Addendum to the Mitigation and Monitoring Report Program

Central Marin Ferry Connection Multi-Use Pathway Phase I
Marin County, California

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1.0 INTRODUCTION

This Addendum (Addendum) is being submitted to update the off-site mitigation portion of the original Central Marin Ferry Connection Multi-use Pathway Phase Project Mitigation Monitoring and Reporting Program (MMRP, Bill Whitney, April 2014). The primary objectives of the Addendum are to describe the revised mitigation activities for the off-site mitigation project located at Creekside Park designed to replace affected wetland habitat, including replacement of wetland vegetation. The Addendum also addresses the proposed off-site mitigation activities, mitigation implementation and vegetation planting, mitigation goals, and maintenance and monitoring of the off-site mitigation site. Activities not discussed in this Addendum will be implemented as originally proposed in the MMRP.

WRA, Inc, (WRA) has prepared this Addendum on behalf of the Transportation Authority of Marin and Marin County Parks.

1.1 Project Description

The Transportation Authority of Marin and the County of Marin are proposing to construct a new multi-use pathway intended to further promote non-motorized commute alternatives and enhance recreational travel within the City of Larkspur in Marin County, California. The Central Marin Ferry Connection Multi-use Pathway Project (CMFC Project) contains two phases (Phase I and II). Phase I is the scope of this CMFC Project and would include a multi-use pathway from the future Cal Park Hill Tunnel Rehabilitation and Path Project and future Sonoma Marin Area Rail Transit (SMART) Larkspur Station located east of U.S. Highway 101 and north of East Sir Francis Drake Boulevard to the existing multi-use pathway located south of East Sir Francis Drake Boulevard along the north bank of Corte Madera Creek (postmile [PM] 8.5 to PM 8.9). The CMFC Project would be located within the SMART, California Department of Transportation (Caltrans), and City of Larkspur rights-of-way. Phase II would include an extension of the Phase I multi-use pathway south over Corte Madera Creek to Wornum Drive, but has not yet been planned or programmed and is not part this Project's scope.

Construction of the multi-use pathway would require the installation of support structures (i.e., piles, footings, and piers) within the tidal salt marsh and tidal channels. The installation of these structures would likely involve dewatering (i.e., the use of coffer dams, etc.). The construction access area may involve the deposition of fill material within the tidal salt marsh and may consist of layers of a synthetic geo-grid material and gravel that would be used to construct an earthen platform. Alternatively, a temporary trestle may be constructed on which construction equipment would drive. This may include a platform suspended on support structures elevated above the ground. These options would enable construction vehicles to access the tidal salt marsh area and construct the multi-use pathway.

