



Natural Shoreline Infrastructure in Humboldt Bay for Intertidal Coastal Marsh Restoration and Transportation Corridor Protection

Technical Working Group Meeting #6
June 8, 2022



NFWF



OCEAN
PROTECTION
COUNCIL

Project Shoreline and Reference Marshes



Scope of Work

Tasks

Task 1: Grant Administration / Project Management

Task 2: Stakeholder Engagement and Consultation

Task 3: Site Assessment

3.1 – Topographic and bathymetric survey

3.2 – Sediment characterization

3.3 – Habitat evaluation and vegetation mapping

3.4 – Geomorphic evaluation

3.5 – Hydraulic analysis

Task 4: Preliminary Design

4.1 – Goals and objectives

4.2 – Options evaluation

4.3 – Engineering design

4.4 – Re-vegetation plan

4.5 – Access and staging plan

4.6 – Monitoring plan

4.7 – Habitat effects analysis

Task 5: Reporting

Timeline

Date	Key Milestones
August 3, 2020	<ul style="list-style-type: none"> • Technical working group meeting #1 (introduction)
December 15, 2020	<ul style="list-style-type: none"> • Technical working group meeting #2 (update on site assessment)
May 6, 2021	<ul style="list-style-type: none"> • Technical working group meeting #3 (draft goals and design options)
May 31, 2021	<ul style="list-style-type: none"> • Due date for receiving written comments on goals/objectives and preliminary design options
September 29, 2021	<ul style="list-style-type: none"> • Release draft report for site assessment and design options
October 12, 2021	<ul style="list-style-type: none"> • Technical working group meeting #4 (select apparent best option)
November 2021	<ul style="list-style-type: none"> • Site Visit (November 2nd) • Received Comments on Draft Existing Condition Report
February/March 2022	<ul style="list-style-type: none"> • Respond to Comments on Draft Existing Condition Report
March 18, 2022	<ul style="list-style-type: none"> • Technical working group meeting #5 (35% Design Progress Update)
May 20, 2022	<ul style="list-style-type: none"> • Release final draft and 50% design plans
June 8, 2022	<ul style="list-style-type: none"> • Technical working group meeting #6 (50% Design and Next Steps)
June 10, 2022	<ul style="list-style-type: none"> • Due date for receiving written comments on report and plans
June 30, 2022	<ul style="list-style-type: none"> • Finalize Report and Project Completion

Presentation Overview

1. Recap Design and Phasing
 - a) Design Criteria and Considerations
 - b) Design Components and Revegetation
 - c) Construction Phasing
 - d) Construction Cost
2. Post-Construction Monitoring & Management Framework
3. Ecosystem Services and Project Benefits
4. Permitting and Regulatory Considerations
5. Implementation Strategy and Next Steps

Recap Design Development



Recap Design Development: Key Design Considerations

1. Restore/enhance intertidal salt marsh habitat to be resilient to sea level rise and in equilibrium with hydraulic and geomorphic processes
2. Protect infrastructure (Humboldt Bay Trail and Highway 101) from wind-wave runup, overtopping flooding and erosion
3. Input from Technical Working Group (TWG) about minimizing the use of shoreline hardening, particularly from rock slope protection and compatibility with Bay Trail South
4. Desire for beneficial re-use of dredge spoils and timing of available fine sediment
5. Permitting, Constructability, Phasing/Scalability, ROW and Cost
6. Adaptability to SLR and compatible with a range of long-term backshore uses (i.e. elevated HWY 101, causeway, etc.)

Recap Design Development: Selected Apparent Best Alternative



EXISTING CONDITIONS



FUTURE CONDITIONS

Recap Design Development: Design Criteria

Salt Marsh Geometry

1. Sufficient width and elevation to dissipate wave energy and promote colonization of native marsh species.
2. Sufficient width and transitional zone that enhance sediment trapping and promotes deposition.

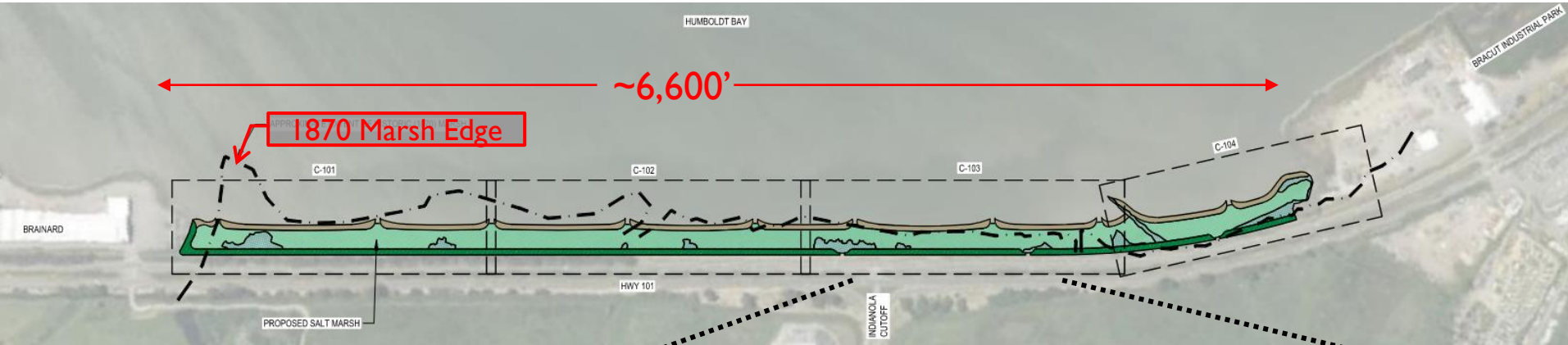
Stability

3. Provide initial stabilization of marsh edge until marsh vegetation is established.
4. Reduce susceptibility of long-term marsh edge erosion to wave energy.
5. Minimize lateral marsh edge erosion from tidal and wind generated currents at the interface with existing Bracut (north) and Brainard (south) levee rock slope protection.

