



San Francisco Bay Restoration Authority  
December 15th, 2023

# North Richmond Living Levee & Collaborative Shoreline Adaptation Plan



WEST COUNTY  
WASTEWATER

**MITHÜN**



**NHA | ADVISORS**  
Financial & Policy Strategies.  
Delivered.



*North Richmond  
Area Community  
Leaders*



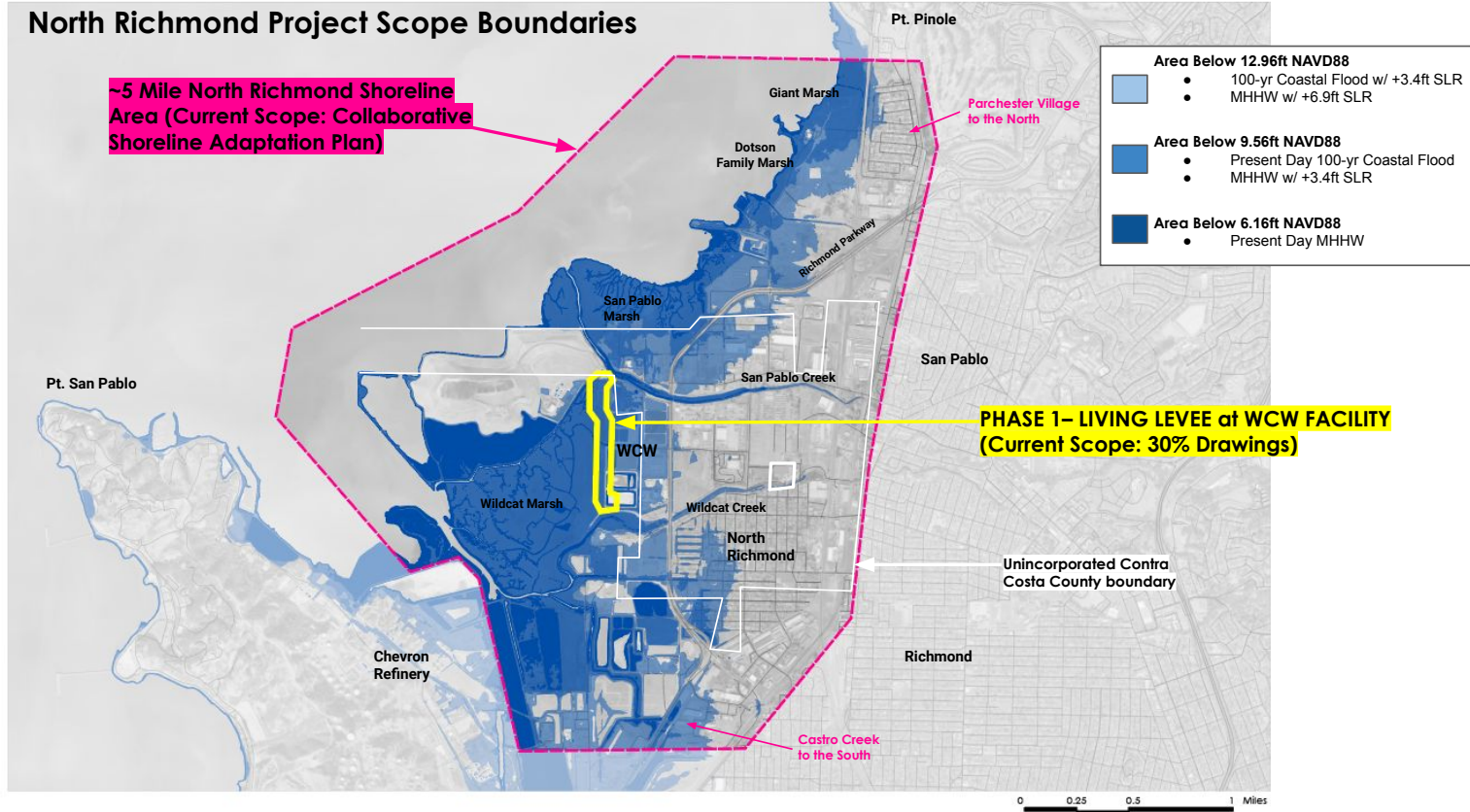
**Project Summary & Updates (15 mins)**

- **Project Scope and Goals: flood mitigation for critical infrastructure, habitat protection, public access;**  
(Andrew Clough, General Manager - West County Wastewater)
- **Project History and Regional Collaboration** (Josh Bradt - Bay Area Regional Collaborative)
- **Project Design: multi-benefits approach, trail enhancement, community co-design**  
(Graham Laird Prentice, Project Designer - Mithun)
- **Community Engagement: outreach, participatory model, workforce development, tribal engagement**  
(Naama Raz-Yaseef, Community Engagement Manager - The Watershed Project)
- **Phase 1 Living Levee at West County Wastewater**  
(Graham + Eddie Divita, Civil Engineer - Environmental Science Associates)
- **Outlook Going Forward**

# North Richmond Project Scope Boundaries

**~5 Mile North Richmond Shoreline Area (Current Scope: Collaborative Shoreline Adaptation Plan)**

<b>Area Below 12.96ft NAVD88</b>	<ul style="list-style-type: none"> <li>• 100-yr Coastal Flood w/ +3.4ft SLR</li> <li>• MHHW w/ +6.9ft SLR</li> </ul>
<b>Area Below 9.56ft NAVD88</b>	<ul style="list-style-type: none"> <li>• Present Day 100-yr Coastal Flood</li> <li>• MHHW w/ +3.4ft SLR</li> </ul>
<b>Area Below 6.16ft NAVD88</b>	<ul style="list-style-type: none"> <li>• Present Day MHHW</li> </ul>



**PHASE 1- LIVING LEVEL at WCW FACILITY (Current Scope: 30% Drawings)**

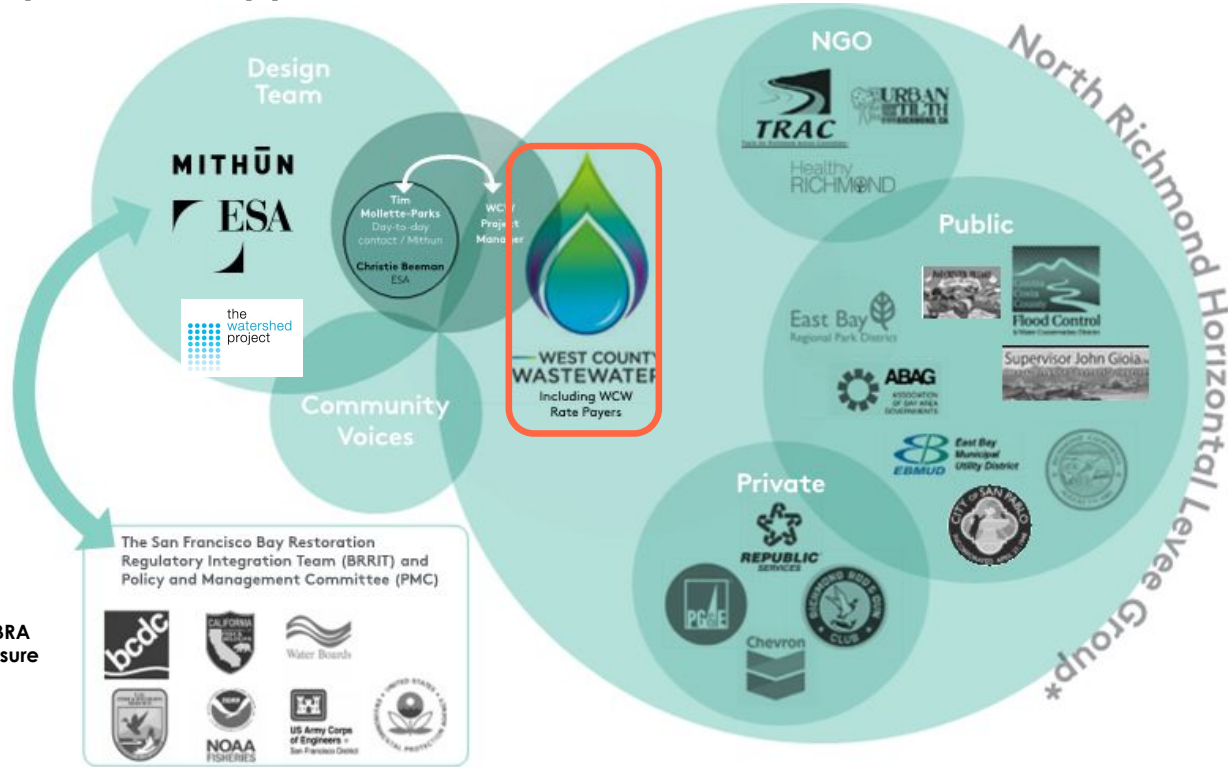
Unincorporated Contra Costa County boundary

## North Richmond Levee Working Group



- **Regular Meetings since September 2019, with lead from San Francisco Estuary Partnership & West County Wastewater**
- **Position Nature-based Adaptations for external funding opportunities**
- **Provide information, support to WCW Project Management Team throughout conceptual design process for a Prototype Living Levee & Shoreline Adaptation Planning effort**

# Partnerships-based Approach



\*Funded by SFBRA grant with Measure AA \$

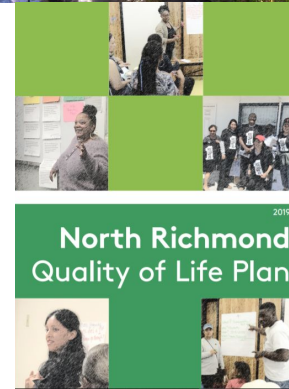
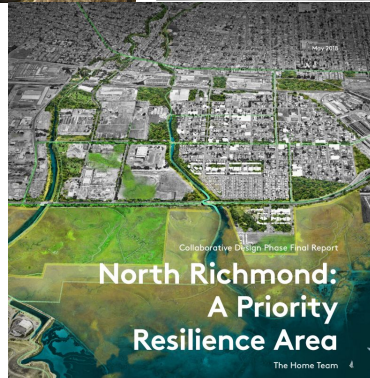
# Building on the Legacy of Organizing, Planning & Stewardship in North Richmond