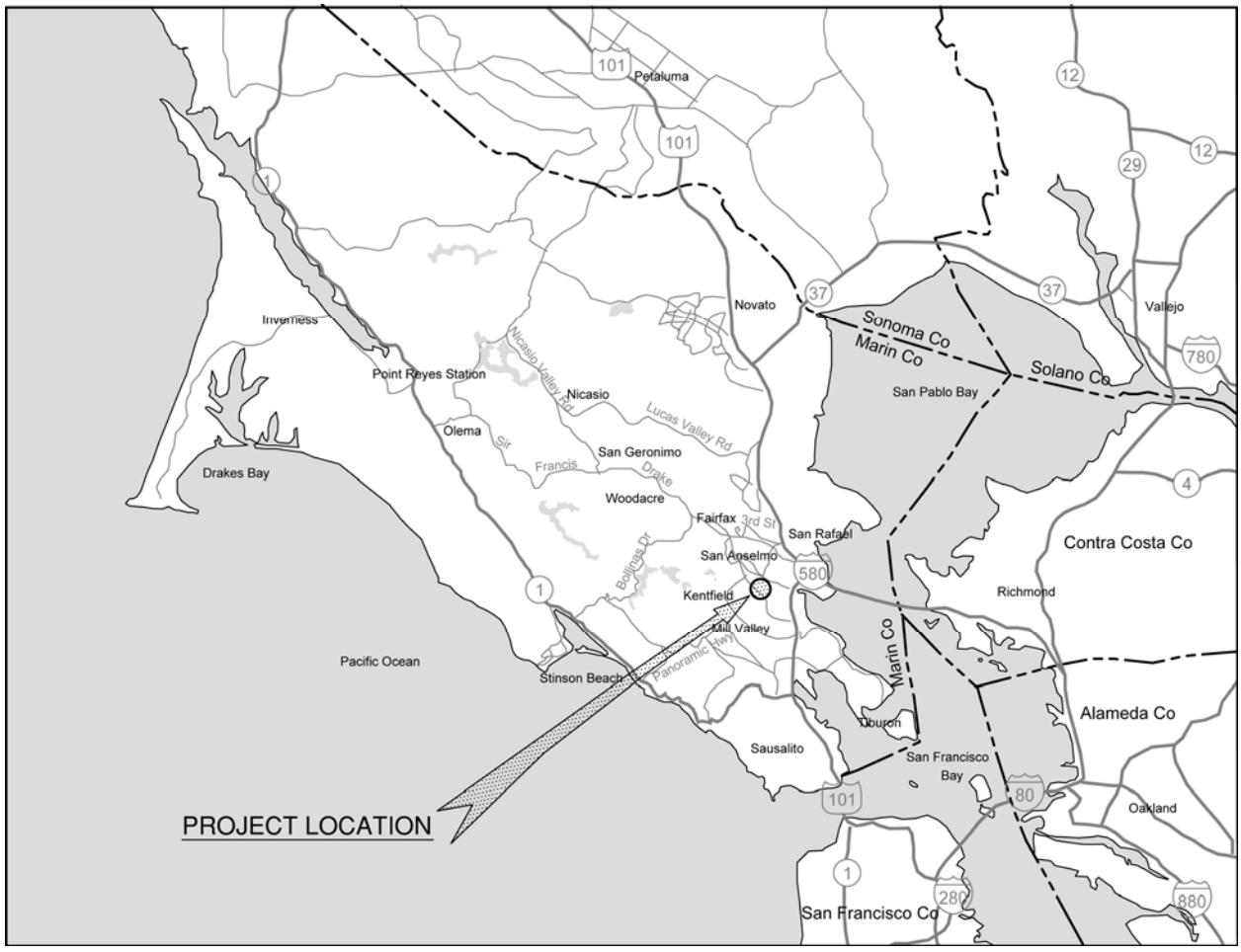
The County of Marin will be completing a number of construction activities within the CMFC project site, including on-site restoration within the salt marsh and Corte Madera Creek. This Addendum does not address the on-site restoration activities.

At the off-site mitigation site, the County will restore and enhance the tidal salt marsh at Creekside Marsh to offset the impacts to the tidal salt marsh at the CMFC Project site. Creekside Marsh is a 21-acre tidal wetland on unincorporated land near Kentfield, Marin

County, California, as shown on Figure 1: Vicinity Map. The marsh and adjacent park are owned and operated by Marin County Parks.

The target off-site restoration areas have been adapted from the original mitigation actions proposed in the MMRP. This revised program of mitigation actions at Creekside Marsh is consistent with the mitigation goals outlined in the MMRP and will continue to provide the required 1.424 acres of off-site mitigation, but will do so in the areas of the marsh that are in the greatest need of restoration.

Figure 1: Vicinity Map



Source: Stetson Engineers 2012

1.2 Related Permits

Permits pertaining to this project include:
BCDC – Application No 2011.004.00 (CMFC Project Location)
USACOE – File number 2012-00216N
FWS – Caltrans File Number CML 6406 (010), 04-MRN-0-TAM
CDFW – Notification No. 1600-2012-0248-R3
RWQCB – CIWQS Reg. Meas. 387315; CIWQS Place ID 786026

2.0 PROPOSED MITIGATION SITE

2.1 Mitigation Site Location

The proposed off-site mitigation area is located at Creekside Marsh.

2.2 Existing Conditions of Proposed Mitigation Site

Creekside Marsh comprises a 21-acre tidal wetland on unincorporated land near Kentfield, Marin County, California. The US Army Corps of Engineers filled this marsh 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. In the mid-1970s, Creekside Park, recently renamed Hal Brown Park, was developed and the marsh restored. The marsh is separated from the channel of Corte Madera Creek by an earthen berm and pathway that is routinely used by runners, walkers, cyclists, and bird watchers.

The marsh has two distinct sections. The southeastern portion, connected to Corte Madera Creek by a single-bore culvert through the berm near Bon Air Bridge, is particularly deficient in tidal exchange. This deficiency will be addressed by enlarging the singe-bore culvert under separate permits, including BCDC Permit App. No. M2014.003.00. The western portion, fed by the 4-bore culvert, has more robust tidal exchange; the 4-bore culvert 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.

Habitats and elevations within and adjacent to the marsh include the following:

- Low Marsh: The low marsh zone within the marsh is located between approximately 2.0 and 5.5' NAVD88. This habitat is characterized by unvegetated mudflats within tidal channels, and channel margins that are dominated by cordgrass (*Spartina foliosa*).

