SHIFTING SANDS

A Pilot For Adaptive Coastal Wetland Migration In The Face Of Climate Impacts

In the face of inevitable climate impacts along our coastlines it is vital to establish a cultural and practical alliance with the associated risks to better inform our landscape design interventions. By connecting a private 10-acre golf course to the adjacent Malibu Lagoon, creating an expanded wetland habitat and State Park, this design will employ solutions that acknowledge the need for adaptive infrastructure in coastal environments, while enhancing public access, stewardship and education around this vital ecosystem.

Julia Bennett
Capstone 2024

CONTENTS

ACKNOWLEDGEMENTS

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...And of course my incredible UCLA Extension Landscape Architecture cohort who inspire me and lift me up. I am thrilled to have traveled this long road with you all.

- Julia

INTRODUCTION

PREPARING FOR CLIMATE FUTURES

PROJECT LOCATION | A HIGHLY URBANIZED COASTLINE

Los Angeles County is home to some of the most popular beaches in the country, found along the historic Pacific Coast Highway.

The **21 mile stretch of coastline** in Malibu experiences **13 million visitors** annually. However, the cost of such high traffic is the need for significant infrastructure to support it. This urban encroachment on the landscape has resulted in **significant beach and habitat loss**, **issues with water quality**, and has increased **vulnerability to patterns of erosion** throughout the Santa Monica Bay.

CONTEXT | LAND USE + SITE AREAS

SITE DETAILS

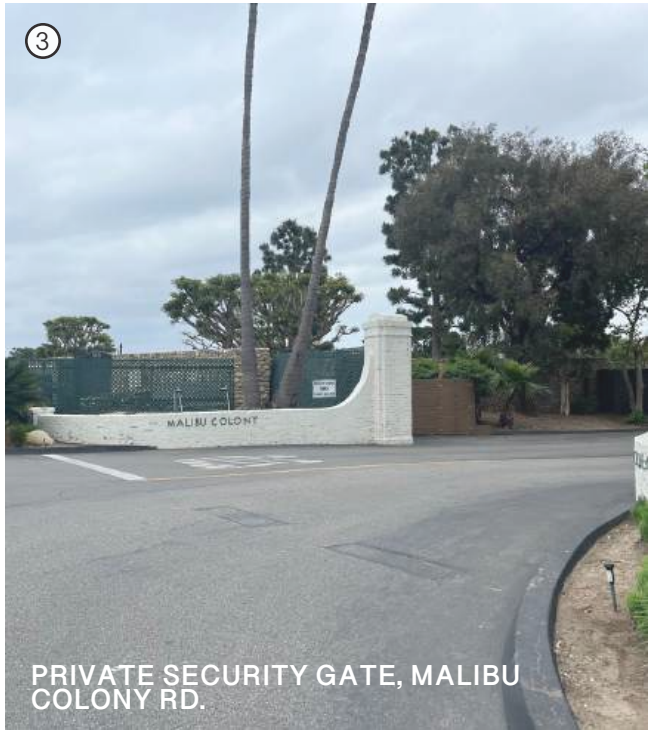
A **10 ACRES : 23554 Pacific Coast Highway,. Malibu,. CA,. 90265:** Privately owned golf-course dedicated to Coastal Conservancy and CA State Parks upon the death of both estate owners and developed as an extension of the existing lagoon restoration area. Conditions of this transfer are outlined in the Enforcement Agreement drawn in 2004. Dedication is pending one surviving owner.

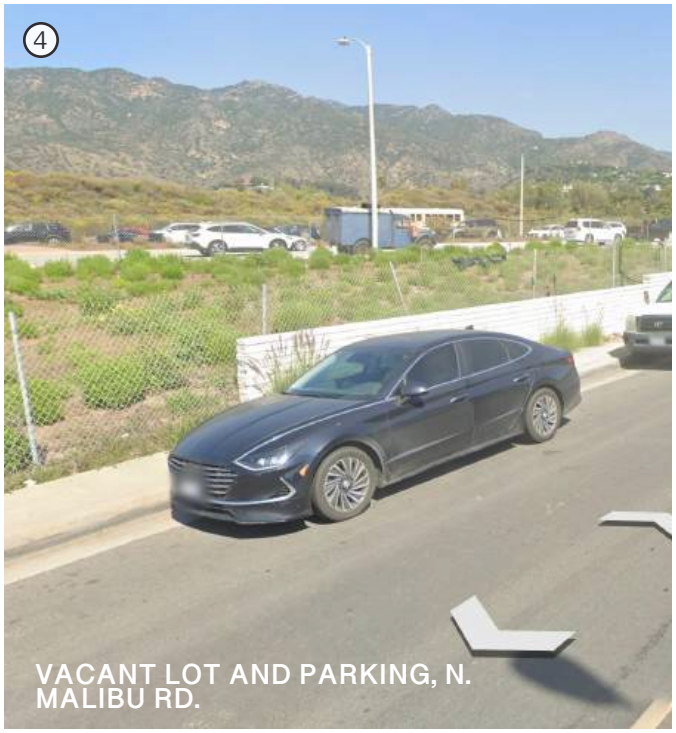
B **3 ACRES: 23644 Malibu Rd, Malibu, CA 90265:** Residentially Zoned. Vacant lot to the west of the golf course. Owned by the Perenchio Foundation.

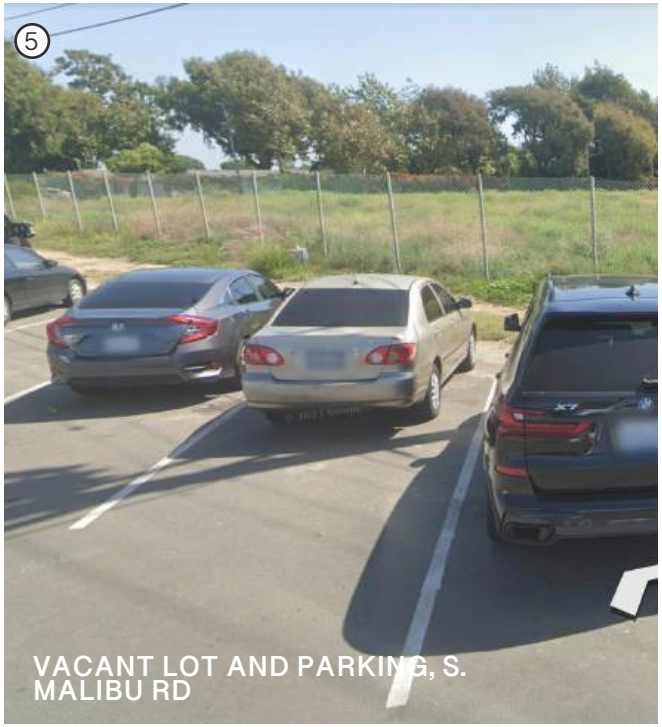
C **1 ACRE: 23554 Pacific Coast Highway,. Malibu,. CA,. 90265:** Commercially zoned. Vacant lot. Sold in 2023. Ownership TBD.

- CALIFORNIA STATE PARK
- RESIDENTIAL
- COMMERCIAL
- PUBLIC PARK / OPEN SPACE
- NATURAL OPEN SPACE
- LA COUNTY BEACH
- CIVIC CENTER
- PROPOSED SITE AREAS

SITE CONTEXT | EXISTING EDGE CONDITIONS







CONTEXT | A STATE PARK-TO-BE

COASTAL COMMISSION SETTLEMENT KEY TERMS

- No easement, license, right to enter, or otherwise use Malibu Colony Rd.

- Land development: public open space, passive use, native landscaping, trails, picnic areas, interpretive signage, removal of existing vegetation

- 8' wall on W and SW edges to remain as a barrier to Malibu Colony

- Wetland restoration can only take place in designated area. Edges can shift by 20' in any direction as long as the area inside the boundaries is a maximum of 2 acres and is contiguous with existing Malibu Lagoon restoration area

- No parking permitted on dedicated parcel

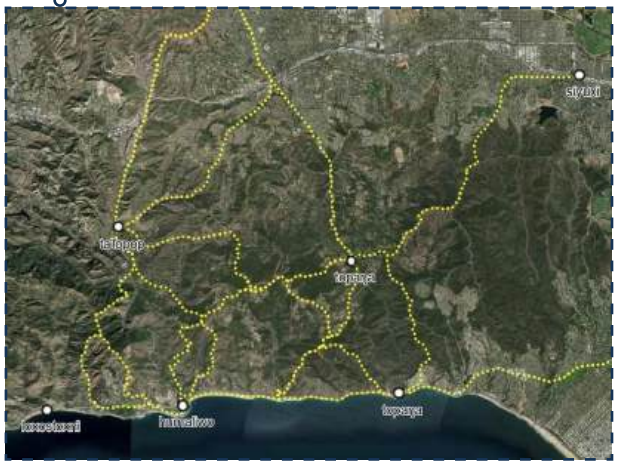
PROPOSED SITE AREAS
DEDICATED PARCEL
EXISTING STORM DRAIN
2 ACRE WETLAND RESTORATION BOUNDARY
EXISTING 8' WALL (TO REMAIN)
PROJECTED HABITAT CONNECTIONS
20' ALLOWABLE WETLAND BOUNDARY SHIFT
50' EASEMENT FOR PED. ACCESS TO COLONY
EXISTING MAINTENANCE SHED

RESEARCH + ANALYSIS

1542 Conquistador Juan Rodriguez Cabrillo moored at Malibu Lagoon to obtain fresh water, initiating the Spanish colonial presence that would nearly eradicate Indigenous people from the area over the next 200 years.

1892 Frederick Rindge purchases Rancho Topanga Malibu Sequit for $10/acre, including 21 miles of coastline. Only members of the Rindge family were permitted to access the ranch.

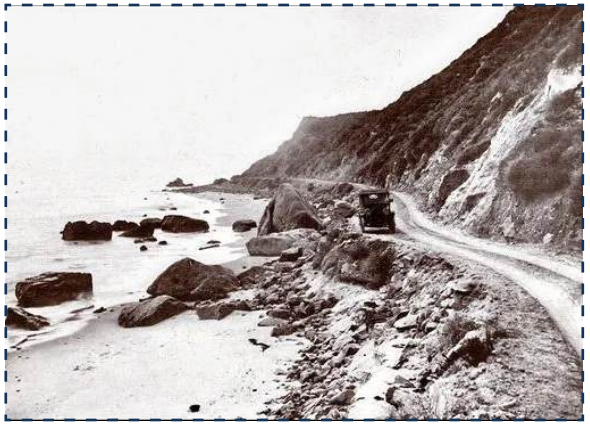
1926 The Rindge family begins to offer property for lease at the Malibu Colony at $1 per sq. ft of ocean frontage, with the provision that any structures had to be torn down in 10 years. Wealthy and famous tenants flocked to the private beach-front community. Lots were available for purchase by 1935, before the 10 year provision could be enacted.



6000 BC Indigenous Chumash tribes existed in a complex network along the Malibu coast and throughout the Santa Monica Mountains. The village of Humaliwo (huma-li-woo), located at the Malibu Lagoon was a primary hub for politics, trade, and harvest - a “Western Gate”.

1802 13,000 acres of Malibu is forcibly taken from Indigenous peoples and privatized under the Spanish Mission System as Rancho Topanga Malibu Sequit. 118 members of the Humaliwo village were removed and relocated by the Spanish colonists.

1902 May Rindge spent millions in legal and construction costs erecting a “railway to nowhere” to prevent imminent domain laws from allowing construction of a railway, and later the Pacific Coast Highway, through the ranch.



1983 CDPR purchased the Malibu Lagoon land, executing the first restoration of the former Caltrans dump site and ball fields back into a coastal lagoon.

SITE PRECEDENT | RESTORATION
Malibu Lagoon Restoration + Enhancement Project

LOCATION: Malibu, CA

COST: $7,000,000

AREA: 12 acres

- Direct connection and expansion into proposed site
- Represents challenges + successes of wetland restoration at this site
- Ongoing monitoring of successful habitat and species to tie into
- Inventory of program + design language

FIRST RESTORATION

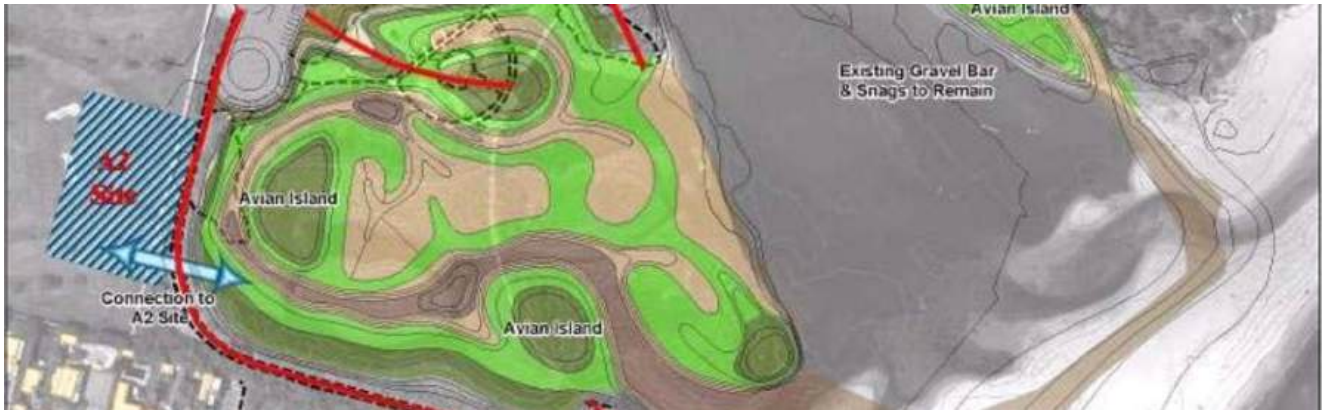
1983: Former Caltrans dumpsite and ball fields are restored to a Lagoon.

Prioritization of visitor experience resulted in steadily declining fish and invertebrate species

SECOND RESTORATION

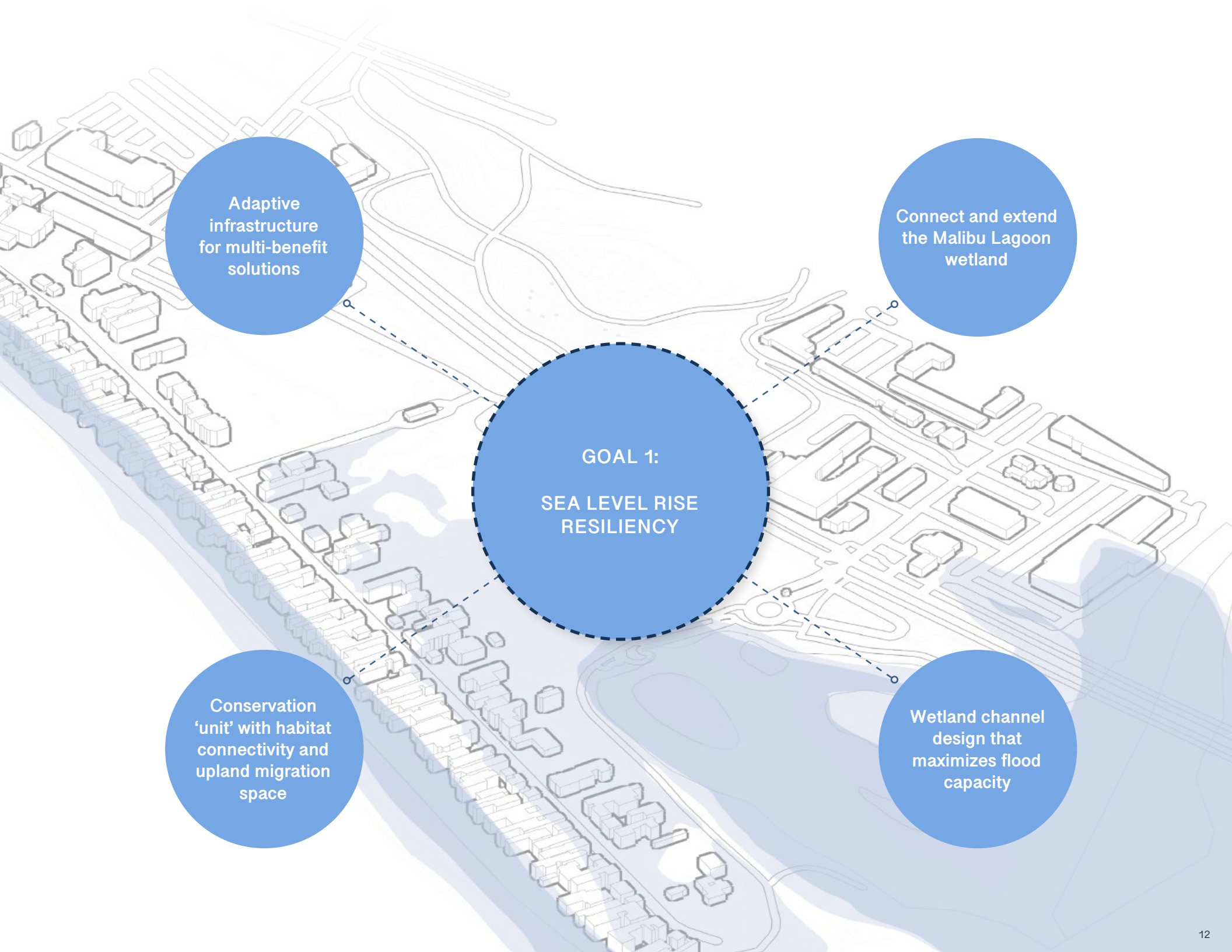
2012: Malibu Lagoon Restoration + Enhancement Project.

