BEYOND THE BERM

Designing a Climate-Resilient Future for Carpinteria's Shoreline

As climate change reshapes California's coastline, this project serves as a model for adapting coastal landscapes while balancing environmental, social, and economic priorities. By restoring natural coastal processes, relocating vulnerable infrastructure, increasing wildlife habitat, and improving connectivity within Carpinteria State Beach, this project proposes a resilient and accessible waterfront for future generations.

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Capstone Project Studio, Summer 2025
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UCLA Extension Landscape Architecture Program

CONTENTS

PROJECT INTRODUCTION

RESEARCH + ANALYSIS

CONCEPT DEVELOPMENT

MASTER PLAN DESIGN

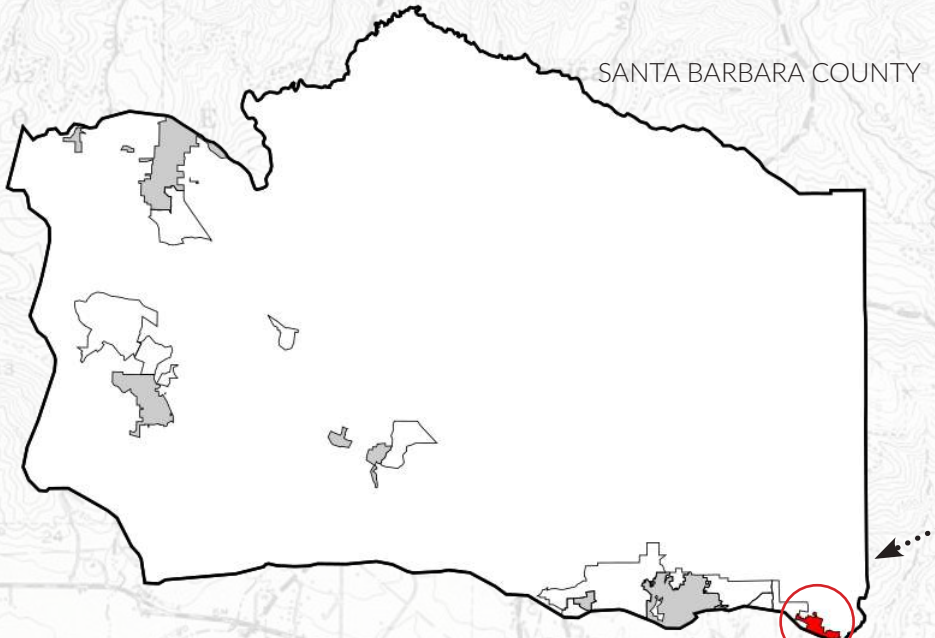
PROJECT CONCLUSION

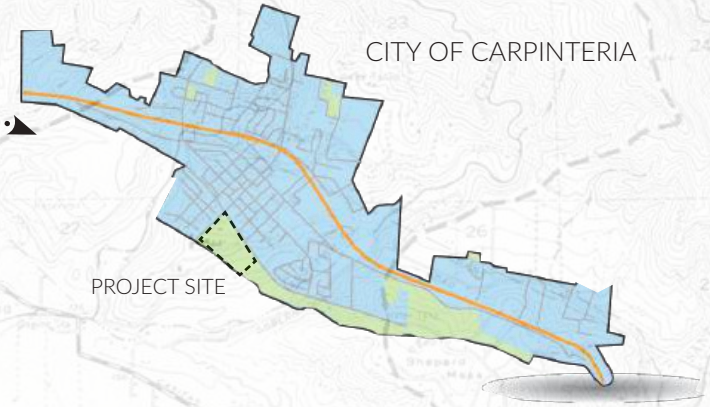
ACKNOWLEDGMENTS

Thank you to the wonderful teachers and mentors who have guided me over the past four years and helped bring this project to life—especially Meg Coffee and Stephanie Landregan. I am also deeply grateful to my UCLA Extension Landscape Architecture cohort(s) and my personal support system, who have carried me through this challenging yet rewarding chapter with encouragement, inspiration, and humor.

PROJECT INTRODUCTION

PROJECT LOCATION





The site is located in Carpinteria, CA, a small and quaint seaside city in the southeast corner of Santa Barbara County. Carpinteria is nestled between the Santa Ynez Mountains and the Pacific Ocean. The entire extent of the city is located within the designated California Coastal Zone.

SITE HISTORY

1300s | CANALINO

The Canalino (coastal Chumash) inhabited the coastal regions of what is now Santa Barbara County, including Carpinteria. Drawn by abundant coastal resources, they established villages near estuaries and river mouths along the lowlands adjacent to Carpinteria Creek (the project site) and on the mesa to the east.

1769 | SPANISH COLONIZATION

The Portolá Expedition reached Carpinteria, marking the first European contact with the Chumash people and initiating changes in culture, ecology, and land use. In 1786, Carpinteria Valley was granted to the Spanish Missions, leading to the displacement, suffering, and decline of the Chumash population.

1850 | AMERICAN PERIOD

California became a U.S. state following the Mexican-American War. Lands were opened to American settlers under the 1862 Homestead Act. The loss of native vegetation, which worsened with U.S. agricultural practices, led to increased erosion and estuary siltation. Ranching and farming further reduced open water habitats in local estuaries.

1869-1914 | URBANIZATION

Agriculture, urbanization, and climate shifts significantly reshaped Carpinteria Valley and Salt Marsh (named El Estero de la Carpinteria), altering natural resources. An 1869 U.S. Coast Survey map shows the salt marsh's original extent, stretching beyond its current boundaries. The first historic settlement began on the estuary's northern edge near Santa Monica Creek and Carpinteria Avenue.

1884 | RAILROAD CONSTRUCTION

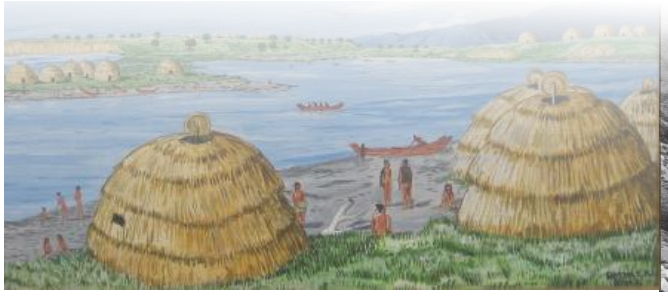
Construction of the Union Pacific Railroad occurred on a berm in the wetlands along the northern edge of the estuary. This resulted in the fragmentation and filling of the eastern portion of the estuary for further city development. Road construction, wetland infilling, and residential development contributed to reduction of habitats.

20TH CENTURY | ENVIRONMENTAL SETTING

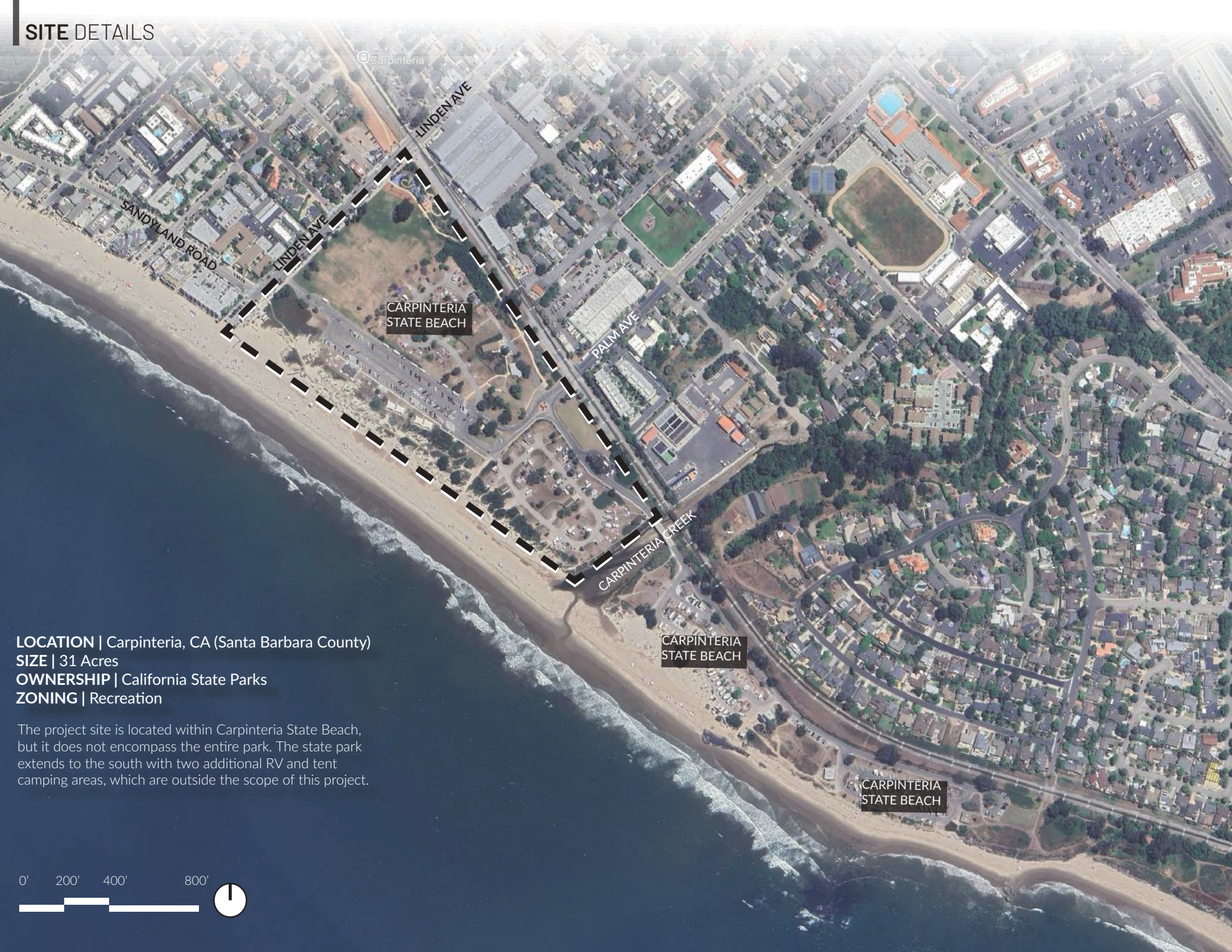
Estuary infilling has been an ongoing process, associated with upland erosion. Possibly as early as 200 years ago, human alteration of the local watersheds caused increased sediment load and siltation in the basin. Combined with wetland draining and diking, this transformed much of the marsh into uplands. Clark (1962) estimated the Carpinteria Salt Marsh once covered three-quarters of the valley—today it's less than half that size.

1977 | SALT MARSH RESERVE

The Carpinteria Salt Marsh Reserve was established by the University of California Natural Reserve System. Laws like the 1976 California Coastal Act and local coastal plans help protect the remaining estuary by recognizing its vital ecosystem and socio-economic value, however it is separated from the developed Carpinteria State Beach, which was once an extension of the original estuary.



SITE DETAILS



LOCATION | Carpinteria, CA (Santa Barbara County)
SIZE | 31 Acres
OWNERSHIP | California State Parks
ZONING | Recreation

The project site is located within Carpinteria State Beach, but it does not encompass the entire park. The state park extends to the south with two additional RV and tent camping areas, which are outside the scope of this project.

PROJECT JUSTIFICATION

RISING SEAS THREATEN THE SHORELINE

The Carpinteria shoreline, like many along California's coast, faces imminent threats from climate change, with sea levels projected to rise five feet by the year 2100. This amount of sea level rise will inundate shoreline housing, flood significant portions of Carpinteria State Beach, eliminate vital coastal habitat, and permanently alter the city's relationship with its waterfront.

WINTER STORM BERM BEING CONSTRUCTED

'THE BERM'

Since 1983, the City of Carpinteria has relied on the Winter Storm Berm Program to buffer coastal properties from wave action and flooding during the winter storm season. This temporary berm, which spans 1,375 feet and stands 9.5 feet tall, is constructed each fall and removed each spring.

WINTER BERM EFFICACY

The berm is an inadequate long-term solution due high costs ($35,000 annually), seasonal impacts to beach usability, and diminishing effectiveness in the face of accelerated sea level rise and shoreline erosion. Once sea levels rise beyond two feet, the protective capacity of the berm becomes significantly compromised, increasing the risk of storm over-topping, beach erosion, and infrastructural damage. Furthermore, the berm only aims to protect shoreline housing, but does not address the State Beach, wildlife habitat, or other vulnerable waterfront infrastructure.

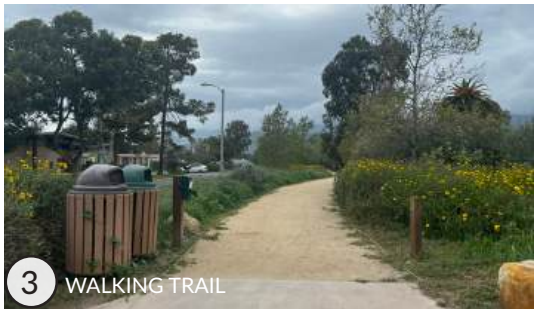
'DUNE AND SHORELINE MANAGEMENT PLAN' PROPOSAL

To address the diminishing return of the winter berm, the city worked with USACE to produce a Storm Damage and Shoreline Protection Feasibility Study which identified a range possible solutions to address coastal erosion. Despite the consideration of long-term efficacy, these measures again only serve to project the Sandyland Road waterfront housing units (and a limited group of stakeholders) and do not address the broader loss of shoreline and habitat along Carpinteria State Beach.