- High Marsh: The high marsh zone within the marsh is located between approximately 5.5 and 6.6' NAVD88. This habitat is characterized by broad marsh plains that are dominated by pickleweed (*Salicornia pacifica*), fleshy jaumea (*Jaumea carnosa*) and salt grass (*Distichlis spicata*).

- Transition Zone: The transition zone within the marsh is located between approximately 6.5 and 7.0' NAVD88. This habitat is a narrow margin between the marsh and the uplands, and is dominated by salt grass, marsh rosemary (*Frankenia salina*), marsh gumplant (*Grindelia stricta* var*. angustifolia*) and California sea-lavender (*Limonium californicum*).

- Uplands: The upland zone above the marsh is located above 7.0' NAVD88. This zone is dominated by non-native annual grasses.

As shown on Figure 2, BCDC jurisdiction over San Francisco Bay extends to areas supporting tidal marsh vegetation up to an elevation of 8.24' NAVD88 (5' above MSL).

2.3 Existing Soil Conditions

The US Army Corps of Engineers filled this marsh 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. In the mid-1970s, Creekside Park, recently renamed Hal Brown Park, was developed and the marsh restored. When it was restored, some areas were left with compacted, gravelly soil unsuitable for marsh vegetation. Some areas, including those proposed for restoration, are still unvegetated as a result of the impacts from this historic fill and restoration, which may include mineral gravelly soil that had has low water holding capacity, hyper-saline conditions, and heavy compaction.

Figure 2: Project Site Plan

Off-site Mitigation, Central Marin Ferry Connection Multi-use Pathway Project: Marin County, California

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ENVIRONMENTAL CONSULTANTS

Date: April 2014
Map By: Mark Brandi
Base Source: ArcGIS Basemap

Path: L:\Acad 2000 Files\24000\24032\gis\arcmap\BCDC Site Plan_rev.mxd

3.0 PROPOSED WETLAND MITIGATION

3.1 Mitigation Wetland Goals

To mitigate for the permanent loss of 0.004 acre of tidal marsh and shade impacts to 0.113 acre of tidal marsh, the Project will restore 0.004 acres of tidal marsh and enhance 1.284 acres of tidal marsh, and 0.136 acre of upland refugia habiatat with transition zone and upland plants. The goals of the project include:

- Restore high marsh plain vegetation by removing the deck and alleviating compaction in bare soil areas that are the appropriate elevation for salt grass, pickleweed, and othertidal marsh plants. The soil in these areas is compacted and in some cases very poorly drained.

- Adding structural diversity to the transitional zone. Promote gumplant at the upper edge of the transition zone near the high tide line. Once the plants are established, they have the potential to provide nesting habitat for clapper rail as well as some degree of high-tide refugia. Salt grass and perennial pickleweed already lining the channels provide shelter for clapper rails in the channels.

- Provide high-tide upland refugia. Coyote brush (Baccharis pilularis) will be planted higher and adjacent to the gumplant to provide additional high-tide refugia.

3.2 Restored Mitigation Wetland Description

The following is a description of the target areas within Creekside Marsh to be restored as mitigation for the Central Marin Ferry Connection Multi-use Pathway Project.

The revised restoration areas are described below and are shown on Figure 2: Project Site Plan:

a) *Deck Removal and Pathway Restoration (0.22 acres)*: The existing deck and unauthorized trail leading south from the deck will be removed. These areas will then be cultivated to loosen the soil; limited grading by hand or light equipment may be required to remove the deck and a portion of the trail, but no heavy equipment will be used. High marsh, transition zone and upland plants will be installed in the footprint of the removed deck and trail, and a temporary fence and / or signage will be installed as needed to keep pedestrian traffic out of the marsh.

b) *"Inverted T" (0.214 acres)*: The "Inverted T" site is composed of dredge spoils placed by the U.S. Army Corps of Engineers and does not currently support vegetation apparently due to its poor drainage, relatively high elevation, and/or compacted soil. The existing topography of this site will first be evaluated to determine if small-scale grading will create positive drainage of the bare areas. If grading is necessary, the site will be re-contoured to support habitat for high marsh and transition zone plant species. Prior to grading, temporary construction fencing will be installed between the work area and the marsh to prevent any disturbance or encroachment of construction activities into the marsh. Following grading, the soil will be tilled to loosen it for planting by hand or with a small five-horsepower wheeled-tiller. The site will be planted with high marsh and transition zone plant species, such as pickleweed, salt grass, and gumplant.

