CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

ORDER No. R2-2017-0028

WASTE DISCHARGE REQUIREMENTS and WATER QUALITY CERTIFICATION for:

MARIN COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
STREAM MAINTENANCE PROGRAM
MARIN COUNTY

The California Regional Water Quality Control Board, San Francisco Bay Region (hereinafter the Regional Water Board), finds that:

1. The Marin County Flood Control and Water Conservation District (District) has applied to the Regional Water Board for authorization to implement its Stream Maintenance Program (SMP). The goal of the SMP is to provide flood protection and maintain channel conveyance capacity while enhancing natural resources within subject streams. This Order covers discharges associated with routine stream maintenance activities, including sediment management, vegetation management, bank stabilization, and a group of other maintenance activities in streams within the District's maintenance jurisdiction.

2. This Order applies to the following flood control zones as described in Figure 1-1 of the SMP: Zone 1 (Novato), Zone 3 (Richardson Bay), Zone 4 (Bel Aire and Strawberry Circle), Zone 5 (Stinson Beach), Zone 6 (San Rafael Meadows), Zone 7 (Santa Venetia), and Zone 9 (Ross Valley). This Order also applies to one County Service Area (13, Upper Lucas Valley). These areas are located in watersheds that drain to either San Francisco Bay or the Pacific Ocean and are all entirely within the jurisdiction of this Regional Water Board. All descriptions, findings, and provisions in this Order apply only to stream maintenance activities at 122 designated sites listed in Appendix A of the SMP Manual, which are located within the above referenced flood control zones and County Service Area.

3. This Order authorizes five years of stream maintenance activities as follows:

    a. Year 1: The District developed an SMP Manual and appendices, dated April 2017, to guide implementation of the SMP. The SMP Manual describes flood control channel maintenance activities, impact avoidance and minimization measures (AMMs), general and activity-specific conditions, best management practices (BMPs), and program management and reporting procedures. This Order authorizes Year 1 maintenance activities based on the SMP Manual.

    b. Years 2, 3 and 4: This Order requires submission of a revised SMP Manual prior to Year 2 maintenance activities for approval by the Regional Water Board's Executive Officer. Prior to approval, the Regional Water Board will publicly notice the revised SMP and will take into consideration comments received by the public. This Order authorizes Years 2, 3, and 4 maintenance activities based on the approved revised SMP Manual.

c. Year 5: This Order requires submission of quantitative thresholds by Year 4 of the SMP for approval by the Executive Officer. This Order authorizes Year 5 maintenance activities based on the approved and implemented quantitative thresholds integrated into the SMP Manual.

4. On April 28, 2017, the District submitted an application for Water Quality Certification and Waste Discharge Requirements (WDRs) to the Regional Water Board.

5. This Order authorizes the District to complete flood management and associated activities as described in the SMP Manual, and as described herein, consistent with the Order's requirements. Additions to the list of SMP sites (Appendix A) covered by this Order may be submitted, acceptable to the Executive Officer, with the revised SMP Manual in Year 2 and Year 4. SMP activities shall be limited to sites identified in the revised SMP Manual for all subsequent years, unless an addendum to the Order is filed with the Regional Water Board, publicly noticed, and approved by the Executive Officer to include new sites that may arise as new projects are added to the District's maintenance program over time (i.e., from the Watershed Program).

SMP Description, Impacts, and Mitigation

6. The SMP Manual covers five types of routine maintenance activities: vegetation management, sediment and debris removal, erosion control, maintenance and repair of flood control structures, and levee maintenance. These activities occur in flood control and natural channels and other facilities on an as-needed basis. This Order authorizes maintenance activities consistent with limits in the District's routine maintenance agreement with the California Department of Fish and Wildlife (CDFW). These limits are as follows:

   a. Maximum length of maintenance within a concrete engineered flood control channels is 2,800 contiguous linear feet;
   b. Maximum length of maintenance within an earthen engineered flood control channel is 800 contiguous linear feet;
   c. Maximum length of maintenance within a natural channel is 600 contiguous linear feet; and
   d. Maximum volume of debris or sediment removed from any site is 2,100 cubic yards.

   These activities may not exceed a program wide cumulative annual total of 5,000 linear feet of creek channel and 11,000 cubic yards of sediment and debris. Over the Order's 5-year term, these activities may not exceed a program wide cumulative total of 25,000 linear feet and 55,000 cubic yards of sediment and debris. Exceptions to these limits may be approved on a case-by-case basis through the submittal of the Notification, acceptable to the Executive Officer, provided the project is demonstrated to not result in greater impacts than a project that conforms to the limits of this Order.

7. Most of the sites included in the SMP are located within urbanized valley floors in eastern Marin County that are constrained by roads, buildings, bridges, culverts, and other structures. At many sites, urbanization has impacted geomorphic processes within the stream, driving the need for maintenance.

8. The SMP does not include activities that would result in permanent impacts. Furthermore, the SMP has been developed to minimize temporary impacts to beneficial uses. The SMP Manual proposes activities that would generally result in long-term beneficial effects on riparian and aquatic habitat for plant, fish, and wildlife species. Each SMP site has been evaluated for its potential to support special status species or sensitive habitats. Sites with the potential to support special status species have species-specific AMMs referenced in Appendix D of the SMP Manual and fully explained in Appendix F. Each maintenance site and type of maintenance activity has its own AMMs, conditions, and BMPs that will avoid and minimize detrimental impacts to the maximum extent practicable.

9. Temporary impacts from SMP activities that cannot be entirely avoided through pre-maintenance planning will be mitigated through implementation of environmental enhancement activities, including, but not limited to, AMMs listed in the SMP Manual, such as native willow staking, planting of native riparian vegetation, trash removal, and non-native/invasive plant removal, within the flood control zones. Mitigation under the SMP will be provided at a minimum ratio of 1.1:1 (acres/linear feet enhanced to acres disturbed). The first increment of 1:1 mitigation ratio will be provided onsite by directly restoring the area disturbed. The next increment of 0.1:1 mitigation ratio will be provided through on- or offsite mitigation activities including, but not limited to, AMMs and other environmental enhancement activities that increase habitat value and function. This increment mitigates for the temporary impacts that persist while onsite mitigation is becoming fully established. The intent of the SMP is to develop long-term improvements to creeks within the District's jurisdiction. Therefore, long-term enhancement projects, as well as projects that reduce the need for future maintenance implemented by the District, may be counted towards the 0.1:1 mitigation increment.

10. The District will designate environmental staff to provide day-to-day oversight of the SMP including: project planning; notifications to resource agencies; project implementation, scheduling, and training; and annual reporting. The District will also designate Environmental Compliance Coordinators (ECCs) to oversee the biological protection components of the SMP. During project implementation, the ECCs will ensure that the District implements all necessary precautions to avoid impacts to the environment, including adherence to AMMs, general and activity-specific conditions and prohibitions, and BMPs.

11. Appendix A of the SMP Manual designates SMP sites on or near streams that support anadromous salmonids. In 2004, Marin County adopted the *Guidelines for Protecting Aquatic Habitat and Salmon Fisheries for County Road Maintenance.*[1] This Road Maintenance Manual describes protocols and BMPs to protect listed salmonids and their habitat. The SMP includes Road Maintenance Manual principles that are applied whenever the District works in or near a salmonid stream. These principles include, but are not limited to:

1 The Fishery Network of the Central California Coastal Counties (FishNet 4C), MFG Inc., Prunuske Chatham Inc., and Pacific Watersheds Associates. 2004. *Guidelines for Protecting Aquatic Habitat and Salmon Fisheries for County Road Maintenance.* Funded by: FishNet4C Counties, California Department of Fish and Wildlife, National Marine Fisheries Service, and California Resource Agency.

a. Maintaining a low-flow channel for habitat and fish passage;

b. Maintaining vegetation on lower streambanks to support aquatic life and salmonids;

c. Maintaining and enhancing instream complexity for habitat heterogeneity, cover, and refugia; and

d. Preserving and protecting large woody debris (LWD) in streams.

LWD removal will only occur where woody debris poses a significant risk to infrastructure or could cause flooding due to diminished channel capacity. The SMP Manual shall be revised to reflect that locations with reoccurring LWD removal shall be assessed for alternate treatments (i.e., adjustments in maintenance activities or potential capital improvements) so that the frequency of LWD removal/modification is reduced. These assessments shall be conducted and documented as part of the pre-project assessments to investigate the root cause of reoccurring LWD removal and reported in the Notification each year.

12. Impacts to anadromous salmonid streams and riparian corridors associated with these streams will be mitigated by actions that benefit salmonids. Actions to mitigate impacts to salmonid streams may include the implementation of AMMs identified in the SMP manual, such as removal of invasive non-native plant species, replanting native species, clearing of trash and debris from the channel, and long-term enhancement projects that reduce the need for future maintenance and/or directly improve salmonid habitat (i.e. fish passage projects). Mitigation actions will be determined on a site-by-site basis from the assessment of the nature of the impacts and in consultation with staff from Regional Water Board, CDFW, and NMFS.

13. The District removes sediment from channels it maintains on an as-needed basis when sediment accumulates and interferes with the conveyance of a channel, road crossing, or flood control facility to a level that would significantly reduce flood flow capacity. The number of sediment removal projects undertaken annually and the quantity of sediment removed in a given year depends on past weather and hydrologic conditions, as well as the frequency and extent of past maintenance activities. Sediment removal requirements are generally greater following a wet winter with higher than usual runoff, slope erosion, and sediment delivery compared to an average or dry winter.

14. Appendix A in the SMP Manual identifies sediment removal sites that accumulate sediment due to various geomorphic processes. Often, multiple geomorphic processes at different scales are responsible for sediment deposition at a particular site. Understanding the geomorphic processes that underlie chronic sedimentation can help the District develop effective long-term solutions, such as infrastructure upgrades and watershed improvements. This could reduce, and in some cases, eliminate the need for periodic sediment removal at specific SMP sites. Furthermore, understanding geomorphic processes at each site will allow the District to develop thresholds that appropriately minimize the frequency of sediment removal. The SMP currently assigns each SMP site a geomorphic code. However, these codes do not link site-specific conditions to landscape-scale processes and do not include thresholds, or the process for developing thresholds, to determine when sediment removal is necessary at each site and track conditions over time.

This Order requires the geomorphic coding system in the SMP Manual to be revised to better capture linkages between site-specific conditions and landscape scale processes. This Order also requires the development of thresholds that identify when sediment and in channel vegetation removal is necessary. The development of quantitative thresholds may include the use of channel cross-sections, pictograms, and other methods applicable to the variable conditions and data limitations at specific sites within the program. When combined, the geomorphic coding system and thresholds will allow the District to efficiently maintain flood capacity while decreasing the frequency and extent of sediment removal. This will also assist the District in identifying long-term solutions that will reduce and, in some cases, eliminate the need for periodic sediment removal at specific SMP sites.

15. Equipment types, equipment locations, crew sizes, and staging areas for sediment removal activities vary depending on the needs of each site. Sediment removal equipment includes long-reach excavators, backhoes, haulers, and front loaders. Excavated sediment is placed directly into dump trucks or placed in/pushed to staging areas, then lifted into dump trucks and hauled to one of the two Marin County corporation yards in central or west Marin County. Sediment removal activities can also include the removal of debris including tires, shopping carts, trash, furniture, and other non-sedimentary deposits. Debris is removed from the creek by hand and hauled out by dump trucks to a certified landfill.

16. This Order requires the SMP Manual to be revised to indicate that, whenever feasible, the District shall beneficially re-use excavated sediments for appropriate road base applications. Alternate beneficial re-use projects may be submitted for approval in the Notification if an acceptable Sediment Sampling and Analysis Plan is included and approved by the Executive Officer prior to the sediment reuse. For all other instances, the District shall dispose excavated sediment at a certified landfill and will test materials in accordance with the landfill requirements.

17. The goal of vegetation management is to maintain channel hydraulic capacity by selectively limbing and trimming plants along the upper channel banks, while maintaining canopy cover to shade the channel and shade out invasive non-native plants. Vegetation management also maintains over-hanging, low-lying herbaceous vegetation along the edge of the channel to support stream habitats. All vegetation removal is limited to above-ground work.

18. Vegetation management includes trimming and removal of instream vegetation and may occur annually at SMP sites. The District conducts vegetation management when instream vegetation decreases a channel's flood conveyance capacity, impedes access to channels and flood control facilities, or creates excessive hydraulic roughness to the extent that flow is diverted. Vegetation management can also occur when non-native vegetation reduces the success of native vegetation. This Order requires the SMP Manual to be revised to include a quantitative metric describing the degree to which vegetation is contributing to channel roughness and develop thresholds for acceptable channel roughness values for each SMP site to help identify when vegetation management is or is not necessary. Development of a quantitative metric may include the use of cross-sections, pictograms, and other methods applicable to the variable conditions and data limitations at specific sites within the program. This information will reveal the frequency of needed vegetation management activities, help identify areas where alternate strategies to maintain conveyance may be

more effective, and help the District manage vegetation only to the extent necessary to maintain existing levels of flood protection.

19. The District infrequently removes trees. Removal of mature, healthy trees is only necessary when pruning is insufficient to reduce hydraulic roughness to the acceptable threshold. Removal of sick, dying, or dead trees is only necessary when they reduce channel capacity, increase flood hazard, or pose a safety hazard to adjacent structures. If tree removal is indicated, the District will consult with CDFW prior to removal. Small trees shall be replanted in different locations as specified in the SMP Manual. Pruned portions of large willows may be planted into bare slopes or utilized for slope stabilization.

20. Vegetation management is limited to mechanical methods such as cutting and removing vegetation above the ground by hand or with loppers, hand saws, chain saws, pole saws, weed eaters, and other hand tools. This approach improves channel capacity in the wet season while allowing valuable wetland vegetation to re-sprout in spring and summer. This Order does not authorize the use of pesticides and/or herbicides to control vegetation for the maintenance of stream channels. Revegetation and tree planting/relocation may occur throughout the year, based on optimal planting conditions.

21. The SMP Manual describes cattail removal as an activity that is generally carried out on an annual basis. Cattails, tules, and other emergent aquatic plants provide ecosystem services, such as channel shading, food production, and bird nesting habitat, along stream channels. This Order requires the SMP Manual to be revised to reflect that at SMP sites where emergent vegetation is blocking the channel, above-ground biomass will be removed with a weed-whacker or similar means that leaves behind the subsurface root structures. This will allow the vegetation to re-establish and provide ecosystem services in the spring and summer after the wet season. Full root mass removal may be authorized on a site-by-site basis, when it is proven necessary for maintaining a low flow channel.

22. Erosion control refers to the as-needed stabilization of failing earthen creek banks using biotechnical techniques such as brush mattresses and willow walls. Erosion control is implemented when failing earthen creek banks have the potential to interfere with flood control activities. The equipment typically used for erosion control can include excavators, haulers, front loaders, and bulldozers. Erosion control projects are implemented between June 15 and October 15. This Order requires the SMP Manual to be revised to reflect that biostabilization methods shall be based on accepted guidelines such as the Natural Resource Conservation Service (NRCS)[2] and the Corps[3] manuals.

2 Bentrup, G. and J.C. Hoag. 1998. *The Practical Streambank Bioengineering Guide, User's Guide for Natural Streambank Stabilization Techniques in the Arid and Semi-Arid Great Basin and Intermountain West.* U.S. Department of Agriculture, Natural Resources Conservation Service. Available online at https://www.nrcs.usda.gov/Internet/FSE_PLANTMATERIALS/publications/idpmcpu116.pdf.

3 Fischenich, C. 2001. *Stability Thresholds for Stream Restoration Materials*. EMRRP Technical Notes Collection (ERDC TN-EMRRP-SR-29). U.S. Army Engineer Research and Development Center, U.S. Army Corps of Engineers, Vicksburg, MS. Available online at http://www.spa.usace.army.mil/Portals/16/docs/civilworks/regulatory/Stream%20Information%20and%20Management/ERDC%20Stability%20Thresholds.pdf.

23. Maintenance and repair of flood control structures refers to actions that maintain weirs, tide gates, diversion structures, trash racks, stream gage structures, grade control structures, energy dissipaters, utility line crossings, culverts, outfalls, storm drain or pump station inlet/outlet structures, and similar structures.

24. Flood control structure maintenance and repair shall be conducted during the general maintenance activity window from June 15 to October 15 and is triggered when facilities are deteriorating such that their function is impaired or when facilities' maintenance intervals have been reached. Some structures, such as tide gates, require annual maintenance while others may be maintained on an as-needed basis.

25. Levee maintenance refers to activities that stabilize levees so that they continue to provide flood protection. Levee maintenance activities occur when plant growth on levee roads impedes safe access to flood control facilities and for levee inspections, when levees are eroding or settling such that they require additional fill material to achieve their original height, and/or when burrowing mammals damage the stability of levees. Mowing frequency of side slopes is limited to one event every four years or as part of a post-storm assessment or disaster declaration. On an annual basis, approximately 1,500 linear feet and 0.14 acres of levees may be mowed in one maintenance season. The entire length of the levee would be mowed on both the landward and creek side of the levee. On the creek side of the levee, mowing will target non-native vegetation and may include Baccharis (coyote bush) on the upper slope above the high tide line. Native tidal vegetation at the high tide line or lower will be avoided and will not be mowed. All AMMs and BMPs for creek and levee maintenance shall be applied in accordance with the SMP Manual.

26. Levee maintenance activities include mowing access routes and limited mowing of side slopes as needed in order to conduct geotechnical assessments for levee safety, placing fill on levee tops, and controlling burrowing rodent populations. Burrowing rodents are trapped and their burrows are filled with an earth/concrete mix or earthen material. The District does not use rodenticides or other poisons for rodent control.

27. Maintenance activities to reduce fire fuel loads are not authorized under this Order.

28. The Order does not authorize larger capital improvement projects (e.g., construction of a new pump station), large sediment removal projects (sediment removal beyond the specified limits of this Order, e.g., dredging of the mainstem of Novato Creek), new bank stabilization projects that use riprap or other non-bioengineered methods, or other projects with permanent impacts or substantial temporary impacts.

29. The SMP shall be implemented through an annual work cycle that consists of pre-project assessment by District staff and notification to the Regional Water Board for review and approval, implementation, and reporting.

30. During pre-project assessment, District staff will visit each of the SMP sites in their zones and use a combination of professional judgment, local knowledge, and available data to assess the need for maintenance. For SMP sites where sediment removal is indicated, District staff will assess the type of sediments present in the channel and the fluvial processes governing channel geomorphology in order to evaluate the potential for sediment

removal to impact bed/bank stability at the site and upstream. District staff will determine how and where to excavate sediments such that the excavation is consistent with dominant fluvial geomorphic processes and the resulting channel optimizes sediment transport.

31. District staff will identify and prioritize SMP sites where chronic sedimentation problems could be addressed via infrastructure improvements. Where feasible, the District will include these SMP sites in an Individual Flood Zone Work Program or integrated into the larger Marin County Public Works Capital Improvement Program. District staff will record their observations for each site in a separate worksheet that describes the type of work proposed, its dimensions, timing, and related attributes. This Order requires Appendix I (the worksheet) in the SMP Manual to be revised to include the quantitative channel metrics and thresholds as well as space to enter the area (in square feet) of proposed SMP activities such as sediment or vegetation removal.

32. District staff will take pre-project photographs of each site and include them with each site's individual worksheet. Over time, information from the worksheets (i.e. quantitative channel metrics and thresholds) will help the District to quantify the need for maintenance, document changes in site conditions, and adapt their maintenance approach. This Order requires the pre-project site assessment worksheet in the SMP Manual to be revised to reflect that locations with recurring sediment, vegetation, and/or LWD removal shall be documented and assessed for alternate treatments (i.e., capital improvements) so that the frequency of sediment, vegetation, and/or LWD removal/modification is reduced.

