# ATTACHMENT A

## SUPPLEMENTAL ENVIRONMENTAL PROJECT PROPOSAL

## Southeastern Creekside Marsh Habitat Enhancement Project

# Proposal for
# Southeastern Creekside Marsh Habitat Enhancement
# Supplemental Environmental Project

## Basic Information:

1. **Project Name:** Southeastern Creekside Marsh Habitat Enhancement SEP

2. **Project Developed By:** Friends of Corte Madera Creek Watershed, with input from the Ross Valley Watershed Program

3. **Project to be Performed By:** Friends of Corte Madera Creek Watershed and Marin County

4. **Contact:** Sandra Guldman, sandra.guldman@gmail.com, 415-456-5052

## Project Description

5. **Components of the Southeastern Creekside Marsh Habitat Enhancement**
   ***Background:*** Creekside Marsh comprises a 21-acre restored wetland in Kentfield, California (Figure 1). The area was originally tidal wetland; the US Army Corps of Engineers filled it and many other tidal wetlands in the watershed with dredge spoils in the late 1960s when the earthen channel for the Corte Madera Creek Flood Control Project was constructed. The marsh is separated from the main channel of Corte Madera Creek by a berm, topped with a heavily used paved path; a 4-bore culvert connects the marsh to the main channel of the creek at the upstream end of the marsh; a single culvert through the berm is located near the downstream end of the park. These culverts limit circulation of tidal flow in the marsh and limit its use by fish.

   Although there are hydraulic connections within the marsh, there are two distinct sections. The southeastern portion, connected to Corte Madera Creek by a single culvert near Bon Air Bridge, is particularly deficient in tidal exchange. Storm drains from the Bon Air sub-drainage enter this part of the marsh. Figure 2 shows three views of the project area.

   The western portion of Creekside Marsh, fed by the 4-bore culvert, has much more robust tidal exchange; the main channel is also the mouth of McAllister Creek, which drains the Laurel Grove and Wolfe Grade sub-watersheds characterized by low-density residential development. The tidal exchange in the western and central portions of the marsh is mostly from the 4-bore culvert, although there is some hydraulic connection between the two sides of the marsh at very high tides.

   ***Biological Resources:*** Creekside Marsh has a breeding population of the California clapper rail (*Rallus longirostris obsoletus*) and is considered suitable habitat for the salt marsh harvest mouse (*Reithrodontomys raviventris*), both federally and state-listed as endangered. Steelhead trout (*Oncorhynchus mykiss*), federally listed as threatened, migrate through the estuary, now poorly connected to Creekside Marsh

by culverts in bad repair. Other special-status species may be found in the marsh or adjacent main channel of Corte Madera Creek.

When Creekside Marsh was restored in the early 1970s, about ten years after it was filled, two species of invasive cordgrass were introduced: *Spartina densiflora* and *S. anglica*. *S. densiflora* is particularly aggressive and infested the entire watershed. Large meadows of *S. densiflora* developed within Creekside Marsh, crowding out native vegetation and trapping sediment that raised the elevation of much of the marsh so that it no longer supports native cordgrass, *S. foliosa*, an important component of California clapper rail habitat. Under the auspices of the Invasive Spartina Project (ISP), the invasive cordgrasses at Creekside Marsh have been treated since 2005. Significant progress has been made and planting of *Grindelia stricta* began in January 2012.

Several areas within the marsh have no vegetation, even though they are inundated at most high tides. Drainage appears poor in those areas and, in some, the soil is mostly compacted sand and gravel poorly suited to marsh vegetation. Not even invasive cordgrasses were able to grow in these areas.

***Project Area and Scope:*** The maximum extent of the Project Area for this SEP (Figure 3) is approximately 4 acres in the southeastern portion of Creekside Marsh, where the tidal flow is delivered through the single 60-inch culvert near Bon Air Road. The complete project has three components:

- enlarging the culvert from a cross-sectional area of 20 square feet to 35 square feet; the larger culvert would increase daily average tidal exchange from 11.0 acre-feet/day to 15.4 acre-feet/day;
- adding new channels to provide enhanced clapper rail habitat and to supply adequate tidal flow to areas that are currently poorly drained, some of which are completely devoid of vegetation; and
- restoring flow to an existing channel that has filled in. We propose to first salvage vegetation (mostly Jaumea and pickleweed) from this area and use it to plant areas enhanced by the additional flow through the larger culvert. If the sediment is not eroded naturally from the channel enough to meet design conveyance, we can return later and excavate it.

The Flood Control District is responsible for maintaining the culvert as designed, not for enlarging it, so the SEP would not be funding design and permitting that would otherwise be the responsibility of the Flood Control District. Enlarging the culvert is the key component because without a significantly larger culvert, there would not be adequate flow to maintain the channels and, except for the two that carry significant stormwater flows, the channels would fill in over time and the benefits of the project would be lost. Furthermore, the California Environmental Quality Act, which applies to this project, requires that the Lead Agency review the whole of a project. It would not be acceptable to request permits only for the SEP-funded portion of the project without an analysis of the entire project.

***Goals:*** The Southeastern Creekside Marsh Habitat Enhancement SEP goals are to:

1. Increase the tidal prism to increase flushing in the marsh, improve the health of the marsh vegetation, and better manage sediment and flood flows in Corte Madera Creek;
2. Enhance clapper rail habitat by restoring flow to a channel that has filled in;
3. Enhance mid-to-high-marsh plain by improving tidal circulation; and
4. Provide access to rearing habitat and high-flow refugia for fish in the estuary by enlarging the culvert connecting the marsh to the main channel of Corte Madera Creek.