c) *Berm (0.333 acres)*: The berm site is also composed of dredge spoils placed by the U.S. Army Corps of Engineers however currently supports native marsh some non-native upland vegetation due to its relatively higher elevation relative to the inverted T area. . This site will be planted with gumplant and / or coyote bush, as appropriate for elevations determined by survey of the area. Due to the compacted soil of the berm, a one-man gasoline-powered auger may be used to install holes for the plantings if digging by hand is too slow. In areas where there is other vegetation, gumplant will be planted at a lower density than in bare areas. Other than the auger, all planting will be completed by hand.

d) *Island (0.094 acres)*: Enhancement of the island site will involve planting gumplant in a ring around the site, at appropriate elevations for the species. In areas where there is existing vegetation, gumplant will be planted at lower density than in bare areas. All planting will be completed by hand.

f) *Inner Marsh (.562 acres)*: The bare areas within the inner marsh adjacent to the island on Figure 1 are areas where non-native *Spartina densiflora* was removed by the Invasive Spartina Project (ISP) and the Friends of Corte Madera Creek. This effort was not a part of this project and was not compensatory in nature, but was required as part of the ISP's ongoing efforts to eradicate non-native *Spartina* from the San Francisco Bay. These areas will be re-planted with native mid- and high marsh species such as pickleweed.

4.0 RESTORED WETLAND IMPLEMENTATION PLAN

Based on the elevations of the enhancement areas and adjacent existing marsh, topography is expected to be appropriate for establishment of salt marsh plants and the current hydrologic regimes will allow for tidal inundation. The mitigation plan will remove a small amount of fill (the deck and associated asphalt path) from areas that are within the high marsh to achieve appropriate tidal marsh elevations. In order to reduce potential impacts to California clapper rail and other special-status species, all enhancement activities and monitoring at Hal Brown Park will follow the avoidance and minimization measures outlined in Table 1 of the MMRP (see Appendix A). A service-approved California clapper rail biologist will coordinate access to the marsh and remain onsite during enhancement activities. Subsequent vegetation monitoring will also be supervised by a California clapper rail biologist.

4.1 Planting Preparation

Prior to any soil disturbance, a monitor will evaluate the need for exclusion fencing. Where the work areas are near pickleweed, fencing to exclude salt marsh harvest mice will be installed if the environmental compliance monitor recommends it. In areas that are deemed to not require fencing, the environmental compliance monitor will be on-site during all ground disturbing activities.

The existing deck will be removed and unauthorized trail leading south from the deck will be revegetated. In addition, there are several areas in Creekside Marsh where dredge spoils placed by the US Army Corps of Engineers have never supported vegetation, such as the 'inverted T'. Other areas have been compacted by pedestrian and bicycle traffic. Areas of compaction will be cultivated to loosen the soil and maintain drainage.

Soil testing of bare areas will be undertaken to identify any soil chemistry problems. If necessary, soil amendments, including sulfur, compost, and gypsum, will be applied to lower salinity and ensure wetland plant establishment. Freshwater irrigation may be applied to leach salts further from these soil areas prior to planting and in the first year to establish new plants. If amendments and leaching are not adequate to rehabilitate the existing bare soil areas, soil may be imported to provide a viable growing medium for tidal marsh plants.

No heavy equipment will be used. Cultivation of the bare areas will be done using a small five-horsepower wheeled-tiller.

A small area of upland adjacent to the deck was paved with asphalt that served as a trail connection to the deck. The asphalt paving will be saw cut and removed. All subbase gravels will also be removed and disposed of off-site. The area will be restored with transitional and upland plantings to discourage pedestrian traffic into the newly restored marsh areas. Heavy equipment may be used in upland non vegetated areas in order to remove and dispose the asphalt and deck.

To protect the existing marsh from any inadvertent fill, existing wetland areas along the edges of the proposed excavation area shall be fenced prior to site grading. A wetland biologist will be present during excavation of the mitigation wetland to ensure that all protective measures are in place, and proper avoidance techniques are being followed to avoid any impacts to existing wetlands.

In areas that are not tilled, an efficient process for planting is to make a hole the size of the planting container and slip the plant into it with minimal surface disturbance. Plugs of transplanted high marsh plain plants are typically bigger than “stubbies” and a larger hole is needed. If progress in planting is too slow, a one-man gasoline auger, fitted with a 2- to 3-inch bit, will be used to dig holes the diameter of the tubes in which the plants are grown. This technique minimizes disturbance of the marsh and reduces the time required for planting. To avoid discharges of petroleum hydrocarbons from the equipment into the salt marsh and creek, the following best management practices will be implemented:

- All equipment shall be maintained in order to prevent leaks of automotive fluids such as gasoline, oils, or solvents. A Spill Response Plan shall be prepared. Hazardous materials such as fuels, oils, solvents, etc. shall be stored in sealable containers and designated locations at least 100 feet (30 meters) from wetlands and aquatic habitats.