33. The Order requires the submittal of an annual Pre-Project Notification (Notification) by May 1 of proposed maintenance activities for the upcoming season acceptable to the Executive Officer. The Notification will include a list of all SMP sites proposed for maintenance, the type of activity proposed for each site, and copies of the SMP Manual pre-project assessment worksheets for each SMP site and pre-project photographs. The District shall also submit a continually-updated list of documented chronic maintenance sites that could be addressed in the future by capital improvement projects and/or adjustments in maintenance techniques. The District may submit an amended Notification after May 1 that identifies additional maintenance projects that became necessary due to late season rain events and/or changing site conditions. Additional work at designated SMP sites must meet the criteria described in the SMP Manual, must not be located where conditions affecting fish and wildlife resources at the site have substantially changed, or where such resources would be adversely affected by the proposed maintenance activity.

34. The Order authorizes work proposed in the Notification for the 2017 maintenance season, submitted on June 15, 2017. The District shall have until July 31, 2017, to submit an amended Notification for the 2017 maintenance season that identifies any additional sites or revisions to maintenance project scope. Additional or revised maintenance shall not commence until the District has received written approval from the Executive Officer. All subsequent years of the SMP shall adhere to the Notification submittal deadline required by this Order and the SMP Manual.

35. The general work window for SMP activities is from June 15 to October 31, with most work occurring between July 1 and October 15. District staff will conduct pre-construction

surveys to locate special status species before maintenance activities commence and work at each site will be scheduled around relevant species' work windows.

36. By February 15 of each year following the completion of maintenance activities, the District shall submit an Annual Report, acceptable to the Executive Officer. The Annual Report shall include a description of maintenance activities conducted, pre and post-work photographs, mitigation implemented, and monitoring results for each site. The Annual Report shall also describe any lessons learned and recommendations to update BMPs identified in the SMP Manual, if needed.

37. The District will maintain information on annual SMP activities in continually updated databases that will track progress towards achieving the SMP's goals and compliance with programmatic permit conditions. The database will be updated annually with the following information:

    - GIS reach mapping;
    - BMP tracking;
    - Pre-and post-project photos;
    - Channel geomorphic characterizations;
    - Annual maintenance notes documenting triggers;
    - Special status species mapping;
    - Invasive species locations;
    - Specific data required by permits;
    - Notification packages; and
    - Annual reports.

38. This Order requires that, after each maintenance season, District and Regional Water Board staff meet to discuss the performance of the SMP, review lessons learned from the prior construction season, and determine the need to improve stream maintenance techniques and BMPs. The District shall propose improved stream maintenance techniques and BMPs identified in connection with such review for Executive Officer approval, then to be implemented in all subsequent maintenance years.

39. Every five years, the District will review the SMP and assess its long-term effectiveness in consultation with the Regional Water Board. The review will address maintenance activities conducted to date, AMMs and BMPs, data management, the adequacy of adaptive updates and revisions to the SMP Manual, and overall program coordination and communication between the District and the regulatory agencies. The District will implement updates or amendments to the SMP Manual as approved by the Executive Officer in connection with such review.

40. The SMP Manual describes training procedures for contractors including Department of Public Works (DPW) Roads Crews, Conservation Corps North Bay (CCNB) staff, Students and Teachers Restoring a Watershed (STRAW) volunteers, independent contractors, and

municipal partners. District environmental staff and ECCs will be responsible for providing appropriate training for SMP contractors that includes implementation of general and site-specific conditions, AMMs, and BMPs.

41. This Order does not authorize the discharge of wastewater to a water of the State resulting from the handling and placement of sediment at a temporary stockpile site.

42. This Order is conditioned upon total payment of the full fee required in State regulations (23 California Code of Regulations (CCR) section 3833) and owed by the District. The application fee for this project is $120,000, and this Order requires payment of the application fee in full by October 10, 2017. The Applicant must pay an annual discharge fee to the Water Board each fiscal year (July 1–June 30) in accordance with 23 CCR section 3833.

43. The Regional Water Board tracks routine riparian repair and creek maintenance projects in an effort to detect potential systemic instabilities and document project performance in the creeks of the Bay Area. As such, the Applicant is required to submit a Riparian Repair and Maintenance Form (Short Form) describing the Project's location, size, type, and performance measures. An electronic copy of the Short Form and instructions can be downloaded at: http://www.waterboards.ca.gov/sanfranciscobay/certs.shtml. Project information will be made available at the web link: http://ecoatlas.org.

44. This Order requires the District to submit a revised SMP Manual prior to Year 2 maintenance activities for approval by the Executive Officer, with the following revisions included:

    a. Sediment removal activities proposed in the Notification shall include a proposed sediment disposal and/or stockpile location. Prior to beneficially re-using sediment for any application other than road base improvements, the District must submit a Sediment Sampling and Analysis Plan, acceptable to the Executive Officer;

    b. Vegetation management and replanting measures that maximize shading of the active channel, stabilization of active channel banks, and quality of in-stream habitat;

    c. Biostabilization methods based on accepted guidelines such as those developed by the NRCS[4] and the Corps;[5]

    d. A revised geomorphic coding system and reporting of the area (in square feet) of disturbance resulting from proposed SMP activities (e.g., sediment removal, vegetation removal) to better capture linkages between site-specific conditions and landscape scale processes in the pre-project assessment;

4 Bentrup, G. and J.C. Hoag. 1998. *The Practical Streambank Bioengineering Guide, User's Guide for Natural Streambank Stabilization Techniques in the Arid and Semi-Arid Great Basin and Intermountain West.* U.S. Department of Agriculture, Natural Resources Conservation Service. Available online at https://www.nrcs.usda.gov/Internet/FSE_PLANTMATERIALS/publications/idpmcpu116.pdf.

5 Fischenich, C. 2001. *Stability Thresholds for Stream Restoration Materials*. EMRRP Technical Notes Collection (ERDC TN-EMRRP-SR-29). U.S. Army Engineer Research and Development Center, U.S. Army Corps of Engineers, Vicksburg, MS. Available online at http://www.spa.usace.army.mil/Portals/16/docs/civilworks/regulatory/Stream%20Information%20and%20Management/ERDC%20Stability%20Thresholds.pdf.

e. A workplan to develop quantitative channel metrics that identify thresholds for when sediment removal and vegetation maintenance is necessary. The required quantitative thresholds shall be implemented as part of the SMP Manual by Year 5 of the SMP to create a more effective and performance based method of prioritizing maintenance sites;

f. An assessment of alternative BMPs (e.g., adjustment of maintenance activities or potential capital improvement projects) at locations with recurring LWD, sediment, and/or vegetation removal or other management activities in order to address the root cause of chronic maintenance and reduce the frequency of LWD, sediment, and/or vegetation removal/modification;

g. A minimum mitigation ratio of 1.1:1, and implementation approach to attain this mitigation ratio;

h. The Notification to the Regional Water Board includes copies of the worksheets for each SMP site with pre-project photographs;

i. The Annual Report to the Regional Water Board includes additional information as specified in Provision D.33, such as a list of maintenance activities and associated photographic documentation, mitigation measures, monitoring results, and proposed adaptive implementation;

j. Definitions of active channel, low flow channel, floodplain, terrace, and top of bank to provide clarity and consistency between the District and Regional Water Board staff.

Regulatory Framework

45. The Water Quality Control Plan for the San Francisco Bay Basin (Basin Plan) is the Regional Water Board's master water quality control planning document. It designates beneficial uses and water quality objectives for waters of the State, including surface waters and groundwater. It also includes implementation plans to achieve water quality objectives. The Basin Plan was duly adopted by the Regional Water Board and approved by the State Water Resources Control Board (State Water Board), Office of Administrative Law, and U.S. EPA, where required.

46. The Basin Plan lists the following existing and potential beneficial uses for surface waters within the SMP watersheds:

a. Municipal Supply;

b. Industrial Service Supply;

c. Industrial Process Supply;

d. Commercial and Sport Fishing;

e. Shellfish Harvesting;

f. Cold Freshwater Habitat;

g. Estuarine Habitat;

h. Fish Migration;

i. Preservation of Rare and Endangered Species;

j. Fish Spawning;

k. Warm Freshwater Habitat;

l. Wildlife Habitat;

m. Water Contact Recreation;

n. Noncontact Water Recreation; and

o. Navigation.

47. Novato, Miller, Gallinas, San Rafael, Corte Madera, and Coyote creeks, as well as Arroyo Corte Madera del Presidio, are all identified as impaired on the Clean Water Act (CWA) section 303(d) list by diazinon, an organochlorine pesticide.

48. The creeks in Flood Control Zones 1, 7, and 13 drain into San Pablo Bay. San Pablo Bay is identified as impaired on the CWA section 303(d) list and is listed as impaired by chlordane, dichloro-diphenyl-trichloroethane (DDT), dieldrin, dioxin compounds, invasive species, furan compounds, mercury, polychlorinated biphenyls (PCBs), and selenium.

49. The creeks in Flood Control Zone 9 drain into San Francisco Bay (Central). San Francisco Bay (Central) is identified as impaired on the CWA section 303(d) list and is listed as impaired by chlordane, dichloro-diphenyl-trichloroethane (DDT), dieldrin, dioxin compounds, invasive species, furan compounds, mercury, polychlorinated biphenyls (PCBs), selenium, and trash.

50. The creeks in Flood Control Zones 3 and 4 drain into Richardson Bay. Richardson Bay is identified as impaired on the CWA section 303(d) list and is listed as impaired by chlordane, coliform bacteria, dichloro-diphenyl-trichloroethane (DDT), dieldrin, dioxin compounds, invasive species, furan compounds, mercury, polychlorinated biphenyls (PCBs), and selenium.

51. The California Environmental Quality Act (CEQA) requires all discretionary projects approved by public agencies to be in full compliance with CEQA and requires a lead agency to prepare an appropriate environmental document for such projects. The District prepared and certified the SMP (then called the Routine Maintenance Activities Program) Initial Study – Mitigated Negative Declaration (IS-MND) on June 4, 2012 (State Clearinghouse No. 2012022053). The IS-MND found potentially significant impacts that are under the purview and jurisdiction of the Regional Water Board. Specifically, it identified potentially significant impacts to: 1) soil erosion; 2) water quality; 3) surface water availability to support aquatic habitats; 4) aquatic species including habitat for special status species; and 5) invasive species. The IS-MND also found that the mitigation measures would mitigate all of these impacts to less-than-significant levels. The mitigation measures specified in the IS-MND include a suite of programmatic impact avoidance and minimization measures (AMMs) as well as site-specific AMMs to avoid, for example, impacts to special-status species.

The Regional Water Board, as a responsible agency under CEQA, has considered the IS-MND and finds that the potentially significant environmental impacts of the proposed activities, which are within the Regional Water Board's purview and jurisdiction, have

been identified and mitigated to less-than-significant levels. Specifically, potentially significant impacts to aquatic species and water quality will be mitigated through implementation of the mitigation measures set forth in the IS-MND, and the mitigation identified in and required by this Order.

52. It is the policy of the State of California that every human being has the right to safe, clean, affordable, and accessible water adequate for human consumption, cooking, and sanitary purposes. This Order promotes that policy by requiring discharges to meet discharge levels designed to protect human health and ensure that water is safe for domestic use.

53. The Regional Water Board provided public notice of the application pursuant to CCR title 23, section 3858, on May 17, 2017, and posted information describing the project on the Regional Water Board's website. The Regional Water Board has notified the District and interested parties of its intent to issue WDRs and Water Quality Certification for the activities proposed in the SMP.

54. The Regional Water Board, in a public meeting on July 12, 2017, heard and considered all comments pertaining to this Order.

55. The CWA (33 U.S.C. § 1251-1387) was enacted "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters" (33 U.S.C. § 1251(a)). CWA section 401 (33 U.S.C. § 1341) requires every applicant for a federal license or permit that may result in a discharge into navigable waters to provide the licensing or permitting federal agency with certification that the project will be in compliance with specified provisions of the CWA, including water quality standards and implementation plans promulgated pursuant to CWA section 303 (33 U.S.C. § 1313). CWA section 401 directs the agency responsible for certification to prescribe effluent limitations and other limitations necessary to ensure compliance with the CWA and with any other appropriate requirement of state law. CWA section 401 further provides that state certification conditions shall become conditions of any federal license or permit for the project. These discharges are also regulated under California Water Code (CWC) section 13263 and CCR title 23. Technical reports required by this Order are required pursuant to CWC section 13267. The burden, including costs, of providing these reports bears a reasonable relationship to the need for the report and the benefits to be obtained, including demonstrating compliance with this Order, the Basin Plan, State water quality objectives and protection of habitat beneficial uses.

    Pursuant to 23 CCR sections 3857 and 3859, the Regional Water Board is issuing Water Quality Certification and WDRs for the activities proposed in the SMP, as described in the SMP Manual.

The Regional Water Board certifies that the Stream Maintenance Program described herein complies with CWA sections 301, 302, 303, 306, 307, and 401 and with applicable provisions of State law, provided that the District complies with the following terms and conditions, which are hereby ordered:

A. Discharge Prohibitions

Except as authorized in this Order, each of the following are prohibited:

1. The direct or indirect discharge of wastes, as defined in CWC section 13050(d), as a result of activities on the active project site to surface waters or surface water drainage courses is prohibited.

2. Degradation of any water supply.

3. Vegetation management activities (including downed tree management) that could result in longer-term adverse impacts, such as a deleterious increase in sediment input into waters of the State and destabilization of stream banks.

4. Vegetation management activities that adversely impact the riparian zone, shade, canopy coverage, or habitat.

5. The discharge of any excavated sediment from designated disposal areas. The designated disposal areas are: a) any offsite, authorized temporary or permanent location maintained in compliance with federal and State regulations, b) any onsite, authorized temporary or permanent location, provided material shall be isolated and contained to prevent impacts to waters of the State and their beneficial uses, or c) a permitted landfill.

6. The discharge of sediment and runoff or decant water from excavated materials disposed of at any temporary or permanent disposal site to surface waters of the State.

7. The discharge or threatened discharge of construction-related materials or wastes into waters of the State, including as a result of rainfall or runoff. When operations are completed, any excess material shall be removed from the work area and any areas adjacent to the work area where such material may be washed into waters of the State.

8. The creation of a condition of pollution or nuisance as defined in CWC sections 13050 (l) and (m), respectively, as a result of SMP activities.

9. Degradation of groundwater beneficial uses as a result of the SMP.

B. Discharge Specifications

1. Appropriate soil erosion control measures shall be undertaken and maintained to prevent discharge of sediment to surface waters or surface water drainage courses. The SMP Manual shall refer to the BASMAA *Flood Control Facility Maintenance Best Management Practices: A Manual for Minimizing Environmental Impacts from Stream and Channel Maintenance Activities* (June 2000) and the *FishNet Manual: Guidelines for*

Protecting Habitat and Salmon Fisheries for County Road Maintenance (2008) for guidance on the appropriate erosion/sediment control measures and construction BMPs.

2. In accordance with CWC section 13260, the District shall file with the Regional Water Board a report of any material change in the character, location, or quantity of this waste discharge that is beyond the scope of this Order. Any proposed material change in the discharge requires approval by the Regional Water Board after a hearing under CWC section 13263.

3. The District shall immediately, and in no case no more than 24 hours, notify the Regional Board staff by telephone or email whenever an adverse condition occurs as a result of this discharge. An adverse condition includes, but is not limited to, a violation or threatened violation of the conditions of this Order, spill of petroleum products or toxic chemicals, or damage to control facilities that could affect compliance. A written notification of the adverse condition shall be submitted to the Regional Water Board within five days of occurrence. The written notification shall identify the adverse condition, describe the actions necessary to remedy the condition, and specify a timetable, subject to approval by the Executive Officer, for the remedial actions.

C. Receiving Water Limitations

1. SMP activities shall not cause the following conditions to exist in waters of the State at any place:

   a. Waters shall not contain floating material, including solids, liquids, foams, and scum, in concentrations that cause nuisance or adversely affect beneficial uses.

   b. Waters shall not contain oils, greases, waxes, or other materials in concentrations that result in a visible film or coating on the surface of the water or on objects in the water, that cause nuisance, or that otherwise adversely affect beneficial uses.

   c. Waters shall not contain biostimulatory substances in concentration that promote aquatic growth to the extent that such growth cause nuisance or adversely affect beneficial uses.

   d. Waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.

   e. The natural receiving water temperature of inland surface waters shall not be altered unless it can be demonstrated to the satisfaction of the Regional Water Board that such alteration in temperature does not adversely affect beneficial uses. Further, the temperature of any cold or warm freshwater habitat shall not be increased by more than 5°F (2.8°C) above the natural receiving water temperature.

2. SMP activities shall not cause the following limits to be exceeded in waters of the State at any point:

   a. Dissolved Oxygen: 5.0 (WARM) or 7.0 (COLD) mg/l minimum. When natural factors cause lesser concentrations, then this discharge shall not

cause further reduction in the concentration of dissolved oxygen.

b. Dissolved Sulfide: All water shall be free from dissolved sulfide concentrations above natural background levels. Concentrations of only a few hundredths of a milligram per liter can cause a noticeable odor or be toxic to aquatic life. Violation of the sulfide objective will reflect violation of dissolved oxygen objectives as sulfides cannot exist to a significant degree in an oxygenated environment.

c. pH: A variation of natural ambient pH by more than 0.5 pH units.

d. Toxicity: All waters shall be maintained free of toxic substances in concentrations that are lethal to or that produce other detrimental responses in aquatic organisms.

e. Un-ionized Ammonia: 0.025 mg/L as N, annual median; and 0.16 mg/L as N, maximum.

f. Salinity: The project shall not increase total dissolved solids or salinity to a degree that adversely affects beneficial uses.

g. Turbidity: Waters shall be free of changes in turbidity that cause nuisance or adversely affect beneficial uses. Increases from normal background light penetration or turbidity relatable to waste discharge shall not be greater than 10 percent in areas where natural turbidity is greater than 50 NTU.

4. SMP activities shall not cause a violation of any particular water quality standard for receiving waters adopted by the Regional Water Board or the State Water Board as required by the CWA and regulations adopted thereunder. If more stringent applicable water quality standards are promulgated or approved pursuant to CWA section 303, or amendments thereto, the Regional Water Board may revise and modify this Order in accordance with such more stringent standards.

D. Provisions

Management of Removed Sediment

1. The District may temporarily stockpile excavated sediment prior to disposal or reuse, provided that appropriate State and federal regulations are met and BMPs are implemented to protect water quality and beneficial uses. The excavated sediment may be stockpiled onsite for up to three working days before it is removed for offsite disposal. The excavated sediment may also be temporarily stockpiled at an offsite location provided that runoff, sediment, or decant water from the excavated materials shall not contact surface waters of the State.

2. The District is required to implement the Bay Area Air Quality Management District's (BAAQMD) Basic Dust Control Measures (www.baaqmd.gov) at SMP sites less than four acres in size, including site management and transportation BMPs.

3. The District shall haul sediment removed as part of maintenance activities to one of its two corporation yards or another approved location for storage until final disposal. The District shall ultimately dispose of dewatered material at a permitted landfill, an appropriately permitted upland sediment disposal site, or an acceptable re-use site in accordance with applicable State and federal regulations and the applicable provisions of this Order.