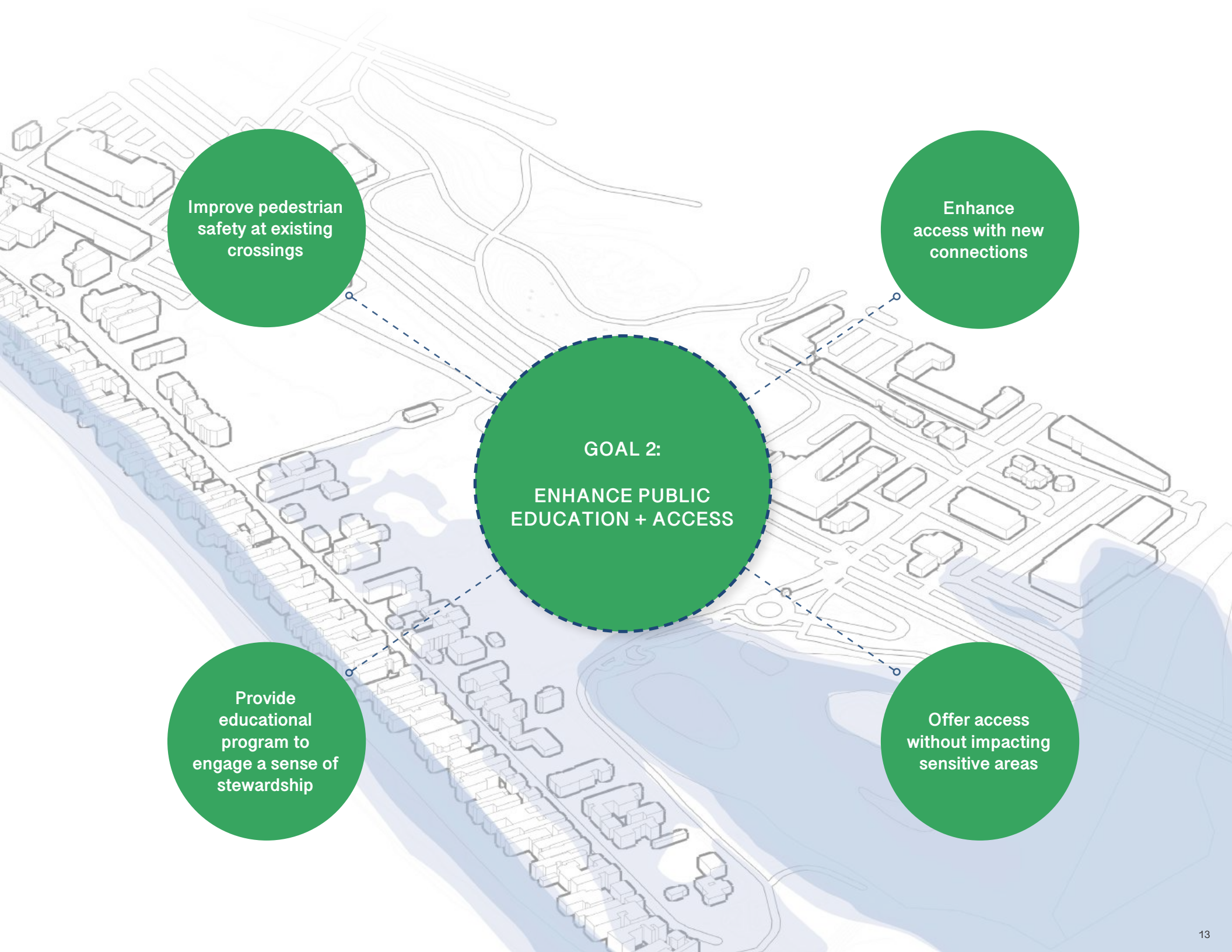
Habitat restoration, parking enhancements, and interpretive educational features.

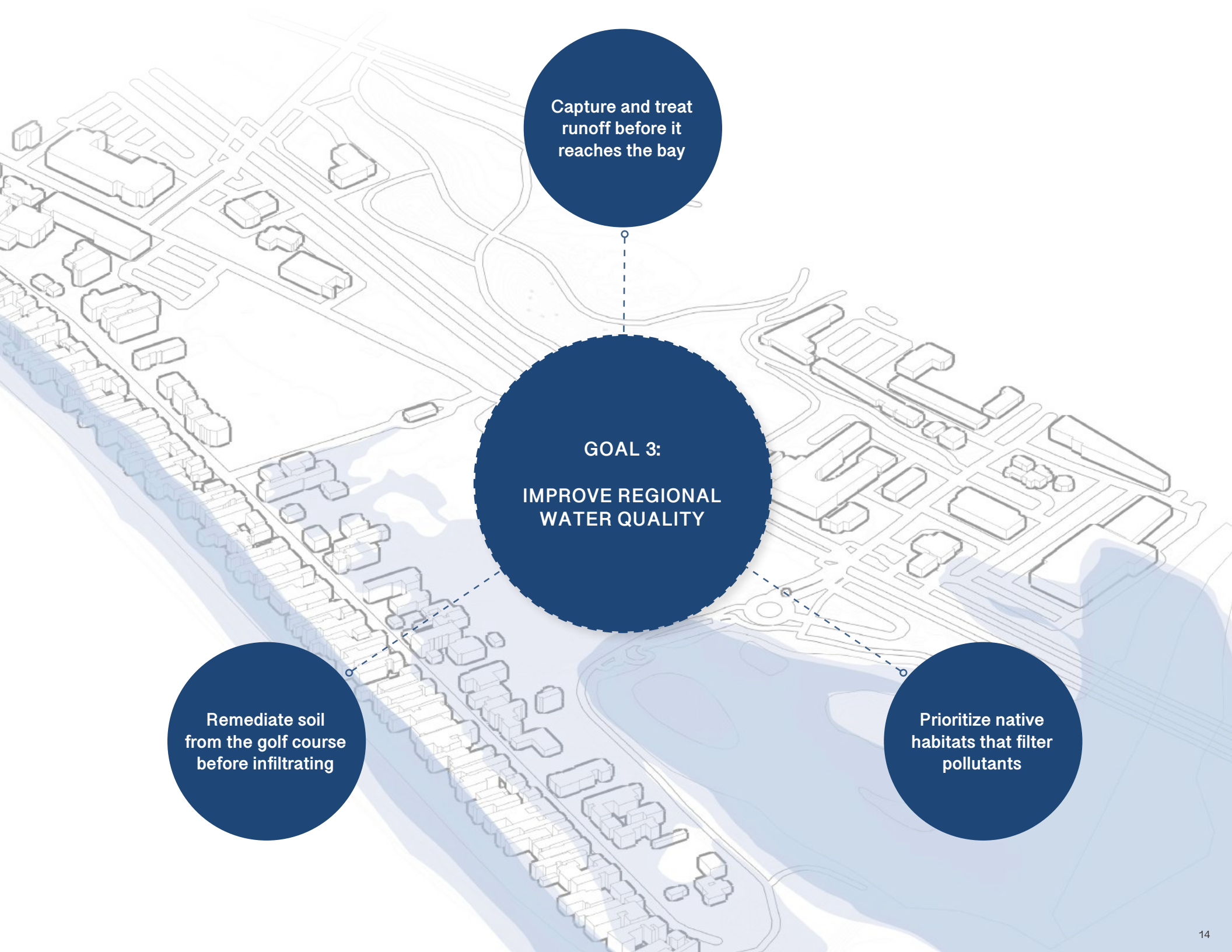


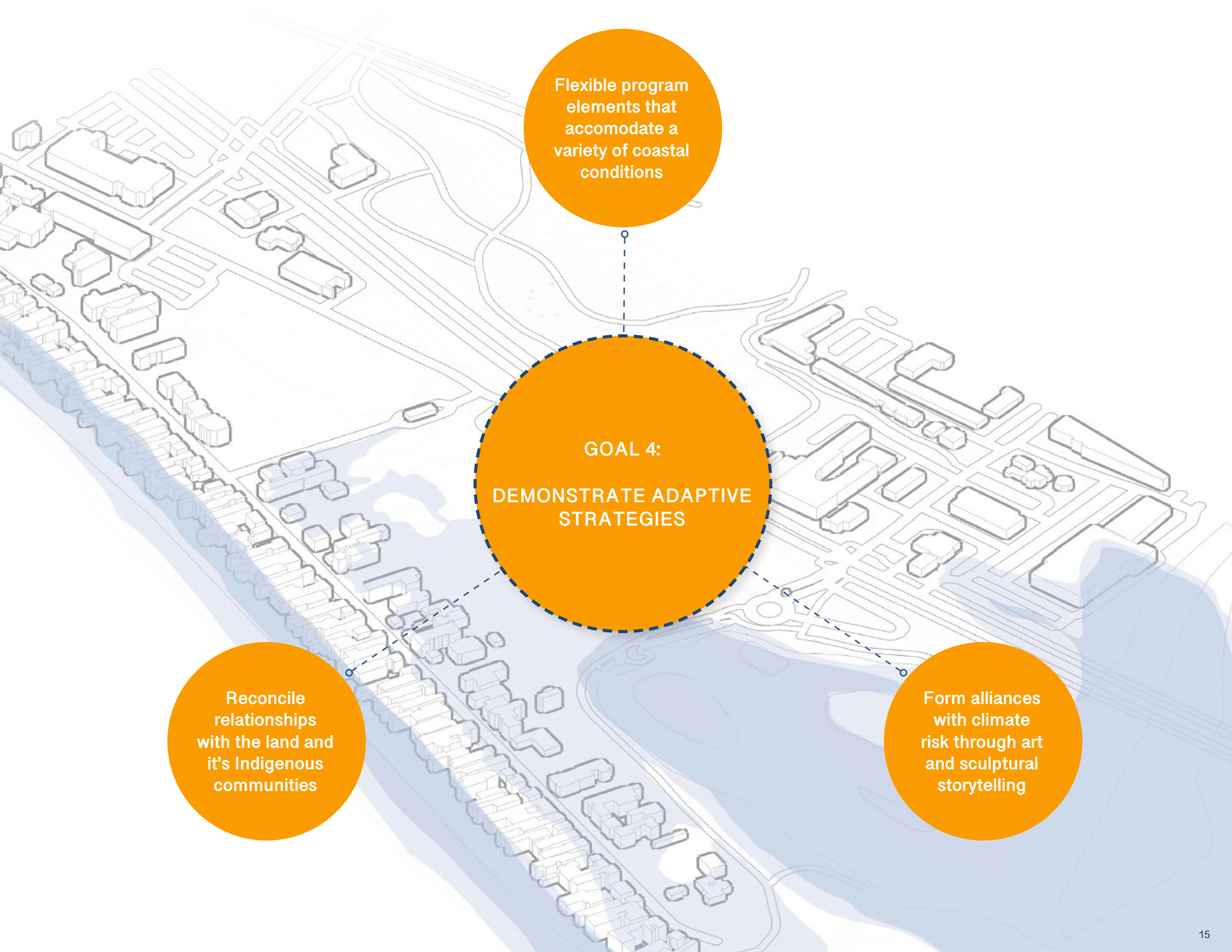
ONGOING MONITORING

ANNUAL monitoring reports show improvements in water quality, re-emergence of critical species, and resilience to environmental impacts from fires, storms, and floods.


Adaptive infrastructure for multi-benefit solutions
Connect and extend the Malibu Lagoon wetland
GOAL 1:
SEA LEVEL RISE RESILIENCY
Conservation 'unit' with habitat connectivity and upland migration space
Wetland channel design that maximizes flood capacity


Improve pedestrian safety at existing crossings
Enhance access with new connections
GOAL 2:
ENHANCE PUBLIC EDUCATION + ACCESS
Provide educational program to engage a sense of stewardship
Offer access without impacting sensitive areas


Capture and treat runoff before it reaches the bay
GOAL 3:
IMPROVE REGIONAL WATER QUALITY
Remediate soil from the golf course before infiltrating
Prioritize native habitats that filter pollutants


Flexible program elements that accomodate a variety of coastal conditions
GOAL 4:
DEMONSTRATE ADAPTIVE STRATEGIES
Reconcile relationships with the land and it's Indigenous communities
Form alliances with climate risk through art and sculptural storytelling

COUNTY OF LA BEACHES + HARBORS
- Sea Level Rise Vulnerability Assessment (2016)
- Coastal Resiliency Study (2023)

CITY OF MALIBU
- Local Coastal Program Land Use Plan (2002)
- Coastal Resilience Plan (Pending)

MALIBU LAGOON RESTORATION + ENHANCEMENT PROJECT

LANDSCAPES OF RETREAT
Dr. Rosetta Elkin

DESIGN WITH NATURE
Ian McHarg

ENVIRONMENTAL POLICY

ECOLOGICAL DEMANDS

ADAPTIVE DESIGN STRATEGIES

ENVIRONMENTAL PROTECTION AGENCY
- California Wetland Program Plan (2023-2028)

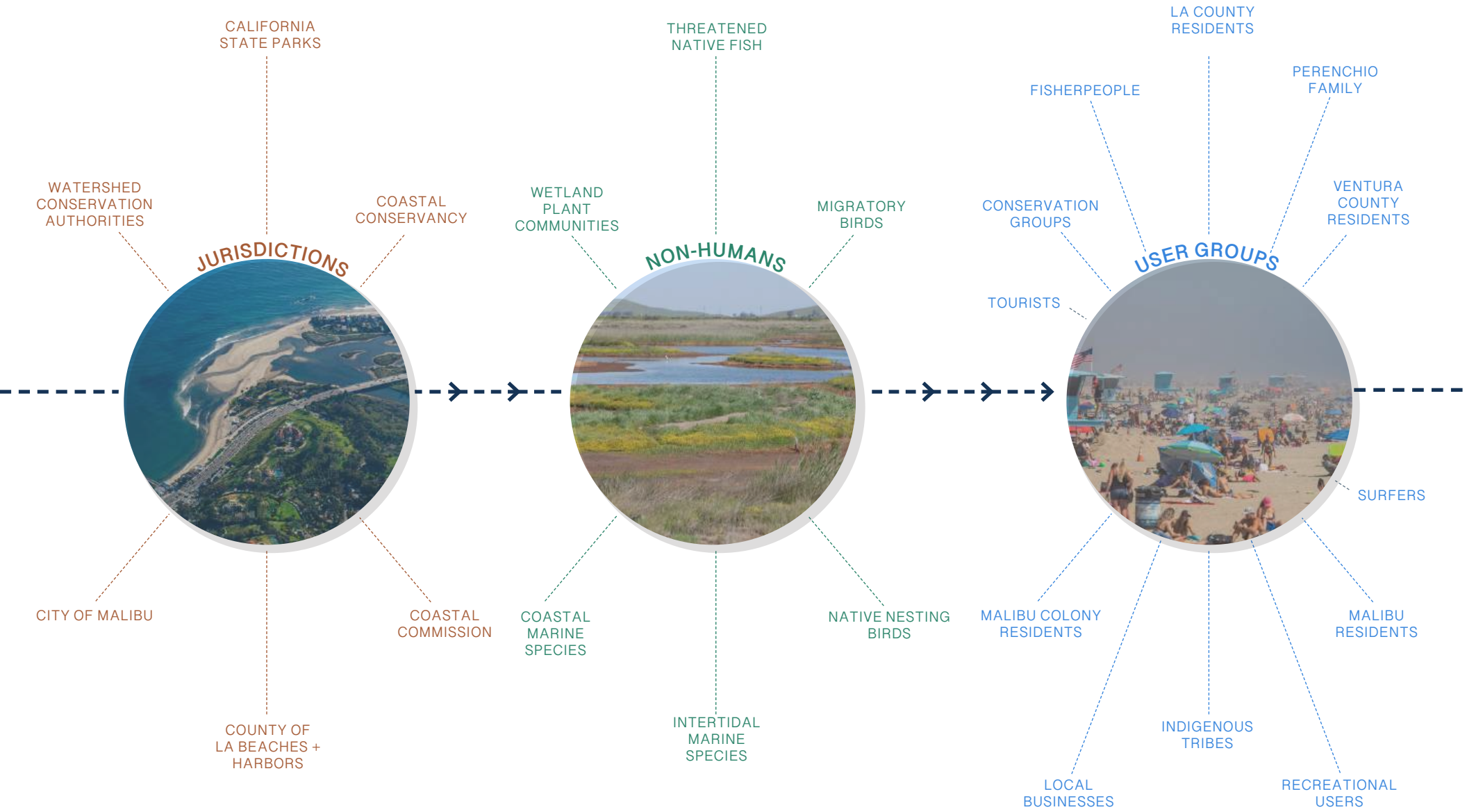
STATE OF CALIFORNIA
- Sea Level Rise Guidance (2024 Draft)
- Coastal Commission Enforcement Agreement (2004)

SCCWRP REGIONAL STRATEGY FOR THE FUTURE OF SOUTHERN CALIFORNIA'S WETLANDS (2018)

WETLAND MANAGEMENT STRATEGY RECOMMENDATIONS
Southerns California Wetland Regional Strategy Report

COASTAL INFRASTRUCTURE: A TYPOLOGY FOR THE NEXT CENTURY OF ADAPTATION TO SEA-LEVEL RISE
Dr. Kristina Hill, et. al, 2015

USERS + STAKEHOLDERS



MODELS FOR SEA LEVEL RISE AND DYNAMIC FLOODING

NOAA and other models focus primarily on sea level rise with a static tide level. The USGS Dynamic Flood Model (2019) reaches beyond those parameters to account for storms, short-term variability, erosion response and tidal non-linearity to form a more comprehensive portrait of potential impacts.