- Servicing of vehicles and construction equipment including fueling, cleaning, and maintenance shall occur at least 100 feet (30 meters) from any aquatic habitat unless they are separated by topographic or drainage barrier or unless they are located at an already existing gas station. Staging areas may occur closer to the project activities as required.

4.2 Mitigation Wetland Planting Plan

The planting plan for the marsh restoration and enhancements will include the species listed in Table 1. Container stock for plantings will be purchased from local nurseries as necessary. Plants will be located at elevations appropriate for the expected marsh hydrology.

Table 1. Native Species to be planted in the mitigation wetland.

Species	Common Name	Zone	Size	Spacing
Baccharis pilularis	coyote brush	Upland (transition)	4” pot	6’ on center
Distichlis spicata	saltgrass	Mid-marsh	plugs	2’ on center
Frankenia salina	alkali heath	Upper Marsh, Transition	4” pot	3’ on center
Grindelia stricta	gumplant	Upper Marsh	Supercells (RLC7)	4’ on center
Jaumea carnosa	marsh jaumea	Upper marsh	4” pot	3’ on center
Salicornia pacifica	pickleweed	Mid-marsh	plugs	2’ on center

4.3 Schedule

Construction is expected to begin September 1, 2014, after the completion of the California clapper rail breeding season and will be completed by December 31, 2014.

4.4 Irrigation

Upland transition species like gumplant and coyote brush will require temporary drip irrigation to be established. In addition, some areas such as the ‘inverted T’ may have high salinity and may

require temporary spray irrigation to reduce salinity in the soils for plant establishment to be successful.

4.5 As-Built Conditions

A brief letter report outlining the as-built conditions of the wetland mitigation area will be prepared and submitted to the Corps, RWQCB, and BCDC, FWS, and CDFW within thirty days

5.0 MAINTENANCE

5.1 Maintenance Activities

Initial maintenance activities that will be required at the mitigation sites include a visual assessment of the condition of planted marsh vegetation. If a significant percentage of these plants appear to die immediately following planting, additional soil testing may need to occur to ensure that soil pH levels are correct. If significant levels of erosion occur in the mitigation areas, additional planting may be recommended.

Weed removal will also be undertaken on the mitigation sites to ensure vigorous growth by target vegetation. Biologists will also monitor the extent of perennial pepperweed (*Lepidium latifolium*), Spartina alterniflora, Spartina densiflora, broom, or star thistle and other non-native invasive plants found on Cal IPC List A and Red Alert List. Removal of invasive species will be completed by hand as part of the maintenance effort.

5.2 Maintenance Schedule

Inspections for erosion will be conducted after major storm events during the first winter following planting of the mitigation wetlands. Thereafter, inspections for erosion will only be conducted after extreme storm events. Inspections for invasive non-native plants will be conducted during the annual mitigation site vegetation monitoring visit.

5.3 Responsible Parties

The applicant will be responsible for conducting the maintenance activities as described above.

6.0 MONITORING PLAN

Annual monitoring for a five-year period will be required at the mitigation site to document habitat development and determine if mitigation success criteria have been met. Monitoring will be conducted and reports will be prepared by a qualified wetland biologist with experience in mitigation monitoring.

6.1 Success Criteria

Following implementation of the mitigation plan, a five-year monitoring program will be conducted to determine whether the wetland restoration sites have achieved functions similar to the nearby reference salt marshes, and whether modification of the site designs or implementation procedures are necessary.

The criteria that will be used to determine the success of the off-site mitigation area will be:

YEAR 1

- Erosion is minimal based on visual inspection.
- Total Plant Cover within the wetland restoration areas should average at least 10% of the total plant cover in the adjacent reference sites.
- Absolute Cover of Native Species within the wetland restoration areas should average at least 5% of the absolute cover of native species in the adjacent reference sites.
- Invasive exotic plant species found on Cal IPC List A and Red Alert List will not exceed five percent cover.

YEAR 2

- Total Plant Cover within the wetland restoration areas should average at least 20% of the total plant cover in the adjacent reference sites.
- Absolute Cover of Native Species within the wetland restoration areas should average at least 15% of the absolute cover of native species in the adjacent reference sites.
- Invasive exotic plant species found on Cal IPC List A and Red Alert List will not exceed five percent cover.

YEAR 3

- Total Plant Cover within the wetland restoration areas should average at least 35% of the total plant cover in the adjacent reference sites.
- Absolute Cover of Native Species within the wetland restoration areas should average at least 30% of the absolute cover of native species in the adjacent reference sites.
- Invasive exotic plant species found on Cal IPC List A and Red Alert List will not exceed five percent cover.