Tidal Channel Network

6. Restore tidal exchange, sediment delivery and improve marsh drainage.

50% Design Concept: Design Components



EXISTING SALT MARSH



UPLAND / SALT MARSH
TRANSITIONAL SLOPE



NEW SALT MARSH



BARRIER / SHINGLE BEACH



ROCK SLOPE PROTECTION



TIDAL CHANNEL



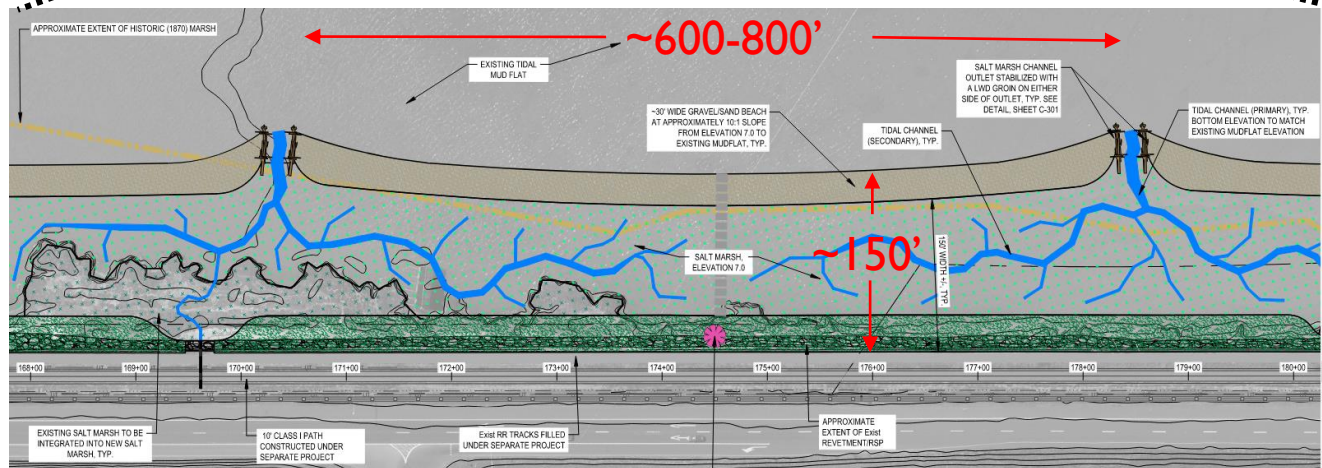
HISTORIC MARSH LIMIT



LARGE WOODY DEBRIS (LWD) GROIN



POTENTIAL NATURE STUDY
VIEWING AREA



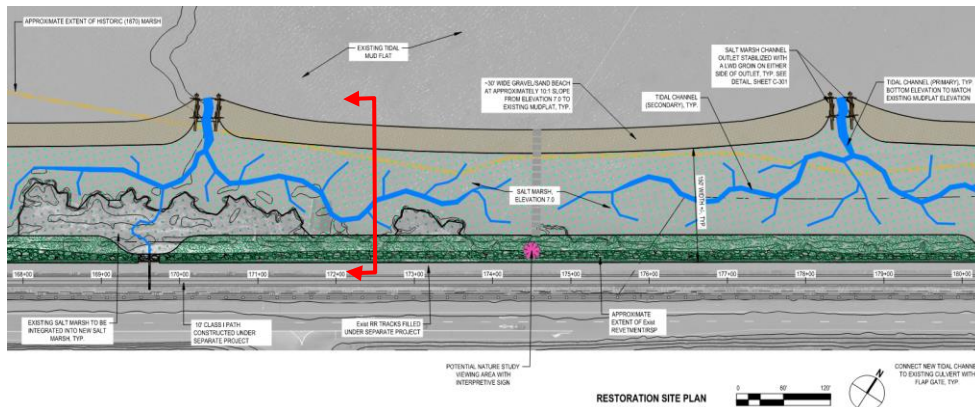
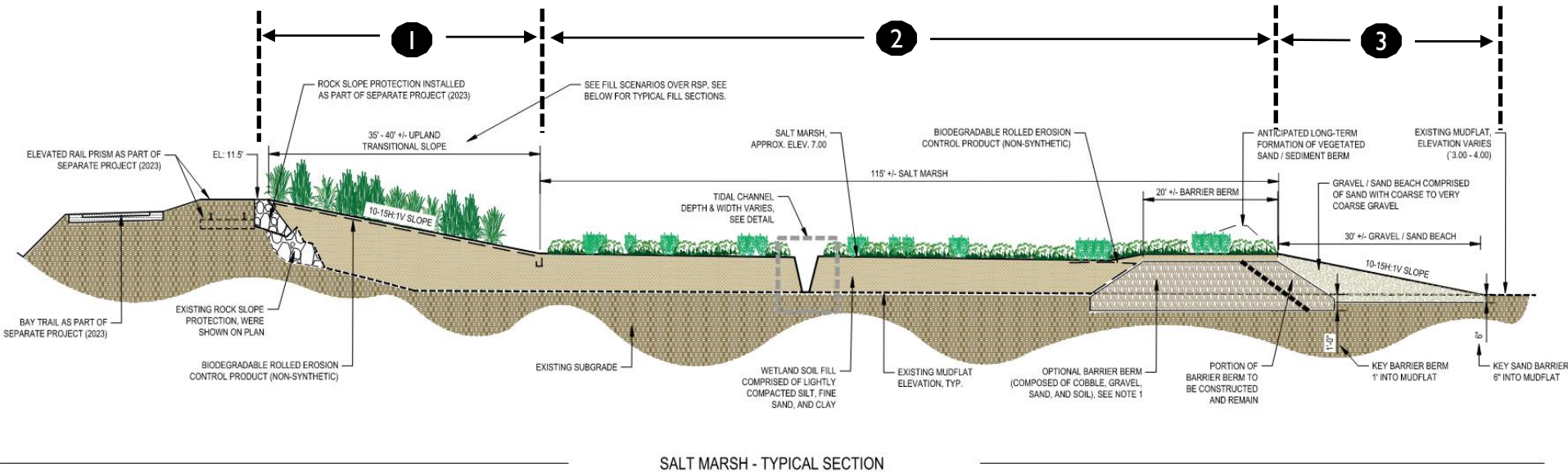
POTENTIAL NATURE STUDY
VIEWING AREA WITH
INTERPRETIVE SIGN

RESTORATION SITE PLAN



CONNECT NEW TIDAL CHANNEL
TO EXISTING CULVERT WITH
FLAP GATE, TYP.

50% Design Concept: Typical Cross-section



- 1** Transition Zone
- 2** Marsh Plain with Barrier Berm
- 3** Barrier/Shingle Beach

50% Design Concept: Transition Slope (High Marsh Ecotone)

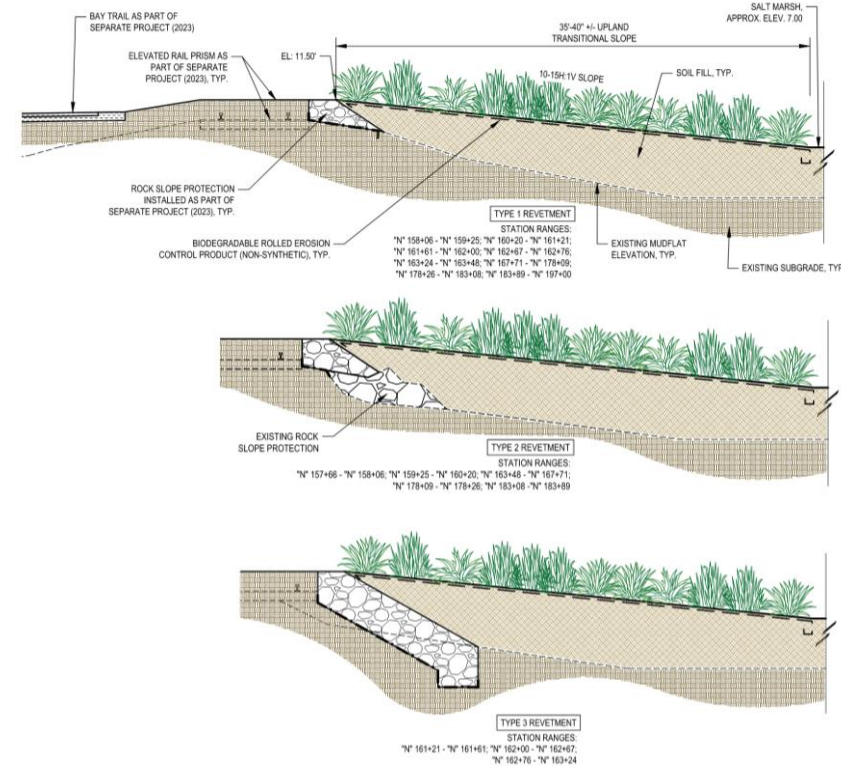
1. Elevation: 7-11ft (>MHHW)
2. Slope: ~10H:1V
3. Compatible with Humboldt Bay Trail South
4. Revegetation: Actively seeded, wetland plugs and biodegradable coir fabric