The following work plan describes the steps funded by the SEP.

**Task 1: Characterize Existing Conditions**

**Task 1a Prepare a Detailed Digital Topographic Digital Elevation Model (DEM) of Creekside Marsh:** Stetson Engineers (Stetson) will prepare a detailed digital topographic DEM at a small cell size (e.g., 1 ft by 1 ft) for the entire marsh under existing conditions using the recent Light Detection And Ranging (LiDAR) data obtained from the Federal Emergency Management Agency. The DEM will be prepared using a geographic information system and will be used to create the bathymetric file of the 2-dimensional MIKE 21[1] model.

**Subtask 1b Evaluate Soils:** Soil chemistry, fertility, and texture will be tested to identify where soil is deficient. If soil fertility or texture needs improvement, a strategy for addressing the deficiencies will be developed.

**Subtask 1c Map Jurisdictional Wetlands and Vegetation:** Plant species distribution will be classified and mapped into vegetation communities based on elevation and functional groups. Plant species elevation ranges will be determined by limited ground-truthing and elevation surveys. This elevation survey will also serve as the basis for the habitat design and planting plan for the project

**Task 2: Develop Criteria for Marsh Design**

**Subtask 2a Identify Criteria for Biological Resources:** Clapper rails need these three habitat components:

1. Narrow sinuous channels, lined by *Sarcocornia pacifica* and *Distichlis spicata* with abundant *G. stricta* for nesting;
2. Monocot structure, like *S. foliosa,* along the banks of larger channels and in the marsh plain if it's the right elevation, or patches of *Scirpus* at points of freshwater influence (near a source of sprinkler run-off, even); and
3. Higher elevation areas that provide high-tide refugia. Refugia should flood a couple of times a year on the very highest tides, but have vegetation (like *G. stricta*) that still stick out above the flood waters providing cover.

[1] MIKE 21 is a modeling system for two-dimensional free-surface flows that can be applied in lakes, estuaries, bays, coastal areas, and seas where stratification can be neglected. MIKE 21 can be applied to a wide range of hydraulic phenomena, including tidal currents, storm surges, secondary circulations (eddies and vortices), harbour seiching, dam-breaks, and tsunamis.

Salt marsh harvest mice use *S. pacific*a, particularly dense, tall stands. The project will result in a net increase in high marsh plain vegetation dominated by *S. pacific*a.

Many species of fish use the estuary, notably *Oncorhynchus mykiss* (steelhead trout) that migrate through it and adjust to changes in water salinity while in the estuary. Channels in the wetland could provide high-flow refugia in the winter. To benefit fish, passage through the new culvert should be possible at all tidal levels and risk of stranding should be limited.

**Task 2b Identify the Threshold Water Level in the Marsh for Flooding of the Residential Parcels:** There are residential parcels on the western edge of the Creekside Marsh. Stetson will carefully examine recent topographic data at the western edge of the Creekside Marsh and conduct a field visit/survey to determine the threshold water level in marsh when flooding of the residential parcels happens. This flooding water level threshold will need to be considered in sizing the enlarged culvert. That is, the culvert will need to be sized to increase hydraulic communication between the earthen channel and marsh, but not so much that the flooding water level threshold is reached during an extreme high tide event.

**Task 3: Design Channels and Culvert**
**Task 3a Build a MIKE FLOOD 2-Dimensional Unsteady Hydraulic Models:** Stetson will first develop a MIKE 11[2] model for a selected reach of the earthen channel and a MIKE 21 model for the marsh separately. Once test runs of the two separate models are conducted and the two models are runnable and stable, Stetson will then couple the two models using hydraulic links representing the upstream and downstream culverts. The model will simulate the flood and ebb of the tide between the bay and the earthen channel as well as the tidal-induced flow exchange between the earthen channel and the adjacent Creekside Marsh by way of the upstream and downstream culverts.

The model will be calibrated to the observed water levels within the marsh measured during the two-week period of April 23 to May 7, 2010 as part of the Flood Zone 9 project. The calibrated water levels and velocity distributions within the marsh will be examined to understand the hydrodynamics and the muting effect within the marsh, particularly in the eastern portion of the marsh. These results will inform determination of modifications of channels in the eastern portion of the marsh (Subtask 3b) and for sizing the enlarged culvert (Subtask 3c).

[2] MIKE 11 is a one-dimensional unsteady hydraulic model that provides the water surface elevation in a channel.

**Subtask 3b Conduct MIKE FLOOD[3] Hydraulic Model Simulations to Determine Channel Modifications within the Eastern Portion of the Marsh:** Because the hydrodynamics of the marsh will affect the sizing of the enlarged culvert, based on the results of Subtask 2c above Stetson will first conduct model simulations to determined modifications of the channels within the eastern portion of the marsh. Stetson will work with project biologists to arrive at a modified channel configuration that achieves the target biological-hydrological design objectives

**Subtask 3c Conduct MIKE FLOOD Hydraulic Model Simulations to Size the Enlarged Culvert*:*** Once the channel modifications within the eastern portion of the marsh are determined, Stetson will then size the enlarged culvert using the calibrated MIKE FLOOD model. Stetson will run repetitive simulations, starting with the existing culverts, to determine the extent to which enlargement of the downstream culvert might increase the volume of the tidal prism without violating the flooding water level threshold, using the existing culverts as the baseline condition. The simulated stage hydrograph of the eastern portion of the marsh under existing conditions will be compared with the tidal stage hydrograph in the adjacent earthen channel to examine the difference in timing and magnitude. A significant difference would suggest that the hydraulic capacity of the existing single 60-inch culvert limits the hydraulic communication between the channel and the eastern portion of the marsh. Incrementally larger sizes for this culvert will be simulated and evaluated through repetitive model simulations until “the point of diminishing returns” (i.e., benefits) is reached. Based on the modeling results, Stetson will recommend the dimension and invert elevation of the enlarged culvert for preparation of design plans.