ZONE A | LINDEN FIELD

ZONE B | DAY USE AREA + SHORELINE

ZONE C | ANACAPA CAMPGROUND, PLAY AREA + VISITOR CENTER



ZONE D | ENTRANCE, SANTA CRUZ CAMPGROUND + RIVERMOUTH

RESEARCH + ANALYSIS

EXISTING PROGRAMMING + USERS

LINDEN PARK USERS

- Local Carpinteria residents (all ages)
- Occasional community-event attendees
- Dogs and owners

CAMPGROUND USERS

- Out-of-town visitors
- All ages: families with children, retirees, young couples
- Youth groups and school programs
- RVers (primarily families with young children and retirees)

DAY USE AREA USERS

- Local Carpinteria residents and families
- Visitors from nearby Southern California areas
- Beach goers and surfers (especially during summer months)

CARPINTERIA DEMOGRAPHICS

- Population: 13,100
- Median age: 44.5
- Median Household Income: $104,233

STAKEHOLDERS

- Government agencies (CA State Parks, City of Carpinteria, Santa Barbara County)
- Local Carpinteria residents
- Marine species
- Shorebirds + migratory birds
- Tourists

SITE CONTEXT

SEA LEVEL RISE VULNERABILITY

NOAA's Projected Flood Depth at 5' Sea Level Rise

Low-Lying Areas

Maximum Wave Run-Up

Site Boundary

CARPINTERIA'S COASTAL VULNERABILITY

NOAA's sea level rise charts primarily focus on long-term projections of mean sea level changes, not considering the increased coastal flooding from tidal variations and storm surge. The project site is projected to experience varying levels of inundation by 2100, particularly in the Linden Field and day-use parking areas. Additionally, outside of the site boundaries, many residential structures will be impacted, and the Salt Marsh will be fully inundated, eliminating vital habitat for wildlife such as migratory birds, fish, and other species dependent on the marsh ecosystem, while also exacerbating coastal erosion.

GOALS + OBJECTIVES

SEA LEVEL RISE RESILIENCE

- Introduce a shoreline adaptation strategy that accommodates for long-term sea level rise
- Restore natural coastal processes
- Relocate vulnerable infrastructure, including RV campsites, to less ecologically sensitive areas

EQUITABLE LAND USE + PUBLIC ACCESS

- Create equitable public access to the waterfront
- Introduce programming that broadly serves the community and visitors alike
- Repurpose the underutilized and flood-prone Linden Field as a climate-adaptive public asset with improved drainage, habitat value, and recreational potential

WILDLIFE HABITAT RESTORATION

- Improve water quality and mitigate runoff to support healthier marine & estuarine life
- Create wildlife corridors and connectivity amongst Carpinteria's preserved spaces
- Restore diminishing coastal wetland habitats

IMPROVED CONNECTIVITY

- Reconnect fragmented open spaces through trails and green corridors
- Improve multi-modal access and connection within site
- Enhance ecological corridors between coastal and inland habitats
- Strengthen community and cultural ties to the coastline

DESIGN METHODOLOGY

SEA LEVEL RISE RESILIENCE

APPROACH

- Design should preserve public access to and along beach
- Design should prioritize protection of coastal habitats
- Design should follow natural processes and follow the logic of the land
- Determine project lifespan to guide evaluation of sea level rise projections and design for high adaptive capacity

METHODS

- Prioritize use of natural infrastructure, and minimize shoreline armoring
- Managed retreat: structure relocation and/or abandonment
- *Coastal Infrastructure: A Typology For The Next Century Of Adaptation To Sea-Level Rise* - Dr. Kristina Hill
- *Design with Nature* - Ian L. McHarg
- *Sea Level Rise Adaptation Strategy* - California State Parks
- Living Shoreline Projects - U.S. Fish and Wildlife Service
- SCAPE Studio
- Strategic Plan (2021-2026) BEACON

EQUITABLE LAND USE + PUBLIC ACCESS

APPROACH

- Design assesses the vulnerability of public access to the park, especially in the face of coastal erosion and higher sea levels.

METHODS

- Landscape Mosaic ideology
- Multispecies Urbanism - Debra Solomon
- *Designing with Community in Mind* - Anna Cawrse and Joshua Brooks
- *Outdoors for All, Providing Equitable Access to Parks and Nature* - California Natural Resources Agency

WILDLIFE HABITAT RESTORATION

APPROACH

- Design considers the loss of native habitats due to climate impacts and sea level rise, including salt marsh inundation and beach erosion.

METHODS

- Regrading for floodplain adaptation - North Campus Open Space Project
- Wetland Protection Strategy from SCCWRP (2019)

IMPROVED CONNECTIVITY

APPROACH

- Design considers and engages with local and regional environmental, coastal, and developmental policies.

METHODS

- City of Carpinteria Coastal Land Use Plan (2024)
- California Coastal Act (1976)
- State of CA Sea Level Rise Guidance (2024)
- City of Carpinteria Local Hazard Mitigation Plan (2023)

PROJECT PRECEDENT | SURFERS' POINT VENTURA

LOCATION | Ventura, CA
TYPE | Shoreline Restoration + Retreat
SIZE | 2.5 acres
COMPLETED | 2012 (Phase 1)

PROJECT CONTEXT + GOALS

- Well-recognized coastline restoration project that was initiated by Surfrider Foundation in 1991
- Responds to decades of severe beach erosion that threatened public infrastructure and ecological habitat
- A forward-thinking "managed retreat" approach was implemented—relocating vulnerable infrastructure (parking lot and bike path) inland and restoring the shoreline's natural systems
- Design prioritizes coastal resilience and habitat protection while maintaining public access

KEY FEATURES + AMENITIES

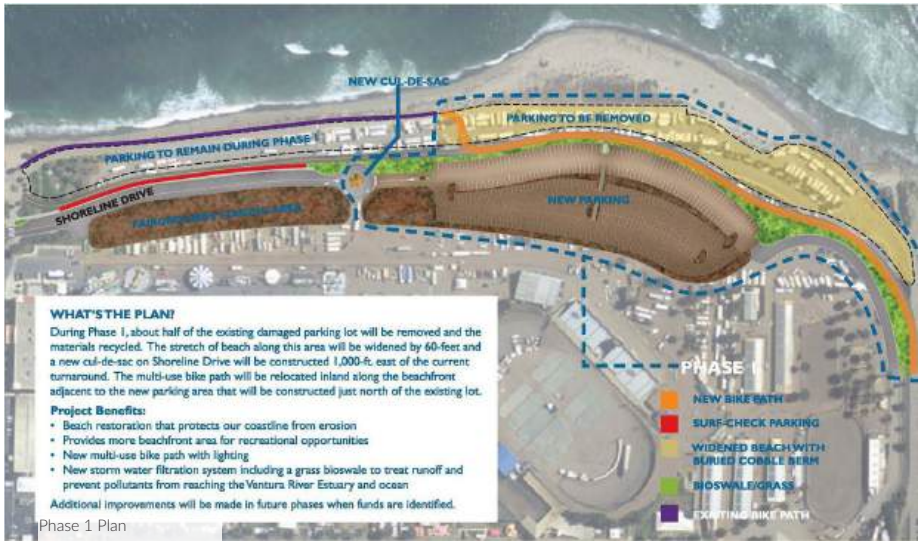
Sand Dune Restoration // Native Cobble Berm // Beach Nourishment // Native Vegetation // Parking Lot + Existing Bike Path Relocation // Boardwalk Trails // LID Parking // Boardwalk Trail System // ADA-Compliant Access + Paths //


Bike Path Before Construction


New Bike Path + Parking

AREAS OF ALIGNMENT + APPLICABLE ELEMENTS

- **Public Access:** High value coastal area with coveted access and recreation. Demonstrates increased resilience and enhanced public use through a new multi-use path, improved beach access, and additional parking with amenities.
- **Low-Impact Development Parking:** Implementing runoff treatment controls, permeable surfaces, and stormwater treatment to relocated parking lot.
- **Managed Shoreline Retreat:** Relocation of vulnerable infrastructure. Restoration of retreat area and re-contouring with natural beach materials to protect restored area.



Phase 1 Plan


Phase 2 Rendering

PROJECT PRECEDENT | UCSB NORTH CAMPUS RESTORATION

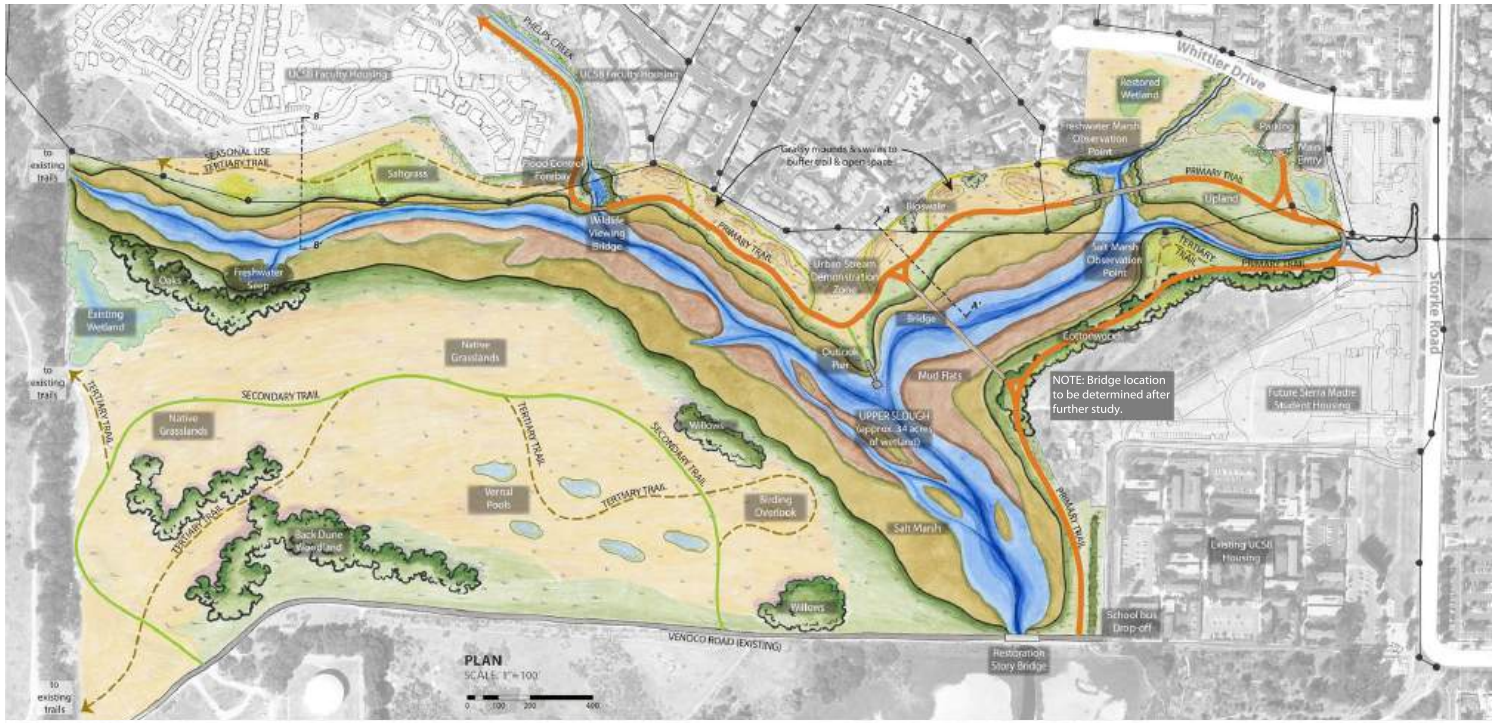
LOCATION | Goleta, CA
PROJECT TYPE | Wetland Restoration
SIZE | 136 Acres
COMPLETED | 2018

PROJECT CONTEXT + GOALS

- The 63-acre former Ocean Meadows Golf Course was acquired by The Trust for Public Land
- Project planning process incorporated community engagement, revealing strong public support for a naturalistic landscape that prioritized both wildlife habitat and public access
- Restoration efforts focused on reestablishing disrupted native wetland and upland ecosystems that connect to Devereux Slough

KEY FEATURES + AMENITIES

Tidal Wetlands // Freshwater Marshes // Grasslands // Wildlife Habitat Restoration // Public Trail + Boardwalk Access // Soil Reuse // Floodplain Restoration // Education + Stewardship Programs



AREAS OF ALIGNMENT + APPLICABLE ELEMENTS

- **Sea Level Resilience:** Tidal wetlands act as buffer against storm surge and coastal flooding. Restored water flow between the slough and upland areas. Emphasis on native planting and natural landforms.
- **Flood Protection:** Excavated and redistributed soil to lower the floodplain by two feet, reducing flood risk for surrounding neighborhoods.
- **Low-Impact Trails:** Use of raised boardwalks to maintain access with tidal encroachment.
- **Habitat Protection:** Restored various wildlife habitats through hydrology, invasive species removal, and erosion control.


Photo Credit: Bill Dewey

PROJECT PRECEDENT | DOTSON FAMILY MARSH RESTORATION

LOCATION | Richmond, CA
TYPE | Wetland Restoration + Public Access
SIZE | 150 Acres
COMPLETED | 2017

PROJECT CONTEXT + GOALS

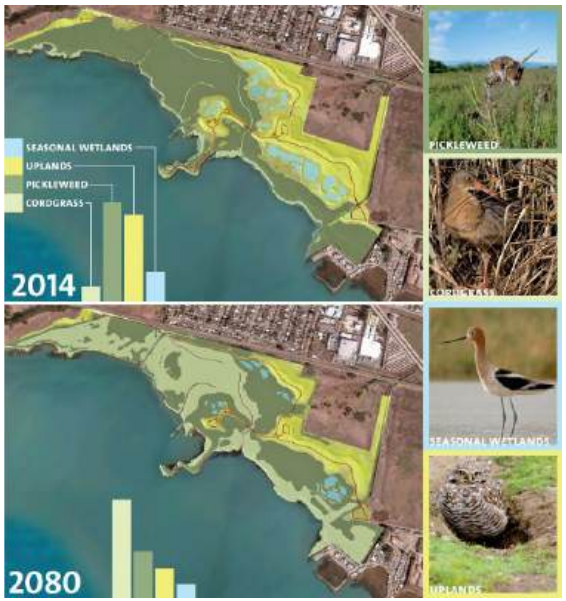
- Award-winning project that encompasses 150-acres at Point Pinole Regional Shoreline
- Expanded public shoreline access, closing a critical gap in the regional Bay Trail
- Restored 30-acres of historically filled tidal marsh habitat to reestablish the natural marsh plain.