4. The District shall submit a revised SMP Manual to indicate that excavated sediment shall be dealt with in one of three ways:

    a. Excavated sediment may be beneficially re-used as road base in accordance with the following limitations. Sediment re-used for road base shall be placed at least 50 feet away from a surface water body and 3 feet above groundwater, and then capped with impervious surface to prevent contact with waters of the State;

    b. The District may propose alternate beneficial re-use sites besides road base re-use, if and only if, a Sediment Sampling and Analysis Plan (SAP) is submitted and approved by the Executive Officer prior to sediment removal activities. The Sediment Sampling and Analysis Plan shall consist of sediment testing and an evaluation to determine the suitability for disposal or reuse based on sediment chemistry. Sampling frequency shall follow the *Guidelines for Implementing the Inland Testing Manual in the San Francisco Bay Region* (DMMO, September 2001). Sediment samples shall be collected and analyzed according to the *Beneficial Reuse of Dredged Materials: Sediment Screening and Testing Guidelines* (SFB-RWQCB 2000), or *The Designated Level Methodology for Waste Classification and Cleanup Level Determination* (CVR-RWQCB, 1989) as appropriate for the proposed disposal or reuse site. Sediment testing results and recommended beneficial re-use site will be submitted to the Regional Water Board for review and approval with the Notification. In general, sediment reuse sites can be characterized into three categories. These categories include (1) onsite reuse, (2) other wetland, channel, or floodplain restoration reuse, and (3) upland agricultural or commercial reuse (dry). The goal is to select disposal options that maximize beneficial reuse of the sediment while minimizing environmental effects; and/or

    c. The District shall dispose of any other sediment at a certified landfill and will test materials in accordance with landfill requirements.

    Proposed sediment disposal, stockpiling, and/or beneficial re-use sites shall be submitted annually to the Executive Officer for review and approval with the Notification. Sediment disposal and stockpile sites are identified when the need for sediment removal activities occurs, which may not be necessary every year. The disposal of any hazardous, designated or non-hazardous waste as defined in CCR27, Division 2, Subdivision 1, Chapter 2 shall be conducted in accordance with applicable State and federal regulations.

5. The District shall have equipment and supplies (e.g., filter fabric, turbidity curtain) onsite (or readily available nearby) that could immediately be deployed as additional measures

to minimize the levels and impacts of turbidity that exceed water quality objectives.

6. All staging shall occur on adjacent access roads or previously disturbed areas. Sediment shall be staged in areas that have been previously disturbed (e.g., service roads and turn-outs). If repair activities affect the active channel, the work area shall be isolated from flowing stream segments using silt fences, wattles, or cofferdams and restored to pre-project conditions after maintenance is complete.

7. The District shall clean up, remove, and relocate any wastes that are discharged in violation of this Order.

8. The District shall demonstrate compliance with all permitting and CEQA review requirements for offsite sediment disposal sites proposed for the SMP and for any alternative offsite sediment disposal sites. If requested by the Executive Officer, a delineation of existing jurisdictional waters of the State and United States at any temporary or permanent sediment disposal site, verified according to the Corps' delineation standards, shall be conducted prior to the preparation for disposal and submitted for the Executive Officer's acceptance prior to the disposal of sediment.

Vegetation Management

9. The District shall follow the vegetation removal and management guidelines described in the SMP Manual.

10. The District shall revise the SMP Manual to indicate that vegetation management and replanting measures shall maximize shading of the active channel, stabilization of active channel banks, and quality of in-stream habitat as described in the Regional Water Board's 2009 Technical Memorandum: "Maintenance, Management, and Monitoring Protocols for Stream Projects That Must Take Flood Risk into Consideration.[6]" Further, the revised vegetation management measures shall include incorporation of environmental quality features into concrete or grouted flood control channels to the maximum extent practicable. Lastly, the revised vegetation management measures shall specify that emergent vegetation that impedes channel capacity shall be managed by removing above-ground biomass with manual methods, such as a scythe or weed-whacker, in the fall after the bird nesting season is complete and leaving the subsurface rhizomes untouched. SMP sites at the confluence of creeks and up or downstream of culverts or flood control structures where vegetation has grown into the active channel may be approved for full removal of subsurface roots if it is determined to be necessary in order to maintain a low flow channel.

Sediment and Vegetation Removal

11. Targeted and localized sediment removal in concrete engineered channels shall be limited to 2,800 linear feet, in earthen engineered channels to 800 linear feet, and in natural channels to 600 linear feet of channel. The maximum volume of debris or sediment removed from any site shall be 2,100 cubic yards. Targeted and localized vegetation

6 San Francisco Bay Regional Water Quality Control Board (2009) "Maintenance, Management, and Monitoring Protocols for Stream Projects that Must Take Flood Risk into Consideration," Technical Memorandum and Rapid Assess (See the case studies for Wildcat Creek and the San Lorenzo River).

removal areas shall be proposed in the Notification and assessed on a site-by-site basis.

These activities may not exceed a program-wide cumulative annual total of 5,000 linear feet of creek channel and 11,000 cubic yards of sediment and debris. Over the 5-year term of this Order, these activities will not exceed the program wide cumulative total of 25,000 linear feet and 55,000 cubic yards of sediment and debris. Should the Order be extended, additional work may not exceed the program-wide cumulative annual total of 5,000 linear feet of creek channel and 11,000 cubic yards of sediment and debris.

Exceptions to the established limits for maintenance activities may be proposed in the Notification and approved on a case-by case basis if found acceptable to the Executive Officer.

12. For all sediment and vegetation removal maintenance proposed to be implemented, the District shall justify the need for such actions in the Notification. This analysis shall incorporate the geomorphic coding system and shall include, but not be limited to, an evaluation of whether in-stream vegetation or sediment removal is necessary and the short- and long-term benefits of the proposed removal actions.

13. Once developed and implemented, the District will include quantitative channel metrics and thresholds in the pre-project assessments to be reported in the Notifications. These channel metrics and thresholds shall incorporate all factors influencing flood control (e.g., channel dimensions, hydrology, vegetation, geomorphology, existing flood control structures) to prioritize maintenance sites, verify when corrective actions are necessary, and that proposed corrective actions are sufficient for each maintenance type. Development of quantitative thresholds may employ the use of cross-sections, pictogram templates and/or other approved methods to establish thresholds that trigger maintenance activities. At a minimum, the vegetation management assessment shall include reach management strategies using a primary objective to sustain and restore a selected desirable value for vegetative roughness to balance the functions of the vegetation for erosion control, shade, temperature control, and other water quality parameters with habitat functions and values and flood risk reduction.

14. If maintenance activities are identified to potentially cause impacts to bank stability, alterations of streambed slope, and/or alterations of sediment transport fluvial processes, this Order requires a project specific notification to the Regional Water Board. The District shall submit a grading plan along with information on the steps taken towards simulating a dynamic equilibrium channel. This includes the project design details with a channel form (e.g., channel shape, width/depth ratio) consistent with channel dimension objectives. The District shall not implement the grading plan until receiving the Executive Officer's written acceptance, verifying that the proposed grading plan was designed to be self-sustaining and will not impact upstream or downstream reaches.

Erosion Control and Bank Stabilization

15. The District shall use the biostabilization methods described in the SMP Manual.

16. The District shall revise the SMP Manual to indicate that biostabilization methods shall be consistent with accepted guidelines developed by agencies such as NRCS[7] and the Corps.[8] Rock installation is prohibited under the SMP. Any changes to the bank repair methods shall be proposed in the Notification.

Other Maintenance Activities

17. Other stream maintenance activities included in the SMP (debris removal, facilities maintenance and repair of flood control structures, and levee maintenance) shall not result in direct or cumulative significant impacts to water quality or beneficial uses of waters of the State.

18. Maintenance activities that may result in modifications to stream cross-sections and or profiles shall be implemented to achieve sustainable and appropriate channel geometries through implementation of the Geomorphic Coding and Quantitative Thresholds Provisions below.

Geomorphic Coding and Quantitative Thresholds

19. The District shall revise the SMP Manual with the following modification to Appendix I (site worksheet). The existing geomorphic coding system shall be revised to better capture the linkages between site-specific conditions and landscape-scale processes, as follows:

    a. Site is located within an alluvial depositional zone (sudden reduction in channel gradient).

    b. Human activity (watershed development, channel confinement, etc.) has caused the site to shift from a transport zone to a depositional zone.

    c. Bridges, culverts, and/or related crossings at a site have dimensions that are smaller than the active channel, leading to velocity changes that cause sediment to drop out.

    d. Site is at the fluvial-tidal interface and accretes tidally- and fluvially-deposited sediment.

    e. Site is located at a channel bend where sediments form a point bar.

    f. Site is located downstream of areas of chronic (terrestrial) sediment delivery (e.g. gullies).

    g. Site is located downstream of episodic sediment delivery (e.g. landslides).

    h. Site is located in an area where vegetation slows flows and leads to sediment deposition.

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7 Bentrup, G. and J.C. Hoag. 1998. *The Practical Streambank Bioengineering Guide, User's Guide for Natural Streambank Stabilization Techniques in the Arid and Semi-Arid Great Basin and Intermountain West.* U.S. Department of Agriculture, Natural Resources Conservation Service. Available on-line at https://www.nrcs.usda.gov/Internet/FSE_PLANTMATERIALS/publications/idpmcpu116.pdf.

8 Fischenich, C. 2001. *Stability Thresholds for Stream Restoration Materials*. EMRRP Technical Notes Collection (ERDC TN-EMRRP-SR-29). U.S. Army Engineer Research and Development Center, U.S. Army Corps of Engineers, Vicksburg, MS. Available online at http://www.spa.usace.army.mil/Portals/16/docs/civilworks/regulatory/Stream%20Information%20and%20Management/ERDC%20Stability%20Thresholds.pdf.

i. Site receives sediment from erosion of adjacent channel banks (changes in width:depth ratios).

j. Site is located within an engineered sediment basin.

Appendix I of the SMP Manual shall also be revised to provide space to enter the area (in square feet) of disturbance resulting from SMP activities (e.g., sediment removal, vegetation removal).

20. The District shall revise the SMP Manual to include a workplan for developing reach scale quantitative channel metrics and thresholds associated with the geomorphic coding system so that quantifiable information will inform when maintenance is needed for flood protection. Further, these channel metrics and thresholds shall be sufficient to facilitate identification of stream equilibrium conditions, address excessive erosion and deposition problems, and promote sustainable habitat conditions. The SMP Manual shall be updated by Year 5 with the fully developed quantitative channel metrics and thresholds incorporated appropriately. The workplan shall be submitted before Year 2 and must include a plan for the following:

    a. The District shall develop quantifiable objectives for channel roughness, channel dimensions, and determine the tolerance for loss of freeboard for major channels District and Regional Water Board staff select from the SMP Manual. Site selection shall be assessed from a reach scale perspective and shall be based on criteria such as environmental sensitivity (i.e., steelhead resources), frequency of maintenance, extent of impacts from maintenance, applicability of quantitative thresholds, and reach scale representative sites.

    b. The District shall provide preliminary estimates of stage-discharge relationships for selected SMP sites. These estimates should be based on actual field measurements. For those channels lacking sufficient flow data, the District shall implement a program for developing stage-discharge relationships for larger magnitude flows and employ a combination of cross-sections, pictogram templates, or other approved methods applicable to the variable conditions and data limitations at specific sites within the program.

    c. For SMP sites most likely subject to the most frequent maintenance (reoccurring vegetation and sediment removal), the District shall develop estimates of channel dimensions/roughness for best establishing quasi-equilibrium conditions to avoid future excessive erosion of or deposition within an active channel while simultaneously maintaining an acceptable level of flood control. These dimensions can be established using a combination of information from regional stream restoration curves, reference reach data, computation of effective discharges, shear stresses, cross-sections, pictogram templates, or other approved methods to establish thresholds that trigger maintenance activities. These estimations of active channel dimensions and roughness should guide the management approaches contained in the SMP and be used in implementing maintenance activities in order to achieve more sustainable channel shapes and floodplains.[9]

[9] San Francisco Bay Regional Water Quality Control Board (2009), "Rapid Permit Checklist for Streams and Floodplains, A User's Guide," Technical Assistance Document

d. By Year 5, the District shall use quantitative thresholds, in addition to the pre-project assessment worksheets, to develop the prioritized list of those SMP sites most likely to require maintenance submitted with the Notification.

Avoidance and Minimization Measures and Best Management Practices

21. The District shall implement the AMMs and BMPs to prevent pollutants from discharging into waters of the State.

22. The District shall follow the procedures and protocols in the Fishnet 4C Manual when removing LWD for maintenance purposes.[10] LWD shall not be removed or managed in a channel if it functions as habitat for salmonids and other threatened and endangered species unless demonstrated to pose a significant risk of blocking a culvert, bridge, or otherwise obstruct flow or cause structural damage. In that case, it may be relocated, repositioned, and/or cabled to a stream bank in a manner that protects existing habitat to the maximum extent feasible. For channels designated by the SMP Manual to not have potential salmonid or other threatened and endangered species habitat, LWD can be immediately removed or relocated to a more suitable location if the LWD is posing a significant risk of flooding and/or structural damage.

23. The District shall revise the SMP Manual to reflect that locations with recurring sediment, vegetation, and LWD removal or management activities shall be assessed for alternate treatments (i.e., adjustments in maintenance activities or potential capital improvements) so that the frequency of sediment, vegetation, and/or LWD removal/modification is reduced. These assessments shall be conducted as part of the pre-project assessments to investigate the root cause of reoccurring maintenance and reported in the Notifications each year. Once quantitative thresholds have been developed and incorporated into the SMP, this assessment shall become streamlined for effectively prioritizing maintenance sites and/or identifying potential capital improvement projects. Potential solutions that address the root cause shall be reported in the Notification in a separate prioritized list of SMP sites with chronic problems.

24. The District shall divert any in-flow at a maintenance site around the active maintenance site in a non-erosive manner.

25. The District shall immediately halt work activities if fish, amphibians, or other aquatic organisms are exhibiting stress or dead within 300 feet of the work activity or discharge. The District shall immediately assign a qualified biologist to investigate the cause of the problem, to define an acceptable corrective action plan, and to determine if the cause is related to SMP activities. The District shall immediately report all incidents involving dead or stressed aquatic organisms, as well as prescribed action plans, to Regional Water Board and CDFW staff.

[10] Fishnet 4C, MFG, Inc., Prunuske Chatham, Inc., Pacific Watershed Associates (2004) Guidelines For Protecting Aquatic Habitat and Salmon Fisheries for County Road Maintenance, prepared for Fishnet 4C Counties, California Department of Fish and Wildlife, National Marine Fisheries Service, California Resources Agency

Compensatory Mitigation

26. The District shall revise the SMP Manual to require a mitigation ratio of 1.1:1 for any temporary impacts and include specific mitigation actions and/or AMMs for temporary impacts at each SMP site. Each site shall be evaluated for the appropriate AMMs and mitigation action(s), which may include, but not be limited to, headwater-area erosion control, native willow staking, planting of native riparian vegetation, removal of trash, and removal of invasive plant species.

27. Mitigation actions shall be proposed, acceptable to the Executive Officer, in the Notifications. Approval of mitigation for temporary impacts to salmonid streams relies on verification that the District consulted with experts from CDFW and NMFS to identify mitigation strategies that maximize ecological functions to support salmonids. All mitigation activities shall be completed as described in the final SMP Manual.

28. The District shall implement all mitigation measures identified in the IS-MND relating to aquatic species, water quality, and hazardous materials.

Program Management

29. By May 1 of each year, the District shall submit, acceptable to the Executive Officer, the Notification to the Regional Water Board. The Notification package shall include a prioritized list of all SMP sites proposed for maintenance. For each site listed, the Notification shall describe:

    - The type of activity proposed;
    - The site's geomorphic coding;
    - Measurements of metrics compared to quantitative thresholds;
    - The site's individual worksheets, including photographs of pre-project conditions;
    - If the site involves sediment removal, include the proposed plan for beneficial re-use or disposal with the appropriate Sediment Sampling and Analysis Plan;
    - A determination of whether the proposed activities could impact any channels identified as functioning as potential habitat for threatened or endangered species, or providing habitat for different life cycles for salmonids (i.e., migration, spawning, rearing, or refugia); and
    - The specific actions that will be implemented to mitigate for impacts.

    The District shall provide a separate inventory of SMP sites prioritized for stream maintenance-related capital improvement projects that address chronic maintenance problems such as sediment, vegetation, and LWD removal. The inventory should include an assessment of the causes of the chronic problems and potential modifications to maintenance activities or corrective action plans that would address these problems. The purpose of this inventory is to guide assessments and determine specific causes of maintenance problems and to develop priority maintenance prevention projects.

    The District may also submit an amended Notification after May 1 that identifies additional maintenance projects that became necessary due to late season rain events

and/or changing site conditions. The Executive Officer will approve the Notification and provide a Notice to Proceed or indicate needed modification within 30 days of submittal. The Executive Officer may remove projects from the annual proposed projects list if the Executive Officer determines that those projects are not covered by the authorization provided by this Order.

30. The Order authorizes work proposed in the Notification for the 2017 maintenance season, submitted on June 15, 2017. The District shall have until July 31, 2017, to submit an amended Notification for the 2017 maintenance season that identifies any additional sites or revisions to maintenance project scope. Additional or revised maintenance shall not commence until the District has received written approval from the Executive Officer. All subsequent years of the SMP shall adhere to the Notification submittal deadline required by Provision D.29 and the SMP Manual.

31. All SMP activities shall be developed by an interdisciplinary team with expertise in fisheries biology, hydrology, and fluvial geomorphology. The team's expertise shall be documented in the Notification.

32. District staff shall conduct pre-construction surveys to locate special status species and habitat before maintenance activities commence to ensure the appropriate AMMs, BMPs, and work schedule will be implemented to protect relevant species.

33. By February 15 of each year, the District shall submit, acceptable to the Executive Officer, an Annual Report to the Regional Water Board that, at a minimum, includes:

    - A description of maintenance activities and both pre- and post-work photographs of each SMP site where maintenance activities were conducted during the previous year;
    - Mitigation implemented;
    - Monitoring results for each site;
    - A description of any lessons learned and recommendations to update BMPs identified in the SMP Manual, as needed; and

34. The Applicant is required to use the Short Form to provide project information annually within 30 days of implementing maintenance activities. An electronic copy of the Short Form and instructions can be downloaded at: http://www.waterboards.ca.gov/sanfranciscobay/certs.shtml. The completed Short Form and map showing the project site boundaries shall be submitted electronically to habitatdata@waterboards.ca.gov or shall be submitted as a hard copy to both: 1) the Water Board (see the address on the letterhead), to the attention of EcoAtlas; and 2) the San Francisco Estuary Institute, 4911 Central Avenue, Richmond, CA 94804, to the attention of EcoAtlas.

35. The following activities may be excluded from the Notification and may occur any time at the discretion of the District and consistent with the SMP Manual: maintenance of existing access roads located along the top-of-bank where there will be no impact on waters of the State; maintenance of V-ditches along existing service roads where all work is above the level of top-of-bank of the adjacent stream and there will be no impact to

waters of the State; and removal of debris (e.g., trash, shopping carts) accumulations using hand labor and not involving the removal of vegetation or LWD.

36. After each maintenance season, the District shall coordinate with Regional Water Board to discuss the performance of the SMP, review lessons learned from the completed construction season, and determine the need to implement improved stream maintenance techniques, AMMs, and BMPs. The District shall propose improved stream maintenance techniques, AMMs, and BMPs identified in connection with such review for Executive Officer approval then implement in all subsequent maintenance years.

