

Neighborhood Scale Sea Level Rise Adaptation: Local Leadership

Jack Liebster, Marin County Coastal Planner

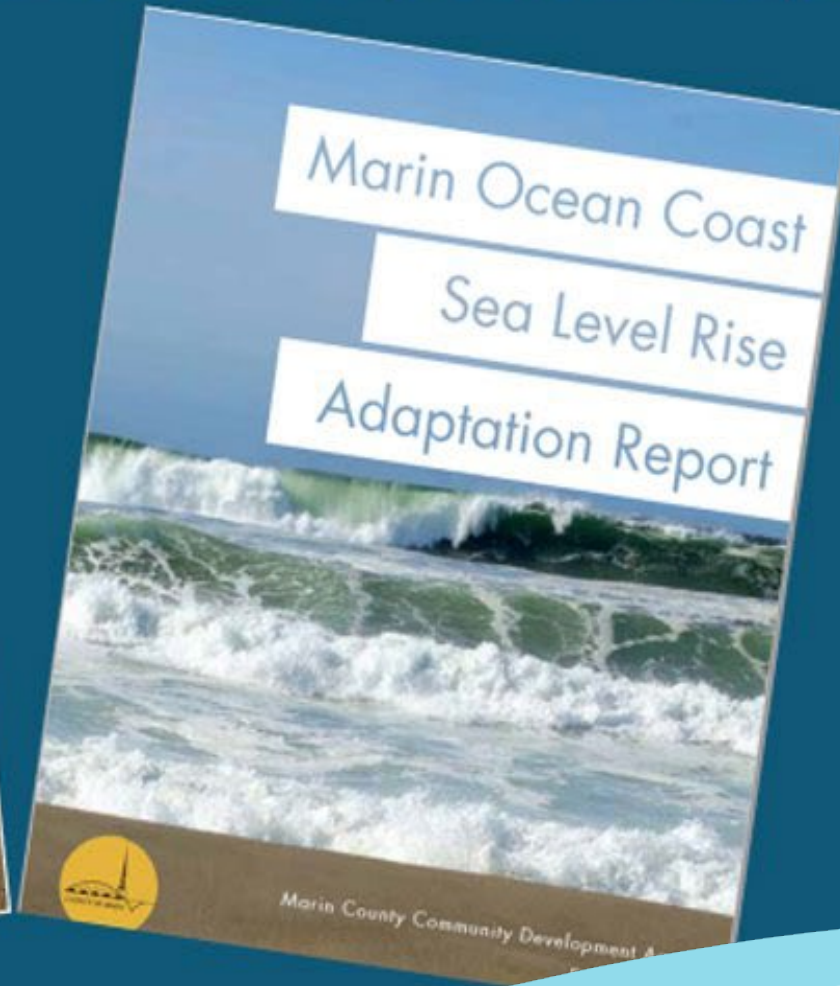
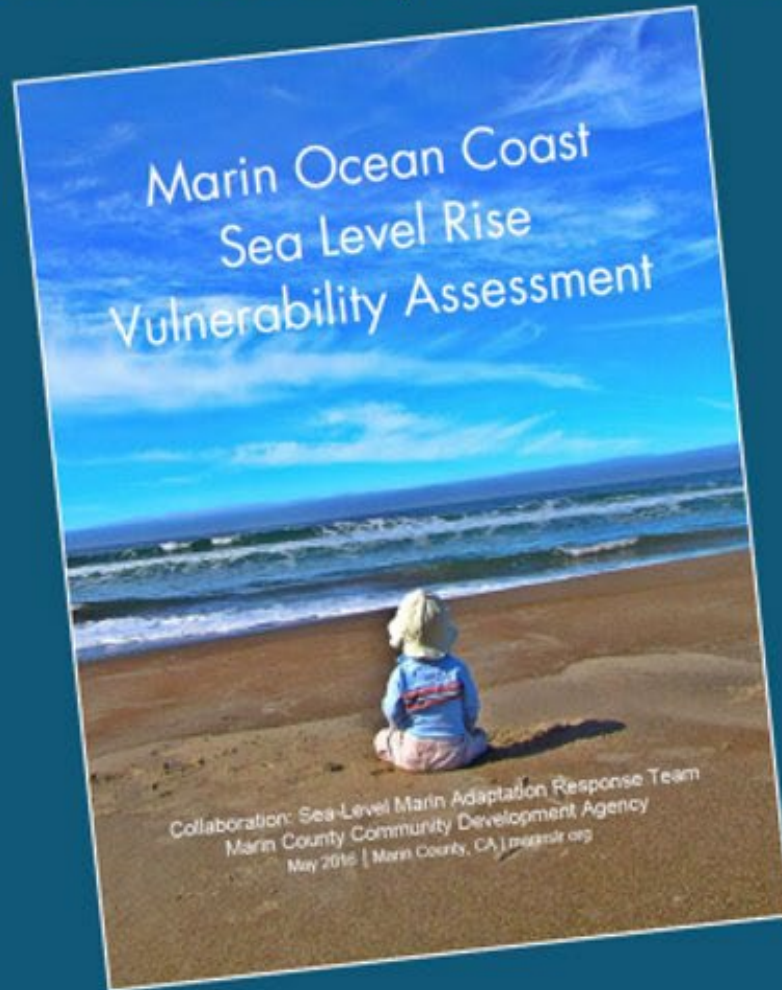
Presentation Elements