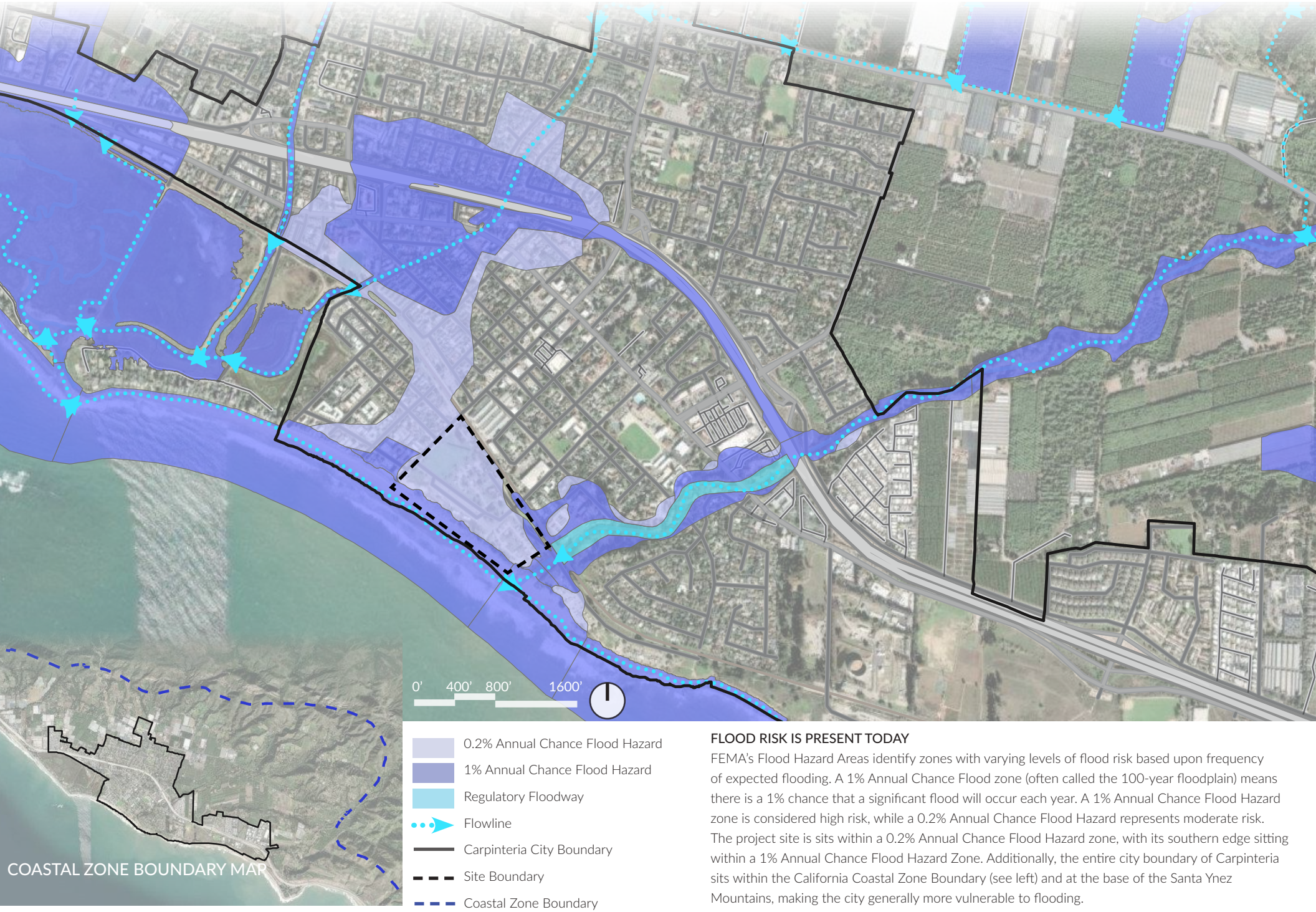
KEY FEATURES + AMENITIES

1.5-mile San Francisco Bay Trail Extension // New Entrance to Point Pinole Regional Shoreline // Parking + Restrooms // Picnic Area // 1,100-foot Boardwalk // Marsh Restoration // Coastal Prairie and Other Native Habitats // Tidal Wetlands // Freshwater Seasonal Wetlands //

AREAS OF ALIGNMENT + APPLICABLE ELEMENTS

- **Public Access + Connection:** Balancing access with habitat protection via boardwalks, designated trails & viewing platforms. Connecting regional bike trail.
- **Natural Hydrology + Marsh Restoration:** Reestablished the natural marsh plain, previously infilled like Carpinteria, to restore natural water flow—achieved by regrading, levee breaching, and restoring native vegetation.
- **Sea Level Rise Resilience:** Restoring tidal wetlands allowing for natural function and adaptation. Incorporation of transitional zones between wetland and upland areas, allowing for upland migration.





FLOOD RISK IS PRESENT TODAY

FEMA's Flood Hazard Areas identify zones with varying levels of flood risk based upon frequency of expected flooding. A 1% Annual Chance Flood zone (often called the 100-year floodplain) means there is a 1% chance that a significant flood will occur each year. A 1% Annual Chance Flood Hazard zone is considered high risk, while a 0.2% Annual Chance Flood Hazard represents moderate risk. The project site is sits within a 0.2% Annual Chance Flood Hazard zone, with its southern edge sitting within a 1% Annual Chance Flood Hazard Zone. Additionally, the entire city boundary of Carpinteria sits within the California Coastal Zone Boundary (see left) and at the base of the Santa Ynez Mountains, making the city generally more vulnerable to flooding.

State Land
County Land
City Land
Special District Land
City Boundary
Site Boundary
California Coastal Trail

CARPINTERIA'S PATCHWORK OF OPEN SPACES

Carpinteria is home to several coveted protected spaces that fall under various jurisdictions including Carpinteria Salt Marsh Reserve, Carpinteria State Beach, Carpinteria Bluffs Nature Preserve, and Tar Pits Park. Advocacy groups like Citizens for the Carpinteria Bluffs have rallied around preserving Carpinteria's open spaces for many years. Although each site features its own internal trail system to some extent, there is a lack of continuous, connected access between them. Carpinteria State Beach, located centrally, suffers from limited and unclear circulation, further complicating movement between these open spaces.

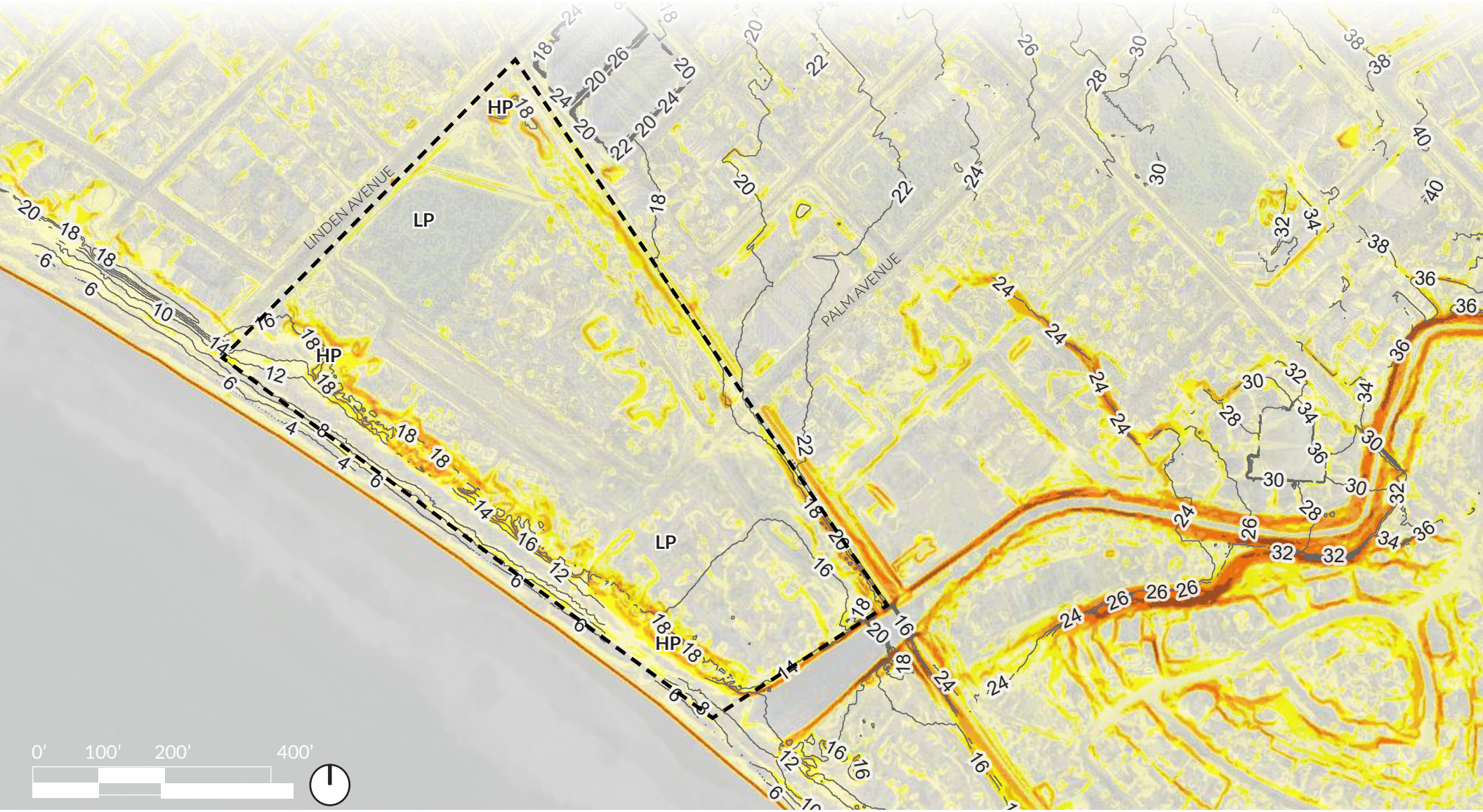
The California Coastal Trail does pass through portions of the area, but it remains fragmented, often diverting pedestrians onto busy streets or narrow sidewalks with insufficient wayfinding. As a result, visitors must navigate a patchwork of disconnected trails, parking lots, and roadways to move between these spaces which limits safe and equitable public access to Carpinteria's coastline and valuable open spaces.

ESTUARY + TIDAL HABITAT AREA

This map highlights key estuarine and tidal habitat areas identified through the California Department of Fish and Wildlife's Areas of Conservation Emphasis (ACE) analysis. Carpinteria is home to extensive tidal wetlands that provide crucial feeding and nesting areas for fish, invertebrates, and bird species. It is important to assess how much of this valuable habitat could be lost due to projected sea level rise over the next 50 to 100 years.

TERRESTRIAL NATIVE BIRD RICHNESS

This terrestrial native bird richness map, created through the Areas of Conservation Emphasis (ACE) initiative, illustrates the diversity and concentration of bird species in the Carpinteria region. Notably, the Salt Marsh and Carpinteria State Beach are identified as areas of high bird species richness. Protecting these vital habitats and supporting ecosystem health will be essential as we confront the challenges of climate change and rising sea levels.



- Very Steep (31°- 90°)
- Steep (21° - 30°)
- Moderately Steep (16° - 20°)
- Gently Steep (11° - 15°)
- Strongly Sloping (6° - 10°)
- Gently Sloping (3° - 5°)
- Flat/ Nearly Level (0 - 3°)
- 2’ Contours
- Site Boundary
- **HP** High Point
- **LP** Low Point

A LOW LYING PARK

This section of Carpinteria State Beach features a gently sloping coastal plain that transitions from sandy beaches and dunes to low-lying inland areas. The site’s topography is generally flat, with subtle elevation changes, particularly around the restored dune and boardwalk area adjacent to the beach. The day parking area and Linden Field, which are located behind the dunes, sit at or near sea level, making them susceptible to tidal inundation, groundwater emergence, storm surges, and sea level rise.

PUBLIC ACCESS + PEDESTRIAN CIRCULATION

The site is situated between the Amtrak railroad to the north and the Pacific Ocean to the south. Circulation and access are limited, particularly for the public. There is one main vehicular entrance and two exits. The primary exit is a one-way and services the day-use parking. Most of the site's vehicular circulation is designed to serve campground access. A large day-use parking lot is available but requires paid entry and alternative free public parking is offered along Linden Avenue.

Pedestrian circulation throughout the site is fragmented and challenging to navigate. For visitors arriving on foot, there are two pedestrian entrances along Linden Avenue. One leads to a decomposed granite trail, while the other leads to a dune boardwalk with beach access points. These two trails terminate abruptly and are not connected. To access the southern half of the site on foot, the only available path is a sidewalk running alongside the primary state park road.

