

**Bair Island Wetland Restoration Project Monitoring Plan
Monitoring Review Team (MRT) Meeting
of the San Francisco Bay Wetland Monitoring Group
held on February 28, 2007
9:00am – 12:30pm**

Summary Report (May 7, 2007)

[Note that Clyde Morris will submit his version of the revised table of Monitoring Elements & Schedule for review].

This is a summary report of the Monitoring Review Team (MRT) meeting to discuss a Monitoring Plan for the Bair Island Wetland Restoration Project. The meeting was held on February 28, 2007 from 9 a.m. to 12:30 p.m. at the California State Building, 1515 Clay Street, Oakland, CA 94612. This report represents the understanding and recollections of the attending committee members and project representatives based on their collective review of their comments as compiled by the San Francisco Regional Water Quality Control Board (Water Board). This report represents only the advisory opinions of individual participants and pertains only to this project. *It is not intended to be verbatim or legally binding on the participants including the monitoring review team, permit applicant, or regulatory agencies.* Please contact Andree Breaux at abreaux@waterboards.ca.gov if you have any questions or comments regarding these notes.

Attendees

Monitoring Review Team (MRT)

Andree Breaux (Chair), Water Board; John Callaway, University of San Francisco; Josh Collins, San Francisco Estuary Institute; Phil Lebednik, LFR, Inc.; Nadav Nur, Point Reyes Bird Observatory.

Project Representatives

Clyde Morris, U.S. Fish and Wild Service (FWS); Lisa Stallings, Life Sciences; John Krause, California Department of Fish & Game (CDFG)

Administrative Staff

Agnes Farres, Water Board; Xavier Fernandez, San Francisco Estuary Project.

Meeting Summary

Introductions and Purpose of Meeting (Andree Breaux)

The meeting began with an introduction of participants. The purpose of the meeting was to solicit recommendations for developing a minimal but sufficient monitoring program

that will protect beneficial uses of wetland habitats and other waters of the state while encouraging large restoration projects by avoiding unreasonably expensive monitoring requirements. The Water Board staff found the MRT's recommendations for developing a minimal monitoring program for the Napa Salt Plant Restoration Project to be very useful, and is looking for similar recommendations for the Bair Island Restoration Project (Bair Island Project). The Napa Salt Plant permit is currently being drafted and will be issued in 2007 or 2008.

The FWS would like at least one of the permits for the Bair Island Project to be issued within two months so that it can take advantage of available dredge or upland material. To help meet this accelerated schedule, the Water Board staff will use the Waste Discharge Requirements (WDR) for the Hamilton Airfield Restoration Project (Hamilton Project) as a template. The Hamilton Project used dredged sediment and the Bair Island Project proposes to use dredged sediment. (The Napa Plant Site project also proposes to raise elevations to speed tidal marsh development, but it will try to use material from onsite which has already been tested and approved). The Water Board staff will consider the recommendations from this meeting in its decision on monitoring requirements for the Bair Island Project and it will also forward the meeting minutes to the U.S. Army Corps of Engineers (USACE) and Bay Conservation and Development Commission (BCDC) for their consideration. The final meeting notes will also be posted on the Wetland Regional Monitoring Program website at <http://www.wrmp.org/documents.html>.

Key principles to consider for recommending a minimal wetland *restoration* monitoring program for public agencies with very limited resources were agreed to at an earlier meeting of the MRT.¹ These included: (1) Make sure that all the data are highly relevant; (2) For any collected data there should be a predicted state or condition indicating when the related goal or objective is met; (3) Focus on condition, not its causes; (4) Ensure that project goals and objectives are addressed by the monitoring program; (5) Mine other projects for needed data; (6) Maximize the use of available human resources.

It was also noted that the Bair Island Project will have performance expectations and criteria that will be used to evaluate the project as it develops. Monitoring for some permit elements such as water quality, contaminants, and some hydrological and biological features will be required by the Water Board and have enforceable limits; however, once the habitat targets are finalized, failure to meet them in the future should not trigger penalties that require the applicants to provide new wetland habitat. Failure to meet the habitat targets should trigger a review of the monitoring data and an attempt to determine why. It is important to encourage wetland restoration (as opposed to

¹ It is important to make the distinction between wetland restoration and compensatory wetland mitigation projects. The former frequently have minor impacts on wetlands with the intention of substantially increasing wetland functions and area. The latter are typically required by law as a result of permanent losses to wetlands through some human activity such as permanent fill and loss of the wetland habitat. Compensatory wetland projects typically require wetland replacement at higher ratios to replace lost functions and monitoring to show that performance criteria are met.

mitigation, see footnote #1) by public agencies that own the land in order to increase wetlands in the region.