**Subtask 3d Evaluate Benefits of the Enlarged Culvert in Terms of Tidal Prism Enlargement and Long-Term Sediment Scour in the Earthen Channel and Report Results:** Stetson will utilize the analysis approach that was developed for the marsh/earthen channel analysis for the Ross Valley Capital Improvement Plan Study to evaluate the benefits of the enlarged culvert in terms of tidal prism enlargement and long-term sediment scour in the earthen channel. Enlarging the prism will increase typical tidal flow and theoretically will increase channel depths. Stetson will evaluate potential for reducing periodic dredging needs in the tidal zone by expanding the tidal prism by the marshland floodplain restoration to increase natural daily sediment transport into San Francisco Bay under existing and future sea level conditions.

**Subtask 3e Prepare 50% Drawings:** Stetson and WRA Environmental Consultants (WRA) will prepare 50% drawing for use in the permit process. The designs will be presented with a technical memorandum that documents the analyses and summarizes the results. The memo will mainly include two parts; one part will document the MIKE FLOOD model configuration, data and assumptions used in the model, model calibration, and model simulation results. The other part will

[3] MIKE FLOOD is used to link the one-dimensional MIKE 11 and the two-dimensional MIKE 21 to analyze flood plains.

summarize the approach and results of the analysis of the sediment management benefits of the culvert enlargement.

**Subtask 3f Develop Planting and Public Access Plan:** We propose to salvage plants from the filled in channel and from the areas disturbed during installation of the larger culvert. These plants will be installed in around the new culvert and in currently bare areas. These bare areas may need some grading to be at the appropriate elevation and adequately drained. The planting plan will identify these areas, and those which can be planted in their current configuration. Planting along adjacent high marsh edges and upland areas to provide high-tide refugia is part of separate efforts, so it is not included here.

**Task 4: Conduct Environmental Review and Obtain Permits**
**Subtask 4a Evaluate Ability of Marsh Design to Respond to Climate Change:** Creekside Marsh has some upland areas where wetland vegetation can move to higher elevations as sea level rises. PRBO[4] Conservation Science is under contract with the North Bay Watershed Association (NBWA), in cooperation with Marin County Flood Control District, to evaluate the extent and impacts of modeled sea-level rise. That, and other studies underway, may inform this effort.

**Subtask 4b Prepare Biological Assessment**: At a minimum, California clapper rails, salt marsh harvest mice, and steelhead could be affected by the project. Other special-status species will be considered as appropriate.

**Subtask 4c Prepare CEQA Document**: The project must comply with the California Environmental Quality Act (CEQA), with Marin County as the lead agency. This proposal assumes that an Initial Study (IS) amended to be a Mitigated Negative Declaration (MND) will be the appropriate level of CEQA review for the proposed Eastern Creekside Marsh Enhancement Project. Environmental review for the proposed project is anticipated to include the following significant tasks and associated work products: Administrative Draft IS/MND, Draft IS/MND, Final IS/MND.

**Subtask 4d Prepare Joint Aquatic Resource Permits Application (JARPA) Documents**: Friends will prepare the JARPA documents with support from WRA and Stetson. Approvals for the project must be issued by several state and federal agencies:

- United States (US) Army Corps of Engineers: Consult with US Fish and Wildlife Service and National Oceanic an Atmospheric Administration (NOAA) National Marine Fisheries Service under Section 7 of the Federal Endangered Species Act;
- US Army Corps of Engineers: Evaluate the potential for impacts to cultural resources;
- Regional Water Resources Control Board: Provide Section 401 Certification;

[4] PRBO Conservation Science is the new name for what used to be the Point Reyes Bird Observatory; this represents a name change, not the use of an acronym.

- California Department of Fish and Game: Provide a Streambed Alteration Agreement and act as a responsible agency under CEQA; and
- Bay Conservation and Development Commission: Evaluate compliance with the McAteer-Petris Act

**Subtask 4f Respond to Comments**: The team will respond to comments from reviewers and revise the plans as necessary to respond to comments.

**Task 5: Enlarge Culvert**
**Subtask 5a Conduct Land Surveys:** Stetson will conduct land surveys around the culvert before the final design drawings and specifications are developed.

**Subtask 5b Prepare Bid Package:** Based on comments received during the permitting process, Stetson will prepare 80% design drawings and specifications for review and comment. Upon receipt of review comments from Marin County Flood Control District for the 80% design, Stetson will finalize the design and prepare a complete bid package for construction. Bid documents will include signed and sealed engineered drawings, contract specifications per County Standards and technical specifications sufficient to bid and construct the proposed final design. An engineer's estimate of probable cost will be prepared based on the final design.

**Subtask 5c Support Construction.** Stetson will support the bidding process by attending a pre-bid meeting, preparing response to questions, attending a public bid opening, reviewing bids and preparing a due diligence memo reviewing the contractors who submitted the three lowest bids. Once a contract is awarded, Stetson will attend a pre-construction meeting, review material submittals and show drawings. Stetson will administer the construction contract including reviewing pay quantities.

**Subtask 5d Install Culvert**. Construction of the culvert involves salvaging plants from the area to be disturbed, installing cofferdams to dewater the work area, removing the old culvert, installing the new culvert, restoring the path, and installing erosion control. At key times during construction, as spot checks and as issues arise, Stetson will inspect the contractors work for compliance with the design.