CONCEPT DEVELOPMENT

EVALUATING POSSIBLE PROTECTIVE MEASURES

HARD DEFENSES

WHAT IT IS

- Structural flood barriers placed offshore to reduce water encroachment
- Levees, seawalls, bulkheads, dikes, breakwaters, groins

PROS

- Offers immediate protection
- Offers high level of protection

CONS

- High cost
- Requires ongoing maintenance
- Negatively impacts natural coastal systems and habitats
- Inhibits dune growth
- Less adaptable to future needs

FEASIBILITY FOR PROJECT

MEETS PROJECT GOALS

DUNE RESTORATION

*Selected for design

WHAT IT IS

- Rebuilding, enhancing, and expanding coastal sand dunes

PROS

- Supports biodiversity and native habitats
- Acts as habitat corridor
- Maintains natural sediment
- Reduces erosion and acts as buffer zone

CONS

- Requires space
- Renourishment maintenance is required
- Effectiveness against sea rise is variable based on storm intensity

FEASIBILITY FOR PROJECT

MEETS PROJECT GOALS

BEACH NOURISHMENT

WHAT IT IS

- Adding sand to an eroded beach, restoring beach width
- Widens and raises the beach

PROS

- Recreational benefits
- Reduces shoreline erosion
- Helps maintain native habitats, if compatible sand is used

CONS

- Short lifespan
- High cost and regular maintenance required
- Can disrupt marine ecosystems
- Viewed as a temporary fix
- Difficult to source compatible sand

FEASIBILITY FOR PROJECT

MEETS PROJECT GOALS

ECOSYSTEM-BASED ADAPTATION

*Selected for design

WHAT IT IS

- Using natural systems to buffer climate impacts
- Wetland and marsh restoration
- Floodplain restoration
- Reef restoration (living breakwater)

PROS

- Natural water absorption
- Supports native habitats
- Low maintenance costs
- Adaptive to long-term change

CONS

- Requires space
- Takes time to establish
- Less protective in catastrophic weather events

FEASIBILITY FOR PROJECT

MEETS PROJECT GOALS

MANAGED RETREAT

WHAT IT IS

- Relocating coastal infrastructure, housing, and neighborhoods
- Reestablishing natural land use

PROS

- Highly effective in protecting people and assets
- Supports large scale ecological restoration
- Can be phased over time

CONS

- High cost
- Complex legal and land use barriers
- High public resistance
- Housing relocation is challenging
- Loss of local revenue

FEASIBILITY FOR PROJECT

MEETS PROJECT GOALS

SITE CONSTRAINTS

SITE OPPORTUNITIES

PROGRAM ELEMENTS

SEA LEVEL RISE RESILIENCE

EQUITABLE LAND USE + PUBLIC ACCESS

WILDLIFE HABITAT RESTORATION

IMPROVED CONNECTIVITY

RESTORED WETLAND

7 acre restored wetland and salt marsh in the existing Linden Field low-lying area.

NATIVE DUNE RESTORATION

1.5 acre dune restoration and habitat expansion inland to accommodate rising seas and erosion.

EXTENDED TRAIL SYSTEM

Expanded 1/4 mile mixed use trail system and extension of ADA-compliant trails

ELEVATED BOARDWALK

Elevated boardwalk extension (500 ft) with viewing decks that enables circulation and protects sensitive habitat area.

OUTDOOR CLASSROOM

Outdoor classroom (400 sq ft) and stewardship programs. Public event space.

PEDESTRIAN ENTRY PLAZA

Clearer park entry points from downtown Carpinteria, creating a stronger connection to the broader trail systems.

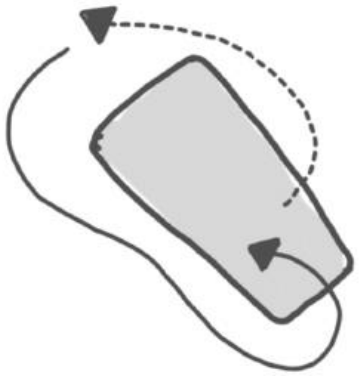
PARK AMENITIES

Picnic areas, pavilion rental, bike rental, and facilities — providing programming for visitors while retaining park revenue.

DESIGN METAPHORS

REWRITING THE SHORELINE:

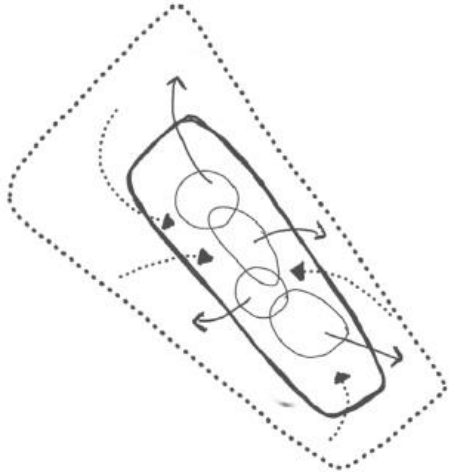
The past as prelude to future resilience



This design begins by confronting the site's layered history: What came before the park as we know it today? By recovering the site's original identity as a salt marsh and reintroducing wetland ecologies, we use the past as a guide for future resilience. Reintroducing natural dunes and wetland systems will help accommodate climate impacts. Interpretive features reveal layers of lost landscapes, allowing visitors to understand both what was and what's at stake. Through rewilding, restoration, and remembrance, the shoreline is rewritten—not erased.

FROM FRINGE TO FOCUS:

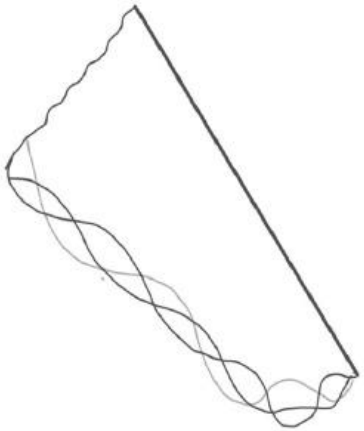
Reclaiming the margins as the heart of the landscape



What was once peripheral—ecology, habitat, and cultural memory—now becomes the central focus of the design. This project reorients the park's values, shifting emphasis from built recreation that caters to tourism to natural systems and access for the local community. The overlooked and underutilized focuses no longer live on the fringes. Instead, they are brought forward, restored, and celebrated.

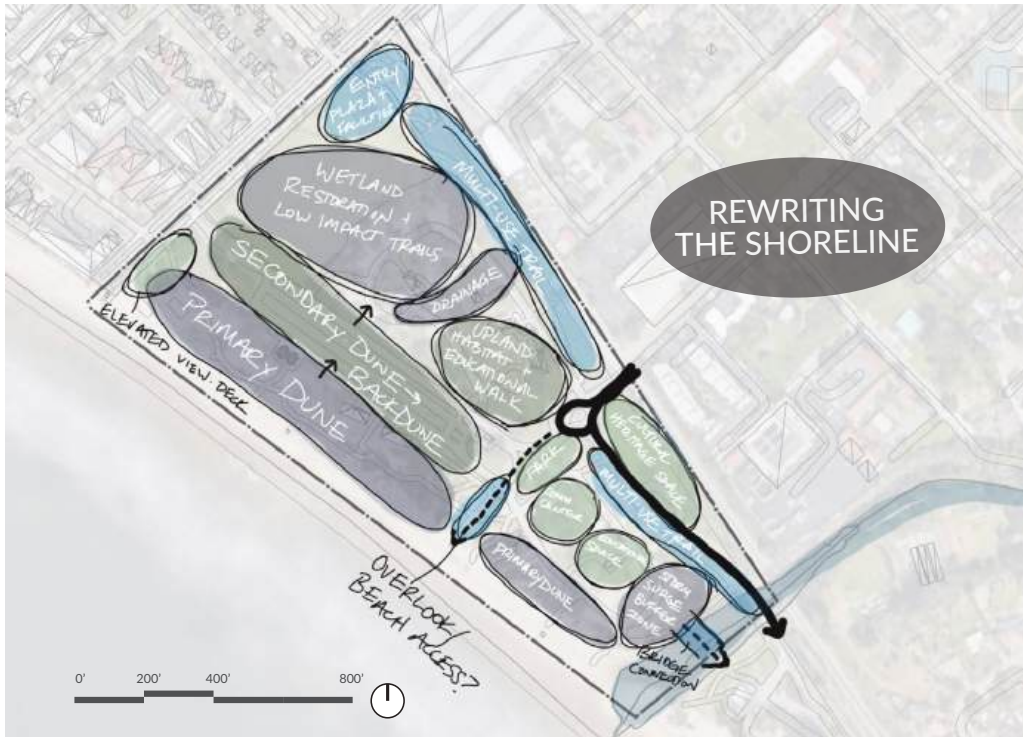
FLUID BOUNDARIES:

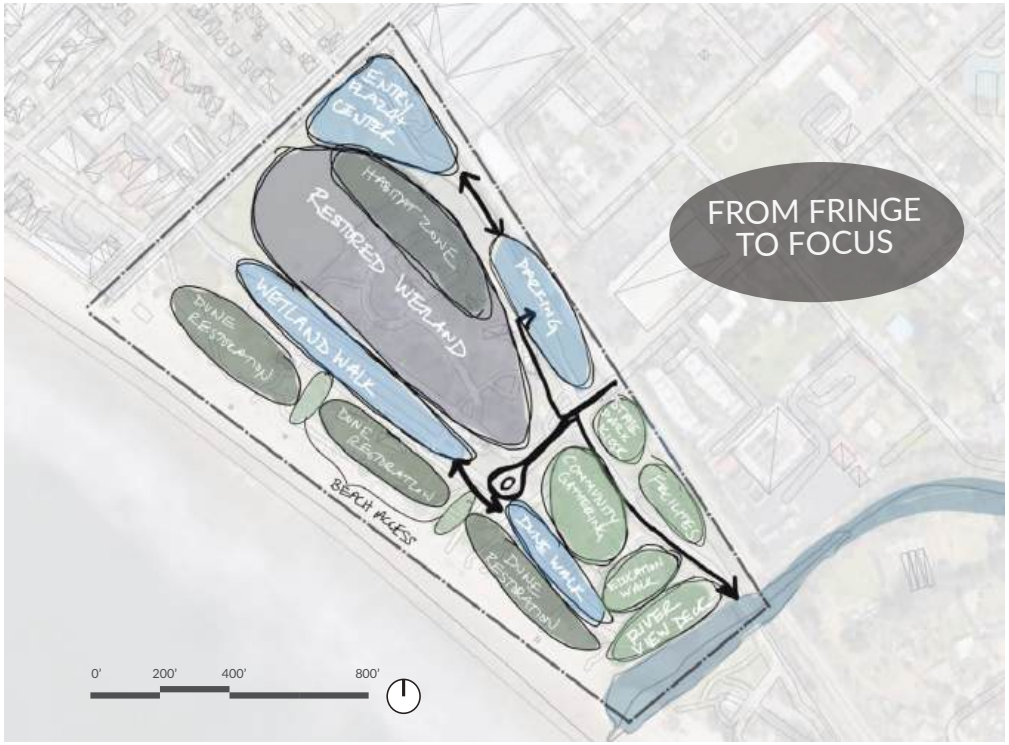
Designing with the rhythms of tide, time, and terrain

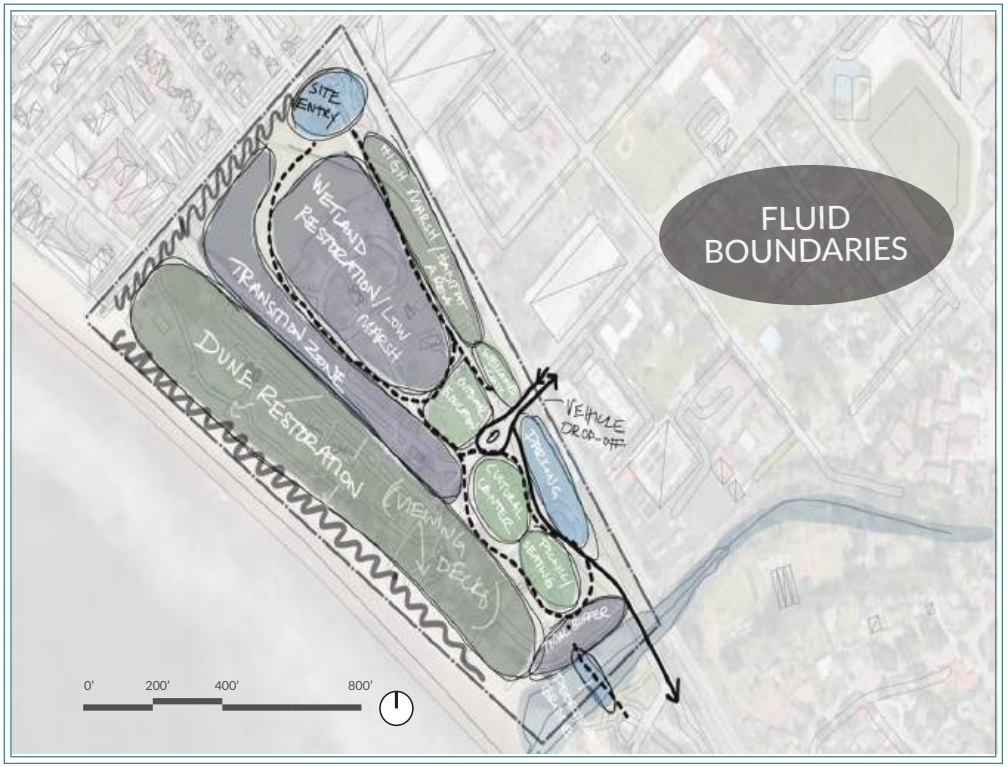


Approaching the shoreline and edges of the site not as a fixed edge, but as a fluid boundary—responsive, adaptive, and alive. This design reintroduces a natural wetland system that ebbs and flows with seasonal changes and tidal movements, honoring the site's ecological memory. The park is shaped to absorb, filter, and hold water, supporting both habitat and resilience. As the climate shifts, the landscape responds—a dynamic edge built to accommodate infiltration, inundation, and uncertainty.

