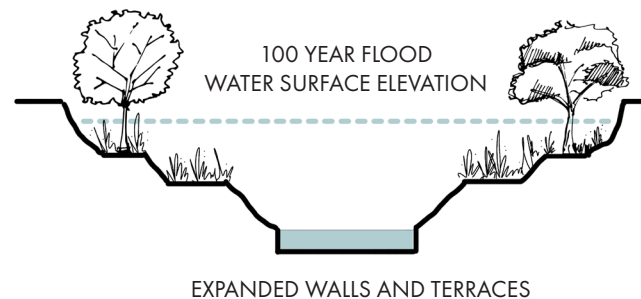
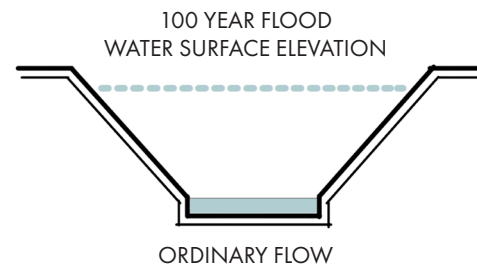


## PROGRAM

- Terraced channel walls
- Whole-site floodplain to increase flood capacity
- Floodable amphitheater
- Water quality treatment
- Cisterns for water storage

## STRATEGY

### MAINTAINING FLOOD CONVEYANCE



## METHODOLOGY & PRECEDENTS



Lower LA River Revitalization Plan - City of Los Angeles: Framework for implementing development projects along the lower LA River

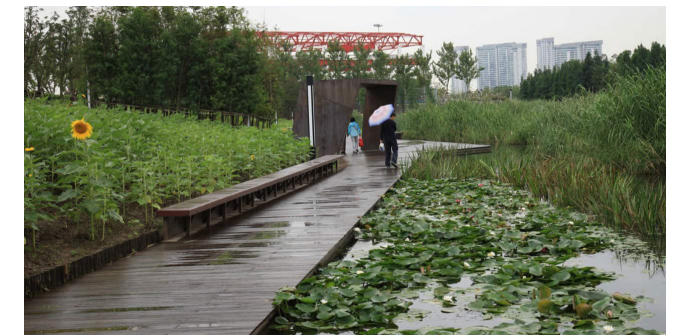


Landscape as Infrastructure - Bélanger, P., 2016: A landscape is successful if it cleans water, reduces flood risk, builds soil, supports biodiversity

Precedent: Bending the River, L.A., by Metabolic Studio<sup>19</sup>

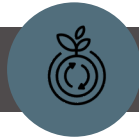


Precedent: Shanghai Houtan Park, by Turenscape





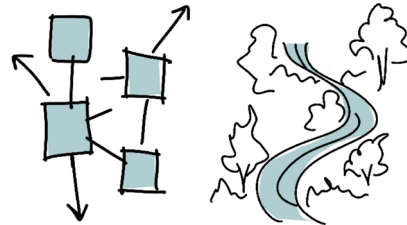
## GOAL 2: Restore Ecological Function



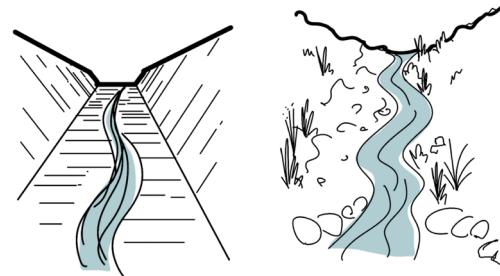
### PROGRAM

- Native habitat expansion
- Phytoremediation biotope
- Floodplain habitat mosaics
- Bird nesting structures
- Amphibian wetland habitat
- Native plant nursery
- Soil-building & compost pickup
- Observation deck
- Monitoring study to assess the impacts of regenerative strategies for wider application

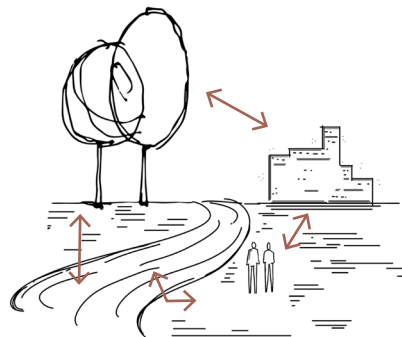
### STRATEGY



IMPROVED HABITAT CONNECTION

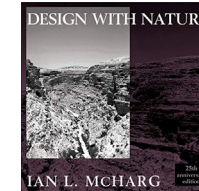


INCREASED INFILTRATION



SYSTEMS NOT ELEMENTS

### METHODOLOGY & PRECEDENTS



Design with Nature - McHarg, Ian, 1969: Mapping / layering environmental systems

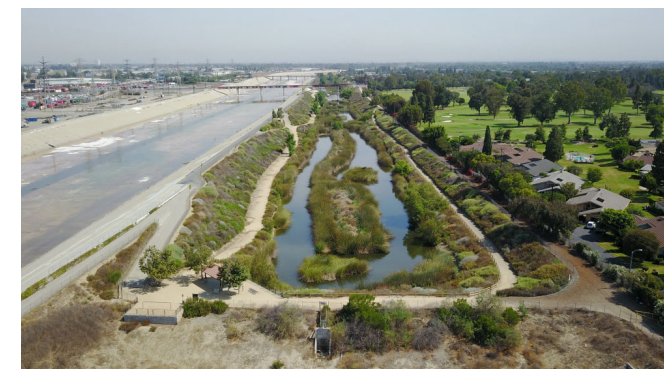


Landscape as Infrastructure - Bélanger, P., 2016: Landscape is a working system, not a decorative surface; ecologies should be judged by performance, not appearance.



Regenerative Design for Sustainable Development - John Tillman Lyle, 1994: Regenerative systems based on self-renewing processes

Precedent: Dominguez Gap Wetlands, L.A., by LA County of Public Works<sup>20</sup>



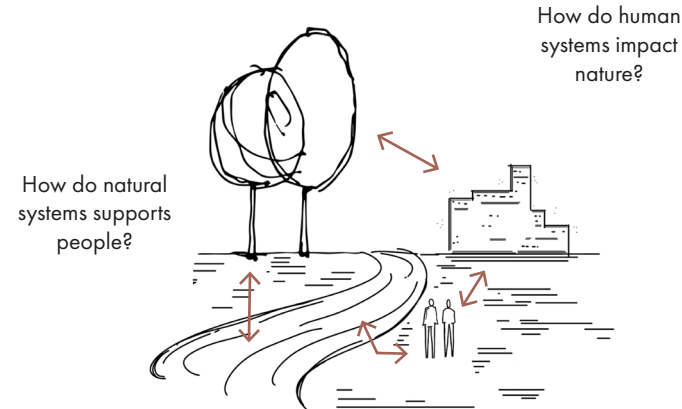
# GOAL 3: Create Equitable Public Access



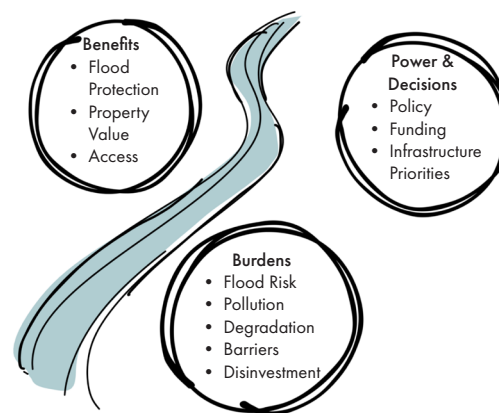
## PROGRAM

- Bridge connections over 710 Freeway and LA River
- Bike and pedestrian pathway connection around 710 Freeway
- Equestrian connection from Rancho del Amo to Rancho Rio Verde
- Multi-purpose community gathering space
- Trails for people to recreate and engage with the wetland habitat
- Outdoor classrooms
- Parking
- River promenade

## STRATEGY



SYSTEMS NOT ELEMENTS



INFRASTRUCTURE IS POLITICAL

## METHODOLOGY & PRECEDENTS



Lower LA River Revitalization Plan - City of Los Angeles: Framework for implementing development projects along the lower LA River



Regenerative Design for Sustainable Development - John Tillman Lyle, 1994: Cultural, social, and economic implications of regenerative systems



Landscape as Infrastructure - Bélanger, P., 2016: Infrastructure is political, not neutral.

Precedent: Taylor Yard Bridge, L.A., by SPF:architects<sup>21</sup>





# CONCEPT DEVELOPMENT

# PROGRAM ELEMENTS

## BUBBLE DIAGRAM

1



Reform Urban Flood Infrastructure

2

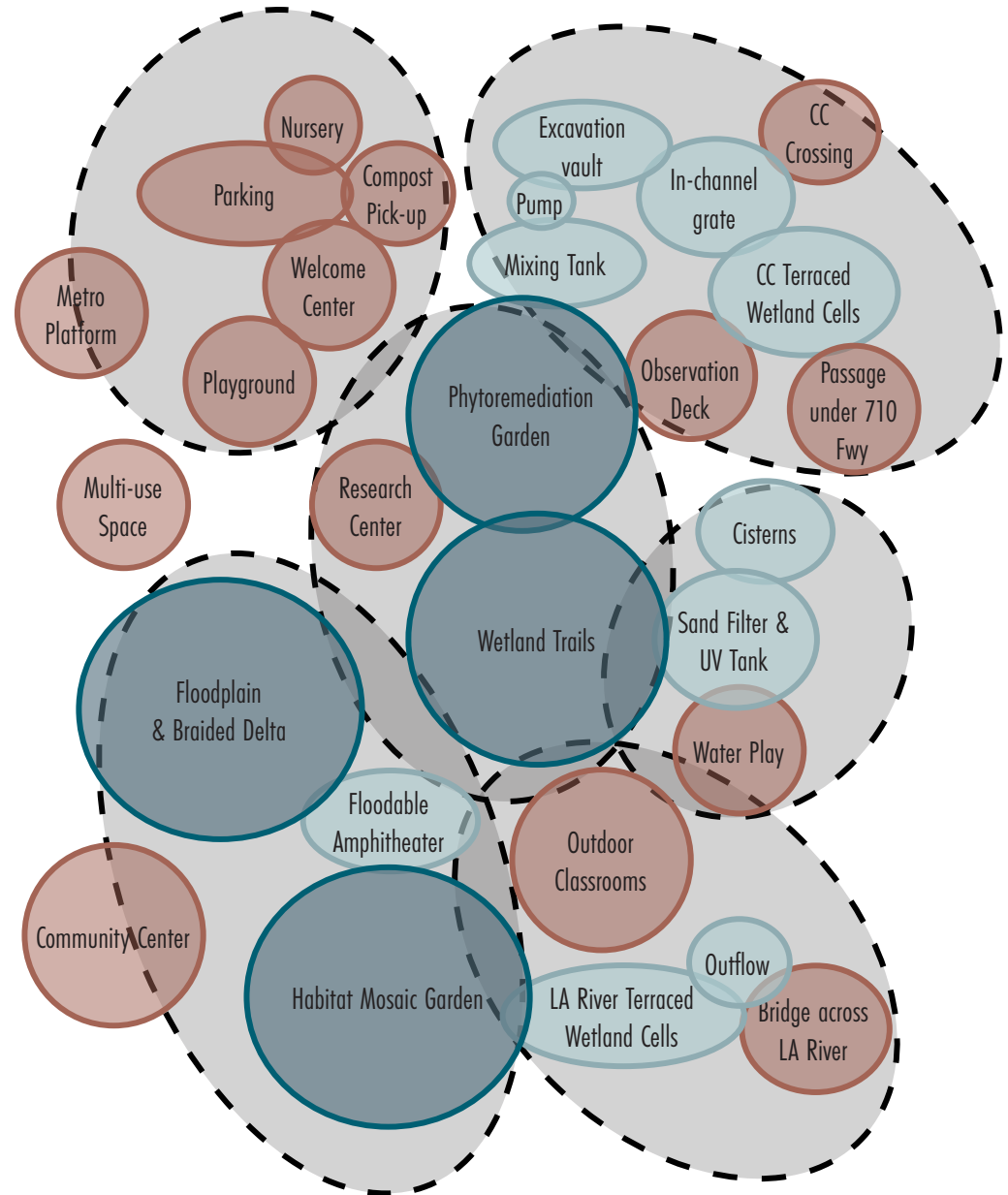


Restore Ecological Function

3

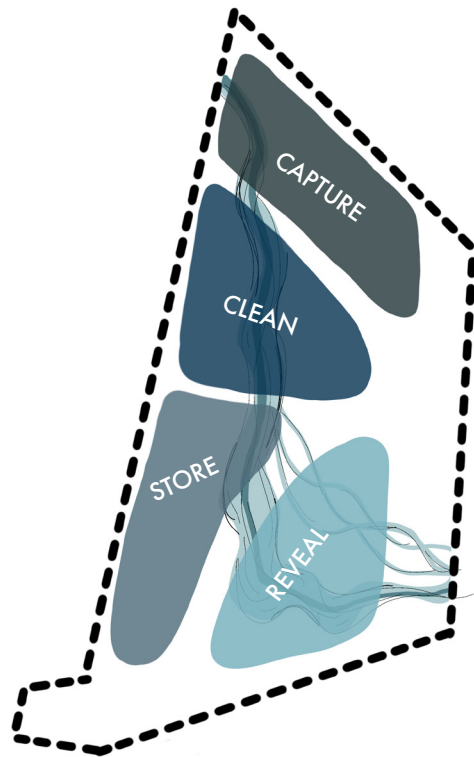


Create Equitable Public Access





## FUNCTIONAL CONCEPT



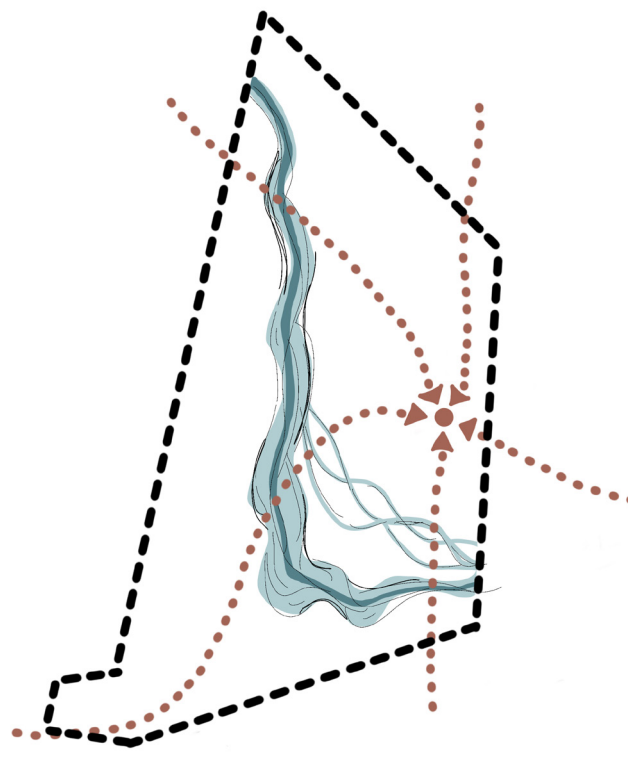
"RENEWAL"

NTS 

### WATER RENEWED

- Polluted water is captured from Compton Creek and directed onto the site
- Water is cleaned through phytoremediation
- Groundwater recharge
- Water as a part of the landscape