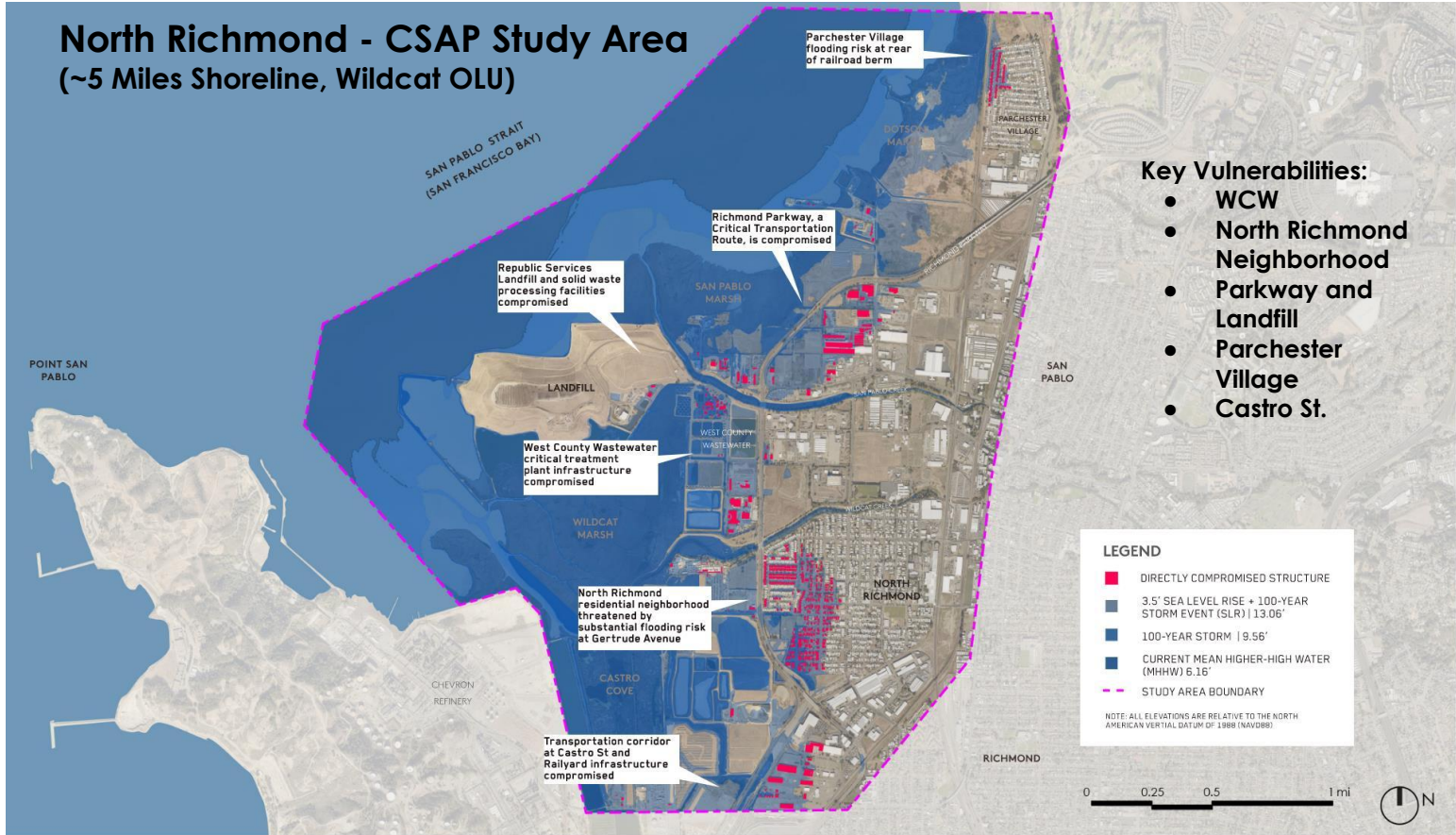
## North Richmond Shoreline VISION

A community-based approach to planning for the upland transition zone

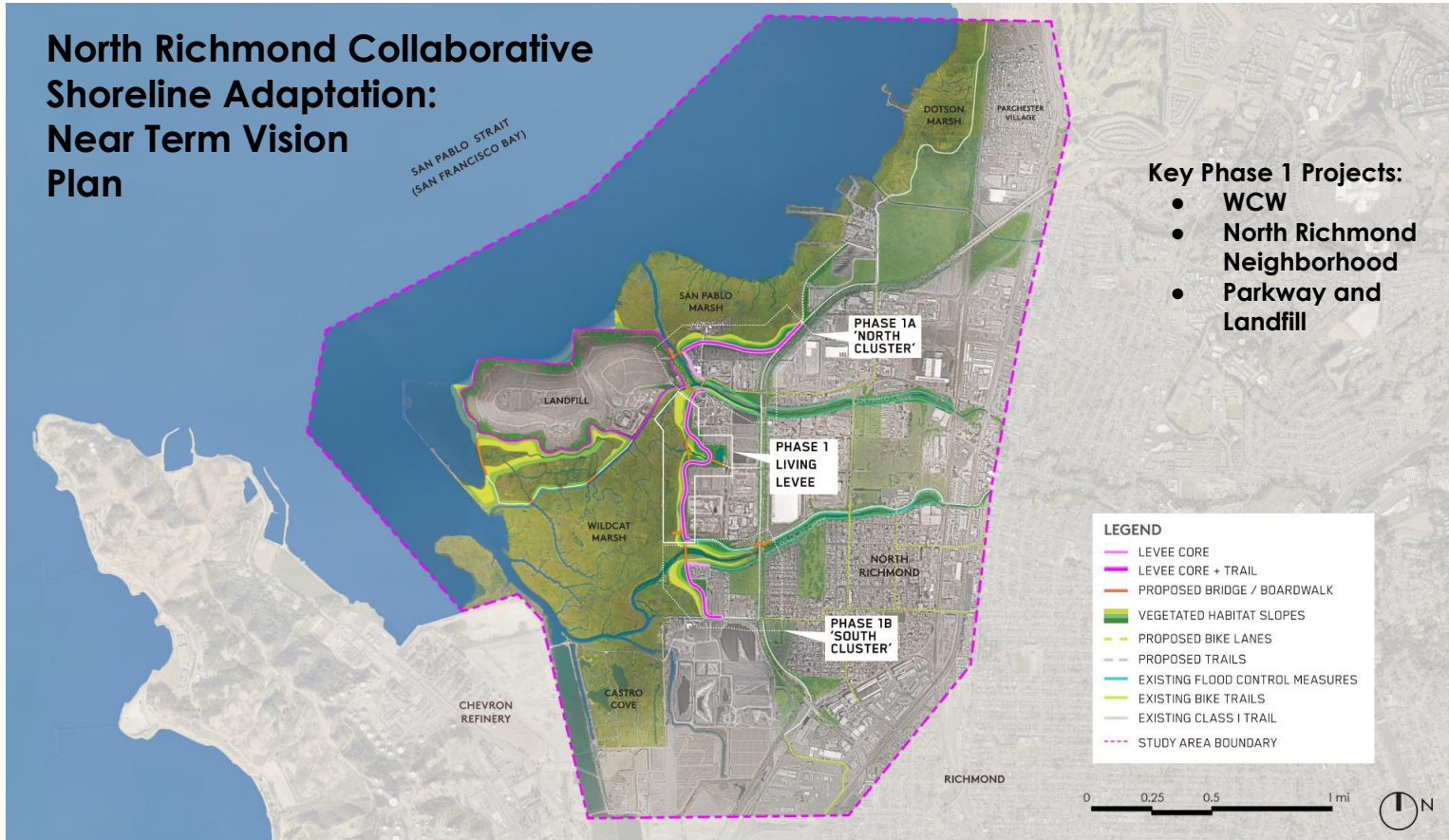
The North Richmond Shoreline should be managed, restored and protected to sustain multiple benefits including ecosystem services, community health, economic stability, local jobs, educational opportunities, safe places for recreation, vibrant natural habitat and a source of clean, healthy food.



# North Richmond - CSAP Study Area (~5 Miles Shoreline, Wildcat OLU)



# North Richmond Collaborative Shoreline Adaptation: Near Term Vision Plan





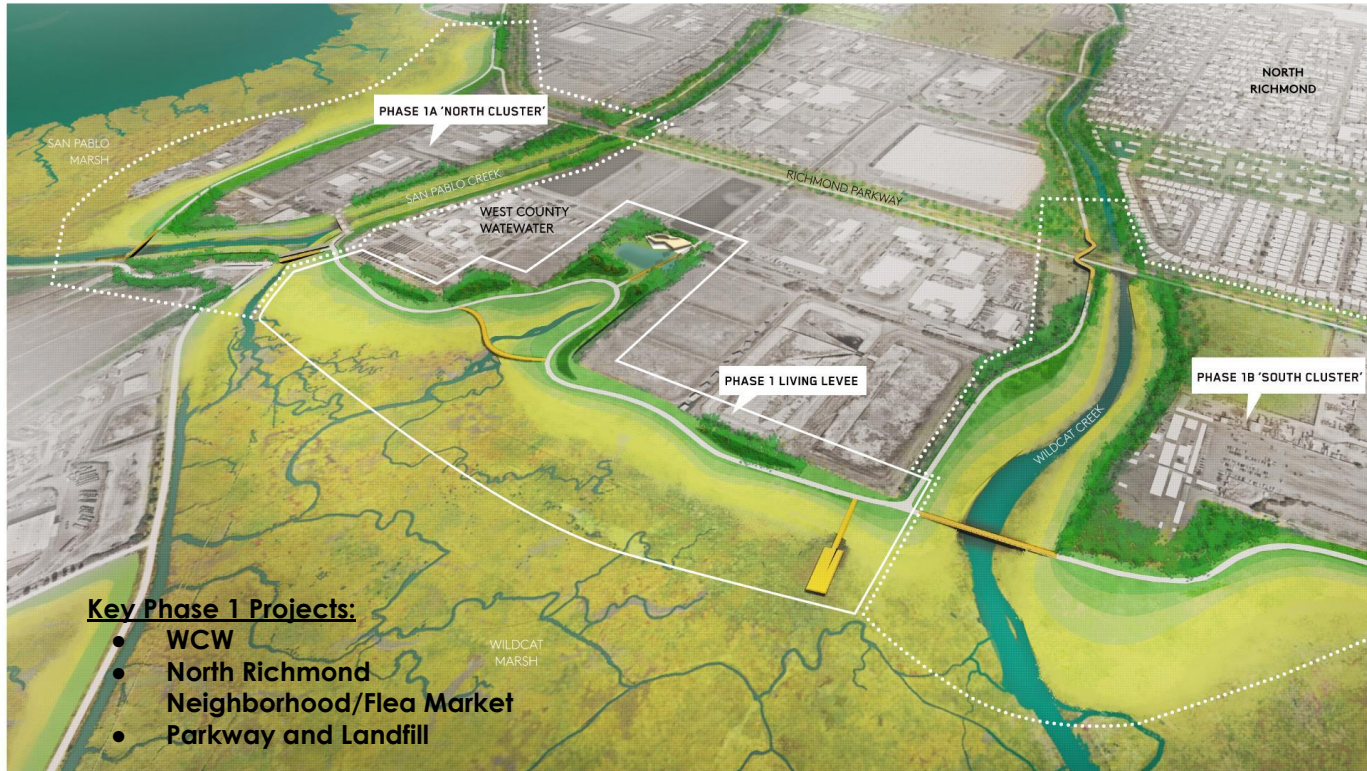
# Near Term Vision: Phase 1 Living Levee at West County Wastewater

Multi-Benefit Adaptation Project to provide:

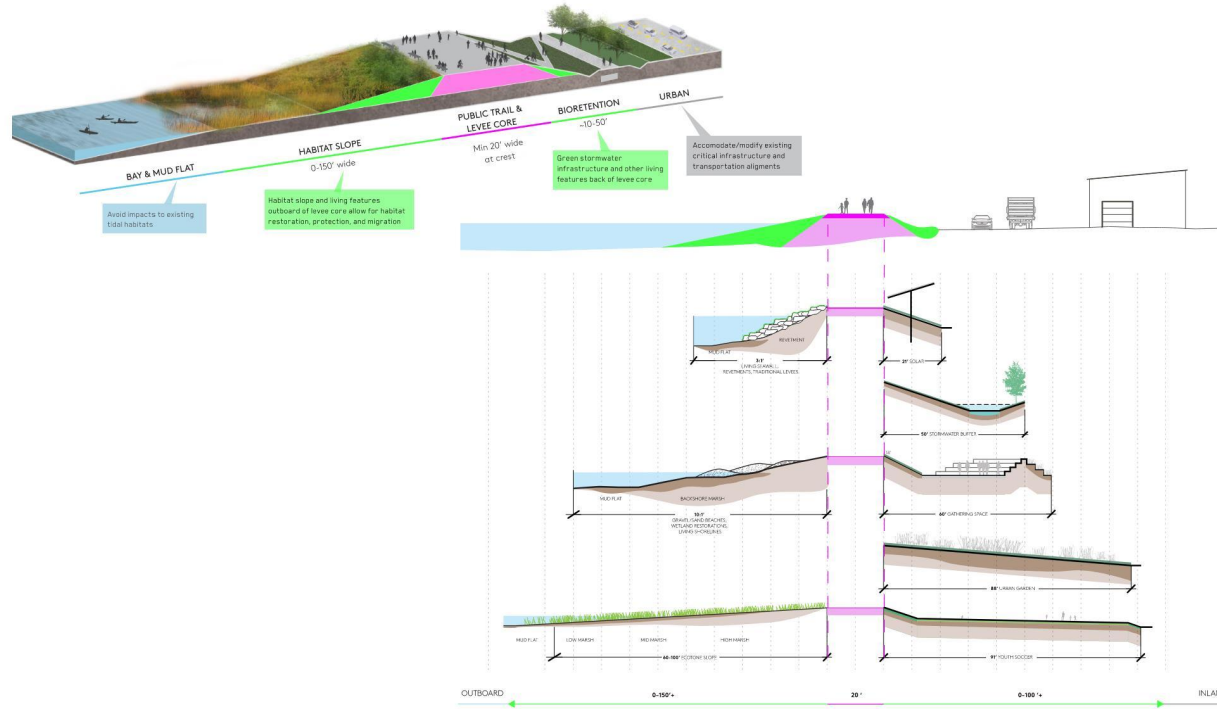
- Flood protection
- Habitat creation and migration
- Permanent, safe public access



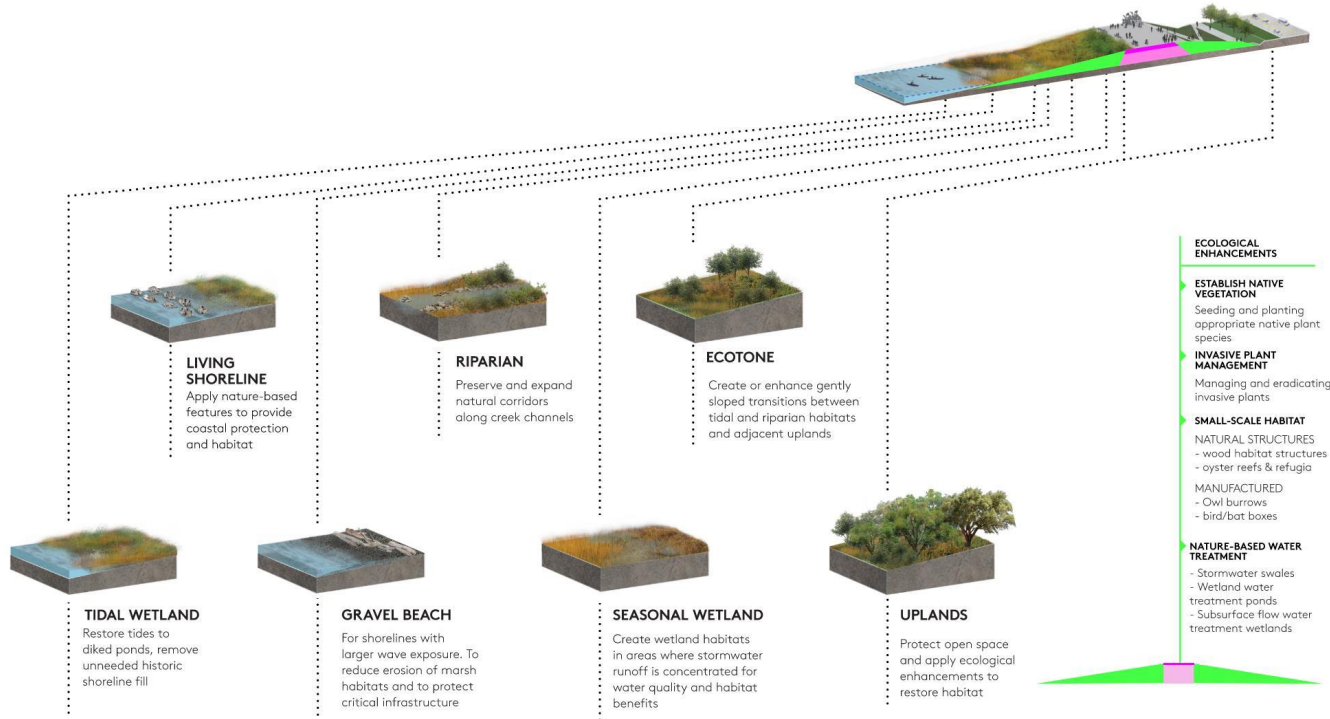
## Summary of Near-Term Recommendations



# Living Levees: A Flexible Band



# Habitats



# Habitats

## NORTH RICHMOND SHORELINE SPECIES OF THE BAY

Shearwaters possess the ability to swim underwater, resembling the Pacific Grebe when swimming. They spend up to five years learning to fly before returning to the ground to breed. They return to their natal island to breed and raise their young.

**Central California Coast Shearwater**  
*Oceanodroma leucorhoa*

**Longfin Smelt**  
*Sprotus rostratus*

**Pacific Herring**  
*Clupea pallasii*

**Eelgrass**  
*Zostera marina*

## MARSH

Northern coastal salt marsh, also called saline emergent wetland or tidal marsh, is a highly productive, herbaceous community of salt-tolerant species forming a moderate to dense cover up to 5 feet tall. This community is usually found along shallow intertidal margins of bays, lagoons, and estuaries where the Pacific side are subject to regular tidal inundation for at least part of the year. Most species grow actively in the summer and are dormant in winter. San Francisco Estuary salt marshes provide food and nesting habitat for a wide variety of bird species. Tidal ponds are natural depressional areas that develop in higher elevation marsh areas. They typically are unvegetated and are inundated only during highest tides. Their primary use when the water evaporates, though they are typically not heavily utilized by wildlife, except for shorebirds, when flooded, the edges of tidal ponds are associated with rare plants.

## WETLAND

Coastal wetlands are areas of habitat marsh that have been isolated from tidal influence by levees or berms. They generally retain salt marsh vegetation, typically a low-lying cover up to 5 feet tall. They may also include some non-salt-tolerant vegetation and are typically more associated with seasonal wetlands. Some berms can accumulate freshwater and vegetation more typically associated with seasonal wetlands can become dominant. Seasonal wetlands are generally situated around marshes primarily during winter and early spring when water capacity is high and through the Suisun Area Berms and bays may fringe over or in the seasonal wetlands marsh areas. They typically are unvegetated and are inundated only during highest tides. Their primary use when the water evaporates, though they are typically not heavily utilized by wildlife, except for shorebirds, when flooded, the edges of tidal ponds are associated with rare plants.