Seed Application

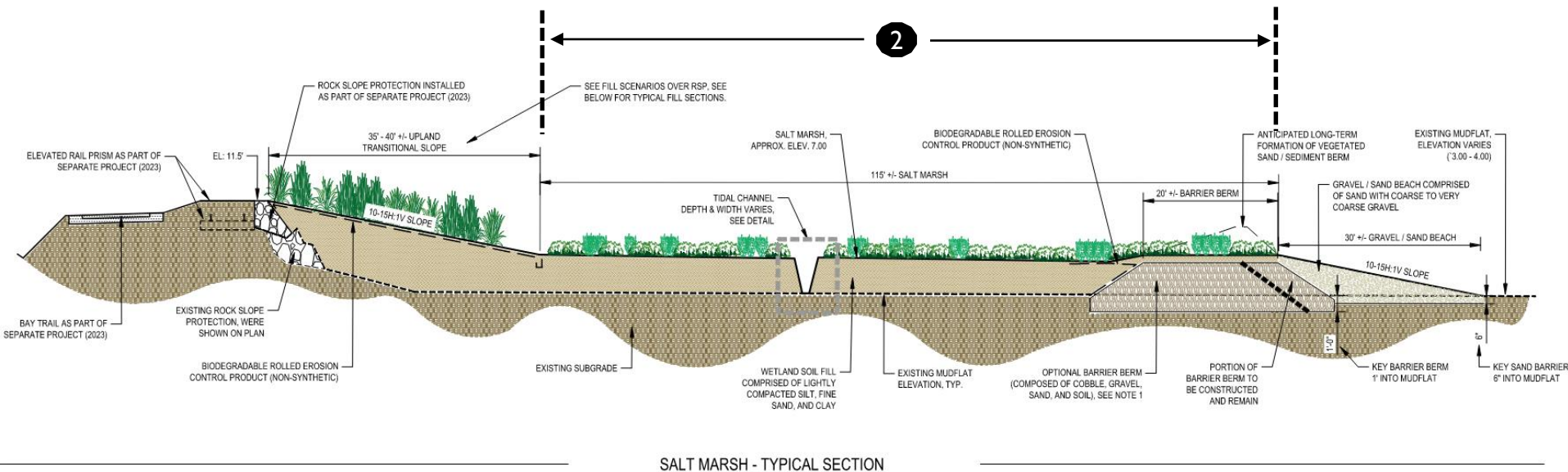
Common name	Scientific name	Lifeform	Pure Live Seed (PLS) Lbs/Acre
Cows clover	<i>Trifolium wormskioldii</i>	Perennial herb	1.0
Dune rush	<i>Juncus lescurii</i>	Perennial rush	1.5
Marsh gumplant	<i>Grindelia stricta</i>	Sub-shrub	2.0
Meadow barley	<i>Hordeum brachyantherum</i>	Perennial grass	15.0
Pacific aster	<i>Symphotrichum chilense</i>	Perennial herb	0.1
Seacoast angelica	<i>Angelica lucida</i>	Perennial herb	2.0
Tufted hairgrass	<i>Deschampsia caespitosa</i>	Perennial grass	12.0
Total			33.6

Plug Planting

Common name	Scientific name	Average Spacing (feet)	Percent of Total
Coastal gumplant	<i>Grindelia stricta</i> var. <i>stricta</i>	3	10
Pacific aster	<i>Symphotrichum chilense</i>	3-4	10
Pacific silverweed	<i>Potentilla anserina</i> ssp. <i>pacifica</i>	2-3	25
Salt rush	<i>Juncus lescurii</i>	3	20
Seacoast angelica	<i>Angelica lucida</i>	4	10
Tufted hair grass	<i>Deschampsia caespitosa</i> ssp. <i>beringensis</i>	3	25

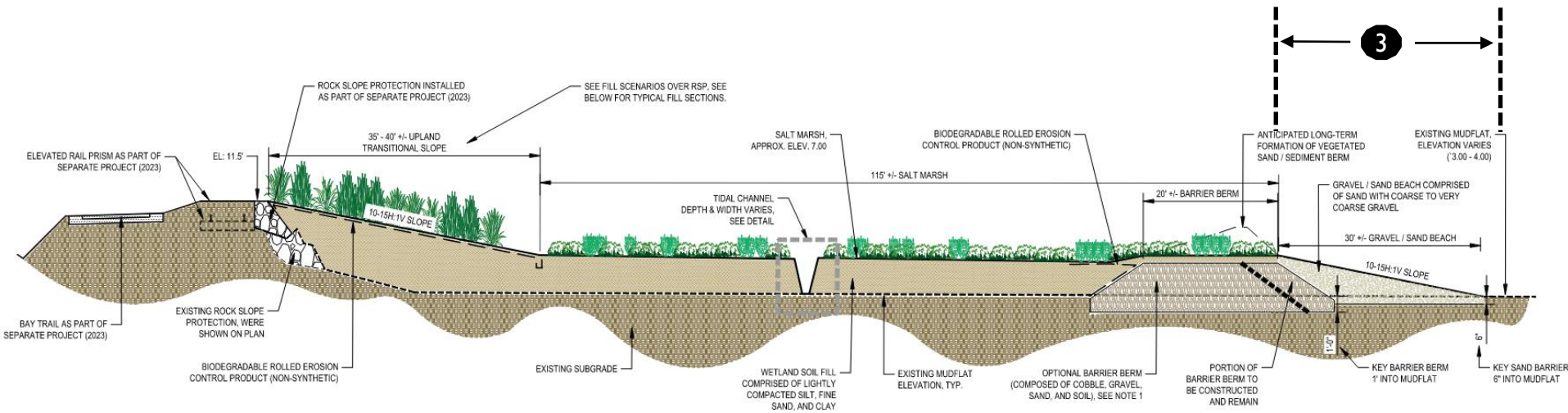


50% Design Concept: Salt Marsh and Barrier Berm



1. Elevation: ~7ft (~MHHW)
2. Revegetation: Natural (Passive) recruitment
3. Barrier berm comprised of sediment, sand, gravel/cobble

50% Design Concept: Coarse Sand & Gravel Barrier/Shingle Beach



SALT MARSH - TYPICAL SECTION

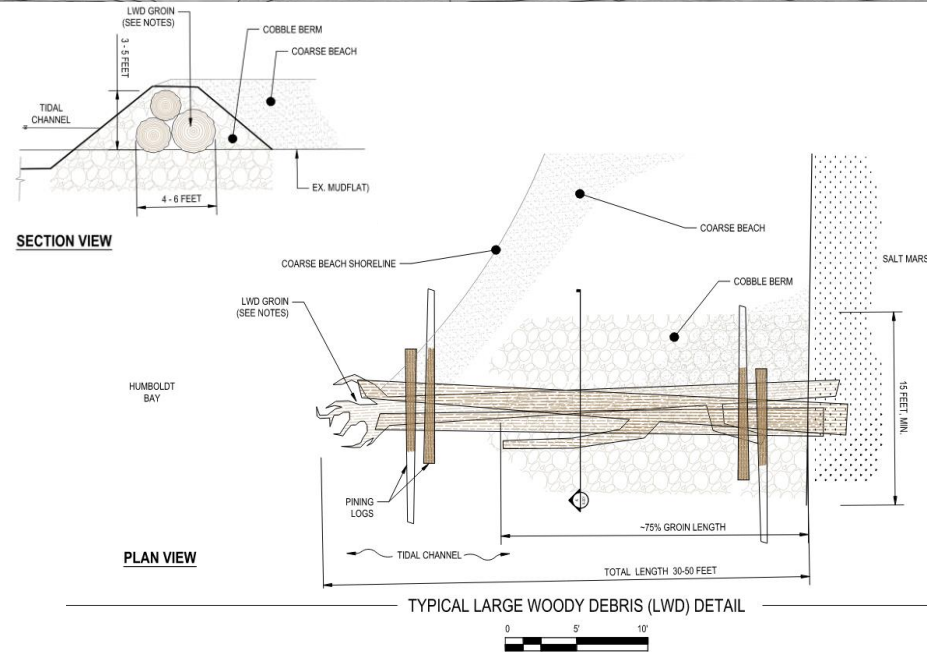
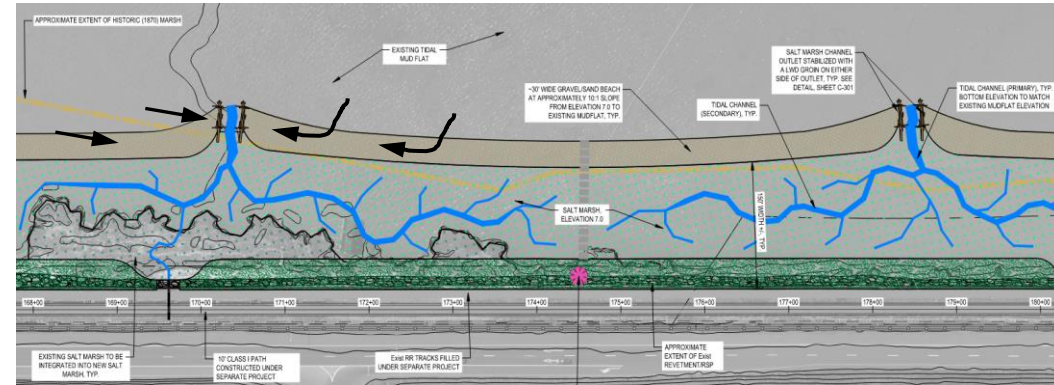