## PHILOSOPHICAL CONCEPT



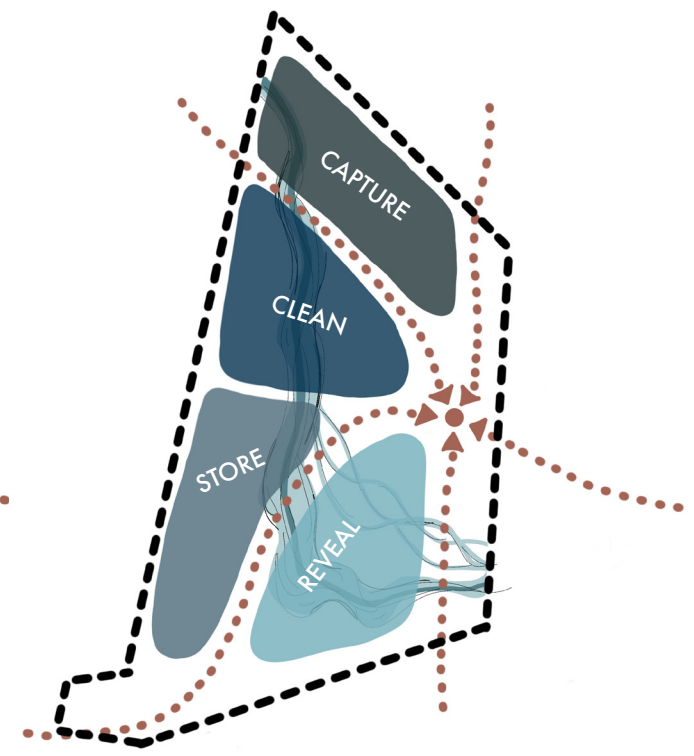
"CONFLUENCE"

NTS 

### CONFLUENCE

- People and communities
- Habitat & wildlife
- Waterways
- Modes of transportation

## COMBINED CONCEPT



"REGENERATIVE CONFLUENCE"

NTS 

### REGENERATIVE CONFLUENCE

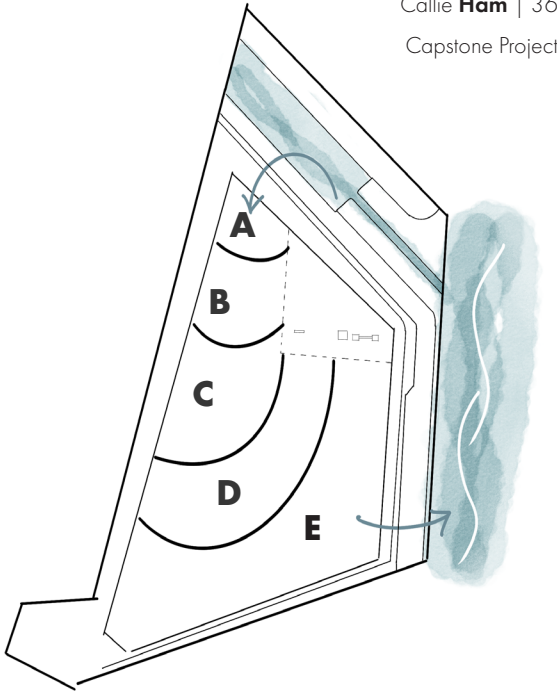
- Regeneration as dynamic landscape
- Confluence of people, wildlife, & nature in a regenerative space

# CONCEPTUAL DESIGN

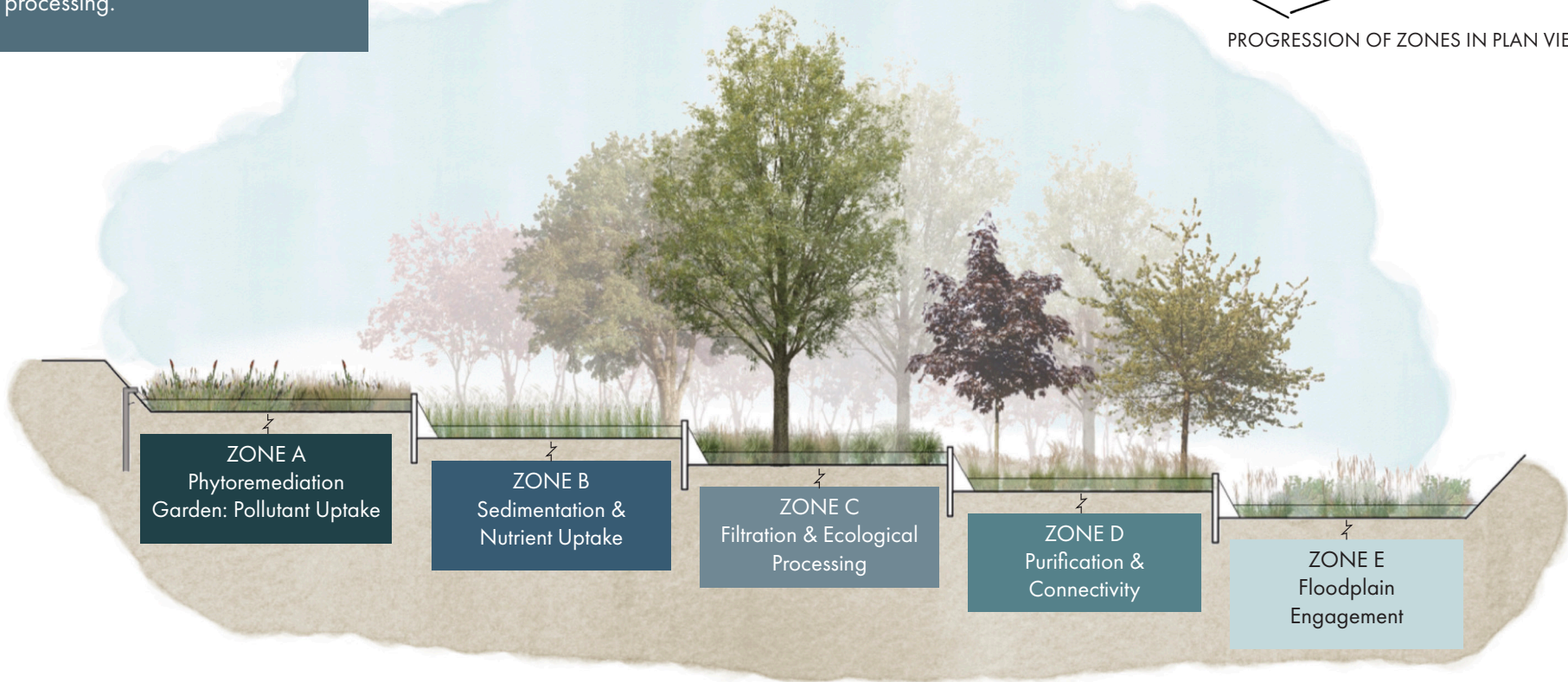
## STAGES OF WATER TRANSFORMATION

Water moves through a series of terraced landscapes, with each tier slowing, storing, filtering, and transforming water before passing it downstream.

Weirs establish distinct hydrological zones while creating changing conditions for habitat, public access, and ecological processing.



PROGRESSION OF ZONES IN PLAN VIEW    NTS    ▲

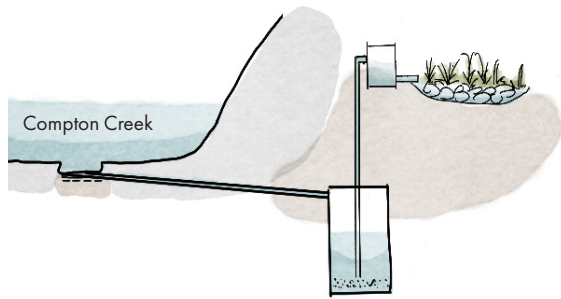


CONCEPTUAL SECTION ELEVATION OF ZONE PROGRESSION

NTS

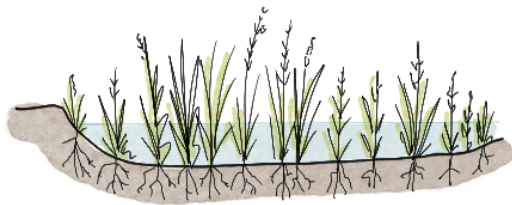


# CONCEPTUAL DESIGN



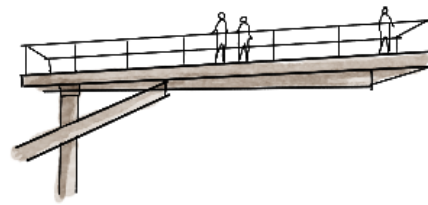
## WATER DIVERSION SYSTEM

In-channel grate allows water to fill an extraction vault, which then pumps water to be cleaned into wetland.



## PHYTOREMEDIATION BIOTOPE

Water is cleaned through layers of phytoremediating plants



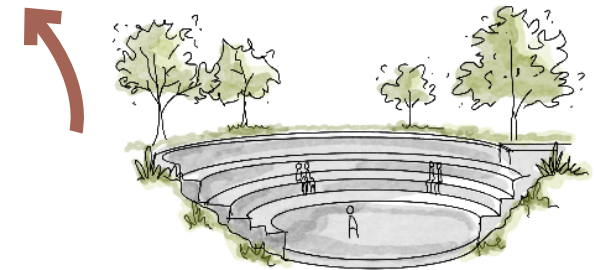
## OBSERVATION DECK

Deck allows for users to observe the hydraulic systems



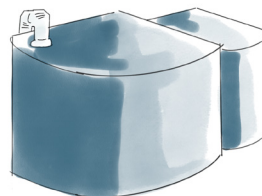
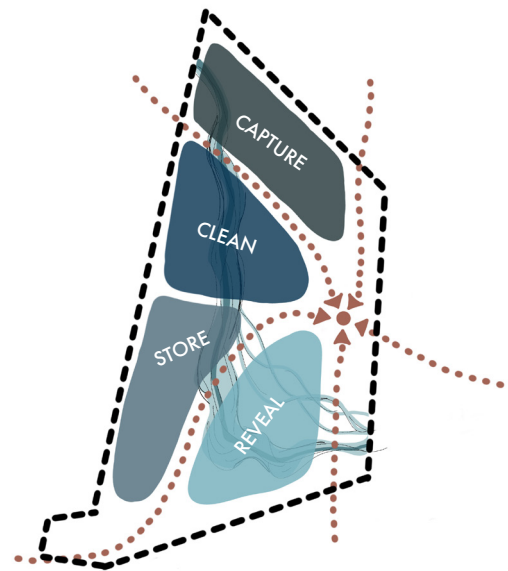
## WETLAND TERRACES

The LA River walls are inlaid with terraces that support native wetland plants and facilitate access to the river.



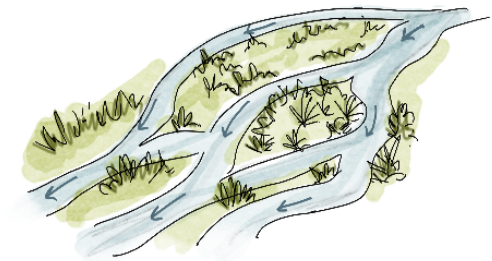
## FLOODABLE AMPHITHEATER

An amphitheater that supports community programming can collect and slow water during heavy rain events.



## UV TREATMENT & STORAGE

Water is further filtered and treated through a UV system and stored for irrigation

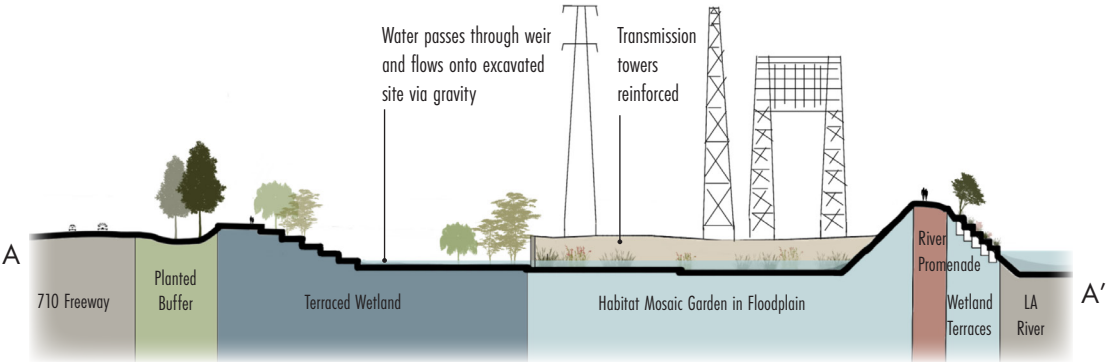


## BRAIDED DELTA

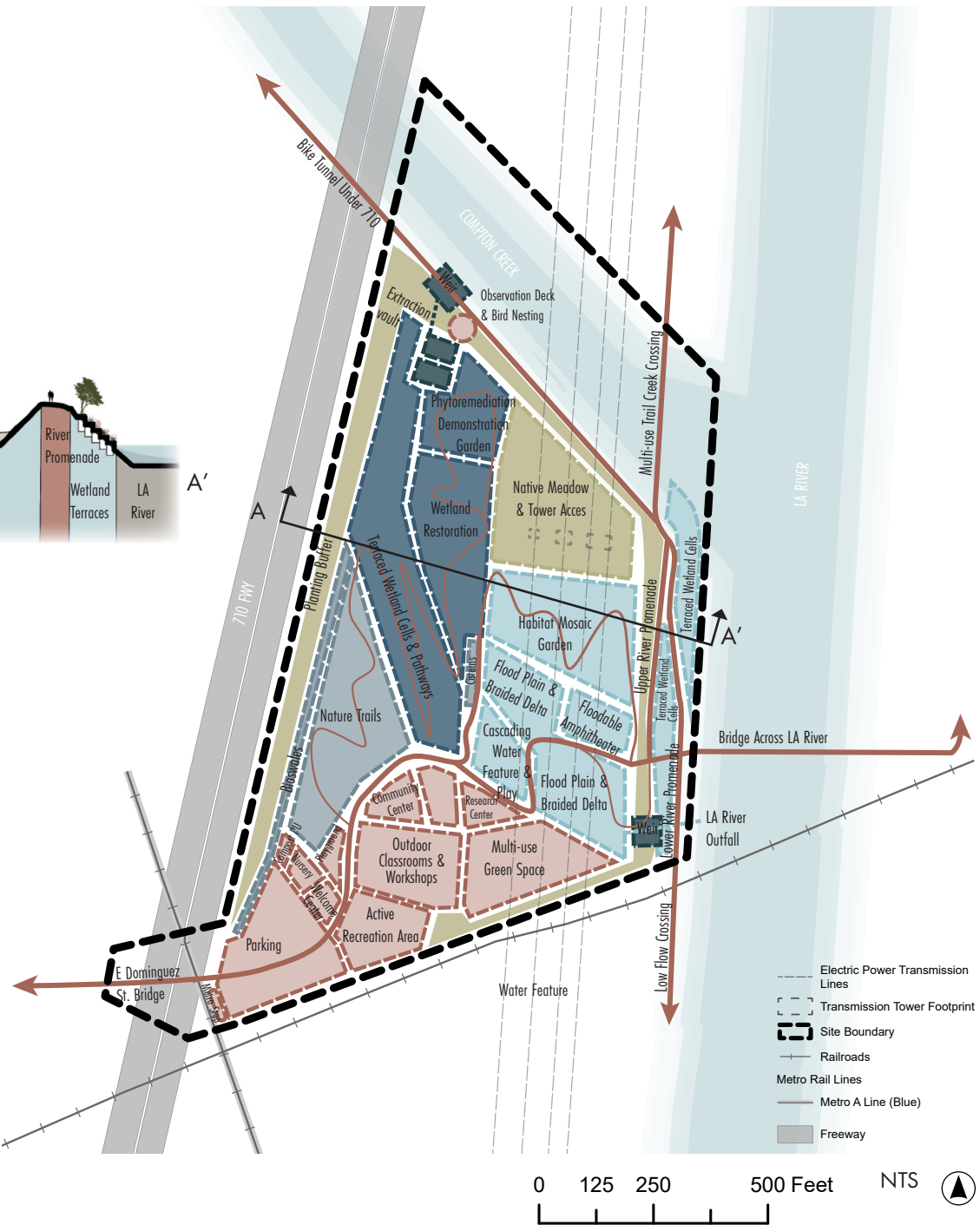
Water disperses through floodplain in a braided delta, supporting plant and wildlife.