37. After five years of SMP implementation, the District shall coordinate a review of the SMP with the Regional Water Board and other regulatory agencies to evaluate its overall effectiveness, and the Regional Water Board may consider issuing Water Quality Certification and WDRs for an additional five years to allow continuation of SMP implementation. The review shall include an assessment of maintenance activities conducted to date, AMMs, BMPs, adequacy of the SMP mitigation program, data management, adaptive updates and revisions of the SMP Manual, and overall program coordination and communication between the District and the regulatory agencies.

38. The District shall revise the SMP Manual to include the following information by Year 2:

    a. Definitions of active channel, low flow channel, floodplain, terrace, and top of bank. These definitions are intended to clarify where and how maintenance activities will occur and provide consistency between the District and other agencies.

    b. Additions to the list of SMP sites (Appendix A) covered by this Order may be submitted, acceptable to the Executive Officer, with the revised SMP Manual prior to Year 2 and Year 5. SMP activities shall be limited to sites identified in the revised SMP Manual for all subsequent years unless an addendum to the Order is filed with the Regional Water Board to the include any new sites that may arise as new projects are added to the District's maintenance program over time (i.e., from the Watershed Program). The addendum shall be publicly noticed for 30 days and all comments shall be considered prior to Executive Officer approval.

39. The District shall revise the SMP Manual to incorporate the following by Year 5:

    a. Provision D.13 requires quantitative thresholds and metrics to be developed with a reach scale approach for the purpose of guiding maintenance activities on priority SMP sites. This shall be used for site prioritization, planning appropriate maintenance techniques, and implementing necessary BMPs and AMMs on SMP sites where the thresholds and metrics are applicable;

    b. Identify priority watershed projects aimed at increasing stormwater infiltration and, thus, reducing sediment or runoff discharges, which can reduce the need for sediment or vegetation removal projects, and improve water quality; and

    c. Adjust program management strategies to a reach scale approach that provide management plans for those reaches potentially functioning as migration, spawning, or high flow refugia habitat for anadromous fish or freshwater shrimp. The management plans are intended to guide maintenance activities with reach-specific

AMMs, BMPs, maintenance techniques, site prioritization and incorporated quantitative thresholds when applicable to enhance protection of priority habitats.

40. By January 31, 2018, the District shall submit a revised SMP Manual acceptable to the Executive Officer that includes the changes described in Provision D.4, D.10, D.11, D.16, D.19, D.20, D.23, D.26, D.29, D.33, and D.38. The revised SMP Manual shall be publicly noticed for 30 days and all comments shall be considered prior to Executive Officer approval. By Year 2 of the SMP, all maintenance activities shall be performed in accordance with the revised SMP Manual.

41. By January 31, 2021, the District shall submit, acceptable to the Executive Officer, a final SMP Manual that includes the changes required in Provisions D.13, D.20, and D.39 of this Order. The proposed changes and additions to the SMP Manual shall be publicly noticed for 30 days and all comments shall be considered prior to Executive Officer approval. By Year 5 of the SMP, all maintenance activities shall be performed in accordance with the final SMP Manual.

Fees

42. This Order is conditioned upon total payment of the full fee required in State regulations (23 CCR sections 2200 and 3833) and owed by the District. The Application fee for the SMP is $120,000 and the District shall remit payment of the fee in full by October 10, 2017. The Applicant shall pay an annual discharge fee to the Regional Water Board each fiscal year (July 1–June 30) in accordance with 23 CCR sections 2200 and 3833.

Records Provisions

43. The District shall maintain a data management system consistent with Chapter 10 of the SMP Manual to monitor stream maintenance activities, natural resources in the SMP area, permitting requirements, and mitigation efforts.

44. The Executive Officer may request submittal of data to the Regional Water Board at times outside of the reporting requirements specified in this Order.

45. The District shall retain records of all monitoring information, including all calibration and maintenance records, copies of all reports required by this Order, and records of all data used to complete the application for this Order, for a period of at least five years from the date of the sample, measurement, report, or application. This period may be extended by request of the Executive Officer at any time.

46. The District shall submit both electronic and hard copy versions of all reports or documents required by this Order.

General Provisions

47. All provisions in this Order apply to all channels and activities identified in the SMP Manual.

48. The following activities are not included in the SMP Manual and, therefore, are not covered in this Order: capital improvement projects; discharge of decant water from

excavated/dredged sediments back to receiving waters; projects that would alter the designed flood conveyance capacity of a channel; pesticide or herbicide applications; fire fuel load management activities; and emergency activities and procedures. A situation is considered an "emergency" if it is a sudden, unexpected occurrence involving a clear and imminent danger that demands immediate action to prevent or mitigate loss of or damage to life, health, property, or essential public services. Emergency includes such occurrences as fire, flood, earthquake or other soil or geologic movements, as well as such occurrences as riot, accident, or sabotage (California Public Resources Code section 21060.3).

49. The District shall comply with all the Prohibitions, Discharge Specifications, Receiving Water Limitations, and Provisions of this Order immediately upon adoption of the Order or as provided in the Order.

50. The District shall comply with all necessary approvals or permits for the SMP and its mitigation projects from applicable government agencies, including, but not limited to, the Regional Water Board, CDFW, Corps, USFWS, NMFS, and local agencies. The District shall submit copies of such approvals or permits to the Executive Officer prior to SMP implementation.

51. The District shall implement the SMP in accordance with the conditions described in the final SMP Manual and the findings and requirements of this Order and shall comply with all applicable water quality standards.

52. SMP activities occurring within the channel below the top of bank shall only occur from June 15 to October 31 or the first significant rainfall after October 15, whichever occurs first (significant rainfall is defined as 0.5 inch of rain in a 24-hour period). No new instream sediment removal or bank stabilization work shall start after October 15 of any year, but work already underway shall have until October 31 to be completed. In particularly dry years, when channels remain dry earlier than June 15 or later than October 31, the District may request approval to conduct maintenance activities prior to June 15 or later than October 31. Exceptions may be made on a project-by-project basis with advance approval by the Executive Officer and federal and State regulatory agencies as appropriate. The Executive Officer will consider any forecasted rainfall and any species habitat needs when approving or denying a work window exception. Disturbed soil related to SMP activities shall be stabilized and winterized. Required planting shall be performed no later than the fall/winter planting season in the year following project installation.

53. If, at any time, an unauthorized discharge to surface water (including wetlands, rivers, or streams) occurs, or any water quality problem arises, the associated SMP activities shall cease immediately until corrective actions have been implemented, including ensuring that adequate BMPs are implemented to eliminate the discharge and clean up and remediate any recoverable pollutants. The Regional Water Board shall be notified promptly and in no case more than 24 hours after the unauthorized discharge or water quality problem arises.

54. This Water Quality Certification and issuance of WDRs is subject to modification or revocation upon administrative or judicial review, including review and amendment pursuant to CWC section 13330 and 23 CCR section 3867.

55. This Water Quality Certification is not intended and shall not be construed to apply to any discharge from any activity involving a hydroelectric facility requiring a Federal Energy Regulatory Commission (FERC) license or an amendment to a FERC license unless the pertinent certification application was filed pursuant to 23 CCR section 3855, subdivision (b), and the application specifically identified that a FERC license or amendment to a FERC license for a hydroelectric facility was being sought.

56. The Regional Water Board may add to or modify the conditions of this Order, as appropriate, to implement any new or revised water quality standards and implementation plans, such as new or revised total maximum daily load requirements, adopted or approved pursuant to the California Water Code or CWA section 303.

57. The District shall maintain a copy of this Order and all relevant plans, AMMs, and BMPs at SMP sites, so as to be available at all times to site operating personnel.

58. The District shall correct any and all problems that arise from an SMP activity, including a failure to meet the conditions of this Order that results in an unauthorized release of pollutants, including sediment.

59. The District shall permit the Regional Water Board staff or its authorized representative, upon presentation of credentials:

    a. Entry on to the premises on which maintenance activities are planned or underway, wastes are located, or in which records are kept.

    b. Access to copy any records required to be kept under the terms and conditions of this Order.

    c. Access to inspect any treatment equipment, monitoring equipment or monitoring method required by this Order.

    d. Access to sample any discharge or surface water covered by this Order.

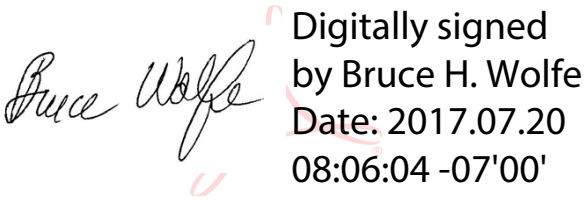
60. In the event of any violation or threatened violation of the conditions of this Order, the violation or threatened violation shall be subject to any remedies, penalties, process or sanctions as provided for under applicable State or federal law. For the purposes of CWA section 401(d), the applicability of any State law authorizing remedies, penalties, process or sanctions constitutes a limitation necessary to assure compliance with the water quality standards and other pertinent requirements incorporated into this Order.

61. This Order is not transferable.

62. The authorization of this Order for SMP activities expires on December 31, 2022. The authorization may be extended by the Executive Officer for up to two years beyond this date, upon the Executive Officer's finding that the Discharger is in compliance with the Order. Mitigation and monitoring requirements that extend beyond the term of this Order

are not subject to the expiration dates outlined above, and remain in full effect and are enforceable.

I, Bruce H. Wolfe, Executive Officer, do hereby certify that the foregoing is a full, complete and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Francisco Bay Region on July 12, 2017.



Bruce H. Wolfe
Executive Officer

Attachment A: Stream Maintenance Program Manual
Attachment B: 2017 Work Plan Pre-Project Notification

Attachment A

Marin Stream Maintenance Program Manual and Appendices

- The Marin Stream Maintenance Program Manual, including its appendices, is attached separately due to its large size: http://www.waterboards.ca.gov/sanfranciscobay/board_info/agendas/2017/July/5c_app_B.pdf

Attachment B

2017 Work Plan Pre-Project Notification

Marin County Stream Maintenance Program

2017 Work Plan Pre-Project Notification to the SF Bay Regional Water Quality Control Board

Submitted June 15, 2017

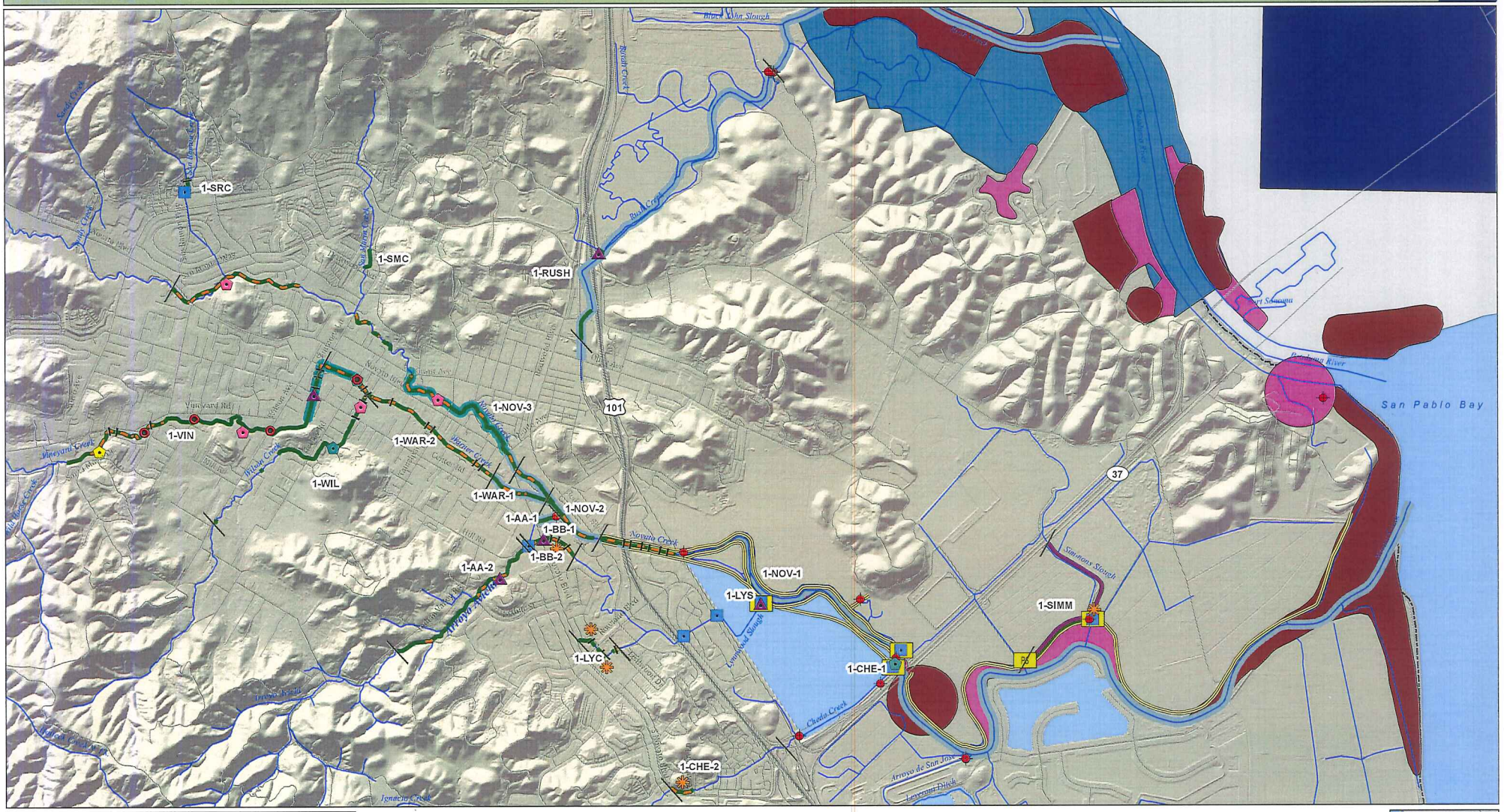
Marin County Stream Maintenance Program

2017 List of Sediment Removal Sites

Zone	Site #	Watershed	Project Site Name in SMP
1	1-RUSH	Rush Creek	Rush Creek
1	1-SIMM	Simmons Slough	Simmons Slough
1	1-VIN	Vineyard Ck	Vineyard Creek
3	3-COY-4	Coyote Creek	Coyote Creek
3	3-COY-3	Coyote Creek	Coyote Creek
3	3-COY-2	Coyote Creek	Coyote Creek
4	4-WEST-2	West Creek- Richardson Bay	West Creek
4	4-EAST-2	East Creek- Richardson Bay	East Creek
5	5-EAS-1d	Easkoot Creek - Bolinas Lagoon	Easkoot Creek
5	5-EAS-1e	Easkoot Creek - Bolinas Lagoon	Easkoot Creek
5	5-EAS-2	Easkoot Creek - Bolinas Lagoon	Easkoot Creek
9	9-MAG-3	Corte Madera Creek	965 Magnolia

Marin County Flood Control District - Stream Maintenance Program

Marin County
Flood Control and
Water Conservation District
April 2017



Map	Flood Control Zone 1 - Novato Lower Novato Creek Watershed
1	

- Fish Passage Barrier
- Vegetation Maintenance
- Levee Maintenance
- Tidal Stream
- Streams
- Sediment Removal
- Sediment Removal
- Erosion Control
- Fuels Reduction
- Cattail cutting
- Tide/Flap Gate
- PS Pump Station
- Trash Rack

Site Limit

- California black rail
- California clapper rail
- California red-legged frog
- Salt-marsh harvest mouse

Restoration site

- Complete
- Ongoing
- Proposed
- Complete

1:30,000

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Flood Control Zone 1 - Novato

Site: 1-RUSH

Site Description:

This work site includes three separate areas of tidally-influenced Rush Creek: 1) tidegates at the downstream end near Cemetery Marsh, 2) sediment and vegetation maintenance at the culvert outlets downstream of Binford Road and 3) vegetation maintenance on a short stretch near Olive Ave between Novato Blvd and Highway 101. The tidegates are in an open salt marsh area.

Rush Creek near Olive Ave. on a veg maintenance reach

Wetlands and other Waters, including Waters of the USACE jurisdiction.

Vegetation communities:

The site is located in northern coastal salt marsh. The upstream area has cattails and a variety of non-native herbaceous and shrubby species. Downstream Site #2 drains into the marsh and Site #3 is more urbanized.

Potentially-occurring special-status species:

California black rail, California clapper rail, and salt marsh harvest mouse near the downstream tidegate.

Avoidance and Minimization Measures:

GAMM-1 through GAMM-6; BIRD-1, MAMM-1.

Maintenance Activities:

Vegetation maintenance, sediment removal and tidegate maintenance.

Best Management Practices:

A-43; A-67;A-69; A-73; A-103; A-107; A-109; A-113; A-117; A-141; A-151; A-157; A-161; A163; A-167; A-179; A-229; EV-1; EV-2; NR-1; NR-3; SC-1 through SC-6; SS-1 through SS-4; VDM-1 through VDM-4; VR-1; VR4b; VR-5; WD-4; WD-5.

1-RUSH: Sediment Removal from Rush Creek

Location: North of Olive/Railroad intersection; excluding the CalTrans ROW.
FC has an easement over State land with County taking responsibility to keep culvert outlets open on this drainage easement. Lat/Long: 38.1187/122.564.
Channel Description: Modified earthen flood control engineered channel; predominant vegetation type is northern coastal salt marsh; sediment removal area is dominated by open water, dense cattails and invasive grasses along Highway 101.
Tidal: Yes
Vegetation/Habitat Types: Tidal riparian; open water and cattails
Geomorphic Codes: Urban/Wildland Interface; Tidal Backwater; Debris or vegetation obstruction, sediment aggradation at outlet
Sediment Issue Severity: Medium; fills in after a decent storm
Chronic Sediment Issues: Sediment aggradation at the culvert outlet from tidal action in a tidal backwater creek reach; Removing sediment in this location would be more effective if there was a reduction of aggradation in the CalTrans reach US.
Dimensions of Work Area: 280 LF, 3 feet depth and 10 feet wide to clear the channel below a 36" culvert
Work Days:- 1-2; every 1-3 years
Equipment: Wheeled front end loader
Equipment Location During Sediment Removal: Adjacent Roadway or pull-out
Heavy Equipment Access and Staging: Across off-road area no vegetation removal
Temporary Stockpile Locations: On off-road area- no vegetation removal
Dewatering: Coffer dam and water diversion needed, therefore it falls under ACOE jurisdiction;
Permits Needed: ACOE 404; DFW 1600 RMA, RWQCB; no Special Status Species present in this project reach
Potentially Occurring Special Status Species: None in the project area; see Species designations on Site Maps attached

Avoidance and Minimization Measures

AMM-1: Environmental Compliance Coordinator, Buffers and Work Stoppages

- Before commencement of a maintenance activity, The District shall designate an Environmental Compliance Coordinator (ECC) who will determine the appropriate AMMs, to implement during operations based on the site fact sheets.

- The ECC shall distribute a work order to maintenance staff and contractors with a list of the AMMs and BMPs applicable to each site. The work order must be completed in a timely manner to allow time for pre-construction surveys.

- The ECC shall assess field conditions at the start of each work day. If any special status species or nesting birds are observed, the ECC shall establish buffers areas, if sufficient, or stop any activity the ECC deems may result in take or destruction of habitat. Stopped work shall not be allowed to resume until appropriate corrective measures have been completed or it has been determined that nesting is complete. The ECC shall immediately report any unauthorized impacts to the appropriate trustee agency (i.e. USFWS, NMFS, USACE, and/or CDFW). The ECC shall coordinate with Maintenance Supervisors to stop any activity the ECC or agencies deems may cause take of a listed species or their habitat. Work shall not be allowed to resume until appropriate corrective measures have been completed.