**SELECTED FOR DESIGN*

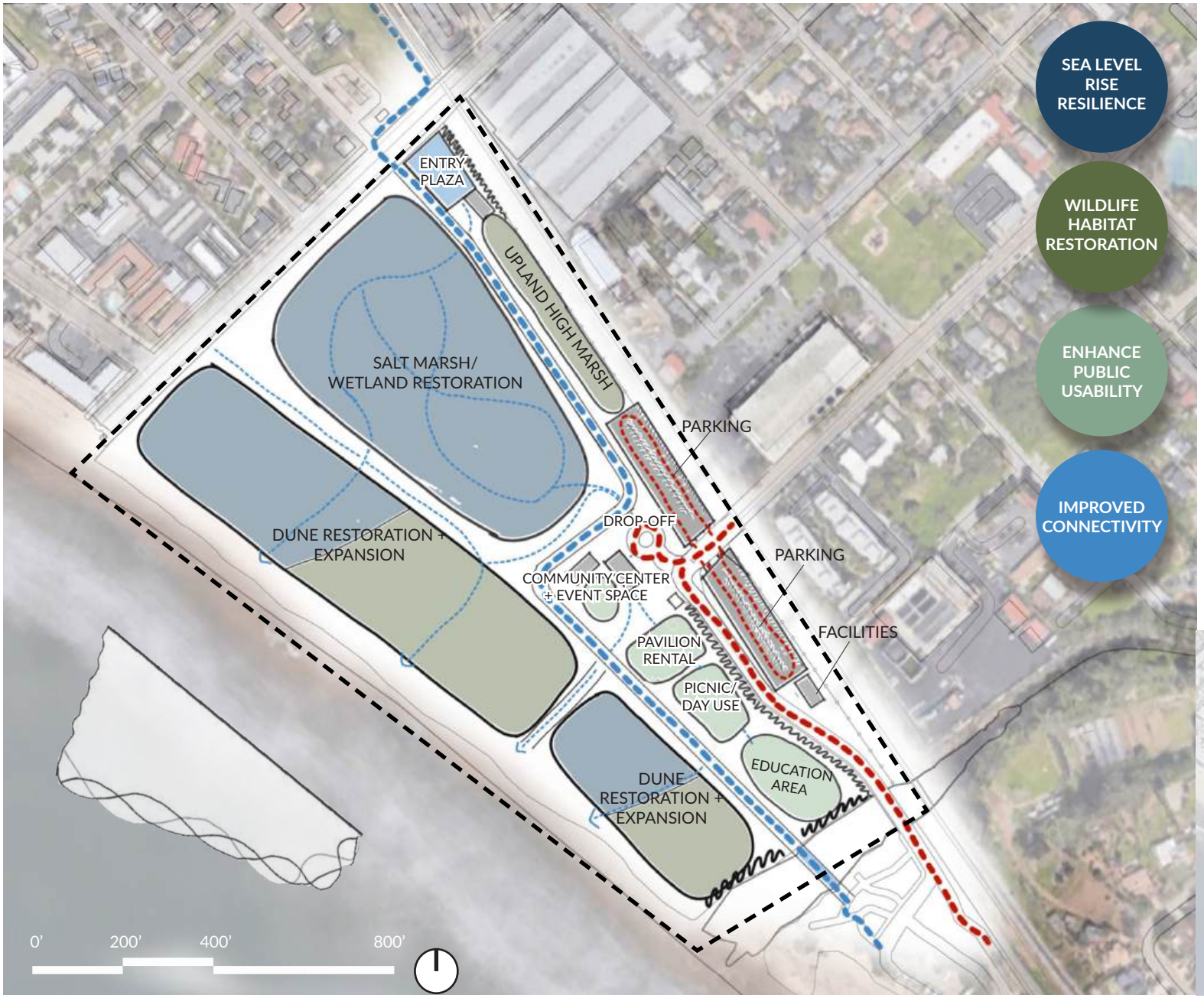






**SELECTED FOR DESIGN*

DESIGN ALTERNATIVE 1 | CONCEPT



SEA LEVEL RISE RESILIENCE

WILDLIFE HABITAT RESTORATION

ENHANCE PUBLIC USABILITY

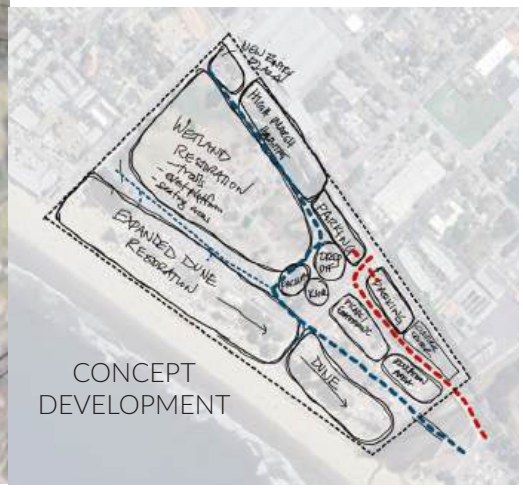
IMPROVED CONNECTIVITY

STRENGTHS

- Comprehensive flood and sea level rise protection
- Expanded wetland that accommodates for current and future impacts to both sea level rise and groundwater rise
- Hardscape and infrastructure relocated to back of site in less flood-prone area

WEAKNESSES

- The two site entries are somewhat disconnected
- There is only one vehicle entrance and exit, which is shared with the rest of the state park and campground
- Camping revenue is not replaced with other revenue sources

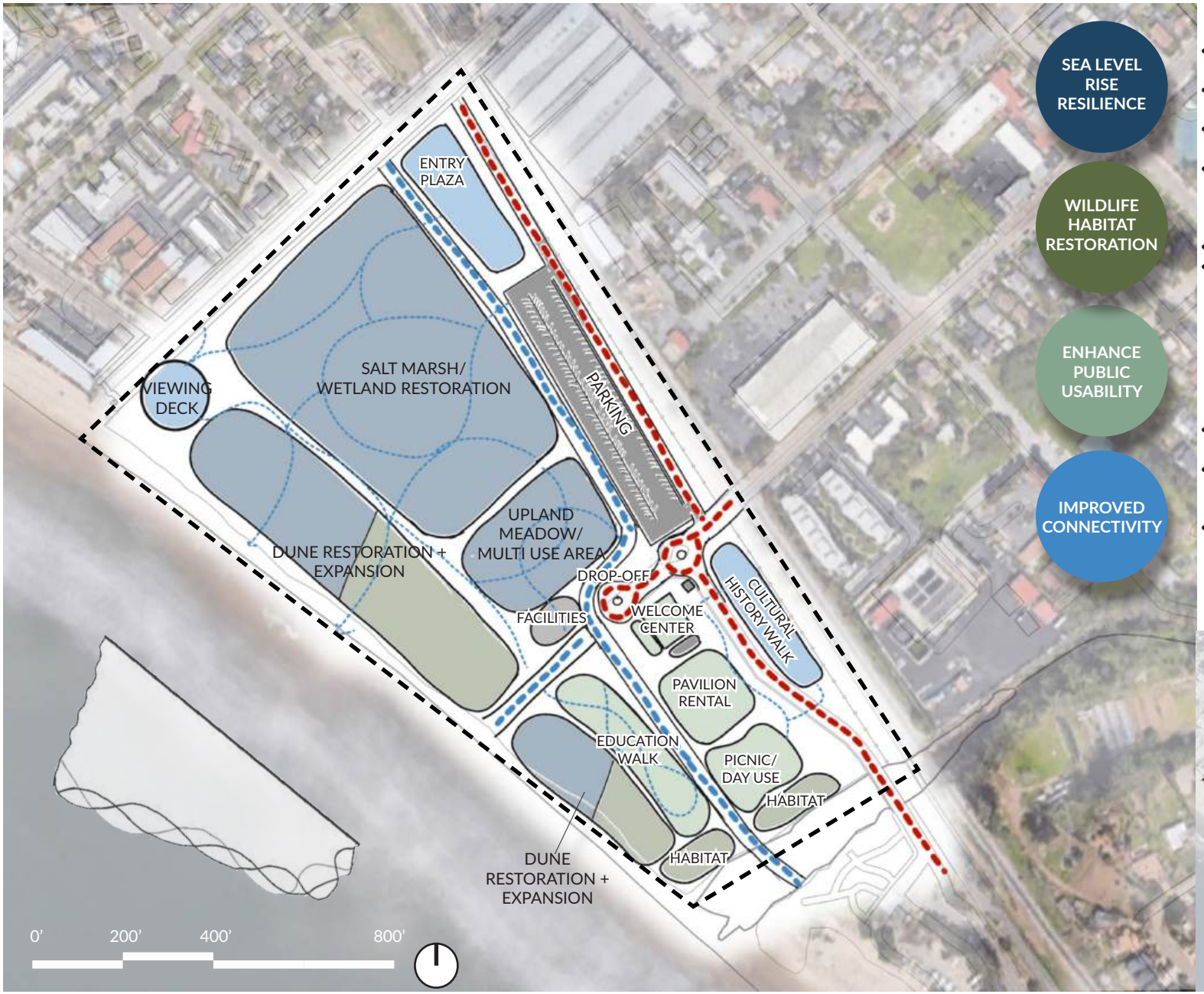


Vehicular Circulation

Pedestrian Circulation

Site Boundary

DESIGN ALTERNATIVE 2 | CONCEPT



SEA LEVEL RISE RESILIENCE

WILDLIFE HABITAT RESTORATION

ENHANCE PUBLIC USABILITY

IMPROVED CONNECTIVITY

STRENGTHS

- Comprehensive flood and sea level rise protection
- The upland marsh area allows for more programming among restoration area
- Parking area relates to entry plaza and can be accessed from Linden Ave by vehicle
- Second vehicular entrance allows for less congestion at current site entrance (which also serves as the primary entry point for the southern end of state park)
- Elevated viewing opportunities
- Most programming is contained in one area of site, allowing for an immersive nature experience in the wetland restoration area

WEAKNESSES

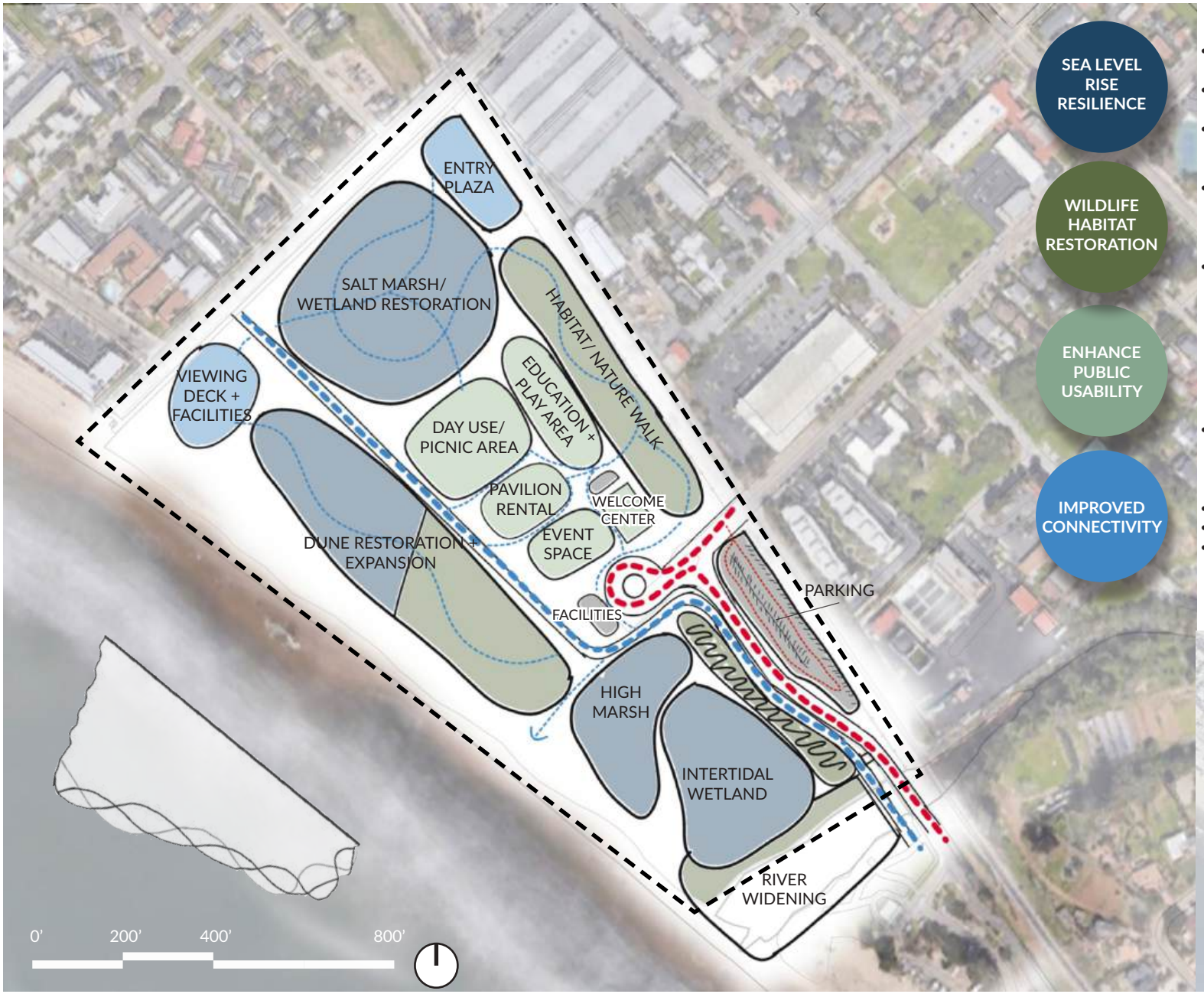
- More vehicle congestion and noise adjacent to wetland area
- More noise from train along the northern edge of site where parking is located (due to loss of vegetation)
- Cultural walk is somewhat disconnected from the rest of the site

Vehicular Circulation

Pedestrian Circulation

Site Boundary

DESIGN ALTERNATIVE 3 | CONCEPT



SEA LEVEL RISE RESILIENCE

WILDLIFE HABITAT RESTORATION

ENHANCE PUBLIC USABILITY

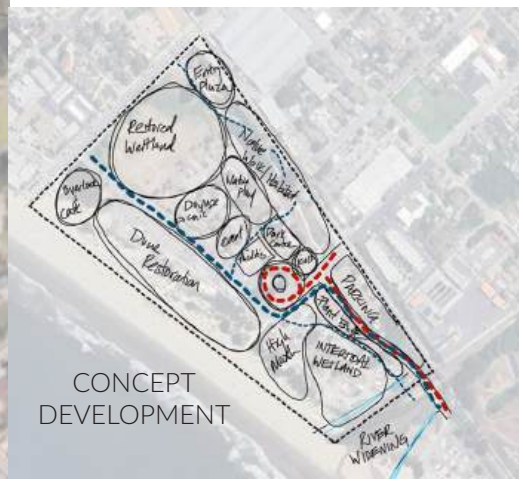
IMPROVED CONNECTIVITY

STRENGTHS

- Significant and diverse increase of habitat area on site
- Habitat and nature walk on north edge of site provides nice noise buffer from train
- Two alternative pedestrian entrances added along Linden Ave, creating better access for the local community
- Plenty of programming for local community, plus the addition of revenue generating programming to replace the loss of camping revenue
- Centralized programming and gathering spaces, easier to access from any entrance