## SHALLOW BAY

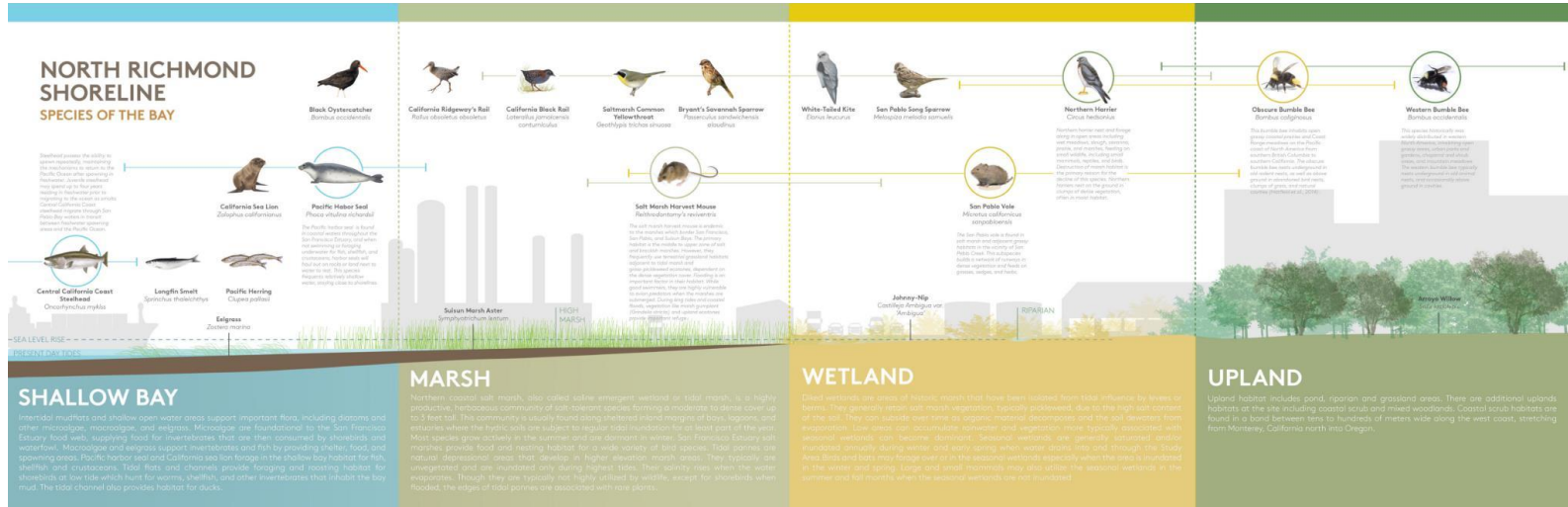
Intertidal mudflats and shallow open water areas support important flora including diatoms and other microalgae, macroalgae, and eelgrass. Macroalgae are foundational to the San Francisco Estuary food web, supplying food for invertebrates that are then consumed by shorebirds and waterfowl. Macroalgae and eelgrass support invertebrates and fish by providing shelter, food, and spawning areas. Pacific harbor seal and California sea lion forage in the shallow bay habitat for fish, shellfish, and crustaceans. Tidal flats and channels provide foraging and roosting habitat for shorebirds at low tide which hunt for worms, shellfish, and other invertebrates that inhabit the bay mud. The tidal channel also provides habitat for ducks.

## WETLAND

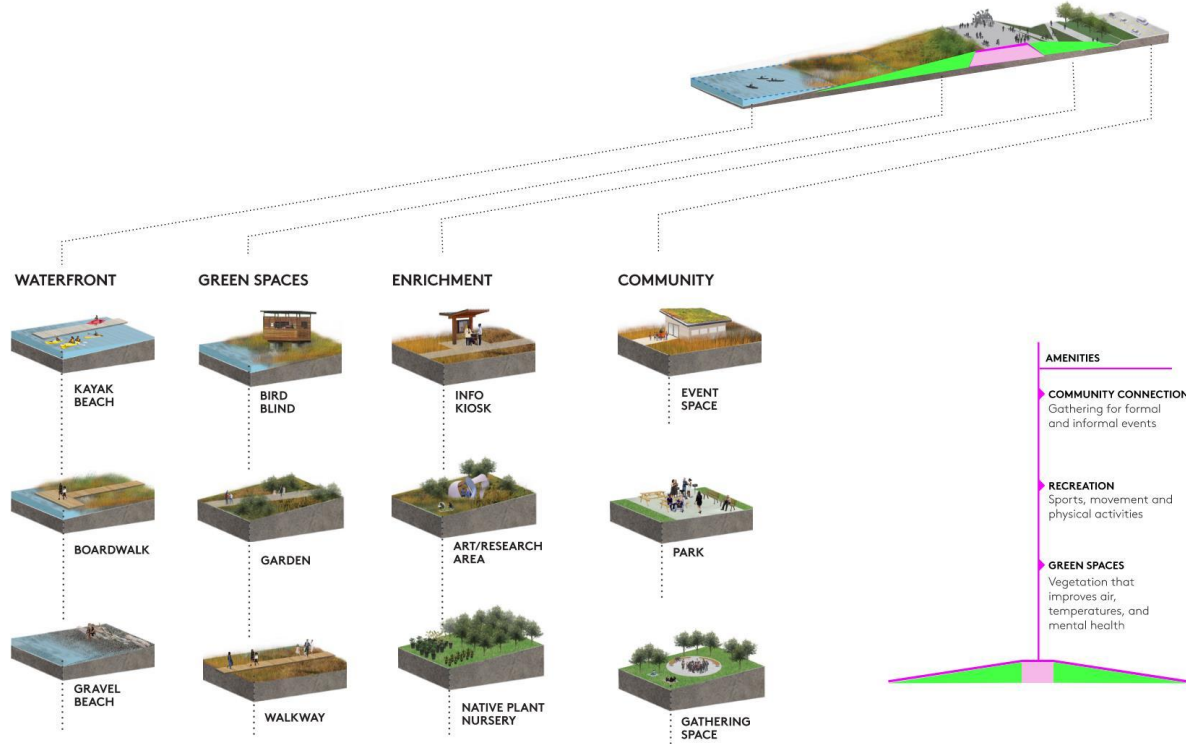
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## UPLAND

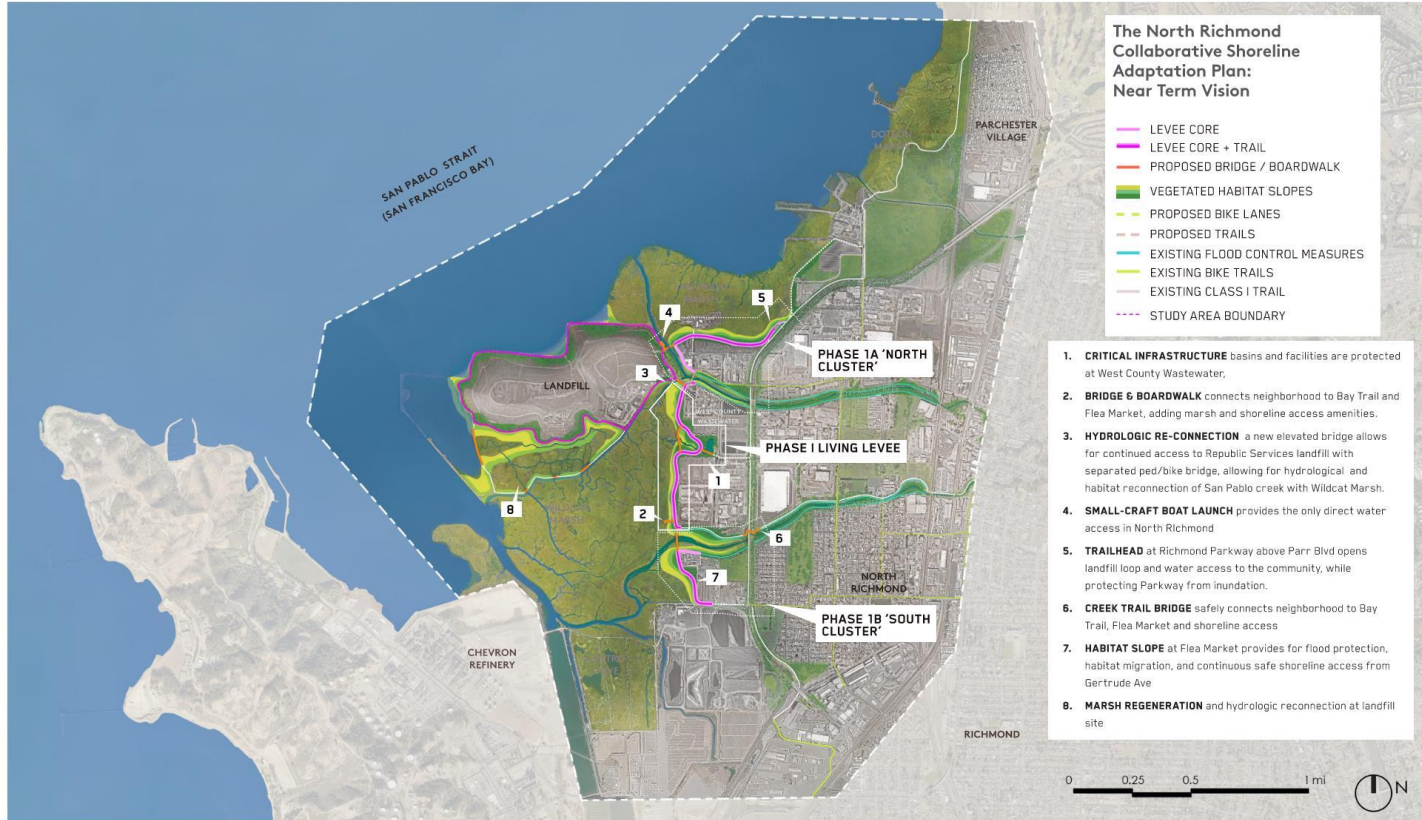
Upland habitat includes pond, riparian and grassland areas. There are additional upland habitats at the site including coastal scrub and mixed woodlands. Coastal scrub habitats are found in a band between levees to hundreds of meters wide along the west coast, stretching from Monterey, California north to Oregon.



# Amenities



# North Richmond Collaborative Shoreline Plan: Near Term Vision

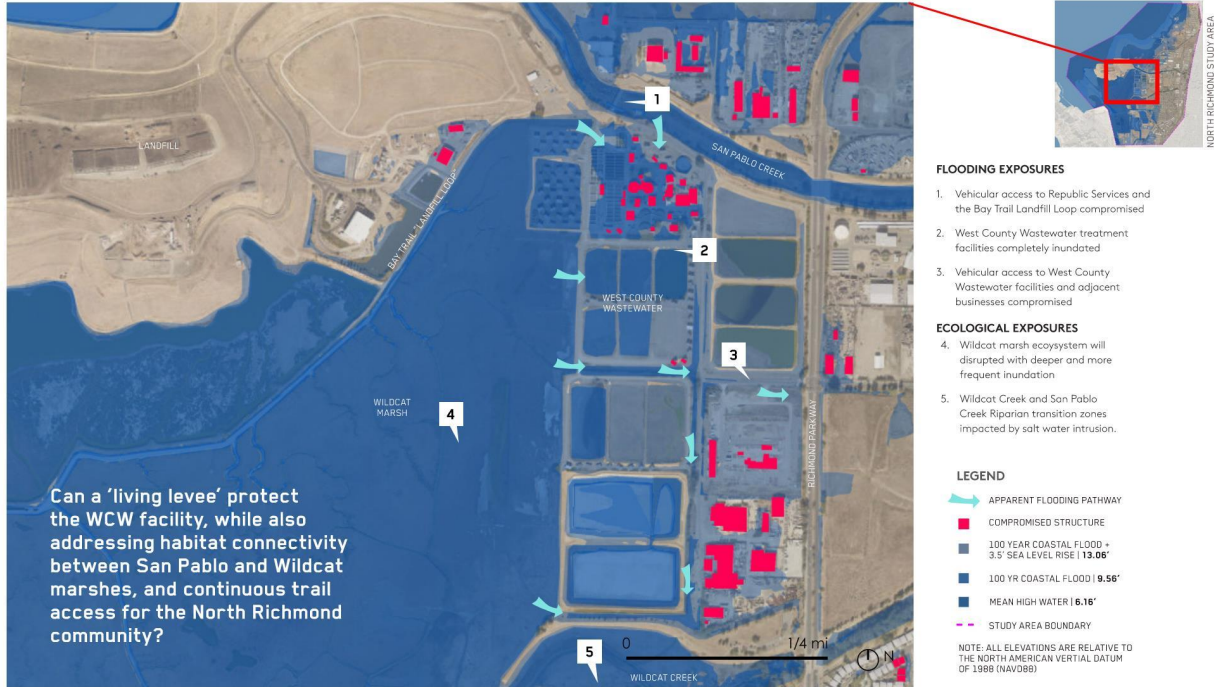


# Looking North over WCW





# Enlarged View: Inundation at West County Wastewater vicinity



# PHASE I – LIVING LEVEE AT WEST COUNTY WASTEWATER

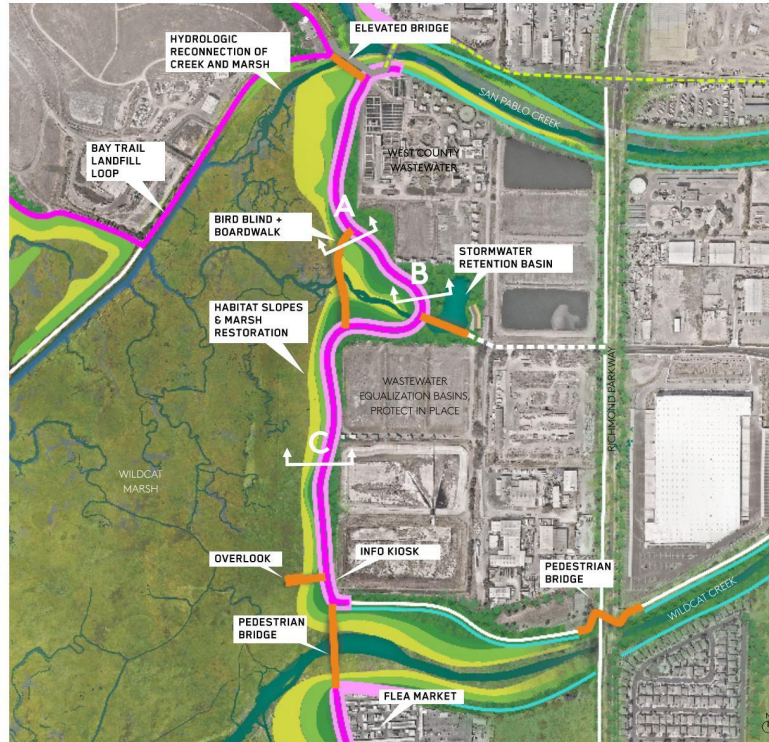
**SECTION "A" WILDCAT MARSH  
BOARDWALK & TRAIL ACCESS**

**SECTION "B" STORMWATER RETENTION**

**SECTION "C" EQUALIZATION BASIN**

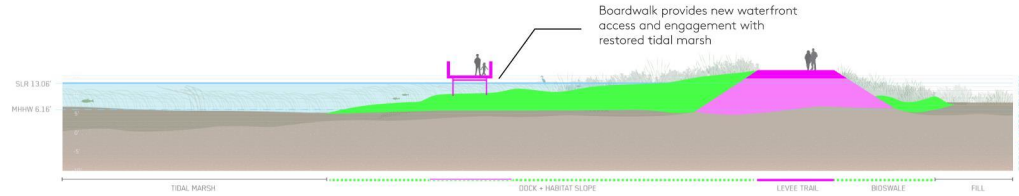
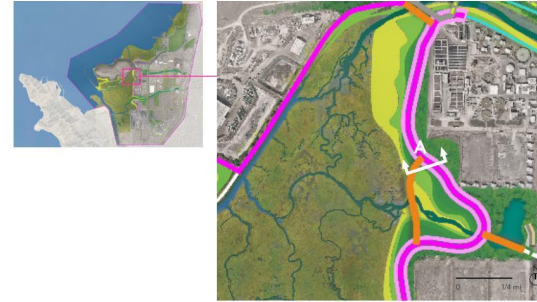
SEE SECTION ENLARGED EXHIBITS ON FOLLOWING PAGES.  
SEE APPENDIX FOR DESIGN DETAILS.