- All on-site maintenance activity personnel shall receive instruction regarding the presence of listed species and the importance of avoiding impacts to these species and their habitat before the start of work.

GAMM-2: Site Preparation/Wildlife Reconnaissance

The ECC shall walk the site each day before maintenance activities commence to locate wildlife; if any special status wildlife species are noted, work will not commence until all individuals have left the work site on their own and/or it has been determined that they are not nesting within the project site.

When maintenance activities require dewatering, a qualified fisheries biologist with appropriate permits shall be on-site to move fish.

All habitat improvements on salmon and steelhead streams shall be done in accordance with techniques in the California Salmonid Stream Habitat Restoration Manual (CDFW 2010d).

GAMM-3: Work Windows

To avoid impacts to special status species, the maintenance activities carried out shall typically occur during the summer low flow season. In addition, species-specific work windows shall be followed to avoid impacts. Table below shows the work windows for species that may be impacted by the proposed maintenance activities. Additional information can be found within the species-specific AMMS.

GAMM-4: Trash Removal

During all activities at project sites, all construction trash that may attract predators shall be properly contained, removed from the work site, and disposed of regularly. Following maintenance activities, all construction trash and maintenance debris shall be removed from work sites and disposed of properly.

GAMM-5: Equipment Staging

Staging/storage areas for equipment, materials, fuels, lubricants, and solvents, shall be located outside of the stream's high water channel and associated riparian area. Stationary equipment such as motors, pumps, generators, compressors, and welders located within the dry portion of the steam channel or adjacent to the stream, shall be positioned over drip-pans. Equipment shall be moved out of the normal high water area of the stream prior to refueling and lubricating. The ECC or Maintenance Supervisor shall ensure that contamination of habitat does not occur during such operations. Best Management Practices covering Chemical Use (Spill Prevention and Control); contained in the BASMAA Flood Control Facility Maintenance Best Management Practices Manual (BAASMA 2000) shall be followed. These BMPs are designed to prevent the discharge of chemicals to flood control channels and storm drain systems and allow prompt and effective response to any accidental spills. All workers shall be informed of the importance of preventing spills and of the appropriate measures to take should a spill occur.

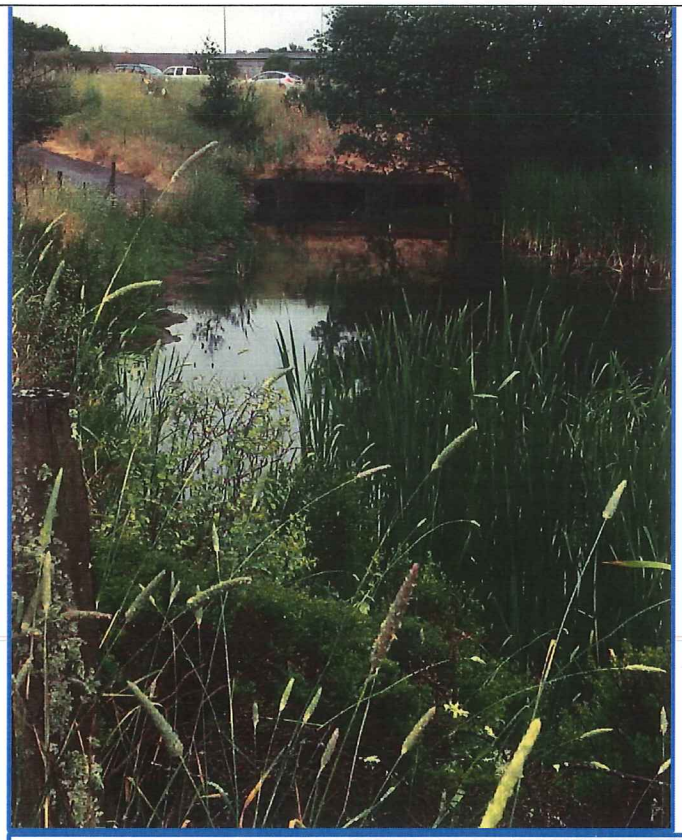
The number of access routes, number and size of staging areas, and the total area of the work site activity shall be limited to the minimum necessary to complete the proposed activity.

GAMM-6: Invasive Species

The ECC shall ensure that the spread or introduction of invasive exotic plants shall be avoided to the maximum extent possible. When practicable, invasive exotic plants at the work site shall be removed.

For all activities in creeks and bay, all gear exposed to water shall be allowed to dry for three days before being used again. Some disinfectants are OK to use per DFG and USFWS (users should check with those agencies). As a precaution against invasive quagga and zebra mussels, if kayaks or any other vessels are used in maintenance activities, crew will wash and dry them off-site prior to using them in another creek or tributary.

1-RUSH: Sediment removal and clearing of cattails to establish a low flow channel downstream of CalTrans culverts under Highway 101. Chronic flooding of Armstrong Ave. occurs when tidal flows and storm flows converge during significant winter storms and downstream channel capacity is compromised due to complete blockage by cattails.



Flood Control Zone 1 - Novato

Site: 1-SIMM
Simmons Slough

Big Bertha pump station at Simmons Slough.

Site Description:

The work site is at the Simmons Slough pump station (which pumps water from the slough into Novato Ck. The area is tidally-influenced; adjacent land uses include flood control and agriculture. Sediment is removed to promote positive flow to Pump intake from DS HWY 37 to Novato Creek Levee and perpendicular levee screw gate to Sanitary District PS. Very low gradient; water at intake is normal; ag-gradation blocks conveyance to PS

Wetlands and other Waters, including Waters of the State:

Sediment removal may be under USACE jurisdiction

Vegetation communities:

The vegetation type at the sediment removal site is northern coastal salt marsh with salt grass and pickleweed; the levee tops around the pump station is annual grass-lands, with dominant species comprised mainly of nonnative grasses, wild radish, and bull mallow.

Potentially-occurring special-status species:

California black rail, California clapper rail, salt marsh harvest mouse.

Avoidance and Minimization Measures:

GAMM-1 through GAMM-6; BIRD-1, MAMM-1.

Maintenance Activities:

Sediment removal and pump station maintenance.

Best Management Practices:

A-43; A-103; A-107; A-109; A-113; A-117; A-141; A-151; A-157; A-161; A163; A-167; A-179; A-229; EV-1; EV-2; NR-1; NR-3; SC-1 through SC-6; SS-1 through SS-4; VDM-1 through VDM-4; VR-1; VR-4a; VR4b; VR-5; WD-4; WD-5.

1-SIMM: Sediment Removal from Simmons Slough drainage ditch

Project Description: The work site is at the Simmons Slough pump station (which pumps water from the slough into Novato Ck. The area is tidally-influenced; adjacent land uses include flood control and agriculture. Sediment is removed to promote positive flow to Pump intake from DS HWY 37 to Novato Creek Levee and perpendicular levee screw gate to Sanitary District PS. Very low gradient; water at intake is normal; aggradation blocks conveyance to PS

Lat/Long: 38.0948 /-122.5167

Channel Description: Engineered flood control channel and ditch

Tidal: Yes

Vegetation/Habitat Types: California Annual Grassland; northern coastal salt marsh

Geomorphic Codes: Engineered silt basin; Debris or vegetation obstruction, sediment aggradation at outlet

Sediment Issue Severity: Medium; fills in after a decent storm

Chronic Sediment Issues: Sediment aggradation blocks access to pump station and causes chronic flooding of Highway 37

Dimensions of Work Area: 2880 LF; 5 feet depth; 25 feet wide

Work Days: 3-4 days;

Equipment: Long-reach excavator, hauler

Equipment Location During Sediment Removal: Top of levee

Heavy Equipment Access and Staging: across-off road area no veg to remove

Temporary Stockpile Locations: On off-road area- no vegetation removal

Dewatering: No

Permits Needed: DFW 1600 RMA, RWQCB;

Potentially Occurring Special Status Species: Salt Marsh Harvest Mouse, Black rail, Ridgeway rail

Avoidance and Minimization Measures

AMM-1: Environmental Compliance Coordinator, Buffers and Work Stoppages

- Before commencement of a maintenance activity, The District shall designate an Environmental Compliance Coordinator (ECC) who will determine the appropriate AMMs, to implement during operations based on the site fact sheets.

- The ECC shall distribute a work order to maintenance staff and contractors with a list of the AMMs and BMPs applicable to each site. The work order must be completed in a timely manner to allow time for pre-construction surveys.

- The ECC shall assess field conditions at the start of each work day. If any special status species or nesting birds are observed, the ECC shall establish buffers areas, if sufficient, or stop any activity the ECC deems may result in take or destruction of habitat. Stopped work shall not be allowed to resume until appropriate corrective measures have been completed or it has been determined that nesting is complete. The ECC shall immediately report any unauthorized impacts to the appropriate trustee agency (i.e. USFWS, NMFS, USACE, and/or CDFW). The ECC shall coordinate with Maintenance Supervisors to stop any activity the ECC or agencies deems may cause take of a listed species or their habitat. Work shall not be allowed to resume until appropriate corrective measures have been completed.

- All on-site maintenance activity personnel shall receive instruction regarding the presence of listed species and the importance of avoiding impacts to these species and their habitat before the start of work.

GAMM-2: Site Preparation/Wildlife Reconnaissance

The ECC shall walk the site each day before maintenance activities commence to locate wildlife; if any special status wildlife species are noted, work will not commence until all individuals have left the work site on their own and/or it has been determined that they are not nesting within the project site.

When maintenance activities require dewatering, a qualified fisheries biologist with appropriate permits shall be on-site to move fish.

All habitat improvements on salmon and steelhead streams shall be done in accordance with techniques in the California Salmonid Stream Habitat Restoration Manual (CDFW 2010d).

GAMM-3: Work Windows

To avoid impacts to special status species, the maintenance activities carried out shall typically occur during the summer low flow season. In addition, species-specific work windows shall be

followed to avoid impacts. Table below shows the work windows for species that may be impacted by the proposed maintenance activities. Additional information can be found within the species-specific AMMS.

GAMM-4: Trash Removal

During all activities at project sites, all construction trash that may attract predators shall be properly contained, removed from the work site, and disposed of regularly. Following maintenance activities, all construction trash and maintenance debris shall be removed from work sites and disposed of properly.

GAMM-5: Equipment Staging

Staging/storage areas for equipment, materials, fuels, lubricants, and solvents, shall be located outside of the stream's high water channel and associated riparian area. Stationary equipment such as motors, pumps, generators, compressors, and welders located within the dry portion of the steam channel or adjacent to the stream, shall be positioned over drip-pans. Equipment shall be moved out of the normal high water area of the stream prior to refueling and lubricating. The ECC or Maintenance Supervisor shall ensure that contamination of habitat does not occur during such operations. Best Management Practices covering Chemical Use (Spill Prevention and Control); contained in the BASMAA Flood Control Facility Maintenance Best Management Practices Manual (BAASMA 2000) shall be followed. These BMPs are designed to prevent the discharge of chemicals to flood control channels and storm drain systems and allow prompt and effective response to any accidental spills. All workers shall be informed of the importance of preventing spills and of the appropriate measures to take should a spill occur.

The number of access routes, number and size of staging areas, and the total area of the work site activity shall be limited to the minimum necessary to complete the proposed activity.

GAMM-6: Invasive Species

The ECC shall ensure that the spread or introduction of invasive exotic plants shall be avoided to the maximum extent possible. When practicable, invasive exotic plants at the work site shall be removed.

For all activities in creeks and bay, all gear exposed to water shall be allowed to dry for three days before being used again. Some disinfectants are OK to use per DFG and USFWS (users should check with those agencies). As a precaution against invasive quagga and zebra mussels, if kayaks or any other vessels are used in maintenance activities, crew will wash and dry them off-site prior to using them in another creek or tributary.

AMMs per Special Status Species

BIRD-1: Ridgway's rail and California black rail

Several of the sites are within (5-10 sites) or immediately adjacent (15-20 sites) to suitable habitat for Ridgway's rail and California black rails. The following measures apply to all sites in or near salt or brackish marshland and will also serve to protect other tidal-marsh dependent species such as saltmarsh common yellowthroat and San Pablo song sparrow.

When working within 250 ft. of salt or brackish marshland during the period February 1st through August 31st, presence for either rail species shall be assumed.

For all maintenance activities except for mowing of levees:

- Maintenance activities shall be scheduled to occur between September 1st and January 31st to avoid the rail breeding season.

- Work shall be scheduled to occur between 8:00 AM and 4:00 PM in order to avoid early morning and late afternoon/evening hours when rails are most active.

- Work shall be scheduled to avoid periods of high tides, as the high water reduces the amount of refugial habitat for the rails. No work shall occur near salt marsh habitats within two hours before or after predicted extreme high tides of 6.5 ft. above the National Geodetic Vertical Datum (NGVD), as measured at the Golden Gate Bridge, and adjusted to the timing of local extreme high tide events at the project sites.

- Activities shall proceed as quickly as possible to reduce disturbance from noise, dust, etc.

- Removal or disturbance of emergent tidal marsh vegetation shall be avoided, and removal or disturbance of vegetation at the tidal marsh/upland interface shall be avoided to provide a buffer of refugial habitat within as wide a swath as possible (3 meter minimum) from the Mean Higher High Water (MHHW) line. If removal is necessary, the work shall be scheduled outside of the breeding season (February 1 – August 31st); all vegetation shall be removed by hand, and shall be salvaged and retained for replacement after work is completed.

- If, for any reason other than fire fuel reduction levee mowing, the District must perform maintenance activities within 250 ft. of salt or brackish marshland during the rail breeding season, the District shall retain a qualified biologist to conduct clapper rail surveys in accordance to most currently available protocols from the Department of Fish and Game and the US Fish and Wildlife Service.

MAMM-1: Salt Marsh Harvest Mouse (SMHM)

The majority of the sites are not in, nor adjacent to, salt marsh harvest mouse habitat; avoidance has been achieved for those sites. At sites XXX which are adjacent to suitable habitat for salt marsh harvest mouse and include work which may require impact to salt marsh harvest mouse habitat by removal of pickleweed, the following AMMS shall be followed:

- When implementing maintenance activities in uplands adjacent to salt or brackish marshland, vehicles will be confined to existing roads where possible, and disturbed areas shall be re-vegetated with brackish marsh species. Crews shall use matting, pontoon boards or other comparable methods whenever feasible to minimize impacts to the existing vegetation. The placement of mats will be approved by CDFW before their placement. Crews shall work exclusively from mat boards and boardwalks to minimize trampling of vegetation.

- If maintenance activities are conducted outside the breeding season, in coordination with USFWS and CDFW, pre-construction surveys shall be conducted within 5 days of the start of maintenance activities to check for presence of mice within the project sites. In addition, the ECC shall be present during maintenance-related activities along and adjacent to all suitable nesting habitat areas to ensure that salt marsh harvest mice are not present.

- Work shall be scheduled to avoid periods of high tides, as the high water reduces the amount of refugial habitat for SMHM. Generally, work should not be scheduled to occur between 2 hours before high tide and two hours after high tide.

- Removal or disturbance of emergent tidal marsh vegetation shall be avoided, and removal or disturbance of vegetation at the tidal marsh/upland interface shall be avoided to provide a buffer of refugial habitat within as wide a swath as possible.

- Training sessions shall be given to all workers to inform them of protective measures, instruct them in identification of the salt marsh harvest mouse and its habitat requirements, and inform them of when work needs to be stopped and appropriate officials informed of species presence.

- For project sites where work will intrude into tidal marsh habitat, the ECC shall survey the site prior to beginning work in order to determine the presence/absence of SMHM, and the following measures shall be implemented:

- Under the supervision of the ECC, vegetation shall be removed only with non-mechanized hand tools; no motorized equipment shall be used. Vegetation removal may begin only when no mice are observed, or with CDFW approval, and shall start at the edge farthest from the salt marsh and work its way towards the salt marsh. If a mouse of any species is observed within the areas being removed of vegetation, work

shall stop and CDFW shall be notified. Unless otherwise approved by CDFW, the mouse shall be allowed to leave on its own volition. Removal of pickleweed will generally follow Zedler (2001).

- If trenching takes place within 50 ft. of pickleweed areas, visqueen fencing shall be installed around worksites within pickleweed before excavation activities begin. CDFW will approve the size and placement of fencing. An escape ramp shall be placed in any open trench at the end of the day to allow any entrapped animals to escape.

- The ECC shall be on-site and shall halt project activities if necessary to comply with these terms.

1-SIMM: Sediment removal and clearing of cattails to establish a low flow channel to facilitate drainage to Simmons Slough pump station and reduce flooding of Highway 37

Flood Control Zone 1 - Novato

Site: 1-VIN
Vineyard Creek

Site Description:

The work site is a non-tidal, narrow riparian corridor constrained on both sides by residential development. The site includes several discontinuous sections of non-tidally influenced ripariran corridor.

Adjacent land uses are primarily residential.

Vineyard Creek at the Sonoma-Marin parcel.

Wetlands and other Waters, including Waters of the State:

Exempt from USACE jurisdiction.

Vegetation communities:

The vegetation type is north coast riparian scrub/forest. Tree species include bays, willows, alders. Understory species include wild grape, blue elderberry, Himalayan blackberry, ivy, and native and non-native grasses.

Potentially-occurring special-status species:

Steelhead trout; not present when work is completed during dry season

Avoidance and Minimization Measures:

GAMM-1 through GAMM-6; FISH-1.

Maintenance Activities:

Fire fuel reduction, vegetation maintenance, sediment removal, and erosion control.

Best Management Practices:

A-43; A-53; A-61; A-63; A-67; A-69; A-71; A-73; A-109; A-113; A-117; A-141; A-151; A-157; A-161; A163; A-167; A-179; A-185; A-191; A-193; A-197; A-203; A-211; A-223; A-229; CU-8; EV-1; EV-2; NR-1; NR-3; SC-1 through SC-6; SS-1 through SS-4; VDM-1 through VDM-4; VR-1 through VR-5; WD-4; WD-5.

1-VIN: Sediment Removal from Vineyard Creek in the Novato Watershed

Project Location: Project is accessed from Center Road Bridge in downtown Novato

Project Description:

Lat/Long: 38.1076 -122.5917

Channel Description: The work site is an earthen non-tidal, engineered channel with a narrow riparian corridor constrained on both sides by residential development. The site includes several discontinuous sections of non-tidally influenced riparian corridor. Adjacent land uses are primarily residential.

Tidal: No

Vegetation/Habitat Types: North coast riparian scrub/forest. Tree species include bays, willows, alders. Understory species include wild grape, blue elderberry, Himalayan blackberry, ivy, and native and non-native grasses.

Geomorphic Codes: Reduction in channel gradient, widened cross-sections, debris or vegetation obstruction

Sediment Issue Severity: Medium

Chronic Sediment Issues: Trees 300 ft. US causing scour; sediments deposit at bridge; If City of Novato removes US trees, may alleviate issue

Dimensions of Work Area: 75 LF; 5 feet depth; 5-25 feet wide

Work Days: 3-4 days;

Frequency of removal: every 1-3 years

Equipment: Remove sediment under bridge by using Mini-Skid Steer Track Loader and Backhoe; hand removal and hauler

Equipment Location During Sediment Removal: Adjacent roadway or pull-out

Heavy Equipment Access and Staging: from roadway, parking lot pull-out

Temporary Stockpile Locations: On off-road area- no vegetation removal

Dewatering: No

Permits Needed: DFW 1600 RMA, RWQCB;

Potentially Occurring Special Status Species: Steelhead but not during project implementation since the channel is always dry during the fall when the work is scheduled

impacted by the proposed maintenance activities. Additional information can be found within the species-specific AMMS.