**Subtask 5e Compliance Monitoring:** A clapper rail biologist will be present during installation of cofferdams around the work area, but once the area is dewatered, no clapper rail monitoring will be necessary.

**Task 6: Install Plants**
**Subtask 6a Prepare Soil in Bare Areas:** The planting plan developed in Task 3f will identify areas that can be planted without changes in elevation or new channels through vegetated areas; a preliminary estimate suggests these areas cover approximately 500 square feet. These areas will be hand dug in preparation for planting material salvaged from the filled-in channel, mostly Jaumea and pickleweed.

**Subtask 6b Install Salvaged Plants:** Crews using only hand tools will salvage plants from the channel and immediately plant them in prepared areas. When work at the culvert is complete, the plants salvaged from that area will be planted in disturbed areas. If space is available at the right elevation, we will plant *Grindelia stricta* at the high marsh edge around the new culvert.

**Task 7: Monitor and Report**
**Subtask 7a Conduct Photo-documentation**: Viewpoints will be established and photos taken to provide on-going photo-documentation of the project from pre-construction through completion of monitoring.

**Subtask 7b Prepare Quarterly Reports:** Quarterly reports will be submitted throughout the SEP-funded work

**Subtask 7c Monitor Implementation:** Stetson will provide as-built drawings for the culvert. The areas planted will be photographed and mapped.

**Subtask 7d Monitor Effectiveness:** Stetson will install transducers to measure the change in tidal volume as a result of the enlarged culvert.

**Subtask 7e Monitor Planting:** Surveys will be done annually in September for three years to document the condition of vegetation; annual reports will be submitted describing the survey results. If coverage is less than 40% after two years, more planting will be done.

A Bay-wide collaborative (PRBO Conservation Science, National Wildlife Refuges, East Bay Regional Parks, California Department of Fish and Game, and ISP) monitors California clapper rails. One of the sites is Creekside Marsh, so it is not necessary to include clapper rail monitoring in this project.

**Subtask 7f Prepare Final Report:** A final report will be prepared, summarizing the project through completion of construction and the first September vegetation monitoring.

**Task 8: Manage Project**
Friends project manager will prepare contracts, invoices, and progress reports. She will also attend meetings and provide interim reports to stakeholders and team members of progress. All invoicing and communication will be done electronically to save on office expenses.

## Compliance with SEP Criteria:

This section addresses how the project meets SEP criteria.

6. The Southeastern Creekside Marsh Habitat Enhancement Project directly addresses beneficial uses of waters of the State under **Criterion d, Habitat Restoration or Enhancement** and **Criterion f, Wetland Restoration or Creation**. New tidal channels will be created to provide clapper rail habitat and new high marsh plain

vegetation will provide suitable salt marsh harvest mouse habitat. Increasing the tidal prism will improve conditions for vegetation, wildlife, and fish in the marsh and promote sediment management.

**7.** The SEP contains only measures that go above and beyond applicable obligations of the discharger: Ross Valley Sanitary District (RVSD) has no obligation to maintain or enhance habitat at Creekside Marsh. The marsh is part of a Marin County park; the berm and culverts are owned by Marin County and were installed as part of the US Army Corps of Engineers Corte Madera Creek Flood Control Project.

8. The SEP does not directly benefit, in a fiscal manner, the Water Board's functions, its members, or its staff. Neither will RVSD's board, board functions, and staff benefit from the SEP. All of the funds will be used for the project as described; none of the recipients are connected to RVSD.

9. The SEP has a nexus to the location of the violation. RVSD's SSOs that are considered in the Regional Water Quality Control Board's 2012 Administrative Order occurred immediately adjacent to and/or upstream of Creekside Marsh. Considering the high levels of dilution that occur during wet weather events, it is not known whether these spills entered the marsh. However, the District has agreed to provide funding for this project. This project will enhance habitat directly adjacent to and downstream of the discharges in question.

10. Long-term Maintenance (beyond the SEP-funded project)
    a. Marin County Flood Control District, Zone 9 is responsible for maintaining the culvert and the main channel of Corte Madera Creek under an agreement with the US Army Corps of Engineers.
    b. Typically, native tidal marsh vegetation requires very little maintenance. The ISP will continue to treat and monitor invasive cordgrasses as long as funding is available. Absent the involvement of the ISP, the Marin County Parks Department will be responsible for ensuring that invasive cordgrasses are removed; this will be enforced by the Marin Agricultural Commissioner because all invasive cordgrasses are considered noxious weeds by the California Department of Agriculture.
    c. After SEP funding ends, maintenance and plant surveys will be done by Marin County Parks Department.

11. This project was identified as one component of the Ross Valley Watershed Program, a 20-year program to enhance habitat and reduce flood risk in the Corte Madera Creek Watershed. Marin County Parks Department, the owner and manager of Hal Brown Park at Creekside, supports efforts to enhance Creekside Marsh.

## Project Milestones and Budget:

12. **Schedule and Deliverables:** Figure 4 is a Gantt chart with the project schedule, assuming that we can start work in July 2012. Because of clapper rail nesting season constraints, we can only enter the marsh during the period September 1

through January 31. Construction, that requires entry into the marsh, cannot begin before September 2013. If Marin County cannot review and approve the CEQA document in a timely manner or other permits are delayed beyond October 2013, then construction would be delayed until September 2014. The budget is in Figure 5. RVSD shall be responsible for costs as they are incurred, not to exceed the minimum of the project cost and $249,370.00, and as clarified in Paragraph 13. This commitment shall expire when the project is completed or the agreed funds are expended, whichever shall occur first.

