

HAYWARD REGIONAL SHORELINE ADAPTATION MASTER PLAN

HAYWARD PLANNING COMMISSION
OCTOBER 22, 2020





HAYWARD AREA SHORELINE PLANNING AGENCY

- Established in 1970
- Includes City of Hayward, Hayward Area Recreation & Park District, and East Bay Regional Park District
- Purpose: To coordinate agency planning activities and adopt and carry out policies for the improvement of the Hayward Shoreline for future generations
- General Plan Policy: HAZ-4.3 Shore Realignment Master Plan
- Shoreline Adaptation Master Plan 2018



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HAYWARD REGIONAL SHORELINE ADAPTATION MASTER PLAN

HAYWARD PLANNING COMMISSION

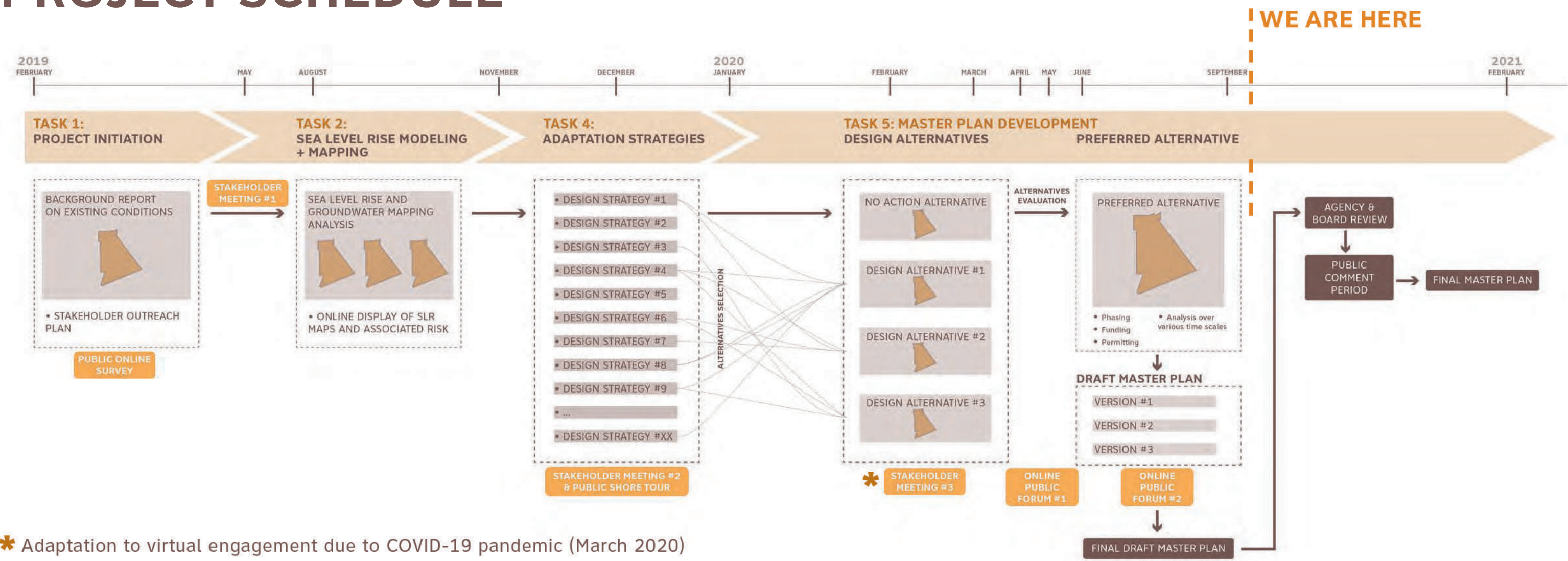
OCTOBER 22, 2020

AGENDA

- **Master Plan Process**
- **Master Plan Assumptions**
- **Master Plan Document**
- **Next steps**

MASTER PLAN PROCESS

PROJECT SCHEDULE



TASK 1: PROJECT INITIATION

Background Report

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HAYWARD REGIONAL SHORELINE MASTER PLAN

FOR THE HAYWARD AREA SHORELINE PLANNING AGENCY (HASPA)

TASK 1 BACKGROUND REPORT & ECOSYSTEM CONDITION

SUBMITTED 06/14/2019
PART OF A JOINT POWERS AGREEMENT OF COH, HARD AND EBRPD

**HAYWARD SHORELINE MASTER PLAN
BAYLANDS ECOLOGY**

LEGEND

- TIDAL MUDFLAT
- TIDAL / MUDFLAT TIDAL MARSH
- DIKED POND / WETLAND
- DIKED STORAGE AND TREATMENT PONDS
- INACTIVE SALT PONDS
- UPLAND LANDFILL

BAYLANDS TODAY
A MOSAIC OF ECOLOGY AND INFRASTRUCTURE

The Hayward Regional Shoreline is a mosaic of bayland environments that supports diverse wildlife habitats and critical urban infrastructure. Formerly a zone of tidal marshes and natural salt ponds, this stretch of shoreline has undergone sequential transformations, resulting in the current mix of restored tidal marshes, inactive industrial salt ponds, filtration marshes, storage ponds, diked wetlands, landfills, solar fields, and biosolids drying beds. Restored tidal marsh is a dominant condition within the Hayward Regional Shoreline Master Plan Project Area. The following includes short descriptions of each tidally influenced marsh.

Oro Loma Marsh is a 364-acre fully tidal marsh restored in 1997. Once diked and degraded wetlands, this area now supports robust habitats, including salt marsh vegetation, seasonal wetlands, high refugia mounds, and tidal flats. The west section of this marsh drains directly into the bay and the east section drains to the bay via Sulphur Creek.

Cogswell Marsh is 250 acres of formerly diked baylands fully restored to tidal marsh in 1980. A reintroduction of bay tidal exchange facilitated the development of a more robust tidal marsh and supported the establishment of federally endangered Salt Marsh Harvest Mouse and Ridgway's Rail populations. Constructed nesting mounds, excavated tidal channels, and invasive species management have also contributed to the success of this ecosystem.

Triangle Marsh is an 8-acre muted tidal marsh system restored in 1990. Robust marsh habitat has developed within the site, but the West Winton Landfill backs onto the site and prevents any further marsh expansion or migration.

HARD Marsh is a 79-acre, fully tidal marsh comprised of mudflats and low marsh habitats. Restoration efforts began in 1986, and currently the marsh does not contain any high ground or islands for wildlife refugia.

Salt Marsh Harvest Mouse Preserve is a 27-acre site of muted tidal marsh managed by East Bay Regional Park District (EBRPD) to maintain habitat for the federally endangered Salt Marsh Harvest Mouse. Currently, there is limited high ground within the site, resulting in the need for combination gates to manage water entering and exiting the system.

Fringe Marshes are established on the outboard side of levees along the shoreline. These areas support unique habitats such as small beaches and rocky intertidal habitat.

Landfills are concentrated in the center of the project area where tidal baylands were filled with unknown debris and waste. The City of Hayward owned West Winton Landfill was capped and closed in 1974, and current monitoring protocols show no contamination to adjacent baylands. North of the city owned landfill is an Alameda County-owned West Winton Landfill. Conversations with experts led the Project Team to identify this area of the project site most in need of further research due to unknown infrastructure conditions.

Inactive salt ponds and freshwater wetlands are also distributed throughout the site and contribute to habitat diversity. Some areas, such as the Oliver Salt Ponds, are historical resources that also support federally endangered bird species.

Sources:

- Adapting to Rising Tides, Hayward Resilience Study, January 2015.
- Philip Williams and Associates, LTD, Preliminary Study of the Effects of Sea Level Rise on the Resources of the Hayward Shoreline, March 2010.

HAYWARD REGIONAL SHORELINE MASTER PLAN

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Online Survey

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HAYWARD REGIONAL SHORELINE MASTER PLAN

FOR THE HAYWARD AREA SHORELINE PLANNING AGENCY (HASPA)

APPENDIX A: ONLINE SURVEY AND STAKEHOLDER INTERVIEWS

SUBMITTED 06/14/2019
PART OF A JOINT POWERS AGREEMENT OF COH, HARD AND EBRPD

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FOR THE HAYWARD AREA SHORELINE PLANNING AGENCY (HASPA)

COMMUNITY OUTREACH PLAN

SUBMITTED 06/14/2019
PART OF A JOINT POWERS AGREEMENT OF COH, HARD AND EBRPD

Community Outreach Plan

TASK 2: DATA COLLECTION AND SEA LEVEL RISE MAPPING

SLR Mapping Report

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SHORELINE MASTER PLAN

FOR THE HAYWARD AREA SHORELINE

AGENCY (HASPA)

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TASK 2

DATA COLLECTION

AND SEA LEVEL R

MAPPING REPORT

SUBMITTED 11/26/2019

TOPOGRAPHY AND BATHYMETRY

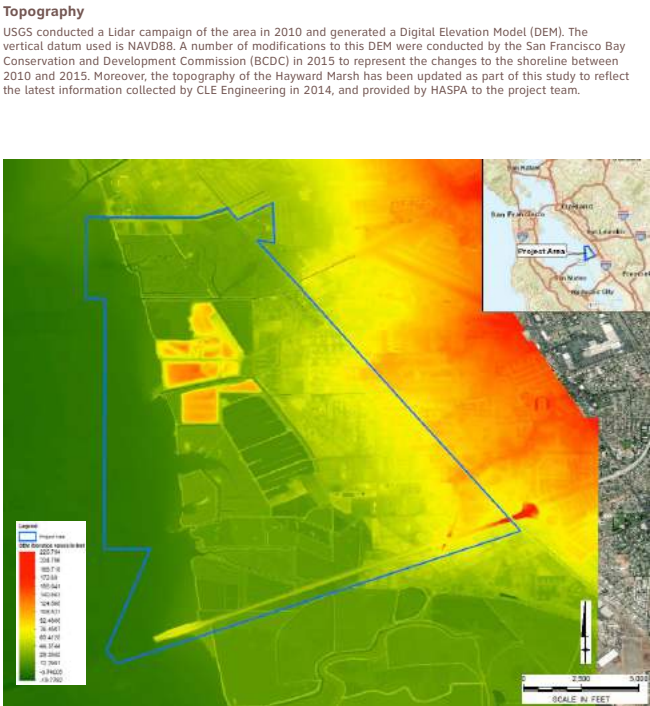


Figure 2: DEM elevations in the project area.