- Sea Level Rise (SLR)
Planning Context
- Stinson Beach Adaptation
and Resilience
Collaboration (ARC)
- Vulnerability Challenges
- Nature-Based Feasibility:
Constructed Dunes
- Next Steps





Vulnerability Assessment & Adaptation Report



Stinson Beach Adaptation and Resilience Collaboration (ARC)



A non-regulatory planning process to address sea level rise



Updates previous Vulnerability Assessment (2016)



Technical experts develop and analyze potential adaptation measures and pathways



Identifies next steps for adaptation, including implementation and monitoring approach

Sea Level Rise Projections for Stinson Beach ARC

(San Francisco projections from State Guidance: OPC 2018)

Sea level Rise Scenario	Projected Year
0 feet	Today
1.6 feet	2050
3.3 feet	2070
6.6 feet	2100

Storm conditions considered at each SLR scenario:

- No storm (inundation from monthly high tides)
- 100-year storm flooding (1% annual chance of occurrence)

Easkoot Creek and Bolinas Lagoon



Hazards Identified and Modeled

- Regular inundation from monthly high tide conditions.
- Extreme coastal storm flooding.
- Extreme coastal storm wave run-up.
- Coastal erosion.
- Groundwater levels, emergence and septic impacts.
- Easkoot Creek flooding.



Stinson Neighborhoods



Seadrift Revetment



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“Patio” Streets Dunes



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“Calle” Streets sloping down from beach