YEAR 4

- Total Plant Cover within the wetland restoration areas should average at least 55% of the total plant cover in the adjacent reference sites.
- Absolute Cover of Native Species within the wetland restoration areas should average at least 55% of the absolute cover of native species in the adjacent reference sites.
- Invasive exotic plant species found on Cal IPC List A and Red Alert List will not exceed five percent cover.

YEAR 5

- Total Plant Cover within the wetland restoration areas should average at least 80% of the total plant cover in the adjacent reference sites.
- Absolute Cover of Native Species within the wetland restoration areas should average at least 75% of the absolute cover of native species in the adjacent reference sites.
- Survival of grindelia in the transitional areas will be ≥85%.
- Survival of coyote brush in the upland areas will be >85%
- Species richness in the wetland restoration and enhancement areas (not including upland areas) will be such that at least four native tidal marsh species are present.
- The mitigation site should be dominated by native tidal wetland or upland transitional plant species.
- Invasive exotic plant species found on Cal IPC List A and Red Alert List will not exceed five percent cover.
- All portions of the enhancement area intended to be restored as wetland habitat (1.288 acres) shall meet the 3 wetland criteria defined by the U.S. Army Corps of Engineers (Environmental Laboratory 1987; Corps 2008).

6.2 Monitoring Methodology

Monitoring of the enhancement areas will include targeted, largely quantitative vegetation monitoring as well as overall monitoring to ensure success.

6.2.1 Targeted Vegetation Monitoring

Three different methods of targeted data collection will be implemented for the three different planting areas. All will be used to estimate vegetative cover, allowing an assessment of whether or not each area is meeting the success criterion. Findings will be reported in annual reports as outlined below.

Mid-Marsh Zone

Within the mid-marsh zone, WRA recommends collecting data within 15 1-meter^2 quadrats. This data will equate to a subset of the habitat and will be used to represent the entire mid-marsh zone. Five of the quadrats will be placed within the "restoration areas" where soil is to be deconsolidated and/or amended, while the remaining ten will be placed throughout the remaining mid-marsh portion of the Mitigation Area. Quadrat locations will be selected randomly during initial monitoring, and their locations will be recorded with a GPS. Quadrats will be taken in the same locations during each monitoring session (unless unforeseen circumstances in the future require one or more quadrats to be relocated). All species within each quadrat will be identified to the highest taxonomic level possible, and percent cover of each species will be recorded. All quadrats will be photographed during each monitoring session.

Upper Marsh Zone

The 'Berm' and 'Island' mitigation areas (0.427 acre combined) will be planted with upper marsh species. These are linear areas where approximately 1,200 young gumplant plants will be planted. Due to the large numbers of plantings, 10 sample areas will be established within the upper marsh portion of the Mitigation Area. Sample area centerpoints will be selected randomly during initial monitoring, and their locations will be recorded with a GPS. Monitoring will be done at the same locations during each monitoring session (unless unforeseen circumstances

in the future require one or more sample areas to be relocated). The sample area will include the area within a 5-foot radius of each centerpoint that is also within the Berm or Island. Within each sample area, all living gumplant individuals will be counted, and the canopy cover of each plant will be estimated. Total vegetative cover will also be estimated. This data will equate to a subset of the habitat and will be used to represent the entire upper marsh zone. Each sample area will be photographed during each monitoring session.

Upland (Transition) Zone

Recommended monitoring for the upland zone will entail a total count of coyote brush plants, along with a canopy cover estimate for each individual. A visual estimate of total vegetative cover within the upland zone will also be recorded. Representative photographs of the upland zone will be taken.

6.2.1 Overall Monitoring

Beyond the targeted monitoring revisions described in Section 6.2.1, each monitoring session will involve additional tasks as described below.

Qualitative Observations

Qualitative observations will describe the general condition of the monitoring area and any noteworthy information that is not adequately represented in the monitoring data. Such information may include:

- Invasion by nonnative species
- Erosion
- Positive or negative developments with regard to habitat quality

Photo Documentation

A minimum of 10 photo points will be established within the mitigation area, in locations which provide good representation of the restored areas. Photographs will be taken before planting, immediately after planting, and annually during the monitoring period. Photographs at each point will be taken in accordance with the guidelines outlined in the MMRP.

Corps Wetland Assessment

In order to meet the permit requirements of the U.S. Army Corps of Engineers, an assessment will be performed in Year 5 to ensure that all portions of the enhancement area intended to be restored as wetlands meets wetland criteria as defined by the Corps' 3-parameter approach (Environmental Laboratory 1987; Corps 2008). A wetland biologist will assess whether the 3 parameters are present throughout these areas based on field observations, and will briefly summarize these observations in the Year 5 and/or final monitoring report. Any areas intended to be restored as wetlands which do not meet the 3 parameters will be discussed in greater detail. No data will be recorded on official Arid West data forms, nor will a comprehensive map of wetland boundaries be produced.