Bathymetry

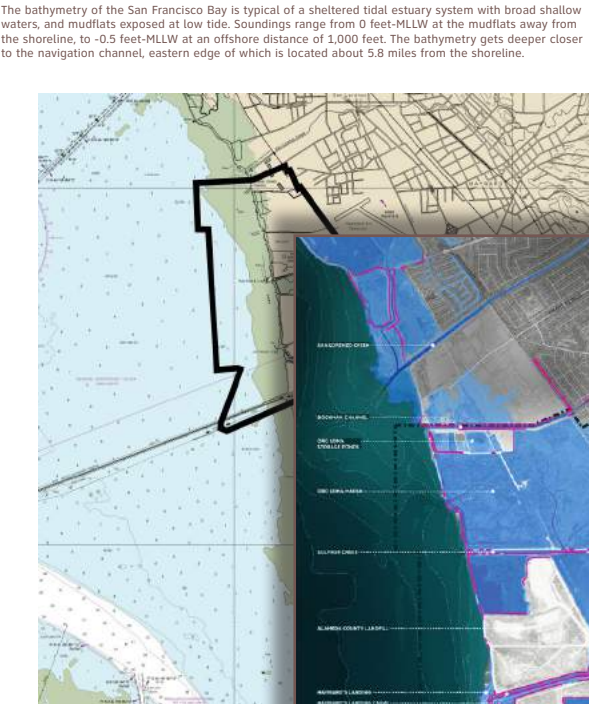
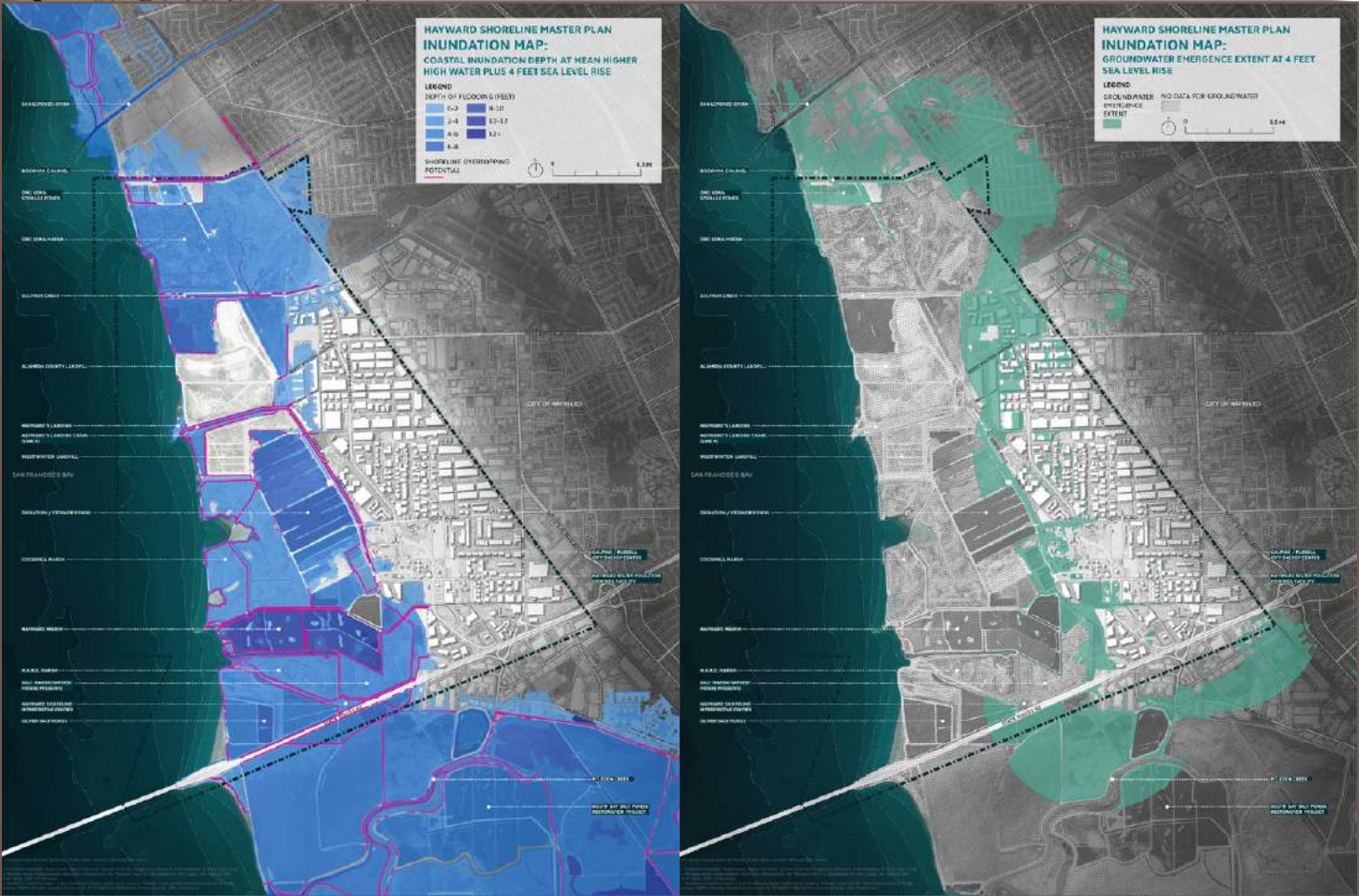
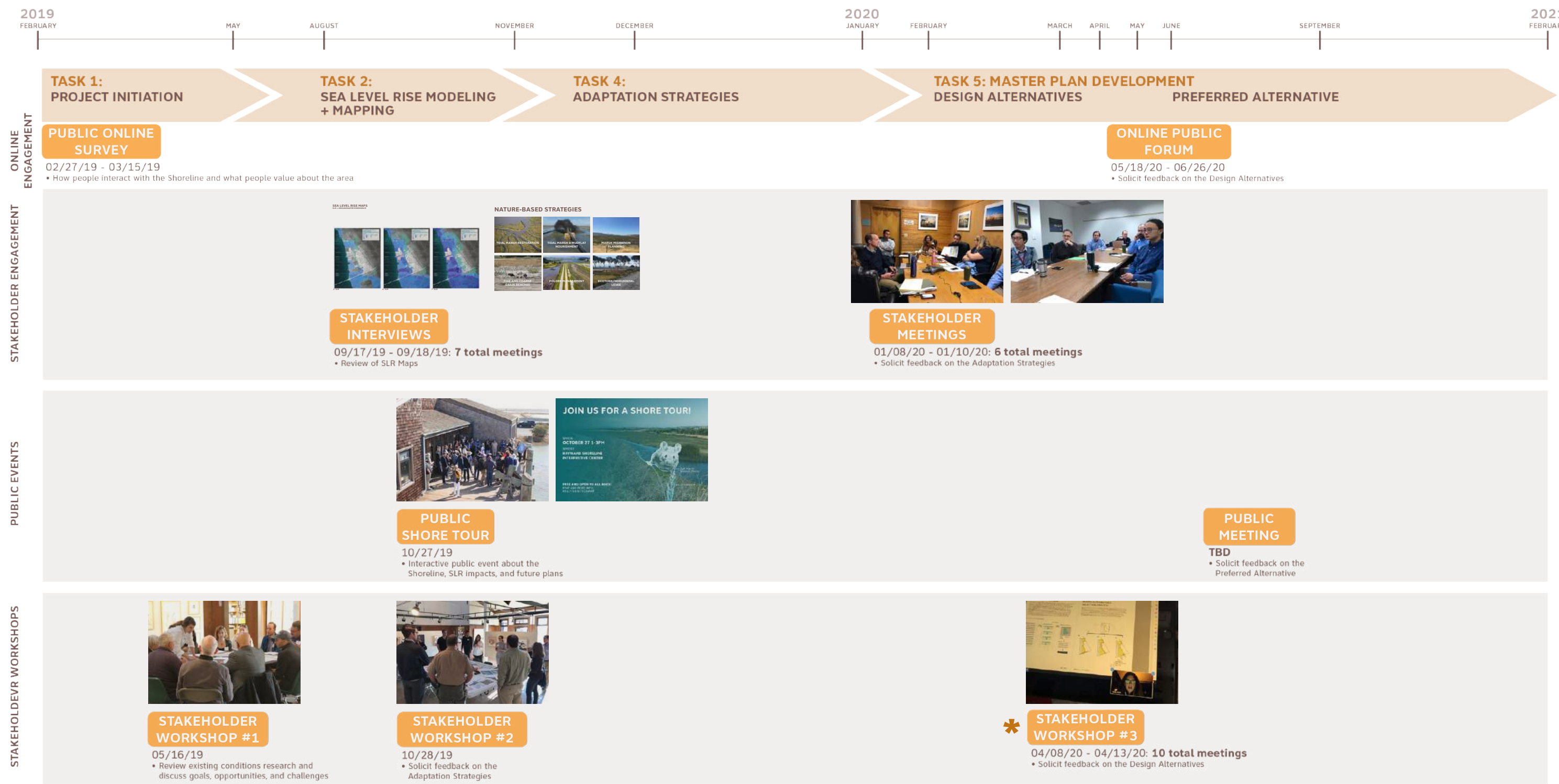


Figure 3: Excerpt of Nautical Chart 18651 highlighting the areas shown in green.



TASK 3: PUBLIC OUTREACH

* Adaptation to virtual engagement due to COVID-19 pandemic (March 2020)



TASK 3: PUBLIC OUTREACH

- ONLINE SURVEY
- 13 STAKEHOLDER MEETINGS
- 3 STAKEHOLDER WORKSHOPS
- PUBLIC SHORE TOUR
- 2 ONLINE PUBLIC FORUMS



TASK 3: PUBLIC OUTREACH

- Final Public & Stakeholder comment period on project website from 10/12 - 11/30
- COH STACK ARTICLE
- LEAFLET NEWSLETTER
- COH SOCIAL MEDIA



TASK 4: PROJECT GOALS

- **CREATE A RESILIENT SHORELINE FOR PEOPLE AND ECOLOGY**
- **ENHANCE THE SHORELINE ENVIRONMENT TO REDUCE RISK TO CRITICAL INFRASTRUCTURE AND BUILT ASSETS**
- **BUILD SOCIAL RESILIENCE IN THE COMMUNITY**
- **BUILD CAPACITY FOR FUTURE GENERATIONS TO ADAPT TO CLIMATE CHANGE**

TASK 4: ADAPTATION RESPONSES

Adaptation Strategies Report

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TASK 4

GOALS AND POLICIES ME

ADAPTATION STRATEGIES

SUBMITTED 02/21/2020

PROJECT GOALS

PROJECT STATEMENT:

The Hayward Regional Shoreline Master Plan creates a framework for resilience to prepare for sea level rise (SLR), groundwater intrusion, and storm surge. The Master Plan is being managed by the Hayward Area Shoreline Planning Agency (HASPA), a joint power authority including the City of Hayward, Hayward Area Recreation and Park District (HARD), and East Bay Regional Park District (EBRPD).

The Hayward Regional Shoreline Master Plan project area is bounded on the north by the Bockman Channel (also called the Bockman Canal) and extends approximately 3.25 miles south to the State Route 92 San Mateo Bridge approach. The extent of the project area into the Bay was defined by the outermost limit of the Hayward Area Shoreline Planning Agency Jurisdictional boundary, and the inland extent of the project area are drawn at the rail corridor. In total, the project area covers six square miles of various land uses, including open space, urban infrastructure, industrial, and residential.

