

## WORK PLAN SUMMARY

### Tomales Bay Living Shorelines Feasibility Project

#### Project Goals and Objectives

Project Goal: Assess the feasibility of living shorelines in Tomales Bay to maintain public access, develop preliminary designs for pilot projects, support vibrant recreational opportunities for users of all socioeconomic circumstances, provide flood and erosion protection against future sea level rise, and extend living shoreline applicability.

#### Project Objectives:

- 1) Develop an interdisciplinary Stakeholder Advisory Committee (SAC) with representation from home and business owners, Non-governmental Organizations (NGOs), technical experts from the scientific community, and federal/state/local agency representatives.
- 2) Compile maps of existing Tomales Bay subtidal habitat.
- 3) Define and describe potential benefits of living shoreline adaptation measures that extend beyond protection from sea level rise impacts, such as improving ecological functions.
- 4) Through modeling of habitat suitability, identify areas where living shorelines could be implemented or enhanced based on conditions including depth, sediment type, waves and currents, salinity, turbidity and other relevant factors.
- 5) Working with agency staff identify regulations and policies pertaining to dredging and filling or other activities which may constrain or prohibit living shorelines. Develop and propose solutions to these regulatory barriers.
- 6) Identify priority sites where living shorelines could protect built assets such as roads and homes, protect and provide public access for users of diverse socioeconomic circumstances, provide erosion and flood protection, and provide habitat. At priority sites, evaluate various living shoreline alternatives to determine most effective option with maximum benefits. Develop preliminary designs for 2-5 pilot projects supported by field studies.
- 7) Develop a set of recommendations on next steps necessary to successfully design and implement identified pilot projects, based on lessons learned from this Feasibility Study. Included as next steps, will be procedures for monitoring and adaptive management.

#### Task 1 Stakeholder Advisory Committee and Public Workshops

CDA staff will take the lead in developing a Stakeholder Advisory Committee (SAC) with representation from local stakeholders including home and business owners, NGOs, technical experts from the scientific community, and agency representatives including the National Park Service, Caltrans, the California Coastal Conservancy, GFNMS, and possibly others identified through project scoping. This SAC will meet regularly throughout the process to review and provide input on the initial scope, as well as draft deliverables.

#### **Description**

Two SAC meetings will be scheduled on the same day as public workshops. The first set of meetings will introduce the project and are scheduled for February 2020. The second set will take place in the summer of 2020 where the evaluation of priority living shoreline sites will be discussed. A third SAC meeting will take place in spring 2021 to review designs. When the feasibility study is complete, CDA and ESA will present the findings in the public webinar in early Fall 2021.

#### **Deliverables**

SAC Roster, Membership memorandums of understanding (MOUs), Meeting Plan, participation in four meetings and meeting notes from those four meetings.

#### Task 2 Compile Maps of Subtidal Habitat

ESA will assemble the datasets needed to characterize subtidal habitats within Tomales Bay. This task will be led by Dane Behrens with assistance from team members Merkel & Associates (subtidal habitat), Ted Grosholz and Chela Zabin (shellfish habitat), Point Blue Conservation Science (shorebird habitat), and Peter Baye (marsh and upland transition ecology).

### **Description**

ESA will compile GIS shapefiles and maps of existing Tomales Bay habitat, referencing Department of Fish and Wildlife datasets and other sources. ESA will identify any data gaps and describe further data collection necessary for next steps required to implement identified pilot projects. Data collection next steps may be further detailed by pilot project in Task 6.

### **Deliverables**

Identification of further mapping needs, Tomales Bay habitat maps, an organized set of all GIS files each including a summary, description, credits, use limitation, extent, and scale range.

## Task 3 Identify Feasible Sites for Living Shorelines

This task will be led by ESA, with team members Point Blue Conservation Science and Peter Baye translating concepts from the OLU methodology developed by SFEI in San Francisco Bay to Tomales Bay. Merkel & Associates and Brad Damitz will leverage their knowledge of the site and understanding of its subtidal habitats to provide guidance on placement and refinement of living shoreline techniques.