WEAKNESSES

- Use of intertidal wetland concept is less natural with the current conditions of site, involving widening the river outlet which is currently well protected from flooding
- Loss of some existing sand dune habitat
- Less parking than currently on site
- Parking is isolated and more difficult to connect to the rest of the site by foot

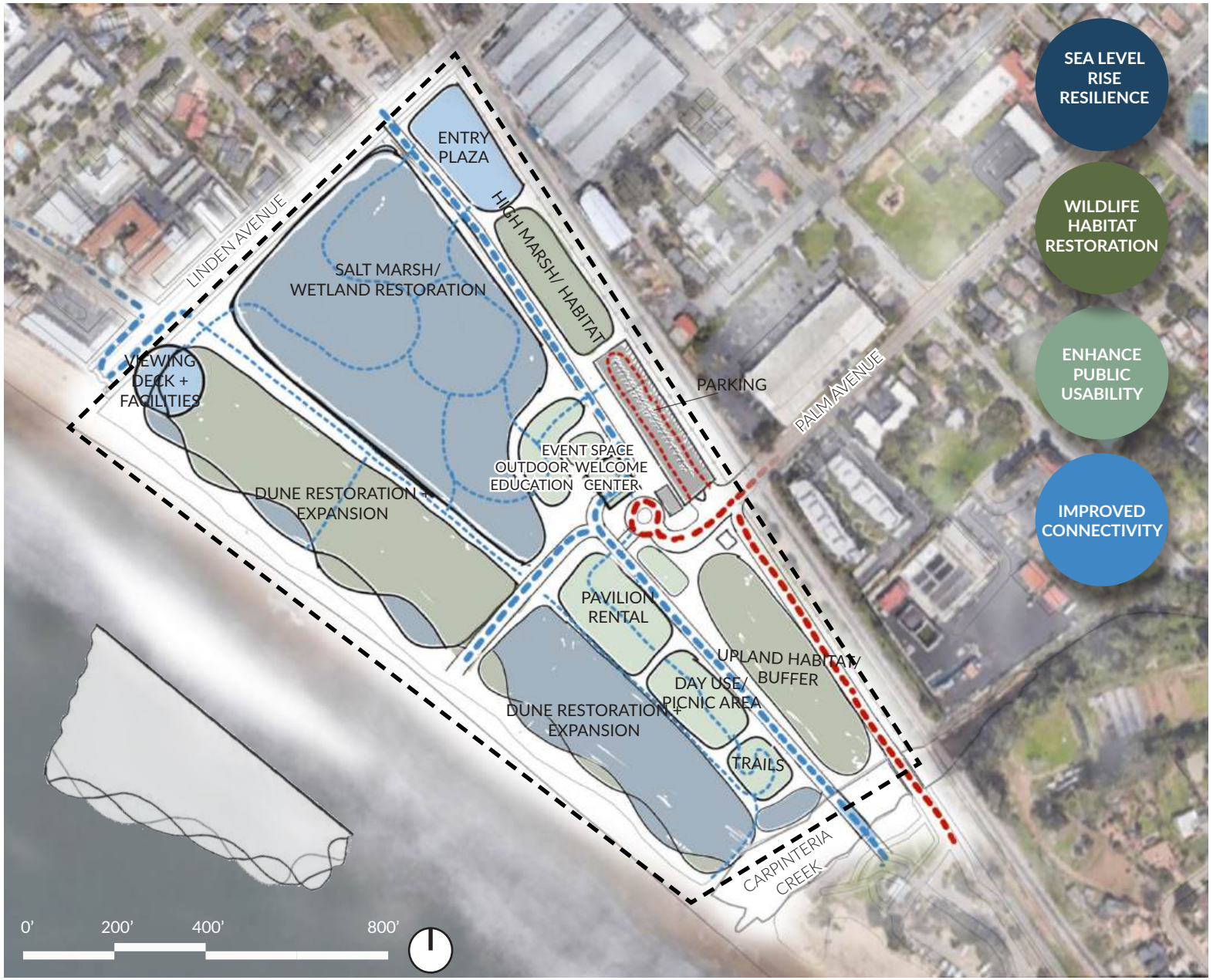


Vehicular Circulation

Pedestrian Circulation

Site Boundary

FINAL DESIGN CONCEPT



Vehicular Circulation

Pedestrian Circulation

Site Boundary

STRENGTHS

- Comprehensive flood protection, accommodating both present and future impacts
- Hardscape area reduced and relocated from shoreline to back of site
- Habitat area along NE edge of site provides nice noise buffer from train
- Two alternative pedestrian entrances added along Linden Ave, creating better access for the local community
- Plenty of programming for local community, plus the addition of revenue generating programming to replace the loss of camping revenue
- Centralized programming and gathering spaces, easier to access from any entrance
- Pedestrian paths are separated from roadway improving pedestrian safety

WEAKNESSES

- Some loss of revenue due to the removal of RV and tent campsites
- Fewer beach access points due to dune restoration and expansion efforts
- Day-use parking lot is located further from the beach

MASTER PLAN DESIGN

DESIGN | FINAL SITE PLAN

PHASE 2 | CREATING AN INTERTIDAL WETLAND

Water inundation on site is not occurring from the most direct paths (the ocean shoreline to the west or the river mouth to the south), due to the protective function of the sand dune system and the area's natural topography.

Instead, floodwaters are entering from the north, extending beyond the Carpinteria Salt Marsh Preserve, passing through downtown residential areas, and reaching into the state park. Even under the projected 5-foot sea level rise scenario for 2100 (left), floodwaters do not breach the shoreline dune system.

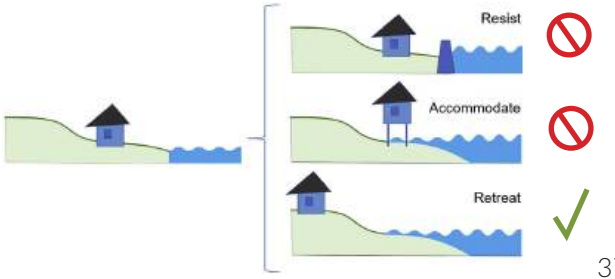
Given this north-to-south flow pattern, establishing a true intertidal wetland on the site would not be feasible without a managed retreat and rewilding of the Sandyland Road shoreline residential area immediately north of the project site.

FUNCTION OF THE PROPOSED WETLAND

The site design—under both present-day flood risks and future projections—provides comprehensive flood protection. As sea levels rise, coastal groundwater levels rise as well. The proposed salt marsh is designed to buffer the site against seasonal flooding, groundwater rise, storm surge, and eventual sea level inundation approaching from the north.

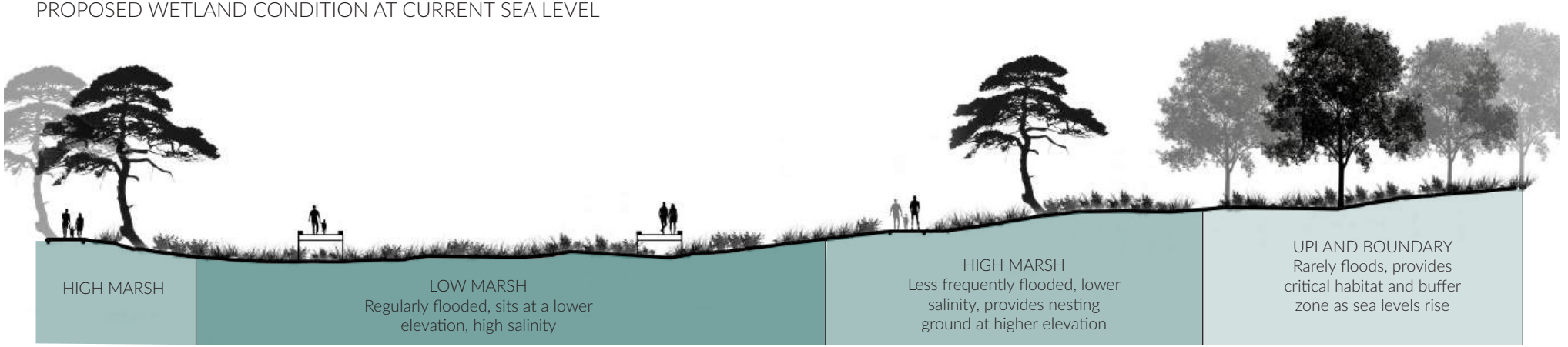
PHASE 2: MANAGED RETREAT

With the removal of the Sandyland housing units, this area of downtown Carpinteria could also be restored to its original salt marsh ecosystem. Connecting the proposed site to the existing salt marsh would enable the area to function as a true intertidal wetland, with natural tidal ebb and flow restored.

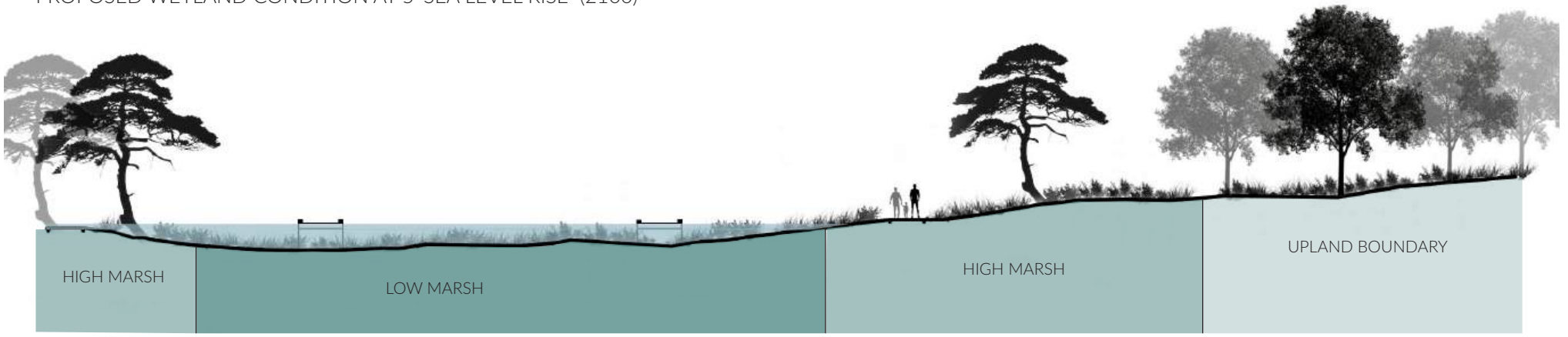


SALT MARSH RESTORATION

PROPOSED WETLAND CONDITION AT CURRENT SEA LEVEL



PROPOSED WETLAND CONDITION AT 5' SEA LEVEL RISE (2100)



CURRENT AND FUTURE **FLOOD PROTECTION**

A salt marsh is a sheltered coastal wetland dominated by salt-tolerant vegetation that traps sediment, slows water, and provides wildlife habitat. As sediment accumulates, marshes rise with sea levels while absorbing water to reduce flooding and protect upland areas.

WETLAND RESTORATION BENEFITS

FLOOD PROTECTION + WATER INFILTRATION
Wetlands act as sponges to absorb both sea water and groundwater inundation.

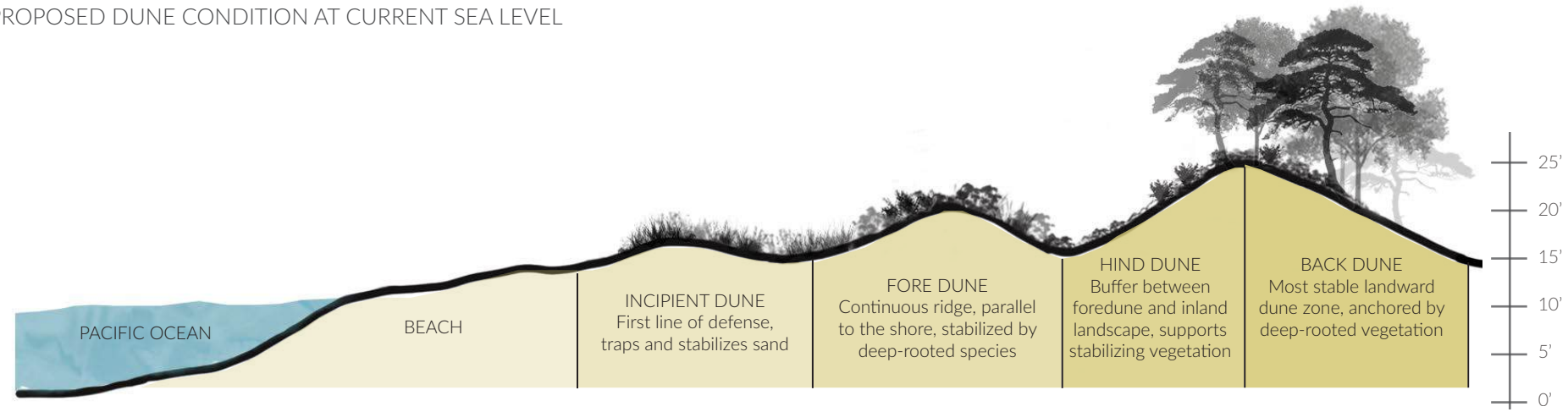
ENVIRONMENTAL BENEFITS
Provides vital ecological functions, including water purification & carbon sequestration, promoting a healthier coast.

BIODIVERSITY + HABITAT
Restores habitat along a shoreline that is increasingly losing habitat due to sea level rise and development.