The project area supports ecological bayland resources, hosts recreational opportunities along the San Francisco Bay Trail, and facilitates educational programming for adjacent residential neighborhoods and businesses at the Hayward Shoreline Interpretive Center. The shoreline is also home to critical urban infrastructure, including wastewater treatment plants, the San Mateo-Hayward Bridge approach (State Route 92), and landfills. The Master Plan will develop various multi-benefit strategies for the shoreline, its existing infrastructure, and the surrounding natural habitat. The Master Plan will consider multiple planning time horizons and sea level rise scenarios. Additionally, it will consider a range of adaptation strategies that can evolve and respond over time to changing sea levels.

The shoreline master plan encompasses four goals.

PROJECT GOALS

Create a Resilient Shoreline Environment for People and Ecology

- Enhance the shoreline's ecological value and adapt to sea level rise
- Enhance recreational opportunities and adapt to climate change
- Create a management framework for adapting to sea level rise over time
- Provide refuge to help endangered shoreline species to adapt climate change

Enhance the Shoreline Environment to Critical Infrastructure and Built Assets

- Align with and enhance existing management plans
- Reduce risk to regional critical utilities from sea level rise, groundwater intrusion, and flood events
- Reduce risk to transportation infrastructure from sea level rise, groundwater intrusion, and flood events
- Reduce risk to agency assets such as the San Mateo-Hayward Bridge, the Bay Trail and marsh restoration projects

Build Social Resilience in the Community

- Promote social equity, environmental justice, and community engagement
- Preserve the local economy and increase resilience
- Prevent the disruption of key community assets

Build Capacity for Future Generations

- Build organizational and community capacity
- Provide a place for education, interpretation, and recreation of the shoreline and climate change
- Foster stewardship of the shoreline's cultural resources

FINE AND COARSE GRAIN BEACHES

Option 1: Beaches in front of Landfills

GOAL / OBJECTIVE

Reduce the risk of erosion to the two landfills and enhance shoreline ecology with gravel nesting habitat.

DESCRIPTION

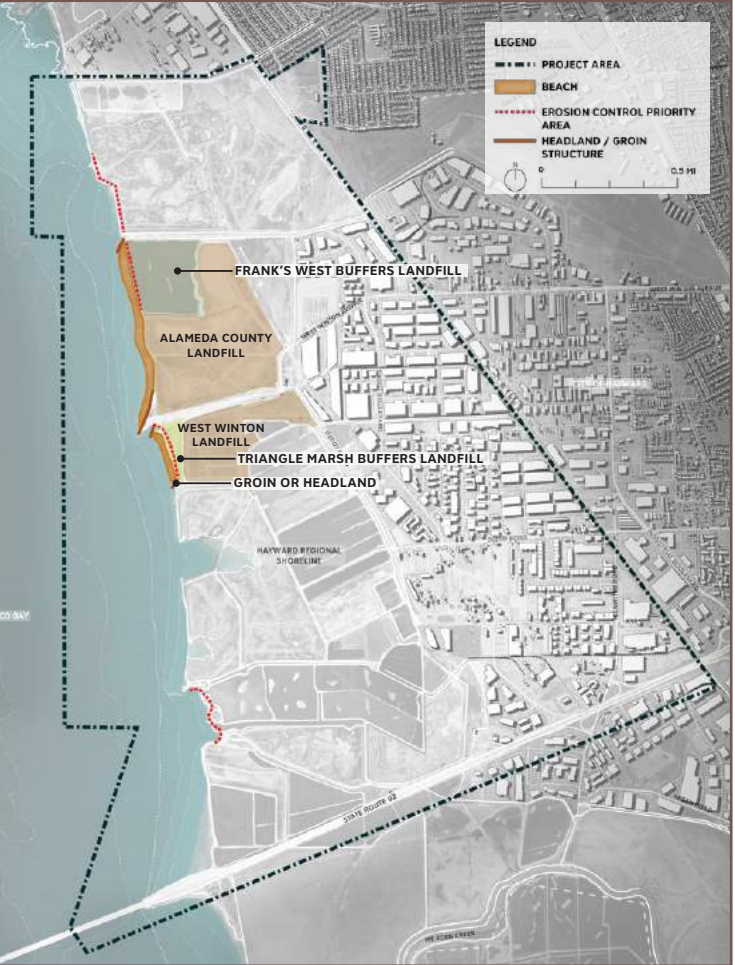
- Gravel beaches in front of Bay shoreline structures in front of Alameda County and West Winton Landfills

PROS

- Reduce erosion to landfill edges
- Reduce levee/berm maintenance adjacent to landfills
- Could enhance shorebird and beach habitat

CONS

- May require artificial replenishment
- May require the installation of lateral containment structures
- Considered as fill under current regulations, which might present permitting challenges



TASK 5: DRAFT MASTER PLAN - DESIGN ALTERNATIVES

Design Alternatives Report

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#1: CLOSER TO THE BAY

This alternative looks at an alignment for the line of protection that reduces risk for a larger portion of the shoreline with a more conservative line of protection aligned closer to the Bay.

In the north end of the project area, the line of protection ties back along the San Lorenzo Creek channel and wraps in front of Oro Loma WWTP to protect it in place. It then cuts through the middle of Oro Loma Marsh and ties back to high ground at the two existing landfills. In the south, the alignment then follows the western edge of the oxidation ponds and cuts immediately south through Hayward and HARD Marsh. A raised access road along SR-92 ties back to high ground at the intersection of Clawiter Road.

This line of protection transforms existing tidal marsh into a muted system, which will be harder to manage with rising sea levels and subsiding land.

The assumed planning elevation for the line of protection is 14.3' NAVD88. The final design flood elevation will require further study and cost analysis.



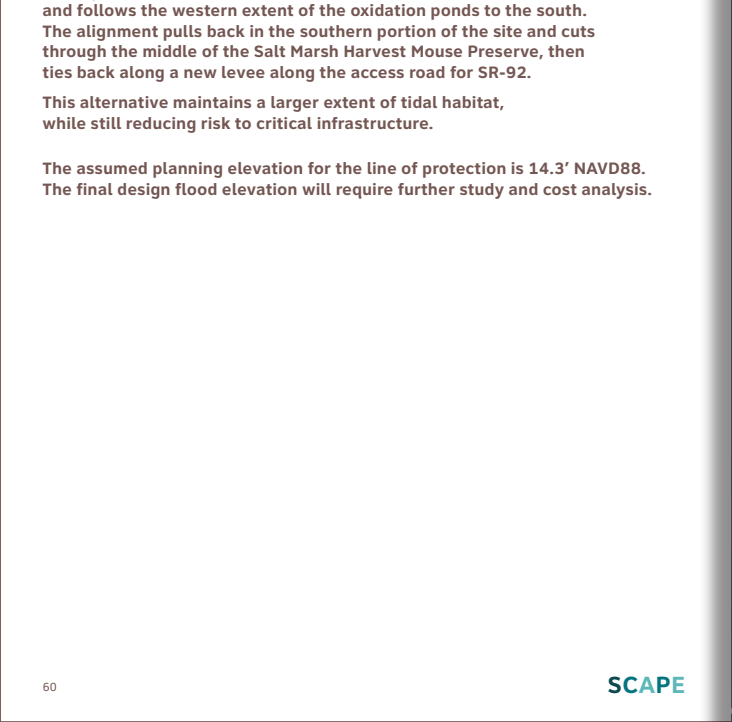
#2: DOWN THE MIDDLE

This alternative looks at an alignment that balances risk reduction and ecological enhancement with a line of protection that runs through the middle of the shoreline area.

The line of protection is pulled back in the north along the Union Pacific Rail Corridor and ties back to high ground at the San Lorenzo Creek channel. It then ties back to high ground at the two existing landfills and follows the western extent of the oxidation ponds to the south. The alignment pulls back in the southern portion of the site and cuts through the middle of the Salt Marsh Harvest Mouse Preserve, then ties back along a new levee along the access road for SR-92.

This alternative maintains a larger extent of tidal habitat, while still reducing risk to critical infrastructure.

The assumed planning elevation for the line of protection is 14.3' NAVD88. The final design flood elevation will require further study and cost analysis.



#3: FURTHER INLAND

This alternative explores an alignment that is pulled the furthest inland to maximize ecological restoration along the shoreline and layer risk reduction infrastructure.

In the north, the line of protection is pulled back along the Union Pacific Rail Corridor and ties back to high ground at the San Lorenzo Creek channel. It then aligns to the eastern edge of Frank's East and ties back to high ground at the two existing landfills. It is pulled to the east of the oxidation ponds and follows the eastern extent of the diked Baylands to the south before tying back to high ground with a levee parallel to SR-92 along Clawiter Road.

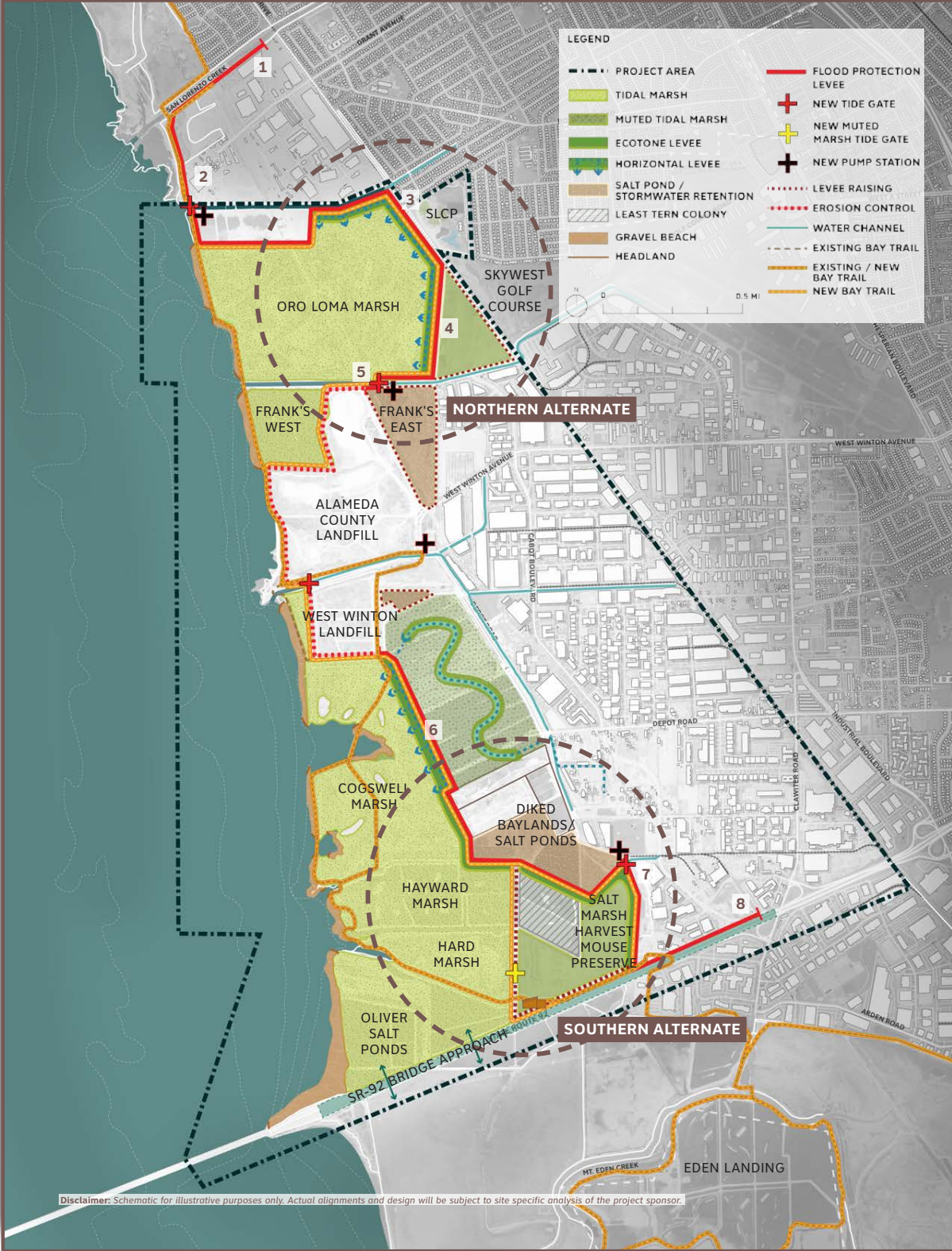
This alternative prioritizes a larger extent of connected tidal habitat that is Bayward of the line of protection and incorporates ecological and risk reduction infrastructure along a wider extent of Baylands.