1. Elevation: ~7ft to Mudflat
2. Slope: ~10H:1V
3. Comprised of sand/gravel

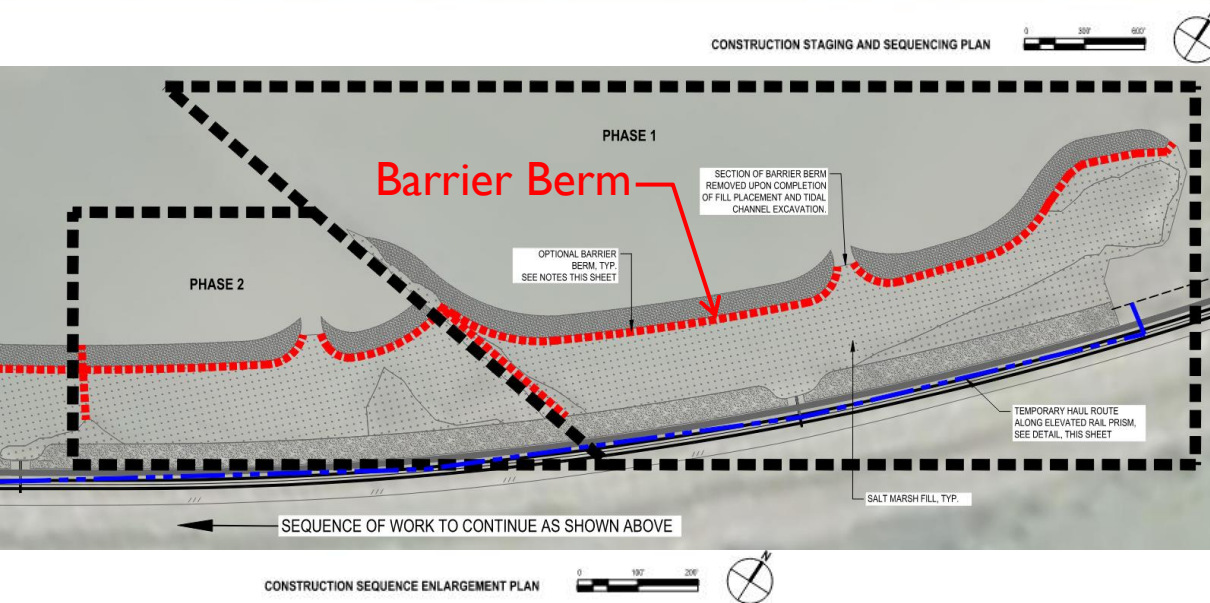
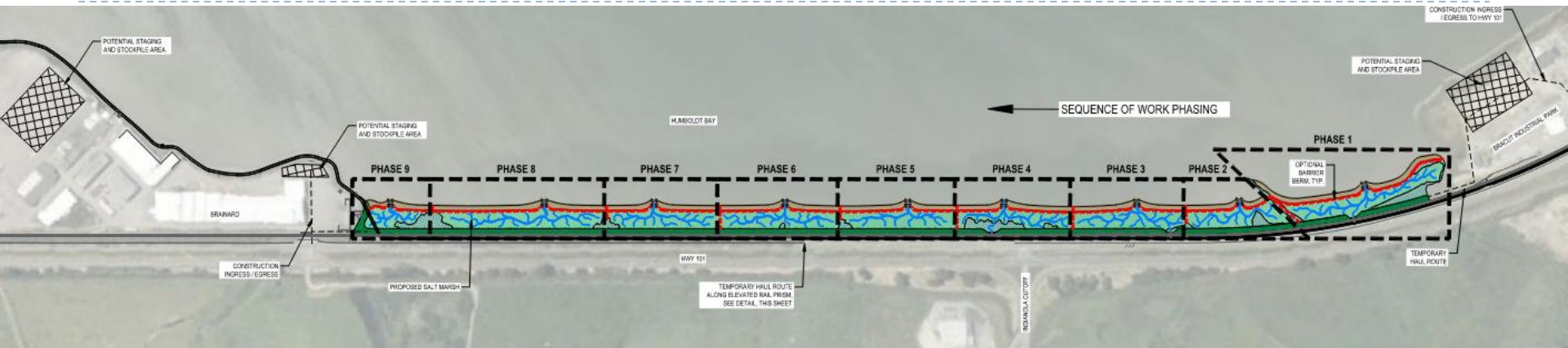


50% Design Concept: LWD Groins or Drift Sills

1. Comprised of LWD and Barrier Berm materials (Sediment/Sand/Gravel/Cobble)
2. Stabilized tidal channel mouth and retain gravel/sand beach materials from long-shore transport

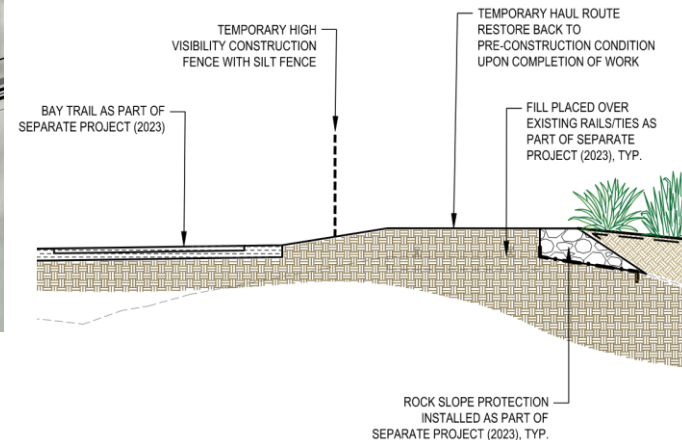


50% Design Concept: Construction Ingress/Egress and Phasing



NOTES:

1. CONSTRUCTION PHASING WILL BE SUBJECT TO AVAILABILITY OF SALT MARSH FILL. ACTUAL PHASING MAY VARY FROM THAT SHOWN.
2. BARRIER BERMS SHOWN ARE OPTIONAL AND MAY BE PLACED TO MAINTAIN THE SALT MARSH FILL AREA DEWATERED DURING CONSTRUCTION AND FOR MATERIAL HAUL ROUTES.
3. BARRIER BERMS PLACED MAY REMAIN IN PLACE FOLLOWING CONSTRUCTION.



Construction Cost (Entire Project)

Opinion of Probable Construction Cost



Client: County of Humboldt - Department of Public Works
 Project Title: Natural Shoreline Infrastructure (Brainard to Bracut)
 Status of Design: 50% Design

Date: 5/7/2022
 GHD Ref: 11214987

Item No.	Description	Unit	Quantity	Unit Cost		Total	
1	Mobilization and Demobilization (Estimated Approx. 4% of Subtotal)	LS	1	\$ 350,000.00	\$ 450,000.00	\$350,000	\$450,000
2	ROW for Staging/Stockpile Area and Notification/Signage	LS	1	\$100,000.00		\$100,000	
3	Water Management, Erosion/Sediment Control, and Environmental Protection	LS	1	\$200,000.00		\$200,000	
4	Construction Survey Staking	LS	1	\$75,000.00		\$75,000	
5	Clearing and Grubbing	LS	1	\$50,000.00		\$50,000	
6	Invasive Spartina Removal	LS	1	\$50,000.00		\$50,000	
7	Soil Fill for Salt Marsh Plain and Ecotone Transition (including tidal channel grading) ¹	CY	130,000	\$25.00	\$50.00	\$3,250,000	\$6,500,000
8	Gravel/Sand Mix for Shingle Beach	CY	20,000	\$100.00		\$2,000,000	
9	Cobble/Gravel/Soil Mix for Barrier Berm	CY	30,000	\$100.00		\$3,000,000	
10	LWD Groins	EA	16	\$10,000.00		\$160,000	
11	Biodegradable Rolled Erosion Control Netting	SQFT	530,000	\$0.50		\$265,000	
12	Fiber Rolls	LF	20,000	\$5.00		\$100,000	
13	Broadcast Native Seed	ACRE	6.1	\$10,000.00		\$61,000	
14	Install Wetland Plugs ²	ACRE	6.1	\$25,000.00		\$152,000	
15	Interpretative Areas (Benches and Signs)	LS	1	\$50,000.00		\$50,000	

	Lower	Upper
Construction Subtotal:	\$ 9,870,000	\$ 13,220,000
30% Estimating Contingency:	\$ 2,970,000	\$ 3,970,000
TOTAL CONSTRUCTION COST:	\$ 12,840,000	\$ 17,190,000

Planning, Engineering, and Environmental Compliance @ 20% (Lower) and 25% (Upper):	\$ 2,568,000	\$ 4,297,500
Construction Management and Administration @ 10% (Lower) and 15% (Upper):	\$ 1,284,000	\$ 2,578,500
TOTAL PROJECT COST³:	\$ 16,700,000	\$ 24,100,000

Post Construction Monitoring and Management (Assumed 3-years)⁴: \$ 150,000 \$ 300,000

Note:

¹ The total opinion of cost is highly sensitive to the unit cost of soil fill, thus a lower and upper unit cost range was provided to reflect the highly variable costs associated with procurement and transport.