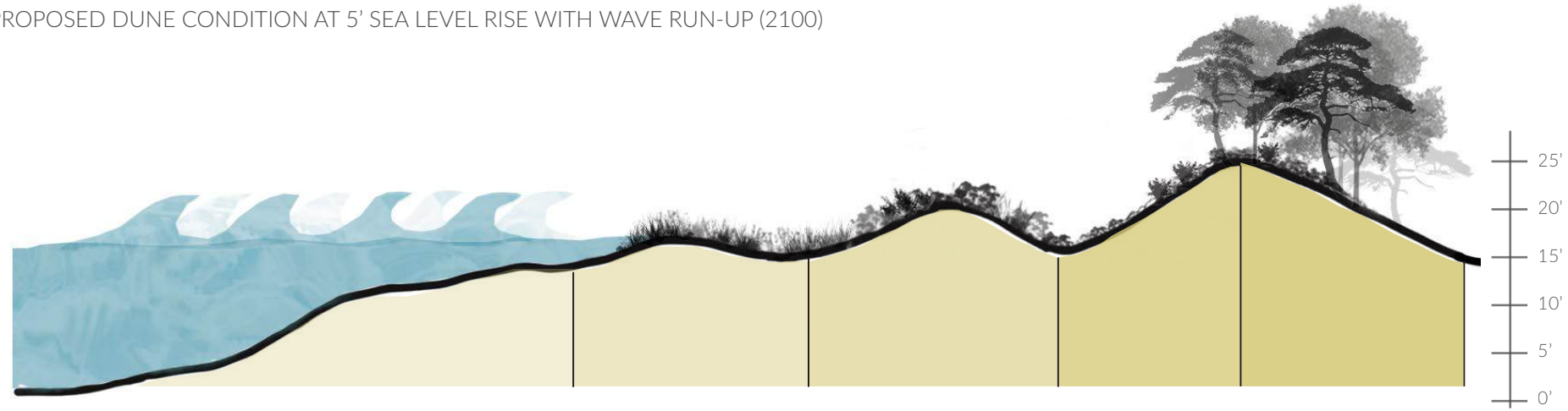
EDUCATION + RECREATION
Wetlands provide opportunities for experiential education and passive recreation.

DUNE RESTORATION

PROPOSED DUNE CONDITION AT CURRENT SEA LEVEL



PROPOSED DUNE CONDITION AT 5' SEA LEVEL RISE WITH WAVE RUN-UP (2100)



SHORELINE PROTECTION FOR FUTURE CLIMATE IMPACTS

Dune systems create multiple layers of natural defense against sea level rise and coastal storm surge. Each dune zone serves a distinct ecological role while contributing to the overall coastal defense system. Together, these layers buffer wave energy, reduce flooding, and provide resilient habitats that adapt to changing conditions.

DUNE RESTORATION BENEFITS

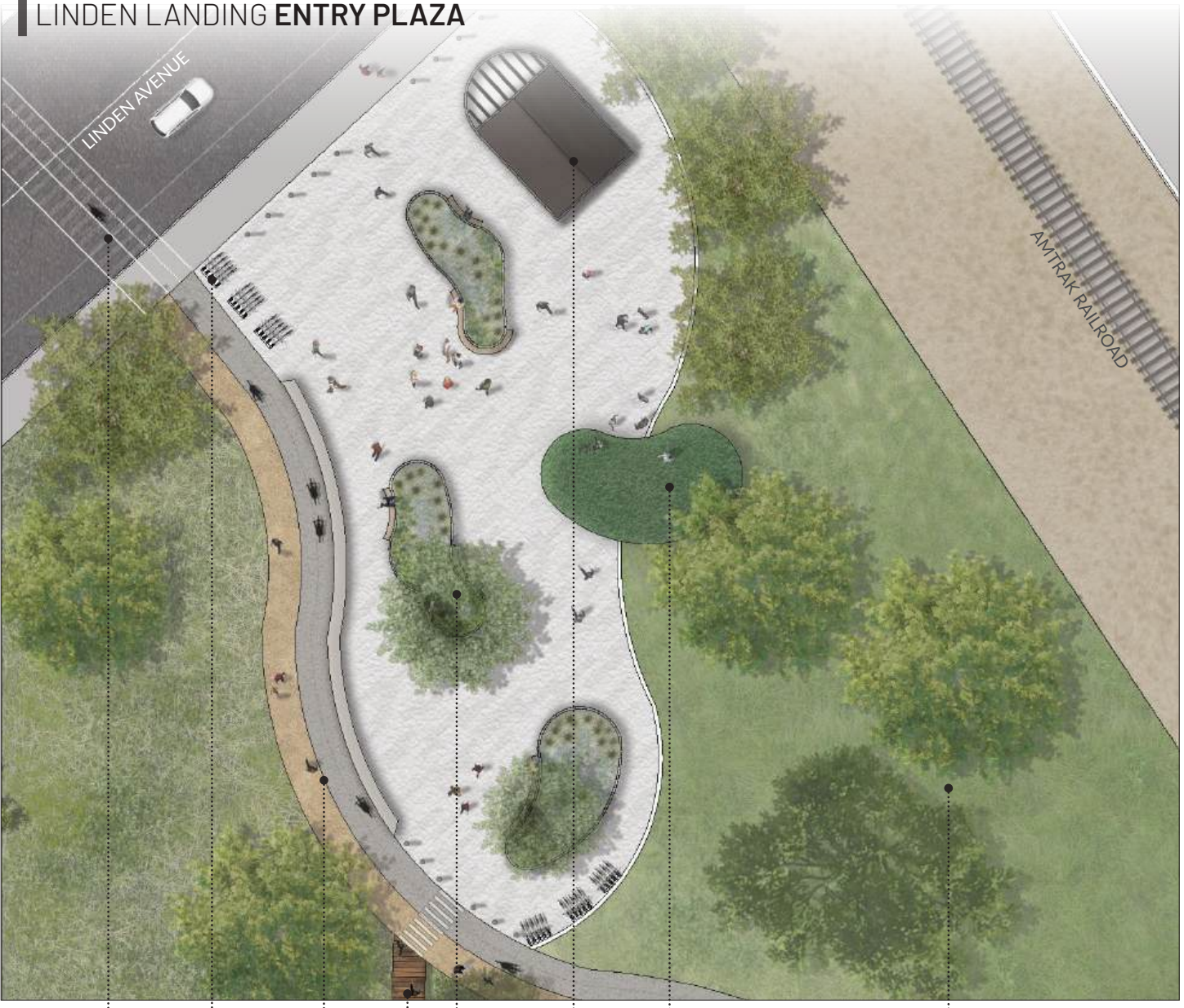
SHORELINE PROTECTION
A layered defense system against coastal flooding and storm surge.

HABITAT RESTORATION
Each dune zone hosts unique wildlife species and native vegetation, all vital to the dune ecosystem.

COMMUNITY ENGAGEMENT
Stewardship opportunities are presented through ongoing dune restoration and maintenance.

EROSION PREVENTION
Revegetating the dune provides stabilization and combats coastal erosion.

LINDEN LANDING **ENTRY PLAZA**



NEW *CALIFORNIA COASTAL TRAIL* CONNECTION POINT

BIKE RACKS & RENTAL

MULTIMODAL TRAIL

SALT MARSH BOARDWALK

SEATED PLANTERS

WELCOME CENTER & TRAILHEAD KIOSK

GRASSY PLAYMOUND

HIGH MARSH HABITAT AND PLANTED SOUND BUFFER

0’ 10’ 20’ 40’

Linden Landing establishes a clear and inviting pedestrian entrance to the site from downtown Carpinteria. Visitors can now easily and comfortably access the site on foot, where they will find a welcome center and trail kiosk providing interpretive displays about the marsh's ecology, general park information, a bike and facility rental desk, and trail maps. The plaza also serves as the site's northern connection point to the multimodal California Coastal Trail.

CARP COMMONS **COMMUNITY CENTER + DAY-USE DROP OFF**

DEMONSTRATION GARDEN

MULTIMODAL TRAIL

AMPHITHEATER SEATING AND EDUCATION AREA

COMMUNITY CENTER WITH ROOFTOP VIEWING DECK

BIKE RENTAL KIOSK

SEATWALL PLANTERS

DROP-OFF CIRCLE

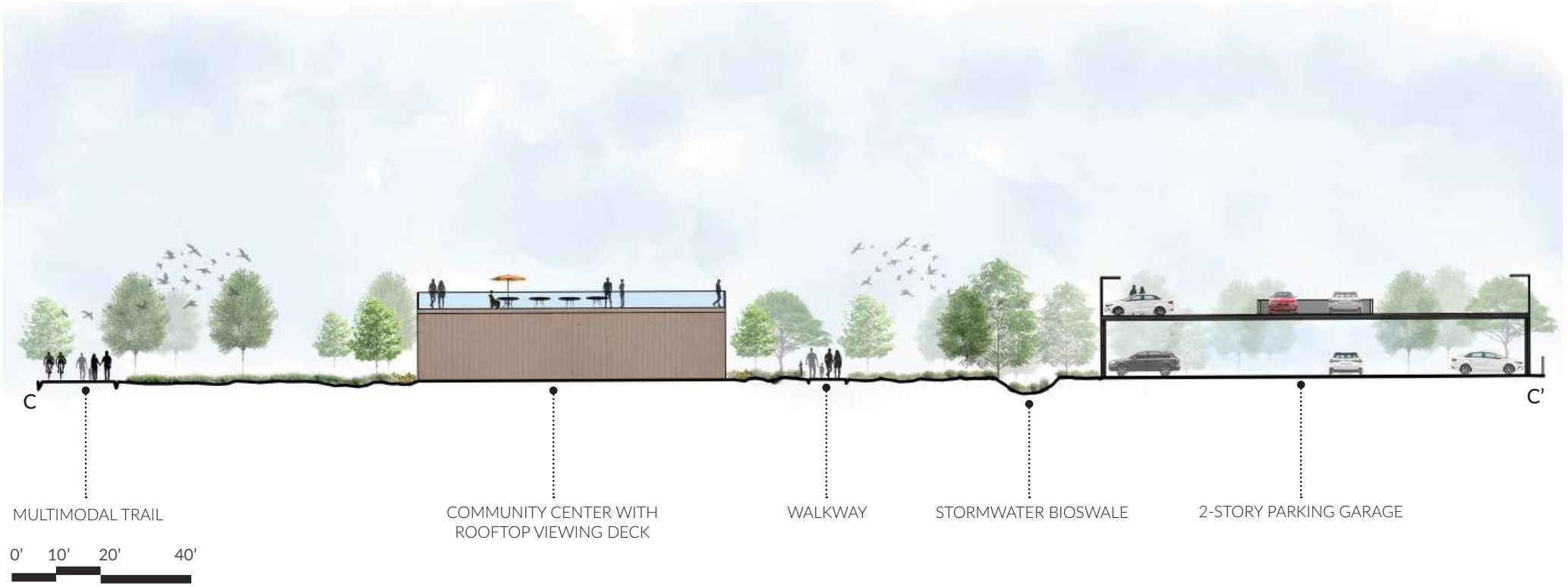
RESTROOMS

DAY-USE PARKING + STORMWATER BIOSWALE

0’ 10’ 20’ 40’

The **community center** establishes a dedicated space that serves local residents and park visitors alike. It supports a wide range of programming, including community events, educational lectures youth summer camps, and volunteer stewardship initiatives. Key features include a rooftop viewing deck and an outdoor amphitheater, creating opportunities for gathering, learning, and celebrating the landscape. This “hard” programming is strategically located in a central area of the site, outside of the most flood-prone zones, ensuring long-term accessibility and resilience.