The assumed planning elevation for the line of protection is 14.3' NAVD88. The final design flood elevation will require further study and cost analysis.



TASK 5: DRAFT MASTER PLAN - PREFERRED ALTERNATIVE

Preferred Alternative



PREFERRED ALTERNATIVE

A COORDINATED VISION FOR THE HAYWARD REGIONAL SHORELINE

The Preferred Alternative balances risk reduction and ecological enhancement to foster a robust and layered system of shoreline adaptation. This hybrid configuration is based upon stakeholder feedback received during the Design Alternatives process.

In the north end of the project area, the line of protection ties into existing levees along San Lorenzo Creek (1) and wraps in front of Oro Loma Wastewater Treatment Plant (2) to protect it in place before crossing Bockman Channel with a new tide gate. It then pulls back along the Union Pacific Rail Corridor (3), then aligns through the southeastern corner of Oro Loma Marsh (4) before crossing Sulphur Creek with a new tide gate and tying back to high ground at the two existing landfills (5). It then follows the western extent of the Wet Weather Storage ponds to the south (6). The alignment pulls back in the southern portion of the site to wrap the back of the Salt Marsh Harvest Mouse Preserve (7), then ties back along a new levee along the access road for SR-92 (8).

A large extent of tidal habitat is enhanced outboard of the line of protection. Tidal marshes, existing and restored, would be monitored over time with an adaptive management plan that could use sediment augmentation to sustain healthy mudflat and marsh elevations in strategic areas. New tidal marsh is restored at Frank's West and Hayward Marsh. Vulnerable ecosystems, like the Oliver Salt Ponds, would also be restored to tidal marshes as sea levels rise and make perimeter levee maintenance less feasible.

A layered system of erosion control measures utilizes gravel beaches to reduce the risk of erosion to levees that shelter the marshes behind. Bayside levees and interior levees would be retained in place to provide additional layered protection for as long as they are feasible to maintain. Erosion protection and subsurface cutoff along the two landfills reduces the risk of erosion and seepage.

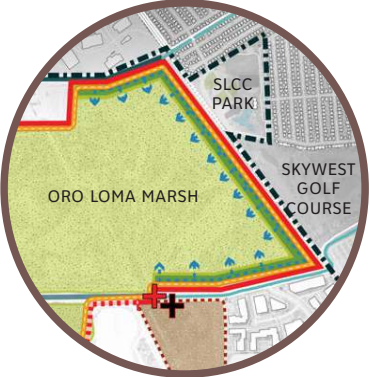
Inland detention ponds at Frank's East and the back portion of Oro Loma Marsh are utilized to hold stormwater before it is pumped to the Bay.

Critical wastewater treatment functions are maintained and enhanced at Oro Loma and Hayward Wastewater Treatment Plants with horizontal levees that outlet treated wastewater effluent across an ecotone slope. Hayward WPCF's existing functions are enhanced with a freshwater treatment marsh that provides nutrient removal and wet weather storage.

The Bay Trail is aligned to promote a diversity of experiences while reducing the risk of flooding.

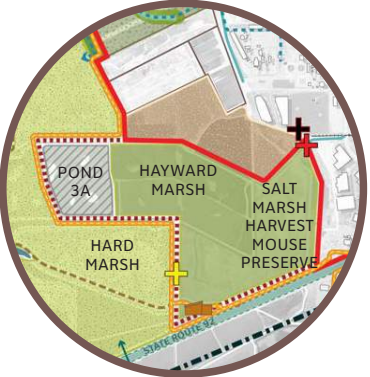
The Hayward Shoreline Interpretive Center is protected in place with interim levee raising and future adaptation could occur through the elevation of the building itself. Its location within a marsh maintains a direct connection to shoreline ecosystems. The San Lorenzo Community Park is also protected in place, but vulnerable to potential groundwater emergence.

Two alternate configurations are outlined below in two areas that may require additional flexibility to align with ongoing projects and permitting constraints.



Northern Alternate

- May be easier to permit since the LOP is outside of BCDC Jurisdiction but more expensive due to lack of stormwater storage capacity

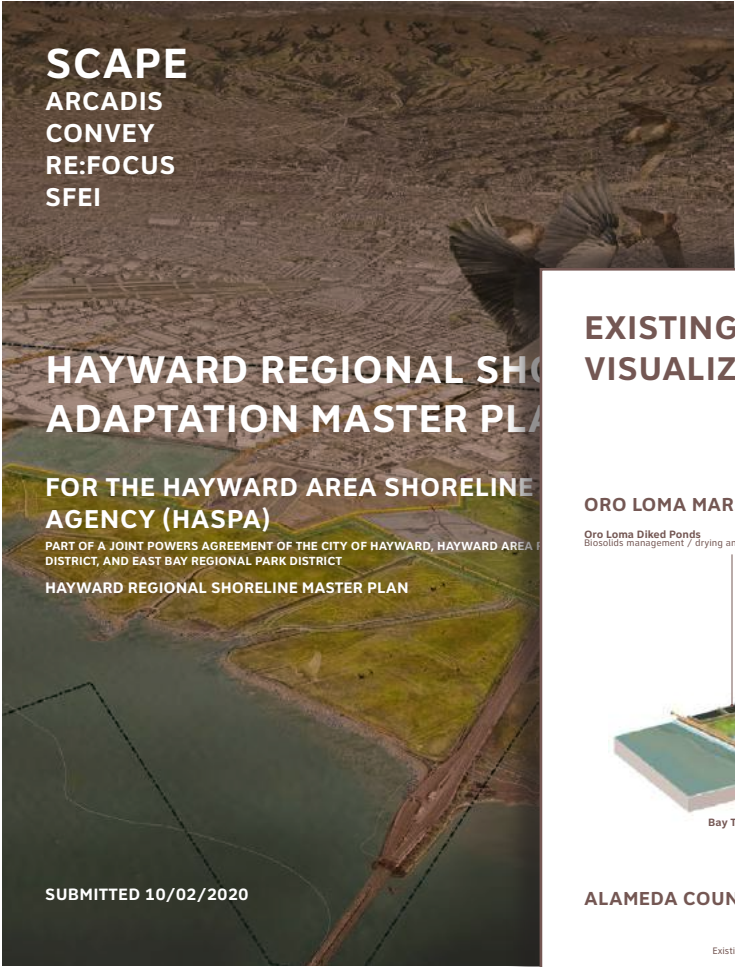


Southern Alternate

- Levee raising goes around Pond 3A (least tern nesting colony)

TASK 5: DRAFT MASTER PLAN - REPORT

Draft Master Plan Report

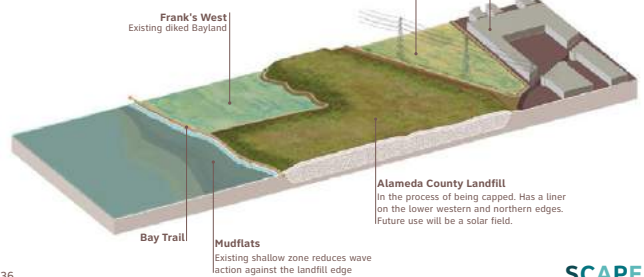


EXISTING CONDITIONS VISUALIZATIONS

ORO LOMA MARSH



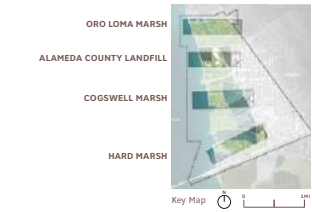
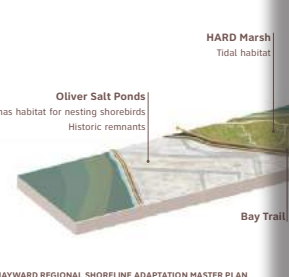
ALAMEDA COUNTY LANDFILL



COGSWELL MARSH



HARD MARSH



POLICY AND PROGRAMMATIC RECOMMENDATIONS

Achieving the master plan vision for the Hayward Regional Shoreline will require collective action on behalf of numerous stakeholders in Hayward and the Bay Area. The following recommendations for policy changes and development of new programs will, along with the structural projects outlined in the master plan, advance a forward-looking vision for the Hayward Regional Shoreline. These include policies that may be pursued by HASPA, its member agencies, as well as other stakeholders in the region. Some of the concepts outlined in this section can be advanced immediately as part of the early project phases, while others will take time to develop consensus among stakeholders and work towards implementation.

The Master Plan vision was shaped through research into existing plans and policies, as well direct engagement with stakeholders charged with planning for the future of the Hayward Regional Shoreline and the Bay Area. See chart on page 126 for a summary of relevant organizations, agencies, plans, and policies.

1. Advance regional dialogue into mechanisms for balancing the protection of at-risk communities and infrastructure and restoring ecosystems.

Key Stakeholders: HASPA, BCDC, ACFCD

There is broad support and consensus throughout the region on the need to plan for sea level rise with a focus on habitat restoration, and an evolving playbook on how to balance long-term, conflicting needs. Planning agencies, regulatory bodies, and infrastructure operators are well-aligned on the need to plan for sea level rise. While there is no clear answer on how to balance the needs of vulnerable infrastructure and communities with the opportunities to maintain and improve habitat, there are many active organizations focused on developing policies and plans to address all aspects of these issues.

HASPA should coordinate with the San Francisco Bay Conservation and Development Commission (BCDC) and other area stakeholders on using the Hayward Regional Shoreline Adaptation Master Plan as a case study in developing innovative solutions that balance these conflicting needs and developing guidance for how other stakeholders in the region can undertake similar processes.