# DESIGN CONCEPT 1

## LIVING TERRACE

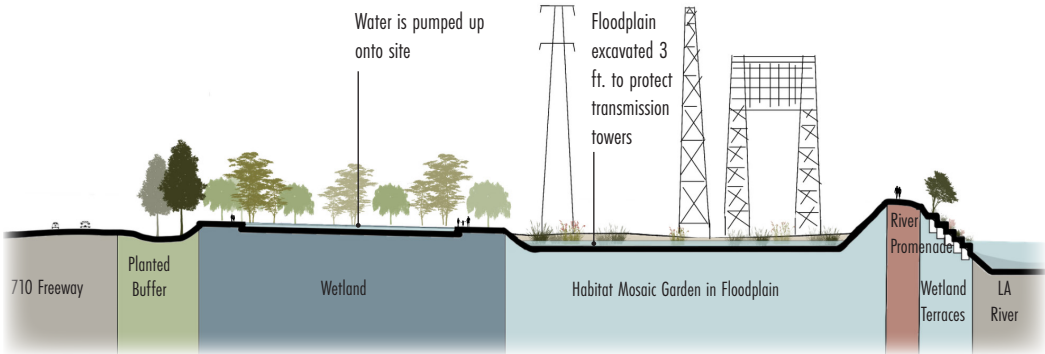


This concept transforms the site through a **series of terraces** that are excavated to create a **gravity-fed hydrologic system**. The site is lowered below the lowest water elevation in Compton Creek while remaining above the lowest elevation of the Los Angeles River, allowing water to flow naturally through the landscape without mechanical pumping. The existing transmission towers remain fully accessible via the required service road, while a weir conveys water beneath the roadway, maintaining both hydraulic continuity and essential maintenance access.

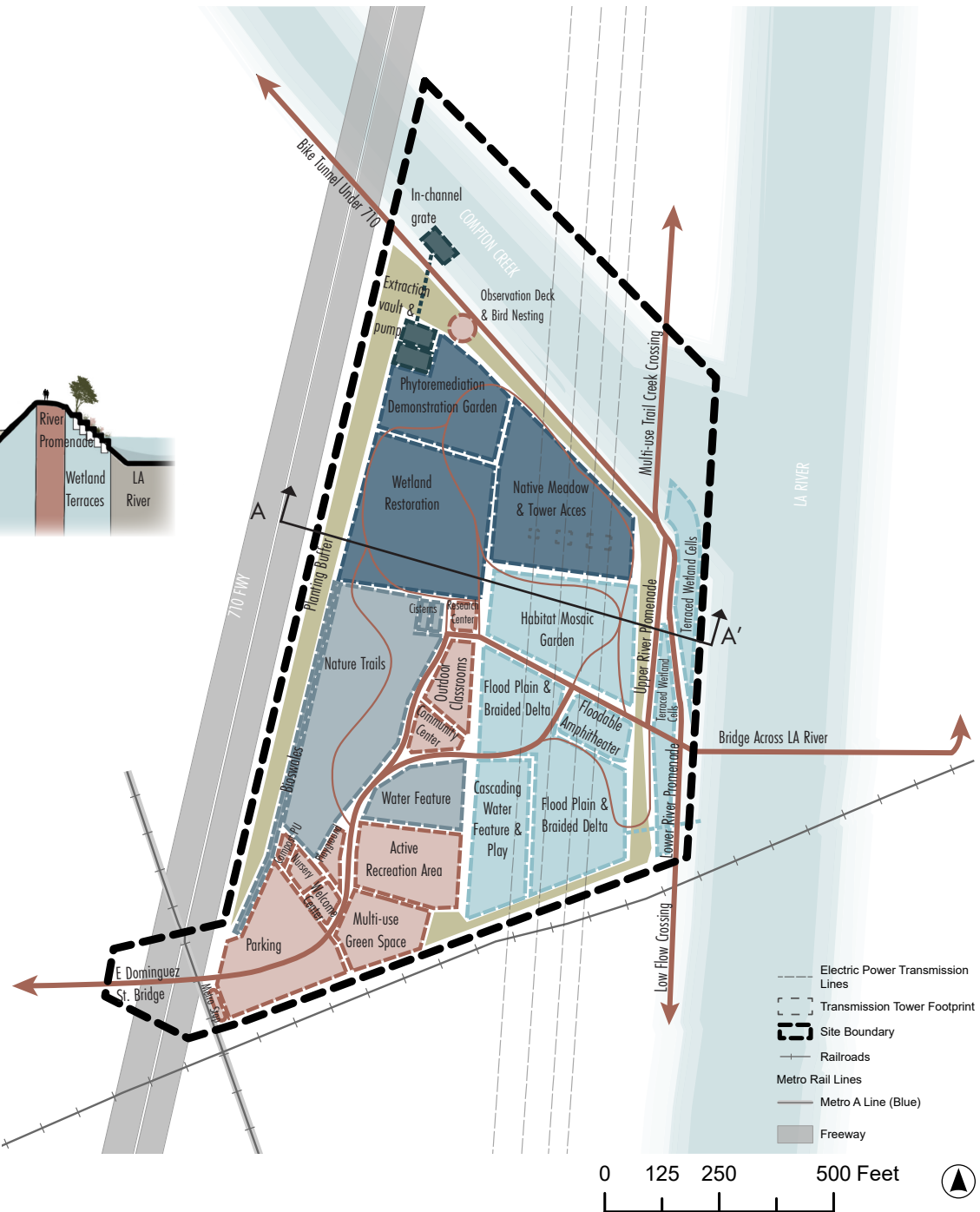




# DESIGN CONCEPT 2 FLOODPLAIN

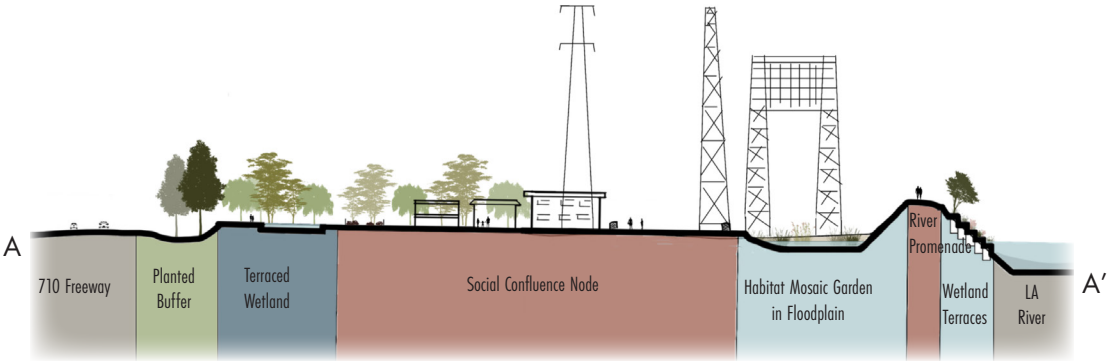


This concept celebrates the **journey of water** through the site, **making its movement, treatment, and transformation both visible and experiential**. Water is first captured through an intake grate below Compton Creek and conveyed to an underground excavation vault, where it is pumped into a constructed wetland for initial treatment. As it flows through the site, the water undergoes additional natural filtration, with a portion stored in cisterns for irrigation and the remainder conveyed to the floodplain. There, it becomes an interactive landscape feature through educational water elements and a floodable amphitheater that responds to changing water levels. Finally, the treated water exits the site through an outfall to the Los Angeles River, passing through a series of terraced wetland cells that provide a final stage of polishing before reentering the river.

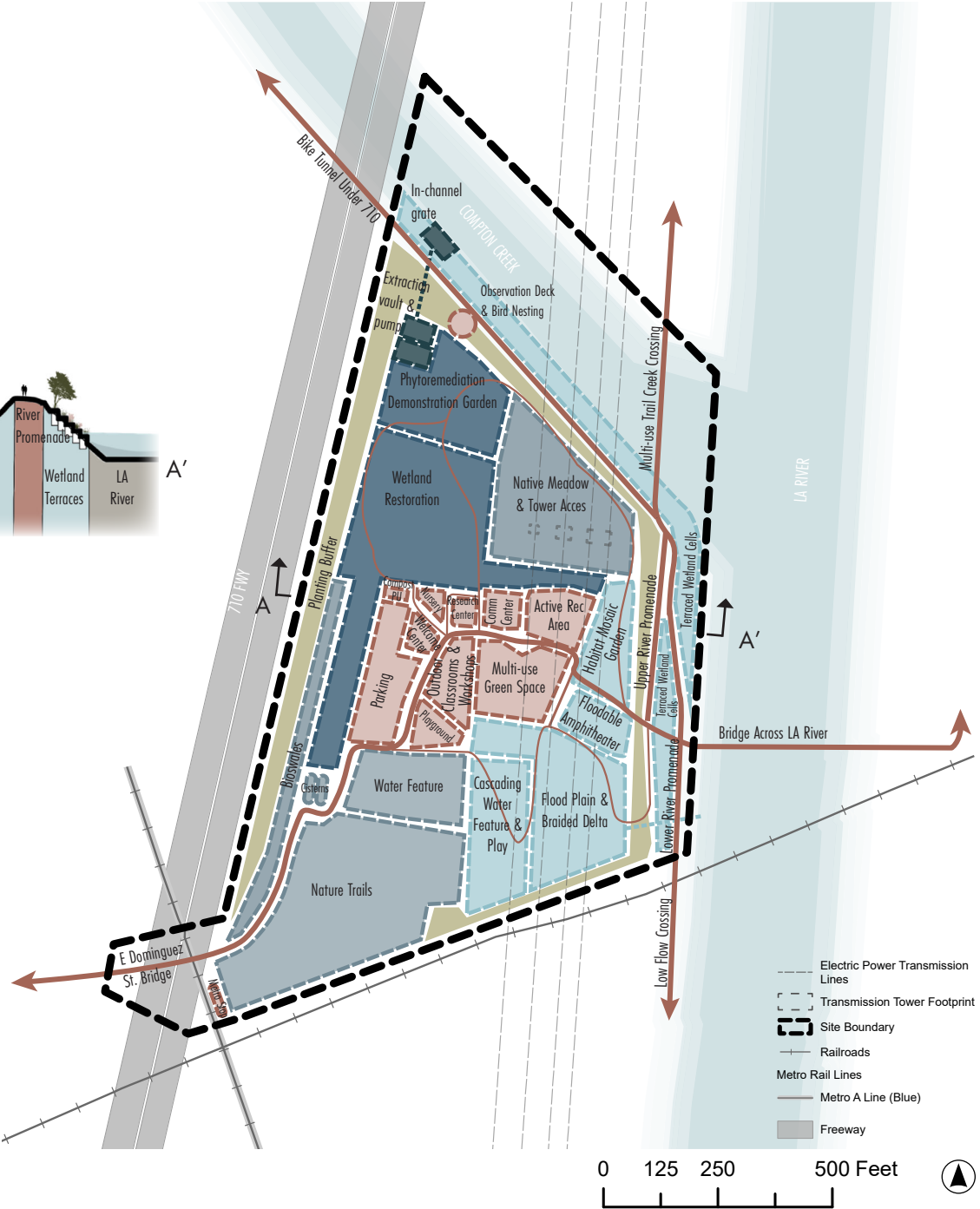


# DESIGN CONCEPT 3

## CONFLUENCE



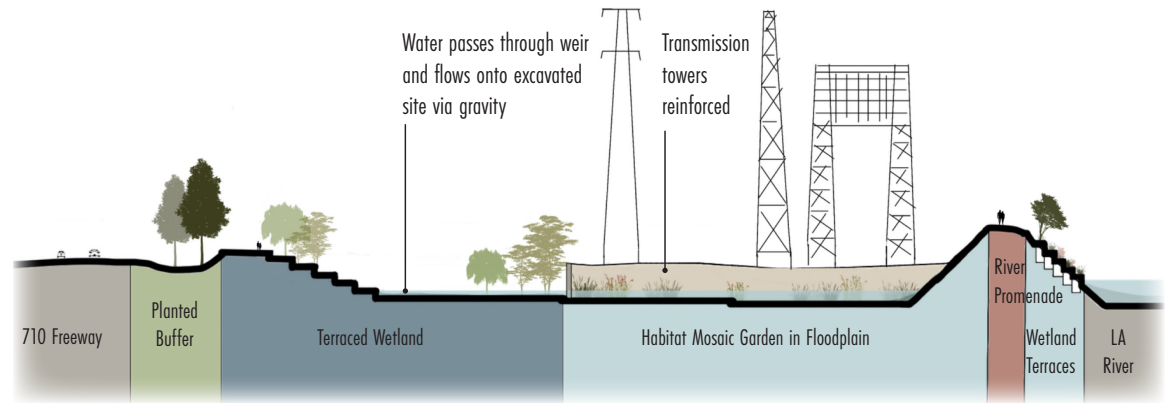
This concept establishes the heart of the site by concentrating its primary programmatic elements into a **central confluence**. The welcome center, community center, outdoor classrooms and workshops, research center, plant nursery, compost pick-up, playground, multi-use green space, and active recreation area are organized as an interconnected civic and ecological hub, fostering community gathering, learning, and recreation while strengthening connections between people and place.