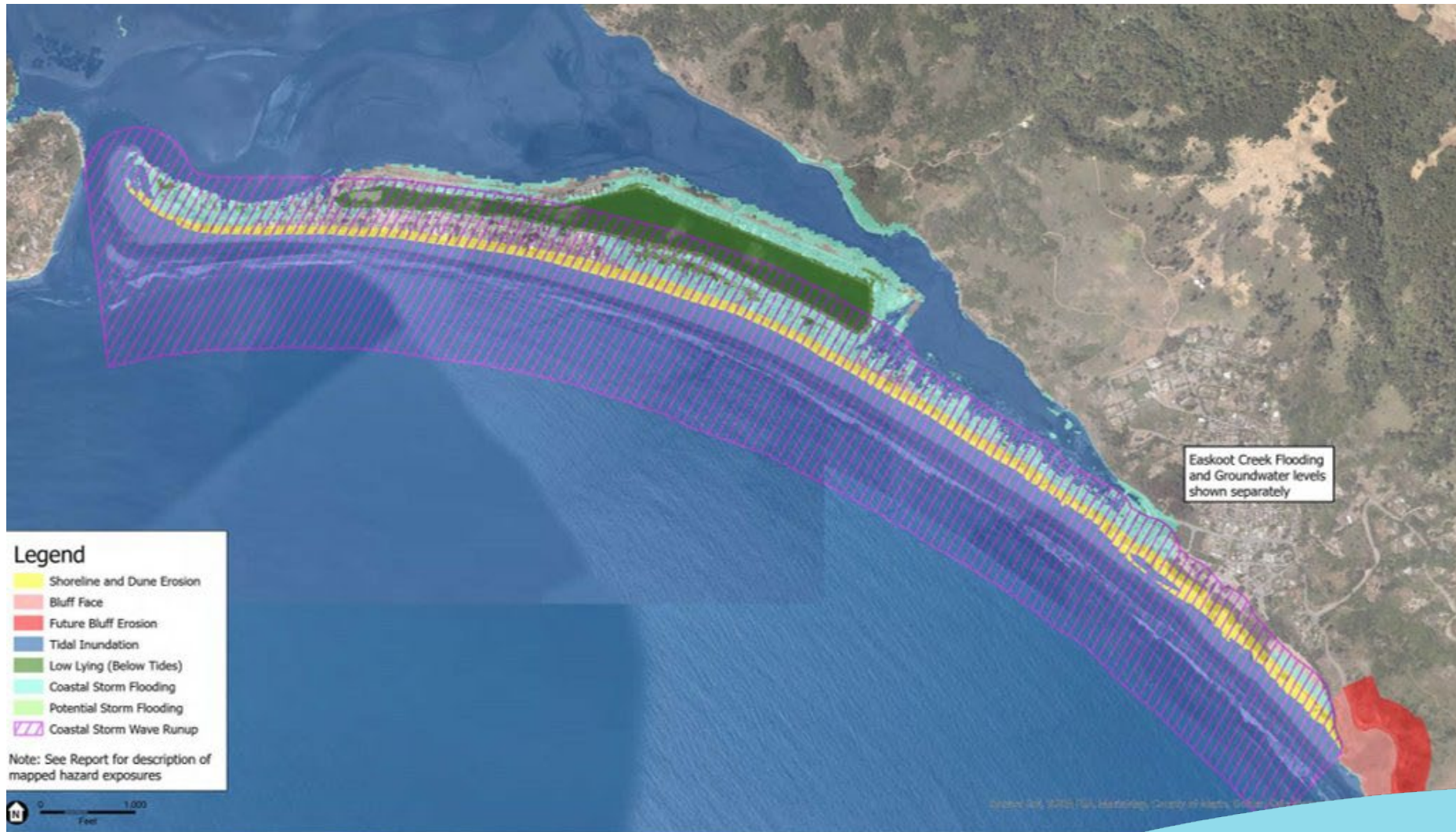
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NPS Stinson Beach Park



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SLR Impacts 3.3 feet Sea Level Rise



Stinson Beach ARC: Draft Sea Level Rise Vulnerability Assessment.
Marin County & Environmental Science Associates. April 2023

Potential Adaptations to be Evaluated

- Elevating homes on piles in wave zone
- Elevating homes on fill in targeted flood zones
- Coastal armoring along beach
- Floodwalls along Bolinas Lagoon
- Pump stations
- Maintaining and restoring beaches and dunes
- Improving septic systems and/or transition to community wastewater treatment
- Elevating and/or rerouting roads and Shoreline Highway
- Improving marsh perimeter transitional habitat
- Dune creation/restoration
- Upgrading utilities lines, connections and utility trenches
- Relocation and/or realignment