Fully implementing the Master Plan will require an extensive permitting process. Recent reforms aimed at streamlining the process are positive signs, though they are focused on ecological restoration, and it is unclear how hybrid grey infrastructure approaches will be treated. In order to advance the Master Plan as well as similar approaches throughout the region, BCDC and other permitting agencies should coordinate on additional permitting reforms to balance near-term habitat impacts with long-term ecosystem health.

In addition, HASPA should coordinate with ACFCD and other stakeholders on how to integrate this Master Plan into their long-term plans for flood protection and stormwater management.

2. Increase flood protection standards for new construction and renovations.

Key Stakeholders: City of Hayward

A significant portion of Hayward's industrial district is at risk storm surge, sea level rise and groundwater emergence. Increasing standards for new construction means incorporating higher standards of flood protection to reduce risk to future development. Some areas may be removed from the floodplain following the construction of a FEMA-certified levee, however, additional code standards are still recommendation to serve as redundancy measures in the case of overtopping.

Hayward's current municipal code requires that the lowest floor in any new or substantial improvement of any residential structure to be at or above the Base Flood Elevation (BFE). The lowest floor of a nonresidential structure, including the basement, is required to be floodproofed so that the structure's walls located below the base flood level are substantially impermeable to the passage of water. To increase standards for new construction, an amount of "freeboard" or additional elevation above the BFE could be required and applied to all FIRM zones. These floodplain requirements also could be extended to the 500-year floodplain.

Additional improvements could include strengthening storage requirements for hazard materials in areas at risk from storm surge, as well as modifying stormwater management standards and incorporating additional requirements to manage rising groundwater tables.

These are several examples of how codes can be modified to advance the resiliency of future development to flooding. The City should pursue

a thorough review of its code standards to identify ways in which new buildings could be designed to withstand storm surge through floodproofing and manage more stormwater on site.

3. Remove regulatory impediments to higher standards of flood protection

Key Stakeholders: City of Hayward, BCDC, BRRIT

In Hayward, existing regulatory impediments may hinder enacting further resilience measures. These could include zoning height limits, permitting requirements and fees, and any unintended side effects of these policies. Removing regulatory impediments would make it easier, faster, and more affordable to adopt resilience measures.

Hayward's Industrial District encourages the development of industrial uses to promote a desirable and attractive working environment with a minimum disruption to surrounding properties. Currently under this zoning, there are no height limits in this area for industrial buildings. The maximum height for an office or commercial building is 40ft. Retaining walls which are not a part of walls of buildings shall not exceed 6 feet in height as measured from finished grade elevation to top of wall.

Hayward should review zoning code limits on buildings and walls to ensure that they would not pose a barrier to property pursuing floodproofing. Additional measures could include working alongside the San Francisco Bay Restoration Regulatory Integration Team (BRRIT) to improve the permitting process in terms of either shortening the length of providing technical assistance for the pre-application phase for flood management infrastructure.

4. Provide support for property owners to protect assets through loans, grants, and tax incentives.

Key Stakeholders: City of Hayward, State of California

A main deterrent to building resilient new construction projects or the retrofitting of existing buildings is funding. Funding in the form of loans, grants, and tax incentives will ensure more developers and property owners are able to promote resilient development. These funding mechanisms can be modeled after existing programs in California like water board brownfield remediation loans/grants or solar tax credits.

Brownfield remediation grant¹:

The Targeted Site Investigation Program (TSI) is funded by the United States Environmental Protection Agency (U.S. EPA). TSI Program has been part of California

Department of Toxic Substances Control (DTSC) CERCLA 128(a) State and Tribal Response Program Grant. DTSC provides environmental services to local governments, school districts, and non-profit organizations to facilitate the return of brownfields to safe and productive uses. The program focused on properties with a clear need for redevelopment, strong redevelopment potential, real or perceived contamination, and municipal/ community support for redevelopment. Assessment, investigation, and cleanup planning have been provided to over 100 projects, in 68 cities, and 30 counties, throughout the State of California.

Solar tax credits²:

The Investment Tax Credit (ITC) grants an amount of 26% of the purchase cost of your solar system to homeowners. A tax credit is a dollar-for-dollar reduction in the income taxes that a person or company would otherwise pay the federal government. The ITC is based on the amount of investment in solar property. Both the residential and commercial ITC are equal to 26 percent of the basis that is invested in eligible solar property which has begun construction through 2019.

Using the brownfield remediation grants and solar tax credits as example funding mechanisms, Hayward could work to develop and secure funding for resilient development.

5. Develop technical support and education to help industrial businesses understand risks from sea level rise and develop mitigation actions

Key Stakeholders: City of Hayward, private agencies, local non-profits, and community groups

In order to develop effective resilience measures within Hayward's industrial district, climate and flood risk must be broadly understood by stakeholders in the area. Providing technical support and education specifically to industrial businesses in the area may increase protection and reduce risk. Technical support and education may include awareness campaigns, community engagement, risk audits, risk modeling, and more.

Hayward could partner with organizations like The Business Resiliency Initiative (BRI) to promote resiliency plans for industrial businesses along the shoreline. BRI is a project launched by Valley Vision and its partners to increase the resilience of our regional economy by increasing the preparedness

Sources:
1. https://www.cdcr.org/DTSC_Fundings/State-Targeted-Site-Investigation-Program/TSI/TSI%20Program/About%20the%20TSI%20Program/About%20the%20Program
2. <https://solartechnology.com/blog/california-solar-tax-credits/#?ts=The%20Investment%20Tax%20Credit%20ITC%20Program%20and%20the%202019%202021>

- **246 page report**
 - Updates from board & agency review comments
 - Implementation Considerations
 - Phasing Plan
 - Implementable Projects
- **Appendix A: Stakeholder & Public Comments**
- **Appendix B: Cost Estimates**

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HAYWARD REGIONAL SHORELINE ADAPTATION MASTER PLAN

**FOR THE HAYWARD AREA SHORELINE PLANNING
AGENCY (HASPA)**

PART OF A JOINT POWERS AGREEMENT OF THE CITY OF HAYWARD, HAYWARD AREA RECREATION AND PARK
DISTRICT, AND EAST BAY REGIONAL PARK DISTRICT

