WRMP Near-term Monitoring Implementation Priorities

Purpose: Provide information about the WRMP's near-term monitoring priorities for the WRMP for September 2023 through June 2025, using current funding from the Restoration Authority and in-kind matching program funds.

Audience: WRMP Steering Committee

Background: WRMP has existing grant funds from the San Francisco Bay Restoration Authority (RA) to support program development and near-term science implementation, including a small budget to facilitate pilot monitoring through June 2025. This initial monitoring is an opportunity to launch data collection and analysis efforts and develop preliminary products that illustrate the power and usefulness of the WRMP. It is also an opportunity to test the program's technical approach, from conception through data collection, analysis, synthesis, interpretation, management, and communication. This work will also allow the WRMP to pilot its approach to program administration, governance, and contracting personnel to conduct the monitoring.

Criteria for selection of near-term implementation activities:

➢ Will help answer the program's Guiding and Management questions.
➢ Low-cost with high return on investment.
➢ Leverages historical and/or existing datasets.
➢ Broad spatial coverage.
➢ Supports evaluation of restoration projects within a regional context.
➢ Addresses near-term science priorities and/or restoration & management actions, particularly regarding the resilience of the region's wetlands to climate change.

Near-term science priorities for WRMP monitoring to address:

➢ Track restoration progress and measure tidal marsh extent.
➢ Start to track how well marshes are functioning.

> ➤ Detect which marshes, if any, are showing early indications of drowning due to sea level rise.

TAC approval: In April 2023, the WRMP staff solicited feedback from the Technical Advisory Committee on a list of possible monitoring indicators or analyses to pursue in the near-term. The TAC approved the implementation activities below, in order of priority, on June 8, 2023. These three priorities were selected because they address all of the criteria outlined above, they span the range of monitoring approaches from remote sensed imagery analysis, rapid assessment of condition, and site-scale field monitoring (consistent with Levels 1, 2, 3 monitoring as defined by EPA and the California WRAMP framework) and in particular, all three implementation activities leverage historical monitoring investments. Building upon these historical datasets will allow the WRMP to relatively quickly produce information that addresses the near-term science priorities listed above, and establish a solid foundation for future program monitoring.

Proposed WRMP early implementation actions:

1. Conduct regional analyses of wetland extent and characteristics from the Baylands Change Basemap.

The WRMP will perform geospatial analyses using the Baylands Change Basemap (BCB) to:
   a.) Establish baseline characterization of tidal wetland habitats in the lower San Francisco Estuary
   b.) Track restoration progress (for example, the acres of vegetated tidal wetland that have been restored since the most recent baylands mapping in 2009)
   c.) Derive metrics of interest aligned with other efforts in the region, including the RDMMP/Shoreline Resilience Framework, the State of the Estuary Report (SOTER), and the San Francisco Bay Restoration Authority Performance Measures that will be applied consistently in future remapping efforts to enable calculations of change over time. For example, this may include subregional maps of "complete" marshes (as defined by the Baylands Ecosystem Habitat Goals 2015 Science Update) or analysis of where new investments in restoration projects can improve landscape connectivity.

2. Conduct California Rapid Assessment Methods (CRAM) assessments of WRMP Priority Network Sites

CRAM is a well-established rapid assessment approach for assessing wetland condition. This method is used throughout California, which helps to provide context for additional data acquisition in the Bay Area. Previous CRAM assessments around the Bay will enable an analysis of change in wetland condition over time.

Initial WRMP efforts will focus on using historical CRAM assessments and a regional Cumulative Distribution Function (CDF) to characterize wetlands in the WRMP Priority Monitoring Site Network. This analysis will be used to select a subset of WRMP Monitoring Sites to assess using CRAM. This approach will:

a) Establish a baseline understanding of marsh condition at WRMP Network Sites.
b) Facilitate detection of change in CRAM scores over time (for sites that have been previously assessed using CRAM).
c) Evaluate WRMP Network Site CRAM scores relative to regional trends (CDFs).
d) Compare WRMP Project Sites to established Habitat Development Curves (HDCs) and see how they compare to Benchmark and Reference Sites.
e) Serve as a basis for comparison for the condition of other restoration projects in the Bay.

3. Purchase and Deploy Sediment Elevation Tables-Marker Horizons (SET-MHs) in Underrepresented Sub-regions and Conduct Region-wide SET-MH Data Collection

Detecting if marshes are beginning to drown is a near-term priority for WRMP monitoring. Deep rod Sediment Elevation Table-Marker Horizons (SET-MHs) assess total elevation change and accretion locally, which are processes critical to understanding wetland vulnerability to sea level rise (SLR). Building out and monitoring this network of SET-MHs begins to answer the question of whether and where marsh accretion is keeping pace with SLR and where marshes are at risk of drowning.
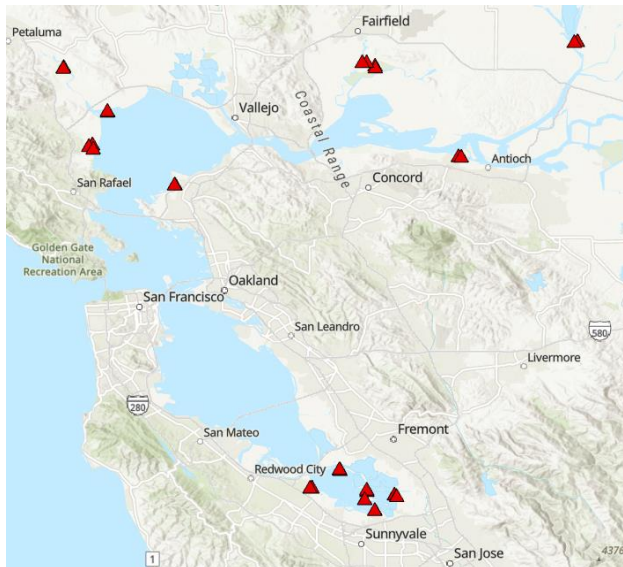

Figure 1: Map of Existing SET Locations

SET-MHs have been deployed at sites throughout the region and historic data can be leveraged at these locations. However, many SET-MHs already in place are not consistently monitored. By re-sampling these locations, the WRMP can leverage long-term monitoring data to quickly achieve meaningful results. In addition, new SET-MHs will be deployed in the WRMP Monitoring Site network to augment the data from existing SET-MHs that are relatively well-distributed throughout most of the rest of the San Francisco Estuary. The WRMP will fund partners at USGS to a) install new SET-MHs in locations that fill regional gaps; b) monitor existing SETS; and c) analyze the data to inform decision-making about new restoration projects.