In that assessment, by 2100 projections will impact **107 structures** and **1.10 miles of the PCH** just within the boundaries of this map resulting in potentially billions of dollars of damage and the loss of significant areas of beach and coastal habitat if area for upland migration is not available.

- PROPOSED SITE AREAS
- 2 ACRE WETLAND RESTORATION BOUNDARY
- HIGH WAVE MARK BY 2100
- LOW-LYING AREAS - FLOODING LIKELY
- EXISTING STRUCTURES TO BE IMPACTED BY 2100
- 20' ALLOWABLE WETLAND BOUNDARY SHIFT

PEDESTRIAN ACCESS + CIRCULATION BETWEEN KEY SITES

PCH imposes high risk and difficulty for pedestrian circulation across key sites in the area due to high traffic and very limited crossings with stop lights. The connections between Legacy Park and the Malibu Mart are strong, and offer a variety of routes for pedestrian and ADA use. The same can not be said for the cross-PCH connection between the Mart and Malibu Lagoon State Park, where there is one cross walk and very few elements alerting users about the park. Sidewalks are limited and sporatic surrounding the Golf Course and adjacent lots, so users parked on Malibu Road have to walk in the street or on an informal gravel path to reach the Lagoon or PCH.

- PRIMARY VEHICULAR (PCH)
- SECONDARY VEHICULAR
- TERTIARY VEHICULAR
- PRIVATE ROAD
- TRAILS
- PEDESTRIAN CROSSWALK
- GRAVEL PATH
- SIDEWALKS
- ELEVATED BRIDGE
- PUBLIC PARKING
- BUS STOP (LA METRO 534)
- PARKING PAY STATION

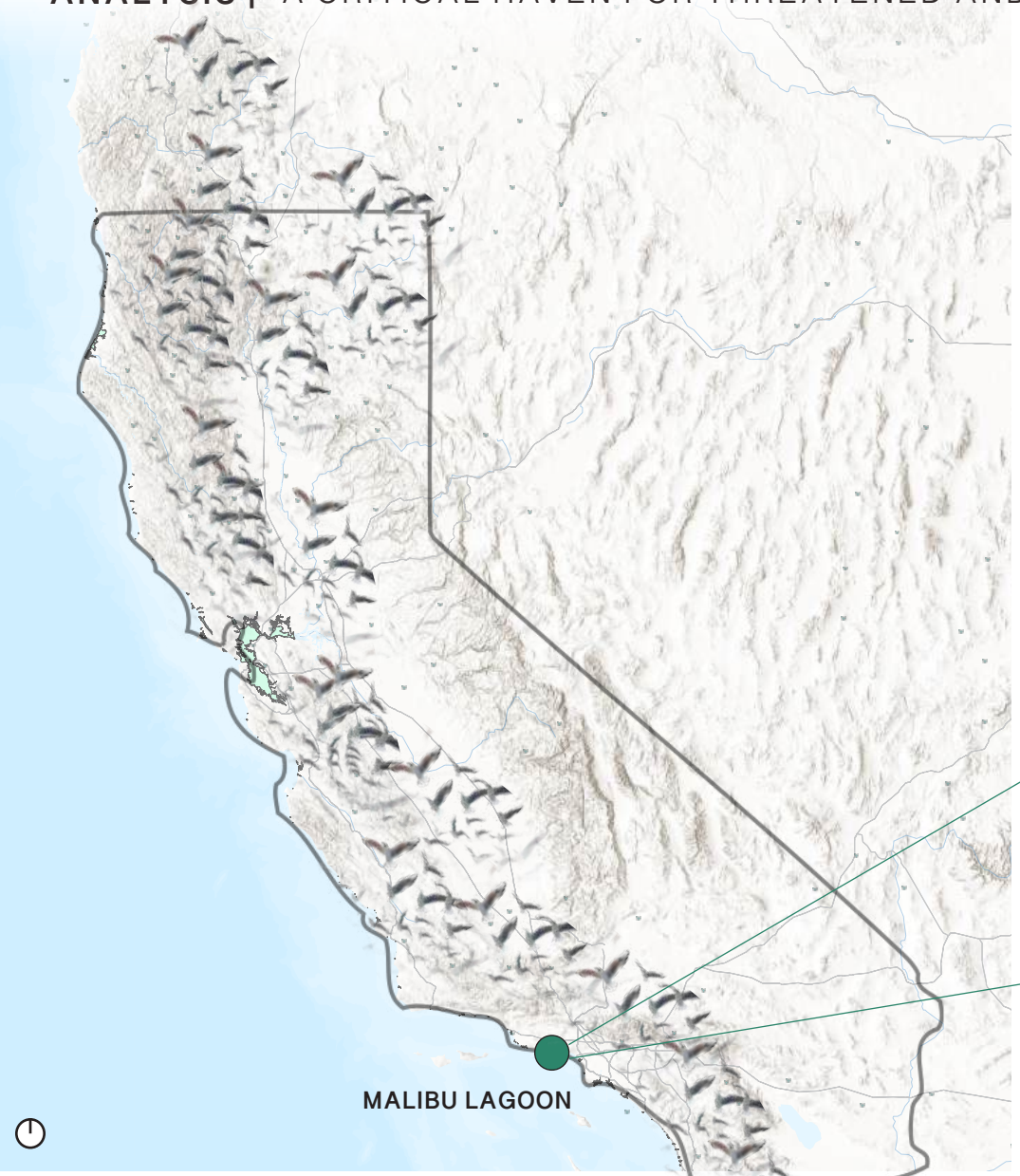
THE FUTURE OF THE MALIBU CREEK WATERSHED

There are a number of inputs that affect the health and vitality of the Malibu Creek Watershed, the second largest watershed in the Santa Monica Bay and home to 90,000 residents. Efforts are being made to mitigate nutrient discharges and keep the Creek clean, ensuring it can to provide critical habitat into the future.

One of the largest entities discharging into the creek, Tapia Water Treatment Plant, has been ordered by the EPA to cease that practice by 2030. The EPA has also identified other top nutrient sources including several hundred thousand gallons of septic discharge per day from commercial developments, irrigation and urban runoff upstream from areas like Calabasas, as well as fertilizer and pesticides from the existing golf course.

- 101 FREEWAY
- PACIFIC COAST HIGHWAY
- MALIBU CREEK REACH
- TRIBUTARY STREAMS
- AVG 1500 PEOPLE/SQ. MILE
- TAPIA WATER TREATMENT PLANT
- DAM
- SITE AREA

ANALYSIS | A CRITICAL HAVEN FOR THREATENED AND MIGRATORY SPECIES



Malibu Lagoon is one of the few remaining natural estuaries found along the Pacific Flyway - the migratory bird highway between warm areas in the south to colder climates in the north.

75+ Species of water birds

70+ Species of land birds

use Malibu Lagoon for food, shelter, and habitat

2 Federally endangered birds

2 Federally endangered fish

use the tidewaters of Malibu Lagoon for habitat and spawning

WETLANDS OVERALL

1.5 million gallons of floodwater can be stored by **one acre** of wetlands.

Provide key **habitat** and nursery grounds for valuable and **threatened wildlife**

$2.3 billion in annual coastal protection services are provided by wetlands.

20% reduction in property damage during storms

AT THIS SITE

3 million gallons
of floodwater capture across 2+ acres of proposed new wetland area

75+ Species of water birds

70+ Species of land birds

use Malibu Lagoon for food, shelter, and habitat

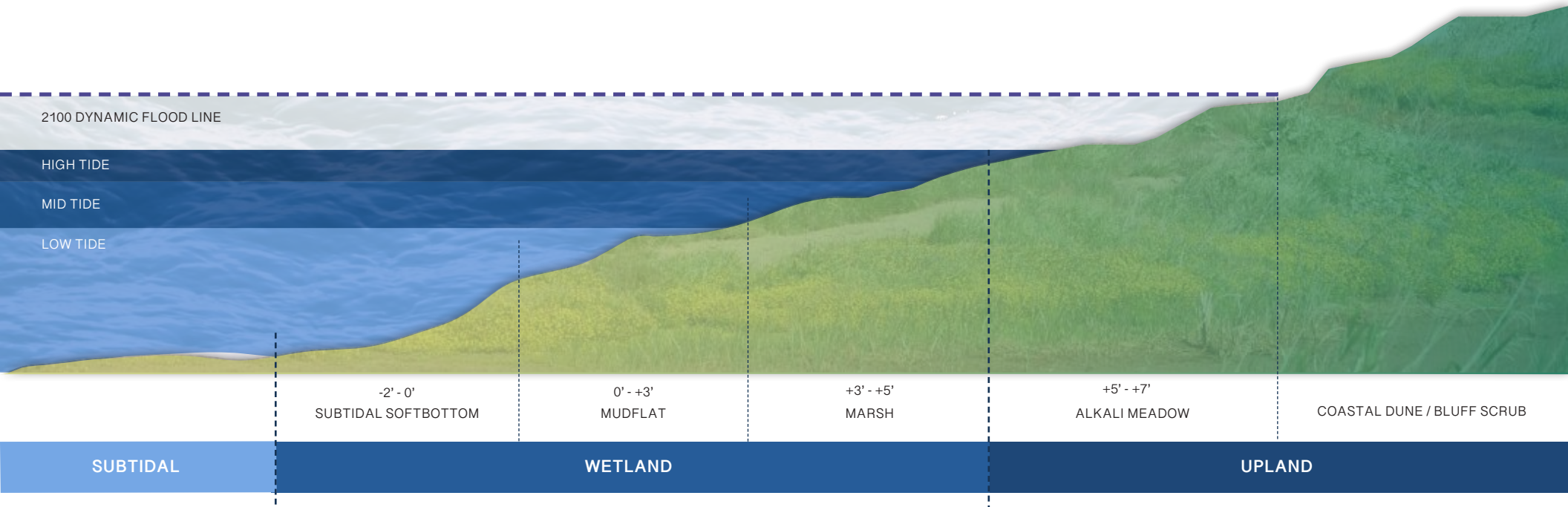
2 Federally endangered birds

2 Federally endangered fish

use the tidewaters for habitat and spawning

Protections and cost savings for Existing Lagoon, Malibu Mart, Pacific Coast Highway

WHY A WETLAND? | PRESERVING PLANT COMMUNITIES



Eel Grass
Zostera pacifica

Pickleweed
Salicornia virginica

Sea Lavender
Limonium californicum

Alkali Heath
Frankenia salina

Salt Grass
Distichlis spicata

Southwestern Spiny Rush
Juncus acutus

Dune Buckwheat
Eriogonum parvifolium

Lemonadeberry
Rhus integrifolia

PROJECT PRECEDENTS | RESTORATION + UPLAND MIGRATION

Upper Devereux Slough Restoriation, Santa Barbara CA

Aerial image of the restoration area at the time of it's completion in 2017.
Image Credit: Bill Dewey

Aerial image of the restoration area with high water, 2023
Image Credit: Bill Dewey

AREAS OF ALIGNMENT

- Acquisition of private land as retreat strategy
- Sea level rise resiliency
- Coastal wetland habitat restoration
- Renewing public access + education

In addition to the restoration within site boundaries, totaling more than 130 acres, the project also connected adjacent areas of protected open space and the lower Devereux Slough, providing even stronger opportunities for wildlife connections and expanded habitat.

Through the acquisition of the 64 acre golf course, this development demonstrates retreat through transformation of landscape in order to recognize and prepare for climate futures.

Beyond the restoration, there was much attention paid to increasing access to the formerly private areas by adding trails, boardwalks, educational spaces, and scientific study.

LOCATION: UCSB Campus, Santa Barbara, CA

COST: $15,100,000

AREA: 136 Acres

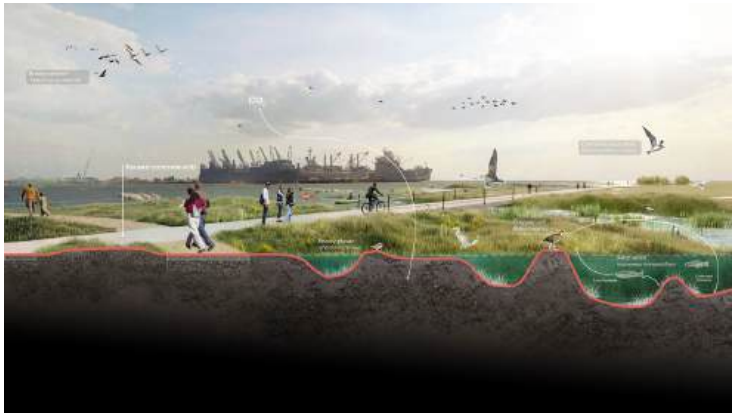
PROJECT DESCRIPTION: The project area totals 136 acres, including the 68.3 acre South Parcel, 64 acre Ocean Meadows golf course, and 3.7 acre Whittier parcel. Restoration of the slough resulted in the creation of 45 acres of wetland habitat, including 22 acres of intermittently tidal estuarine wetlands and 56 acres of upland and transitional habitat.

The project improves water quality in the slough by removing the current golf course, provides increased buffer area for storm surges and predicted sea level rise, increases permeable surfaces, and expands the capacity of the Devereux Creek floodplain. Fill material removed from the property as part of restoration activities has facilitated restoration of the neighboring 69-acre property to a matrix of habitat areas.

Habitat compositions for the restoration
North Campus Open Space Restoration Project Monitoring Report, 2023

PROJECT PRECEDENTS | RESTORING PUBLIC ACCESS + EDUCATION

De-Pave Park, Alameda, CA



AREAS OF ALIGNMENT

- Wetland Restoration of previous brownsite
- Sea level rise resiliency
- Coastal wetland habitat restoration
- Renewing public access + education
- Performance metrics as basis for success

By converting a publicly inaccessible brownfield consisting primarily of concrete slabs into a wetland restoration park with public recreation and educational amenities, De-Pave Park offers a demonstration in adaptive strategies for urban coastlines.

The park design re-uses 100% of the removed paving in the existing landscape to create fill and landscape features for future park areas that will remain above the waterline, while allowing 60% of the park to become intertidal with 3-6 feet of sea level rise, and 90% of the park becoming de-paved.

LOCATION: Alameda, CA

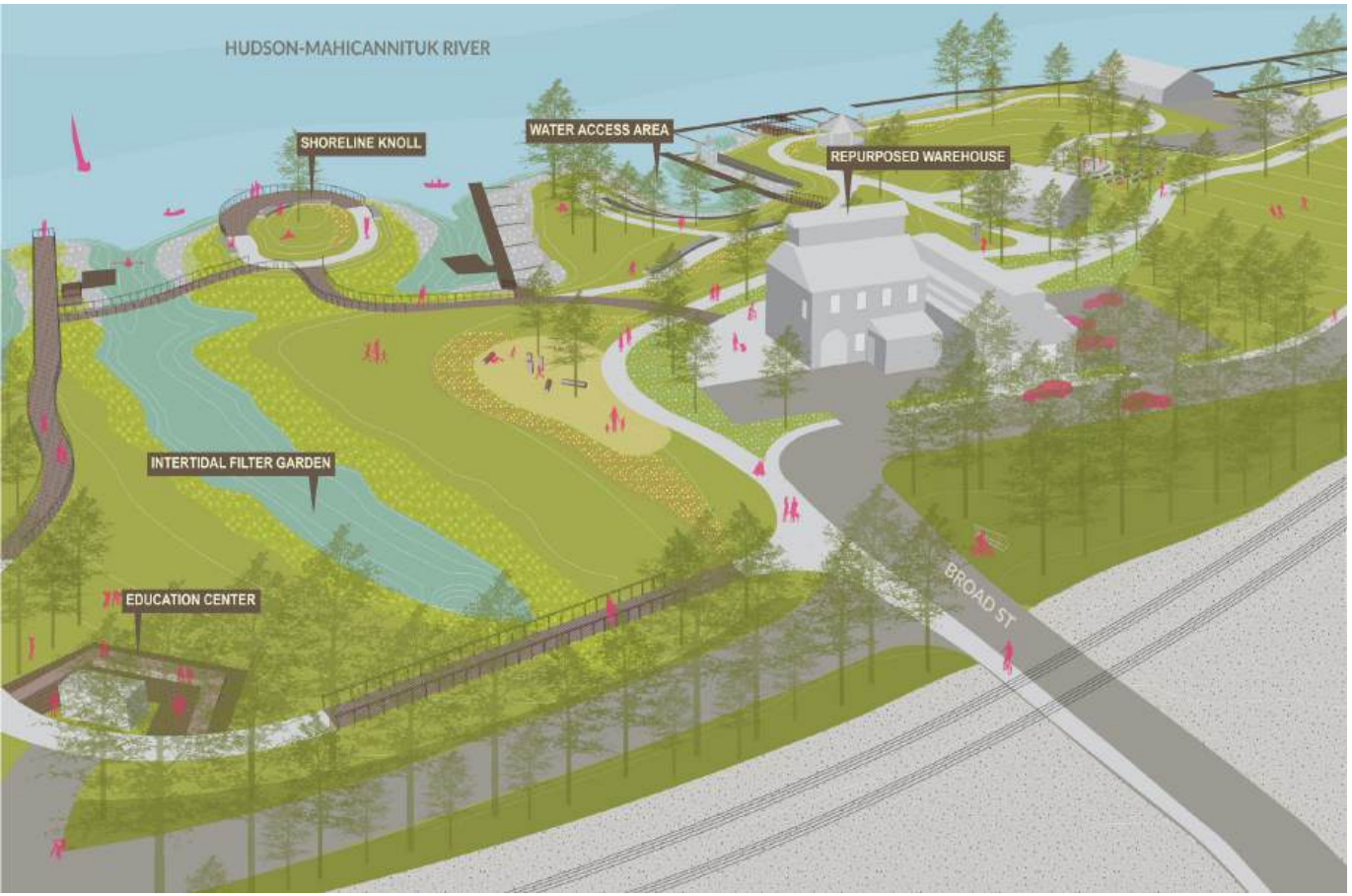
COST: TBD

AREA: 19 Acres

PROJECT DESCRIPTION: De-Pave Park creates 19-acres of new tidal marshes and wildlife habitat for aquatic species, shorebirds, waterfowl, and marine mammals within a dense urban area with public access and educational programming. Public access includes pedestrian trails, observation points over the marsh, that are accessible to people of all physical abilities, a promenade running the length of the park, interpretive educational signage and programs, beach and terraced seating, picnic areas and nature play, tide pools, restrooms, and parking lot. The park design was approved by the Alameda City Council and has received restoration funding through the Measure AA Grant from the San Francisco Bay Restoration Authority.