Project Overview (Clyde Morris)

Prior to the meeting, the MRT was provided with hardcopies of project descriptions including the Restoration Project Monitoring Plan (H.T. Harvey & Philip Williams & Associates, 2004) and the U.S. FWS Biological Opinion (2006) which are both contained in the Final Environmental Impact Report (FEIR); (both documents are included on this web page).

The Don Edwards Wildlife Refuge has a very limited budget for programs to monitor restoration projects (\$200K + ¼ Full-Time Equivalent staffing). This budget limitation prevents the refuge from being able to meet specifications in the current monitoring plan and Biological Opinion (BO). As a result, the Bair Island Project is in jeopardy and will not be implemented unless requirements in the monitoring plan and BO are reduced. Refuge staff requested recommendations from the MRT that would help focus monitoring on the essential restoration goals of the project, while avoiding additional flooding in the area or bird strikes at the nearby airport. Furthermore, the elements included in the monitoring plan should provide information that managers can act upon, but the MRT recognizes that not all recommended monitoring elements will meet this requirement.

Project Background

The site consists of diked tidal marsh and is divided into three areas (Outer, Middle, and Inner Bair Island) by levees. The site was initially diked for agriculture and has subsequently been used for salt production. Subsidence has occurred in all three areas; however, the degree of subsidence varies between the areas. Inner Bair Island has subsided about 2.5 feet as compared to less than 1 foot of subsidence on both Middle and Outer Bair Island. As a result, Inner Bair Island will form ponds and take at least 50 to 100 years to become vegetated, if natural sedimentation processes are the only mechanism for increasing elevation. The ponds will attract waterfowl that will pose a strike hazard for planes landing at San Carlos Airport just to the north. To minimize these impacts, fill will be used to raise elevations on Inner Bair Island to a point where marsh vegetation can establish and a small region just south of the airport will be raised to upland elevations. To accomplish this, about 1 million cubic yards of fill will be needed. Initial estimates (that are subject to change) are that about 200,000 cubic yards of the fill will consist of dredged materials from Redwood Creek with the rest coming from upland excavation material. The fill materials will be analyzed and the results compared to the Water Board's wetland cover criteria for estuarine wetlands before placement. The cost of the testing will be covered by fees paid to the Refuge for the right to dispose of dredged and excavated materials on Inner Bair Island.

The drainage pattern of the surrounding creeks and sloughs has also been altered by the dredging of Redwood Creek. Historically, water drained through both Steinberger Slough and Redwood Creek. Currently, water drains entirely through Redwood Creek because dredging has increased the flow capacity of this creek and Steinberger Slough

has remained too shallow to capture any flow. Hydrogeomorphic models predict that restoring tidal action to the site will result in sediment deposition in Redwood Creek instead of in the restoration area where it is needed, and cause dangerously high flow velocities at Pete's Outer Harbor. To minimize these impacts, the following measures were proposed:

- Placement of a flow restrictor in Corkscrew slough (see Figure 4 from the attached H.T. Harvey & PWA 2004 monitoring plan) to force water out of Steinberger Slough
- Restore the historic meander through Inner Bair Island
- Harden a segment of the meander nearest Pete's Harbor

The flow constrictor may be removed once down cutting of Steinberger Slough has stabilized the system.

The project planned to breach the Outer Bair Island dikes in 2007, but this has been delayed because an invasive plant species -- invasive cordgrass (*Spartina alterniflora*) -- was found in the project vicinity. The project now plans on breaching the Outer Bair Island dikes in the fall of 2008 after the invasive *Spartina* has been eradicated.

Project Goals and Objectives for the Restoration of Bair Island

The primary goals of the project are to:

- (1) restore tidal wetlands on Bair Island;
- (2) provide habitat for endangered and other native species; and
- (3) enhance public awareness of and maintain public access.

The major objectives are:

- Restore and enhance habitat for the endangered California Clapper Rail (*Rallus longirostris obsoletus*) and salt marsh harvest mouse (*Reithrodontomys raviventris*).
- Create and enhance habitat for other wetland dependent species, if compatible with restoration for the Clapper Rail and harvest mouse.
- Minimize disturbance to sensitive species (e.g., Clapper Rails, harbor seals [*Phoca vitulina*]).
- Provide the control of undesirable species including invasive plants, undesirable predators, and mosquitoes.
- Enhance the public's awareness of the unique resources at Bair Island by providing opportunities for wildlife-oriented recreation and nature study.