GAMM-4: Trash Removal

During all activities at project sites, all construction trash that may attract predators shall be properly contained, removed from the work site, and disposed of regularly. Following maintenance activities, all construction trash and maintenance debris shall be removed from work sites and disposed of properly.

GAMM-5: Equipment Staging

Staging/storage areas for equipment, materials, fuels, lubricants, and solvents, shall be located outside of the stream's high water channel and associated riparian area. Stationary equipment such as motors, pumps, generators, compressors, and welders located within the dry portion of the steam channel or adjacent to the stream, shall be positioned over drip-pans. Equipment shall be moved out of the normal high water area of the stream prior to refueling and lubricating. The ECC or Maintenance Supervisor shall ensure that contamination of habitat does not occur during such operations. Best Management Practices covering Chemical Use (Spill Prevention and Control); contained in the BASMAA Flood Control Facility Maintenance Best Management Practices Manual (BAASMA 2000) shall be followed. These BMPs are designed to prevent the discharge of chemicals to flood control channels and storm drain systems and allow prompt and effective response to any accidental spills. All workers shall be informed of the importance of preventing spills and of the appropriate measures to take should a spill occur.

The number of access routes, number and size of staging areas, and the total area of the work site activity shall be limited to the minimum necessary to complete the proposed activity.

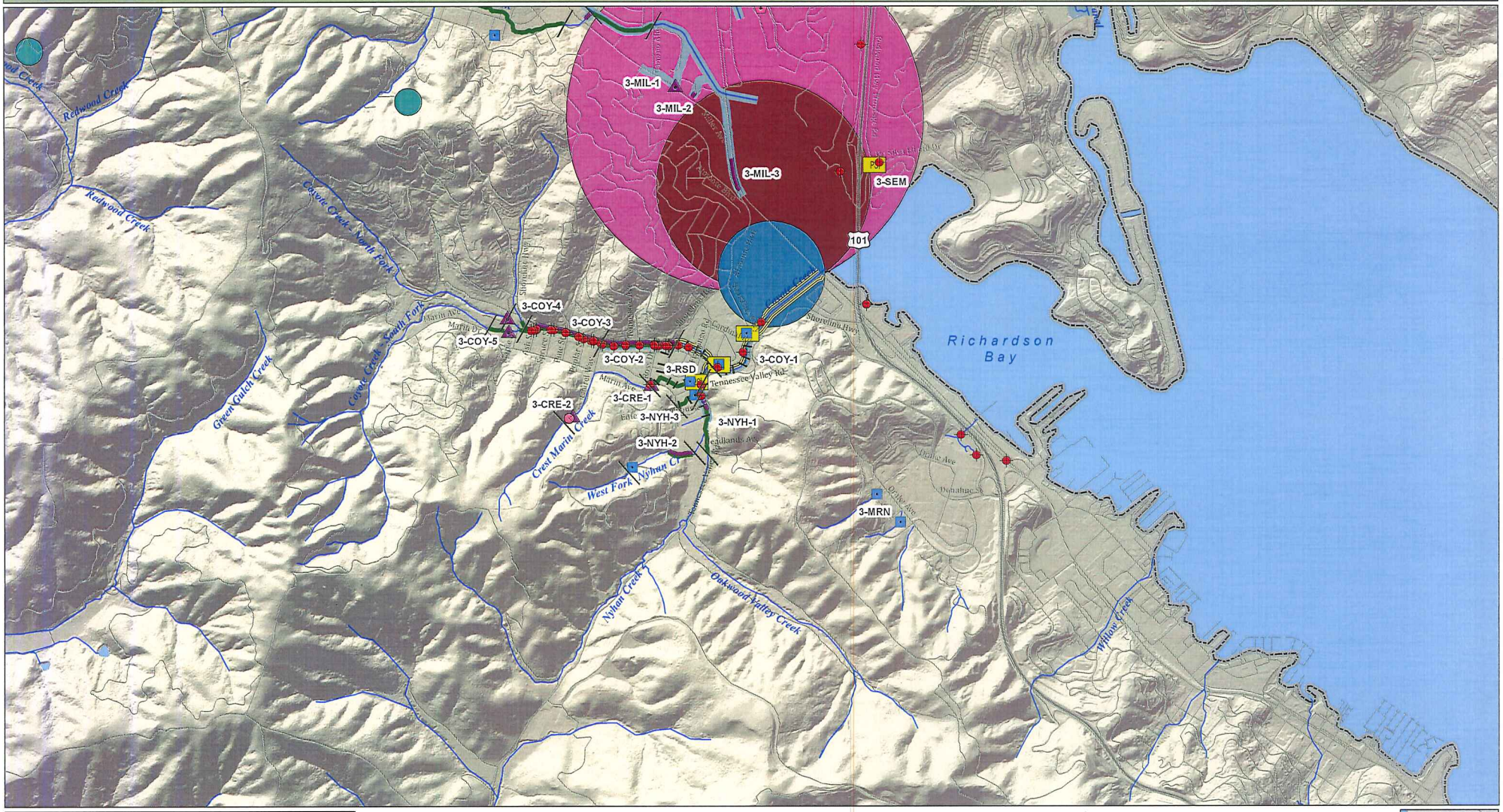
GAMM-6: Invasive Species

The ECC shall ensure that the spread or introduction of invasive exotic plants shall be avoided to the maximum extent possible. When practicable, invasive exotic plants at the work site shall be removed.

For all activities in creeks and bay, all gear exposed to water shall be allowed to dry for three days before being used again. Some disinfectants are OK to use per DFG and USFWS (users should check with those agencies). As a precaution against invasive quagga and zebra mussels, if kayaks or any other vessels are used in maintenance activities, crew will wash and dry them off-site prior to using them in another creek or tributary.

Marin County Flood Control and Water Conservation District - Routine Maintenance Activities

Marin County
Flood Control and
Water Conservation District
April 2017



Map	Flood Control Zone 3 - Richardson Bay Coyote Creek Watershed
5	

- Fish Passage Barrier
- Vegetation Maintenance
- Levee
- Tidal Stream
- Streams
- Sediment Removal
- Sediment Removal
- Erosion Control
- Fuels Reduction
- Tide/Flap Gate
- Pump Station
- Trash Rack
- Silt Basin
- Site Location Limit
- California black rail
- California clapper rail
- Northern spotted owl
- salt-marsh harvest mouse

Restoration site

- Complete
- Ongoing
- Proposed

1:20,000

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Flood Control Zone 3 - Richardson Bay

Site: 3-COY-2
Coyote Creek

Site Description:

The site is tidal with concrete channel and extends from the start of the concrete bottom upstream to Laurel Way.

Surrounding land use is residential and commercial.

Wetlands and other Waters, including Waters of the State:

Subject to USACE jurisdiction.

Vegetation communities:

The channel bottom is concrete; predominant vegetation type on the banks is north coast riparian scrub/forest.

Potentially-occurring special-status species:

None.

Avoidance and Minimization Measures:

GAMM-1 through GAMM-6.

Maintenance Activities:

Vegetation maintenance, sediment removal, erosion control, and tidegate maintenance.

Best Management Practices:

A-43; A-53; A-61; A-63; A-67; A-69; A-71; A-73; A-103; A-107; A-109; A-113; A-117; A-141; A-151; A-157; A-161; A163; A-167; A-179; A-185; A-191; A-193; A-197; A-203; A-211; A-223; A-229; CU-8; EV-1; EV-2; NR-1; NR-3; SC-1 through SC-6; SS-1 through SS-4; VDM-1 through VDM-4; VR-1 through VR-5; WD-4; WD-5.

3-COY-2: Sediment Removal from Coyote Creek Concrete Channel

Project Location: The site is the concrete channel extending from the start of the concrete bottom downstream of Ross Dr. upstream to Laurel Way. Surrounding land use is residential and commercial.

Project Description: Remove accumulated sediment from bottom of concrete channel. Lower equipment (e.g., small loader) into channel to push material to DS end where an excavator will be placed at the top-of-bank to remove and load material.

Lat/Long: 37°52'44.29" N 122°31'58.35" W

Channel Description: Concrete

Tidal: Yes

Vegetation/Habitat Types: Concrete bottom, no emergent vegetation present; predominant vegetation type on the banks is north coast riparian scrub/forest.

Geomorphic Codes: Urban/Wildlife interface, sediment aggradation at outlet

Sediment Issue Severity: Low; chronic

Chronic Sediment Issues: Hydraulic model provides triggers; goal is to remove US sediments in concrete channel rather than lower tidal earthen channel with habitat.

Dimensions of Work Area: 1325 LF; 6 feet depth; 16 feet wide

Work Days: 3-4 days;

Frequency of removal: every 3 years

Equipment: Long-reach Excavator, Loader, Hauler

Equipment Location During Sediment Removal: Adjacent roadway or pull-out and in-channel and top of levee

Heavy Equipment Access and Staging: from roadway, parking lot pull-out, no veg to remove; across off-road areas

Temporary Stockpile Locations: On off-road area- no vegetation removal

Dewatering: Yes

Permits Needed: DFW 1600 RMA, RWQCB;

Potentially Occurring Special Status Species: None

Avoidance and Minimization Measures

AMM-1: Environmental Compliance Coordinator, Buffers and Work Stoppages

- Before commencement of a maintenance activity, The District shall designate an Environmental Compliance Coordinator (ECC) who will determine the appropriate AMMs, to implement during operations based on the site fact sheets.

- The ECC shall distribute a work order to maintenance staff and contractors with a list of the AMMs and BMPs applicable to each site. The work order must be completed in a timely manner to allow time for pre-construction surveys.

- The ECC shall assess field conditions at the start of each work day. If any special status species or nesting birds are observed, the ECC shall establish buffers areas, if sufficient, or stop any activity the ECC deems may result in take or destruction of habitat. Stopped work shall not be allowed to resume until appropriate corrective measures have been completed or it has been determined that nesting is complete. The ECC shall immediately report any unauthorized impacts to the appropriate trustee agency (i.e. USFWS, NMFS, USACE, and/or CDFW). The ECC shall coordinate with Maintenance Supervisors to stop any activity the ECC or agencies deems may cause take of a listed species or their habitat. Work shall not be allowed to resume until appropriate corrective measures have been completed.

- All on-site maintenance activity personnel shall receive instruction regarding the presence of listed species and the importance of avoiding impacts to these species and their habitat before the start of work.

GAMM-2: Site Preparation/Wildlife Reconnaissance

The ECC shall walk the site each day before maintenance activities commence to locate wildlife; if any special status wildlife species are noted, work will not commence until all individuals have left the work site on their own and/or it has been determined that they are not nesting within the project site.

When maintenance activities require dewatering, a qualified fisheries biologist with appropriate permits shall be on-site to move fish.

All habitat improvements on salmon and steelhead streams shall be done in accordance with techniques in the California Salmonid Stream Habitat Restoration Manual (CDFW 2010d).

GAMM-3: Work Windows

To avoid impacts to special status species, the maintenance activities carried out shall typically occur during the summer low flow season. In addition, species-specific work windows shall be followed to avoid impacts. Table below shows the work windows for species that may be impacted by the proposed maintenance activities. Additional information can be found within the species-specific AMMS.

GAMM-4: Trash Removal

During all activities at project sites, all construction trash that may attract predators shall be properly contained, removed from the work site, and disposed of regularly. Following maintenance activities, all construction trash and maintenance debris shall be removed from work sites and disposed of properly.

GAMM-5: Equipment Staging

Staging/storage areas for equipment, materials, fuels, lubricants, and solvents, shall be located outside of the stream's high water channel and associated riparian area. Stationary equipment such as motors, pumps, generators, compressors, and welders located within the dry portion of the steam channel or adjacent to the stream, shall be positioned over drip-pans. Equipment shall be moved out of the normal high water area of the stream prior to refueling and lubricating. The ECC or Maintenance Supervisor shall ensure that contamination of habitat does not occur during such operations. Best Management Practices covering Chemical Use (Spill Prevention and Control); contained in the BASMAA Flood Control Facility Maintenance Best Management Practices Manual (BAASMA 2000) shall be followed. These BMPs are designed to prevent the discharge of chemicals to flood control channels and storm drain systems and allow prompt and effective response to any accidental spills. All workers shall be informed of the importance of preventing spills and of the appropriate measures to take should a spill occur.

The number of access routes, number and size of staging areas, and the total area of the work site activity shall be limited to the minimum necessary to complete the proposed activity.

GAMM-6: Invasive Species

The ECC shall ensure that the spread or introduction of invasive exotic plants shall be avoided to the maximum extent possible. When practicable, invasive exotic plants at the work site shall be removed.

For all activities in creeks and bay, all gear exposed to water shall be allowed to dry for three days before being used again. Some disinfectants are OK to use per DFG and USFWS (users should check with those agencies). As a precaution against invasive quagga and zebra mussels, if kayaks or any other vessels are used in maintenance activities, crew will wash and dry them off-site prior to using them in another creek or tributary.

Flood Control Zone 3 - Richardson Bay

Site: 3-COY-3
Coyote Creek

Site Description:

The site consists of a non-tidal, concrete channel. It extends from Laurel Way upstream to Ash St.

Surrounding land use is residential and commercial.

Wetlands and other Waters, including Waters of the State:

Subject to USACE jurisdiction.

Vegetation communities:

The dominant vegetation type is north coast riparian scrub/forest.

Potentially-occurring special-status species:

None.

Avoidance and Minimization Measures:

GAMM-1 through GAMM-6.

Maintenance Activities:

Vegetation maintenance, sediment removal, erosion control, and tidegate maintenance.

Best Management Practices:

A-43; A-53; A-61; A-63; A-67;A-69; A-71; A-73; A-103; A-107; A-109; A-113; A-117; A-141; A-151; A-157; A-161; A163; A-167; A-179; A-185; A-191; A-193; A-197; A-203; A-211; A-223; A-229; CU-8; EV-1; EV-2; NR-1; NR-2; NR-3; SC-1 through SC-6; SS-1 through SS-4; VDM-1 through VDM-4; VR-1 through VR-5; WD-4; WD-5.

3-COY-3: Sediment Removal from Coyote Creek Concrete Channel

Project Location: The site consists of a non-tidal, concrete channel. It extends from Laurel Way upstream to Ash St. Surrounding land use is residential and commercial.

Project Description: Remove accumulated sediment from bottom of concrete channel. Lower equipment (e.g., small loader) into channel to push material to DS end where an excavator will be placed at the top-of-bank to remove and load material.

Lat/Long: 37°52'44.29" N N 122°31'58.35" W

Channel Description: Concrete

Tidal: No

Vegetation/Habitat Types: Concrete bottom, no emergent vegetation present; predominant vegetation type on the banks is north coast riparian scrub/forest.

Geomorphic Codes: Urban/Wildlife interface, sediment aggradation at outlet

Sediment Issue Severity: Low; chronic

Chronic Sediment Issues: Hydraulic model provides triggers; goal is to remove US sediments in concrete channel rather than lower tidal earthen channel with habitat.

Dimensions of Work Area: 100 LF; 6 feet depth; 16 feet wide

Work Days: 3-4 days;

Frequency of removal: every 3 years

Equipment: Long-reach Excavator, Loader, Hauler

Equipment Location During Sediment Removal: Adjacent roadway or pull-out and in-channel and top of levee

Heavy Equipment Access and Staging: from roadway, parking lot pull-out, no veg to remove; across off-road areas

Temporary Stockpile Locations: On off-road area- no vegetation removal

Dewatering: Yes

Permits Needed: DFW 1600 RMA, RWQCB;

Potentially Occurring Special Status Species: None

Avoidance and Minimization Measures

AMM-1: Environmental Compliance Coordinator, Buffers and Work Stoppages

- Before commencement of a maintenance activity, The District shall designate an Environmental Compliance Coordinator (ECC) who will determine the appropriate AMMs, to implement during operations based on the site fact sheets.

- The ECC shall distribute a work order to maintenance staff and contractors with a list of the AMMs and BMPs applicable to each site. The work order must be completed in a timely manner to allow time for pre-construction surveys.

- The ECC shall assess field conditions at the start of each work day. If any special status species or nesting birds are observed, the ECC shall establish buffers areas, if sufficient, or stop any activity the ECC deems may result in take or destruction of habitat. Stopped work shall not be allowed to resume until appropriate corrective measures have been completed or it has been determined that nesting is complete. The ECC shall immediately report any unauthorized impacts to the appropriate trustee agency (i.e. USFWS, NMFS, USACE, and/or CDFW). The ECC shall coordinate with Maintenance Supervisors to stop any activity the ECC or agencies deems may cause take of a listed species or their habitat. Work shall not be allowed to resume until appropriate corrective measures have been completed.

- All on-site maintenance activity personnel shall receive instruction regarding the presence of listed species and the importance of avoiding impacts to these species and their habitat before the start of work.

GAMM-2: Site Preparation/Wildlife Reconnaissance

The ECC shall walk the site each day before maintenance activities commence to locate wildlife; if any special status wildlife species are noted, work will not commence until all individuals have left the work site on their own and/or it has been determined that they are not nesting within the project site.

When maintenance activities require dewatering, a qualified fisheries biologist with appropriate permits shall be on-site to move fish.

All habitat improvements on salmon and steelhead streams shall be done in accordance with techniques in the California Salmonid Stream Habitat Restoration Manual (CDFW 2010d).

GAMM-3: Work Windows

To avoid impacts to special status species, the maintenance activities carried out shall typically occur during the summer low flow season. In addition, species-specific work windows shall be

followed to avoid impacts. Table below shows the work windows for species that may be impacted by the proposed maintenance activities. Additional information can be found within the species-specific AMMS.

GAMM-4: Trash Removal

During all activities at project sites, all construction trash that may attract predators shall be properly contained, removed from the work site, and disposed of regularly. Following maintenance activities, all construction trash and maintenance debris shall be removed from work sites and disposed of properly.

GAMM-5: Equipment Staging

Staging/storage areas for equipment, materials, fuels, lubricants, and solvents, shall be located outside of the stream's high water channel and associated riparian area. Stationary equipment such as motors, pumps, generators, compressors, and welders located within the dry portion of the steam channel or adjacent to the stream, shall be positioned over drip-pans. Equipment shall be moved out of the normal high water area of the stream prior to refueling and lubricating. The ECC or Maintenance Supervisor shall ensure that contamination of habitat does not occur during such operations. Best Management Practices covering Chemical Use (Spill Prevention and Control); contained in the BASMAA Flood Control Facility Maintenance Best Management Practices Manual (BAASMA 2000) shall be followed. These BMPs are designed to prevent the discharge of chemicals to flood control channels and storm drain systems and allow prompt and effective response to any accidental spills. All workers shall be informed of the importance of preventing spills and of the appropriate measures to take should a spill occur.

The number of access routes, number and size of staging areas, and the total area of the work site activity shall be limited to the minimum necessary to complete the proposed activity.

GAMM-6: Invasive Species

The ECC shall ensure that the spread or introduction of invasive exotic plants shall be avoided to the maximum extent possible. When practicable, invasive exotic plants at the work site shall be removed.

For all activities in creeks and bay, all gear exposed to water shall be allowed to dry for three days before being used again. Some disinfectants are OK to use per DFG and USFWS (users should check with those agencies). As a precaution against invasive quagga and zebra mussels, if kayaks or any other vessels are used in maintenance activities, crew will wash and dry them off-site prior to using them in another creek or tributary.