Tasks described in the work plan are in the Gantt chart. Deliverables are as follows:

| **Deliverable** | **Date** |
|---|---|
| Begin work | 7/15/2012 |
| Map of Jurisdictional Wetlands and Vegetation | 10/15/2012 |
| 1st Quarterly Report | 10/15/2012 |
| Planting Plan | 12/14/2012 |
| 2nd Quarterly Report | 1/15/2013 |
| Technical Memo re: Hydraulics Modeling | 1/25/2013 |
| 50% Designs | 1/25/2013 |
| Biological Assessment | 2/25/2013 |
| JARPA and CEQA Doc Submitted | 3/13/2013 |
| 3rd Quarterly Report | 4/15/2013 |
| Copies of Approvals | as available |
| 4th Quarterly Report | 7/15/2013 |
| ***The following dates require approvals from regulators no later than 10/15/13*** | |
| 5th Quarterly Report | 10/15/2013 |
| 6th Quarterly Report | 1/15/2014 |
| Designs as Implemented | 2/21/2014 |
| 7th Quarterly Report | 4/15/2014 |
| Final Construction Report | 5/23/2014 |
| 8th Quarterly Report | 7/15/2014 |
| Final Report including Vegetation Monitoring (after first session of monitoring) | 10/15/2014 |
| Quarterly reports | 1/15, 4/15, 7/15, and 10/15 of 2015 and 2016 |
| Annual Vegetation Reports | 10/15/2015 & 16 |

13. **Accounting:** Friends maintains a separate job number for each project and every transaction entered must have both a job number and an account (e.g., Postage and Delivery, Engineering, Biological Consulting, etc.). The treasurer does not pay bills without the authorization of the Project Manager, to ensure that unauthorized expenditures are not made. We use QuickBooks, a standard accounting program, which makes it easy to maintain accurate records and generate reports.

Any funds left over after the successful completion of the SEP must be turned over to the State Cleanup and Abatement Account.

## Project Performance Measures

14. This table describes measures or indicators for the success of the SEP and procedures to evaluate compliance with the performance measures. The success will be documented by photos, as-built drawings, and vegetation surveys presented in the final report. Vegetation surveys will be conducted each September for three years following planting. If permits are received by 10/15/2013, construction will be completed by late January 2014. If regulatory agencies cannot process applications and issue approvals by then, the work would be delayed one year because the clapper rail nesting season requires that work be done between September 1 and January 31.

| Action | Performance Measure | Procedures to Evaluate Compliance |
|---|---|---|
| Replace old culvert (original x-sec area ~20 sq ft) with new culvert(s) (x-sec area ~35 sq ft) | Increased tidal exchange from 11.0 ac-ft/day to 15.4 ac-ft/day; increased wetted area from 8 acres to 12.8 acres (daily average) | Install pressure transducers that measure water depth to record increased tidal prism. |
| Plant at least 500 square feet of mid-to-high-marsh plain native plants in suitable bare areas. The community is expected to be dominated by Jaumea and pickleweed, with some Frankenia and Limonium. | Provide 50% coverage of native mid-to-high marsh vegetation after 3 years. | Measure plant coverage annually in September for 3 years; install additional plants if coverage is less than 40% after two years. |

## Reports to the Water Board

15. Friends of Corte Madera Creek Watershed will submit quarterly reports on the progress of completion of the SEP to the Regional Water Board, the San Francisco Estuary Partnership, and the State Water Board's Division of Financial Assistance. We will also provide a final report documenting completion of the SEP, and addressing how performance measures were met, along with a copy of accounting records of expenditures.