6.3 Annual Reports to Agencies

Transportation Authority of Marin, Marin County Parks Department, Marin County Department of Public Works, BCDC, US Fish and Wildlife Service (Sacramento Field Office), Regional Water Quality Control Board, and California Department of Fish and Game by October 31 of each year. These reports will assess the progress in meeting performance criteria, and identify any problems with flooding, sedimentation, vandalism, and/or other general causes of poor survival or wetland degradation. If necessary, recommendations to improve success in achieving performance criteria will be made. A final report describing the performance of the mitigation in meeting the success criteria, and success of any necessary corrective measures, will be prepared and submitted to applicable agencies in either Year Five. Mitigation wetland monitoring and reports will be prepared by a qualified wetland biologist with experience in mitigation monitoring.

6.4 Contingency Measures

If annual or final success criteria are not met, the applicant will prepare an analysis of the cause(s) of failure and, if determined necessary by agencies, propose remedial action for approval. If monitoring determines that the wetland fails to meet the vegetation criteria, supplemental planting or seeding of native wetland species shall occur in those areas that do not contain sufficient cover by native wetland plants. The applicant will be responsible for reasonably funding the contingency procedures necessary for successful completion of the mitigation effort.

7.0 COMPLETION OF MITIGATION

7.1 Notification of Completion

Upon completion of five years of monitoring, a final report will be sent to all interested agencies detailing the results of the final year of monitoring. In addition, a Notice of Completion will be prepared, signed by the applicant, and submitted to the Corps to confirm successful completion of the mitigation effort.

8.0 REFERENCES

California Department of Fish and Game. 2007. Natural Diversity Database records for the San Francisco North quadrangle.

Environmental Laboratory. 1987. Corps of Engineers Wetlands Delineation Manual. Department of the Army, Waterways Experiment Station, Vicksburg, MS 39180-0631.

Reed, P.B., Jr. 1988. National list of plant species that occur in wetlands: California (Region 0). U.S. Fish and Wildlife Service Biological Report 88(26.10).

Soil Conservation Service (SCS). 1985. *Soil survey of Marin County, California*. U.S. Department of Agriculture in cooperation with the U.S. Department of the Interior, National Park Service, and University of California Agricultural Experiment Station.

[Corps] U.S. Army Corps of Engineers. 2008. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0). September.

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Appendix A:
Avoidance and Minimization Measures
From MMRP

The County of Marin (also known as "applicant"), as the lead agency for the construction of the CMFC Project, will retain primary responsibility for ensuring that Project activities meet the mitigation program requirements and other permit conditions imposed by participating regulatory agencies. The County of Marin and any monitors it may designate are responsible for monitoring and enforcement of the avoidance and minimization measures (AMMs) that will be applied during Project construction and operation. The contractors selected to construct and operate the Project will be responsible for submitting all documentation and reports to the County of Marin in a timely manner to demonstrate compliance with all mitigation program requirements.

Table 1 lists the Avoidance and Minimization Measures (AMMs) for the CMFC Project, off-site mitigation at Creekside Marsh. For each AMM, the table includes a description, implementing agency, responsible agency, and the timing of implementation of the measures.

Table 1. Off-Site Mitigation Avoidance and Minimization Measures Description

Creekside Marsh Salt Marsh Enhancement and Restoration Project[1]	
AMM	*BR-17: Movement through the Marsh*
Description	Crews conducting salt marsh enhancement activities will follow the guidelines below for minimizing effects to California clapper rails and salt marsh harvest mice while walking in the marsh: • *Movement through the Marsh*. While walking through the marsh, keep noise to a minimum. Avoid using multiple pathways through the marsh. Use trails if they exist. Plan and map your route to minimize environmental impacts and decrease running into hazards/barriers such as large channels. When looking for a suitable place to jump a channel, do not walk along the edge of the channel/slough because these areas provide nesting habitat for the California clapper rail. To find an alternate jump site, walk parallel to the channel at a distance where vegetation is lower in height and where visibility of the ground surface is greater. At all times, observe the environment you are walking through to avoid disturbance. Choose channel jump sites where vegetation is lower or you can clearly discern what you are jumping onto. In general, avoid walking adjacent and parallel to channels/sloughs. • *Avoiding nests and nest substrates*. Tidal marsh species have nests that are well concealed and therefore easy to disturb when walking through the

[1] The following Creekside Marsh Project AMMs are included because the CMFC Project includes the enhancement and restoration at Creekside Marsh as mitigation to offset the impacts to tidal salt marsh.

marsh. To avoid stepping on a nest, do not walk through thick vegetation or areas where you cannot see through to the ground. Avoid walking on vegetation whenever possible since plants serve as nesting substrate for many species in the marsh. In general, be aware of the area you are walking through.