HAYWARD REGIONAL SHORELINE MASTER PLAN

SUBMITTED 10/02/2020

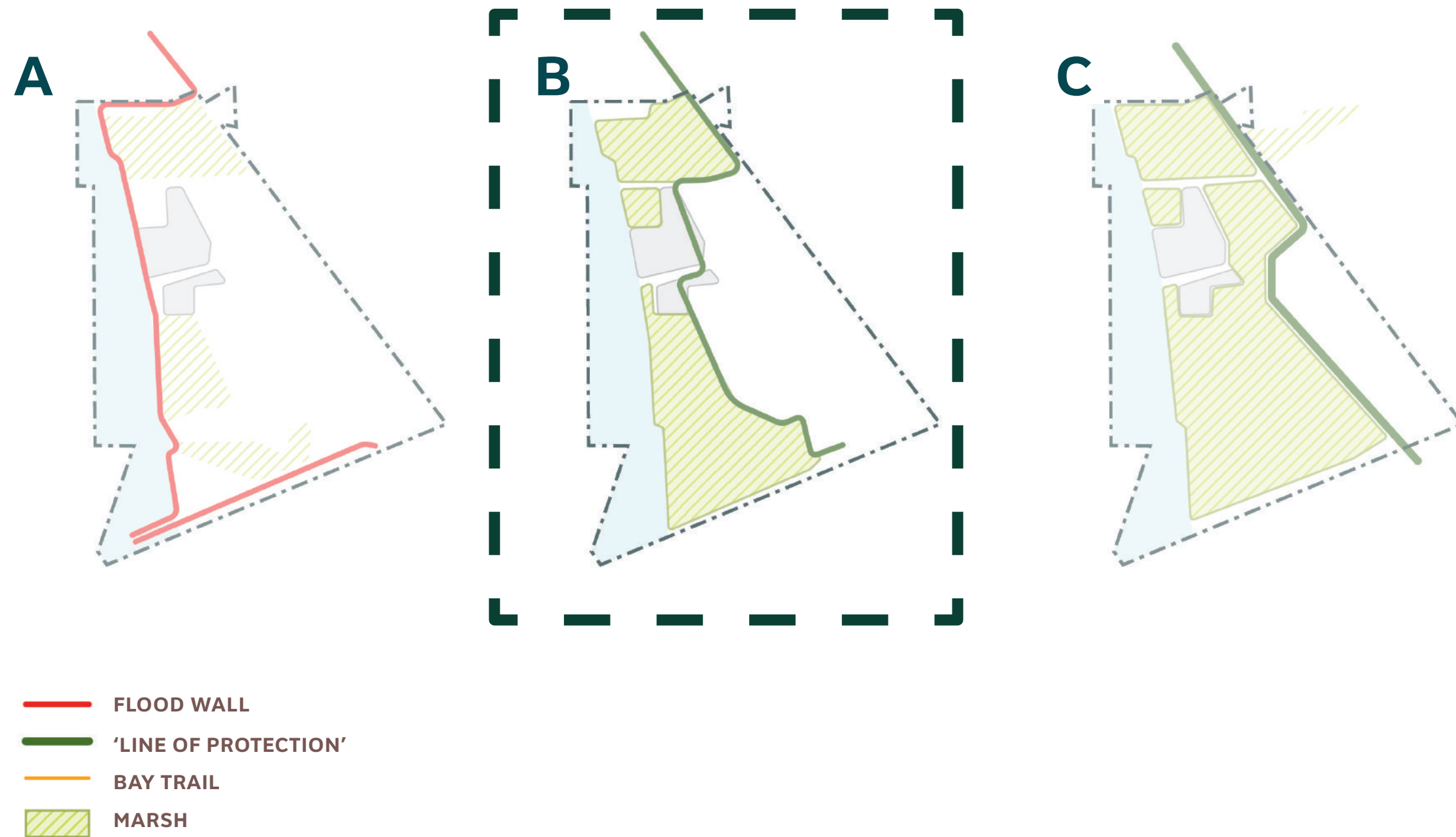
IMPLEMENTATION



MASTER PLAN ASSUMPTIONS

MASTER PLAN ASSUMPTIONS

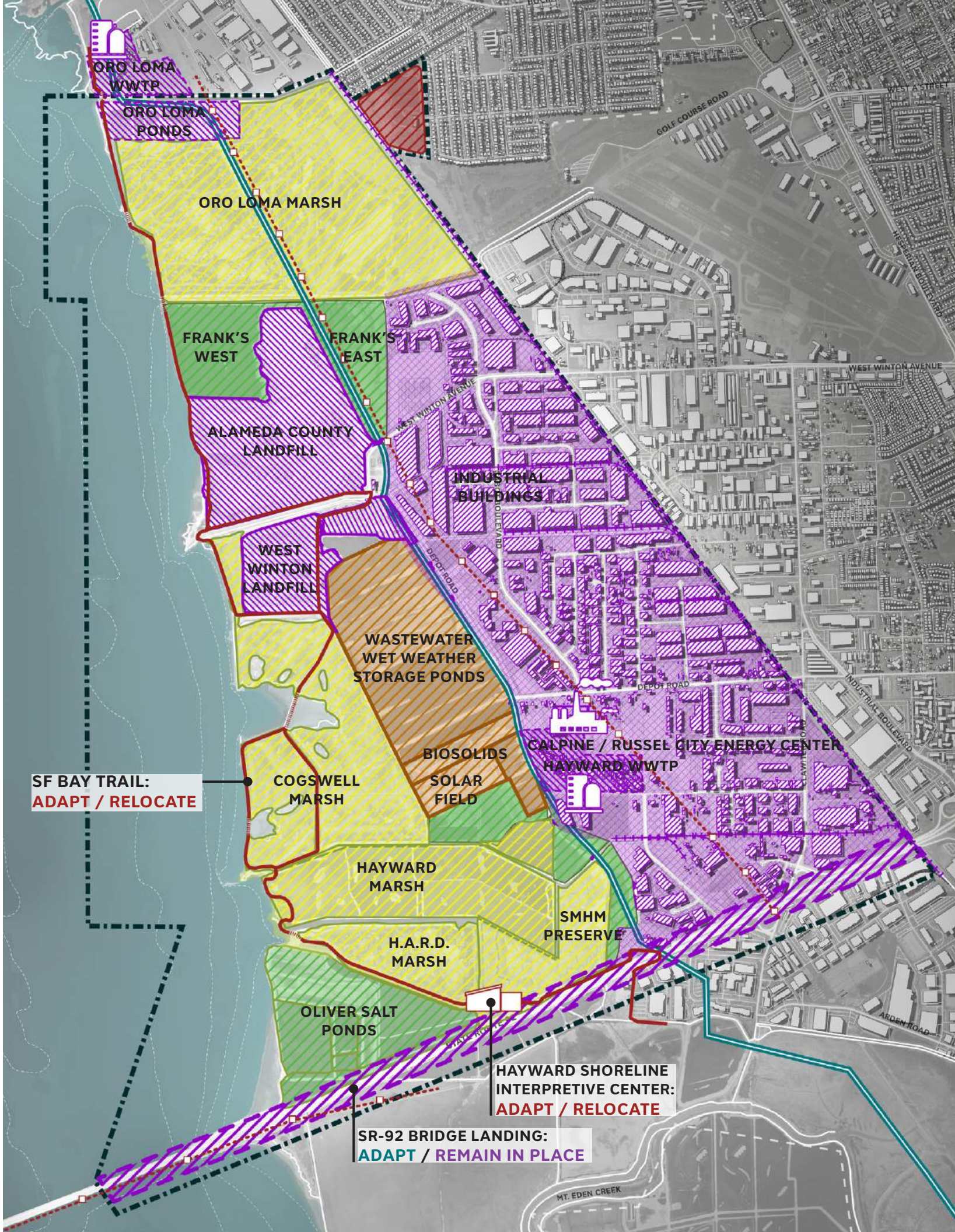
- Working towards feasible and implementable alternatives



STAKEHOLDER FEEDBACK

Compiled Assumptions

- REMAIN IN PLACE
- MAINTAIN CRITICAL USES
- ADAPT IN PLACE (NATURAL ASSET)
- ADAPT IN PLACE (BUILT ASSET)
- ADAPT / RELOCATE (NATURAL ASSET)
- ADAPT / RELOCATE (BUILT ASSET)



SEA LEVEL RISE SCENARIO

- While no target design elevation will be selected with this study, the project team has looked at a line of protection at **14.3' NAVD 88** for planning purposes only, to identify tie-back points and feasibility of a perimeter protection feature.

ACFCD FEMA CERTIFICATION				
BCDC POLICY				
SLR	MHHW + SLR	MHHW + SLR + 100 YEAR STORM	MHHW + SLR + 100 YEAR STORM + 2' FREEBOARD	MHHW + SLR + 500 YEAR STORM
0'	7'	10.3'	12.3'	11.3'
2'	9'	12.3'	14.3'	13.3'
4'	11'	14.3'	16.3'	15.3'
7'	14'	17.3'	19.3'	18.3'

MASTER PLAN DOCUMENT

A VISION FOR THE HAYWARD REGIONAL SHORELINE

The Hayward Shoreline Adaptation Master Plan envisions a diverse mosaic of Bayland environments that host recreational opportunities, facilitate educational programming, and support the continued operation of critical urban infrastructure.

As sea levels rise, this management framework establishes a targeted suite of design strategies and projects to facilitate shoreline adaptation over time. Continued collaboration across agencies, landowners, and the public will ensure the future success of this effort to make the Hayward Regional Shoreline more resilient to climate change and more accessible to all.

OLIVER SALT PONDS

Restored tidal habitat and Salinas Swap

SR-92 BRIDGE APPROACH

Causeway restores tidal connectivity

GRAVEL BEACHES

Outboard of existing levees

HARD MARSH

HAYWARD MARSH

Restored tidal habitat and least tern relocation

ECOTONE LEVEE

EXISTING BAY TRAIL

Maintained as long as possible and connected to the realignment

COGSWELL MARSH

EDUCATION STATIONS

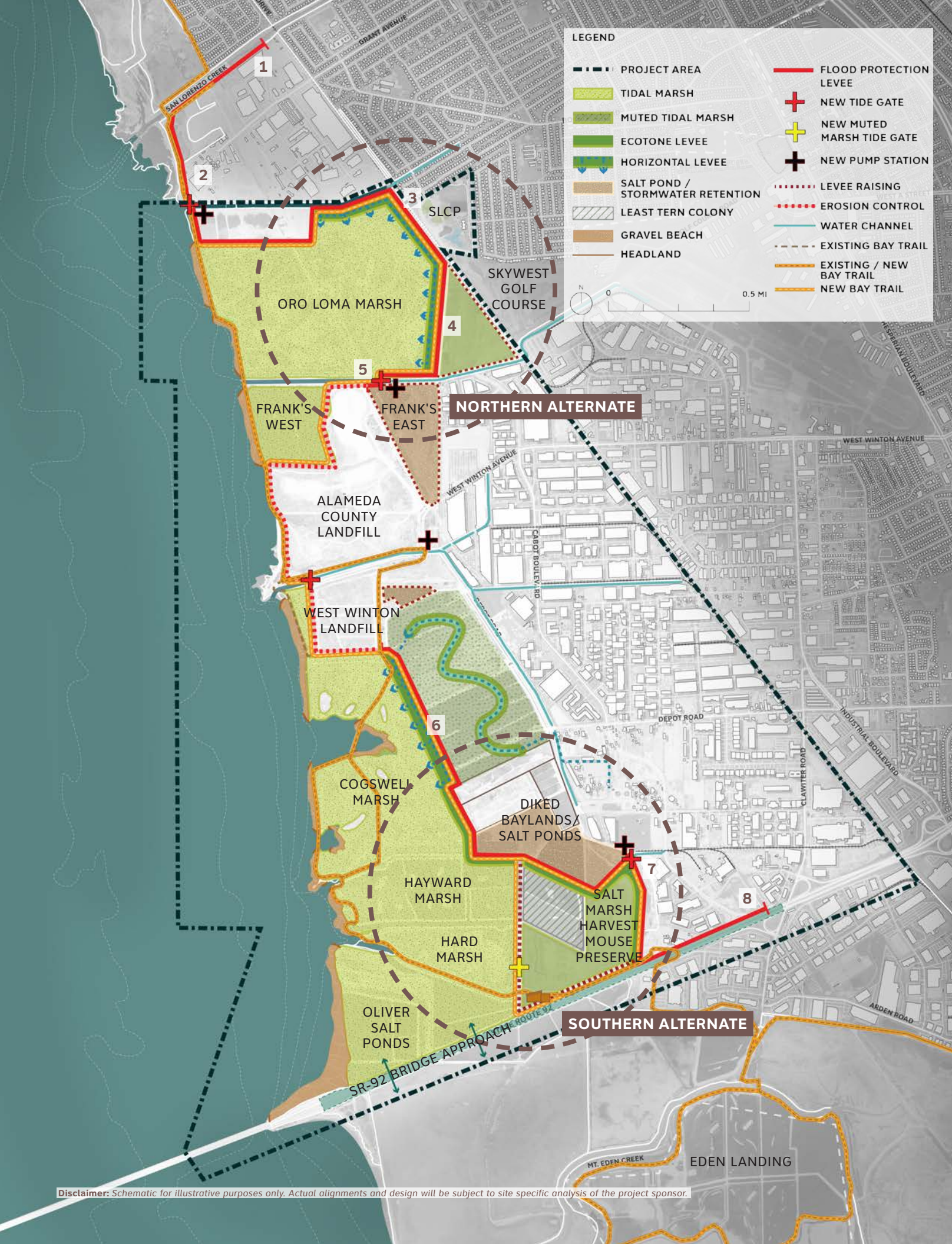
Highlight key educational features, including pilot projects, adaptation strategies, and monitoring of climate change impacts

HORIZONTAL LEVEE

Treated wastewater effluent discharge from Hayward WPCF, built inland of existing Wet Weather Storage pond levee

FRESHWATER TREATMENT MARSH

Nutrient removal and wet weather storage for Hayward WPCF



PREFERRED ALTERNATIVE

A COORDINATED VISION FOR THE HAYWARD REGIONAL SHORELINE

The Preferred Alternative balances risk reduction and ecological enhancement to foster a robust and layered system of shoreline adaptation. This hybrid configuration is based upon stakeholder feedback received during the Design Alternatives process.

In the north end of the project area, the line of protection ties into existing levees along San Lorenzo Creek (1) and wraps in front of Oro Loma Wastewater Treatment Plant (2) to protect it in place before crossing Bockman Channel with a new tide gate. It then pulls back along the Union Pacific Rail Corridor (3), then aligns through the southeastern corner of Oro Loma Marsh (4) before crossing Sulphur Creek with a new tide gate and tying back to high ground at the two existing landfills (5). It then follows the western extent of the Wet Weather Storage ponds to the south (6). The alignment pulls back in the southern portion of the site to wrap the back of the Salt Marsh Harvest Mouse Preserve (7), then ties back along a new levee along the access road for SR-92 (8).

A large extent of tidal habitat is enhanced outboard of the line of protection. Tidal marshes, existing and restored, would be monitored over time with an adaptive management plan that could use sediment augmentation to sustain healthy mudflat and marsh elevations in strategic areas. New tidal marsh is restored at Frank's West and Hayward Marsh. Vulnerable ecosystems, like the Oliver Salt Ponds, would also be restored to tidal marshes as sea levels rise and make perimeter levee maintenance less feasible.

A layered system of erosion control measures utilizes gravel beaches to reduce the risk of erosion to levees that shelter the marshes behind. Bayside levees and interior levees would be retained in place to provide additional layered protection for as long as they are feasible to maintain. Erosion protection and subsurface cutoff along the two landfills reduces the risk of erosion and seepage.