- LEVEE CORE
- LEVEE CORE + TRAIL
- PROPOSED BRIDGE / BOARDWALK
- VEGETATED HABITAT SLOPES
- PROPOSED BIKE LANES
- PROPOSED TRAILS
- EXISTING FLOOD CONTROL MEASURES
- EXISTING BIKE TRAILS
- EXISTING CLASS I TRAIL
- - - STUDY AREA BOUNDARY



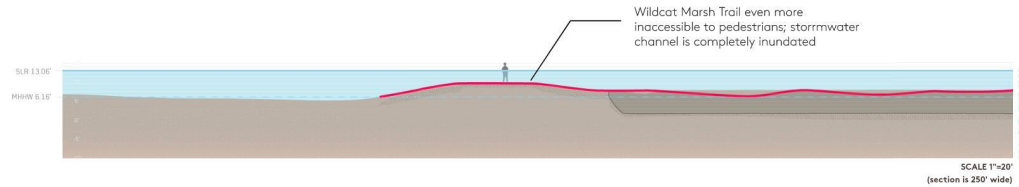
# A Wildcat Marsh Boardwalk & Trail Access

OPENING THE WATERFRONT



## LEGEND

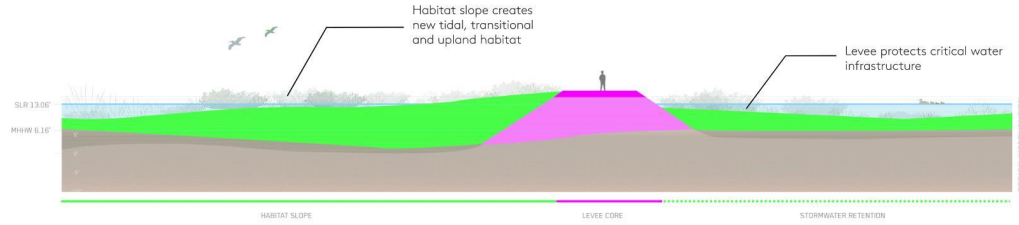
- LEVEE
- HABITAT
- WATER LEVELS
- OVERTOPPING
- GROUND
- SUB-SURFACE GROUNDWATER (ESTIMATED)



SCALE 1"=20'  
(section is 250' wide)

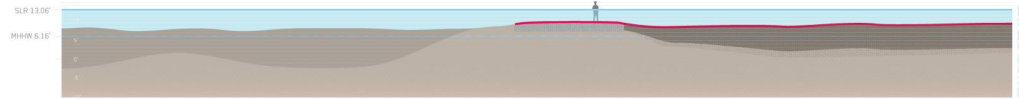
# B Stormwater Retention

PROTECTING WATER AND  
ADDING HABITAT



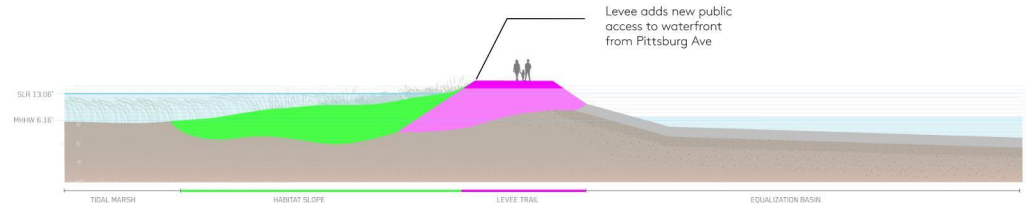
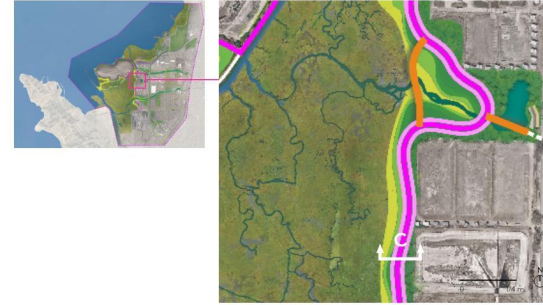
## LEGEND

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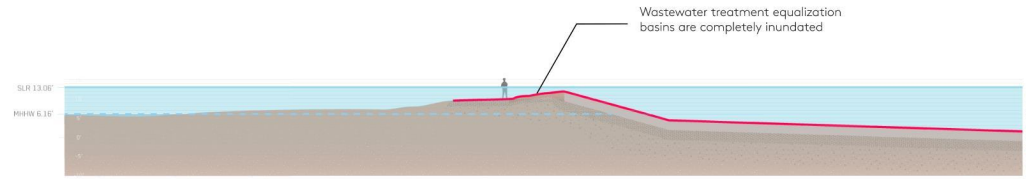
# C Equalization Basin

INTEGRATING PERMANENT PUBLIC ACCESS WITH INFRASTRUCTURE



## LEGEND

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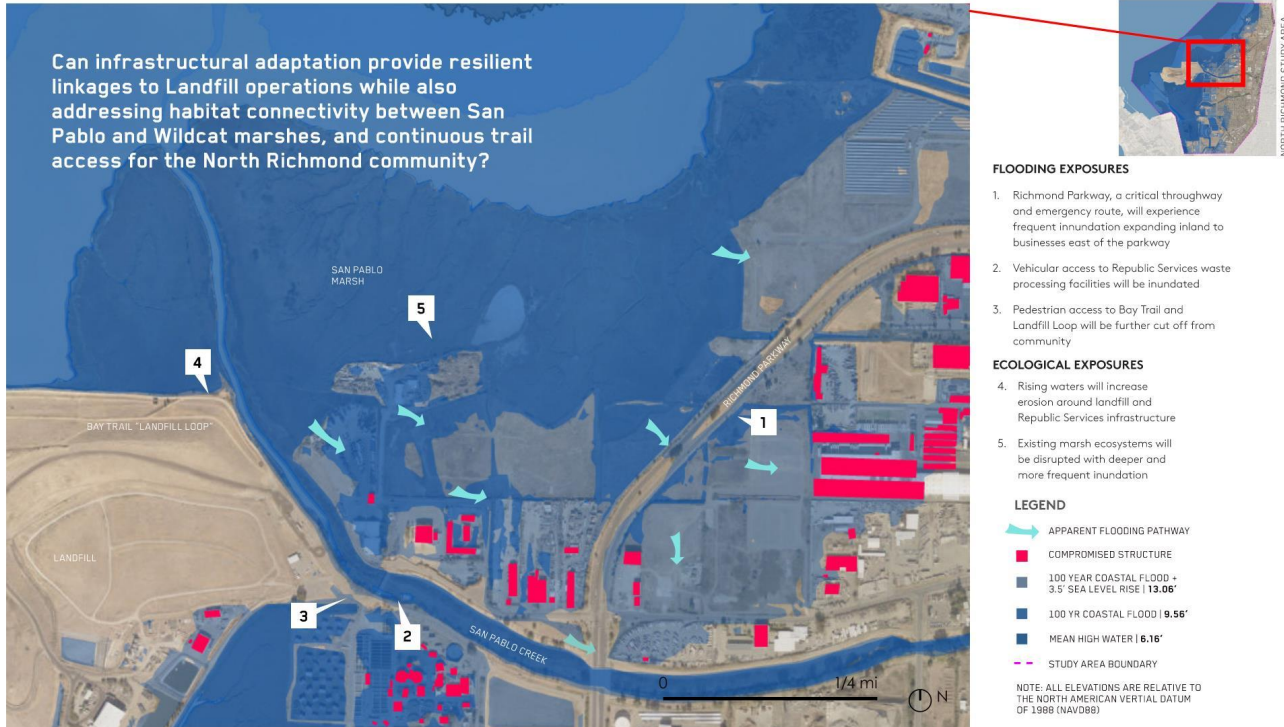


SCALE 1"=20'  
(section is 250' wide)

# Looking South at San Pablo Marsh



# Enlarged View: Inundation at San Pablo Marsh & Richmond Pkwy



# PHASE 1A: "CLUSTER NORTH" CONCEPT DESIGN

SECTION "A" REPUBLIC SERVICES

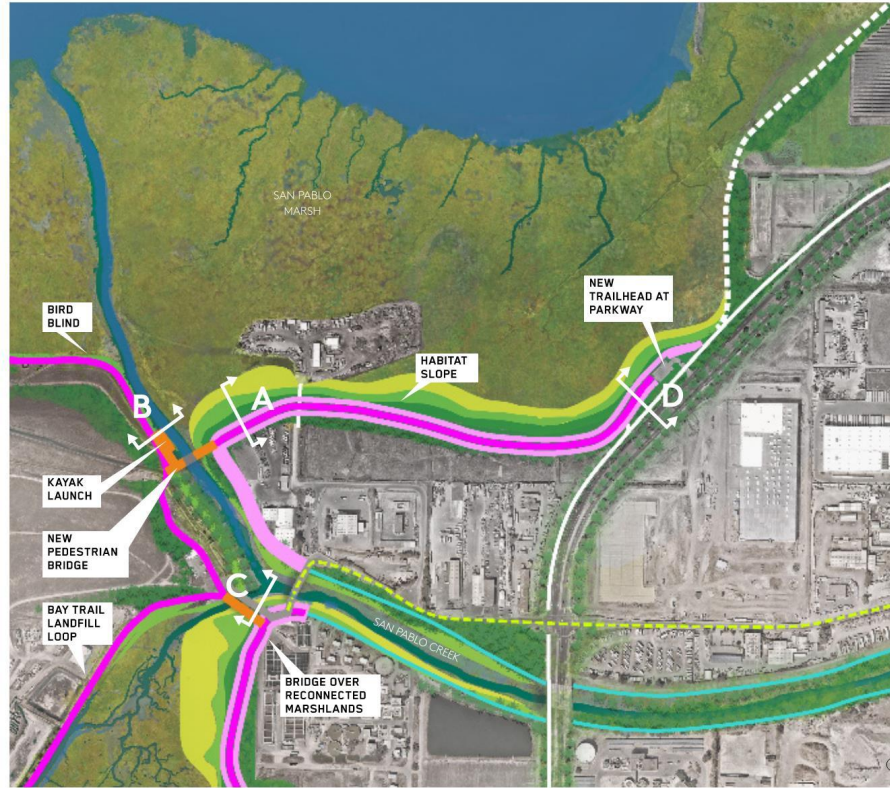
SECTION "B" SMALL-CRAFT LAUNCH

SECTION "C" MARSH RE-CONNECTION

SECTION "D" RICHMOND PARKWAY

SEE SECTION ENLARGED EXHIBITS ON FOLLOWING PAGES

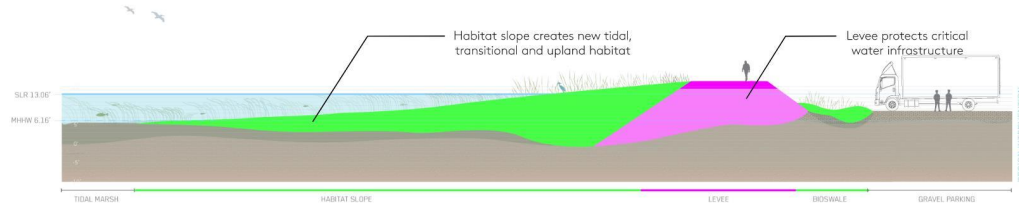
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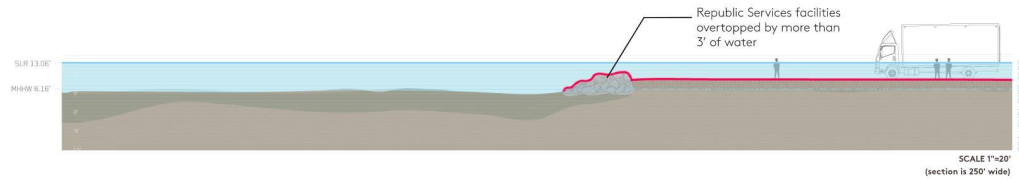
# A Republic Services

INTEGRATING HABITAT ADAPTATION, PERMANENT PUBLIC ACCESS WITH CURRENT FACILITIES



## LEGEND

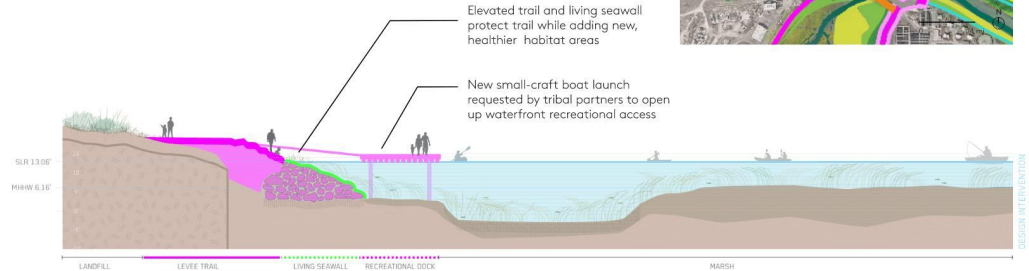
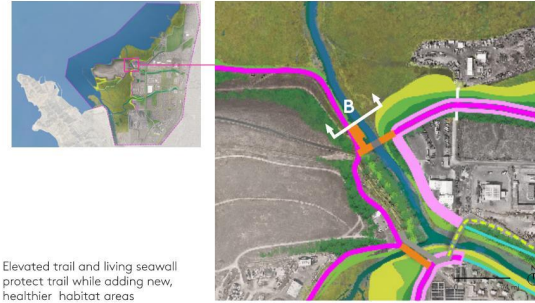
- █ LEVEE
- █ HABITAT
- █ WATER LEVELS
- █ OVERTOPPING
- █ GROUND
- █ SUB-SURFACE GROUNDWATER (ESTIMATED)



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(section is 250' wide)

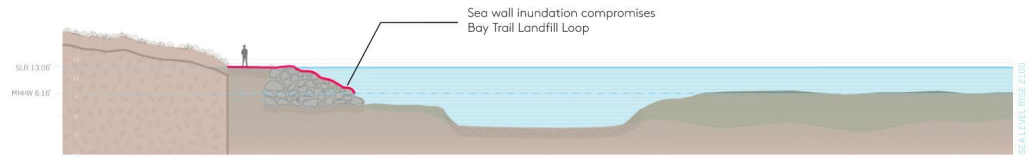
# B Small-Craft Launch

ELEVATING PERMANENT PUBLIC ACCESS WITH RECREATIONAL ASSETS



**LEGEND**

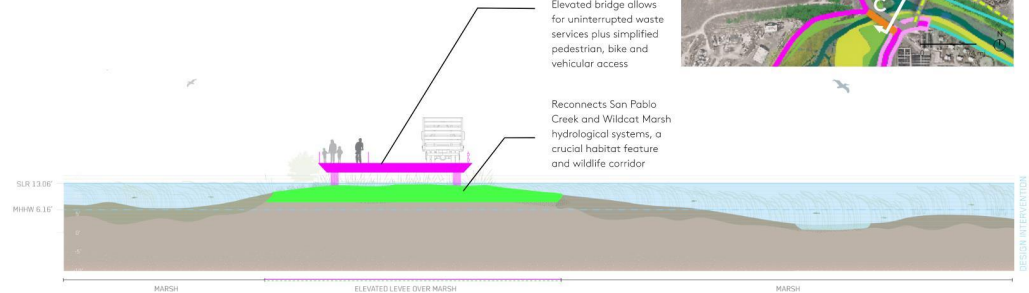
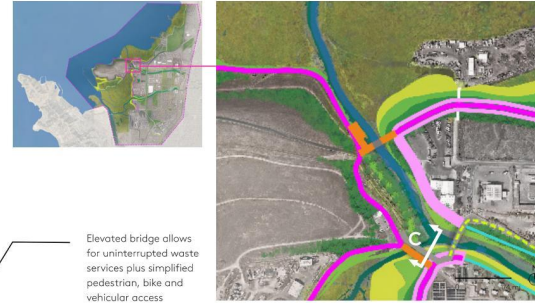
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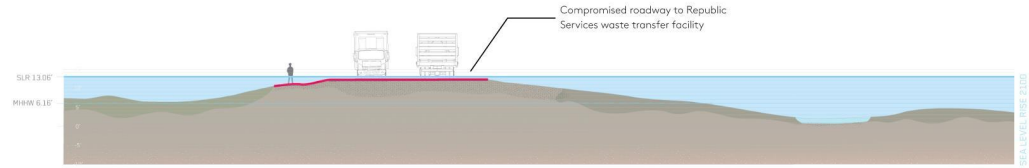
# C Marsh Re-Connection