- *Avoid salt marsh harvest mouse cover*. Avoid high pickleweed cover and wrack where salt marsh harvest mice are likely to occur.
- *Bird behavior*. If a bird vocalizes or flushes within close range of where you are standing or walking (e.g., < 33 feet), it is possible that a nest or young are nearby. When these circumstances arise, stop whatever you are doing and leave the immediate area (be sure to watch where and what you are walking on). Choose an alternate route through the marsh, identify the new route and location of the sighting/occurrence on a map, and record coordinates of the location if possible. Be sure to pass this information on to others that may use the same route or are conducting surveys in the same area. Be very observant of where you walk as you leave the area. There exists the possibility that you could step on a nest of young, both of which can be concealed by vegetation or cryptic. When alarmed, individuals may freeze in place (especially juveniles).
- *Tidal lagoons/ponds*. Avoid walking along tidal lagoons and ponds in marsh interiors that support foraging, roosting, or nesting shorebirds and waterfowl. Be observant of the distance at which birds flush or become alarmed.
- *Tides*. Avoid conducting surveys during high tides as much as possible. These are periods when many wildlife species are at greatest risk (e.g., predation). If your surveys require a high tide, be aware of the increased risk you may cause for wildlife and take all precautions to reduce that risk (e.g., avoiding areas where sensitive species are known to occur).

US Fish and Wildlife Service-approved California clapper rail biologists trained in rail habitat identification will inform salt marsh enhancement activities by being physically

	onsite during enhancement work within the marsh.
Implementing Entity	Contractor
Responsible Entity	County of Marin
Timing	During construction
AMM	*BR-18: Conservation Measures Specific to Revegetation, Revegetation Management, and Vegetation Monitoring Activities*
Description	• All of the proposed salt marsh enhancement work would occur outside of the February 1 through August 31 California clapper rail breeding season. • A US Fish and Wildlife Service-approved biologist will supervise all planting, seeding, restoration maintenance, vegetation monitoring activities and access into the marsh. • Only hand tools will be used during salt marsh enhancement work. If the rockhard root masses are too tough to make adequate progress with hand tools, a small five-horsepower wheeled-tiller could be used to assist with the substrate preparation. • The revegetation and ditching activities will be done outside the breeding season of the California clapper rail. • All work within the marsh at Creekside Marsh will occur on foot. No motorized vehicles will be allowed within the marsh. Foot travel through the marsh will be minimized. For any ditching activities that may occur, the US Fish and Wildlife Service-approved biologist will walk ahead of the ditching machine to ensure that California clapper rails and salt marsh harvest mice are not present in the path of the machine. • All crews will follow the US Fish and Wildlife Service-approved biologist through the marsh to the planting areas along a predetermined route. • The US Fish and Wildlife Service-approved biologist will escort each crew member to their planting area and will direct crews not to wander out of their designated area. • When digging holes for planting or removing non-native vegetation, effects to existing native vegetation will be minimized. • Activities will not occur during extreme high tides, when

	the marsh plain is inundated, because the protective cover for California clapper rails and salt marsh harvest mice is limited and crew activities could prevent the rails and mice from reaching available cover. • No revegetation maintenance or vegetation monitoring activities will occur in potential California clapper rail breeding habitat during the California clapper rail breeding season. All of these activities will be restricted to the upland-marsh ecotone, above mean high water elevation. • For revegetation maintenance, native seed collection, and vegetation monitoring activities, at least one biologist will supervise crews, and will direct crews to remain in the upland-marsh ecotone areas and not to wander into tidal marshes. • For revegetation maintenance during periods when weeds are prevalent, crews of up to 20 members supervised by a biologist will conduct work during a three to four hour time period within upland-marsh ecotones one day per week. Vegetation monitoring will be conducted by one to two trained biologists once per year in September. • If breeding California clapper rails are determined to be present in the marsh, crews conducting revegetation maintenance or vegetation monitoring in the upland-marsh ecotone will be required to minimize the amount of time spent within 700 feet of an identified California clapper rail calling center. • If California clapper rail adults, young, or nests are encountered during any activities, biologists and crews will carefully move away from the birds or nests.
Implementing Entity	Contractor
Responsible Entity	County of Marin
Timing	During construction