PROJECT PRECEDENTS | ADAPTIVE INFRASTRUCTURE

Adaptive Waterfront Park, Hudson, NY



AREAS OF ALIGNMENT

- **Community Engagement**
- **Adaptive Infrastructure**
- **Expansion of Existing Park**
- **Recreation and Education Priorities**

This park is adjacent to urban centers and critical infrastructure, and experiences a high demand for recreational access. Adaptation to climate challenges underpins the design, but through the expansion of the existing parks to include 7 acres of upland migration area, the challenge of maintaining rereational amenities can be preserved while accomplishing resiliency goals.

Rigorous community engagement processes guided the design outcomes and established clear goals the community could get behind.

LOCATION: Hudson, NY

COST: TBD

AREA: 7 Acre

PROJECT DESCRIPTION: Henry Hudson Riverfront Park is a 7 acre park situated along the Hudson River in the City of Hudson, NY. Landscape architects conducted an investigation and redesign of an existing park that is heavily impacted by flooding that will be exacerbated by sea level rise in the near future. The resulting framework plan will adapt to sea level rise, regenerate the shoreline's intertidal ecology, and maintain waterfront recreational access that is critical to the Hudson community.

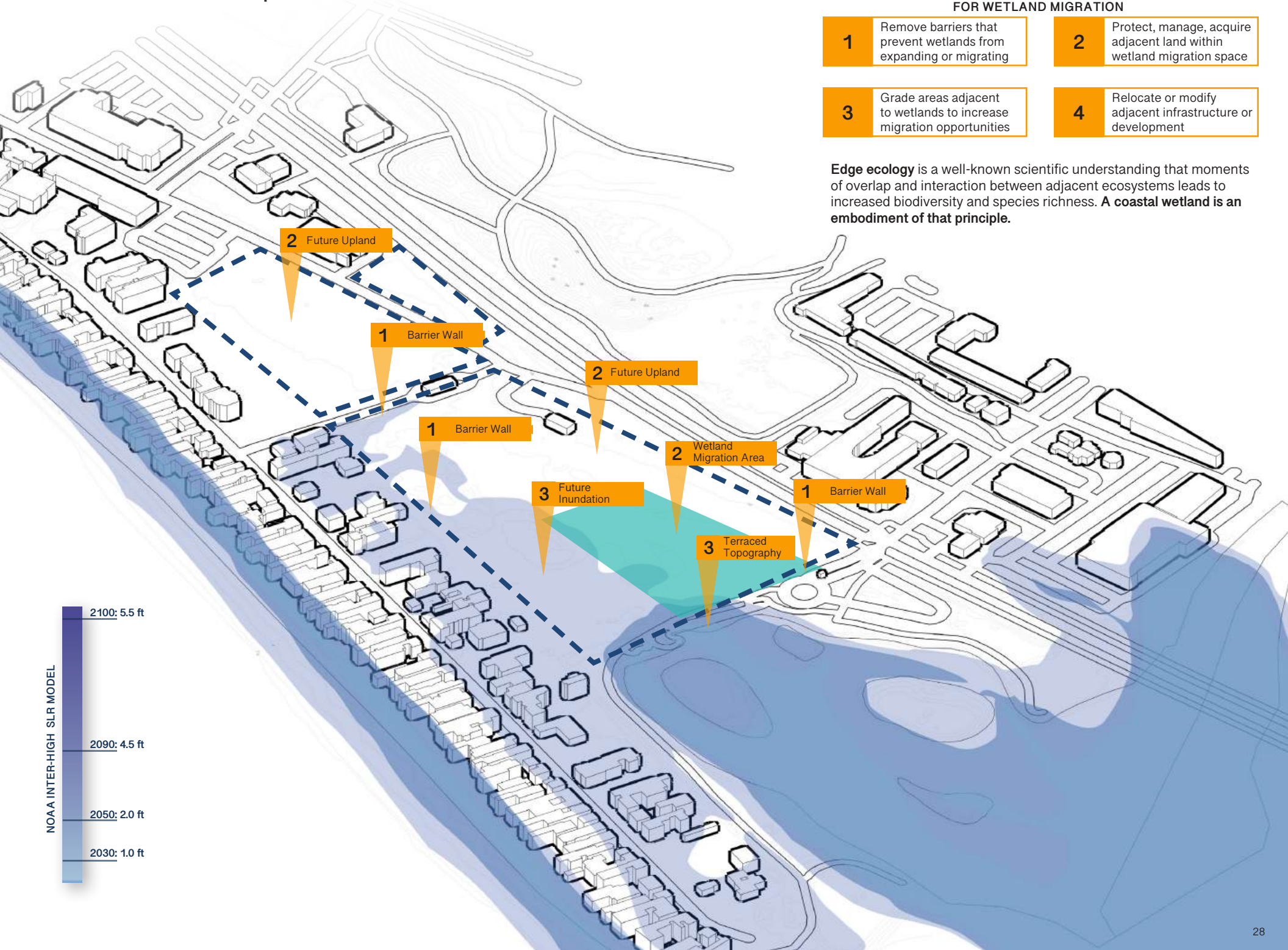
CONCEPT DEVELOPMENT

DESIGN METHODS | EDGE ECOLOGY + UPLAND MIGRATION

DEVELOPMENT STRATEGIES FOR WETLAND MIGRATION

1	Remove barriers that prevent wetlands from expanding or migrating
2	Protect, manage, acquire adjacent land within wetland migration space
3	Grade areas adjacent to wetlands to increase migration opportunities
4	Relocate or modify adjacent infrastructure or development

Edge ecology is a well-known scientific understanding that moments of overlap and interaction between adjacent ecosystems leads to increased biodiversity and species richness. **A coastal wetland is an embodiment of that principle.**



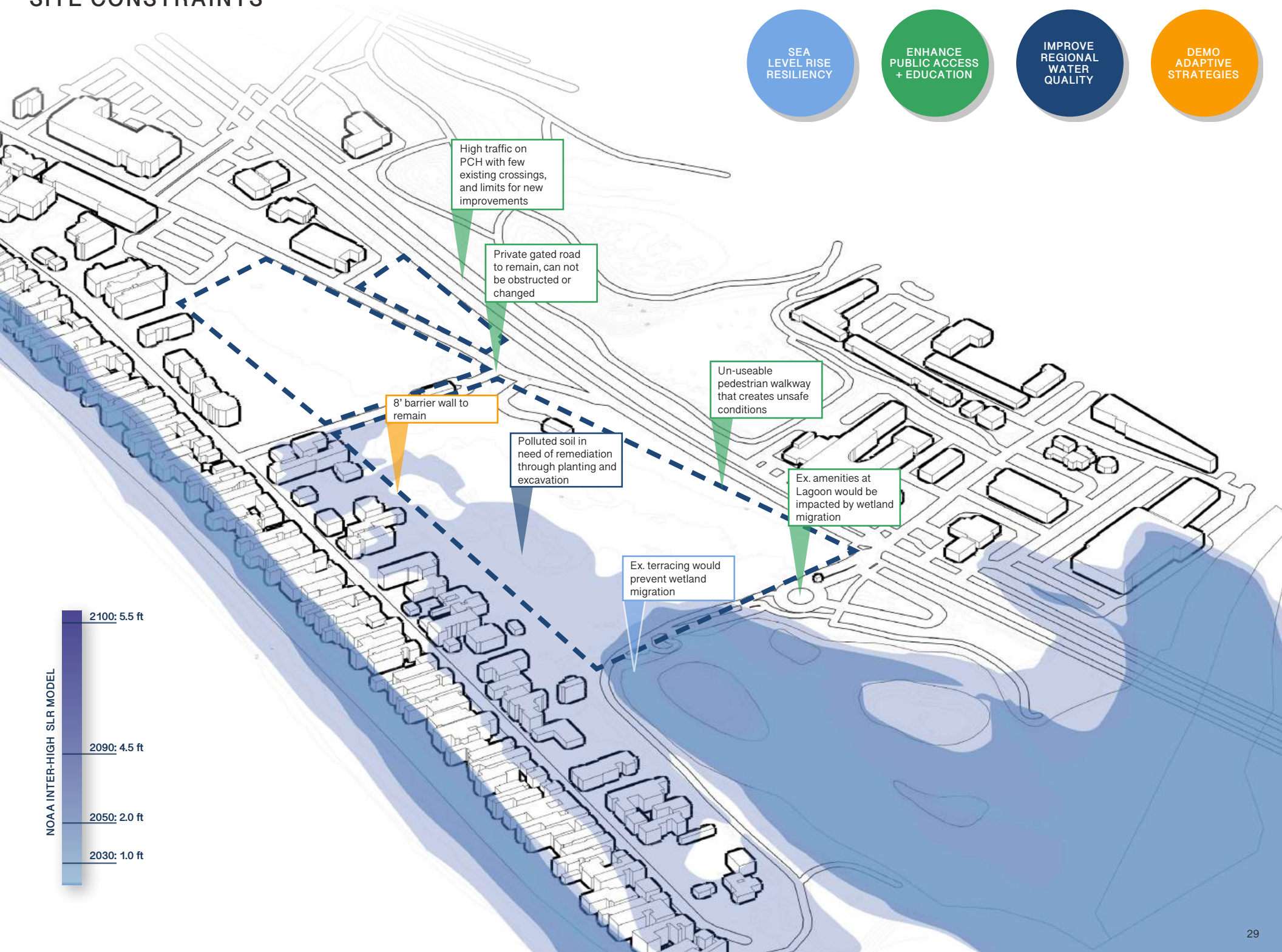
SITE CONSTRAINTS

SEA LEVEL RISE RESILIENCY

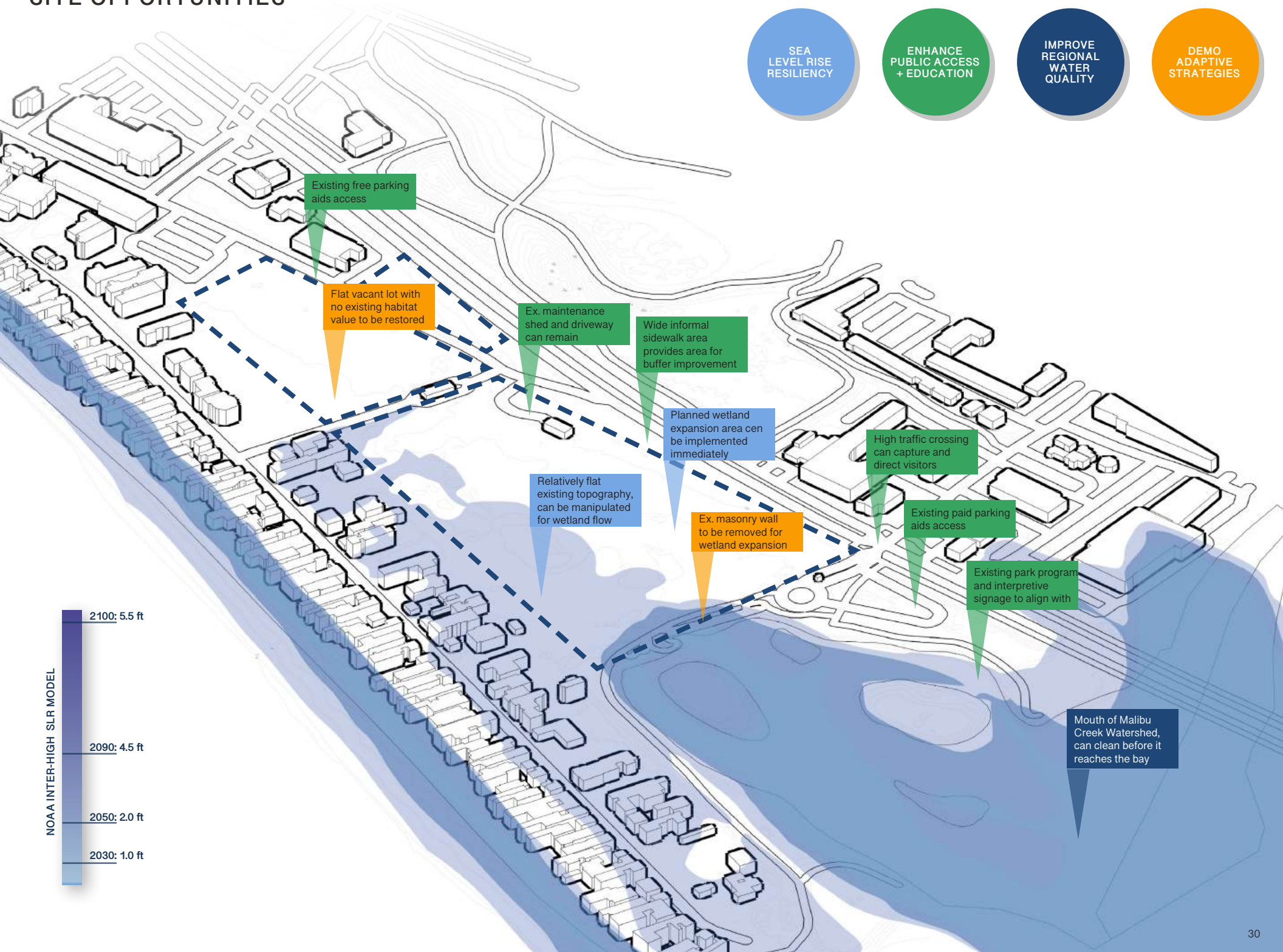
ENHANCE PUBLIC ACCESS + EDUCATION

IMPROVE REGIONAL WATER QUALITY

DEMO ADAPTIVE STRATEGIES



SITE OPPORTUNITIES



EXISTING PROGRAM INVENTORY | MALIBU LAGOON

PROGRAM STATEMENT

"The Malibu Lagoon Restoration and Enhancement Plan presents a comprehensive approach to restore and enhance the ecological structure and function of Malibu Lagoon, as well as to enhance the visitor's experience through improvements to access and interpretation". - Malibu Lagoon Restoration + Enhancement Plan

INTEGRATED SEATING

PARKING W/ STORMWATER CAPTURE

PICNIC AREAS

VISTA DECKS

FLOODABLE SCULPTURE

ELEVATED TRAILS

PORTA-JOHN RESTROOMS

INTERPRETIVE SIGNAGE

HABITAT RESTORATION

WILDLIFE VIEWING

CONCEPT DEVELOPMENT | PROGRAM IDEA MAP

PROGRAM STATEMENT

The design program is for a multi-benefit coastal wetland State Park that serves a wide variety of local and visiting users with educational and stewardship-generating opportunities, and adapts to changing environmental conditions over time. Passive recreational opportunities offer respite from the bustling highway and shopping center. Significant habitat restoration provides new ground for aquatic and terrestrial species and resiliency for future sea level changes.