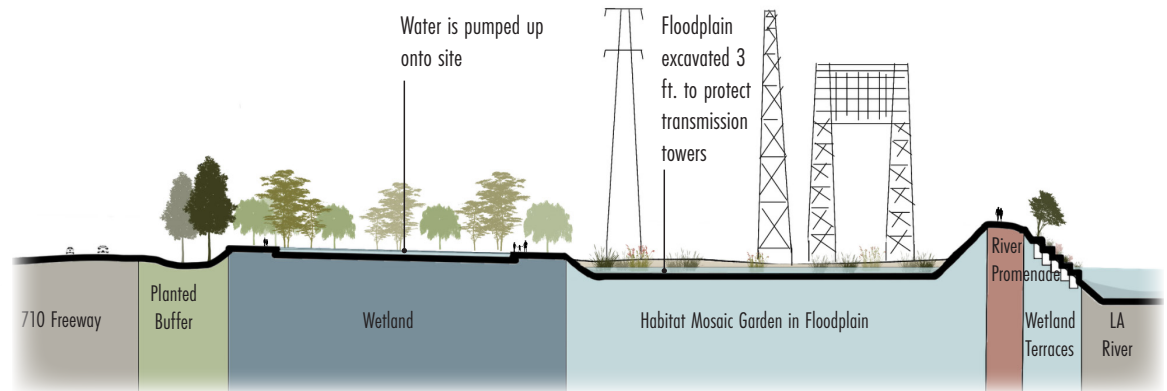
## CONCEPT 1 LIVING TERRACE

- Water is gravity-fed from Compton Creek
- Terracing major design element
- Major excavation required



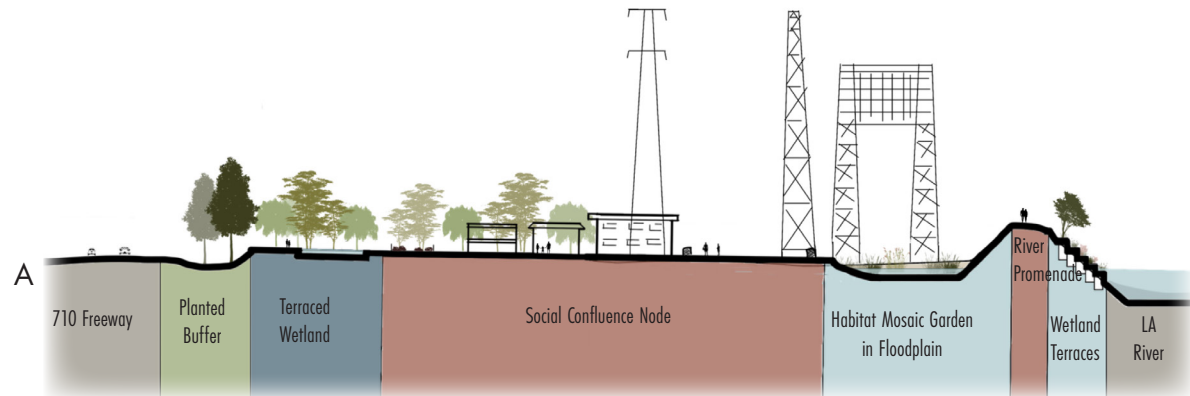
## CONCEPT 2 FLOODPLAIN

- Pumps water up to site
- Floodplain and water play major elements
- Multiple gathering nodes as opposed to one central node

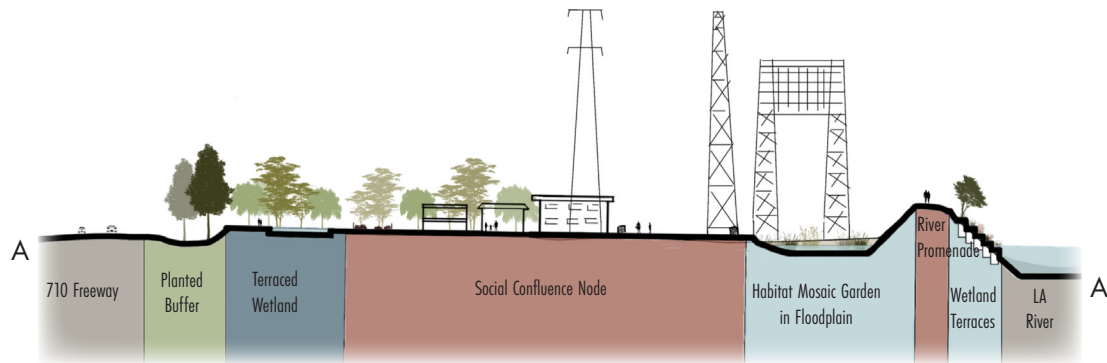


## CONCEPT 3 CONFLUENCE

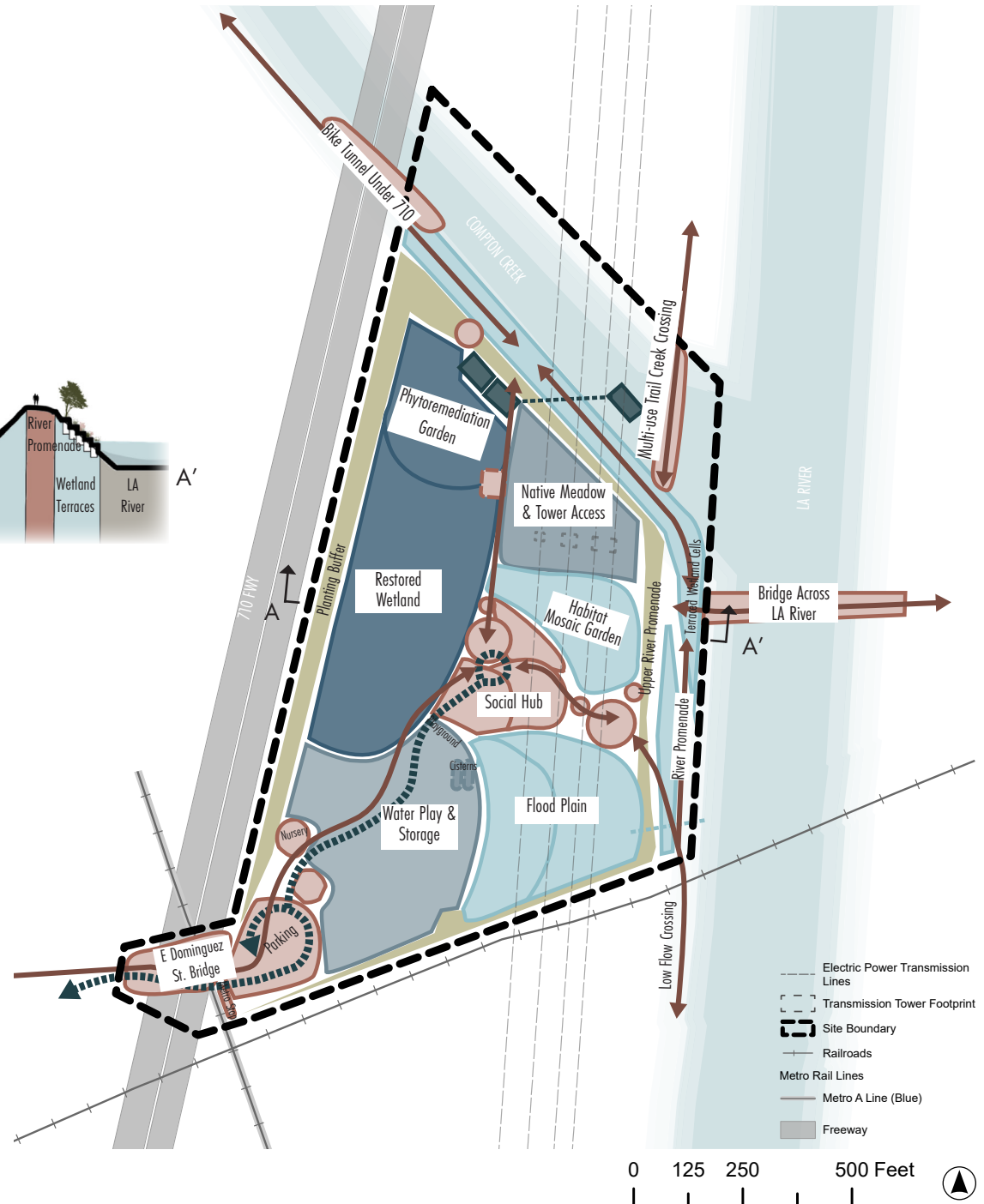
- Gathering nodes concentrated in center of site
- Water and habitat components move around human-centered programming



# FINAL CONCEPT CONFLUENCE



This concept builds on the central confluence as a place where ecological processes, community life, and learning come together. Rather than separating these functions across the site, the final design organizes them around a **connected civic and ecological core, where water management, habitat restoration, recreation, education, and community programs are experienced together.** The confluence becomes more than a meeting point for the waterways—it becomes a meeting point for people, processes, and place.





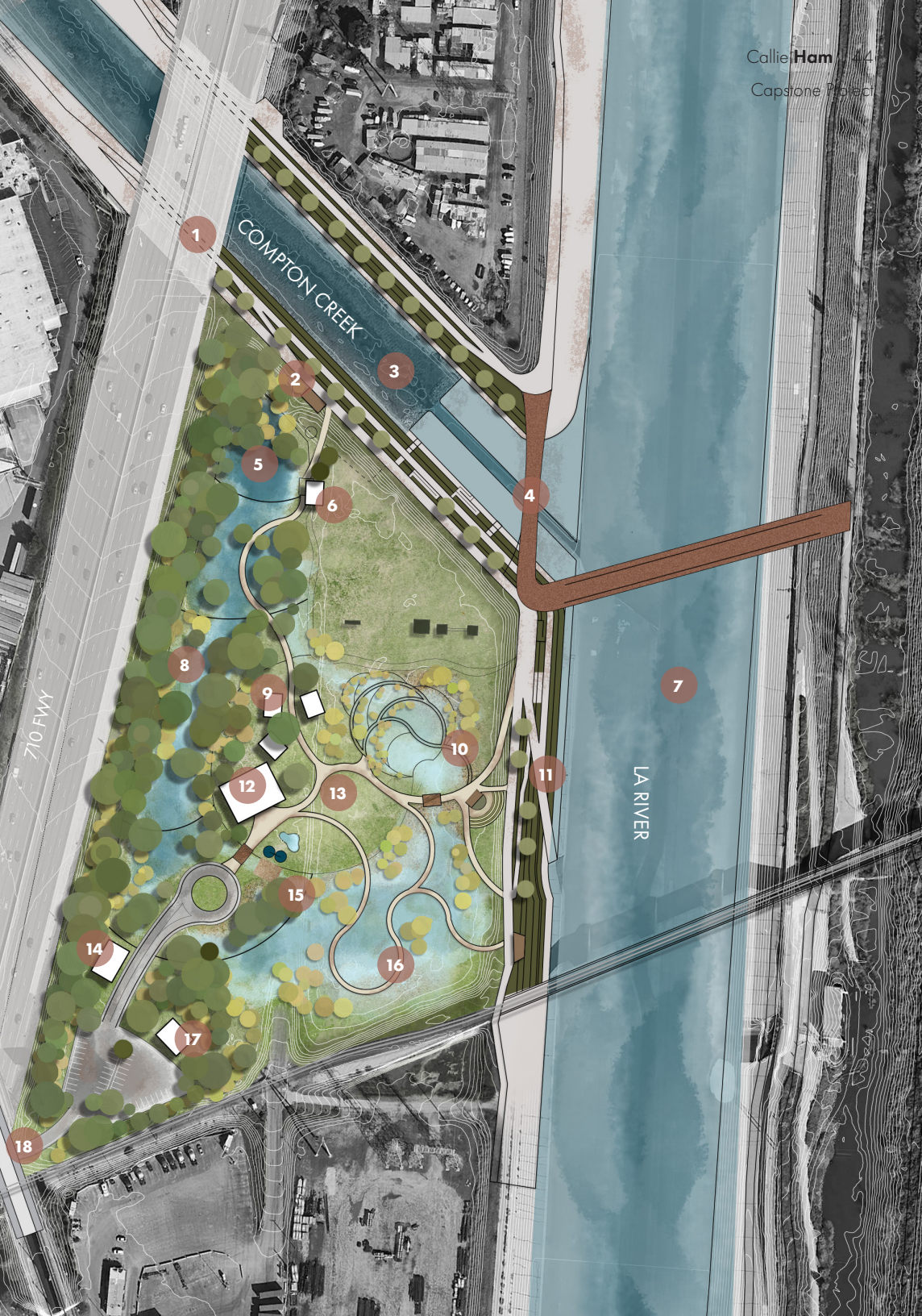
# DESIGN **SOLUTIONS**



# FINAL SITE PLAN

## LEGEND

- 1 BIKE & PEDESTRIAN TUNNEL
- 2 OBSERVATION DECK
- 3 WATER CAPTURE FROM COMPTON CREEK
- 4 COMPTON CREEK CROSSING
- 5 PHYTOREMEDIATION GARDEN
- 6 RESEARCH CENTER
- 7 LA RIVER CROSSING
- 8 RESTORED WETLAND HABITAT
- 9 OUTDOOR CLASSROOMS
- 10 HABITAT MOSAICS
- 11 TERRACED RIVER PROMENADE
- 12 COMMUNITY CENTER
- 13 OUTDOOR REC AREA
- 14 NATIVE PLANT NURSERY & COMPOST PICKUP
- 15 SAND FILTER, UV TREATMENT, & CISTERNS
- 16 FLOODPLAIN TRAILS
- 17 WELCOME CENTER
- 18 NEW METRO STOP, VEHICULAR ENTRANCE & PARKING



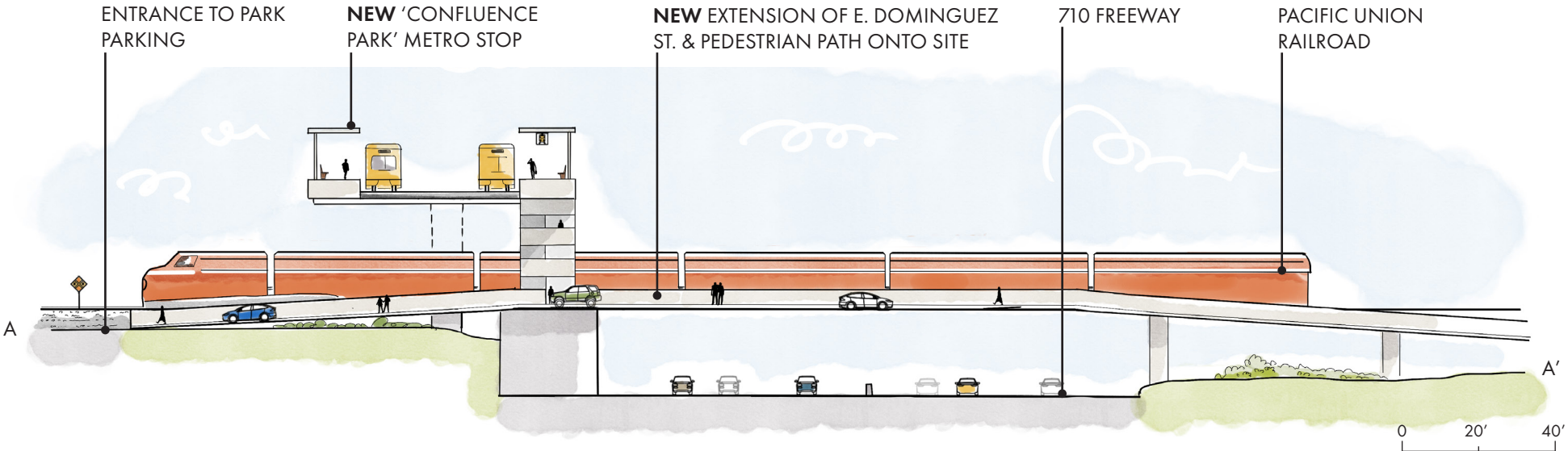
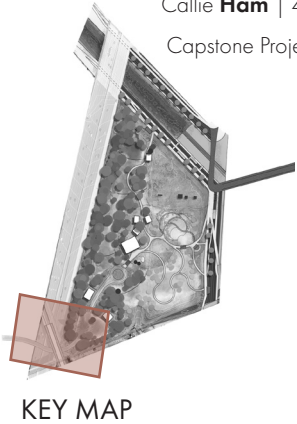
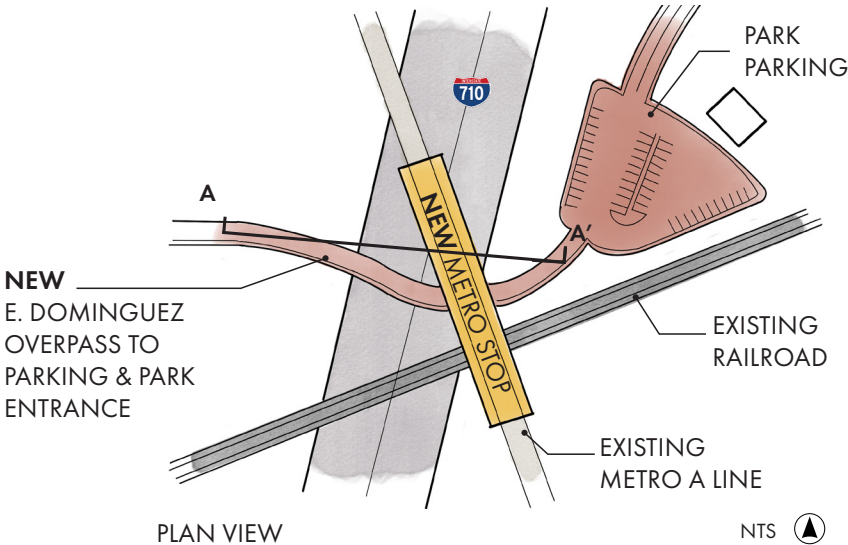


# ARRIVING TO THE SITE

## METRO & VEHICULAR ENTRANCE

E. Dominguez St. extends over the 710 freeway connecting the Carson residential area to the site, allowing both vehicles and pedestrians to have more direct access. The new overpass ramps up at 5-6%, crossing over the 710 freeway at the same elevation as the Pacific Union railroad, leveraging the existing infrastructure and clearances to safely pass under the Metro A line.