Example of elevated home with ground floor garage

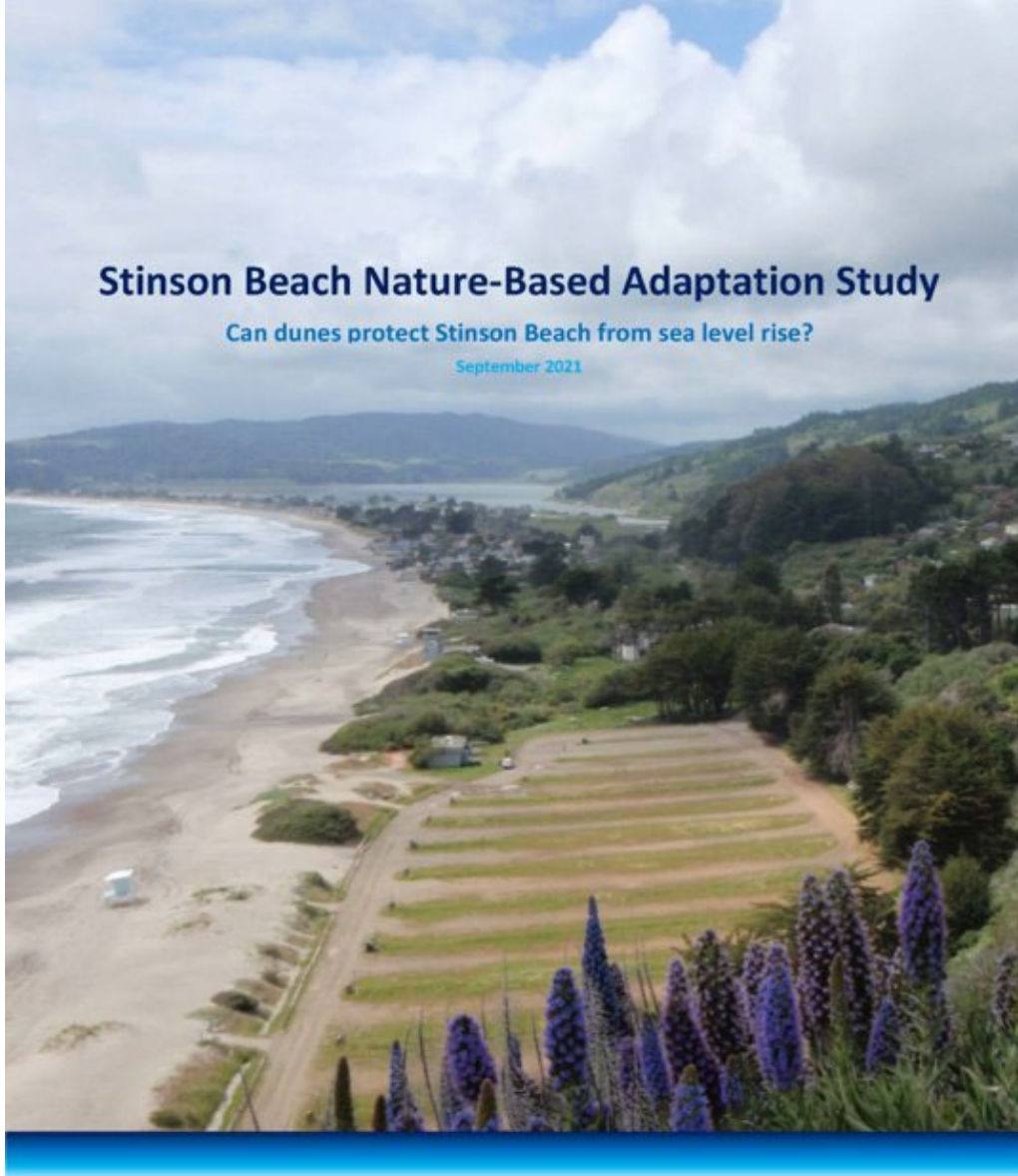


Dune restoration visualization (Manhattan Beach)