SEA LEVEL RISE RESILIENCY

ENHANCE PUBLIC ACCESS + EDUCATION

IMPROVE REGIONAL WATER QUALITY

DEMO ADAPTIVE STRATEGIES

INTEGRATED SEATING

PARKING W/ STORMWATER CAPTURE

PICNIC AREAS

INDIGENOUS CULTURAL HISTORY

VISTA DECKS

FLOODABLE SCULPTURE

HABITAT + PROGRAM "ISLANDS"

ELEVATED TRAILS

RESTROOM FACILITIES

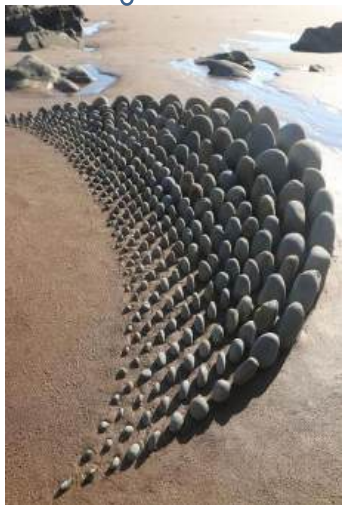
INTERPRETIVE SIGNAGE

HABITAT RESTORATION

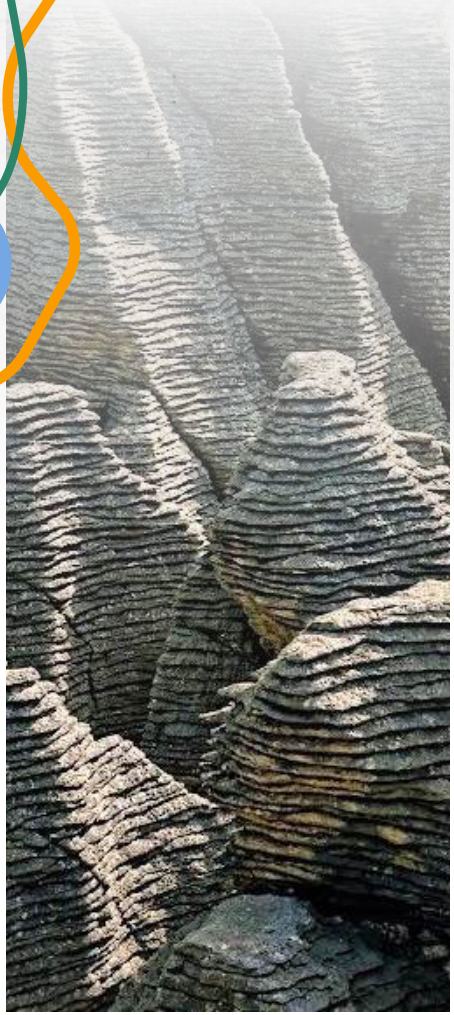
WILDLIFE VIEWING

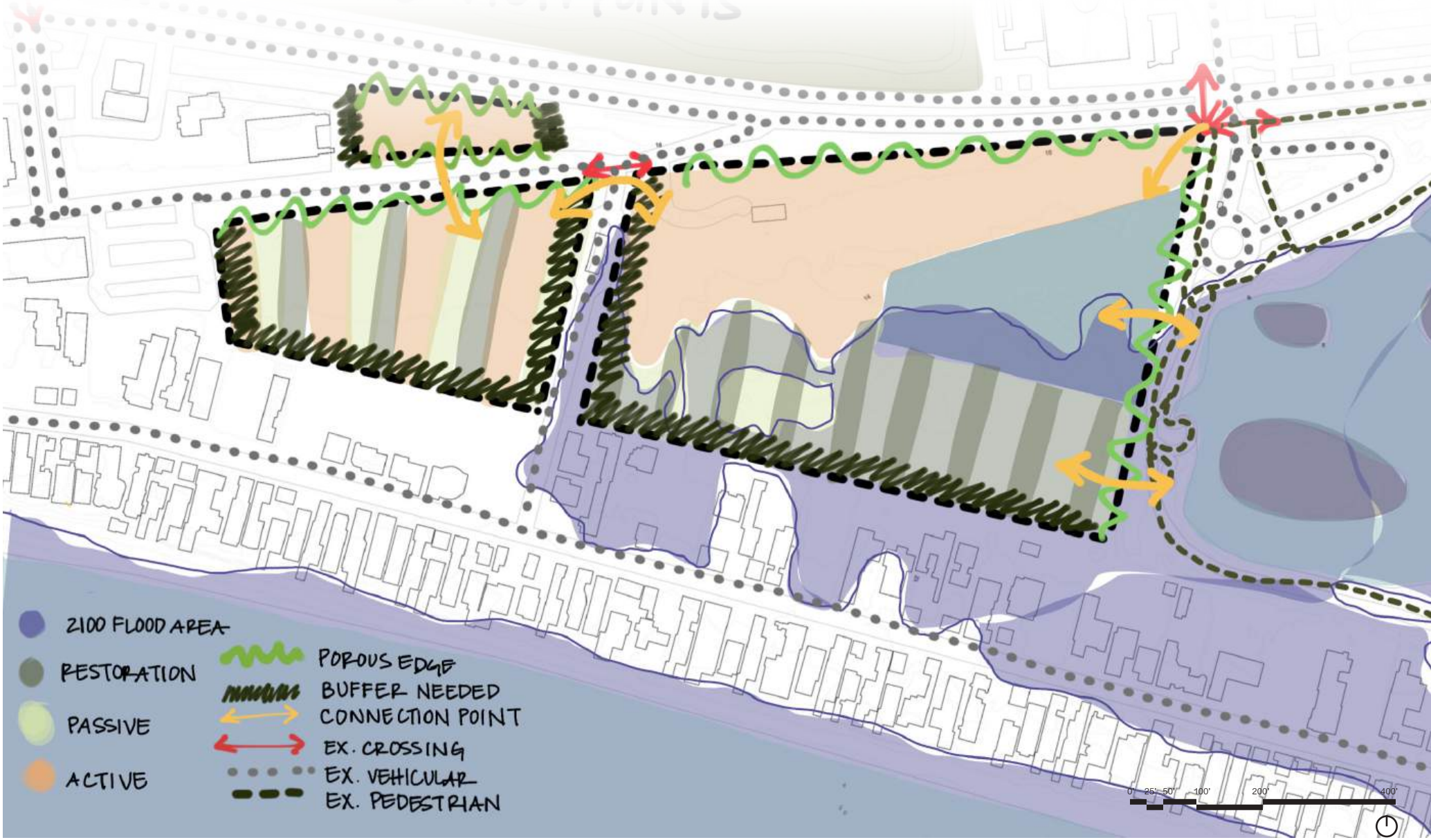
ELEVATED GATHERING SPACES

NATURE PLAY



The design concept is guided by the iterant nature of coastal systems, how the ebb and flow of tides causing erosion and deposition are a natural and integral part of coastal processes, and how those processes manifest themselves in the physical features of the landscape.





DEFINING SITE PROGRAM WITH ANTICIPATED SLR

The 2100 Inundation line may or may not come to pass, but investment in the site should recognize it's probability and respond by orientating more active site elements outside that area. Restoration in the projected inundation areas would present more likelihood of successful habitat migration over time.

Edge conditions and connectivity will also be vital in defining the course of inundation over time. Maintaining porous edges, adding connections to the existing Lagoon, and improving pedestrian conditions at PCH will achieve the goal of increasing access.

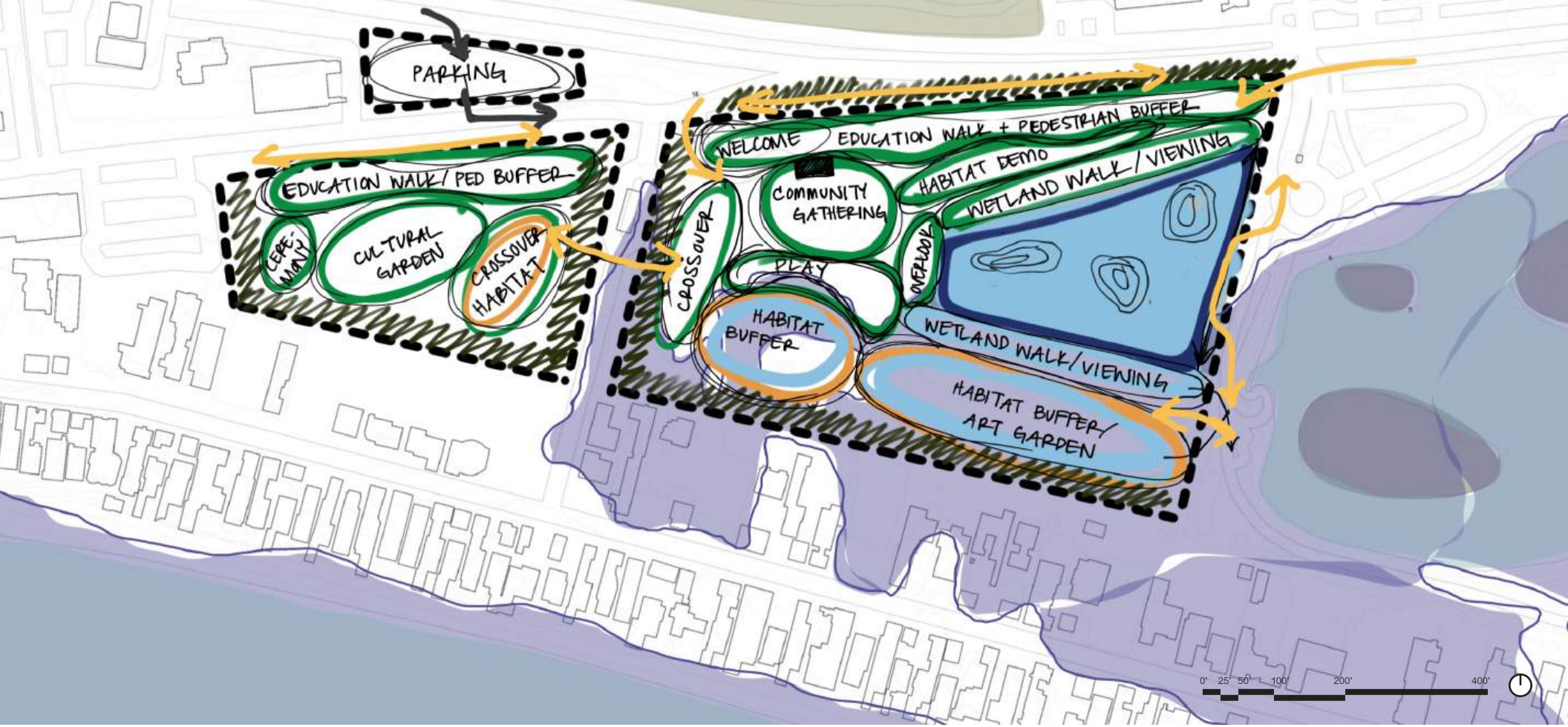
CONCEPT 1 | TRANSITIONS IN TIME

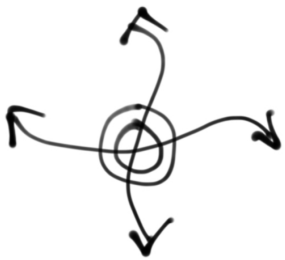
SEA LEVEL RISE RESILIENCY

ENHANCE PUBLIC ACCESS + EDUCATION

IMPROVE REGIONAL WATER QUALITY

DEMO ADAPTIVE STRATEGIES





PROS

- Significant space for pedestrian improvements on PCH
- Bottom half of site prioritizes habitat restoration
- Elevated crossing over Malibu Colony Rd. would be eyecatching
- Walkways around wetland prioritize views and perimeter access
- Large community gathering space

CONS

- Indigenous area isn't integrated into site, no access to water's edge
- Welcome area is far from crossings or typical path of travel from existing park
- Elevated crossing on Malibu Colony Rd. would be costly and difficult

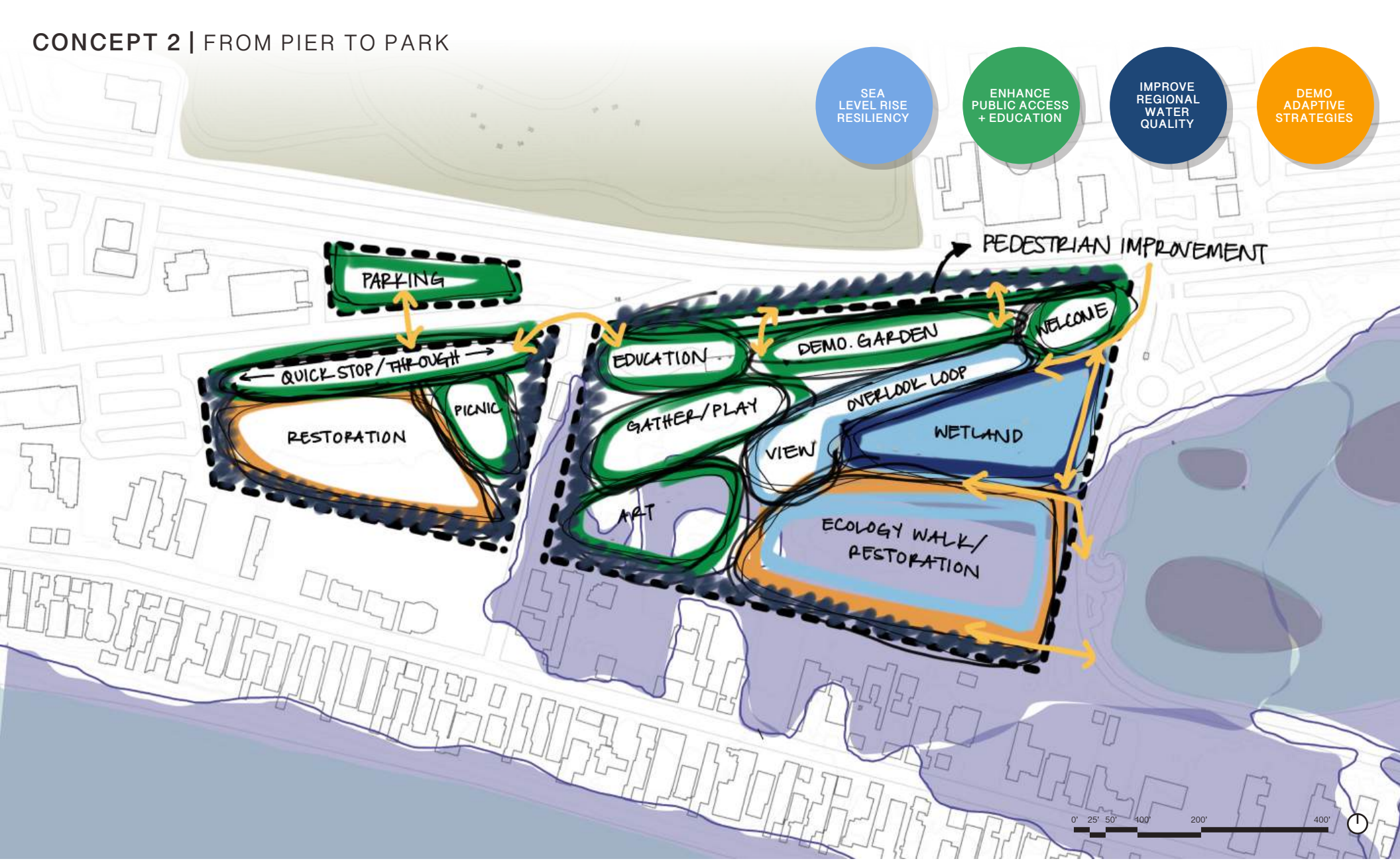
CONCEPT 2 | FROM PIER TO PARK

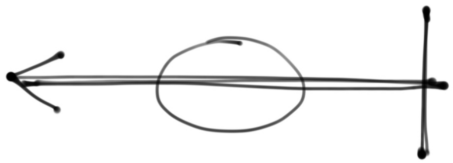
SEA LEVEL RISE RESILIENCY

ENHANCE PUBLIC ACCESS + EDUCATION

IMPROVE REGIONAL WATER QUALITY

DEMO ADAPTIVE STRATEGIES





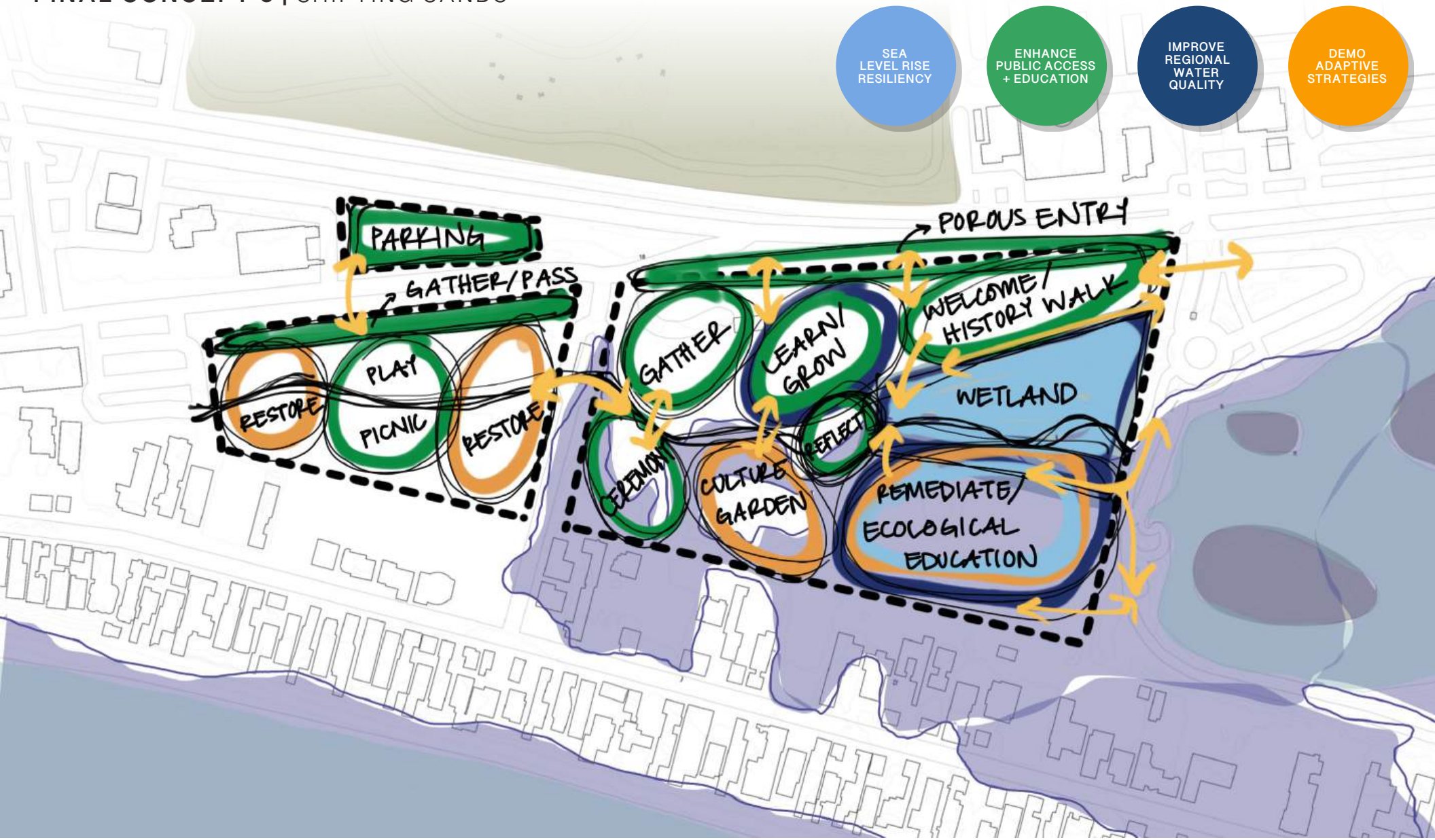
PROS

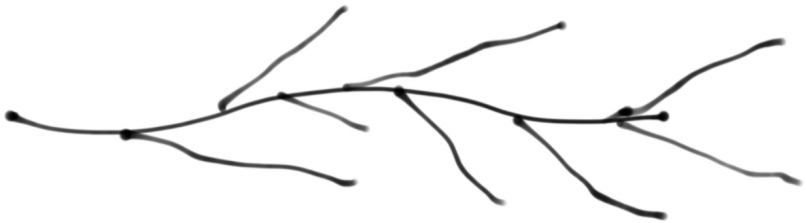
- Large areas dedicated to restoration
- Axis of program to siphon people off PCH and into the park core
- Pedestrian improvements on PCH increase safety and access
- Education hub capitalizes on existing structure and driveway area