RECONNECTING HABITAT CORRIDORS AND  
HYDROLOGICAL FLOWS; INSTALLING PERMANENT,  
SAFE PUBLIC ACCESS



### LEGEND

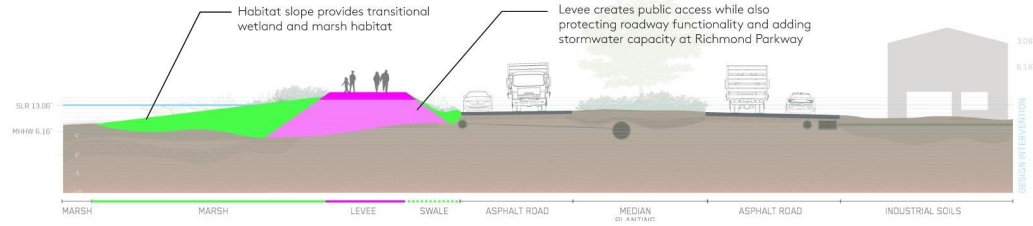
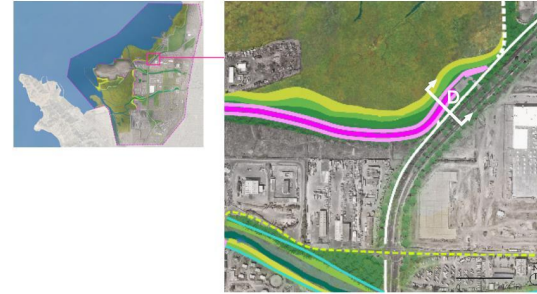
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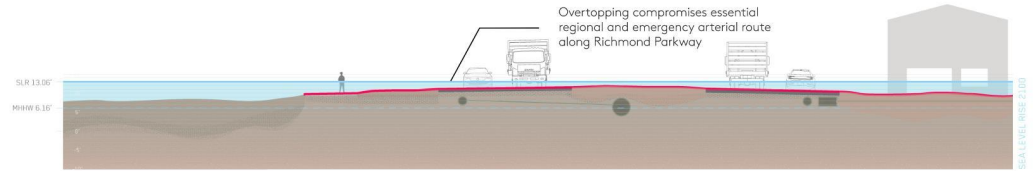
# D Richmond Parkway

PROTECTING A CRITICAL TRANSIT CORRIDOR



### LEGEND

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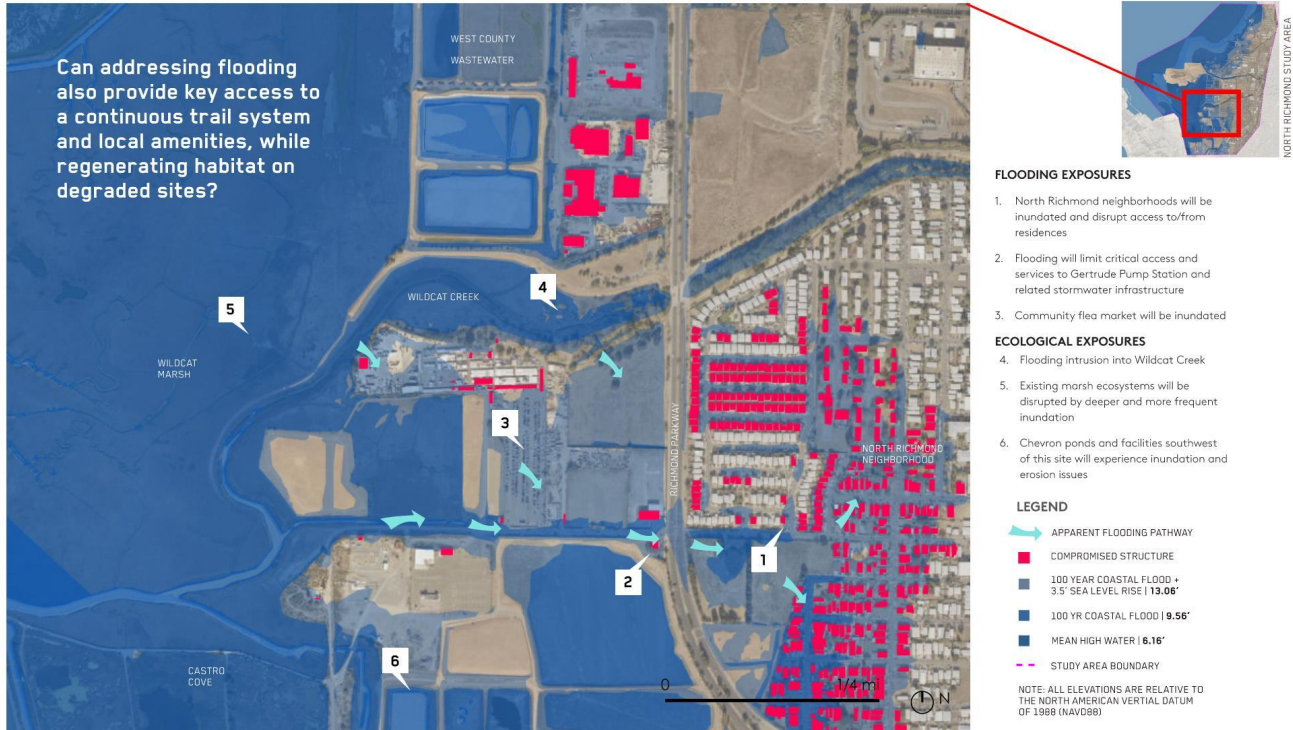


SCALE 1"=20'  
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# Looking West over North Richmond



# Enlarged View: Inundation at North Richmond



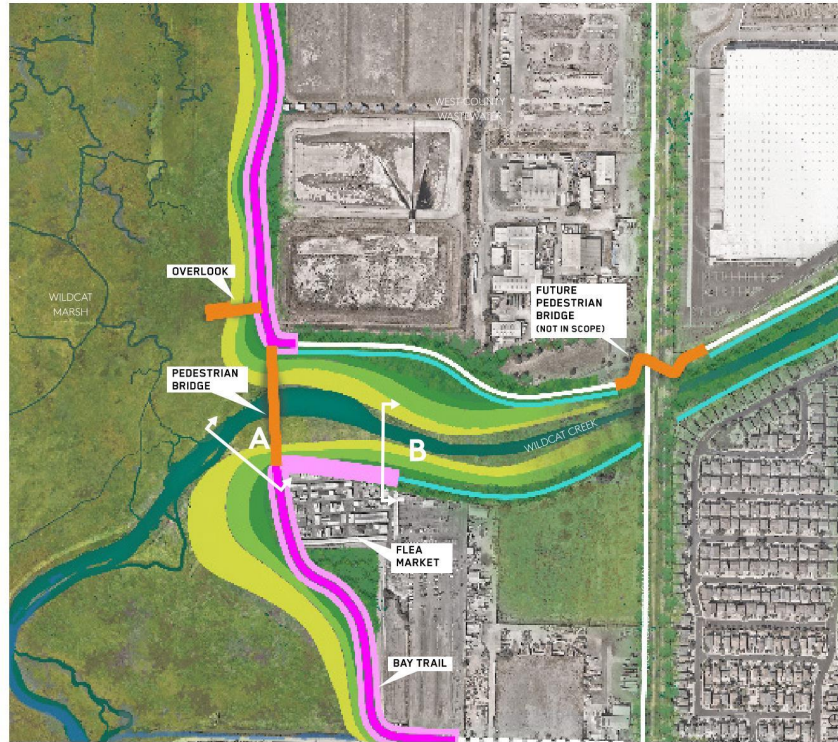
# PHASE 1B: "CLUSTER SOUTH" CONCEPT DESIGN

SECTION "A" MARKET-TO-TRAIL  
CONNECTION

SECTION "B" RIPARIAN HABITAT

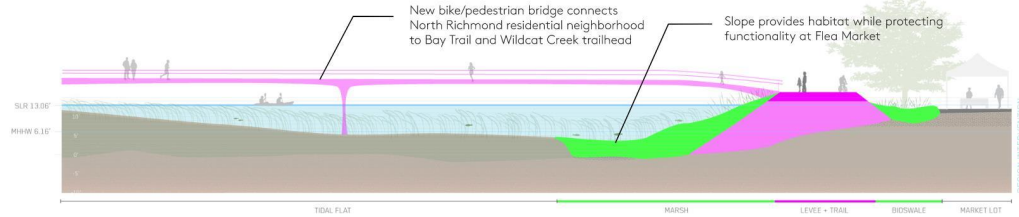
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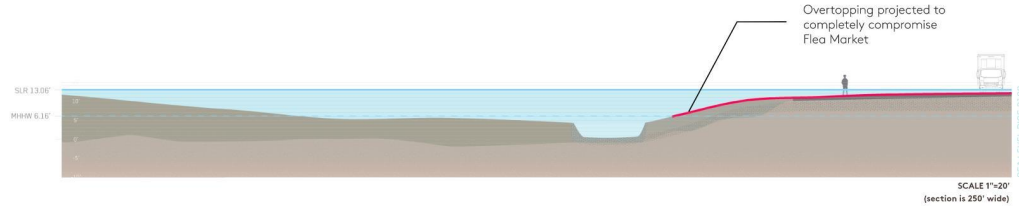
# A Market-to-trail connection