A new metro stop is established along the existing Metro A line, allowing park users to easily access the site through public transit.



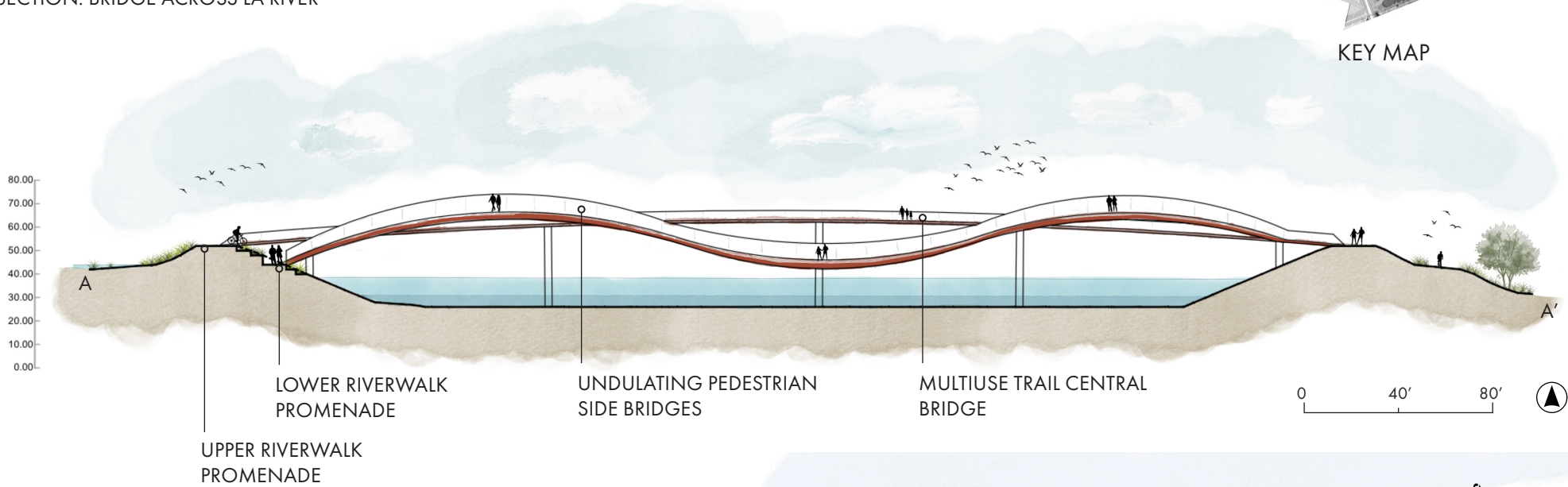
SECTION ELEVATION OF VEHICULAR PARK ENTRANCE AND METRO STOP



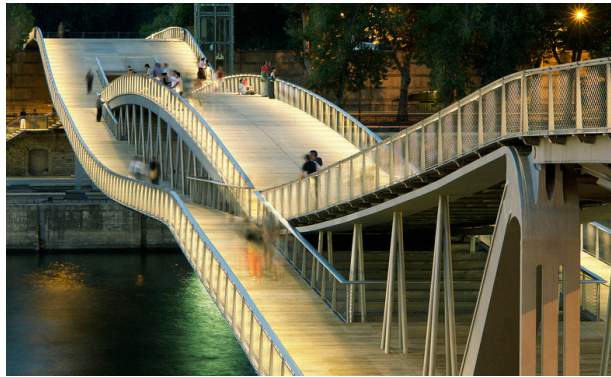
# ARRIVING TO THE SITE

## LA RIVER CROSSING

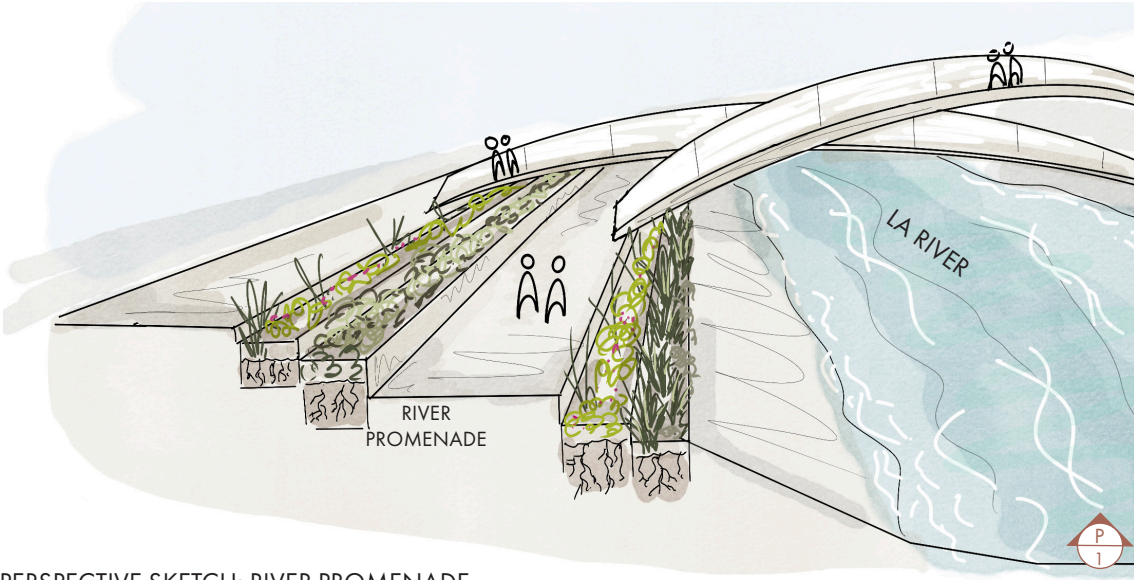
SECTION: BRIDGE ACROSS LA RIVER



INSPIRATION: BRIDGE SHAPED LIKE WATER MOVEMENT



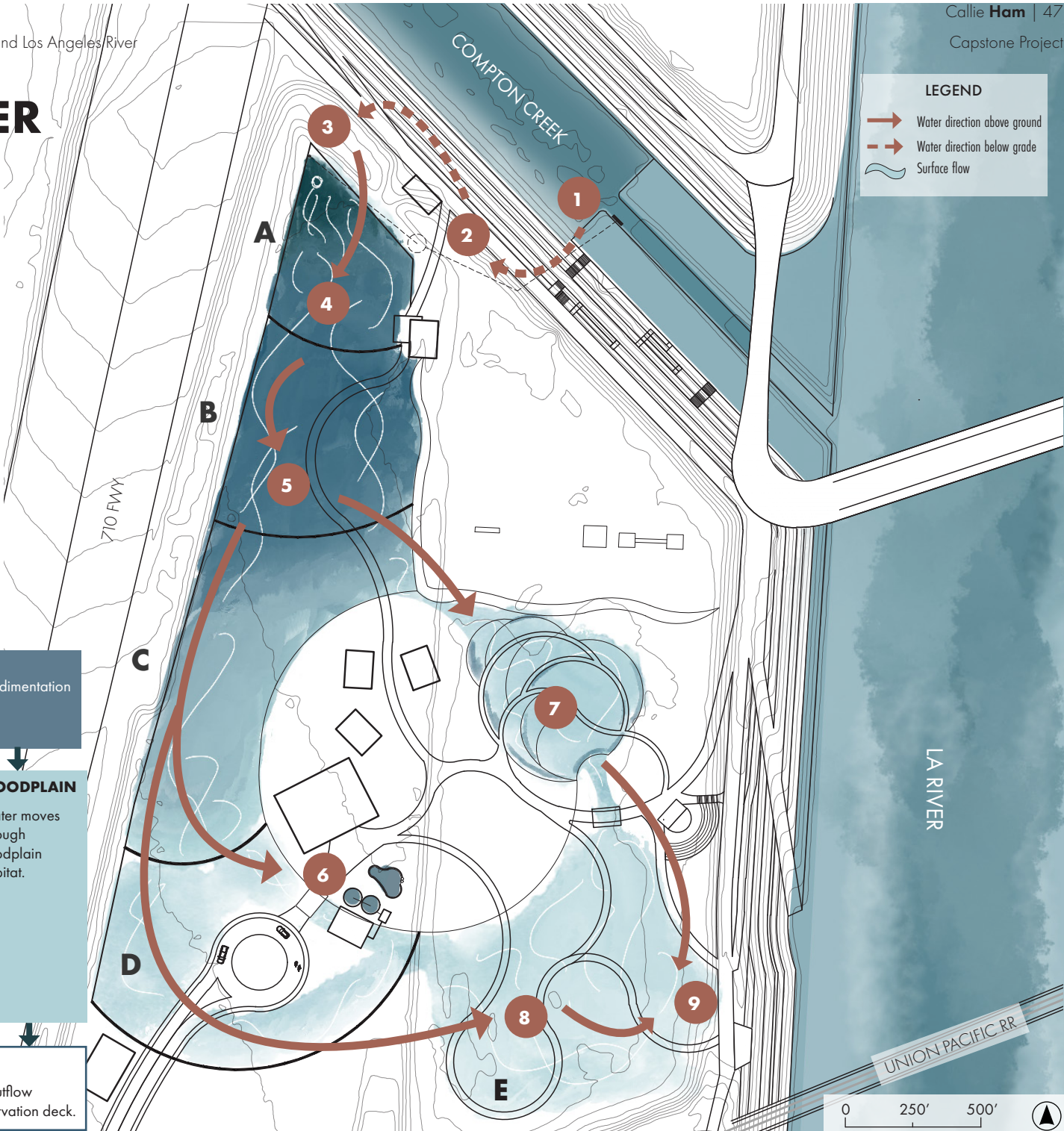
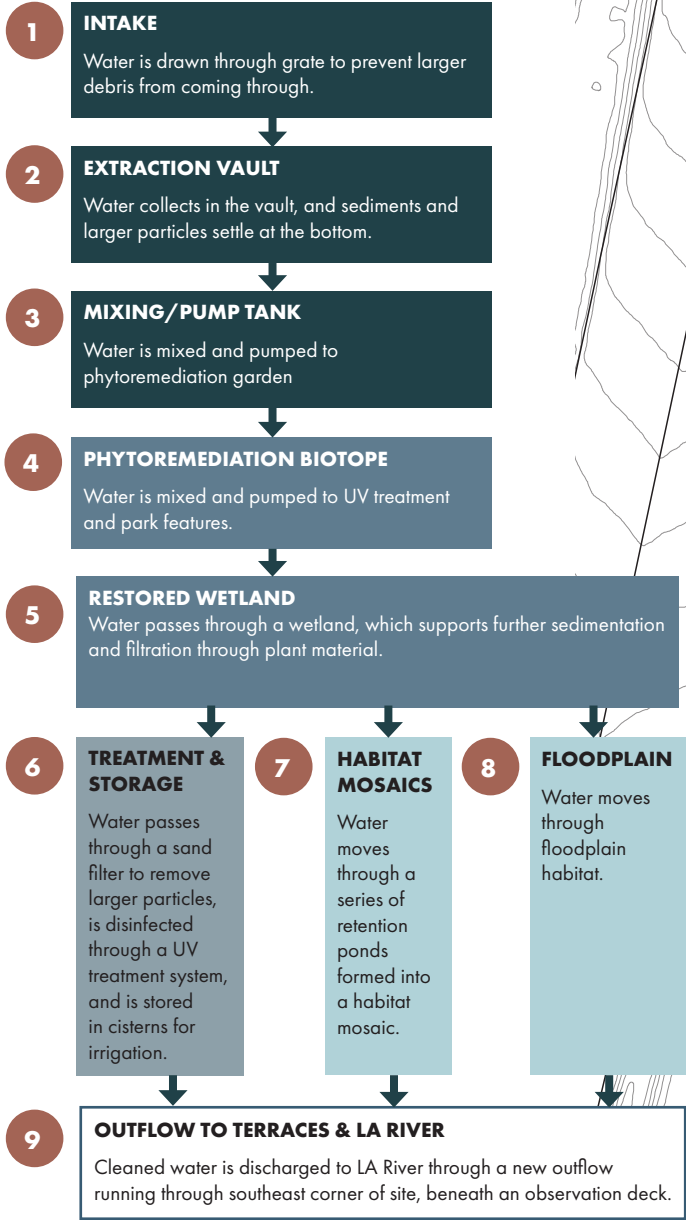
Passerelle Simone-de-Beauvoir Paris, France.<sup>25</sup>