CONS

- No indigenous-dedicated spaces or prioritization
- Program may be redundant with existing Legacy Park and Malibu Lagoon

FINAL CONCEPT 3 | SHIFTING SANDS





PROS

- Prioritizes 2100 inundation line as guiding axis for the site, encouraging recognition of it's effects before they arrive
- Welcome center adjacent to Lagoon and existing crossings/pedestrian paths of travel
- Indigenous history woven into main site area
- Mirrored program elements
- Stewarship and education prioritized

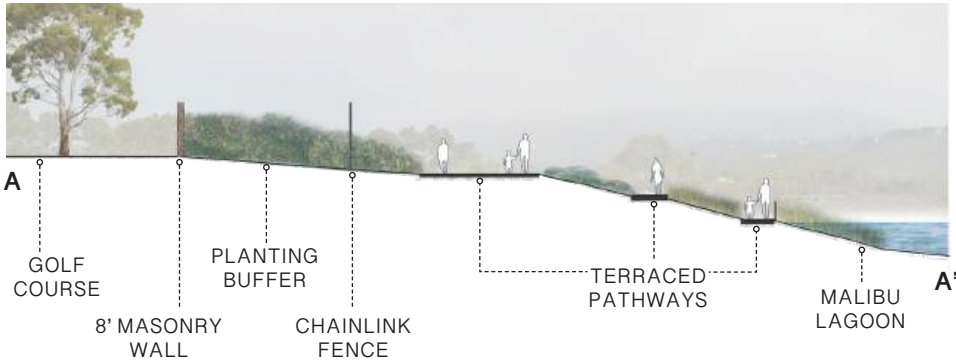
CONS

- Adjacent vacant lot may feel isolated/seperate from the rest of the site
- Connection points across Malibu Colony Rd. at corners of the site may be challenging
- Pedestrian access at PCH wil be higher traffic, may present safety concerns

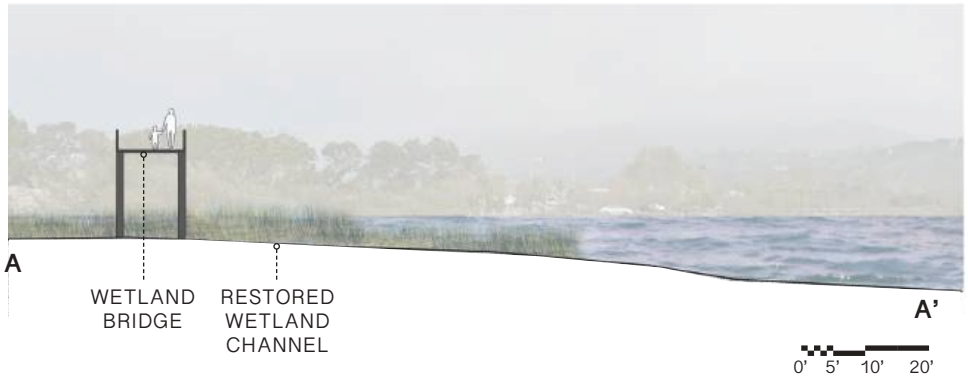
MASTER PLAN DESIGN

SITE PLAN - PRESENT | SHIFTING SANDS

EXISTING CONDITION

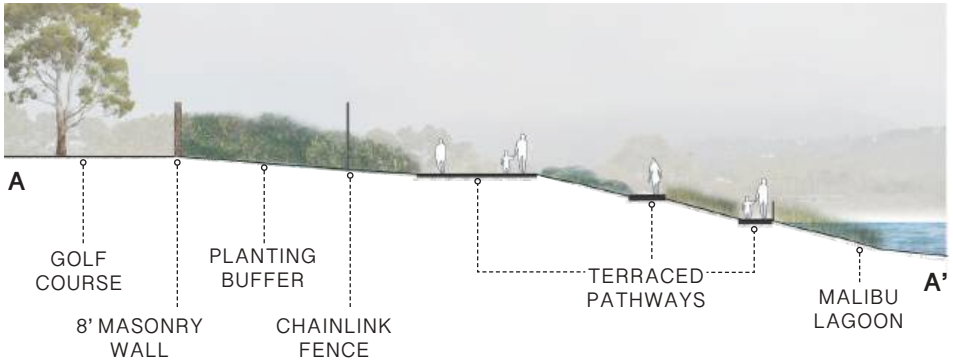


PROPOSED CONDITION



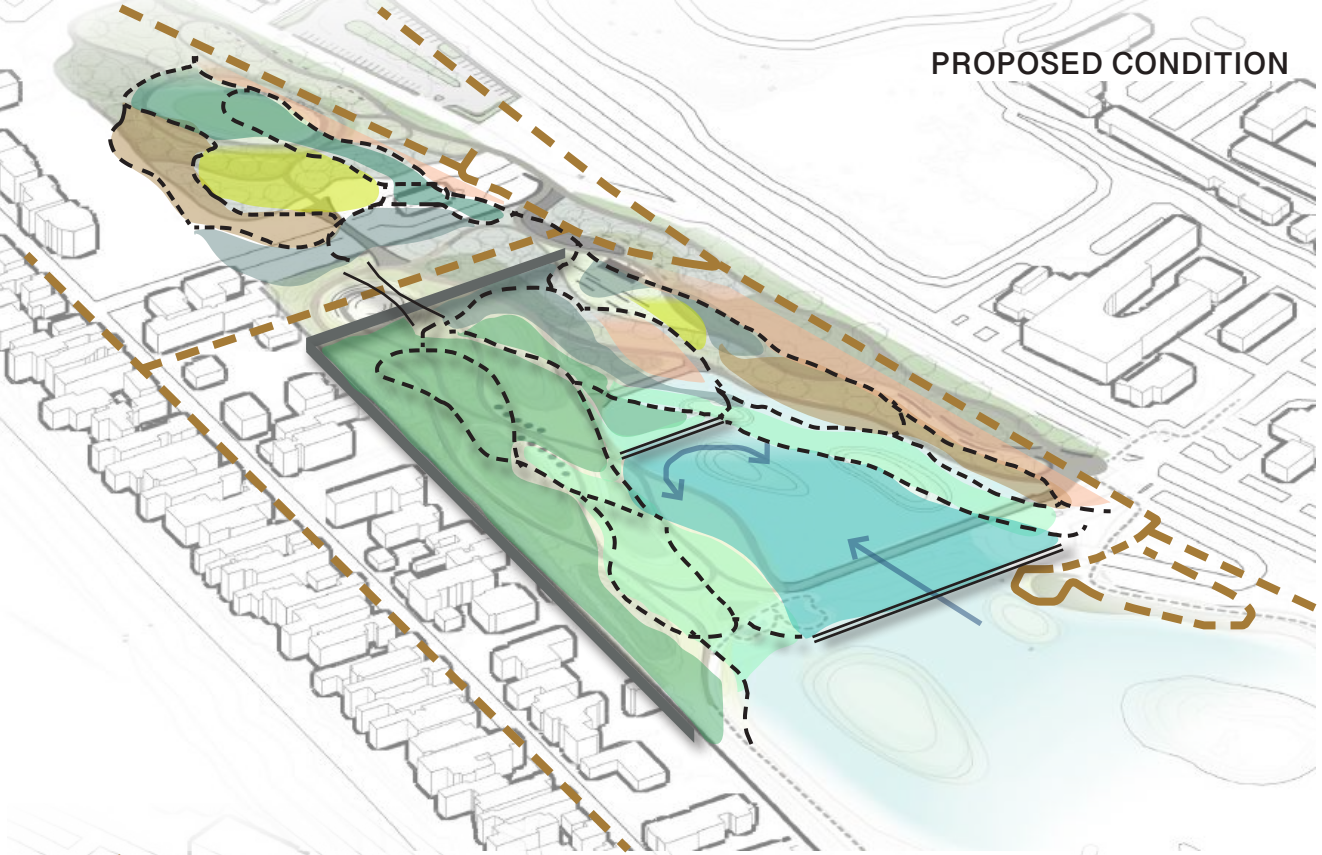
Excavation of the existing edge with the Malibu Lagoon is required to allow the wetland to expand into the 2 acre designated area. Retaining walls can preserve important features at the State Park such as the parking turn around, pathways, and an overlook structure.

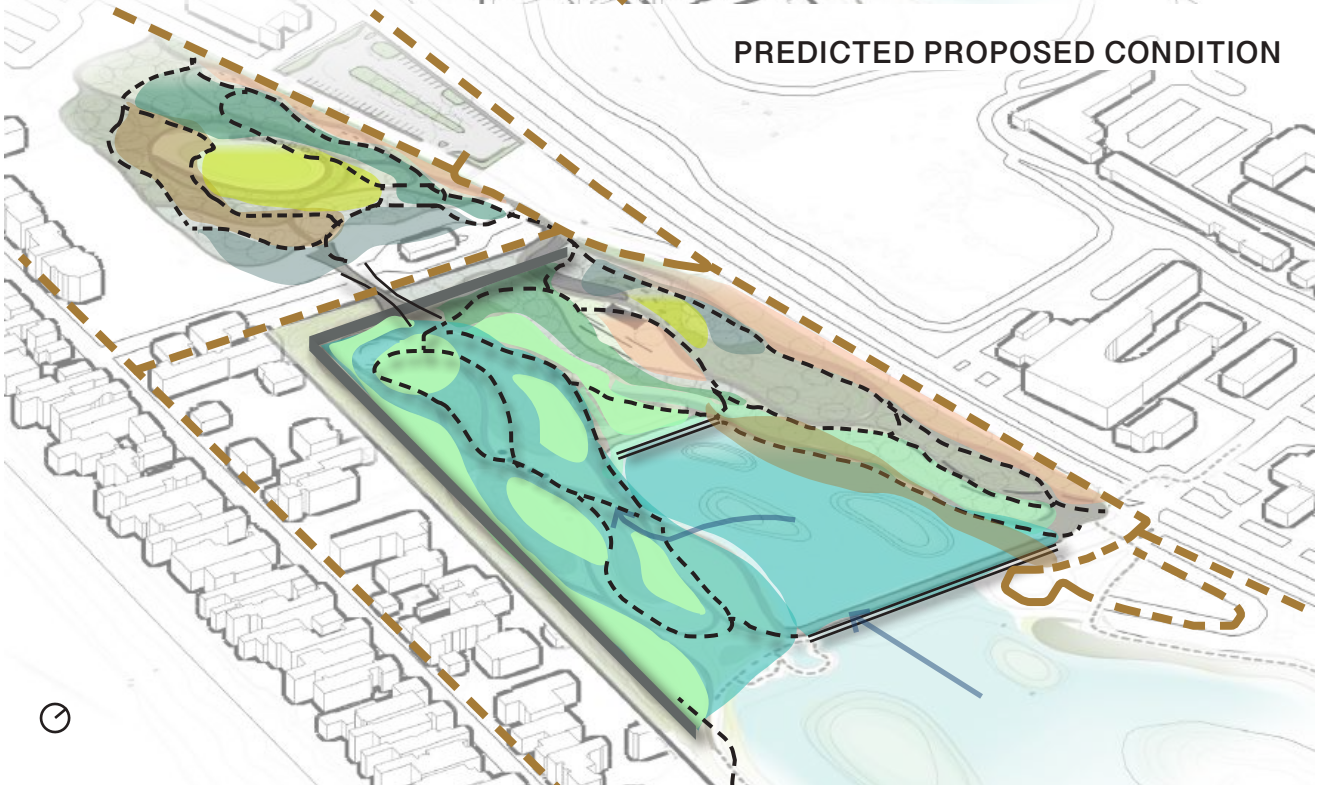
EXISTING CONDITION



PREDICTED PROPOSED CONDITION

Over time the mounded alkali meadows and raised walkways in the southern portion of the site can accomodate flooding if the sea level rise predictions for those areas come to pass. Slowly habitats can migrate to upland areas, and user access is maintained so that visitors may witness these changes as the sands shift.





HABITAT MIGRATION OVER TIME

Shifts in water and habitat are permitted to occur in the design, from a 2 acre wetland to a potential 5 acre expansion by 2100 with plenty of area for critical migration of water and habitat aided by grading that would accommodate flooding over time, creating refuge for sea birds, aquatic species, and plant communities.

- PROPOSED PATHWAYS
- PROPOSED BRIDGES
- VEHICULAR CIRCULATION
- EX. 8' WALL TO REMAIN
- TIDAL FLOW DIRECTION
- WETLAND
- ALKALI MEADOW
- COASTAL BLUFF / DUNE SCRUB
- COASTAL SAGE SCRUB
- COASTAL PRAIRIE
- COASTAL WOODLAND
- NATIVE DEMONSTRATION + BUFFER
- NATIVE GRASS LAWN

EDGE ECOLOGY

The gradient of wetland habitats requires areas of overlap to preserve the biodiversity and environmental services these ecosystems have to over. The boundaries between each community are blurred, allowing for them to shift and morph over time as conditions change. The design anticipates this ecological response by allowing lateral space and appropiate topography in anticipated flood areas throught the southern end of the site for plant communities to migrate without constraint, while also preserving user access.


B
PACIFIC COAST HWY
P1
MALIBU RD.
B'
ABALONE PLAY AREA
PICNIC AREA
STORMWATER BIOSWALE
ABALONE RIDGE PATHWAY
PERMEABLE PAVING ENTRY
WELCOME CENTER + COMMUNITY ROOM
PEDESTRIAN CROSSING TO WETLAND SITE


B
PCH
PARKING
STORMWATER BIOSWALE
(E) SIDEWALK
MALIBU RD.
PICNIC AREA
ABALONE RIDGE PATHWAY
B'

0' 5' 10' 20' 40'

Abalone Entry

P1

Shifts in access and circulation occur through providing parking off PCH with bioswales for stormwater capture, safe pedestrian crossings, buffered sidewalks, and sheltered gathering spaces as well as an engaging welcome center and community room. The Abalone play area, inspired by the ridge and bowl of an abalone shell, offers families a quiet and beautiful space to picnic and relax, away from the bustle of the surrounding area.