INSTALLING PERMANENT, SAFE PUBLIC ACCESS;  
 PROTECTING AN ESSENTIAL COMMUNITY ASSET



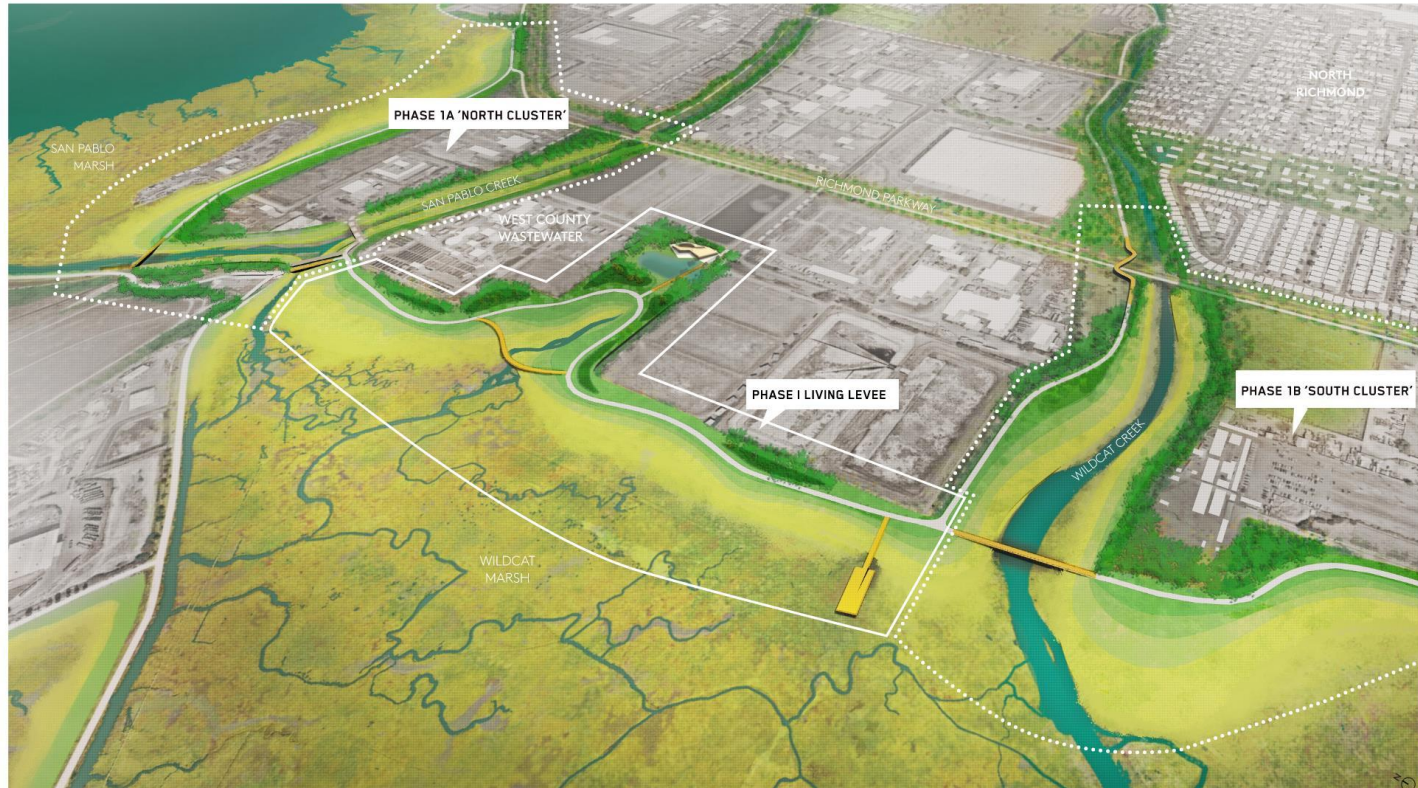
## LEGEND

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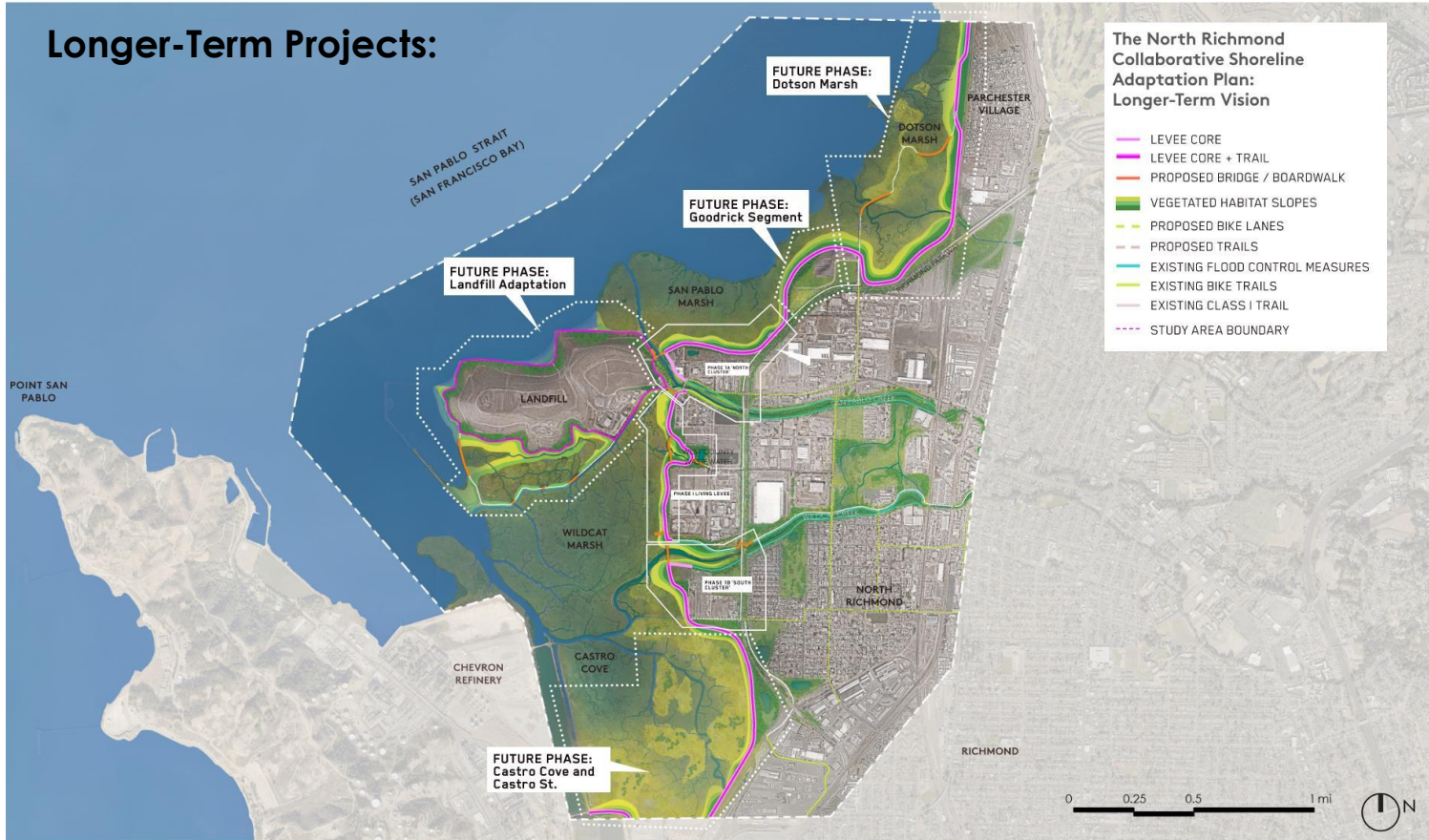




# Critical Near-term Projects:



# Longer-Term Projects:



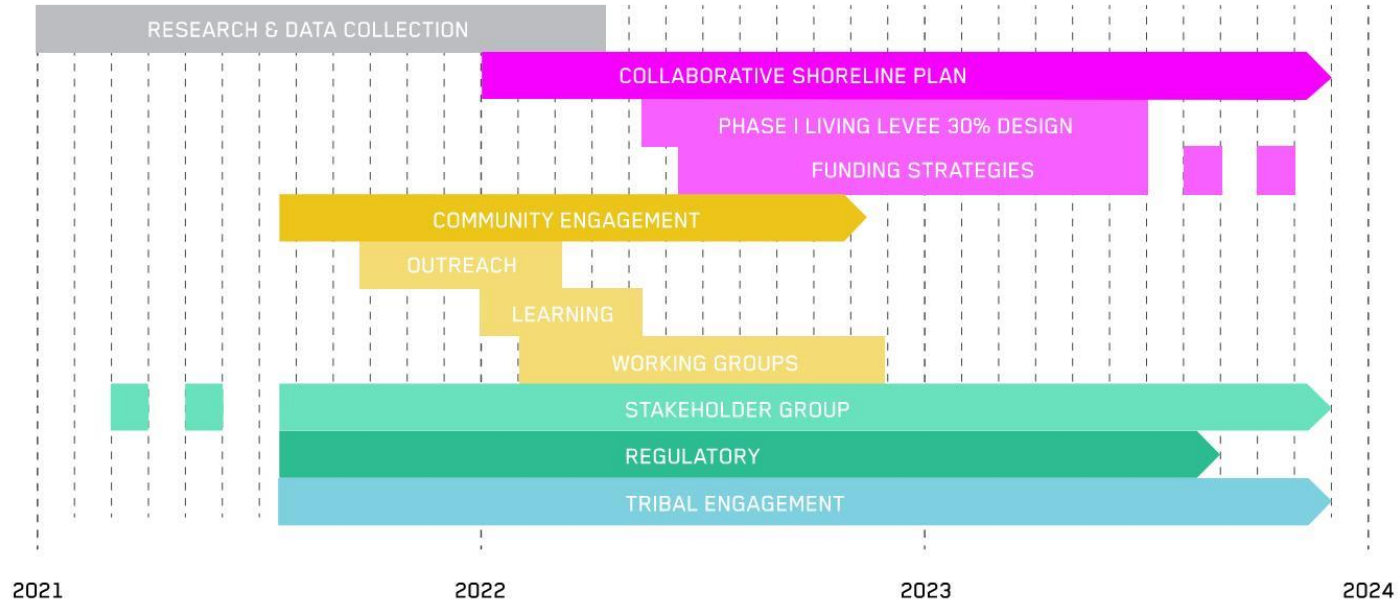
## Community Engagement Frameworks

*Multi-Benefit Sea Level Rise Adaptation on the North Richmond Shoreline has begun long before and will last for long after the design + construction phase*

- Building on years of work and relationship building
- Tribal Engagement
- Surveys
- Educational Workshops
- Design Workshops
- Future Local Workforce Development Discussion



# Frameworks For Community Participation & Co-Design





**COMMUNITY  
ENGAGEMENT**

**COMMUNITY  
DECISION-MAKING**

Outreach → Recruitment

Education → Workgroups

Gather community voices →  
Community research & co-design

# Outreach

## Adaptación de la costa de North Richmond:



### Los miembros de la comunidad:

- Trabajarán aproximadamente de 1 a 2 horas a la semana entre febrero y septiembre de 2022, con un receso de verano durante julio y agosto.
- Completarán tareas incluyendo: coaprendizaje, recopilación y análisis de datos, participación de la comunidad, preparación de materiales y participación y dirección de reuniones.
- Participarán en uno de los grupos de trabajo comunitarios siguientes: Imaginando soluciones, Encuesta comunitaria, o Sostenibilidad y crecimiento.

Los miembros de la comunidad recibirán un pago máximo de \$1,000 por el proyecto (\$50 por reunión)

**La fecha límite de solicitud es el 31 de enero de 2022!!!**

Realizaremos un webinar para proporcionar más información y responder cualquier pregunta el **lunes 24 de enero de 6 a 7 pm**.  
Un enlace al webinar está disponible en [TheWatershedProject.org/Shoreline](https://TheWatershedProject.org/Shoreline).

Para más información y para aplicar, visite [TheWatershedProject.org/Shoreline](https://TheWatershedProject.org/Shoreline) o contacte a Eunice Quintanilla a [eunice@thewatershedproject.org](mailto:eunice@thewatershedproject.org) o 707-726-2829 (mensaje de texto o llamada).



## North Richmond Shoreline Adaptation Project:



### Community Members can participate by:

- Work approximately 1-2 hours a week between February and September 2022, with a summer break during July and August.
- Complete tasks such as co-learning, gathering and analyzing data, conducting community engagement, preparing materials, and participating in one and leading meetings.
- Participate in one of the following community workgroups: Envisioning Solutions, Community Survey, or Sustainability and Growth.

Community members will receive a maximum payment of \$1,000 for the project (\$50 per meeting).

**The application deadline is January 31st, 2022!!!**

We will hold a webinar to provide more information and answer any questions on **Monday, January 24th, 6-7 pm**.

A link to the webinar is available at [TheWatershedProject.org/Shoreline](https://TheWatershedProject.org/Shoreline)

For more information and to apply, visit [TheWatershedProject.org/Shoreline](https://TheWatershedProject.org/Shoreline) or contact Eunice Quintanilla at [eunice@thewatershedproject.org](mailto:eunice@thewatershedproject.org) or 707-726-2829 (text or call).





20+ community members

Regular meetings (paid)

Learning Academy

3 Workgroups

Site Visits





# Online Workshops: Understanding Priorities for Access, Amenities, Activities & Restoration

## Live Markup:

is there a barge or canal or other besides just levee itself?

loops, not just lines!

prioritize bike and pedestrian, swimming access

bridge

clarity of wayfinding

interactive education component - accessible throughout in all languages, eye (so much signage etc) more engaging for youth; history; function of WCW; tribal and indigenous engagement

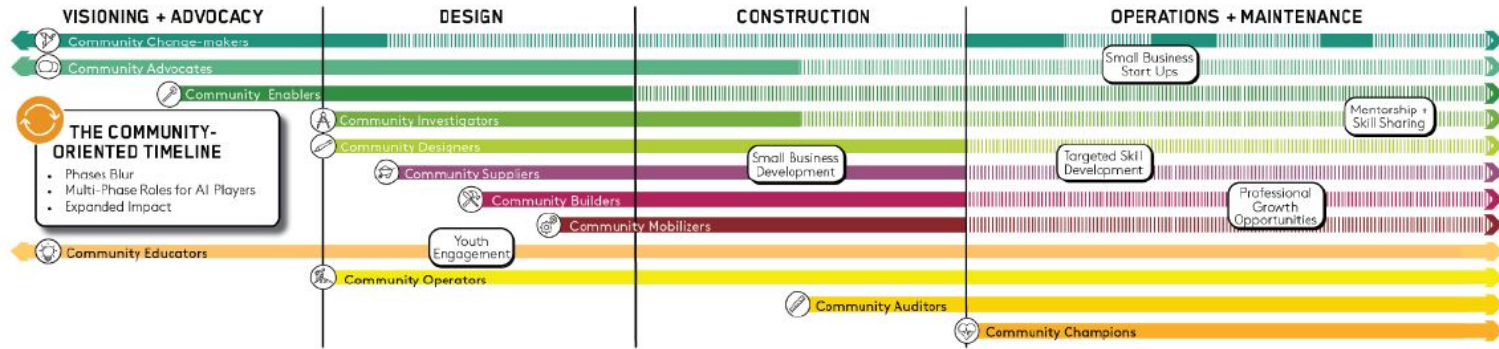
Signage, wayfinding

can wetlands, etc be more accessible, esp for elderly population

ecology center, arts center, quiet program, yoga, etc, meditation in this area

trash & recycling facilities, esp when leaving the flea market (combined w/ environmental)


# Workforce Development: thinking beyond construction to community stabilization and wealth-building



# Tribal Engagement



HOME ABOUT PROGRAMS EVENTS GET INVOLVED NEWSLETTER DONATE



## TRIBAL STORIES FROM THE COAST AND WATERSHEDS OF NORTH RICHMOND, CALIFORNIA



Welcome to the showcase of the Confederated Villages of Lisjan Coastal Stories, created by The Watershed Project as part of the North Richmond Shoreline Adaptation Project.



- Working with the team to develop concept designs for one or more site installation(s) to honor sites of cultural concern within the concept study area
- Building an indigenous storytelling website
- Two site visits with members of the Confederated Villages of Lisjan (Ohlone)
- Zoom meetings and discussions to arrive at shared understanding of role as cultural advisors on the project
- Agreement to provide feedback and help develop interpretive material, including interviews with tribal members



# Education and Interpretation

## The Past

*Bald eagle*  
*California gull*  
*Grizzly bear*  
*Salmon*  
*Mussel*  
*Clam*  
*Crab*  
*Grebe*

In front of you is the North Richmond shoreline, on the San Francisco Bay. This tidal wetland evolved over thousands of years and is well-adapted to changing water levels: the daily high and low tides, and the seasonal spring tides from Walker Creek that flows from the Berkeley hills into the Bay at this location.

We learn from this ecosystem how to cope with current risks such as sea level rise and pollution. For example, the dense vegetation that this habitat supports catches the soil with organic matter, and that increases water infiltration, recharging flows. The gently sloping topography reduces wave energy that can be damaging to the shoreline. Wetland vegetation such as marsh grasses and reeds have deep root systems that anchor the soil, so it is less erodible even under consistently rising water. These plants extract toxins from the soil and the air, making the ecosystem a more habitable for us.

The tidal marshes are an important feeding and nesting area for birds such as the sliver rail, salt marsh harvest mouse, and the California gull. The oysters beds underneath the water provide habitat for species such as Dungeness crab, shore perch, and octopus.

Wetlands slow down river flow. Sediments carried by the creek are retained in this flat area, and over time, accumulation of oyster shells and the wetland's organic material (dead plant material) increases the height of the wetland. This way, the wetland can keep pace with rising sea levels to stay above the water. As an level rises, wetlands can also migrate landward, converting dry inland areas to marshes.

## The Present

*Child looking out window*  
*Modern building*  
*Heron*  
*Map of Richmond area*  
*Fish and shellfish*

People lived and used this shoreline for thousands of years. In the Choctaw language of the original Native people, this area is named "Shackaw" land. Tribal members that live amongst on shore states of how their ancestors livelihood relied on fish and waterfowl from the Bay, and oysters, mussels and berries from the surrounding hills and valleys. They would use reed boats to travel along the Bay's waterways. They had a deep spiritual connection to the land and lived in harmony with the environment. Today, the Lisianski-Thompson communities are working to reembrace the land and revitalize their culture, knowledge, and native languages.

In the 20th and 21st centuries, this shoreline went through heavy industrialization, particularly during and after World War II. The area became a hub for oil refining and chemical manufacturing, including the General Chemical Company, Kopp Shipyard, Ford Motor Assembly Plant, the Richmond Naval Mill, the Clavin-Albee-Fordley Company (manufacturing explosives), and the Cypress Refinery - which still dominates the shoreline.

The industry brought jobs and economic growth to the region, attracting workers. Soon after, African Americans from the Southern US, Mexican Americans, and European farm workers made their home in the nearby North Richmond neighborhood. The community became a hub for music, with world-famous jazz clubs and music venues, including the legendary Club Savoy, attracting top musicians from across the country. After this period of economic growth, residents faced challenges from pollution and environmental degradation and declining industry that led to social and economic instability. Despite these challenges, the community has remained resilient and continued to thrive, with a rich

## The Future

*Butterfly*  
*Fish*  
*Bird*  
*Sunflower*  
*Person*  
*Child*  
*Bird*  
*Map of Richmond area*

This living wetland is expected to be significantly impacted by sea level rise in our coming decades. An sea level rise, since infrastructure will be at risk from coastal floods. This includes the West County Waterwater facility, the Richmond Parkway, some North Richmond homes, and the natural environment - the wetland and all its plants and animals.