Stinson Beach Nature-Based Adaptation Study

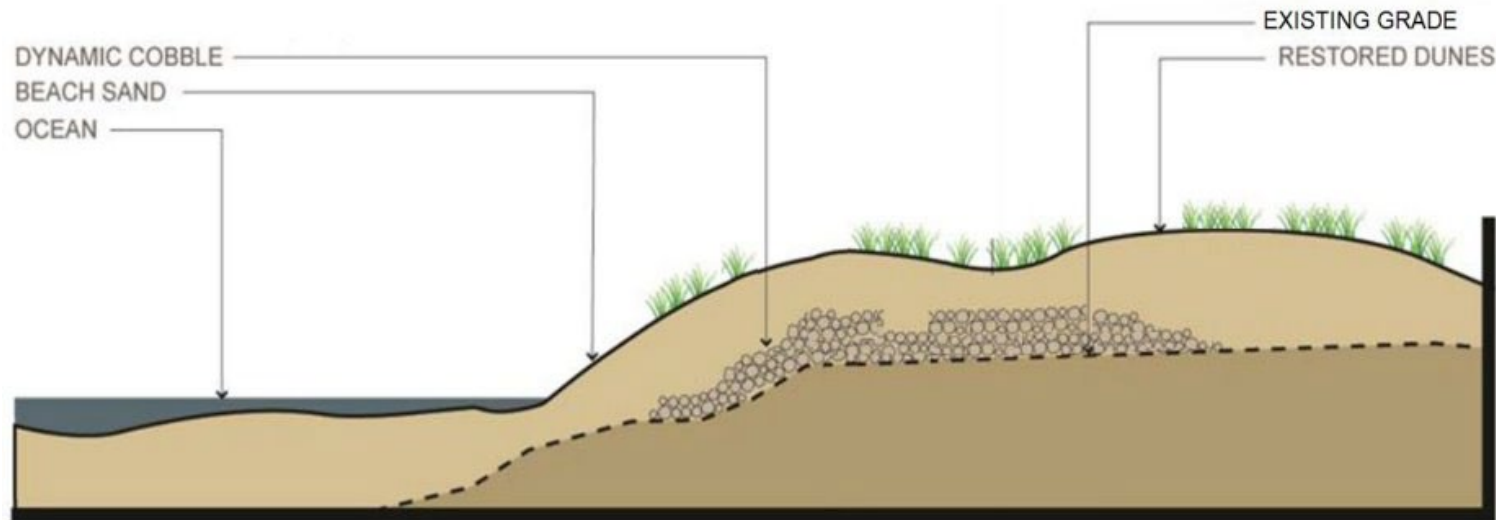
Can dunes protect Stinson Beach from sea level rise?