SHIFTING | ACCESS

EXISTING BOUNDARY WALL TO

PICNIC ENTRY DRIVE

STORMWATER CAPTURE MEDIAN

DROPOFF + FOOD TRUCK PARKING

NATIVE POLLINATOR DEMONSTRATION

RESTROOMS

PICNIC AREAS

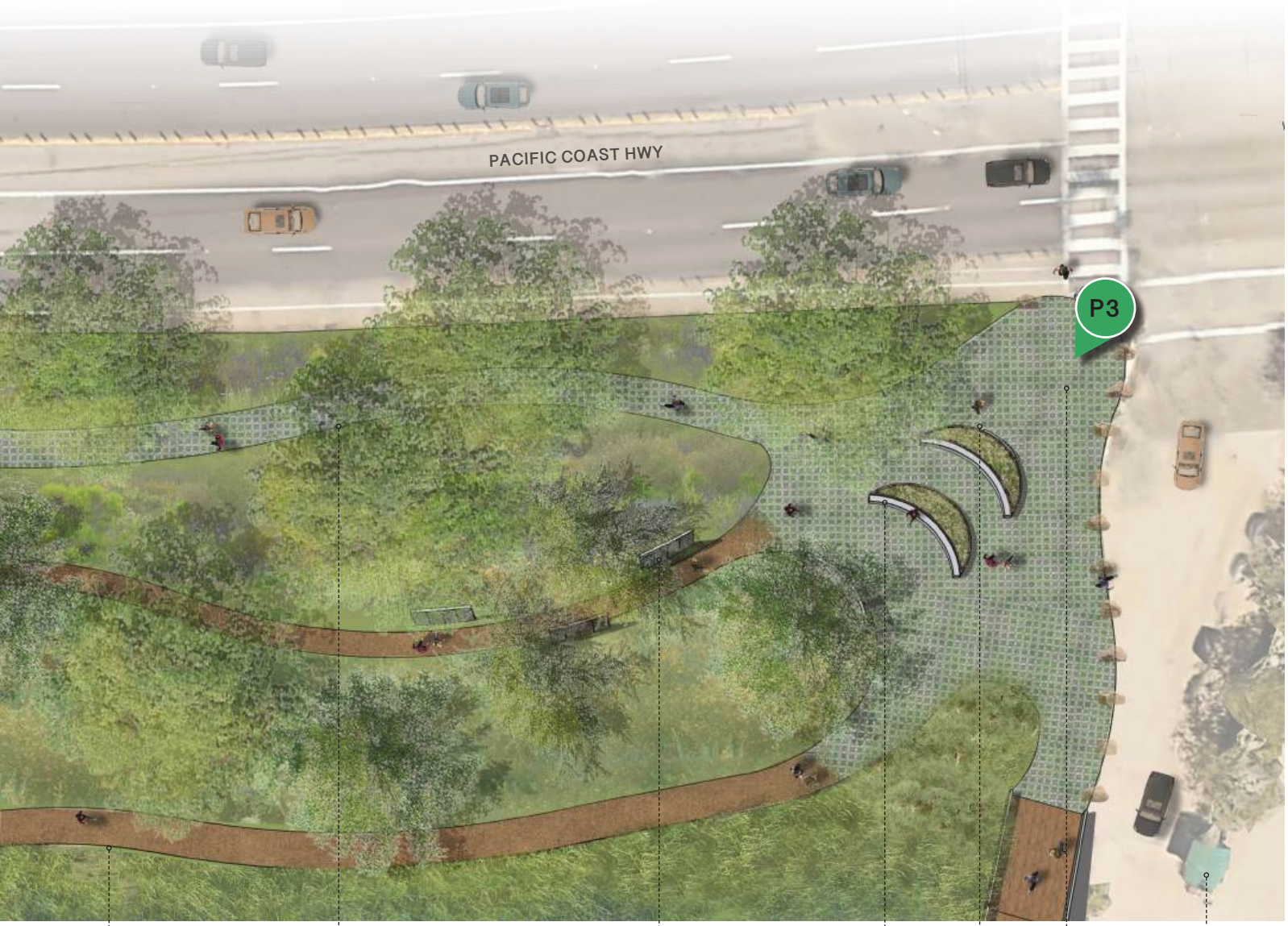
BUFFERED PEDESTRIAN SIDEWALK

0' 5' 10' 20' 40'

Picnic Drop-Off

P2

For visiting groups or those with more significant accessibility needs, there is a drop off where the existing driveway used to be, restroom facilities, and shady picnic areas with great views of the wetland bridge and coastline. A new pedestrian sidewalk, buffered from PCH with soft planting and shady trees provides a safe connection from the existing Malibu Lagoon Entry to the western edge of the site along Malibu Rd.



WETLAND EDGE PATHWAY

BUFFERED PEDESTRIAN SIDEWALK

STORY WALLS MURALS

CRESCENT SEATWALL PLANTERS

ENTRY SIGN

PERMEABLE PAVING ENTRY

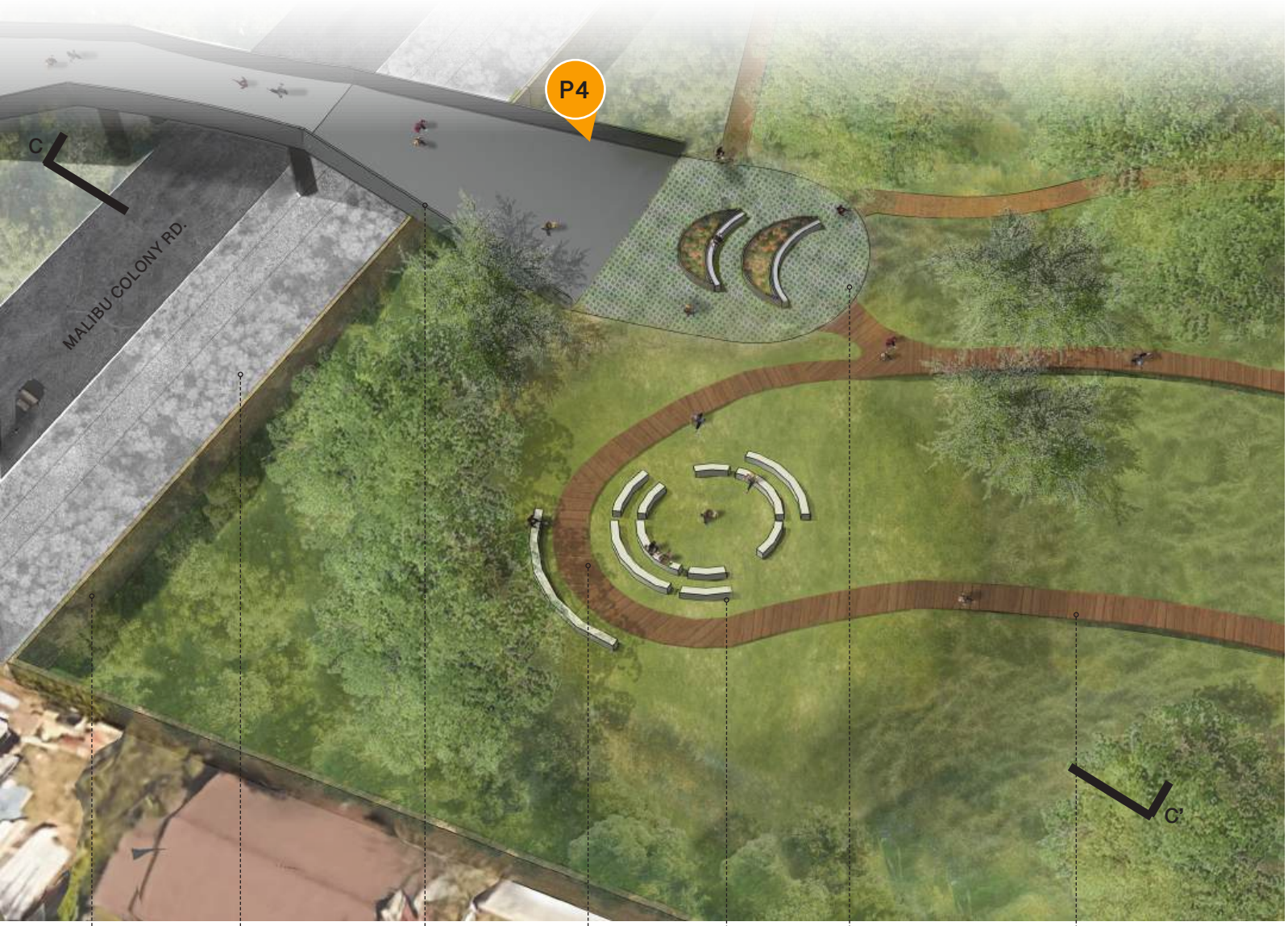
EXISTING MALIBU LAGOON ENTRY

0' 5' 10' 20' 40'

Malibu Lagoon Entry

P3

Improved access is provided at the high traffic crossing with PCH and the existing Lagoon, connecting the retail development and Lagoon parking lot with an entry plaza, signage, and story wall murals to immediately connect visitors to the deep cultural and ecological history they're visiting. An accessible wetland brige takes users across the newly restored wetland and provides views of the entire re-connected lagoon.



(E) BOUNDARY WALL TO REMAIN

(E) 50' BUFFER TO REMAIN

PEDESTRIAN BRIDGE

HUMALIWO CIRCLE MOUND

SEATING ALIGNED WITH SOLAR PATH

PERMEABLE PAVING ENTRY

RAISED WALKWAYS

MALIBU COLONY RD.

(E) 50' BUFFER TO REMAIN

(E) BOUNDARY WALL TO REMAIN

PEDESTRIAN BRIDGE

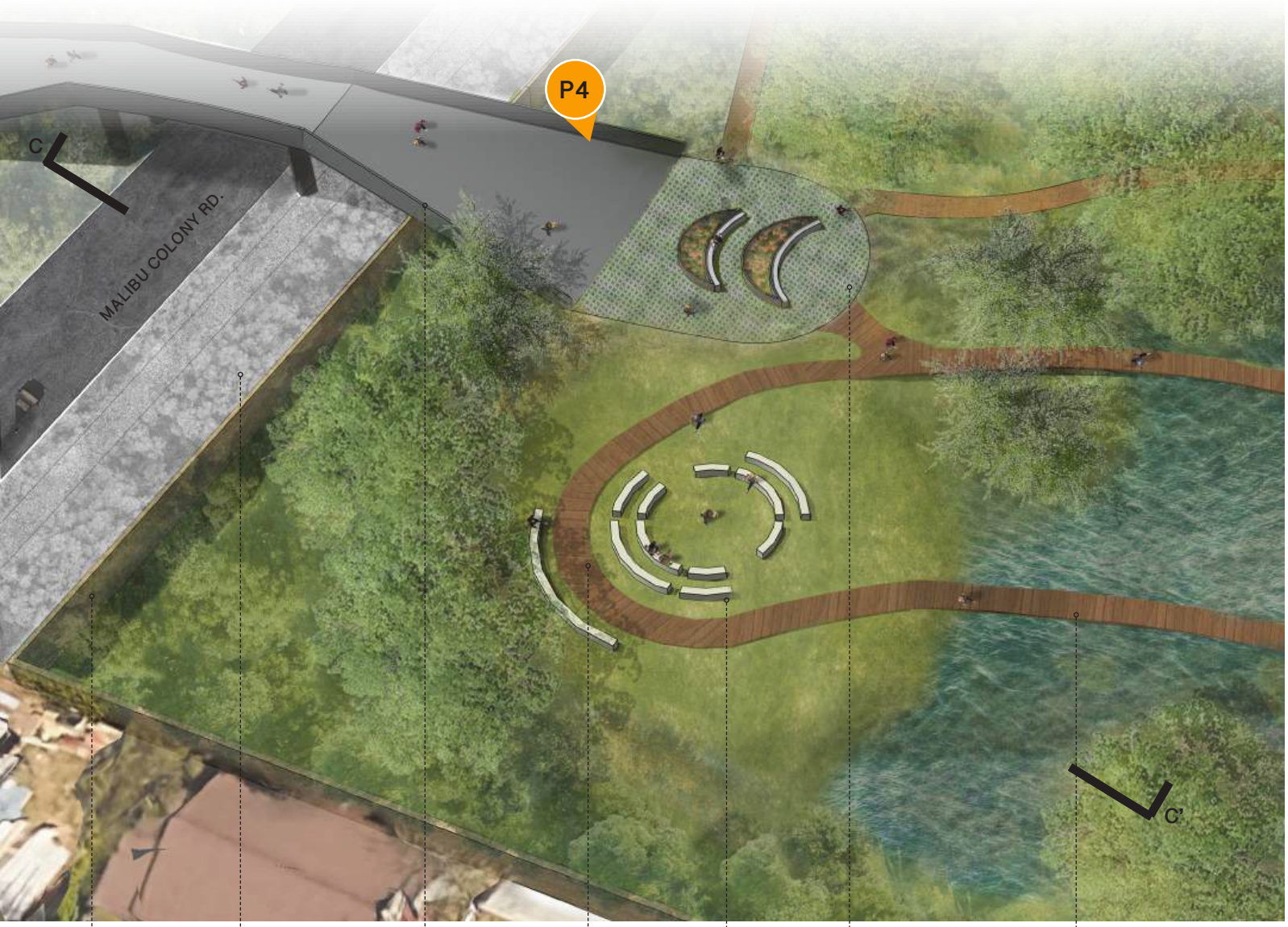
HUMALIWO CIRCLE MOUND

0' 5' 10' 20' 40'

Humaliwo Bridge Entry

P4

For those entering the wetland area from the new parking area, a pedestrian bridge across Malibu Colony Rd. provides a grand 180 degree view of the mountains, coastline, and wetland where visitors over time can witness the wetland migrating into the southern end of the site. A ceremony mound oriented toward the historical location of the Humaliwu village across the Lagoon, and aligned with the solar path calls visitors to consider the sacred history of the site they're entering.



(E) BOUNDARY WALL TO REMAIN

(E) 50' BUFFER TO REMAIN

PEDESTRIAN BRIDGE

HUMALIWO CIRCLE MOUND

SEATING ALIGNED WITH SOLAR PATH

PERMEABLE PAVING ENTRY

RAISED WALKWAYS

MALIBU COLONY RD.

(E) 50' BUFFER TO REMAIN

(E) BOUNDARY WALL TO REMAIN

PEDESTRIAN BRIDGE

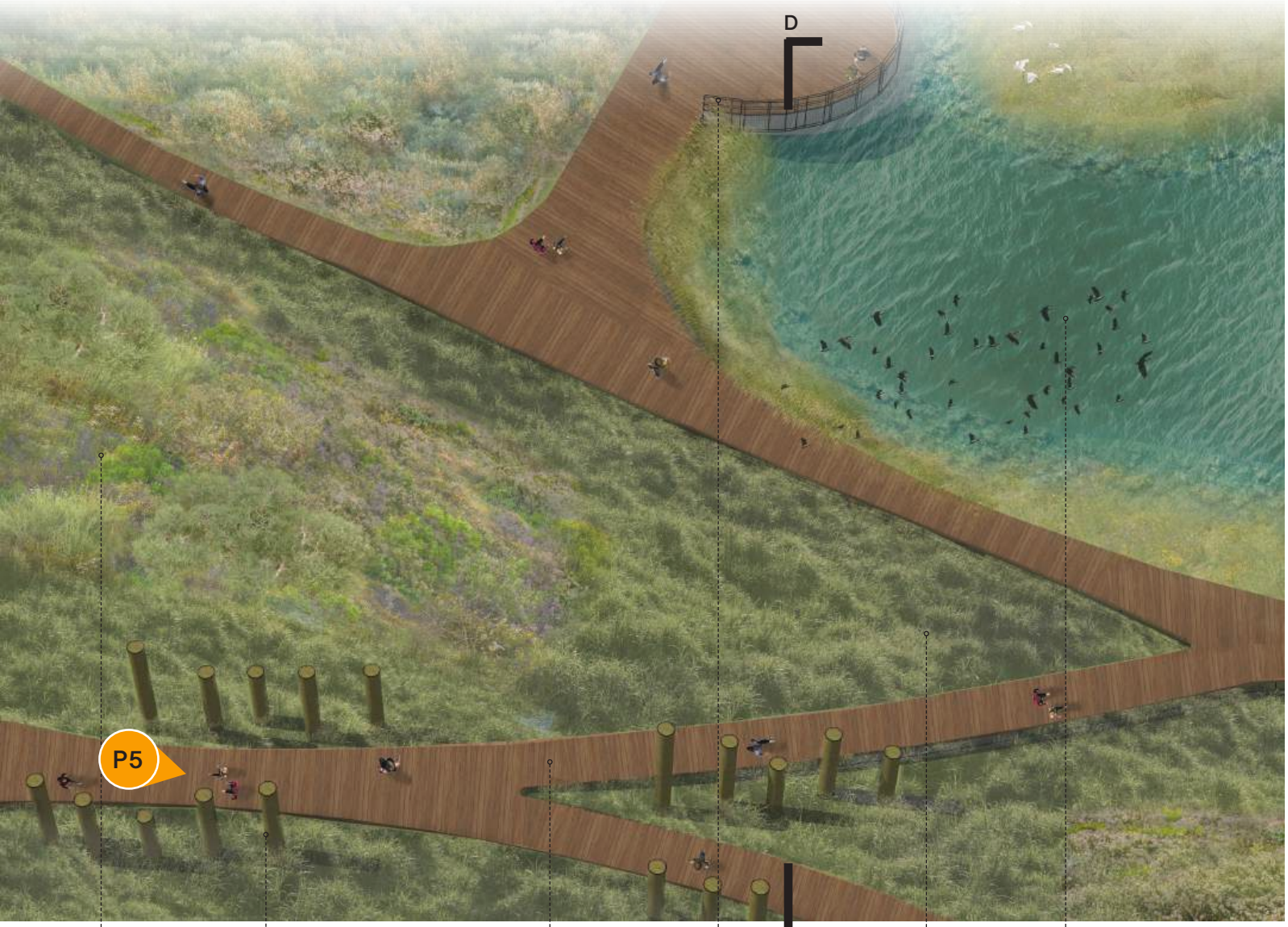
HUMALIWO CIRCLE MOUND

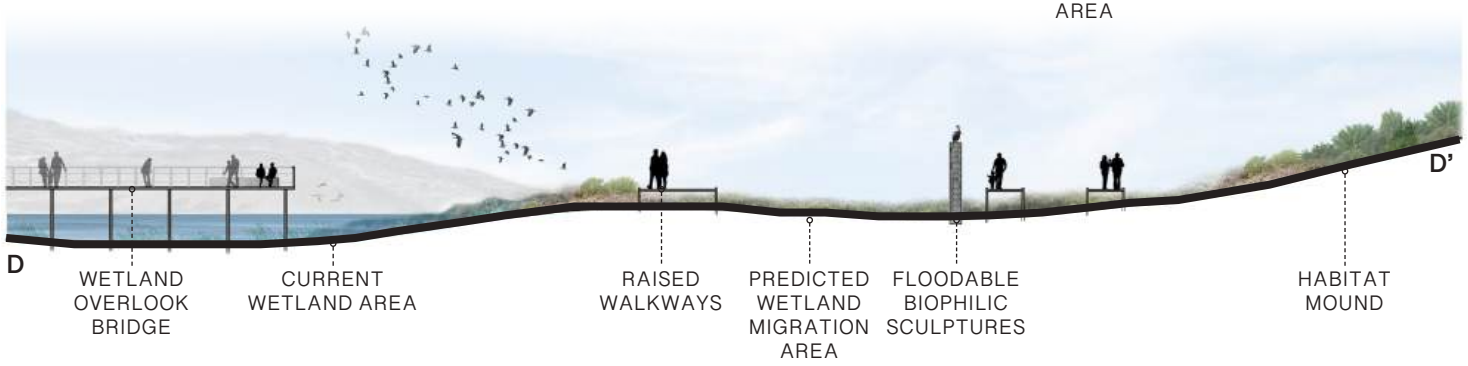
0' 5' 10' 20' 40'

Humaliwo Bridge Entry

P4

The southern end of the site is designed to accomodate flooding over time, which provides resiliency to storms and sea level rise, as well as additional area for critical habitat. It also restores the cultural connection between the Indigenous people who tended this landscape and the ocean, by allowing the water's edge to reach the ceremony mound by 2100.