PERSPECTIVE SKETCH: RIVER PROMENADE



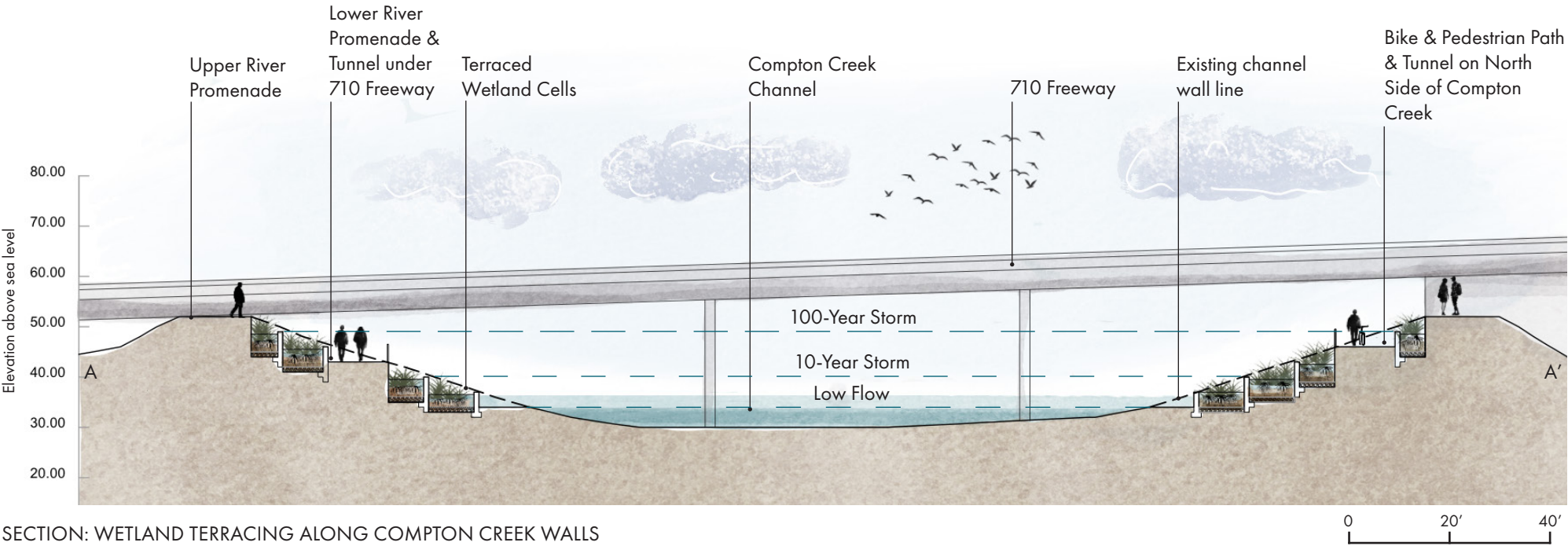
# JOURNEY OF WATER ACROSS ZONES



SECTION ELEVATION

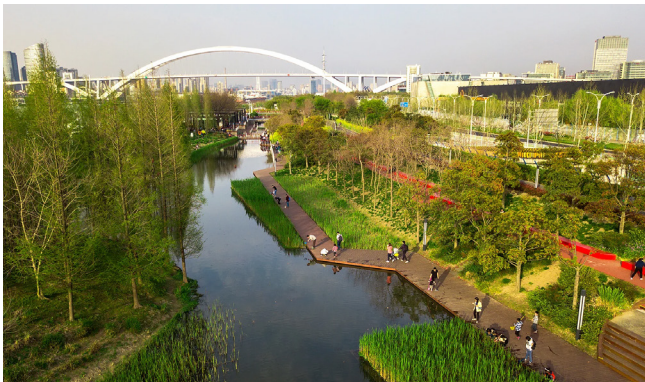


COMPTON CREEK TERRACES



SECTION: WETLAND TERRACING ALONG COMPTON CREEK WALLS

INSPIRATION: URBAN WETLAND TERRACES

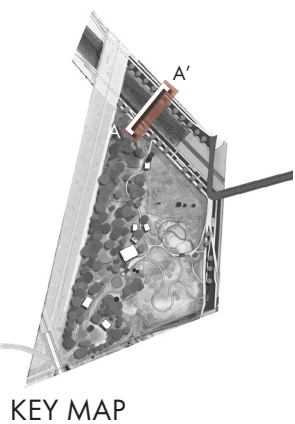


Rice terrace-like features to help purify polluted water, Houtan Park, China<sup>26</sup>

INSPIRATION: URBAN WETLAND TERRACES



Cheongye Stream, Seoul, South Korea.<sup>27</sup>



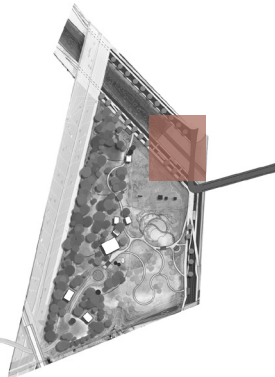
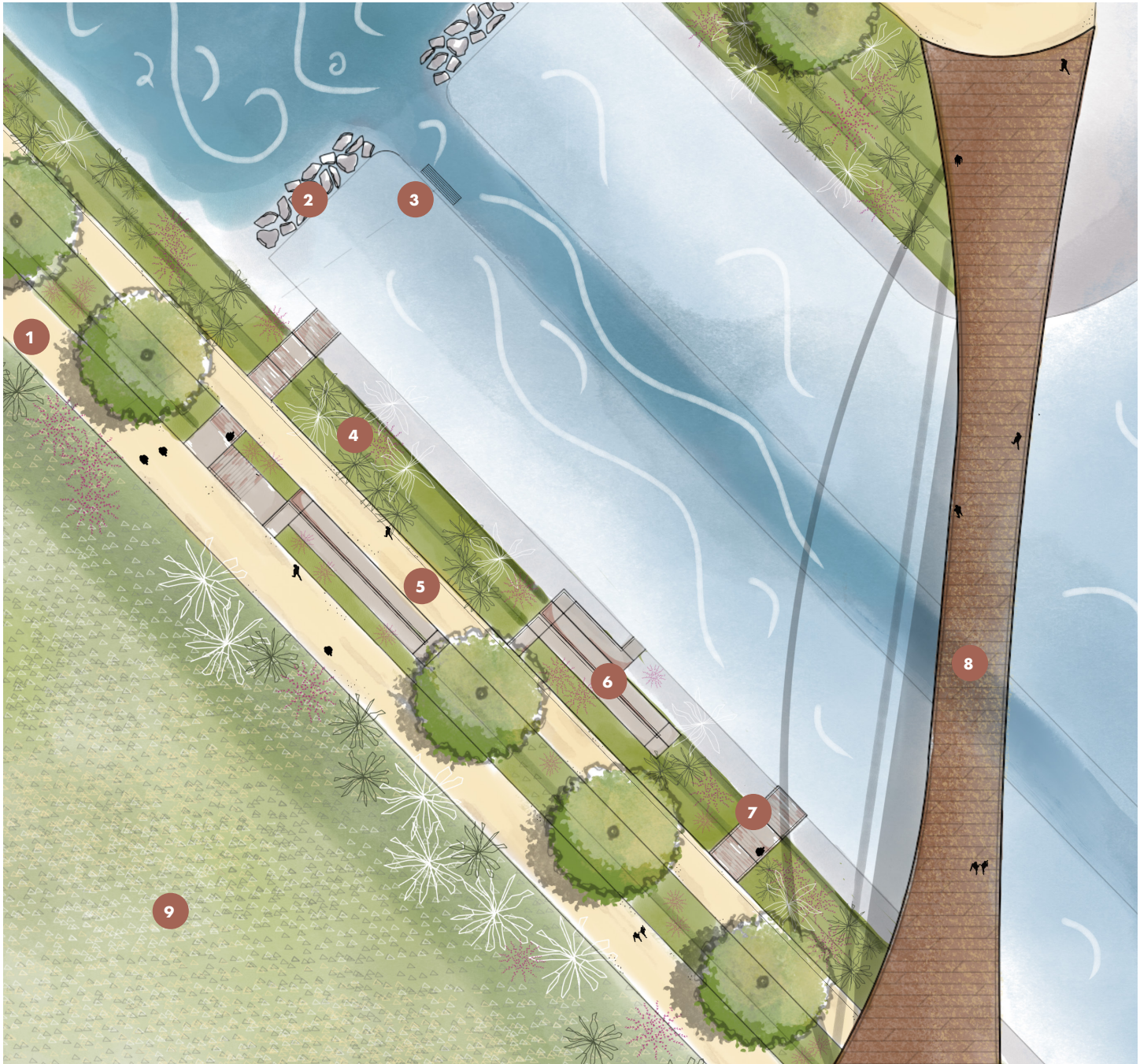
KEY MAP



# ENLARGEMENT COMPTON CREEK TERRACES



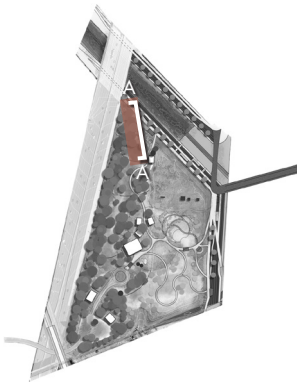
- LEGEND
- 1 UPPER RIVER PROMENADE & MAINTENANCE ROAD
  - 2 COMPTON CREEK DAM
  - 3 WATER INTAKE GRATE TO EXCAVATION VAULT
  - 4 FLOODABLE WETLAND CELLS
  - 5 LOWER RIVER PROMENADE THROUGH TERRACES
  - 6 ADA RAMP
  - 7 STAIRS BETWEEN TERRACE LEVELS
  - 8 COMPTON CREEK CROSSING
  - 9 NATIVE MEADOW AROUND TRANSMISSION TOWERS



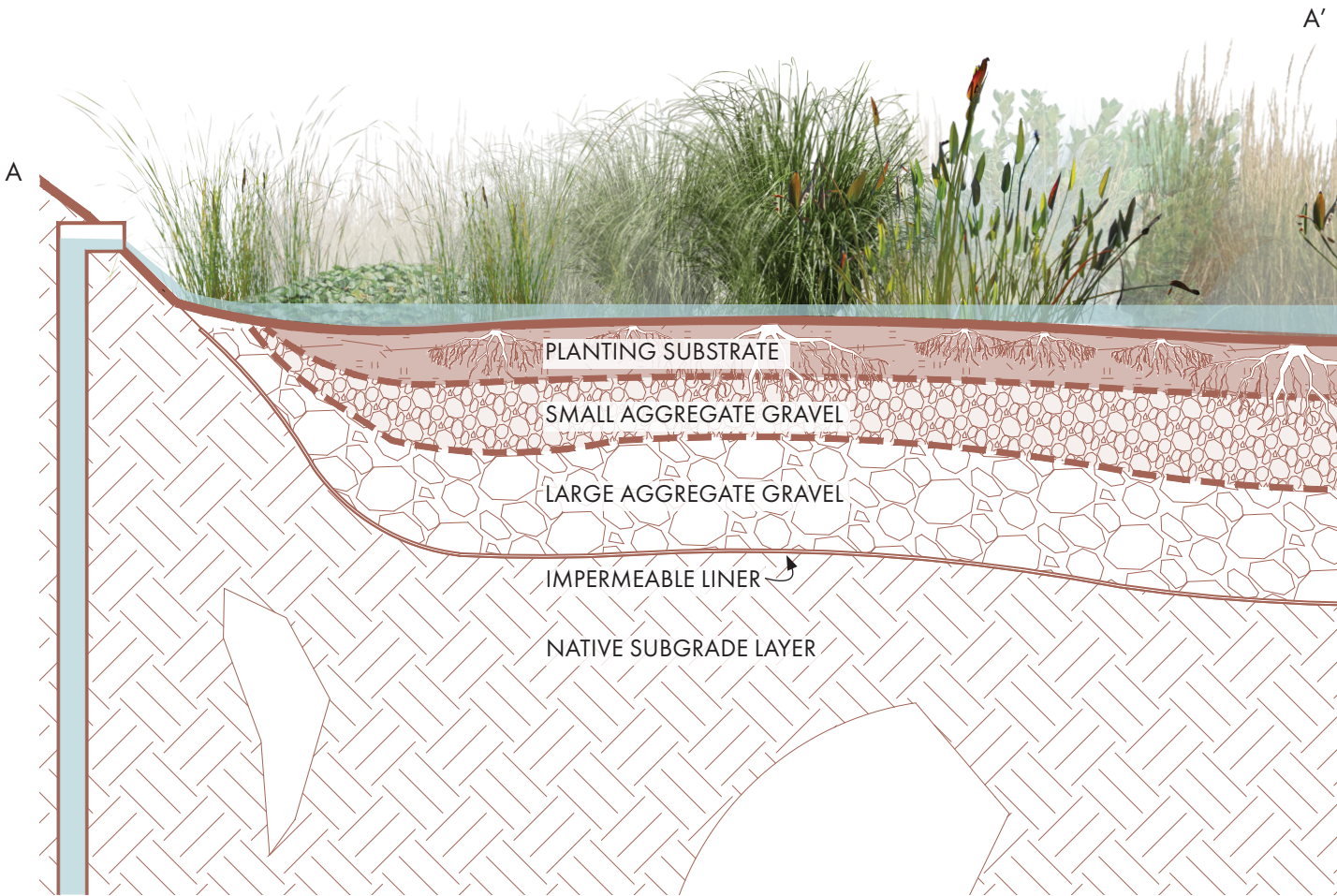
KEY MAP



SECTION ELEVATION    
**PHYTOREMEDIATION BIOTOPE**



KEY MAP



SECTION: PHYTOREMEDIATION BIOTOPE

**PLANT PALETTE:**  
PHYTOREMEDIATION BIOTOPE



Common Rush  
*Juncus patens*



Broadleaf Cattail  
*Typha latifolia*



California Bulrush  
*Schoenoplectus californicus*



Hardstem Bulrush  
*Schoenoplectus acutus*



Native Sedges  
*Carex* spp.