## Third Party Oversight Organization

16. San Francisco Estuary Partnership will provide third-party oversight for this project.

**Figure 1:** Creekside Marsh

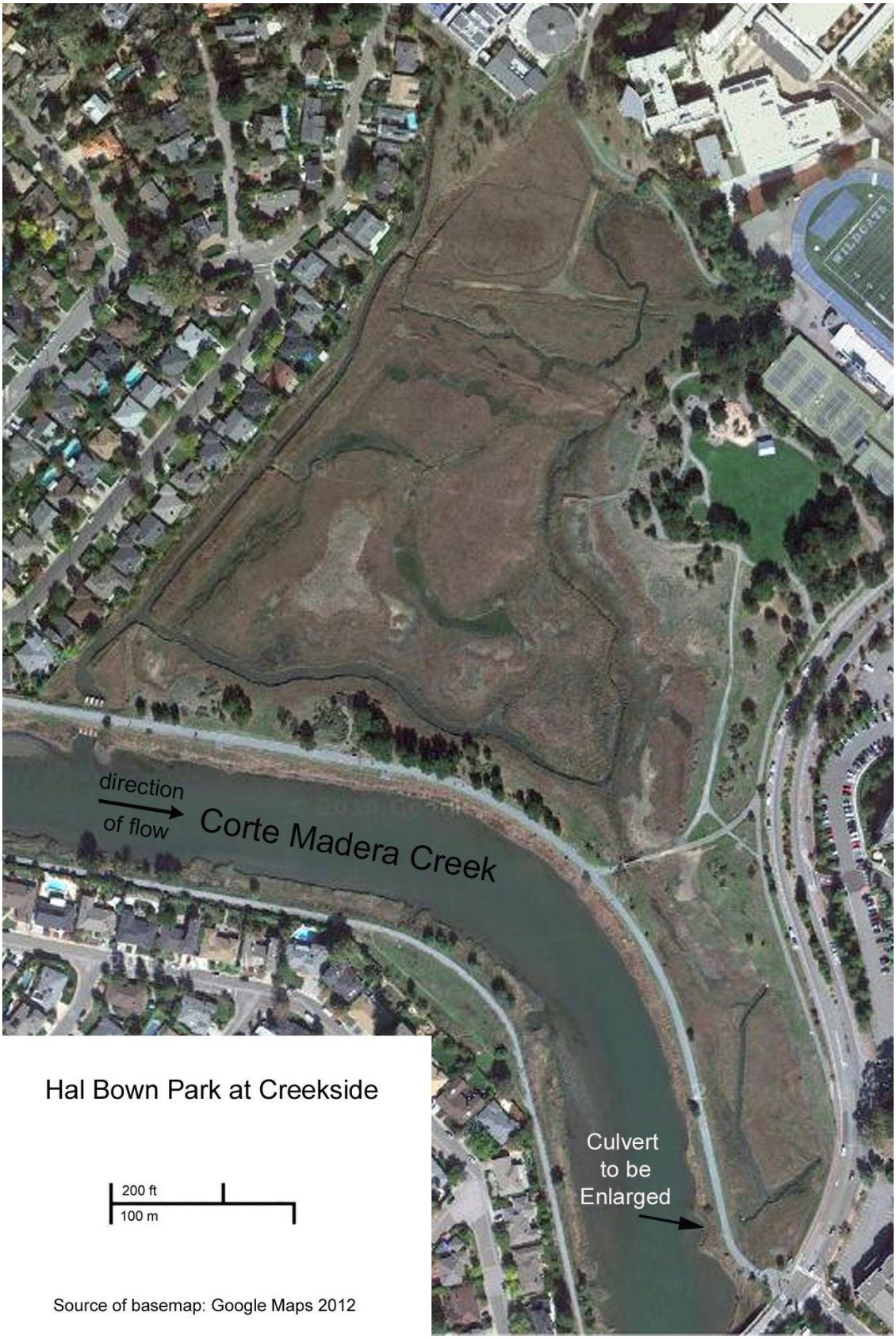

**Figure 2:** Views of Project Area

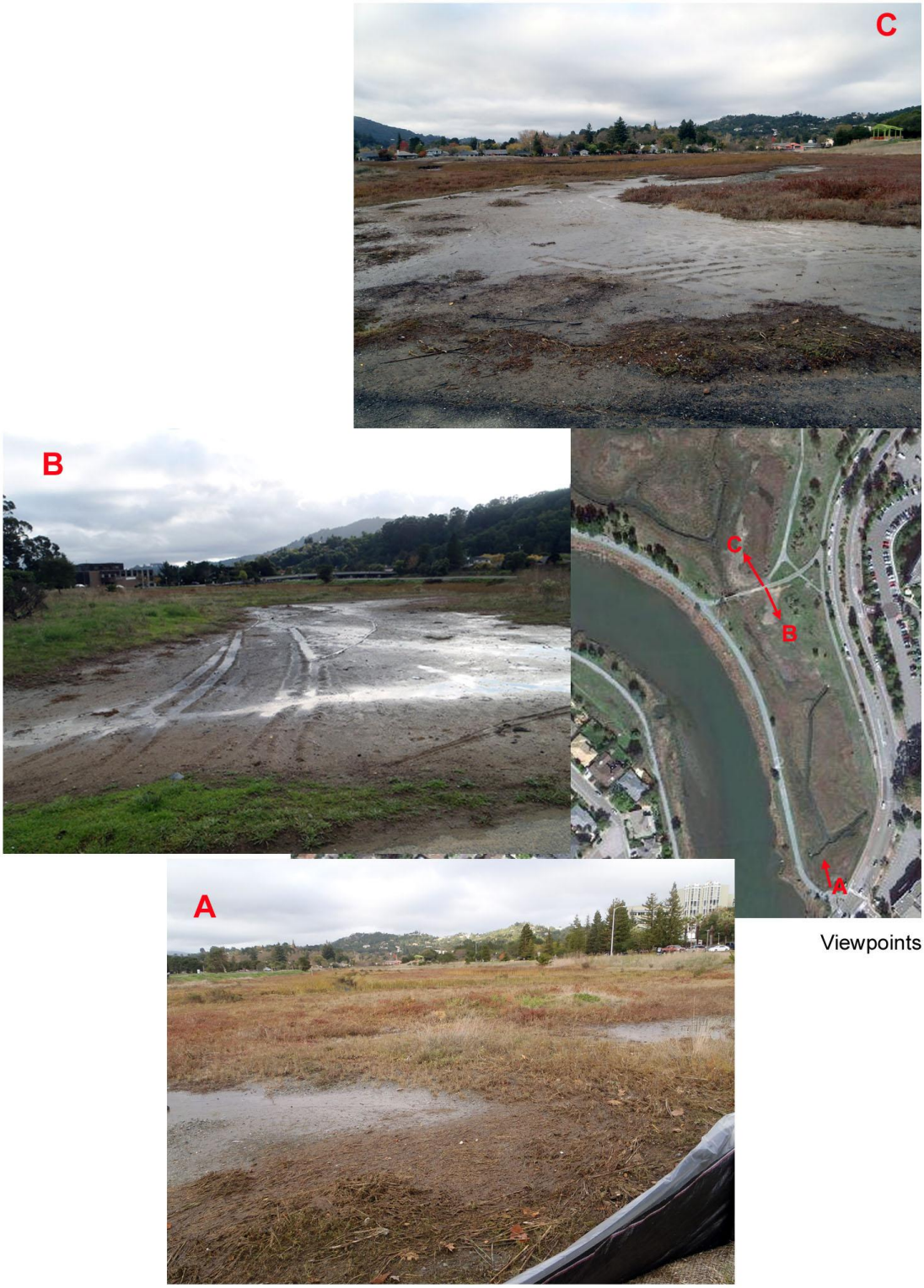

**Figure 3:** Southeastern Creekside Marsh Project Area

**Figure 4:** Schedule

| | Activity Name | Duration (Months) | Start Date | Finish Date |
|---|---|---|---|---|
| 1 | **Task 1: Characterize Site** | **1.00** | **8/1/12** | **8/30/12** |
| 2 | 1a Prepare DEM | 0.86 | 8/1/12 | 8/27/12 |
| 3 | 1b Evaluate Soils | 1.00 | 8/1/12 | 8/30/12 |
| 4 | 1c Map Jurisdictional Wetlands and Vegetation | 1.00 | 8/1/12 | 8/30/12 |
| 5 | **Task 2: Develop Criteria for Marsh Design** | **1.23** | **9/4/12** | **10/10/12** |
| 6 | 2a Identify Criteria for Biological Resources | 1.00 | 9/11/12 | 10/10/12 |
| 7 | 2b Identify Flooding Threshold | 1.00 | 9/4/12 | 10/3/12 |
| 8 | **Task 3: Design Culvert and Channels** | **3.86** | **10/1/12** | **1/25/13** |
| 9 | 3a Build MIKE FLOOD Models | 0.80 | 10/1/12 | 10/24/12 |
| 10 | 3b Design Channels using MIKE FLOOD | 1.00 | 10/22/12 | 11/20/12 |
| 11 | 3c Design Culvert using MIKE FLOOD | 0.75 | 11/26/12 | 12/18/12 |
| 12 | 3d Evaluate Benefits; Report Results of Modeling | 1.00 | 12/17/12 | 1/15/13 |
| 13 | 3e Prepare 50% Designs | 1.36 | 12/17/12 | 1/25/13 |
| 14 | Publish Tech Memo re: Hydraulics Modeling | 0.00 | 1/25/13 | 1/25/13 |
| 15 | 3f Develop Planting and Public Access Plan | 0.91 | 11/19/12 | 12/14/12 |