² Wetland plug planting assumed for Transition Zone only with passive (natural) recruitment of salt marsh species on salt marsh plain.

³ This opinion reflects probable construction costs obtainable for the project location on the date this estimate was prepared. Due to inflation of labor, material and equipment costs and nature of construction cost volatility, prices may vary. Escalation of costs should be considered for future planning and use of this estimate.

⁴ Post construction monitoring cost assumed to require limited management actions and interventions.

Construction Cost (Phase 1)

Opinion of Probable Construction Cost (Phase 1 only)



Client: County of Humboldt - Department of Public Works
 Project Title: Natural Shoreline Infrastructure (Brainard to Bracut)
 Status of Design: 50% Design

Date: 6/6/2022
 GHD Ref: 11214987

Item No.	Description	Unit	Quantity	Unit Cost		Total	
1	Mobilization and Demobilization (Estimated Approx. 4% of Subtotal)	LS	1	\$ 120,000.00	\$ 130,000.00	\$120,000	\$130,000
2	ROW for Staging/Stockpile Area and Notification/Signage	LS	1	\$25,000.00		\$25,000	
3	Water Management, Erosion/Sediment Control, and Environmental Protection	LS	1	\$50,000.00		\$50,000	
4	Construction Survey Staking	LS	1	\$20,000.00		\$20,000	
5	Clearing and Grubbing	LS	1	\$10,000.00		\$10,000	
6	Invasive Spartina Removal	LS	1	\$10,000.00		\$10,000	
7	Soil Fill for Salt Marsh Plain and Ecotone Transition (including tidal channel grading) ¹	CY	20,000	\$25.00	\$50.00	\$500,000	\$1,000,000
8	Gravel/Sand Mix for Shingle Beach	CY	10,000	\$100.00		\$1,000,000	
9	Cobble/Gravel/Soil Mix for Barrier Berm	CY	10,000	\$100.00		\$1,000,000	
10	LWD Groins	EA	2	\$10,000.00		\$20,000	
11	Biodegradable Rolled Erosion Control Netting	SQFT	80,000	\$0.50		\$40,000	
12	Fiber Rolls	LF	20,000	\$5.00		\$100,000	
13	Broadcast Native Seed	ACRE	0.9	\$10,000.00		\$10,000	
14	Install Wetland Plugs ²	ACRE	0.9	\$25,000.00		\$23,000	
15	Interpretative Areas (Benches and Signs)	LS	1	\$10,000.00		\$10,000	

	Lower	Upper
Construction Subtotal:	\$ 2,940,000	\$ 3,450,000
30% Estimating Contingency:	\$ 890,000	\$ 1,040,000
TOTAL CONSTRUCTION COST:	\$ 3,830,000	\$ 4,490,000

Planning, Engineering, and Environmental Compliance @ 20% (Lower) and 25% (Upper):	\$ 766,000	\$ 1,122,500
Construction Management and Administration @ 10% (Lower) and 15% (Upper):	\$ 383,000	\$ 673,500
TOTAL PROJECT COST³:	\$ 5,000,000	\$ 6,300,000

Post Construction Monitoring and Management (Assumed 3-years)⁴: \$ 50,000 \$ 150,000

Note:

¹ The total opinion of cost is highly sensitive to the unit cost of soil fill, thus a lower and upper unit cost range was provided to reflect the highly variable costs associated with procurement and transport.

² Wetland plug planting assumed for Transition Zone only with passive (natural) recruitment of salt marsh species on salt marsh plain.

³ This opinion reflects probable construction costs obtainable for the project location on the date this estimate was prepared. Due to inflation of labor, material and equipment costs and nature of construction cost volatility, prices may vary. Escalation of costs should be considered for future planning and use of this estimate.

⁴ Post construction monitoring cost assumed to require limited management actions and interventions.

Cost Comparison: Phase 1 vs Entire Project

	Phase 1		Entire Project	
	Lower	Upper	Lower	Upper
Construction Subtotal:	\$ 2,940,000	\$ 3,450,000	\$ 9,870,000	\$ 13,220,000
30% Estimating Contingency:	\$ 890,000	\$ 1,040,000	\$ 2,970,000	\$ 3,970,000
TOTAL CONSTRUCTION COST:	\$ 3,830,000	\$ 4,490,000	\$ 12,840,000	\$ 17,190,000
Planning, Engineering, and Environmental Compliance @ 20% (Lower) and 25% (Upper):	\$ 766,000	\$ 1,122,500	\$ 2,568,000	\$ 4,297,500
Construction Management and Administration @ 10% (Lower) and 15% (Upper):	\$ 383,000	\$ 673,500	\$ 1,284,000	\$ 2,578,500
TOTAL PROJECT COST³:	\$ 5,000,000	\$ 6,300,000	\$ 16,700,000	\$ 24,100,000
Post Construction Monitoring and Management (Assumed 3-years) ⁴ :	\$ 50,000	\$ 150,000	\$ 150,000	\$ 300,000

Post-Construction Monitoring & Management Framework



Post-Construction Monitoring & Management Framework:

Key Questions:

1. How has the salt marsh and supporting components (coarse beach, LWD groins and transition slope) adjusted to waves and water levels over the monitoring period?
2. Does the restored salt marsh and supporting components provide habitat of similar value as nearby reference sites?
3. Does the natural shoreline infrastructure provide the ecosystem services and anticipated benefits?
4. Will the natural shoreline infrastructure be resilient and able to respond to sea level rise and future storms without the need for significant intervention?
5. What are some lessons learned that can be applied to future phases or other projects?

Post-Construction Monitoring & Management Framework:

1. Physical/Geomorphic

- a) Monitoring: Marsh elevation, tidal channel/shoreline geometry, LWD groin erosion/deposition, and wave heights (optional)
- b) Methods: Topographic Surveys/UAVs, Surface Elevation Tables (SETs), Photo-points
- c) Frequency: Annual and Following Extreme Events
- d) Management Triggers and Actions: TBD

2. Biological

- a) Monitoring: Vegetation and Avian Species Use
- b) Methods: Vegetation Transects/Quadrats and Photo-points
- c) Frequency: Annual and Seasonal
- d) Success Criteria, Management Triggers and Actions: TBD