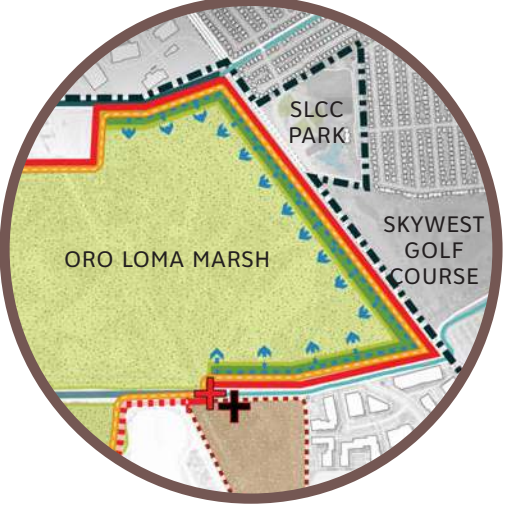
Inland detention ponds at Frank's East and the back portion of Oro Loma Marsh are utilized to hold stormwater before it is pumped to the Bay.

Critical wastewater treatment functions are maintained and enhanced at Oro Loma and Hayward Wastewater Treatment Plants with horizontal levees that outlet treated wastewater effluent across an ecotone slope. Hayward WPCF's existing functions are enhanced with a freshwater treatment marsh that provides nutrient removal and wet weather storage.

The Bay Trail is aligned to promote a diversity of experiences while reducing the risk of flooding.

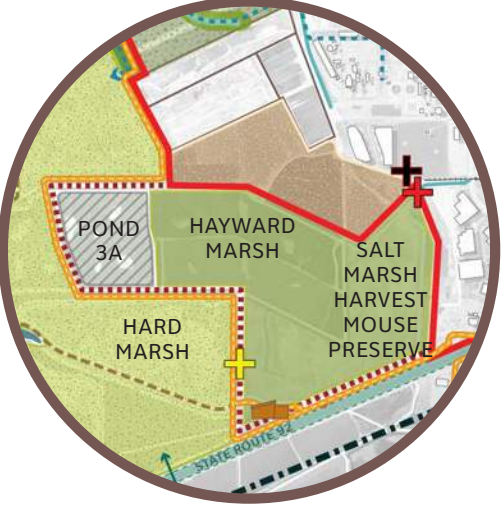
The Hayward Shoreline Interpretive Center is protected in place with interim levee raising and future adaptation could occur through the elevation of the building itself. Its location within a marsh maintains a direct connection to shoreline ecosystems. The San Lorenzo Community Park is also protected in place, but vulnerable to potential groundwater emergence.

Two alternate configurations are outlined below in two areas that may require additional flexibility to align with ongoing projects and permitting constraints.



Northern Alternate

- May be easier to permit since the LOP is outside of BCDC Jurisdiction but more expensive due to lack of stormwater storage capacity



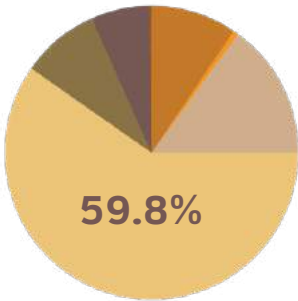
Southern Alternate

- Levee raising goes around Pond 3A (least tern nesting colony)

Disclaimer: Schematic for illustrative purposes only. Actual alignments and design will be subject to site specific analysis of the project sponsor.

PREFERRED ALTERNATIVE COST ESTIMATE

COST SUMMARY



COST ITEM			
	Bay Trail	\$806,541.00	0.2%
	Erosion Protection	\$42,742,368.38	9.3%
	Interpretive Center	\$3,180,000.00	0.7%
	Line of Protection	\$68,743,066.00	14.9%
	Stormwater Management	\$276,261,767.42	59.8%
	Tidal Habitat	\$40,575,864.33	8.8%
	Wastewater Treatment	\$29,424,500.00	6.4%
TOTAL (WITHOUT CONTINGENCY)		\$461,734,100	

TOTAL

COST ITEM	
SUBTOTAL	\$547,547,927
DESIGN (10%)	\$54,754,793
MOBILIZATION (7%)	\$38,328,355
TOTAL	\$640,631,075
CONTINGENCY (50%)	\$320,315,537
TOTAL (WITH CONTINGENCY)	\$960,946,600

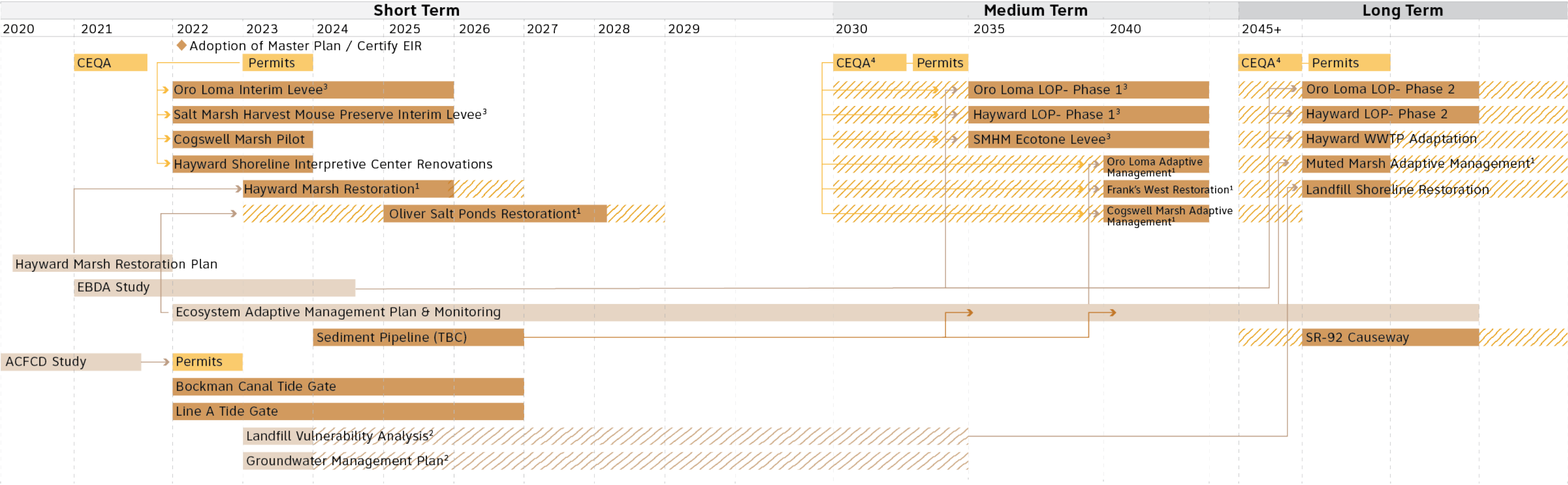
ANNUALIZED OPERATIONS & MAINTENANCE

COST ITEM	LOW END	HIGH END
Bay Trail	\$8,000	\$16,000
Erosion Control	\$427,000	\$854,000
Interpretive Center	\$64,000	\$96,000
Line of Protection	\$637,000	\$1,275,000
Stormwater Management	\$5,492,000	\$8,254,000
Tidal Habitat	\$299,000	\$596,000
Wastewater Treatment	\$806,000	\$1,210,000
TOTAL	\$7,733,000	\$12,301,000

PHASING STRATEGY

IMPLEMENTATION SCHEDULE

The Preferred Alternative is a long-term vision that will be broken down into discrete projects that will be phased over time. The projects identified in the Phasing Plan are initial recommendations, based on guidance from the Project Team. The actual time frames for each project will need to be flexible to align with design, permitting, funding, and construction timelines on a project basis.



Legend

Permitting

Design & Construction

Study, Monitoring

*Hatching represents timing flexibility, see foot notes for more information

Footnotes

¹ Timing dependent on rates of SLR, erosion and sediment accretion, to be monitored through this management plan

² Timing flexible, needed to inform medium and long term projects

³ Timing could be staggered with aligned projects, depending on funding and permitting

⁴ CEQA update dependent on changes in scope since EIR

ORO LOMA INTERIM LEVEE

PROJECT SUMMARY

This project is intended to protect the Oro Lomo wastewater treatment plant and surrounding industrial district from flooding. It includes a flood protection levee designed with meet today's 1% annual chance flood with allowance for mid-range sea level rise, but with a foundation system that allows for the levee to be elevated in the future to accommodate a higher elevation with sea level rise.

The project also includes a new Bay Trail spur extending inland from the shoreline and could provide a connection across the rail line to San Lorenzo Community Park.

A new tide gate and pump station on Bockman Canal is also proposed, which would be planned in coordination with ACFCD pending the results of their stormwater study.

PROJECT SITE & OWNERSHIP

The site is located in the northern reach of the study area. It is owned by the Oro Loma Sanitary District.

KEY STAKEHOLDERS

- HASPA
- City of Hayward
- Oro Lomo Sanitary District
- Bay Trail
- East Bay Regional Parks District

- Alameda County Flood Control District
- San Francisco Bay Conservation and Development Commission
- U.S. Army Corps of Engineers

PERMITTING ASSESSMENT

Regulators are likely to be supportive of the intent of this project, but the permitting process will be extensive.



COST ESTIMATE

High (>\$20 M.)

TIME FRAME

Short Term

FUNDING & FINANCING RECOMMENDATIONS

- **State of California Department of Water Resources Coastal Watershed Flood Risk Reduction**
<https://www.grants.ca.gov/grants/coastal-watershed-flood-risk-reduction-2/>
- **FEMA Building Resilient Infrastructure and Communities (BRIC)**
<https://www.fema.gov/grants/mitigation/building-resilient-infrastructure-communities>



SALT MARSH HARVEST MOUSE PRESERVE INTERIM LEVEE

PROJECT SUMMARY

This project is an interim levee designed to preserve important endangered species habitat, as well as some of the critical infrastructure inland of the site such as the Calpine / Russel City Energy Center and the Hayward Wastewater Treatment Plant. It is intended to protect against today's 1% annual chance flood and in the future will remain as a buffer from more frequent storm events while the long-term Hayward Line of Protection project located further inland will provide greater protection to inland critical infrastructure. The project includes levee raising west of the SMHM preserve from the Solar Fields to the SE corner of the SMHM Preserve. It is planned to run along the current levee alignments from the Hayward Interpretive Center through HARD Marsh. A new spur of the Bay Trail would be provided on top of the levee, which would connect back to the existing Bay Trail along the northern levee of Hayward Marsh.

PROJECT SITE & OWNERSHIP

- The project site is located in the southern reach of the study area, slightly inland from the Bay. East Bay Regional Parks District owns most of the site, with some portions owned by the City of Hayward.

KEY STAKEHOLDERS

- HASPA
- East Bay Regional Parks District
- City of Hayward
- Hayward Area Recreation and Park District

- Alameda County Flood Control District
- San Francisco Bay Conservation and Development Commission
- U.S. Army Corps of Engineers

PERMITTING ASSESSMENT

Regulators are likely to be supportive of the intent of this project, but the permitting process will be extensive. There will be special review regarding impacts on endangered species.