| 16 | **Task 4: Conduct Environmental Review and Obtain Permits** | **8.32** | **1/2/13** | **9/16/13** |
| 17 | 4a Evaluate Response to Climate Change | 0.50 | 1/25/13 | 2/8/13 |
| 18 | 4b Prepare BA | 1.75 | 1/2/13 | 2/25/13 |
| 19 | 4c Prepare CEQA Document | 2.00 | 1/2/13 | 3/4/13 |
| 20 | 4d Prepare JARPA | 2.00 | 1/14/13 | 3/14/13 |
| 21 | 4e Respond to Comments | 0.75 | 5/20/13 | 6/11/13 |
| 22 | Approvals Issued | 0.00 | 9/16/13 | 9/16/13 |
| 23 | **Task 5: Install Larger Culvert** | **3.42** | **9/23/13** | **1/6/14** |
| 24 | 5a Conduct Land Surveys | 0.10 | 9/23/13 | 9/25/13 |
| 25 | 5b Prepare Bid Package | 0.50 | 9/23/13 | 10/7/13 |
| 26 | 5c Support Construction | 1.50 | 11/4/13 | 12/18/13 |
| 27 | 5d Replace Culvert | 1.60 | 11/18/13 | 1/6/14 |
| 28 | 5e Conduct Complaince Monitoring | 0.40 | 11/18/13 | 11/29/13 |
| 29 | **Task 6: Relocate Plants** | **1.84** | **11/18/13** | **1/13/14** |
| 30 | 6a Prepare Bare Areas | 0.50 | 11/18/13 | 12/2/13 |
| 31 | 6b Plant Salvaged Material | 1.60 | 11/25/13 | 1/13/14 |
| 32 | **Task 7: Monitor and Report** | **26.27** | **8/1/12** | **10/17/14** |
| 33 | 7a Conduct Photo-documentation | 26.27 | 8/1/12 | 10/17/14 |
| 34 | 7b Prepare Quarterly Reports (QR) | 23.18 | 8/1/12 | 7/15/14 |
| 35 | 7c Monitor Implementation | 0.00 | 2/21/14 | 2/21/14 |
| 36 | 7d Monitor Effectiveness | 1.00 | 1/6/14 | 2/4/14 |
| 37 | 7e Monitor Planting | 1.00 | 9/8/14 | 10/7/14 |
| 38 | 7f Prepare Final Report | 0.00 | 10/15/14 | 10/15/14 |
| 39 | **Task 8: Manage Project** | 26.27 | 8/1/12 | 10/17/14 |