D
D'
P5
HABITAT MOUNDS
FLOODABLE BIOPHILIC SCULPTURES
RAISED WALKWAYS
WETLAND OVERLOOK BRIDGE
PREDICTED WETLAND MIGRATION AREA
CURRENT WETLAND AREA

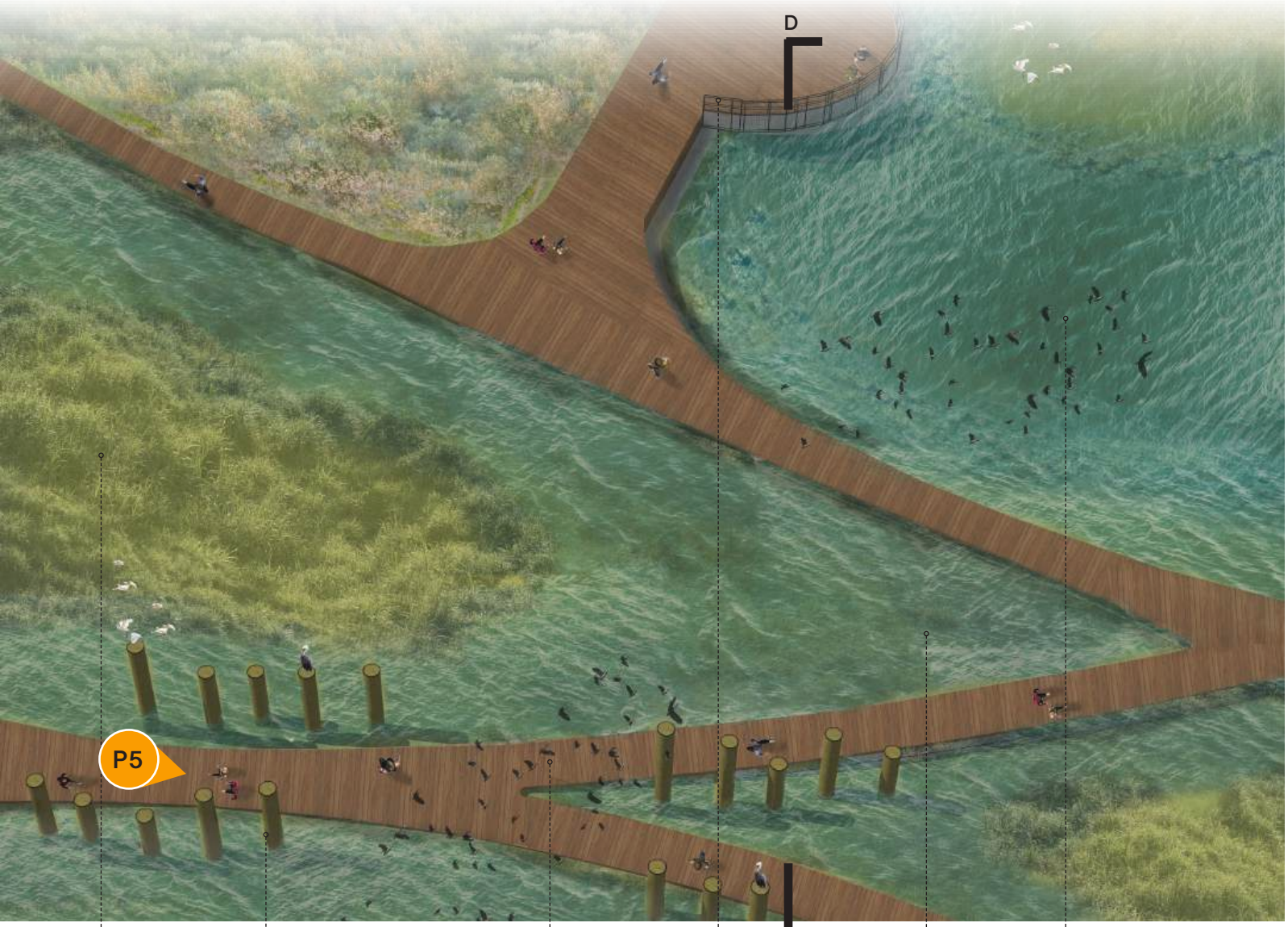

D
D'
WETLAND OVERLOOK BRIDGE
CURRENT WETLAND AREA
RAISED WALKWAYS
PREDICTED WETLAND MIGRATION AREA
FLOODABLE BIOPHILIC SCULPTURES
HABITAT MOUND

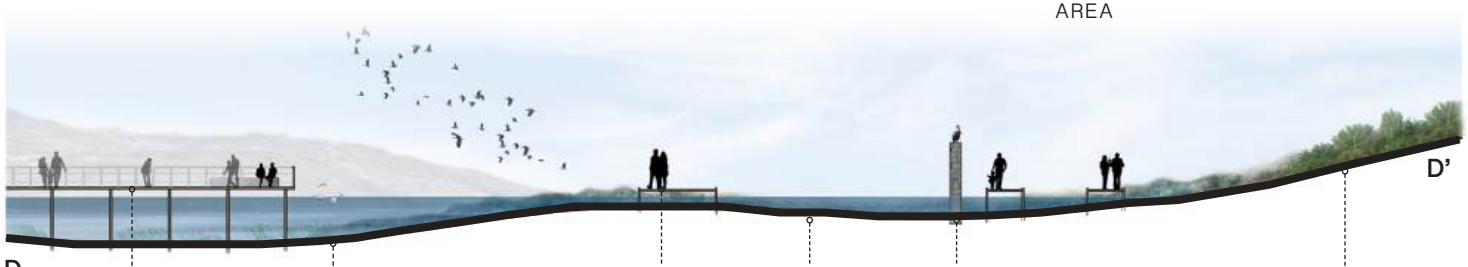
0' 5' 10' 20' 40'

Biophilic Sculpture Walk

P5

From the bird's eye view at the pedestrian bridge, visitors can quickly find themselves at the water's edge, weaving through sculptural pillars alongside raised pathways which can flood over time. The materiality of the coastal environment can be experienced up close - abalone shells, rocks, and wood carving create these seemingly stoic towers, but they will be teeming with life as critters cling to them beneath the tide or perch above mid-flight.


D
D'
P5
HABITAT MOUNDS
FLOODABLE BIOPHILIC SCULPTURES
RAISED WALKWAYS
WETLAND OVERLOOK BRIDGE
PREDICTED WETLAND MIGRATION AREA
CURRENT WETLAND AREA

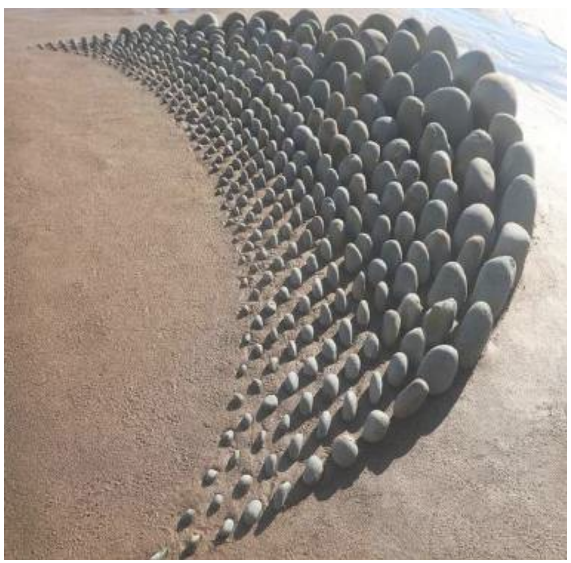

D
D'
WETLAND OVERLOOK BRIDGE
CURRENT WETLAND AREA
RAISED WALKWAYS
PREDICTED WETLAND MIGRATION AREA
FLOODABLE BIOPHILIC SCULPTURES
HABITAT MOUND

0' 5' 10' 20' 40'

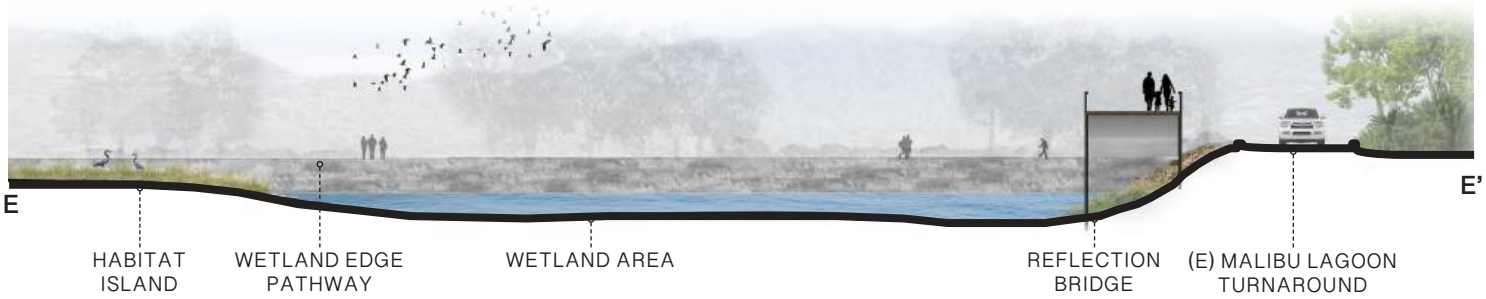
Biophilic Sculpture Walk

P5

As flooding creeps into the sculpture walk over time, the totem sculptures begin to double as habitat, strengthening the bond between people who enjoy the site and the ecological benefits provided by a design that can adapt over time to changes in sea level rise and storm surge.




E
E'
P6
HABITAT ISLAND
WETLAND EDGE PATHWAY
GLASS RAILINGS
BENCH SEATING
PERMEABLE PAVING ENTRY
TIDAL RETAINING WALL
(E) MALIBU LAGOON TURNAROUND


E
E'
HABITAT ISLAND
WETLAND EDGE PATHWAY
WETLAND AREA
REFLECTION BRIDGE
(E) MALIBU LAGOON TURNAROUND

0' 5' 10' 20' 40'

Wetland Bridge

P6

Where there once was a wall, now is a bridge connecting visitors to the past and the future as they look out into the Pacific, or back toward the restored wetland now teeming with life where there once was none. Glass railings provide an unobstructed perspective of both simultaneously, encouraging a consideration of how we as stewards of this critical wetland ecosystem might preserve this magnificent view for generations to come.

SHIFTING SANDS | GOALS ACHIEVEMENT EVALUATION

SEA LEVEL RISE RESILIENCY

12 acres of new native habitat restoration

- **5-6 acres** upland native habitat with potential to accomodate future flood conditions

- **2 acres** of new wetland with 3 million gallons of flood capacity

All pathways and structures are positioned to accomodate predicted sea level rise

ENHANCE PUBLIC ACCESS + EDUCATION

4 new pedestrian access points

4 new community gathering areas

1500' of improved pedestrian safety along PCH

50 parking spots, new vehicular drop off

Entire 14 acre site is ADA accessible

Meaningful cultural and historical program elements throughout

DEMO ADAPTIVE STRATEGIES

600' of boundary wall preventing wetland migration is removed

Wetland channel + surrounding topography designed for predicted future expansion

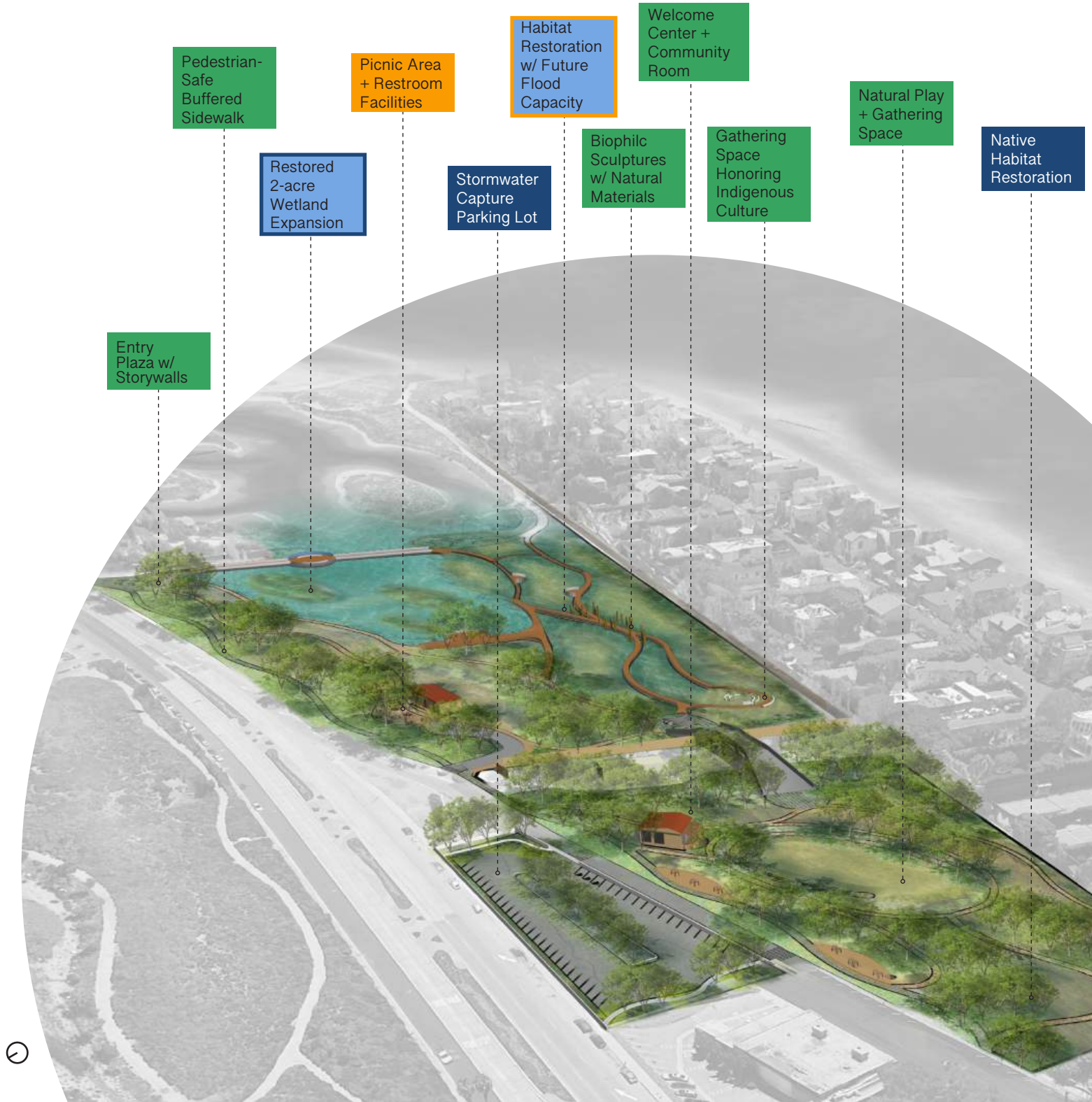
Overlooks and viewpoints positioned for observation of and engagement with changes over time

IMPROVE REGIONAL WATER QUALITY

3500 sq. ft of stormwater capture bioswales

12 acres of native habitat + onsite infiltration

- **2 acres** of new wetland to capture runoff at the mouth of Malibu Creek


Entry Plaza w/ Storywalls
Pedestrian-Safe Buffered Sidewalk
Restored 2-acre Wetland Expansion
Picnic Area + Restroom Facilities
Stormwater Capture Parking Lot
Habitat Restoration w/ Future Flood Capacity
Biophilc Sculptures w/ Natural Materials
Welcome Center + Community Room
Gathering Space Honoring Indigenous Culture
Natural Play + Gathering Space
Native Habitat Restoration

CITATIONS

COVER PAGE: USGS Malagas Creek, 1877
Johnson Station Point, T-Sheets

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JJwithers, https://www.istockphoto.com/photo/aerial-view-high-above-malibu-ca-beach-and-malibu-lagoon-state-beach-gm1206375540-347908591

PAGE 6: Our Coast, Our Future Sea Level Rise Hazard Map
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Malibu Lagoon Aerial
JJwithers, https://www.istockphoto.com/photo/aerial-view-high-above-malibu-ca-beach-and-malibu-lagoon-state-beach-gm1206375540-347908591

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Historic Malibu Ranch Map
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1900s Malibu
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Malibu Lagoon Restoration + Enhancement Habitat Plan
Malibu Lagoon Restoration + Enhancement Plan, 2012

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North Campus Open Space Plan
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https://www.cmgsite.com/places/depave-park/

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https://assemblagelandscape.com/work/henry-hudson-waterfront-park

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https://es.pinterest.com/pin/411727590932821698/

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Buffered Sidewalk
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Abalone Towers
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Biophylic Sculpture
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