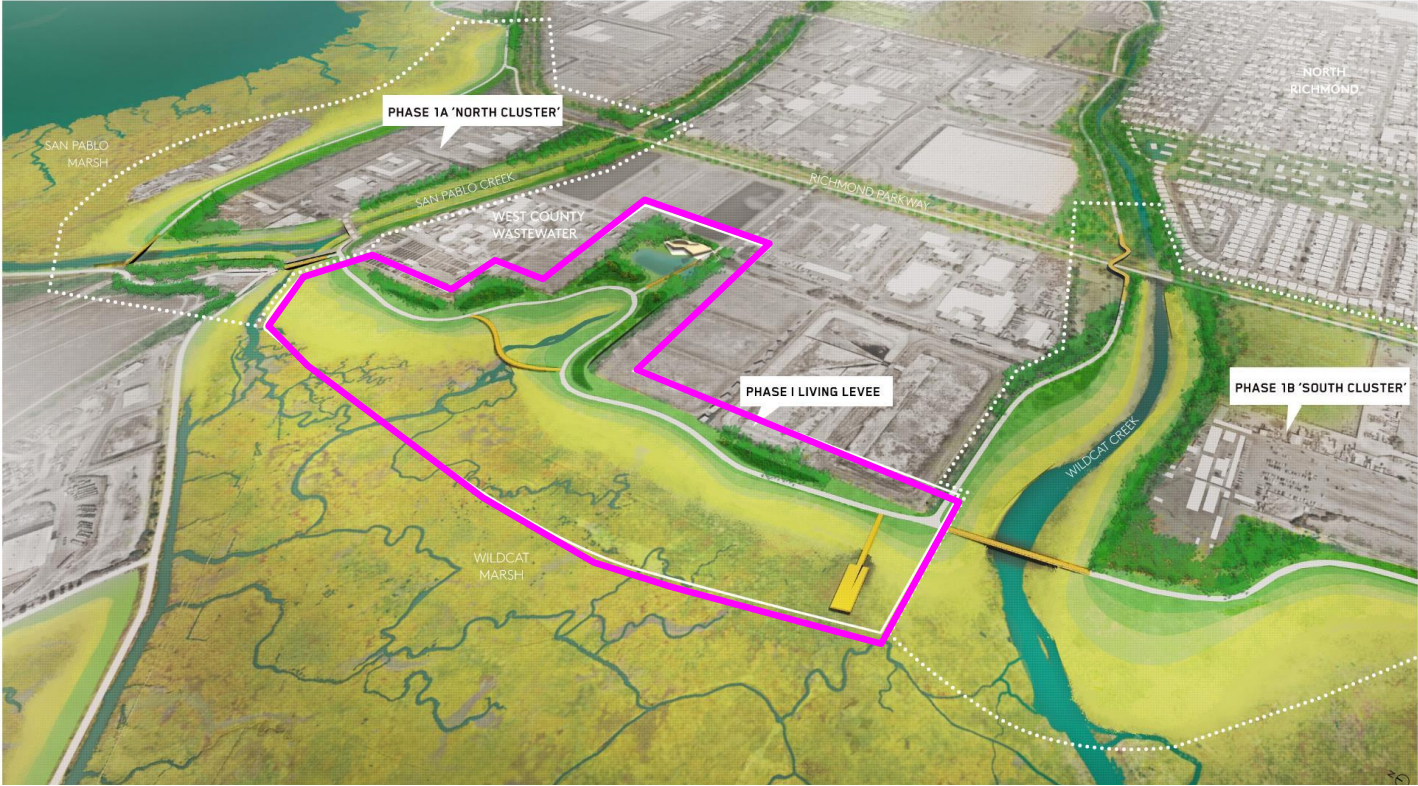
Motivated by over two decades of environmental and community activities, citizens are taking steps for a solution to sea level rise for the North Richmond Shoreline. By constructing a living levee - a low-lying, broad structure built parallel to the shoreline, the shoreline will be more protected from coastal flooding and wave erosion.

The structure is designed to blend with the surrounding landscape and ensure the natural processes of coastal protection, creating a "Nature-based Solution" that uses the benefits and services provided by the natural ecosystems and processes.

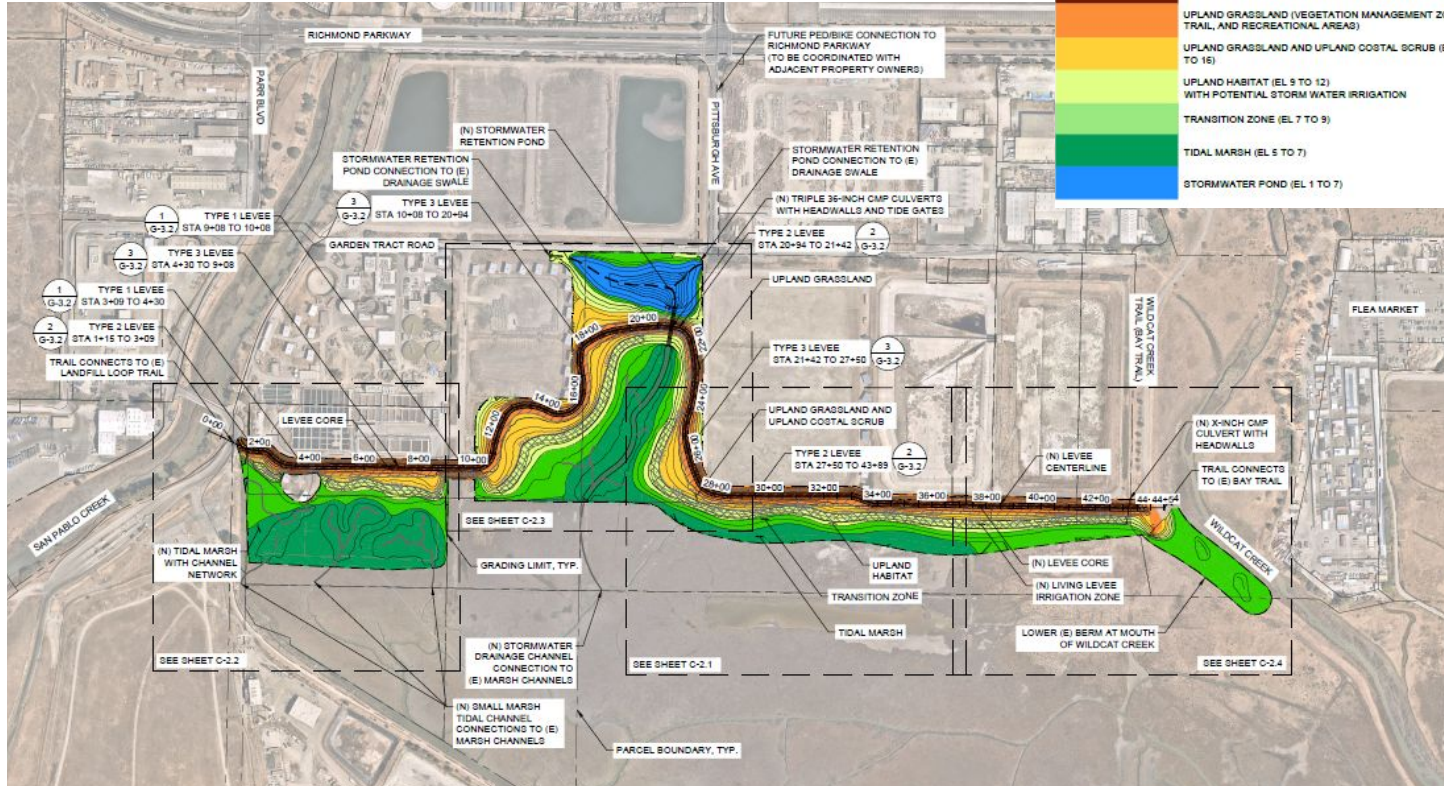
The North Richmond Shoreline Adaptation project will provide opportunities for the neighboring communities to connect with nature - creating walking and biking trails, building small parks and play structures, and improving access to the beautiful area. The design of this project was heavily influenced by the work with community partners that identified community needs and wants.

The watershed project  
This project is currently in its planning stages, and if ground breaking, implementation will start in 2025.

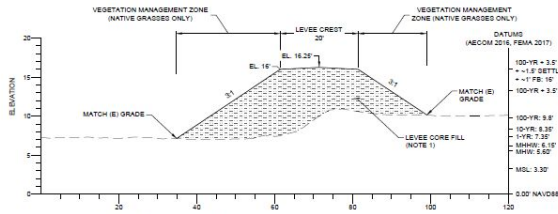
# Phase 1 Living Levee at West County Wastewater



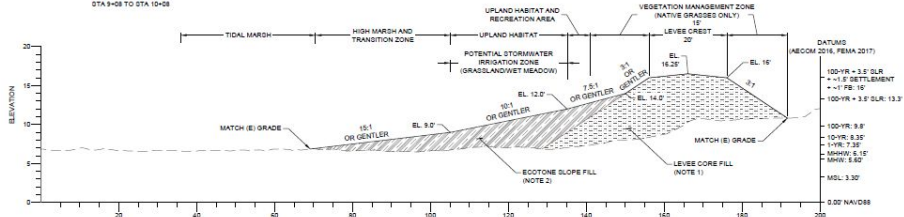
# Phase 1: Living Levee Overview



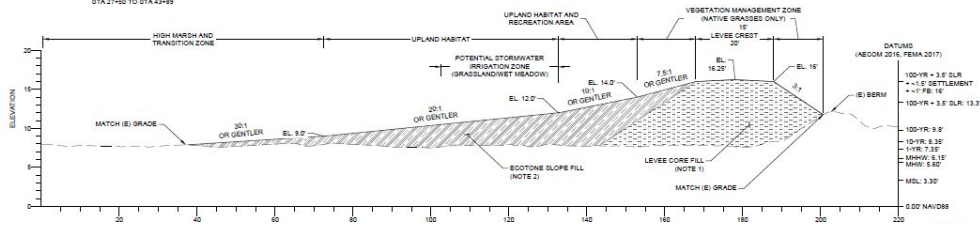
# Phase 1: Living Levee Typical Cross-Sections



1 TYPE 1 LEVEE (MINIMUM WIDTH)  
TYPICAL CROSS SECTION:  
STA 3+08 TO STA+30  
STA 9+08 TO STA 10+08  
SCALE: 1" = 10'



2 TYPE 2 LEVEE (PARTIAL HABITAT SLOPE)  
TYPICAL CROSS SECTION:  
STA 1+15 TO STA 2+05  
STA 20+04 TO STA 21+42  
STA 27+00 TO STA 43+05  
SCALE: 1" = 10'



## Type 1 - "Minimum Width" Levee

- In areas constrained by existing infrastructure or high-value habitats
- Minimum width needed for flood protection and SLR resilience
- Lowest ecological value

## Type 2 - Partial Habitat Slope

- In areas with minor footprint constraints
- 50+ feet for transition-zone and upland native habitats
  - Potential for habitat irrigation with retained stormwater
- Recreation-zone limited to levee crest

## Type 3 - Full Habitat Slope

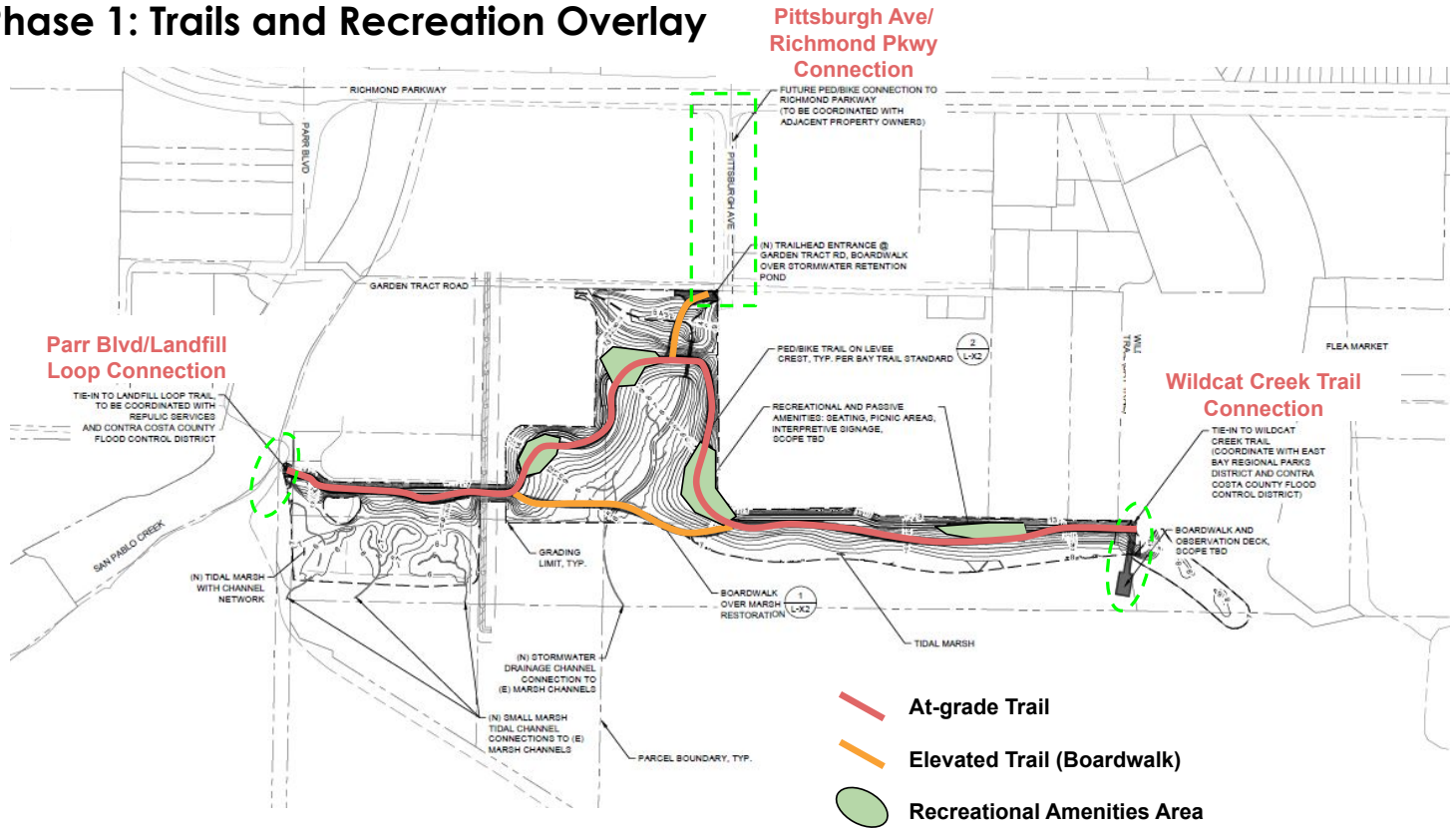
- In areas with no footprint constraints
- 75+ feet for recreation, transition-zone, and upland native habitats
  - Potential for habitat irrigation with retained stormwater
- 25+ feet for recreation amenities (eg. picnic areas, vista points, etc).