September 2021

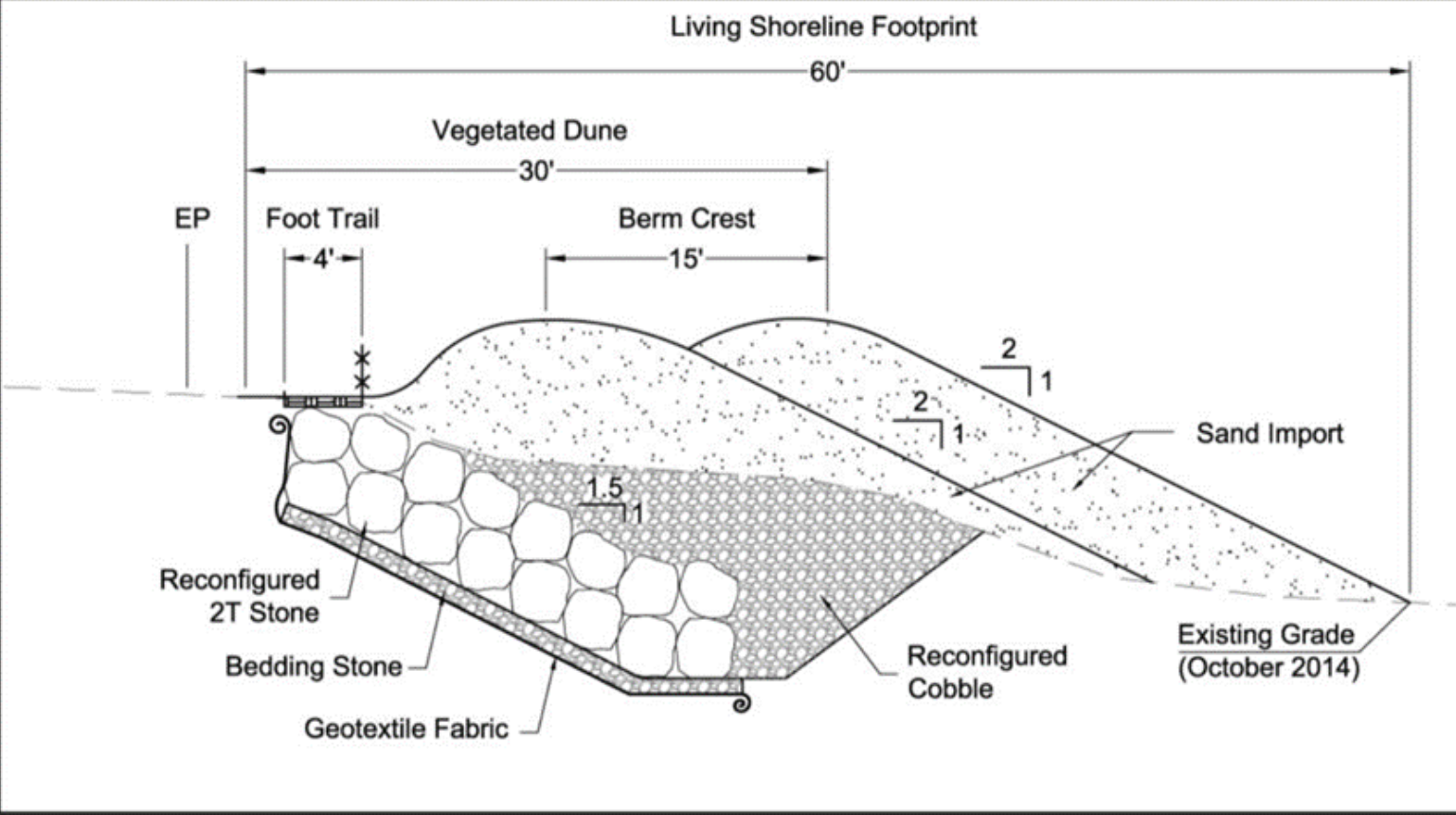


Adaptation Alternative: Living Shoreline

- Dunes provide ecological value and a sacrificial buffer during storms
- Dissipate wave energy and act as a “backstop,” limiting landward extent of shoreline erosion
- Manage dune vegetation to reduce wind-blown sand
- Designed to enhance public access



Cross-section of Cardiff State Beach Living Shoreline



Cardiff Living Shoreline Project: Before (A) and After (B)



Mierau and Urabe, 1/23/2023

Cardiff Living Shoreline post winter storms - 2022



Next Step: Develop Adaptation Pathways & Analysis

Adaptation Pathways are potential measures, implementation triggers, and sequencing

What do they do?


- Respond to projected conditions identified in the vulnerability assessment
- Draw from a range of potential actions to address impacts
- Define measures that are specific to each resource/asset

Pathways will include:

- Identifying steps that are contingent on each other
- Strategic timing
- Identification of potential funding sources
- Steps for implementation
- Suggested monitoring approach for adaptation

Stinson ARC
Community Development Agency

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taken by Virtual Planet for County of Marin

Stinson ARC is officially underway!



Questions and Discussion

Contact: StinsonARC@marincounty.org
Please visit us at marinslr.org