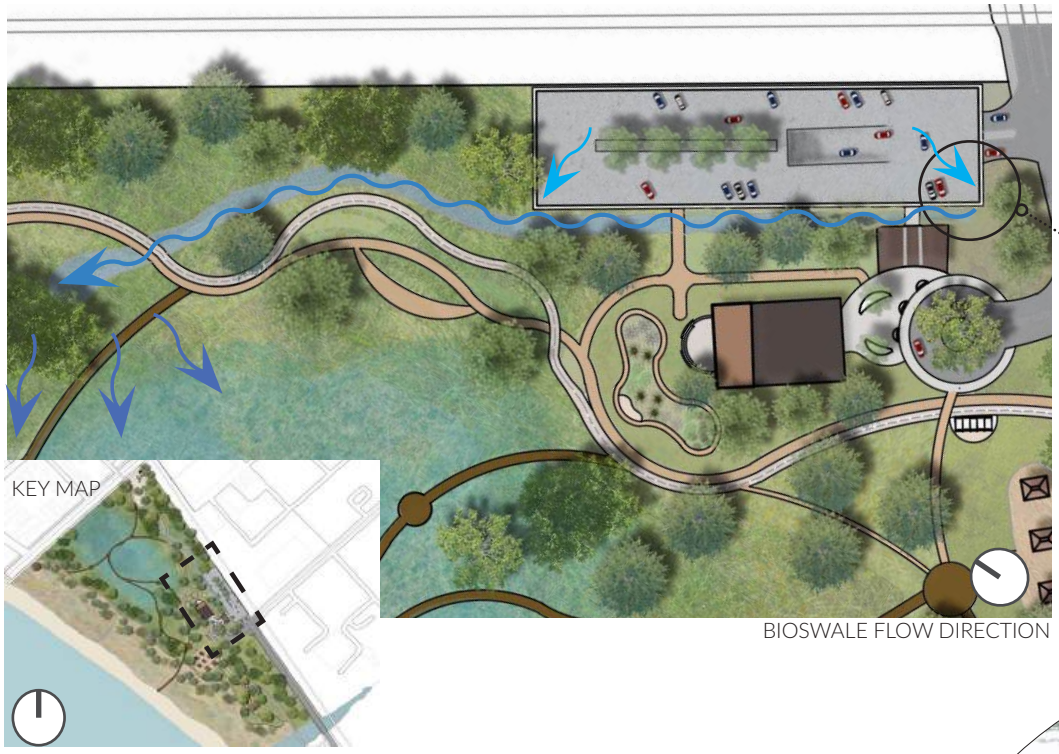
COMMUNITY CENTER + PARKING STRUCTURE



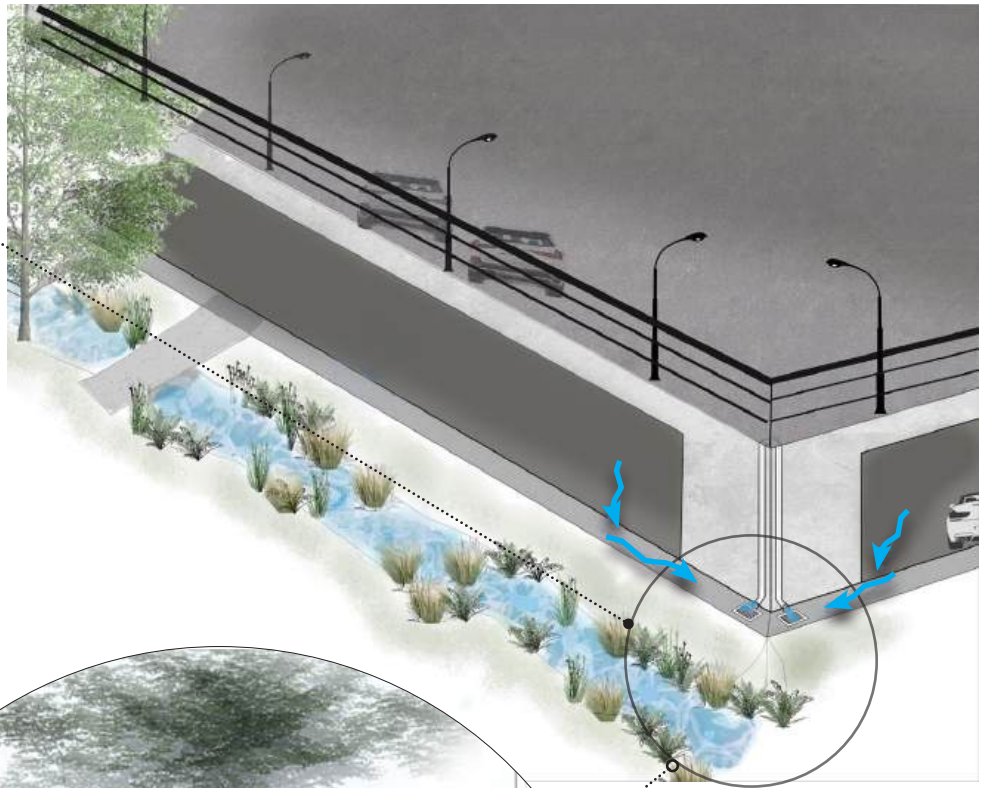
PARKING STRUCTURE INSPIRATION

BIOSWALE CONCEPT

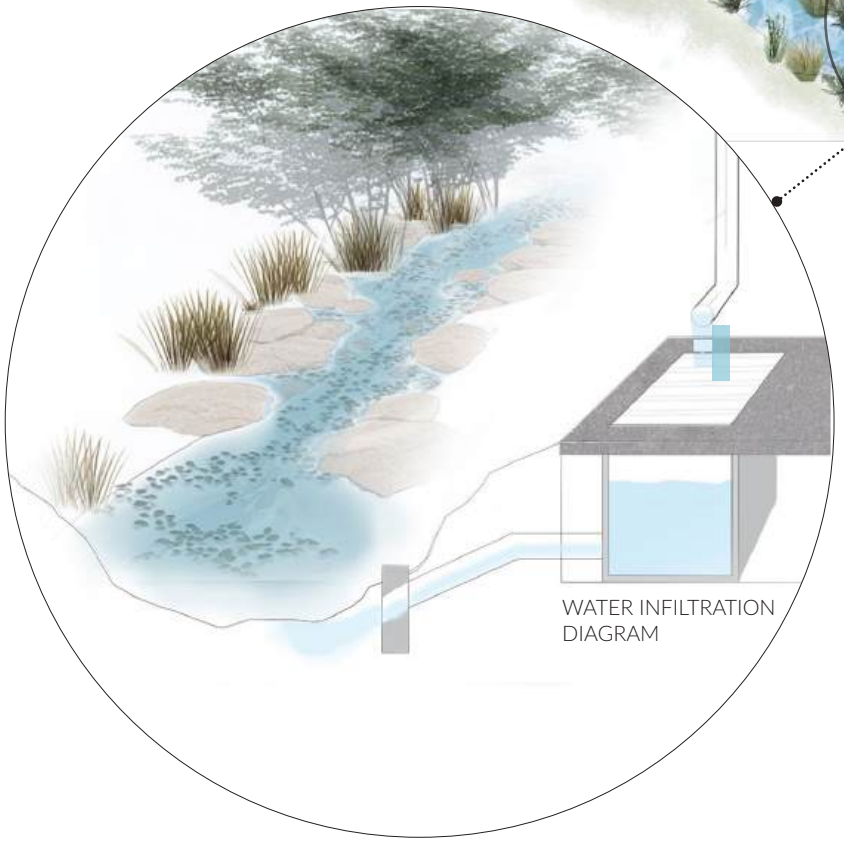
STORMWATER DIAGRAM



BIOSWALE FLOW DIRECTION



PARKING + BIOSWALE ENLARGEMENT



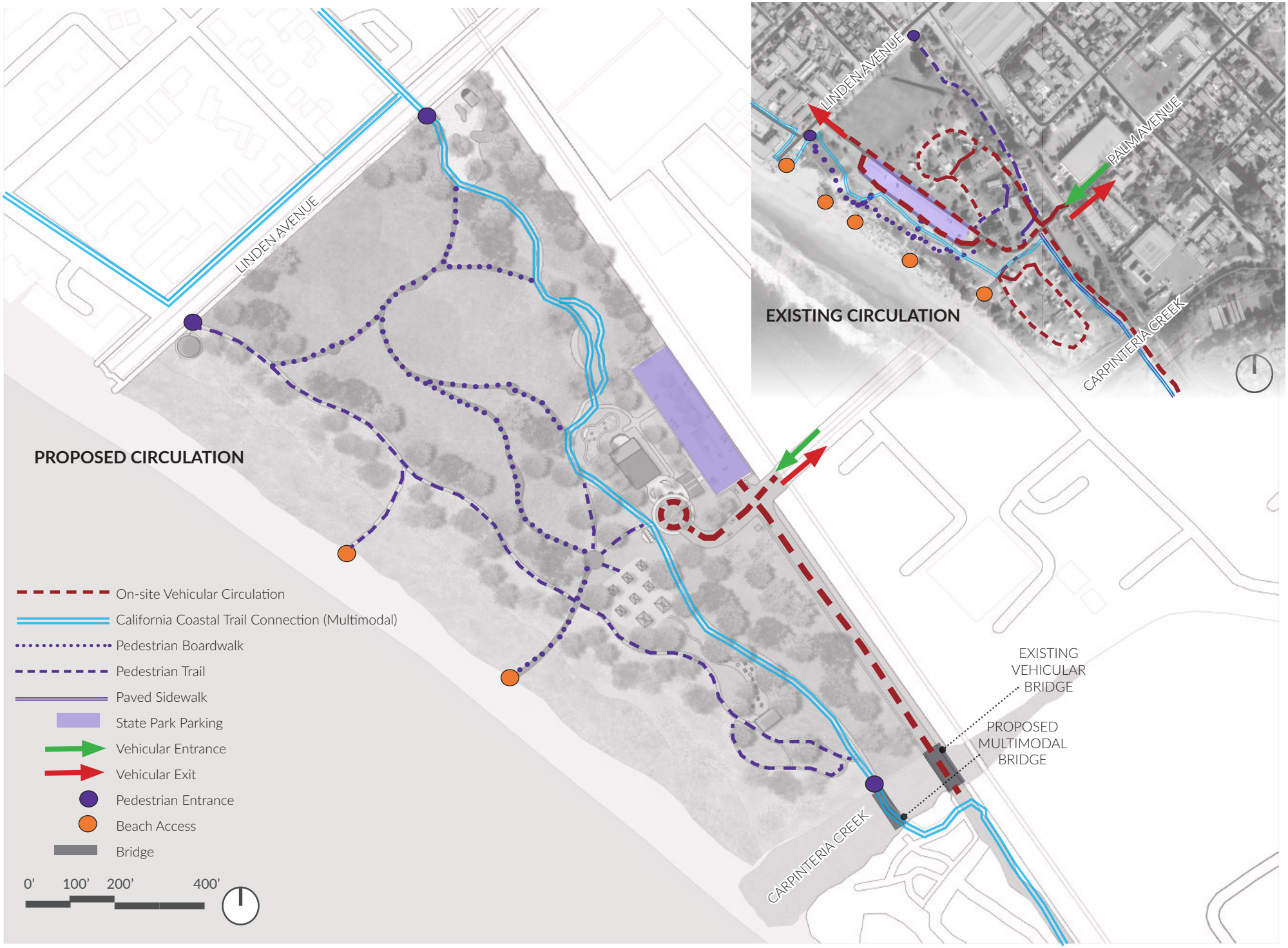
WATER INFILTRATION DIAGRAM

ON-SITE STORMWATER MANAGEMENT

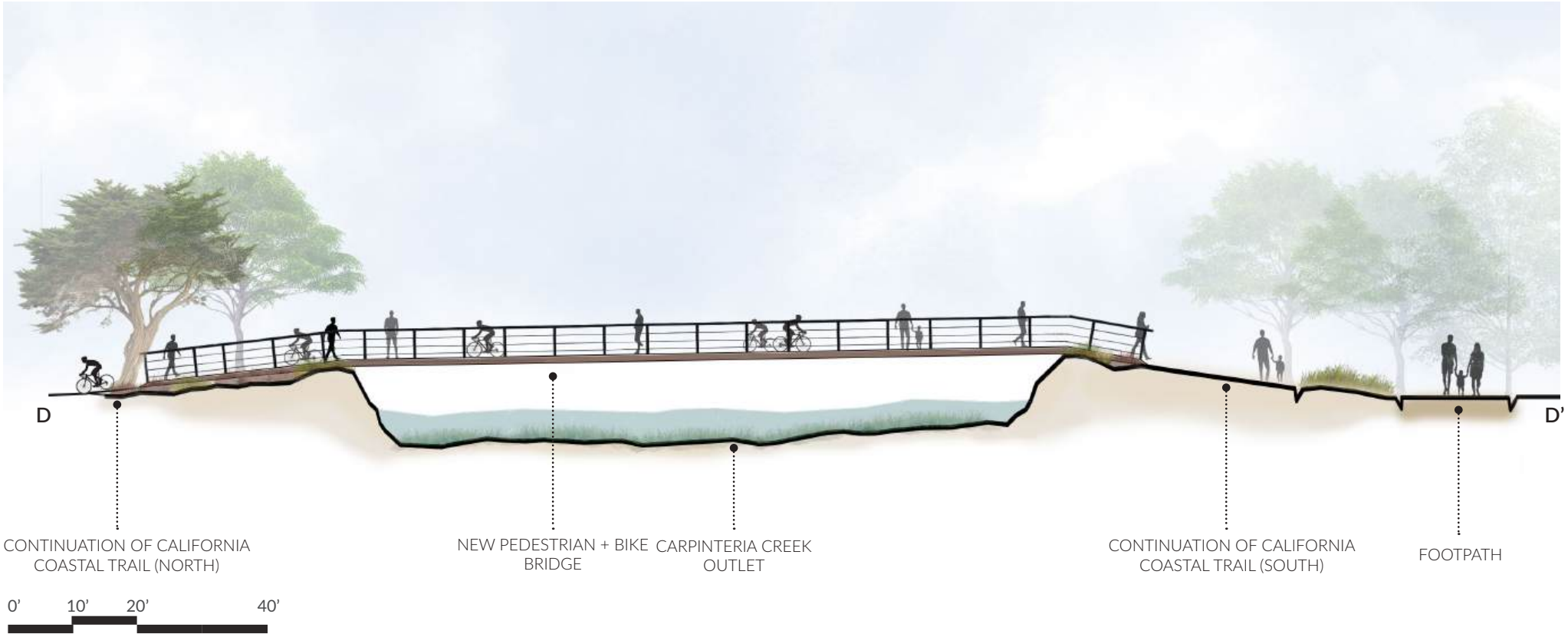
To reduce the impervious parking footprint, a two-level structure has been introduced, cutting the lot area in half while retaining parking space count and day-use revenue.

Stormwater from the upper deck is collected via downspouts and directed to a permeable paving zone and storm drains that wraps the structure's perimeter. Thee drains feed into a stormwater bioswale, which originates along the edge of the parking structure and directs runoff toward the adjacent wetland.

CIRCULATION DIAGRAM



BRIDGE CONNECTION



CONNECTING THE COASTAL TRAIL

The site proposes a new multimodal bridge connecting to the south side of the river, providing a safer alternative to the existing pedestrian and bicycle routes along the roadway. The bridge enhances this section of the California Coastal Trail (CCT), a 1200 mile-long trail that spans the length of the California Coastline and passes through the project site. With this improvement, the CCT is now positioned as a central feature and attraction within the site.

HABITAT RESTORED

SPECIES SUPPORTED BY SALT MARSHES

BELDING'S SAVANNAH SPARROW

LIGHT-FOOTED CLAPPER RAIL

SALT MARSH BIRD'S BEAK (Cordylanthus maritimus ssp. maritimus)

ALKALI HEATH (Frankenia salina)

PICKLEWEED (Salicornia pacifica)

SALTGRASS (Distichlis spicata)

SPECIES SUPPORTED BY SAND DUNES

WESTERN SNOWY PLOVER

BEACH EVENING PRIMROSE (Camissoniopsis cheiranthifolia)

CALIFORNIA LEAST TURN

BEACH SALT BUSH (Atriplex leucophylla)

MYRTLE'S SILVERSPOT

RED SAND VERBENA (Abronia maritima)

GOALS ACHIEVED

CITATIONS

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