3. Annual Reporting (minimum 5 years anticipated)



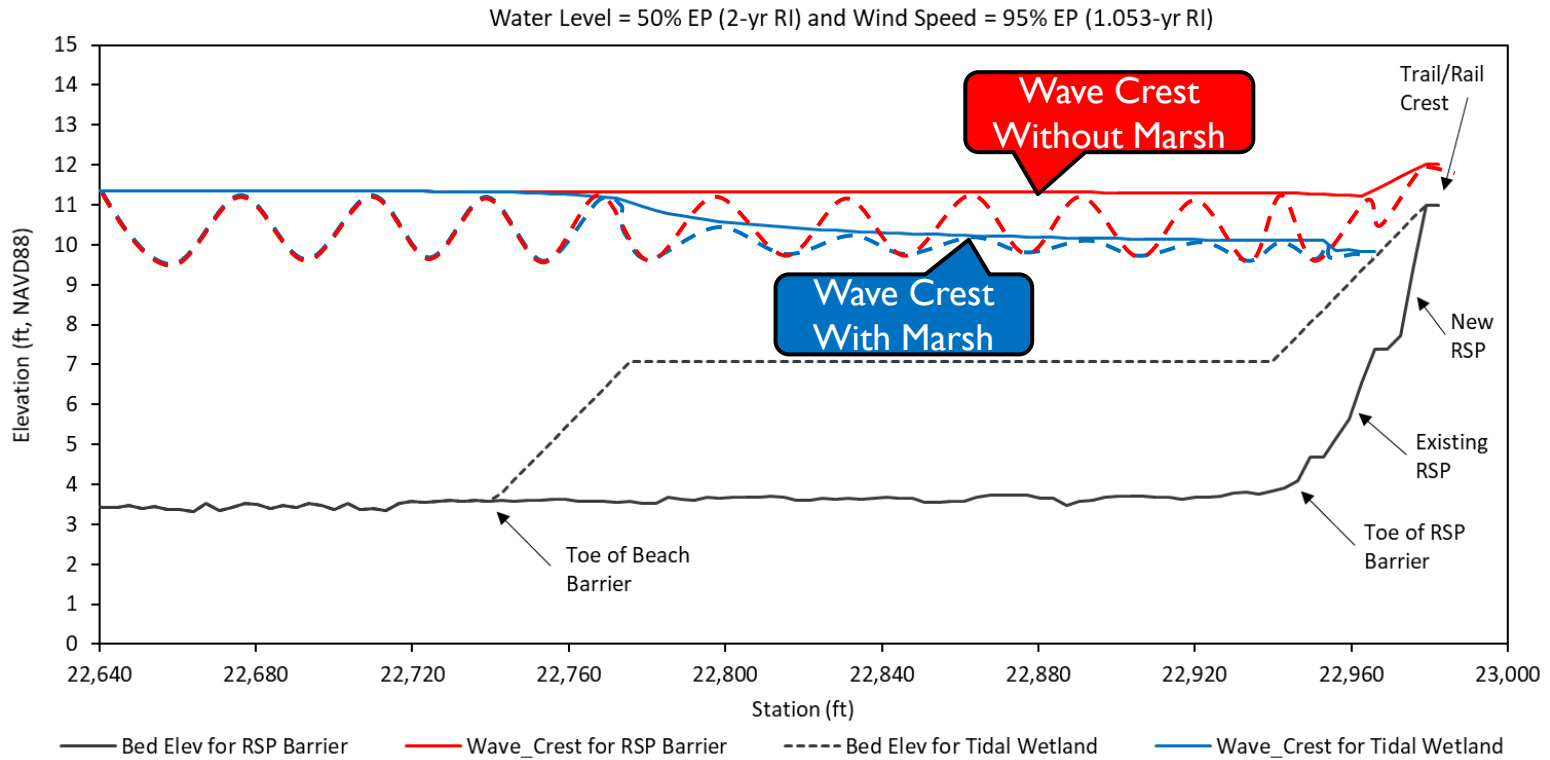
Ecosystem Services and Project Benefits



Ecosystem Services and Project Benefits:

1. Reduced Flooding and Erosion
2. Resilient to SLR and Adaptable to Future Long-Term Backshore Uses
3. Increased Habitat Diversification
4. Carbon Sequestration
5. Improved Water Quality
6. Nature Study Opportunities and Public Access Enhancements

Ecosystem Services and Project Benefits: Reduced Flooding and Erosion



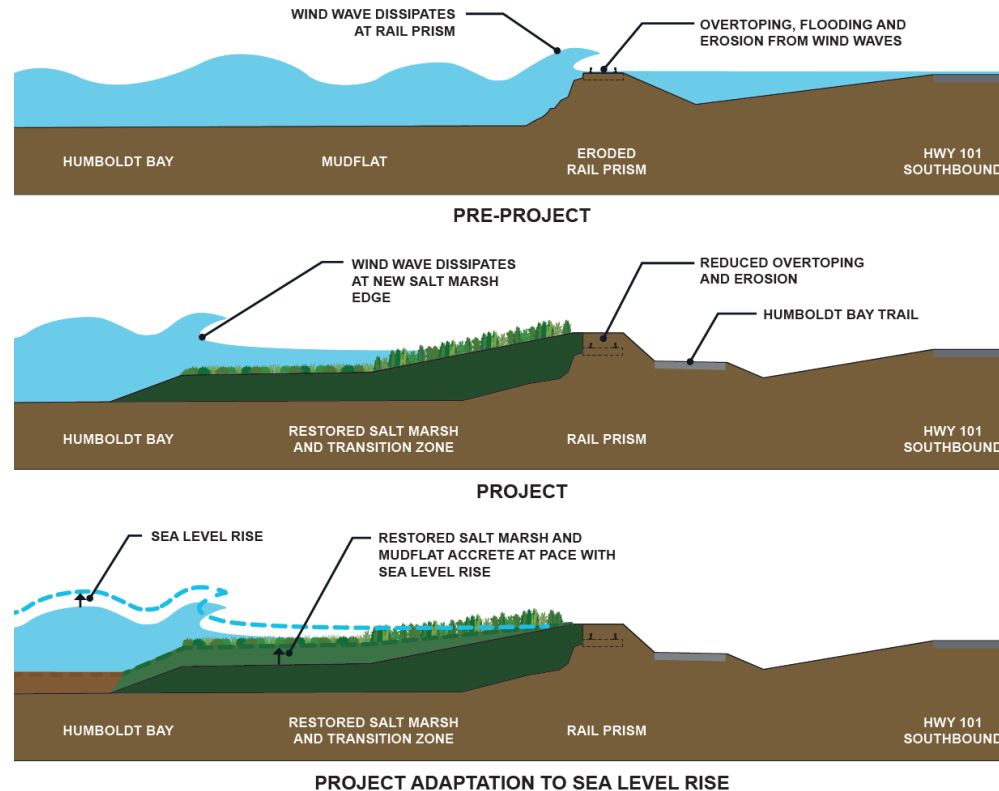
Ecosystem Services and Project Benefits: Reduced Flooding and Erosion

Water Level (RI)	Wind Speed	Pre-Project		Post-Project			
		Flooding	Damage	Flooding/Damage			
10.7 ft (100-yr)	48 mph (100-yr)	Flooding of Highway 101 South Bound Lanes	Damage to Pavement	No Overtopping, Flooding, or Damage with Marsh			
	44 mph (10-yr)		Damage to Rail Prism				
	40 mph (2-yr)				Trail Usability Compromised		
	38 mph (1.053-yr)		No Damage				
10.0 ft (10-yr)	48 mph (100-yr)				Flooding of Trail and Highway Shoulder	No Damage	
	44 mph (10-yr)						Flooding of Trail
	40 mph (2-yr)						
	38 mph (1.053-yr)						No Overtopping, Flooding, or Damage pre- or post-project
9.4 ft (2-yr)	48 mph (100-yr)				No Overtopping, Flooding, or Damage pre- or post-project		
	44 mph (10-yr)						
	40 mph (2-yr)						
	38 mph (1.053-yr)						
8.4 ft (MMMWW)	48 mph (100-yr)	No Overtopping, Flooding, or Damage pre- or post-project					
	44 mph (10-yr)						
	40 mph (2-yr)						
	38 mph (1.053-yr)						
7.1 ft (MHHW)	48 mph (100-yr)	No Overtopping, Flooding, or Damage pre- or post-project					
	44 mph (10-yr)						
	40 mph (2-yr)						
	38 mph (1.053-yr)						