Flood Control Zone 3 - Richardson Bay

Site: 3-COY-4
Coyote Creek

Site Description:

The site is non-tidal and includes the reaches between Ash St. and Maple Ave.

Surrounding land use is residential and commercial.

Wetlands and other Waters, including Waters of the State:

Exempt from USACE jurisdiction.

Vegetation communities:

The predominant vegetation type is north coast riparian scrub/forest.

Potentially-occurring special-status species:

None.

Avoidance and Minimization Measures:

GAMM-1 through GAMM-6.

Maintenance Activities:

Vegetation maintenance and sediment removal.

Best Management Practices:

A-43; A-67;A-69; A-73; A-109; A-113; A-117; A-141; A-151; A-157; A-161; A163; A-167; A-179; A-229; EV-1; EV-2; NR-1; NR-3; SC-1 through SC-6; SS-1 through SS-4; VDM-1 through VDM-4; VR-1; VR4b; VR-5; WD-4; WD-5.

3-COY-4: Sediment Removal from Coyote Creek Concrete Channel

Project Location: Coyote Creek between Pineo Ave. and Northern Ave., approx. 225 ft west of intersection with Maple St.

Project Description: Remove accumulated sediment from 20 ft section of earthen channel immediately US of storm drain pipe inlet leading to Coyote Creek open concrete.

Lat/Long: 37°52'48.98" N 122°32'20.35" W

Channel Description: North Fork Inlet; Open Concrete Channel

Tidal: No

Vegetation/Habitat Types: Concrete bottom, open water - no vegetation

Geomorphic Codes: Urban/Wildlife interface, Debris or vegetation obstruction

Sediment Issue Severity: Low; chronic

Chronic Sediment Issues: Upper watershed erosion on lands not owned by FC

Dimensions of Work Area: 20 LF; 6 feet depth; 16 feet wide

Work Days: 1 day

Frequency of removal: annually

Equipment: Hand removal, Hauler
Equipment Location During Sediment Removal: Adjacent roadway or pull-out

Heavy Equipment Access and Staging: from roadway, parking lot pull-out,

Temporary Stockpile Locations: On off-road area- no vegetation removal

Dewatering: No

Permits Needed: DFW 1600 RMA, RWQCB;

Potentially Occurring Special Status Species: None

Avoidance and Minimization Measures

AMM-1: Environmental Compliance Coordinator, Buffers and Work Stoppages

- Before commencement of a maintenance activity, The District shall designate an Environmental Compliance Coordinator (ECC) who will determine the appropriate AMMs, to implement during operations based on the site fact sheets.

- The ECC shall distribute a work order to maintenance staff and contractors with a list of the AMMs and BMPs applicable to each site. The work order must be completed in a timely manner to allow time for pre-construction surveys.

- The ECC shall assess field conditions at the start of each work day. If any special status species or nesting birds are observed, the ECC shall establish buffers areas, if sufficient, or stop any activity the ECC deems may result in take or destruction of habitat. Stopped work shall not be allowed to resume until appropriate corrective measures have been completed or it has been determined that nesting is complete. The ECC shall immediately report any unauthorized impacts to the appropriate trustee agency (i.e. USFWS, NMFS, USACE, and/or CDFW). The ECC shall coordinate with Maintenance Supervisors to stop any activity the ECC or agencies deems may cause take of a listed species or their habitat. Work shall not be allowed to resume until appropriate corrective measures have been completed.

- All on-site maintenance activity personnel shall receive instruction regarding the presence of listed species and the importance of avoiding impacts to these species and their habitat before the start of work.

GAMM-2: Site Preparation/Wildlife Reconnaissance

The ECC shall walk the site each day before maintenance activities commence to locate wildlife; if any special status wildlife species are noted, work will not commence until all individuals have left the work site on their own and/or it has been determined that they are not nesting within the project site.

When maintenance activities require dewatering, a qualified fisheries biologist with appropriate permits shall be on-site to move fish.

All habitat improvements on salmon and steelhead streams shall be done in accordance with techniques in the California Salmonid Stream Habitat Restoration Manual (CDFW 2010d).

GAMM-3: Work Windows

To avoid impacts to special status species, the maintenance activities carried out shall typically occur during the summer low flow season. In addition, species-specific work windows shall be

followed to avoid impacts. Table below shows the work windows for species that may be impacted by the proposed maintenance activities. Additional information can be found within the species-specific AMMS.

GAMM-4: Trash Removal

During all activities at project sites, all construction trash that may attract predators shall be properly contained, removed from the work site, and disposed of regularly. Following maintenance activities, all construction trash and maintenance debris shall be removed from work sites and disposed of properly.

GAMM-5: Equipment Staging

Staging/storage areas for equipment, materials, fuels, lubricants, and solvents, shall be located outside of the stream's high water channel and associated riparian area. Stationary equipment such as motors, pumps, generators, compressors, and welders located within the dry portion of the steam channel or adjacent to the stream, shall be positioned over drip-pans. Equipment shall be moved out of the normal high water area of the stream prior to refueling and lubricating. The ECC or Maintenance Supervisor shall ensure that contamination of habitat does not occur during such operations. Best Management Practices covering Chemical Use (Spill Prevention and Control); contained in the BASMAA Flood Control Facility Maintenance Best Management Practices Manual (BAASMA 2000) shall be followed. These BMPs are designed to prevent the discharge of chemicals to flood control channels and storm drain systems and allow prompt and effective response to any accidental spills. All workers shall be informed of the importance of preventing spills and of the appropriate measures to take should a spill occur.

The number of access routes, number and size of staging areas, and the total area of the work site activity shall be limited to the minimum necessary to complete the proposed activity.

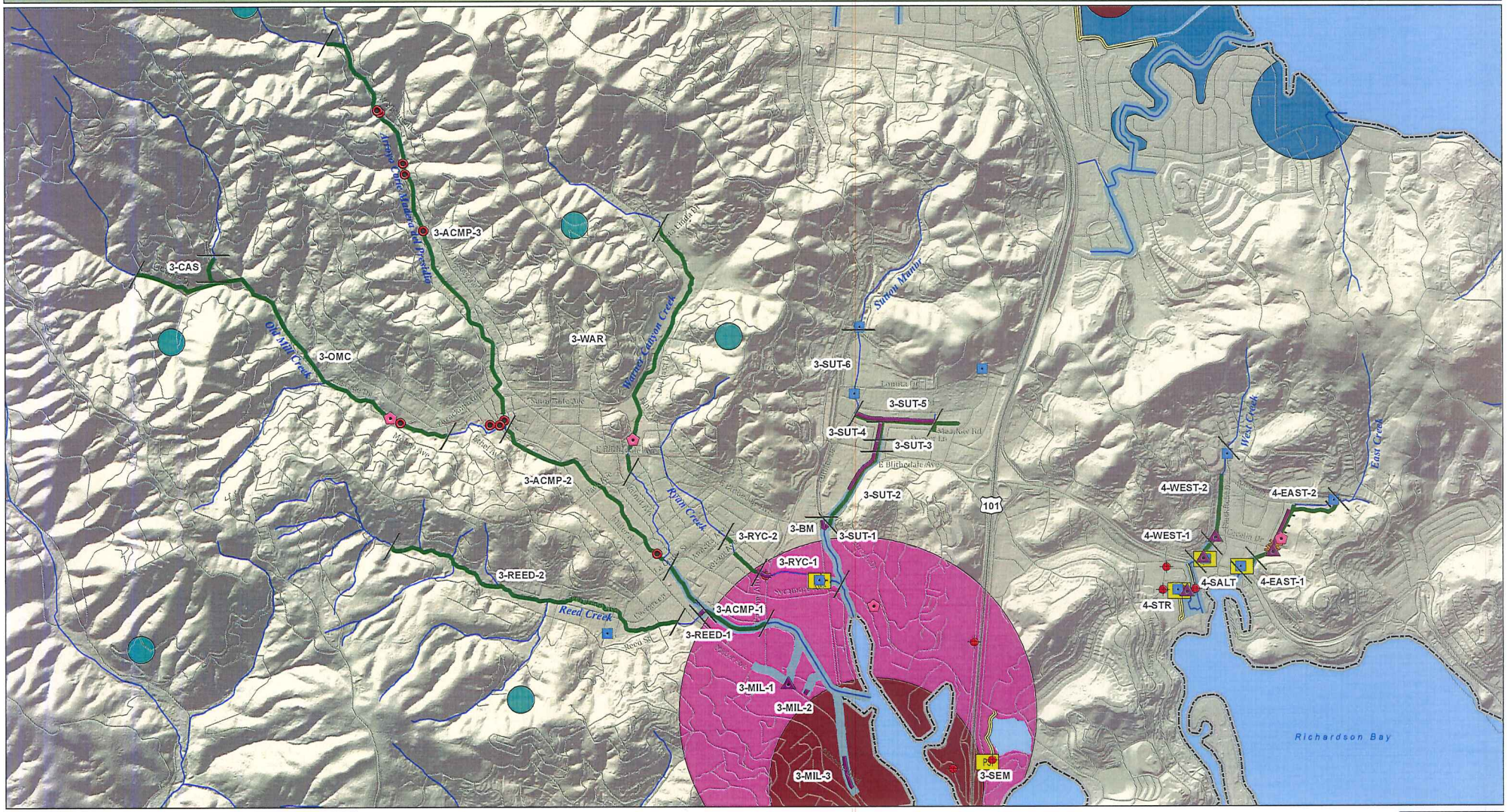
GAMM-6: Invasive Species

The ECC shall ensure that the spread or introduction of invasive exotic plants shall be avoided to the maximum extent possible. When practicable, invasive exotic plants at the work site shall be removed.

For all activities in creeks and bay, all gear exposed to water shall be allowed to dry for three days before being used again. Some disinfectants are OK to use per DFG and USFWS (users should check with those agencies). As a precaution against invasive quagga and zebra mussels, if kayaks or any other vessels are used in maintenance activities, crew will wash and dry them off-site prior to using them in another creek or tributary.

Marin County Flood Control and Water Conservation District - Stream Maintenance Program

Marin County
Flood Control and
Water Conservation District
April 2017



Map	Flood Control Zone 3 - Richardson Bay Arroyo Corte Madera del Presidio Flood Control Zone 4 - Bel Aire East and West Creeks
4	

Fish Passage Barrier
Cattail cutting
Vegetation Maintenance
Tidal Stream
Streams
Sediment Removal
Sediment Removal
Fuels Reduction
Tide\Flap Gate
PS Pump Station
Trash Rack
Site Limit
California black rail
California clapper rail
Northern spotted owl
salt-marsh harvest mouse

Restoration site
Complete
Ongoing
Proposed

1:20,000

0 0.25 0.5 1 Mi

Flood Control Zone 4 - Bel Aire and Strawberry Circle

Site: 4-EAST-2
East Creek

Site Description:

This site is a non-tidal, narrow corridor between residential subdivisions, generally running behind Leland Way and Karen Way.

Wetlands and other Waters, including Waters of the State:

Vegetation communities:

The predominant vegetation type is annual grassland behind Leland Way and north coast riparian scrub/forest behind Karen Way.

Potentially-occurring special-status species:

None.

Avoidance and Minimization Measures:

GAMM-1 through GAMM-6.

Maintenance Activities:

Fire fuel reduction, vegetation maintenance, and sediment removal.

Best Management Practices:

A-43; A-67;A-69; A-73; A-109; A-113; A-117; A-141; A-151; A-157; A-161; A163; A-167; A-179; A-229; EV-1; EV-2; NR-1; NR-3; SC-1 through SC-6; SS-1 through SS-4; VDM-1 through VDM-4; VR-1; VR4b; VR-5; WD-4; WD-5.

4-EAST-2: Sediment Removal from East Creek

Location: East of Leyland Way/Cecelia Way intersection in Tiburon, CA
FC has an easement over East Creek.
Project Description: Remove accumulated sediment from DS side of Cecilia Way crossing within road ROW. Equipment will be located on the bridge. Ditches: Remove sediment along 750 ft. section of channel as necessary. Equipment will be staged from private roadway; need to get signed Right-to-Enter agreement from HOA.
Channel Description: Modified earthen flood control engineered channel.
Tidal: No
Vegetation/Habitat Types: The predominant vegetation type is annual grassland behind Leland Way and north
coast riparian scrub/forest behind Karen Way.
Geomorphic Codes: Road crossing width
Sediment Issue Severity: Medium; fills in after a decent storm
Chronic Sediment Issues: Sediment aggradation at the culvert outlet from sediment
Dimensions of Work Area: 120 LF, 3 feet depth and 10 feet wide to clear the channel below a 5'X10' culvert.
Work Days: 1-2
Equipment: Long reach excavator and Hauler
Equipment Location During Sediment Removal: Adjacent Roadway or pull-out
Heavy Equipment Access and Staging: Across off-road area; no vegetation removal needed
Temporary Stockpile Locations: On off-road area
Dewatering: No
Permits Needed: DFW 1600 RMA, RWQCB
Potentially Occurring Special Status Species: None

Avoidance and Minimization Measures

AMM-1: Environmental Compliance Coordinator, Buffers and Work Stoppages

- Before commencement of a maintenance activity, The District shall designate an Environmental Compliance Coordinator (ECC) who will determine the appropriate AMMs, to implement during operations based on the site fact sheets.

- The ECC shall distribute a work order to maintenance staff and contractors with a list of the AMMs and BMPs applicable to each site. The work order must be completed in a timely manner to allow time for pre-construction surveys.

- The ECC shall assess field conditions at the start of each work day. If any special status species or nesting birds are observed, the ECC shall establish buffers areas, if sufficient, or stop any activity the ECC deems may result in take or destruction of habitat. Stopped work shall not be allowed to resume until appropriate corrective measures have been completed or it has been determined that nesting is complete. The ECC shall immediately report any unauthorized impacts to the appropriate trustee agency (i.e. USFWS, NMFS, USACE, and/or CDFW). The ECC shall coordinate with Maintenance Supervisors to stop any activity the ECC or agencies deems may cause take of a listed species or their habitat. Work shall not be allowed to resume until appropriate corrective measures have been completed.

- All on-site maintenance activity personnel shall receive instruction regarding the presence of listed species and the importance of avoiding impacts to these species and their habitat before the start of work.

GAMM-2: Site Preparation/Wildlife Reconnaissance

The ECC shall walk the site each day before maintenance activities commence to locate wildlife; if any special status wildlife species are noted, work will not commence until all individuals have left the work site on their own and/or it has been determined that they are not nesting within the project site.

When maintenance activities require dewatering, a qualified fisheries biologist with appropriate permits shall be on-site to move fish.

All habitat improvements on salmon and steelhead streams shall be done in accordance with techniques in the California Salmonid Stream Habitat Restoration Manual (CDFW 2010d).

GAMM-3: Work Windows

To avoid impacts to special status species, the maintenance activities carried out shall typically occur during the summer low flow season. In addition, species-specific work windows shall be followed to avoid impacts. Table below shows the work windows for species that may be impacted by the proposed maintenance activities. Additional information can be found within the species-specific AMMS.

GAMM-4: Trash Removal

During all activities at project sites, all construction trash that may attract predators shall be properly contained, removed from the work site, and disposed of regularly. Following maintenance activities, all construction trash and maintenance debris shall be removed from work sites and disposed of properly.

GAMM-5: Equipment Staging

Staging/storage areas for equipment, materials, fuels, lubricants, and solvents, shall be located outside of the stream's high water channel and associated riparian area. Stationary equipment such as motors, pumps, generators, compressors, and welders located within the dry portion of the steam channel or adjacent to the stream, shall be positioned over drip-pans. Equipment shall be moved out of the normal high water area of the stream prior to refueling and lubricating. The ECC or Maintenance Supervisor shall ensure that contamination of habitat does not occur during such operations. Best Management Practices covering Chemical Use (Spill Prevention and Control); contained in the BASMAA Flood Control Facility Maintenance Best Management Practices Manual (BAASMA 2000) shall be followed. These BMPs are designed to prevent the discharge of chemicals to flood control channels and storm drain systems and allow prompt and effective response to any accidental spills. All workers shall be informed of the importance of preventing spills and of the appropriate measures to take should a spill occur.

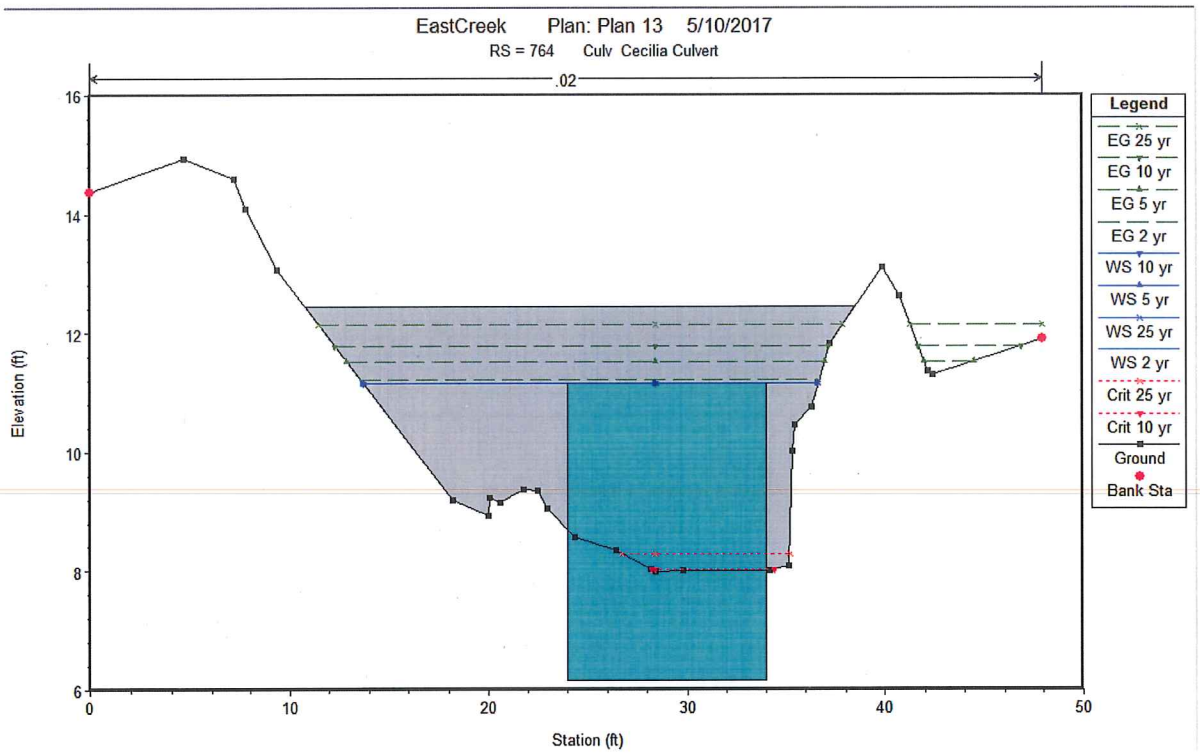
The number of access routes, number and size of staging areas, and the total area of the work site activity shall be limited to the minimum necessary to complete the proposed activity.

GAMM-6: Invasive Species

The ECC shall ensure that the spread or introduction of invasive exotic plants shall be avoided to the maximum extent possible. When practicable, invasive exotic plants at the work site shall be removed.

For all activities in creeks and bay, all gear exposed to water shall be allowed to dry for three days before being used again. Some disinfectants are OK to use per DFG and USFWS (users should check with those agencies). As a precaution against invasive quagga and zebra mussels, if kayaks or any other vessels are used in maintenance activities, crew will wash and dry them off-site prior to using them in another creek or tributary.