Additional objectives were listed in the EIR, but the objectives above were considered of primary importance.

MRT Discussion and Recommendations

To focus the monitoring plan on only the essential elements, the Phil Lebednik suggested that important factors to consider included the following:

- Goals of the project.
- Critical processes of the project.
- Necessary information to adaptively manage the project.

The other MRT members generally agreed with this suggestion. Phil also suggested that the level of effort assigned to monitoring should be adjusted in accordance with the following considerations:

- give priority to those monitoring parameters that will directly contribute to the goals, processes and management alternatives available for the project and identify which of these a parameter is intended to address;
- focus sampling efforts primarily during the critical times(s) and/or location(s) for the high priority monitoring parameters;
- establish realistic benchmarks and/or decision criteria for each parameter so that there is a demonstrable relationship between the data collected and the goals, processes and management alternatives.

With these factors in mind, the MRT reviewed the monitoring elements in Tables 1 and 2 of the H.T. Harvey *Monitoring Plan* (2004). Recommendations based on this review were made with the understanding that if the project does not progress as expected, FWS will be obligated to review the monitoring plan and data to determine why the site is not reaching its targets, present the analysis and recommendations to San Francisco Bay wetland regulatory agencies and the public, and add additional monitoring elements as needed. The MRT's general recommendations are provided below.

[Note that Phil Lebednik abstained from commenting on Hydrologic Element 3 of the table because it is concerned with a human safety issue (flooding) and he was serving as an Ecologist; and Andree Breaux abstained from commenting on all the hydrologic elements. Many of the suggestions below were made by Josh Collins and he has submitted his own detailed notes which provide further explanations; those notes are attached as a separate document.]

Recommendations on the first 6 elements from Table 1 were combined because these elements all relate to hydrology. The MRT also agreed that the elements of the monitoring plan related to hydrology should be reviewed by the MRT or a similar group following the first year of monitoring. Any changes to the hydrologic elements in the monitoring plan should first be reviewed and approved by a competent third party

because of the potential to harm the surrounding property. This caution is restated below for those elements that require particular caution.

HYDROLOGIC ELEMENTS:

- **Element 1 (Tidal Circulation):** Measurements of tide levels were considered necessary to protect against the threat of flooding. To focus the monitoring plan, the MRT suggested only using tide gauges in areas of concern, and using peak data recorders instead of tide gauges in less critical areas, to simplify data management and analysis.
- **Elements 2 (Slough Morphology) and 3 (Targeted Survey of Steinberger Slough):** The MRT recommended combining Elements 2 and 3. Surveys of cross-sections in Elements 2 and 3 were considered important, but the MRT felt that the number of cross-section measurements could probably be reduced. As a result, the hydraulic model should be reviewed by a qualified third party to identify the minimum number of cross-sections needed to evaluate project performance. In addition, the locations of cross-sections should be based on professional judgment using field observations; measurements could be collected every year for the first 3 years, and then reviewed by the MRT or other review body to determine whether the sloughs are performing as expected without posing any flooding risks, after which a future monitoring schedule could be recommended.
- **Element 4 (Marsh Morphology):** The MRT considered the surveys of levee breaches to be important and recommended that these surveys be performed annually for the first 3 years. The MRT also suggested that monitoring elevation along 6 transects and collecting data using sedimentation plates/pins were not critical. (Note that sedimentation plates/pins were considered critical for the Napa Plant Site where salinity is higher, vegetation more sparse, and subsidence greater.)
- **Element 5 (Current Velocities):** The MRT agreed that measuring current velocities was probably unnecessary because cross-section measurements would provide sufficient information to evaluate hydrological processes at Bair Island. However, this should be assessed by a qualified third party before velocity measurements are decreased due to the potential for hydrologic damage.
- **Element 6 (Infrastructure):** The MRT suggested removing the Infrastructure Element from the monitoring plan because it is related to routine maintenance.

Recommendations for the remaining elements were grouped together because these elements all relate to biology. The MRT agreed that a phased approach to monitoring ecological services could be implemented to help minimize costs and that elements of the

monitoring plan related to biology should be reviewed by the MRT or a similar group following the fifth year of monitoring. In general, the phased approach is based on achieving habitat targets before implementing more labor intensive monitoring.