# Phase 1: Site Plan



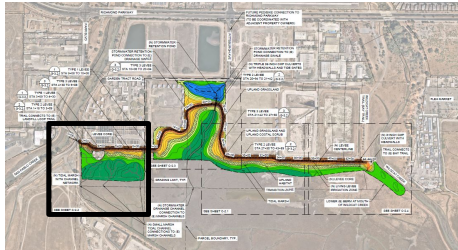


# Phase 1: Trails and Recreation Overlay



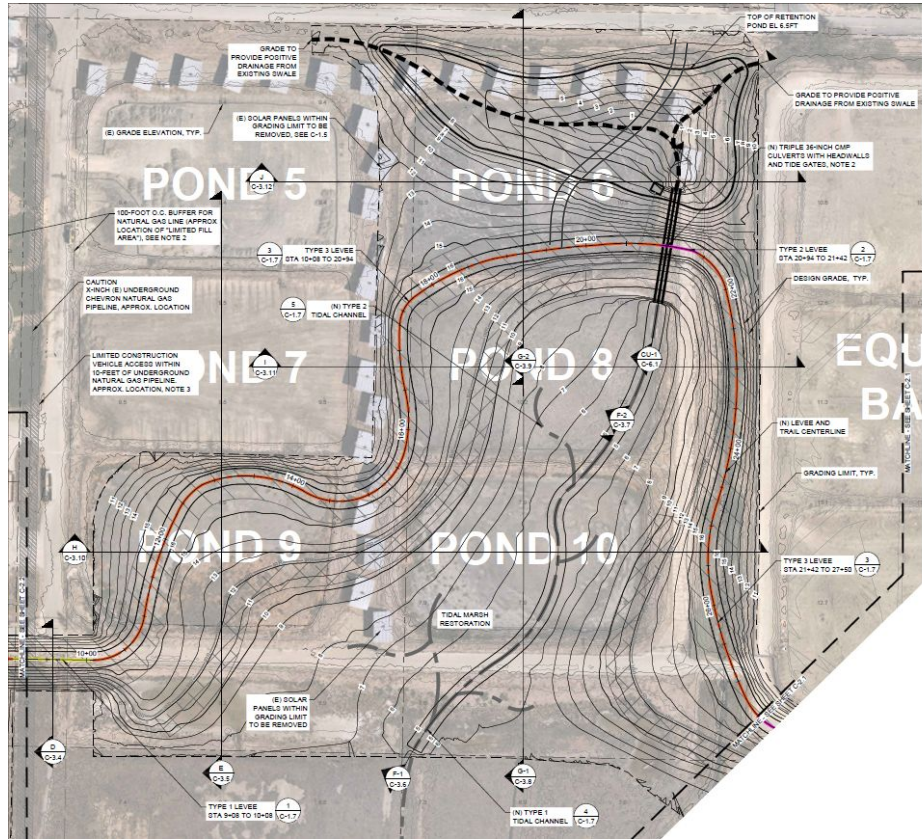
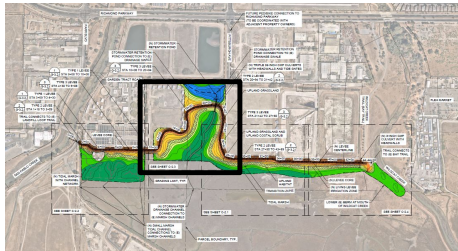
## North Segment (“Lagoon 14”)

- Trail and Levee tie-in to Parr Blvd.
- Restore tidal marsh and tidal channels in Lagoon 14
- Protect PG&E transmission tower



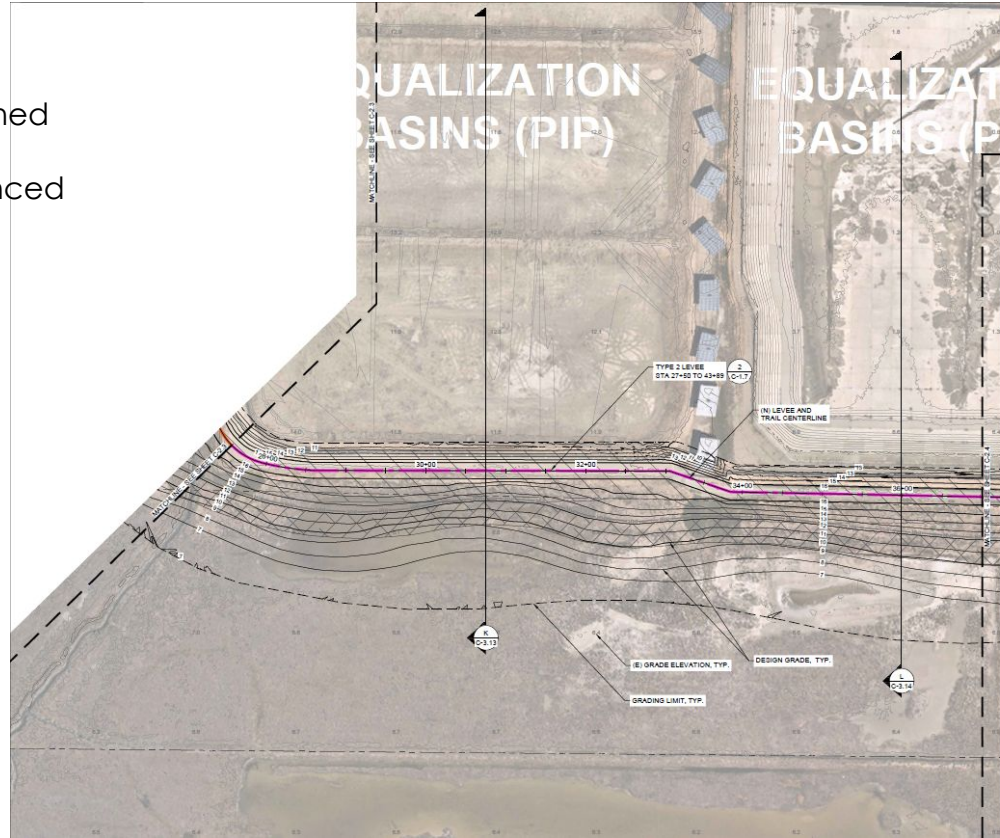
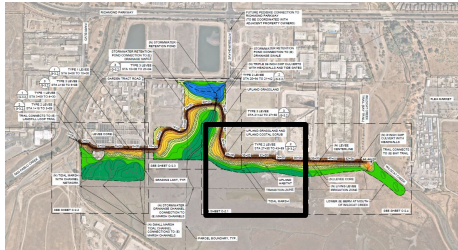
## Central Segment

- Trail connection to Garden Tract Road
- Pond 6 reconfigured as a stormwater retention pond.
- Restore tidal marsh and tidal channels in Ponds 8, 9 & 10.
- Protect Chevron underground natural gas line



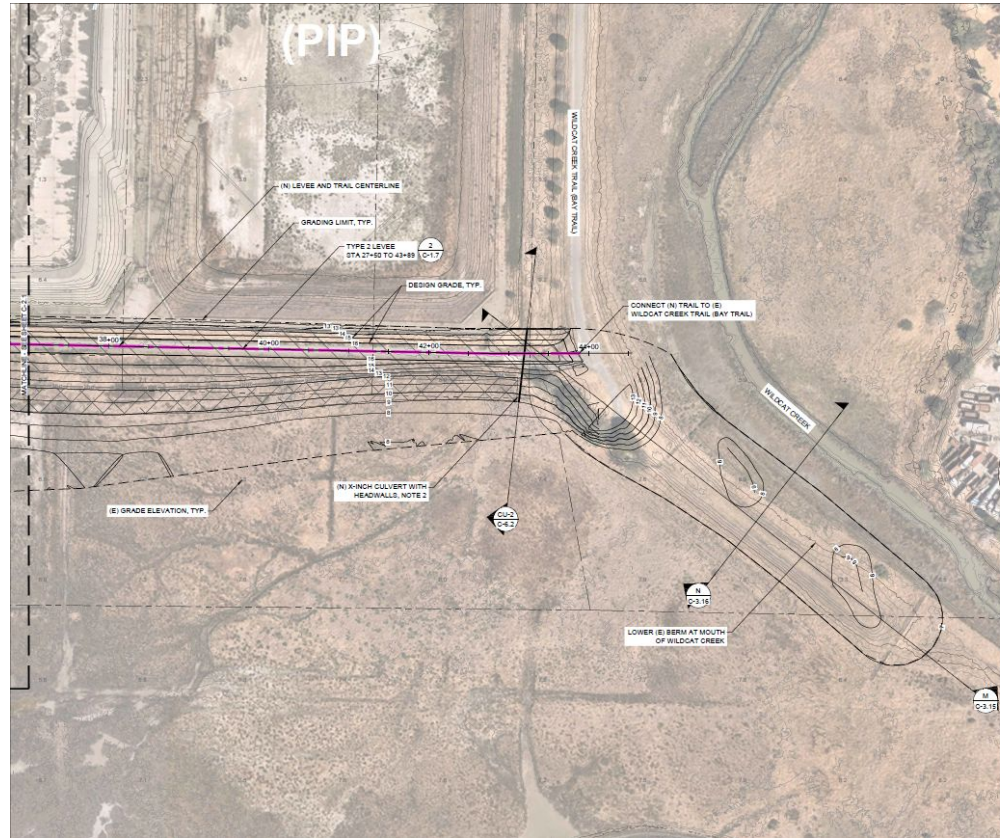
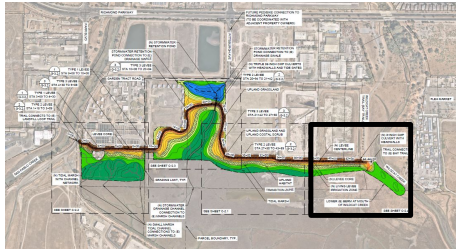
## South Segment 1

- Partial habitat slope with potential irrigation with retained stormwater
- Habitat slope footprint balanced with protection of adjacent existing habitats



## South Segment 2

- Trail and levee tie-in to existing Wildcat Creek trail.
- Partial habitat slope with potential irrigation with retained stormwater
- Habitat slope footprint balanced with protection of adjacent existing habitats



# Earthwork Summary

## Total Fill: 140,000 CY

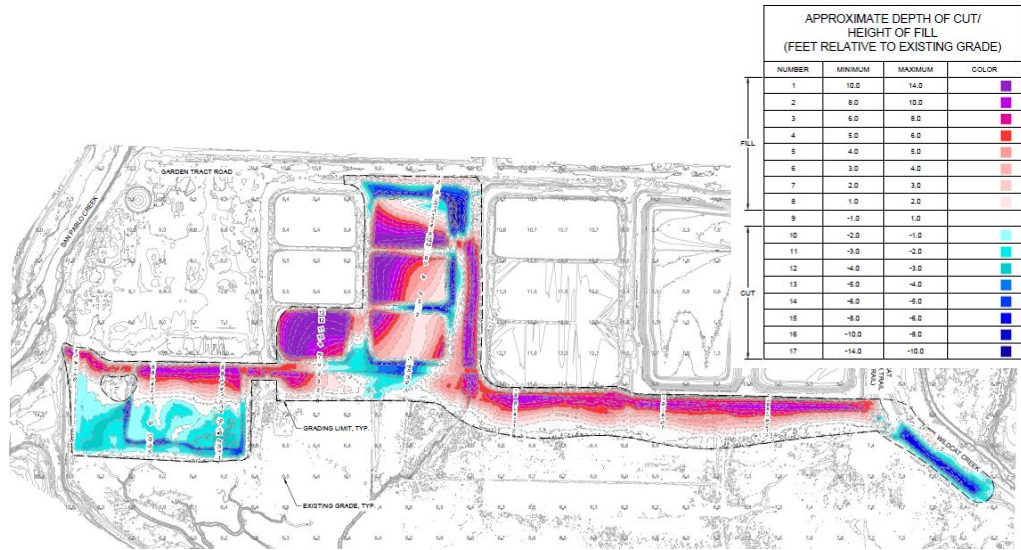
- Levee Core: 50,000 CY
- Habitat Slope: 90,000 CY

## Total Cut: 36,000 CY

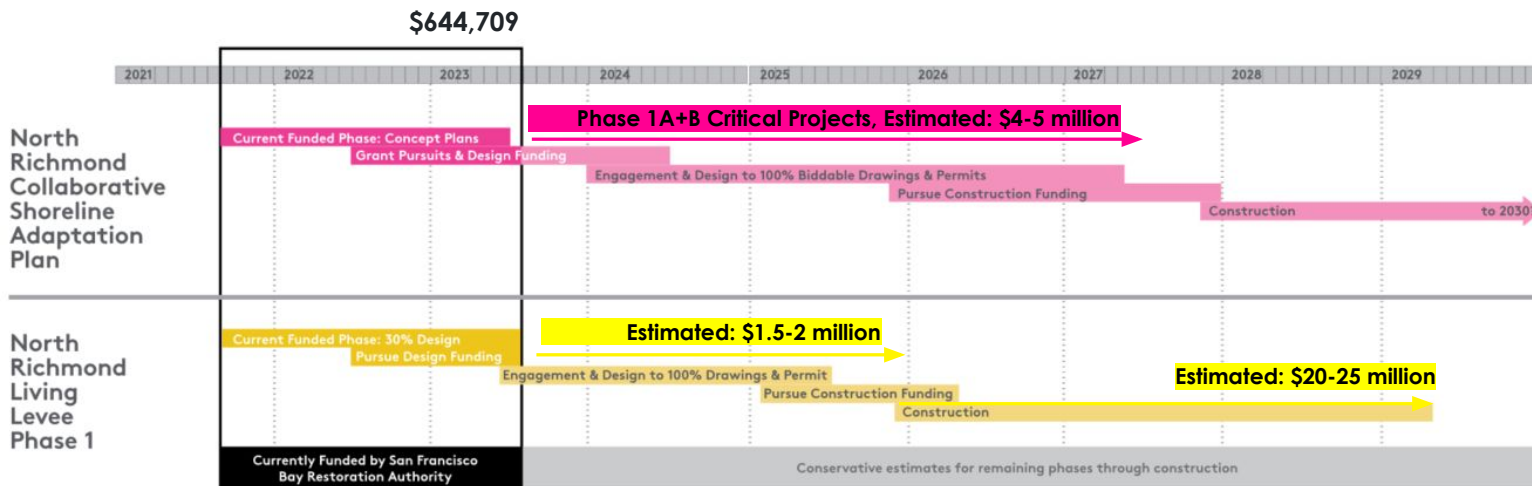
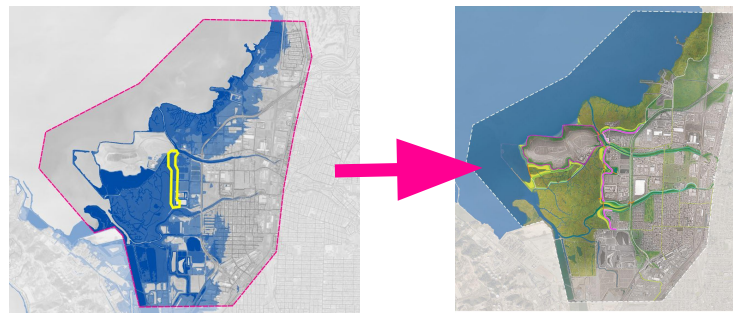
## Required Imported Material: 104,000 CY

- Levee Core: 50,000 CY
- Habitat Slope: 54,000 CY

*Levee core material should meet USACE levee material specifications.*



# Looking Ahead...



## Further Studies Required (Provisional/Anticipated)

### **Technical Studies for 60% to Final Design for Phase 1 Living Levee at West County Wastewater**

- Geotechnical Study
- Utilities coordination (PG&E, Chevron)
- At-grade and elevated trail section designs
- Aquatic Resources Delineation
- Phase 1 & 2 Soils Assessments
- Design for Community & Recreational Elements

### **Additional Technical Studies for Feasibility of Phase 1A North and Phase 1B South Projects**

- Phase 1 & 2 Soils Assessments
- Groundwater contamination testing
- Stormwater and drainage analysis
- Hydraulic/Flooding analysis

**+Community and Governance Capacity Building..**

**+Stakeholder Engagement & Collaboration..**



## In Memoriam...



**Sherry Stanley**  
1947-2022



**Dr. Henry Clark**  
1945-2022



Thank you



WEST COUNTY  
WASTEWATER

MITHÜN



the  
watershed  
project

NORTH RICHMOND  
COMMUNITY MEMBERS



SAN FRANCISCO BAY  
RESTORATION AUTHORITY