### **Description**

ESA will describe and evaluate several types of living shorelines which could be established or enhanced in Tomales Bay. ESA will characterize the requirements of each type in terms of depth, sediment type, waves and currents, salinity, turbidity, site size requirements and other critical parameters, and will identify suitable locations for implementation. ESA will work with CDA to consider tailored application of existing living shoreline suitability approaches, including SFEI's Operational Landscape Unit (OLU) and TNC's Natural Infrastructure Guidelines "Blueprint," in determining necessary site characteristics. As part of this task, ESA will consider existing conditions, and two SLR scenarios which will be chosen in coordination with CDA, and will align with two of the scenarios examined as part of the prior C-SMART study of Tomales Bay.

### **Deliverables**

Descriptions of living shoreline types with maps identifying potential locations of living shorelines sites

## Task 4 Identify Relevant Policies

This task will be led by CDA with support from team member Brad Damitz, with additional coordination and permitting support from Priya Finnemore of ESA and from Peter Baye.

### **Description**

The ESA team will assist the CDA in preparing a comprehensive permitting and regulatory guidance "roadmap" memo, which will identify, by agency and jurisdiction, all required permits and approvals, the procedural requirements for application submittal, and any additional data/information needed to support the permit applications. Included as part of the detailed "permitting roadmap" memo would be a table that includes each agency/jurisdiction, permitting/regulatory requirements (e.g. permit, compliance, consultation), and considerations and recommendations.

CDA staff will take the lead on this evaluation. The ESA team will play a supporting role, and will provide input on regulatory challenges and solutions from other jurisdictions that we have conducted projects in. This will include considerations for dredge and fill activities. For example, for the recent Tule Red Restoration in Suisun Marsh, ESA

helped facilitate permitting of a horizontal levee by requesting that future marsh created on the levee slope with SLR be considered in accounting for marsh loss/gain.

### **Deliverables**

Memo on local policies relevant to living shorelines

### Task 5 Identify Priority Sites and Develop Preliminary Designs

This task will be led by ESA, with all team members providing input and internal review.

### **Description**

The ESA team will support CDA in identifying 2-5 priority pilot project sites in locations where living shorelines may be feasible, based on appropriate shoreline conditions, supportive policies, and locations where built assets such as homes and roads could be protected. Once the priority sites have been identified, ESA will develop for each priority site preliminary designs that approximate the 10% design level, including dimensions of major project features (channels, levees, etc...), cross sections, amounts of removal and/or addition of materials in cubic yards, projections of future conditions with sea level rise, and a narrative to support the feasibility assessment. Project siting and design will aim to maximize co-benefits including habitat protection/ creation/enhancement, flood protection, carbon sequestration, and others.

### **Deliverables**

Report with recommendations for living shoreline implementation. This will be included as a chapter within the final report listed in Task 7.

### Task 6 Recommend Next Steps

This task will be led by ESA with oversight from all team members.

### **Description**

ESA will outline a list of next steps to further Tomales Bay living shoreline implementation, including recommendations for additional data collection, analyses, monitoring, and adaptive management. ESA will identify potential funding sources and participating organizations.

Implementation will require that the designs developed in Task 5 are advanced to the 30, 60, and 100 percent levels under future phases of the project. Given Tomales Bay's unique characteristics that differ from those of SF Bay and much of the open coast (e.g. its interaction with upwelling currents and variation in depths and tidal currents throughout the bay) we anticipate that an adaptive management process and targeted monitoring will be especially important for long-term viability of the pilot sites.

### **Deliverables**

Memo with recommended next steps

### Task 7 Feasibility Study Report

ESA will draft and finalize the project deliverable: Tomales Bay Living Shorelines Feasibility Study. This will incorporate the deliverables from Tasks 1-6 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. Once CDA staff comments are received, ESA will incorporate and finalize the Feasibility Study.

### **Deliverables**

Nature-Based Adaptation at Tomales Bay Feasibility Study (draft and final)