BIOLOGICAL ELEMENTS

- **Element 7 (Habitat Mapping):** The MRT recommended setting habitat targets for the end of the project with a wide range for each habitat type. For example, by Year 30 (or 50, etc.) the three islands are expected to have between 50-100% tidal marsh; 50-100% mudflats; 30-50% channels; 10-20% tidal panes, etc. etc. The habitat types should be defined in the document.

The MRT recommended using aerial photographs from Wetland Tracker to develop habitat maps because these photographs will be collected as part of the South Bay Salt Pond Restoration Project and will be available for free through SFEI's Wetlands Tracker Program. The MRT suggested that the results of habitat mapping could trigger implementation of monitoring designed to assess specific ecological services. Habitat maps would show vegetated areas, bare areas and waterways, and would be performed during years 0, 1, 3, 5, and every fifth year thereafter until a target percent vegetation cover was achieved. The target percent vegetation cover would be for smaller zones within each area (Outer, Middle, and Inner Bair Islands) and would trigger vegetation mapping (Element 8), avian monitoring (Element 10), and salt marsh harvest mouse surveys (Element 11). For Outer Bair Island, three zones with a target of 25 percent vegetation cover were recommended. Note that Middle and Outer Bair already have about 50% cover of low quality vegetation, so it is unlikely that requiring vegetation assessments to start at 5%, which is required for some tidal marsh sites, would be practical at this site.

Josh Collins also recommended that the California Rapid Assessment Method (CRAM) be used to evaluate overall ecosystem health. The MRT agreed to review CRAM and to send comments to Clyde Morris via email.

Annual aerial photos could be reviewed each year to make sure any large-scale problems can be detected and corrected in a timely manner.

- **Element 8 (Vegetation):** The MRT recommended replacing habitat mapping with vegetation mapping once 25 percent total vegetation cover was reached in a zone. The vegetation mapping would be more detailed and would include specific vegetation communities. Josh Collins suggested using the Wetland Regional Monitoring Program's (WRMP) vegetation mapping protocols. The MRT agreed to review the WRMP vegetation mapping protocols and to send comments to Clyde Morris via email. Once the target for total vegetation cover is reached, vegetation

mapping should occur during years 1, 3, 5, and 10 and then in future years based on review by MRT or other similar group.

- **Element 9 (Invasive Cordgrass):** The MRT suggested coordinating with the San Francisco Invasive Spartina Project on monitoring and management of invasive Spartina.
- **Element 10 (Avian monitoring):** The MRT recommended monitoring all birds instead of just monitoring for the California Clapper Rail because it is relatively inexpensive and provides useful data on prey base and other habitat requirements. Bird surveys should be performed during year 1 following breaching of the levees and then during years 1, 3, and 5, and 10 (or until target habitats have been met) after the initial trigger for total vegetation cover is reached. Monitoring would be conducted during all seasons for a wide range of avian species. Further monitoring should be based on review of monitoring data by MRT or other similar group. Nadav Nur will send bird survey protocols to the group for review and comment.
- **Element 11 (Salt Marsh Harvest Mouse):** The MRT recommended monitoring of the salt marsh harvest mouse for presence and not population size. After the target for total vegetation cover is reached, monitoring should be performed during years 1, 3, 5, and then based on review by MRT or other similar group. Monitoring population size was considered impracticable because of confounding factors associated with monitoring protocols for the salt marsh harvest mouse.

Other general MRT recommendations on the project included:

- FWS field staff should keep a journal of general observations which could be attached to the monitoring reports to increase field staff involvement in the overall process. Photos should also be taken and preserved by FWS field staff to show vegetation progress and the presence of wildlife, especially shorebirds and waterfowl. Consultants or any one else monitoring the site, should also take photos to document biological or physical processes. Field photos should be included in the summary reports.
- design should consider the importance of fill material texture as a controlling factor in vegetation establishment. Based on results of previous restoration projects, tidal marsh vegetation does not establish well on coarse materials. Therefore, to maximize the likelihood that finer sediment will accumulate in the rooting zone, the design should prioritize finer material in the top foot of soil either by (a) allowing natural sedimentation or (b) if dredged sediment is used to hasten tidal marsh development, placing the coarser material at the bottom, and leaving the finer material for use as the top layer of fill
- dredge material should be kept wet during and after it is placed on the project site.

The MRT meeting ended with an agreement to continue discussions of performance expectations and criteria via email. These could include a range of values to account for natural variation. Clyde Morris will send his version of the revised Monitoring Table to the MRT for review.