Seep Monkeyflower  
*Erythranthe guttata*



Yerba Mansa  
*Anemopsis californica*

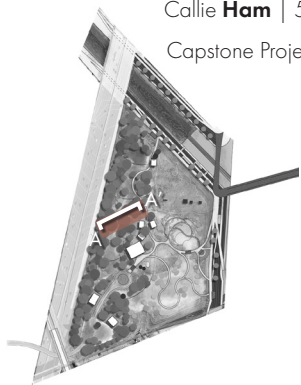


Mosquito Fern  
*Azolla filiculoides*

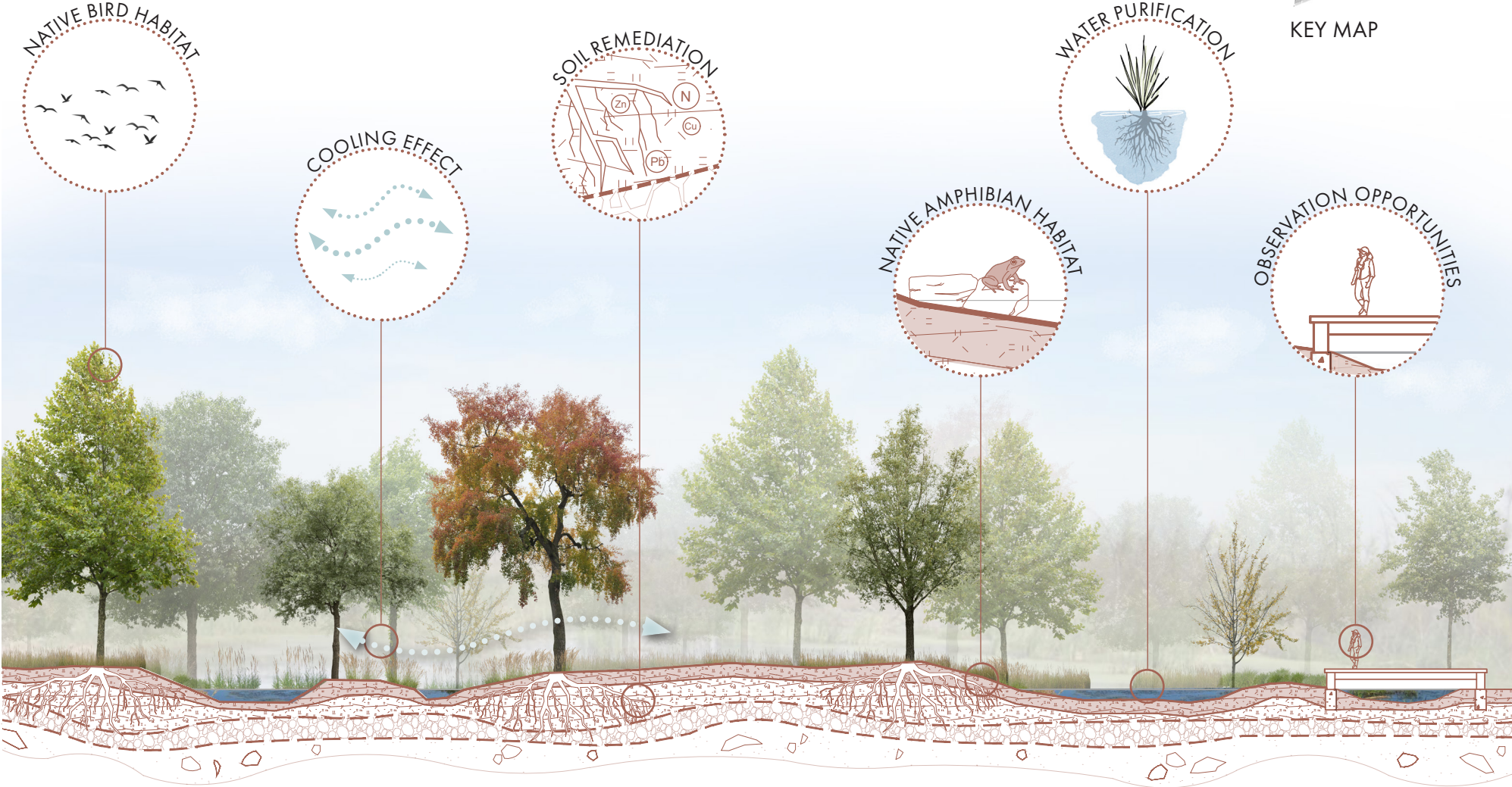


# SECTION ELEVATION

## RESTORED WETLAND



KEY MAP



SECTION ELEVATION OF RESTORED WETLAND



# PLANT PALETTE

## RESTORED WETLAND



Coast Live Oak  
*Quercus agrifolia*



Arroyo Willow  
*Salix lasiolepis*



Fremont Cottonwood  
*Populus fremontii*



Western Sycamore  
*Platanus racemosa*



Mule Fat  
*Baccharis salicifolia*



California Goldenrod  
*Solidago velutina*



Mugwort  
*Artemisia douglasiana*



Native Sedges  
*Carex* spp.



Common Rush  
*Juncus patens*



Broadleaf Cattail  
*Typha latifolia*



California Bulrush  
*Schoenoplectus californicus*



Hardstem Bulrush  
*Schoenoplectus acutus*



Seep Monkeyflower  
*Erythranthe guttata*



Yerba Mansa  
*Anemopsis californica*



Mosquito Fern  
*Azolla filiculoides*

Images: calscape.org

| Phytoremediation Properties                                  |           |          |         |        |         |         |      |          |      |
|--------------------------------------------------------------|-----------|----------|---------|--------|---------|---------|------|----------|------|
| Plant Species                                                | Pollutant |          |         |        |         |         |      |          |      |
|                                                              | Ammonia   | Bacteria | Cadmium | Copper | Nitrate | Nitrite | Lead | Selenium | Zinc |
| Coast Live Oak<br><i>Quercus agrifolia</i>                   |           |          |         |        | X       |         |      |          |      |
| Arroyo Willow<br><i>Salix lasiolepis</i>                     | X         | X        | X       | X      | X       | X       | X    | X        | X    |
| Fremont Cottonwood<br><i>Populus fremontii</i>               | X         | X        | X       |        | X       |         | X    |          |      |
| Western Sycamore<br><i>Platanus racemosa</i>                 | X         |          |         | X      |         |         |      |          | X    |
| Mulefat<br><i>Baccharis salicifolia</i>                      | X         | X        |         | X      | X       |         |      |          | X    |
| California Goldenrod<br><i>Solidago velutina californica</i> |           |          | X       |        |         | X       |      | X        |      |
| Mugwort<br><i>Artemisia douglasiana</i>                      | X         |          | X       |        | X       |         |      |          |      |
| Native Sedges<br><i>Carex</i> spp.                           |           |          | X       |        | X       |         |      |          |      |
| Common Rush<br><i>Juncus patens</i>                          | X         |          |         | X      | X       |         |      |          |      |
| Broadleaf Cattail<br><i>Typha latifolia</i>                  | X         | X        | X       | X      | X       | X       | X    | X        | X    |
| California Bulrush<br><i>Schoenoplectus californicus</i>     | X         | X        | X       | X      | X       | X       | X    |          | X    |
| Hardstem Bulrush<br><i>Schoenoplectus acutus</i>             | X         | X        | X       | X      | X       | X       | X    |          | X    |
| Seep Monkeyflower<br><i>Erythranthe guttata</i>              | X         | X        |         |        | X       | X       |      | X        |      |
| Yerba Mansa<br><i>Anemopsis californica</i>                  |           |          | X       |        |         |         |      |          | X    |
| Mosquito Fern<br><i>Azolla filiculoides</i>                  | X         | X        |         |        | X       | X       | X    | X        |      |



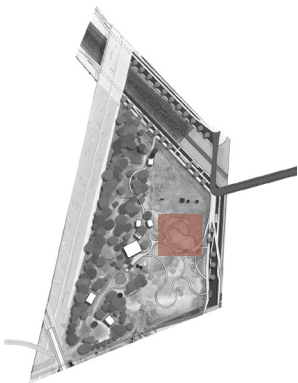
# ENLARGEMENT HABITAT MOSAICS

LEGEND

- 1 PEDESTRIAN TRAILS AND MOSAIC LEVIES
- 2 PLANTED AREA
- 3 ECOLOGICAL INFORMATION PANELS
- 4 RETENTION PONDS
- 5 OUTFLOW

The habitat mosaics create temporary ponding between pathways, creating additional **habitat** for birds, amphibians, and reptiles.

The pathways allow people to **meander through, observe and learn** about local ecology.



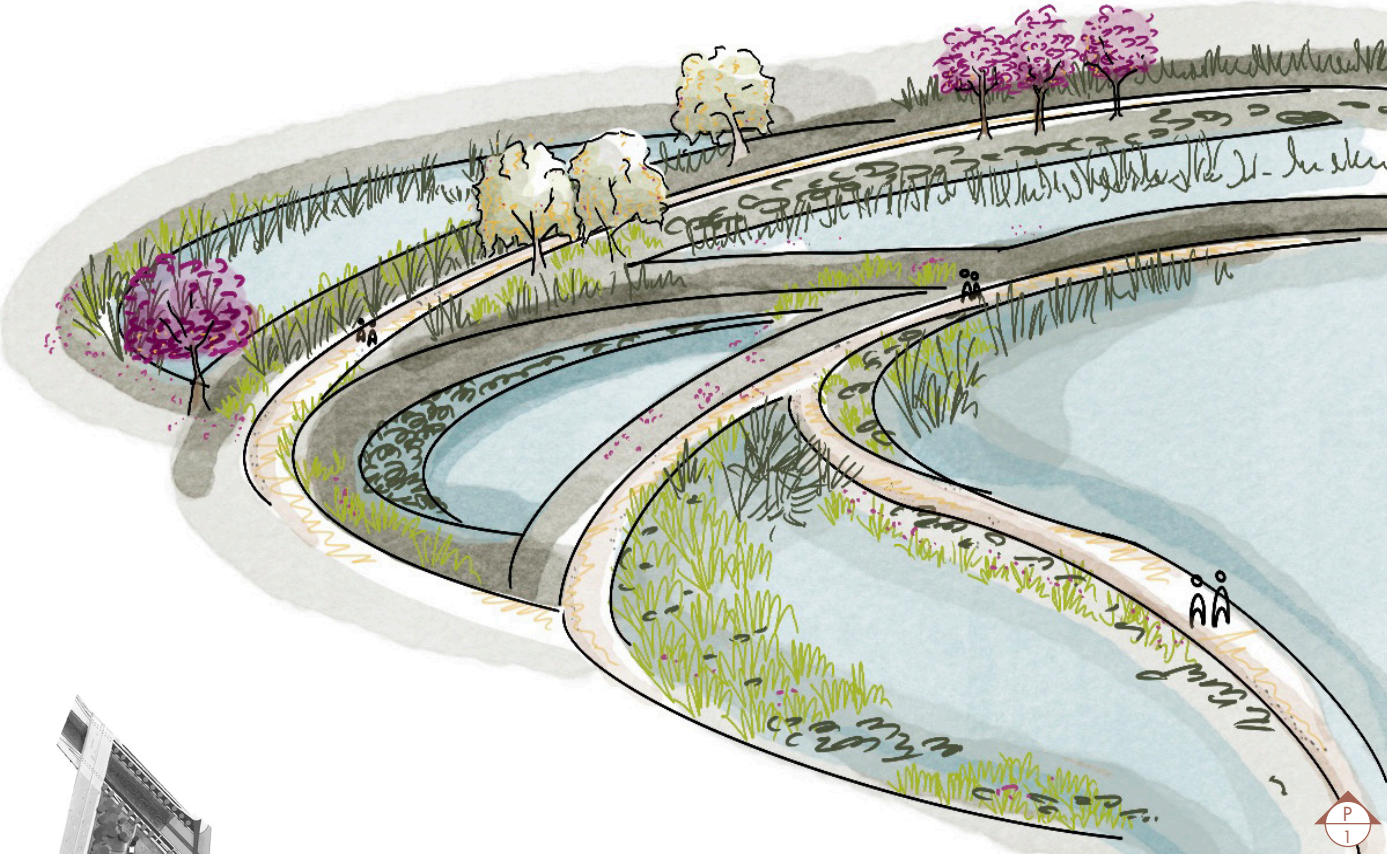
KEY MAP



ENLARGEMENT

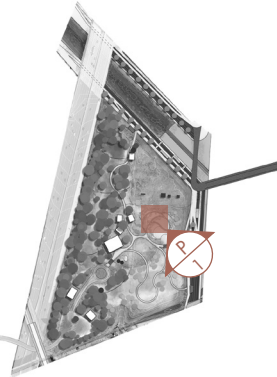


PERSPECTIVE    
**HABITAT MOSAICS & RETENTION POND**  
**PONDS**



**PERSPECTIVE: HABITAT MOSAIC GARDEN**  
Gentle landforms create retention ponds that form a diverse habitat mosaic, increasing infiltration and supporting habitat.

NTS



KEY MAP

INSPIRATION: URBAN WETLAND BIOTOPE



Urban wetland biotope in Tanner Springs Park, Portland, OR<sup>31</sup>

INSPIRATION: HABITAT-SUPPORTING STORMWATER INFRASTRUCTURE



Dominguez Gap Wetland, Los Angeles<sup>30</sup>

INSPIRATION: TERRACED RETENTION PONDS

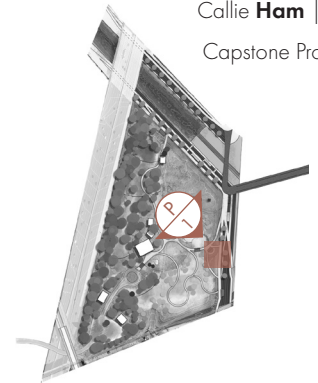


Liupanshui Minghu Wetland Park, Guizhou Province, China<sup>29</sup>



# PERSPECTIVE

## FLOODABLE AMPHITHEATER



KEY MAP



NTS

### PERSPECTIVE: FLOODABLE AMPHITHEATER

A natural-feeling amphitheater is built into the interior side of the LA River channel walls, helping to connect the River Promenade pathways to the rest of the site. The lowest portion is designed to collect and convey accumulated water, helping the site drain while allowing the space to function as both public amenity and resilient flood infrastructure.

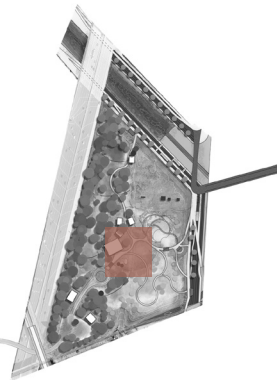


# ENLARGEMENT

## COMMUNITY CENTER

LEGEND

- 1 WEIR
- 2 COMMUNITY CENTER WITH PUBLIC BATHROOM & CAFE
- 3 OPEN-AIR OUTDOOR CLASSROOMS
- 4 PICNIC GARDEN
- 5 BRIDGE TO SOCIAL NODE
- 6 BIKE RACKS
- 7 SITE MODEL WATER FEATURE
- 8 OPEN RECREATION SPACE
- 9 DROP-OFF & FIRETRUCK TURNAROUND
- 10 SAND FILTER
- 11 UV TREATMENT TANK & CISTERNS FOR WATER PLAY & IRRIGATION



KEY MAP



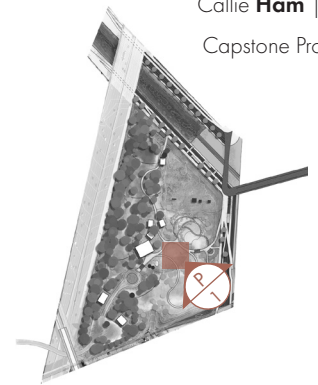
ENLARGEMENT

1" = 40' 0 20' 40'





# PERSPECTIVE SITE MODEL WATER FEATURE



KEY MAP



## PERSPECTIVE OF WATER FEATURE MIMICKING HYDROLOGY ON SITE

A water feature mimicking the hydrology on site serves as an educational tool to teach both children and adults about hydrology, wetland habitat, and nature-based solutions.