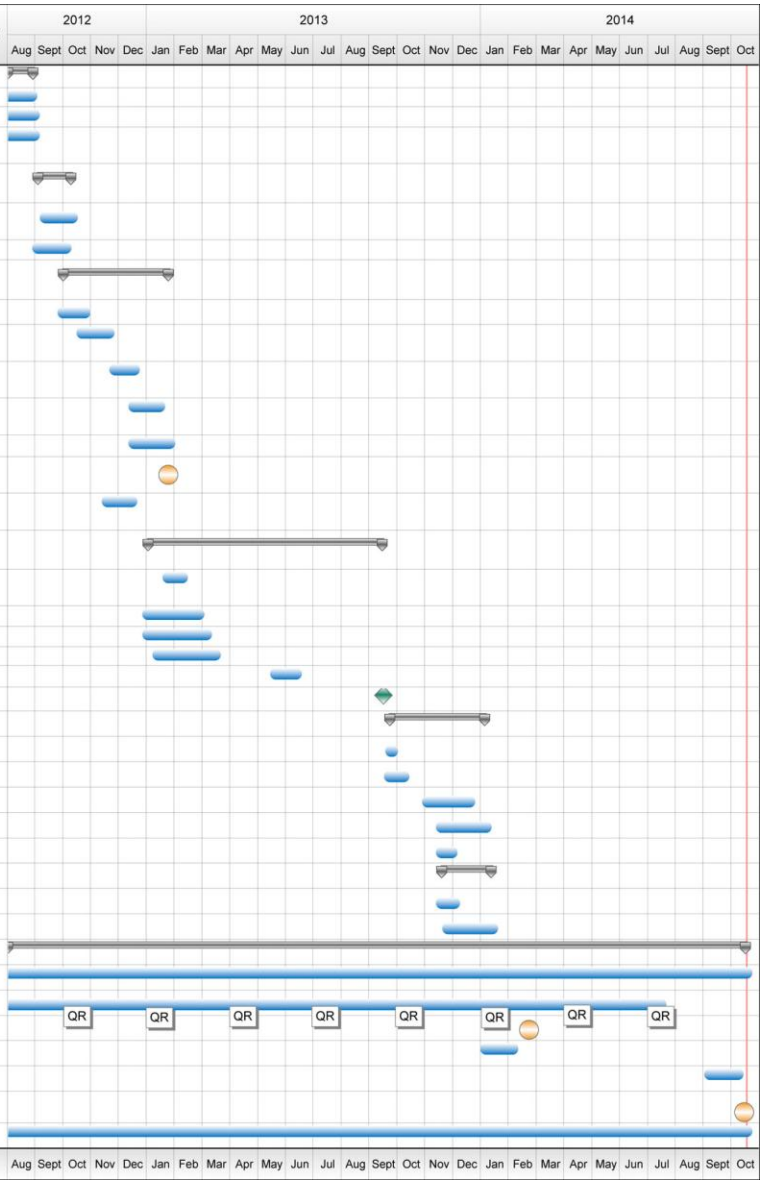

**Figure 5:** Estimated Budget

| Eastern Creekside Marsh Culvert Enlargement - Estimated Budget | | | | | | |
|---|---|---|---|---|---|---|
| | WRA | Stetson | Avocet | Fees | Other Contractor | **TOTAL** |
| **Task 1: Characterize Site** | | | | | | |
| 1a Prepare DEM | | 4,000 | | | | **4,000** |
| 1b Evaluate Soils | 2,400 | | | | | **2,400** |
| 1c Map Jurisdictional Wetlands and Vegetation | 4,300 | | | | | **4,300** |
| **Task 2: Develop Criteria for Marsh Design** | | | | | | |
| 2a Identify Criteria for Biological Resources | 2,100 | | 1,200 | | | **3,300** |
| 2b Identify Flooding Threshold | | 1,500 | | | | **1,500** |
| **Task 3: Design Channels and Culvert** | | | | | | |
| 3a Build MIKE FLOOD Hydraulic Models | | 6,000 | | | | **6,000** |
| 3b Design Channels Using MIKE FLOOD | | 3,000 | | | | **3,000** |
| 3c Design Culvert Using MIKE FLOOD | | 2,000 | | | | **2,000** |
| 3d Evaluate Benefits and Report Models Results | | 4,500 | | | | **4,500** |
| 3e Prepare 50% Designs for Culvert and Marsh | | 19,000 | | | | **19,000** |
| 3f Develop Planting and Public Access Plan | 6,000 | | | | | **6,000** |
| **Task 4: Conduct Environmental Review and Obtain Permits** | | | | | | |
| 4a Evaluate Response to Climate Change | | 3,000 | | | | **3,000** |
| 4b Prepare BA | 5,000 | 2,000 | 440 | | | **7,440** |
| 4c Prepare CEQA Document (Friends & MC Parks) | 5,000 | 2,000 | | 2,500 | | **9,500** |
| 4d Prepare JARPA Documents (Friends) | 1,000 | 5,000 | | 5,000 | | **11,000** |
| 4e Respond to Comments | 4,400 | 2,000 | 220 | | | **6,620** |
| **Design and Permitting Subtotal** | 30,200 | 54,000 | 1,860 | 7,500 | | **93,560** |
| | | | | | | |
| **Task 5: Install Larger Culvert** | | | | | | |
| 5a Conduct Land Surveys | | 2,310 | | | | **2,310** |
| 5b Prepare 80% and Final Culvert Designs | | 12,000 | | | | **12,000** |
| 5c Support Construction | | 14,000 | | | | **14,000** |
| 5d Install Larger Culvert | | | | | 116,000 | **116,000** |
| 5e Conduct Compliance Monitoring | 1,000 | | | | | **1,000** |
| **Task 6: Relocate Plants** | | | | | | |
| 6a Prepare Bare Areas | | | | | 2,500 | **2,500** |
| 6b Plant Salvaged Material | | | | | | **-** |
| **Task 7: Monitor and Report** | | | | | | **-** |
| 7a Conduct Photo-documentation | | | | | | **-** |
| 7b Prepare Quarterly Reports | | | | | | |
| 7c Monitor Implementation | | 5,000 | | | | **5,000** |
| 7d Monitor Effectiveness | | 3,000 | | | | **3,000** |
| 7e Monitor Planting | | | | | | **-** |
| 7f Prepare Final Report | | | | | | **-** |
| **Task 8: Manage Project (Friends)** | | | | | | **-** |
| **Construction and Monitoring Subtotal** | 1,000 | 36,310 | - | - | 118,500 | **155,810** |
| | | | | | | |
| **TOTAL** | **31,200** | **90,310** | **1,860** | **7,500** | **118,500** | **249,370** |