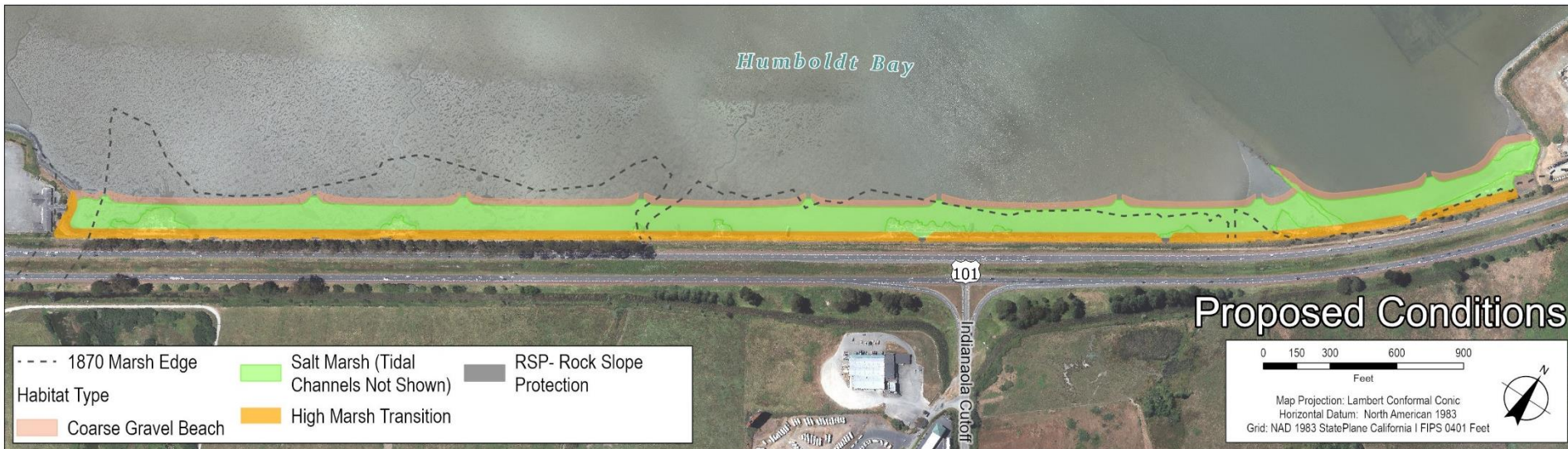
EP = Exceedance Probability, RI = Return Interval

Ecosystem Services and Project Benefits: SLR Resiliency & Adaptability

Water Level	Wind Speed	SLR			
		0 ft	1 ft	2 ft	3 ft
10.7 ft (100-yr)	38 mph (1.053-yr)	Overtopping and flooding with or without marsh			
	40 mph (2-yr)				
	44 mph (10-yr)				
	48 mph (100-yr)				
10.0 ft (10-yr)	38 mph (1.053-yr)	Avoided overtopping and flooding with implementation of marsh			
	40 mph (2-yr)				
	44 mph (10-yr)				
	48 mph (100-yr)				
9.4 ft (2-yr)	38 mph (1.053-yr)	No overtopping with or without marsh			
	40 mph (2-yr)				
	44 mph (10-yr)				
	48 mph (100-yr)				
8.4 ft (MMM)	38 mph (1.053-yr)				
	40 mph (2-yr)				
	44 mph (10-yr)				
	48 mph (100-yr)				
7.1 ft (MHHW)	38 mph (1.053-yr)				
	40 mph (2-yr)				
	44 mph (10-yr)				
	48 mph (100-yr)				



Ecosystem Services and Project Benefits: Increased Habitat Diversity



Ecosystem Services and Project Benefits: Increased Habitat Diversity

Habitat Description	Habitat Area (acres)			
	Historic (1870)	Existing ¹	Proposed	Change
Coarse Gravel Beach	0.00	0.89	4.64	+3.75
Rock Slope Protection (RSP)	0.00	1.30	0.12	-1.18
Mudflat	8.27	22.67	0	-22.67
Salt Marsh	19.89	2.23	17.11	+ 14.88
Spartina Dominated Salt Marsh	0.00	1.07	0	-1.07
Tidal Channels	0.00	0.00	1.00	+ 1
High Marsh Transition	0.00	0.00	5.29	5.29
Total	28.16	28.16	28.16	

¹ Assumes Humboldt Bay Trail South (HBST) Project is constructed

Humboldt Bay Context (Barnhart 1992, Laird 2007, Schlosser & Eicher 2012)

Total Bay	1870 (25,800 acres)	Current (16,000 acres)
Mudflat/Channels	60-70%	65-70%
Salt Marsh	30-40%	4-6%

- Compared to 1870, current salt marsh area is disproportionately lower relative to mudflat
- 22.7 acre reduction in mudflat (0.2-0.4% of total bay mudflat)

Permitting and Regulatory Considerations

Permitting and Regulatory Considerations: (Subject to Implementation Approach)

1. Engage Regulatory Agencies (Future Project Phase)
2. No-Net Loss of Coastal Wetlands (Self Mitigating)
3. CEQA: IS/MND anticipated however other options may exist based on lead agency
 - a) CDFW Cutting the Green Tape Initiative: Statutory Exemption for Restoration Projects (SERP)
 - b) State Water Board General Order: PEIR for Restoration Project Exemption (August 2022)
 - c) Harbor District PEIR for Humboldt Bay Sediment Management (SCH#2018012052)
4. NEPA: Subject to Project Lead and Funding

Permitting and Regulatory Considerations: (Subject to Implementation Approach)

5. Regulatory Permits

- a) County: CUP/Grading/Encroachment Permit
- b) City of Eureka: Grading/Encroachment Permit
- c) Harbor District/State Lands Lease: Shoreline Development Permit
- d) Caltrans: Encroachment Permit
- e) Coastal Commission: Coastal Development Permit
- f) CDFW: 1600 and CESA for Long-fin Smelt and Coho (ITP, Consistency Determination, Safe Harbor Agreement, MOU TBD)
- g) NCRWQCB: 401 Water Quality Certification
- h) USACE: 404 NWP 27 (Habitat Restoration) or NWP 54 (Living Shoreline) which is limited to 500 LF
- i) NOAA: BA/BO (Salmonid coverage under program BO may be feasible)
- j) USFWS: BA/BO (Tidewater Goby)

Implementation Strategy and Next Steps



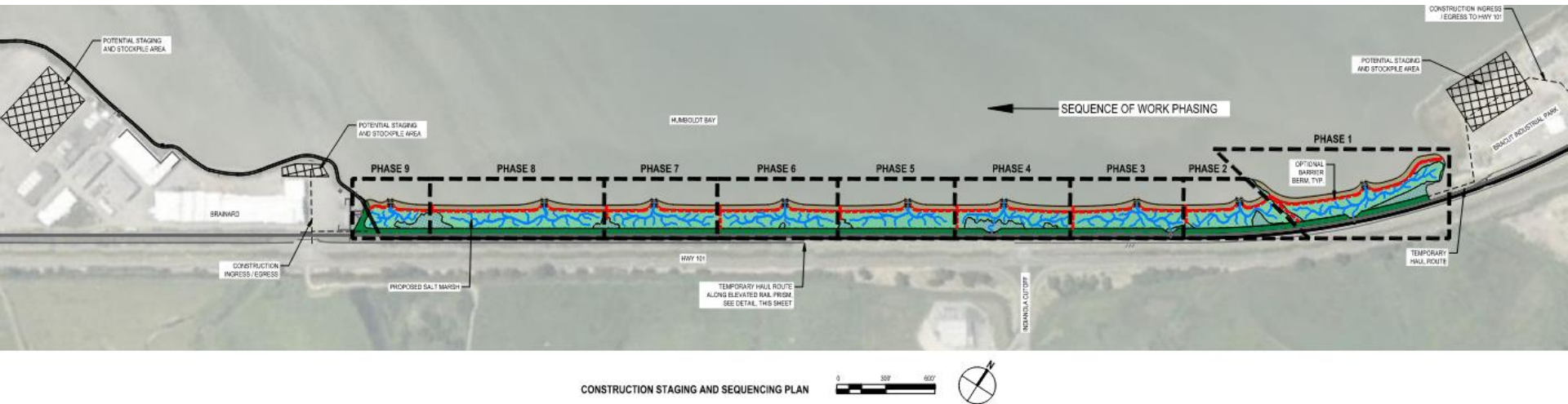
Implementation Strategy and Next Steps: Options to Advance Project

Project Scale:

1. Entire project area
2. Demonstration / Pilot Project (Phase 1 only)
3. Hybrid (phased)

Project Scope:

