

**WORK
PLAN
SUMM
ARY**

**Stinson Beach Nature-Based Adaptation
Feasibility Study**

Task 1 Existing Conditions, Goals and Objectives

For this task, ESA will first engage with the County to reaffirm the project goals and objectives. Following the project confirmation (confirmed Goals and Objectives included below), ESA will conduct a literature review of comparable projects and identify any data gaps. They will develop a detailed characterization of existing conditions and shore dynamics at Stinson Beach, identify reference sites and characterize sediment at Stinson Beach and potential sediment sources.

Project Goal

Increase available information about the feasibility of natural infrastructure on the Marin County coastline.

Project Objectives include:

- 1) Understand sediment transport along Stinson Beach's shore. (ESA is well versed in this, but update to extent possible new information about sediment transport in this area. Use new information from Sediment Group and new CosMoS)
- 2) Characterize historical and modern shoreline change trends. (confirmed)
- 3) Identify sand sources and sand grain size at candidate sand source sites. (confirmed. Already coordinated with Wendy Korsach. Don't have source data particular to the Graben says Bob. And he was surprised by lack of new data coming from Sediment Group. We should vet whether new data is available. From ESA's perspective if someone hasn't done some amount of work on it then it will be a data gap)
- 4) Assess the performance relative to flood and erosion hazards at Stinson Beach. (Both beach side and creek side to avoid creating an additional flood hazard on creek side, not to actually include alternatives to stop flooding on that side)
- 5) Quantify expected life for a range of SLR scenarios, and life-cycle costs (first cost and reconstruction after storms), in terms that inform feasibility as well as support a broader long-term adaptation plan.
- 6) Assess the performance relative to ecology, with a range of alternatives spanning the more engineered (gray) to more natural (green continuum). (Grey alternative as a traditional method and foil to compare other alternatives. James- the nature-based solutions are more near-term [couple feet] and next steps could include other long-term solutions which will be discussed as concepts in the study. That's why managed retreat is discussed in the proposal.)
- 7) Engage local residents and beach users in the decision-making process through presenting and soliciting input on project alternatives (supporting with published materials for our public outreach)
- 8) Evaluate project alternatives with criteria including recreation, habitat, public support, flood protection, costs, and environmental impacts.
- 9) Identify existing regulatory barriers to implementation.

Deliverables

Draft and final technical memo describing existing conditions that includes study area maps, shoreline dynamics, spatial gradients in longshore transport, wave focusing hot spots, historical and modern shoreline

change, and possible sediment source sites. Methods and results of the littoral cell conceptual model will be documented, and sand source/receiver sites will be evaluated.

Task 2 Climate Scenarios and Adaptation Criteria

In this Task, ESA will work with CDA to identify the climate (sea-level rise) scenarios and adaptation thresholds that will be used to develop and evaluate nature-based adaptation alternatives at Stinson Beach. ESA will work with CDA to develop climate (sea-level rise) scenarios that will be used to assess functional life of beach and dune features during Task 3 Adaptation Alternatives. They will identify adaptation thresholds using parameters, such as beach width, dune volume, cobble berm width, sea level rise amount and wave run-up intensity.

Deliverables

Draft and final technical memo describing the selected climate scenarios and adaptation criteria.

Task 3 Adaptation Alternatives

A range of adaptation alternatives will be developed consistent with the project description, goals and objectives (Task 1). The alternatives will be configured to generally conform to the climate scenarios and adaptation criteria (Task 2). The analysis may result in alternatives such as, dune embankment creation, dune creation, dune creation with cobble-gravel berm, cobble berm, or long-term backshore adaptations among others. The short-term alternatives will be evaluated relative to project objectives, including community support, and a preferred alternative will be selected.

Deliverables

Draft and final technical memo that describes and evaluates potential nature-based adaptation alternatives.

Task 4 Public Outreach and Engagement

CDA and ESA will conduct three public workshops. The first workshop will introduce the project to beach managers, permitting agencies, beach users, and residents and will be held in late January or early February 2020. Once alternatives are developed, the ESA team will work with CDA staff to present the alternatives during a second public workshop in the summer of 2020. Upon completion of the Feasibility Study, CDA and ESA will host a public webinar in Spring 2021 to explain the results and discuss next steps. The ESA team will provide advice on the public outreach plan and how community acceptability will be assessed during the workshops.

Deliverables

Draft and final Public Workshop summary report that identifies preferred alternatives based on community input.

Task 5 Regulatory and Policy Input

To complete this task, ESA will work with CDA staff and Brad Damitz to identify and assess all relevant local, state, and federal permit requirements that would be needed to obtain permits for a range of near-term and long-term nature-based adaptation alternatives developed as part of Task 3. We will identify apparent regulatory barriers to implementation but will not eliminate otherwise desirable alternatives solely due to permitting issues. Accordingly, ESA will work with Damitz to collaborate with relevant agencies and stakeholders to identify and compile lessons learned and opportunities for policy initiatives that support restoration activities at Stinson Beach. The following agencies and organizations will be considered for engagement: Greater Farallones National Marine Sanctuary; National Park Service, GGNRA; US Army Corps of Engineers; US Environmental Protection Agency; National Marine Fisheries Service; US Fish and Wildlife Service; Regional Water Quality Control Board; California Coastal Commission; California Department of Fish and Wildlife; California Department of Parks and Recreation (State Parks); California State Lands Commission; Marin County Parks; California State Coastal Conservancy; Coastal Sediment Management Workgroup, and relevant NGOs and academics.

Deliverables

Draft and final technical memo that: identifies policy options to support dredging and sand placement activities on Stinson Beach and summarizes agency collaboration and lessons learned and condenses and evaluates relevant regulations and policies.

Task 6 Feasibility Study Report

ESA will draft and finalize the project deliverable: Stinson Beach Nature-Based Adaptation Feasibility Study. The final Study document will incorporate the deliverables from Tasks 1-5 and will include an Executive Summary with main points for the general public. The document will include images and diagrams and will be written for an audience with varying technical expertise and interests. ESA will provide a draft Study to CDA for review and comment. If requested, ESA will make revisions to the draft prior to the draft being provided for broader review outside of CDA. Once CDA staff comments on the draft are received, ESA will incorporate and finalize the Feasibility Study.

Deliverables

Nature-Based Adaptation at Stinson Beach Feasibility Study (draft and final).