NTS



# MATERIALS PALETTE



Boardwalk decking<sup>35</sup>



Intersecting stone swales<sup>37</sup>



Natural colors and earthy tones<sup>34</sup>



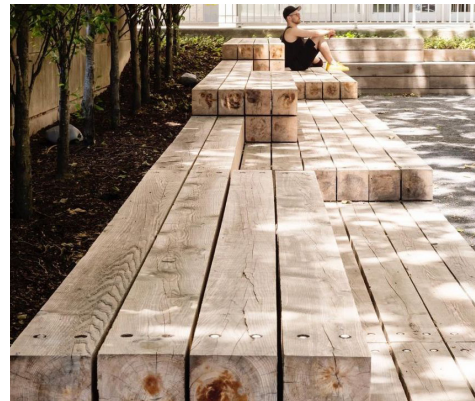
Curved and layered pathways



Artistic bird nesting sculptures<sup>39</sup>



Observation decks<sup>36</sup>



Natural wood seating<sup>38</sup>



Stylized rustic culverts<sup>40</sup>



# CONCLUSIONS

# CONCLUSIONS

## GOAL 1

### Reform Urban Flood Infrastructure

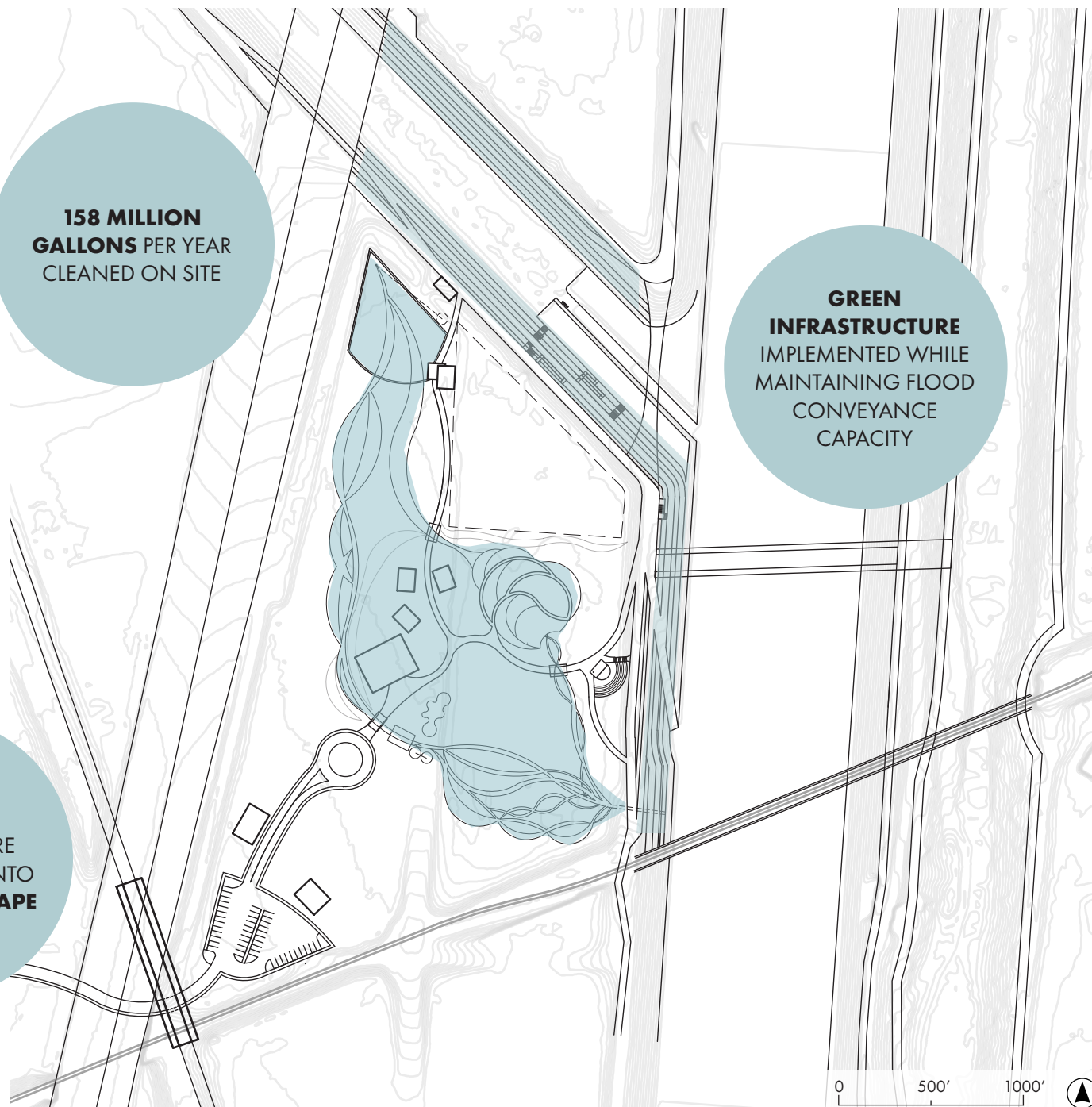
#### OBJECTIVES

1. Maintain flood conveyance while reconfiguring urban flood infrastructure
2. Increase stormwater and groundwater recharge
3. Slow and disperse stormwater flows
4. Transform flood infrastructure into public landscape
5. Reconnect people to urban water systems
6. Demonstrate visible water-cleaning processes within the landscape

**158 MILLION  
GALLONS PER YEAR  
CLEANED ON SITE**

**GREEN  
INFRASTRUCTURE  
IMPLEMENTED WHILE  
MAINTAINING FLOOD  
CONVEYANCE  
CAPACITY**

**FLOOD  
INFRASTRUCTURE  
TRANSFORMED INTO  
PUBLIC LANDSCAPE**





# CONCLUSIONS

## GOAL 2

### Restore Ecological Function

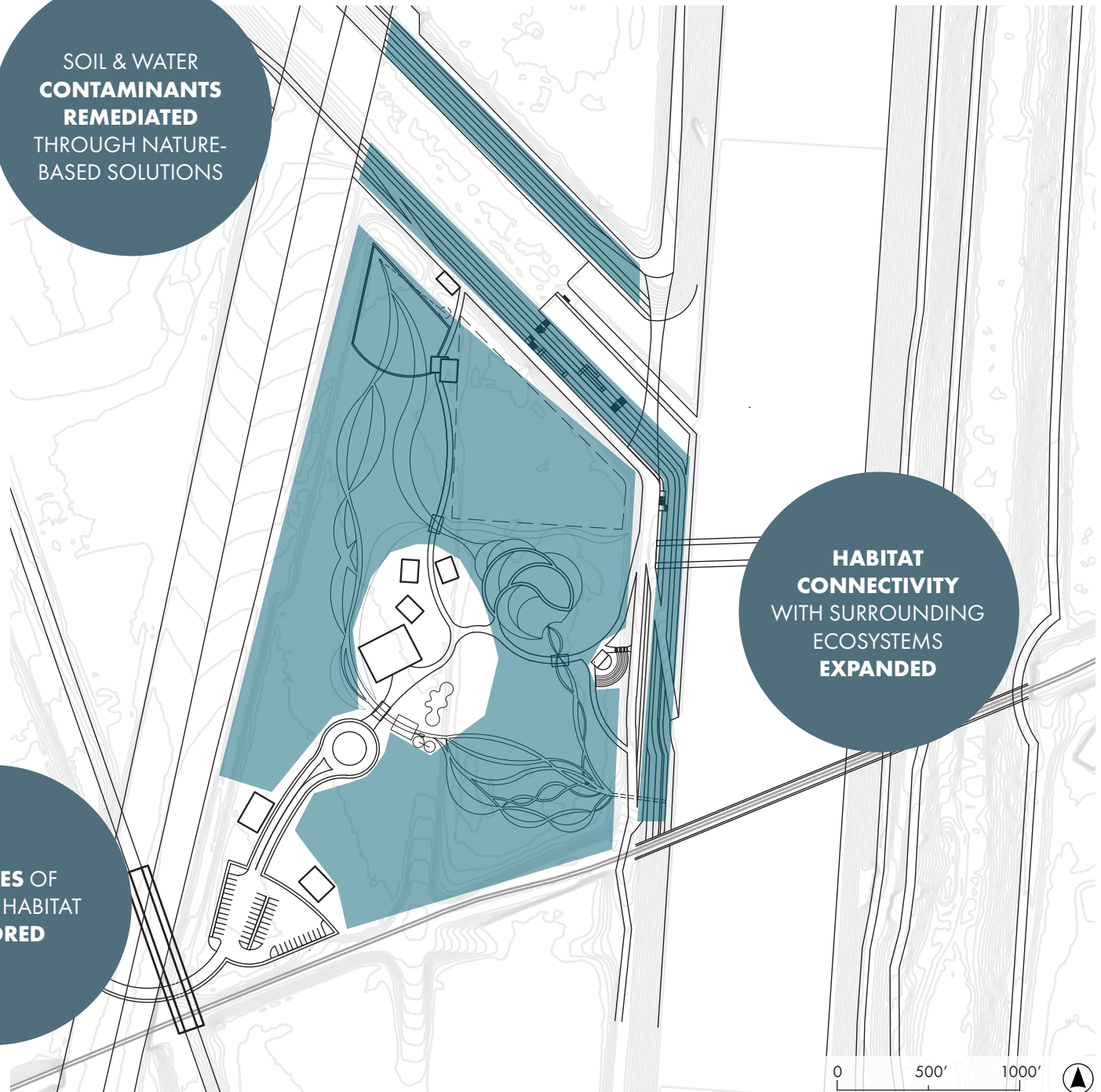
#### OBJECTIVES

1. Restore ecological function within a constrained watershed
2. Improve soil health and reduce contamination through phytoremediation and regenerative practices
3. Construct continuous habitat corridors linking upland, floodplain, and channel edge that support the recolonization of native bird, pollinator, and aquatic species
4. Generate best practices in the application of regenerative principles to an urban context involving flood infrastructure.
5. Educate visitors on regenerative principles, ecological restoration, and native species

SOIL & WATER  
CONTAMINANTS  
REMEDIED  
THROUGH NATURE-  
BASED SOLUTIONS

HABITAT  
CONNECTIVITY  
WITH SURROUNDING  
ECOSYSTEMS  
EXPANDED

25 ACRES OF  
WETLAND HABITAT  
RESTORED



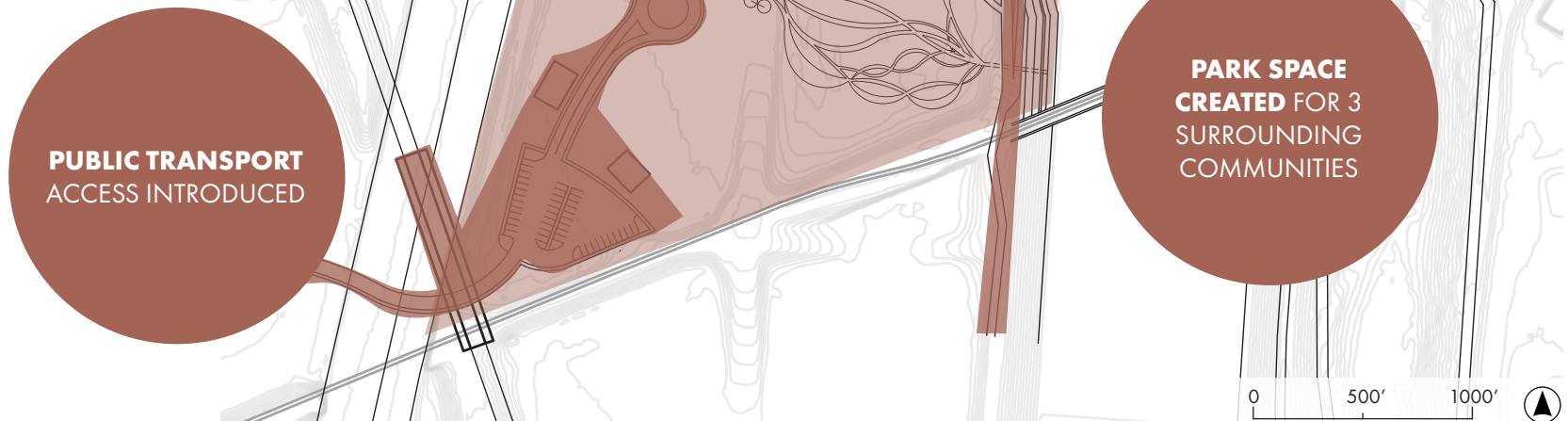
# CONCLUSIONS

## GOAL 3

### Create Equitable Public Access

#### OBJECTIVES

1. Connect adjacent neighborhoods to the river through distributed entry nodes and pathways
2. Provide safe and legible pedestrian access to the site
3. Connect bike pathways to the site from the LA River and Compton Creek
4. Connect equestrian communities north and south of the site
5. Provide open green space for recreation and community events
6. Provide space for communities to celebrate art and culture



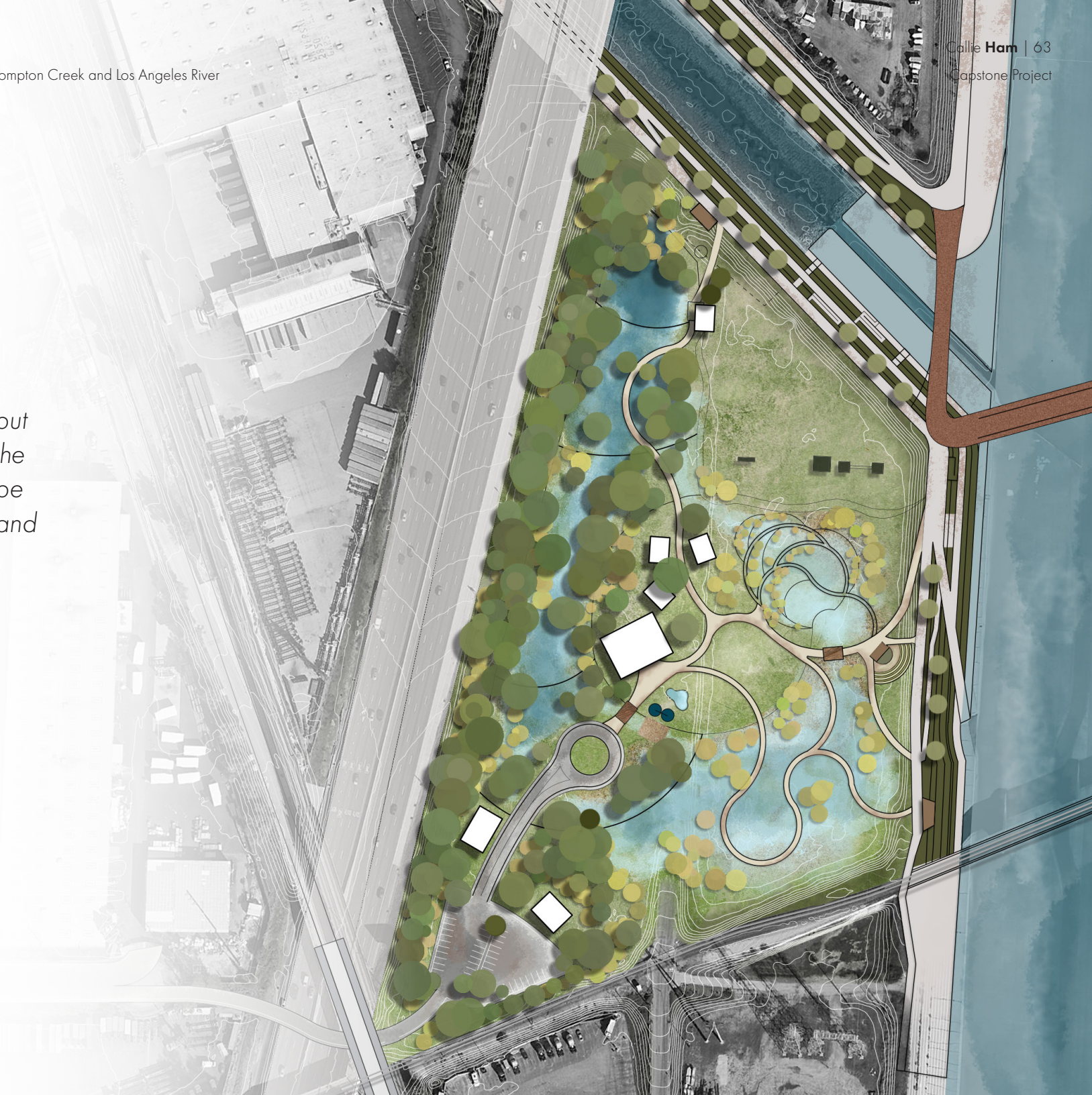


# FINAL THOUGHT

*By transforming flood infrastructure into public landscape, the confluence becomes not just a place where water is managed, but a place where water and the ecosystems that use it can be understood, experienced, and valued...*

## Special thanks to...

Meg Coffee  
Jim Pickel  
Tom Rau  
Will DiBernardo  
Matt Romero  
My fellow classmates  
Mom



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