1. Technical studies and civil design
2. Studies, design, CEQA, permitting
3. Pre-construction & construction

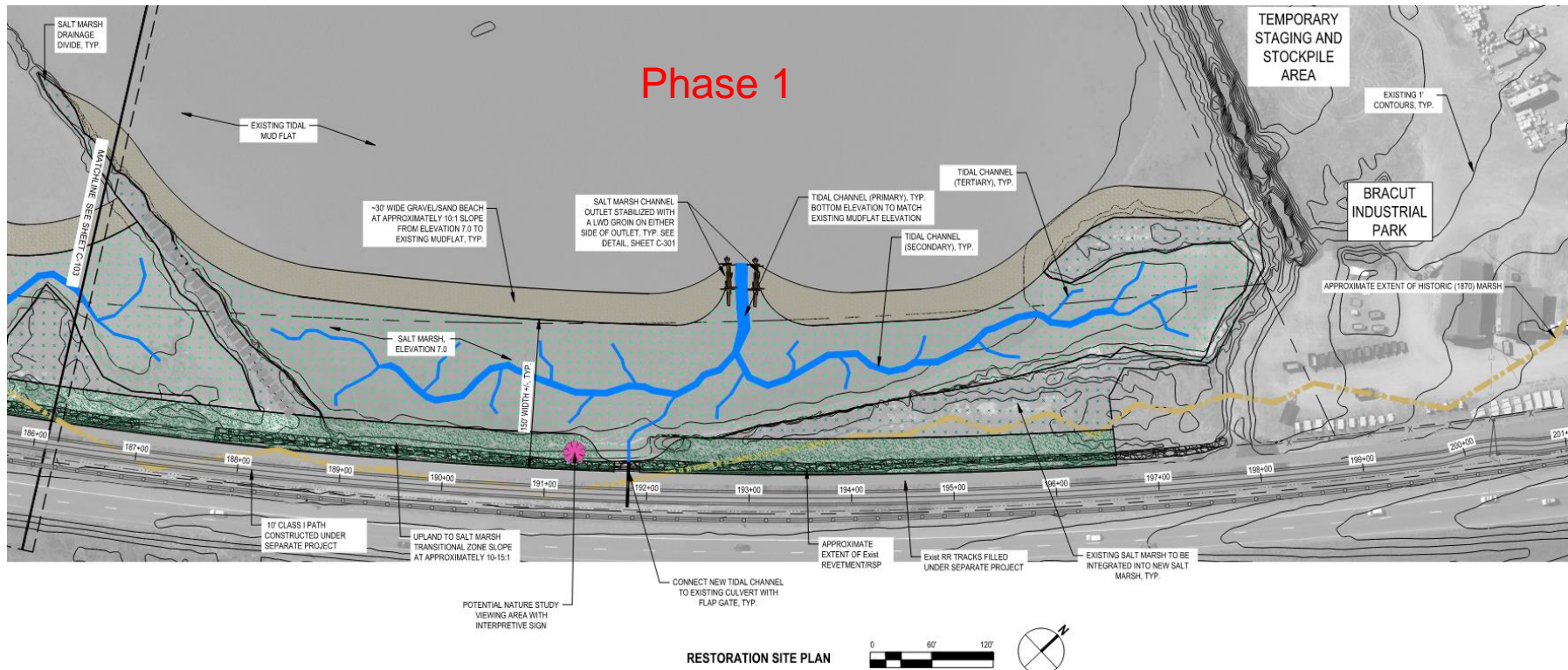
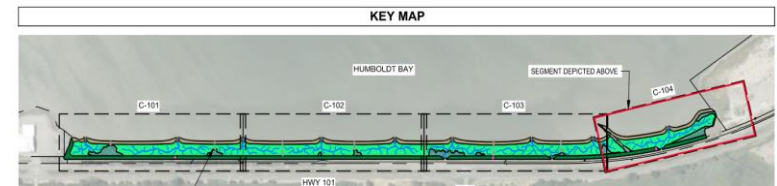


Implementation Strategy and Next Steps: Options to Advance Project

Tasks and Considerations	Option 1: Entire Project	Option 2: Demonstration /Pilot Project (Phase 1 only)	Option 3: Hybrid (phased)
Project Lead	TBD	TBD	TBD
Funding Source(s) for Below	TBD	TBD	TBD
Remaining Technical Studies (Subsequent Slide)	Entire Project	Phase 1 only	Entire Project
Regulatory Compliance	Entire Project	Phase 1 only	Entire Project
Fine Sediment Volume & Sourcing	~130,000 CY	~20,000 CY	~130,000 CY
Final Design	Entire Project	Phase 1 only	Phased as Sediment Sources Become Available
Right-of-Way (ROW)	Multiple Private Parcels	Bracut Lumber, CDFW & County	
Bid & Construction	Entire Project	Phase 1 only	
Monitoring	Entire Project	Phase 1 only	
Construction Cost	\$12.8 - 17.2M	\$3.8 - 4.5M	Comparable to Option 1

Implementation Strategy and Next Steps: Demonstration / Pilot Project (Phase 1) Benefits

1. Increase understanding of construction means/methods of material handling and placement
2. Better define long-term monitoring and management activities to inform future implementation
3. Further define suitability/sources of imported fine sediment related to vegetation establishment and Incremental Sampling Method (ISM) requirements
4. Increase understanding and ease for future regulatory approvals
5. Better define costs and potential future funding sources



Implementation Strategy and Next Steps: Phase 1 Property Ownership



PROPERTY OWNERSHIP			
NO.	APN	OWNERSHIP	PARCEL BNDRY SOURCE
1	501-241-005	COUNTY OF HUMBOLDT	BAY TRAIL PROVIDED BY COUNTY
2	501-241-031	COUNTY OF HUMBOLDT	BAY TRAIL PROVIDED BY COUNTY
3	501-241-030	COUNTY OF HUMBOLDT	BAY TRAIL PROVIDED BY COUNTY
4	501-241-033	BRACUT LUMBER CO	BAY TRAIL PROVIDED BY COUNTY
5	501-241-027	COUNTY OF HUMBOLDT WITH NCRA EASEMENT	BAY TRAIL PROVIDED BY COUNTY
6	404-141-003	COUNTY OF HUMBOLDT WITH NCRA EASEMENT	BAY TRAIL PROVIDED BY COUNTY
7	404-141-005	COUNTY OF HUMBOLDT WITH NCRA EASEMENT	BAY TRAIL PROVIDED BY COUNTY
8	404-141-004	CALIFORNIA REDWOOD COMPANY	BAY TRAIL PROVIDED BY COUNTY
9	404-141-002	COUNTY OF HUMBOLDT	BAY TRAIL PROVIDED BY COUNTY
10	017-081-002	NCRA	BAY TRAIL PROVIDED BY COUNTY
11	405-061-004	CITY OF EUREKA	BAY TRAIL PROVIDED BY COUNTY
12	501-251-003	CITY OF ARCATA	BAY TRAIL PROVIDED BY COUNTY
13	501-241-004	YEUNG YING K & WYNEE M	COUNTY WEB GIS
14	501-241-019	CALIFORNIA STATE DEPARTMENT OF FISH AND WILDLIFE	COUNTY WEB GIS
15	501-241-018	CALIFORNIA STATE DEPARTMENT OF FISH AND WILDLIFE	COUNTY WEB GIS
16	501-241-020	CALIFORNIA STATE DEPARTMENT OF FISH AND WILDLIFE	COUNTY WEB GIS



Remaining Technical Studies and Recommended Next Steps:

1. Expand Outreach to Wider Range of Stakeholders
2. Initiate Regulatory Agency Outreach and Pre-Permitting Consultation
3. Sediment Sampling and Geotechnical Analyses
 - a) Conduct settlement/consolidation analyses to determine long-term placement settlement rates
 - b) Collect Bulk Samples of Existing Gravel Shoreline
 - c) Identify Potential Fine Sediment Sources
 - d) Conduct ISM for site sediment and potential future source sediments
4. Wetland/Upland Conversion Assessment
5. Hydraulic Analysis for Phased Implementation
6. Scenario-based Analysis to Assess Design Robustness and Risks
7. Advance Monitoring and Management Plan
8. Advance Design Plans and Technical Specifications

Implementation Strategy and Next Steps: Example Ecotone Marsh Creation Project



South Bay Salt Pond Project - City of Mountain View

Photos: GHD (Raymond Wong, PhD, PE)



Discussion

▶ Input From TWG

1. Implementation options
2. Other considerations?
3. Level of interest, concerns, recommendations?

▶ Next Steps

1. Submit Draft Report Comments by Friday June 10, 2022
2. Finalize Report and Project Completion: June 30, 2022