COST ESTIMATE

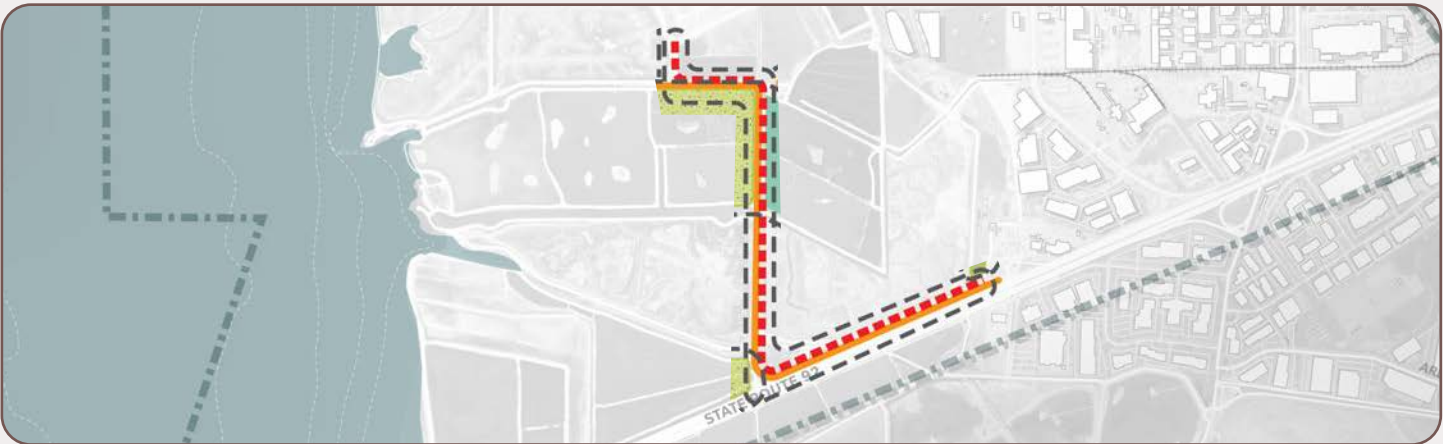
Medium (\$5-\$20 M.)

TIME FRAME

Short Term

FUNDING & FINANCING RECOMMENDATIONS

- **FEMA Building Resilient Infrastructure and Communities (BRIC)**
<https://www.fema.gov/grants/mitigation/building-resilient-infrastructure-communities>
- **CA Department of Fish and Wildlife Endangered Species Conservation and Recovery Grant Program**
<https://wildlife.ca.gov/Grants/Endangered-Species>



POLICY AND PROGRAMMATIC RECOMMENDATIONS

Achieving the master plan vision for the Hayward Regional Shoreline will require collective action on behalf of numerous stakeholders in Hayward and the Bay Area. The following recommendations for policy changes and development of new programs will, along with the structural projects outlined in the master plan, advance a forward-looking vision for the Hayward Regional Shoreline. These include policies that may be pursued by HASPA, its member agencies, as well as other stakeholders in the region. Some of the concepts outlined in this section can be advanced immediately as part of the early project phases, while others will take time to develop consensus among stakeholders and work towards implementation.

The Master Plan vision was shaped through research into existing plans and policies, as well direct engagement with stakeholders charged with planning for the future of the Hayward Regional Shoreline and the Bay Area. See chart on page 126 for a summary of relevant organizations, agencies, plans, and policies.

1. Advance regional dialogue into mechanisms for balancing the protection of at-risk communities and infrastructure and restoring ecosystems.

Key Stakeholders: HASPA, BCDC, ACFCD

There is broad support and consensus throughout the region on the need to plan for sea level rise with a focus on habitat restoration, and an evolving playbook on how to balance long-term, conflicting needs. Planning agencies, regulatory bodies, and infrastructure operators are well-aligned on the need to plan for sea level rise. While there is no clear answer on how to balance the needs of vulnerable infrastructure and communities with the opportunities to maintain and improve habitat, there are many active organizations focused on developing policies and plans to address all aspects of these issues.

HASPA should coordinate with the San Francisco Bay Conservation and Development Commission (BCDC) and other area stakeholders on using the Hayward Regional Shoreline Adaptation Master Plan as a case study in developing innovative solutions that balance these conflicting needs and developing guidance for how other stakeholders in the region can undertake similar processes.

Fully implementing the Master Plan will require an extensive permitting process. Recent reforms aimed at streamlining the process are positive signs, though they are focused on ecological restoration, and it is unclear how hybrid grey infrastructure approaches will be treated. In order to advance the Master Plan as well as similar approaches throughout the region, BCDC and other permitting agencies should coordinate on additional permitting reforms to balance near-term habitat impacts with long-term ecosystem health.

In addition, HASPA should coordinate with ACFCD and other stakeholders on how to integrate this Master Plan into their long-term plans for flood protection and stormwater management.

2. Increase flood protection standards for new construction and renovations.

Key Stakeholders: City of Hayward

A significant portion of Hayward’s industrial district is at risk storm surge, sea level rise and groundwater emergence. Increasing standards for new construction means incorporating higher standards of flood protection to reduce risk to future development. Some areas may be removed from the floodplain following the construction of a FEMA-certified levee, however, additional code standards are still recommendation to serve as redundancy measures in the case of overtopping.

Hayward’s current municipal code requires that the lowest floor in any new or substantial improvement of any residential structure to be at or above the Base Flood Elevation (BFE). The lowest floor of a nonresidential structure, including the basement, is required to be floodproofed so that the structure’s walls located below the base flood level are substantially impermeable to the passage of water. To increase standards for new construction, an amount of “freeboard,” or additional elevation above the BFE could be required and applied to all FIRM zones. These floodplain requirements also could be extended to the 500-year floodplain.

Additional improvements could include strengthening storage requirements for hazard materials in areas at risk from storm surge, as well as modifying stormwater management standards and incorporating additional requirements to manage rising groundwater tables.

These are several examples of how codes can be modified to advance the resiliency of future development to flooding. The City should pursue

a thorough review of its code standards to identify ways in which new buildings could be designed to withstand storm surge through floodproofing and manage more stormwater on site.

3. Remove regulatory impediments to higher standards of flood protection

Key Stakeholders: City of Hayward, BCDC, BRRIT

In Hayward, existing regulatory impediments may hinder enacting further resilience measures. These could include zoning height limits, permitting requirements and fees, and any unintended side effects of these policies. Removing regulatory impediments would make it easier, faster, and more affordable to adopt resilience measures.

Hayward’s Industrial District encourages the development of industrial uses to promote a desirable and attractive working environment with a minimum disruption to surrounding properties. Currently under this zoning, there are no height limits in this area for industrial buildings. The maximum height for an office or commercial building is 40ft. Retaining walls which are not a part of walls of buildings shall not exceed 6 feet in height as measured from finished grade elevation to top of wall.

Hayward should review zoning code limits on buildings and walls to ensure that they would not pose a barrier to property pursuing floodproofing. Additional measures could include working alongside the San Francisco Bay Restoration Regulatory Integration Team (BRRIT) to improve the permitting process in terms of either shortening the length of providing technical assistance for the pre-application phase for flood management infrastructure.

4. Provide support for property owners to protect assets through loans, grants, and tax incentives.

Key Stakeholders: City of Hayward, State of California

A main deterrent to building resilient new construction projects or the retrofitting of existing buildings is funding. Funding in the form of loans, grants, and tax incentives will ensure more developers and property owners are able to promote resilient development. These funding mechanisms can be modeled after existing programs in California like water board brownfield remediation loans/grants or solar tax credits.

Brownfield remediation grant¹:

The Targeted Site Investigation Program (TSI) is funded by the United States Environmental Protection Agency (U.S. EPA). TSI Program has been part of California

Department of Toxic Substances Control (DTSC) CERCLA 128(a) State and Tribal Response Program Grant. DTSC provides environmental services to local governments, school districts, and non-profit organizations to facilitate the return of brownfields to safe and productive uses. The program focused on properties with a clear need for redevelopment, strong redevelopment potential, real or perceived contamination, and municipal/ community support for redevelopment. Assessment, investigation, and cleanup planning have been provided to over 100 projects, in 68 cities, and 30 counties, throughout the State of California.

Solar tax credits²:

The Investment Tax Credit (ITC) grants an amount of 26% of the purchase cost of your solar system to homeowners. A tax credit is a dollar-for-dollar reduction in the income taxes that a person or company would otherwise pay the federal government. The ITC is based on the amount of investment in solar property. Both the residential and commercial ITC are equal to 26 percent of the basis that is invested in eligible solar property which has begun construction through 2019.

Using the brownfield remediation grants and solar tax credits as example funding mechanisms, Hayward could work to develop and secure funding for resilient development.

5. Develop technical support and education to help industrial businesses understand risks from sea level rise and develop mitigation actions

Key Stakeholders: City of Hayward, private agencies, local non-profits, and community groups

In order to develop effective resilience measures within Hayward’s industrial district, climate and flood risk must be broadly understood by stakeholders in the area. Providing technical support and education specifically to industrial businesses in the area may increase protection and reduce risk. Technical support and education may include awareness campaigns, community engagement, risk audits, risk modeling, and more.

Hayward could partner with organizations like The Business Resiliency Initiative (BRI) to promote resiliency plans for industrial businesses along the shoreline. BRI is a project launched by Valley Vision and its partners to increase the resilience of our regional economy by increasing the preparedness

Sources:

1. [https://www.ocl.org/DTSC_Funding#.":text=Targeted%20Site%20Investigation%20\(TSI\)%20Program,school%20districts%20C%20and%20nonprofit%20organizations](https://www.ocl.org/DTSC_Funding#.)
2. [https://solaronline.com/blog/california-solar-tax-credit/#:text=The%20Investment%20Tax%20Credit%20\(ITC,down%20to%2022%25%20in%202021](https://solaronline.com/blog/california-solar-tax-credit/#:text=The%20Investment%20Tax%20Credit%20(ITC,down%20to%2022%25%20in%202021)

NEXT STEPS

NEXT STEPS

- Final Public & Stakeholder comment period on project website from 10/12 - 12/01



PROVIDE FEEDBACK ON THE MASTER PLAN HERE

PURPOSE OF MASTER PLAN

The **Hayward Regional Shoreline Adaptation Master Plan** was commissioned in 2019 by the **Hayward Area Shoreline Planning Agency (HASPA)** a joint powers agency consisting of representatives from the City of Hayward, East Bay Regional Park District (EBRPD), and Hayward Area Recreation and Park District (HARD).

The Master Plan will develop various multi-benefit strategies for the shoreline, its existing infrastructure, and the surrounding natural habitat in order to adapt to Sea Level Rise. Ultimately, it will act as a road map and help guide the development of future projects in a coordinated effort between state and local agencies, landowners, and the public. The Plan will be a forward looking tool for preparation, mitigation, and adaptation to climate change.



COMMENT FORM

The Design Team is now looking to collect feedback on the Master Plan Report. This will inform the finalization of the Final Master Plan document that will be used to guide the implementation of future adaptation projects.

Name (required)

Email (required)

General Comments: Do you have any comments on the final draft of the Master Plan Document?

What elements of the Master Plan you would prioritize in implementation and why?

☐ Yes, sign me up for email updates about the project and future events

Submit

THANK YOU!