4-EAST-2: Sediment removal and clearing of cattails to establish a low flow channel downstream of Cecelia Way culvert along East Creek. In 2017, a survy of the site was conducted by a licensed land surveyor. This survey data was used in a HEC-RAAS model, and the cutler was occluded by approximately 45%



Flood Control Zone 4 - Bel Aire and Strawberry Circle

Site: 4-WEST-2
West Creek

Site Description:

The site is above the extent of tidal influence and is a narrow riparian corridor running between residential backyards.

The predominant land use is residential.

Wetlands and other Waters, including Waters of the State:

Exempt from USACE jurisdiction.

Vegetation communities:

The predominant vegetation type is north coast riparian scrub/forest. Many native species have been planted as mitigation, including spicebush, blue elderberry, and redwood trees.

Potentially-occurring special-status species:

None.

Avoidance and Minimization Measures:

GAMM-1 through GAMM-6.

Maintenance Activities:

Vegetation maintenance and sediment removal.

Best Management Practices:

A-43; A-67;A-69; A-73; A-109; A-113; A-117; A-141; A-151; A-157; A-161; A163; A-167; A-179; A-229; EV-1; EV-2; NR-1; NR-3; SC-1 through SC-6; SS-1 through SS-4; VDM-1 through VDM-4; VR-1; VR4b; VR-5; WD-4; WD-5.

4-WEST-2: Sediment Removal from West Creek

Location: West Creek DS of Cecilia Way.
Project Description: Remove accumulated sediment from DS side of Cecilia Way crossing within road ROW. Long reach excavator will be located on the bridge.
Channel Description: Modified earthen flood control engineered channel.
Tidal: No
Vegetation/Habitat Types: Ruderal non-natives;
Geomorphic Codes: Reduction in channel gradient
Sediment Issue Severity: Medium; fills in after a decent storm
Chronic Sediment Issues: Sediment aggradation at the culvert outlet from sediment
Dimensions of Work Area: 10 LF, 4 feet depth and 6 feet wide
Work Days: 1
Frequency: every 3years
Equipment: Long reach excavator, Wheeled Front End Loader, Hauler
Equipment Location During Sediment Removal: Adjacent roadway or pull-out; Bridge
Heavy Equipment Access and Staging: From roadway, parking lot, or pull-outs - no veg to remove
Temporary Stockpile Locations: On off-road area
Dewatering: No
Permits Needed: DFW 1600 RMA, RWQCB
Potentially Occurring Special Status Species: None

Avoidance and Minimization Measures

AMM-1: Environmental Compliance Coordinator, Buffers and Work Stoppages

- Before commencement of a maintenance activity, The District shall designate an Environmental Compliance Coordinator (ECC) who will determine the appropriate AMMs, to implement during operations based on the site fact sheets.

- The ECC shall distribute a work order to maintenance staff and contractors with a list of the AMMs and BMPs applicable to each site. The work order must be completed in a timely manner to allow time for pre-construction surveys.

- The ECC shall assess field conditions at the start of each work day. If any special status species or nesting birds are observed, the ECC shall establish buffers areas, if sufficient, or stop any activity the ECC deems may result in take or destruction of habitat. Stopped work shall not be allowed to resume until appropriate corrective measures have been completed or it has been determined that nesting is complete. The ECC shall immediately report any unauthorized impacts to the appropriate trustee agency (i.e. USFWS, NMFS, USACE, and/or CDFW). The ECC shall coordinate with Maintenance Supervisors to stop any activity the ECC or agencies deems may cause take of a listed species or their habitat. Work shall not be allowed to resume until appropriate corrective measures have been completed.

- All on-site maintenance activity personnel shall receive instruction regarding the presence of listed species and the importance of avoiding impacts to these species and their habitat before the start of work.

GAMM-2: Site Preparation/Wildlife Reconnaissance

The ECC shall walk the site each day before maintenance activities commence to locate wildlife; if any special status wildlife species are noted, work will not commence until all individuals have left the work site on their own and/or it has been determined that they are not nesting within the project site.

When maintenance activities require dewatering, a qualified fisheries biologist with appropriate permits shall be on-site to move fish.

All habitat improvements on salmon and steelhead streams shall be done in accordance with techniques in the California Salmonid Stream Habitat Restoration Manual (CDFW 2010d).

GAMM-3: Work Windows

To avoid impacts to special status species, the maintenance activities carried out shall typically occur during the summer low flow season. In addition, species-specific work windows shall be followed to avoid impacts. Table below shows the work windows for species that may be impacted by the proposed maintenance activities. Additional information can be found within the species-specific AMMS.

GAMM-4: Trash Removal

During all activities at project sites, all construction trash that may attract predators shall be properly contained, removed from the work site, and disposed of regularly. Following maintenance activities, all construction trash and maintenance debris shall be removed from work sites and disposed of properly.

GAMM-5: Equipment Staging

Staging/storage areas for equipment, materials, fuels, lubricants, and solvents, shall be located outside of the stream's high water channel and associated riparian area. Stationary equipment such as motors, pumps, generators, compressors, and welders located within the dry portion of the steam channel or adjacent to the stream, shall be positioned over drip-pans. Equipment shall be moved out of the normal high water area of the stream prior to refueling and lubricating. The ECC or Maintenance Supervisor shall ensure that contamination of habitat does not occur during such operations. Best Management Practices covering Chemical Use (Spill Prevention and Control); contained in the BASMAA Flood Control Facility Maintenance Best Management Practices Manual (BAASMA 2000) shall be followed. These BMPs are designed to prevent the discharge of chemicals to flood control channels and storm drain systems and allow prompt and effective response to any accidental spills. All workers shall be informed of the importance of preventing spills and of the appropriate measures to take should a spill occur.

The number of access routes, number and size of staging areas, and the total area of the work site activity shall be limited to the minimum necessary to complete the proposed activity.

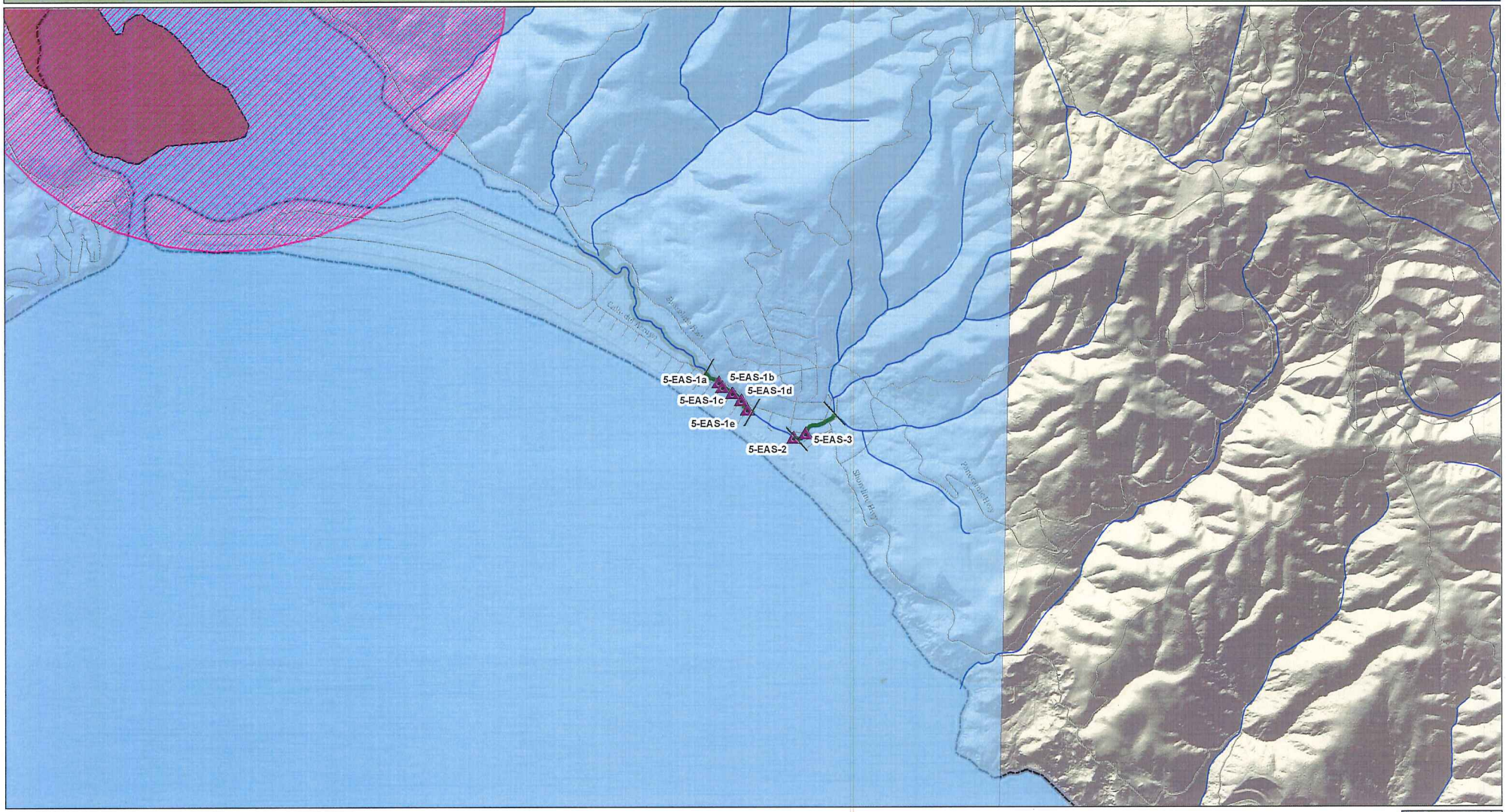
GAMM-6: Invasive Species

The ECC shall ensure that the spread or introduction of invasive exotic plants shall be avoided to the maximum extent possible. When practicable, invasive exotic plants at the work site shall be removed.

For all activities in creeks and bay, all gear exposed to water shall be allowed to dry for three days before being used again. Some disinfectants are OK to use per DFG and USFWS (users should check with those agencies). As a precaution against invasive quagga and zebra mussels, if kayaks or any other vessels are used in maintenance activities, crew will wash and dry them off-site prior to using them in another creek or tributary.

Marin County Flood Control and Water Conservation District - Stream Maintenance Program

Marin County
Flood Control and
Water Conservation District
April 2017



Map	Flood Control Zone 5 - Stinson Beach Easkoot Creek
10	

Fish Passage Barrier
Vegetation Maintenance
Tidal Stream
Streams
Sediment Removal
Sediment Removal
Site Limit
California black rail
California clapper rail
Monarch butterfly

1:20,000

0 0.25 0.5 1 Mi

Flood Control Zone 5 - Stinson Beach

Site: 5-EAS-2
Easkoot Creek

Site Description:

The site is a n off-channel sediment basin which is non-tidal. The site is adjacent to a parking lot on National Park Service land, behind the Parkside Cafe.

Surrounding land use is recreational and commercial.

Wetlands and other Waters, including Waters of the State:

Subject to USACE jurisdiction ???

Vegetation communities:

The dominant vegetation type is north coast riparian scrub/forest, with dominant tree species include bays, buckeyes, willows and a few alders. Shrubs include Himalayan blackberry, cape ivy, broom and pampas grass.

Potentially-occurring special-status species:

Point Reyes bird's beak, coho salmon and steelhead trout, California red-legged frog, California black rail, California clapper rail, and monarch butterfly.

Avoidance and Minimization Measures:

GAMM-1 through GAMM-6, PLA-1, FISH-1, INV-1, AMPH-1, BIRD-1.

Maintenance Activities:

Vegetation maintenance and sediment removal.

Best Management Practices:

A-43; A-67;A-69; A-73; A-109; A-113; A-117; A-141; A-151; A-157; A-161; A163; A-167; A-179; A-229; EV-1; EV-2; NR-1; NR-3; SC-1 through SC-6; SS-1 through SS-4; VDM-1 through VDM-4; VR-1; VR4b; VR-5; WD-4; WD-5.

5-EAS-2-Sediment Removal Easkoot Creek at Constructed Sediment Trap

Project Description: Remove accumulated sediment from the sediment trap constructed in order to detain sediment from traveling downstream from landslides on NPS lands; causing flooding during high winter storms

Project Location: Easkoot Creek; Calle del Pradero intersection with Shoreline Highway.

Lat/Long: 37°53'54.06" N.19" N ; 122°38'27".30 W

Channel Description: Engineered flood control channel with earthen channel

Tidal: No

Vegetation/Habitat Types: Riparian on upper banks;

Geomorphic Codes: Sediment aggradation at constructed flood control trap

Sediment Issue Severity: High;

Chronic Sediment Issues: Low gradient stream with heavy sediment input from landslides on NPS lands in the upper watershed. Sediment aggradation in this system used to be more chronic until County Flood Control built the off-channel sediment trap upstream; now frequency of sediment removal in Easkoot Creek downstream is much less frequent.

Dimensions of Work Area: 20 ft. up and downstream plus 10 ft. under bridge; 25 feet wide

Work Days: 1 day;

Equipment: Long-reach excavator, hauler

Equipment Location During Sediment Removal: Top of bank; access ramp from parking lot

Heavy Equipment Access and Staging: NPS parking lot

Temporary Stockpile Locations: No temporary stockpiling; material hauled off immediately

Dewatering: No

Permits Needed: DFW 1600 RMA, RWQCB;

Potentially Occurring Special Status Species: Steelhead; California Red-legged Frog

Avoidance and Minimization Measures

AMM-1: Environmental Compliance Coordinator, Buffers and Work Stoppages

- Before commencement of a maintenance activity, The District shall designate an Environmental Compliance Coordinator (ECC) who will determine the appropriate AMMs, to implement during operations based on the site fact sheets.

- The ECC shall distribute a work order to maintenance staff and contractors with a list of the AMMs and BMPs applicable to each site. The work order must be completed in a timely manner to allow time for pre-construction surveys.

- The ECC shall assess field conditions at the start of each work day. If any special status species or nesting birds are observed, the ECC shall establish buffers areas, if sufficient, or stop any activity the ECC deems may result in take or destruction of habitat. Stopped work shall not be allowed to resume until appropriate corrective measures have been completed or it has been determined that nesting is complete. The ECC shall immediately report any unauthorized impacts to the appropriate trustee agency (i.e. USFWS, NMFS, USACE, and/or CDFW). The ECC shall coordinate with Maintenance Supervisors to stop any activity the ECC or agencies deems may cause take of a listed species or their habitat. Work shall not be allowed to resume until appropriate corrective measures have been completed.

- All on-site maintenance activity personnel shall receive instruction regarding the presence of listed species and the importance of avoiding impacts to these species and their habitat before the start of work.

GAMM-2: Site Preparation/Wildlife Reconnaissance

The ECC shall walk the site each day before maintenance activities commence to locate wildlife; if any special status wildlife species are noted, work will not commence until all individuals have left the work site on their own and/or it has been determined that they are not nesting within the project site.

When maintenance activities require dewatering, a qualified fisheries biologist with appropriate permits shall be on-site to move fish.

All habitat improvements on salmon and steelhead streams shall be done in accordance with techniques in the California Salmonid Stream Habitat Restoration Manual (CDFW 2010d).

GAMM-3: Work Windows

To avoid impacts to special status species, the maintenance activities carried out shall typically occur during the summer low flow season. In addition, species-specific work windows shall be

followed to avoid impacts. Table below shows the work windows for species that may be impacted by the proposed maintenance activities. Additional information can be found within the species-specific AMMS.

GAMM-4: Trash Removal

During all activities at project sites, all construction trash that may attract predators shall be properly contained, removed from the work site, and disposed of regularly. Following maintenance activities, all construction trash and maintenance debris shall be removed from work sites and disposed of properly.

GAMM-5: Equipment Staging

Staging/storage areas for equipment, materials, fuels, lubricants, and solvents, shall be located outside of the stream's high water channel and associated riparian area. Stationary equipment such as motors, pumps, generators, compressors, and welders located within the dry portion of the steam channel or adjacent to the stream, shall be positioned over drip-pans. Equipment shall be moved out of the normal high water area of the stream prior to refueling and lubricating. The ECC or Maintenance Supervisor shall ensure that contamination of habitat does not occur during such operations. Best Management Practices covering Chemical Use (Spill Prevention and Control); contained in the BASMAA Flood Control Facility Maintenance Best Management Practices Manual (BAASMA 2000) shall be followed. These BMPs are designed to prevent the discharge of chemicals to flood control channels and storm drain systems and allow prompt and effective response to any accidental spills. All workers shall be informed of the importance of preventing spills and of the appropriate measures to take should a spill occur.

The number of access routes, number and size of staging areas, and the total area of the work site activity shall be limited to the minimum necessary to complete the proposed activity.

GAMM-6: Invasive Species

The ECC shall ensure that the spread or introduction of invasive exotic plants shall be avoided to the maximum extent possible. When practicable, invasive exotic plants at the work site shall be removed.

For all activities in creeks and bay, all gear exposed to water shall be allowed to dry for three days before being used again. Some disinfectants are OK to use per DFG and USFWS (users should check with those agencies). As a precaution against invasive quagga and zebra mussels, if kayaks or any other vessels are used in maintenance activities, crew will wash and dry them off-site prior to using them in another creek or tributary.

AMMs per Special Status Species

1.1 Avoidance and Minimization Measures for Fish

The AMM described below is designed to protect fishery resources. Coho may potentially be found in Easkoot Creek in West Marin, although they aren't known to be breeding there. Steelhead trout are known to occur within Novato Creek, Ross Valley, Miller Creek and Richardson Bay, and these measures will also protect other fish species such as Chinook salmon, sturgeon, lampreys, and Sacramento splittail.

FISH-1: Salmonids

If steelhead and/or coho salmon are known to be absent from the project site based on CEMAR/CDFW surveys and there are long-standing natural or artificial downstream barriers sufficient to prevent upstream migration, then avoidance has been accomplished and no further actions are necessary.

If Coho salmon are observed in the project area during winter months or during pre-construction fish capture and relocation activities, all project activities shall cease and DFW and NMFS shall immediately be notified.

If steelhead are determined or presumed to be present in the project site, then the following Avoidance and Minimization Measures shall be implemented:

- All in-stream maintenance activities will be restricted to the low-flow period of June 15th through October 15th. Work above the top of bank or outside of the channel will not be subject to this modified work period.

- To minimize turbidity and stress to special status species, personnel shall avoid walking through stream pools and the thalweg of the channel, and shall instead walk across riffles or outside of the stream bed to access a project site.

- No equipment is to be operated from within the active stream channel unless the stream has been dewatered and fish have been relocated by a qualified and permitted biologist.

- If anadromous salmonids are present, a fisheries biologist with appropriate licenses and equipment (buckets, aerators, etc.) must be on-site to catch and move fish downstream as dewatering proceeds.

- Captured fish shall be handled with extreme care and kept in water to the maximum extent possible during relocation activities. All captured fish shall be kept in cool, shaded, aerated water protected from excessive noise, jostling, or overcrowding any time they are not in the stream and fish shall not be removed from this water except when released. To avoid predation, the biologist shall have at least two containers and segregate young-of-year fish from larger age-classes and other potential aquatic

predators. Captured salmonids will be relocated, as soon as possible, to a suitable instream location in which habitat condition are present to allow for adequate survival of transported fish and fish already present. Cofferdams used to divert water shall be constructed with clean river gravel or sand bags and sealed with sheet plastic.

- If any salmonids are found dead or injured, the biologist shall contact NMFS biologist Rick Rogers by phone immediately at (707) 578-8552 or the NMFS North Central Coast Office at (707) 575-6050. The purpose of the contact is to review the activities resulting in take and to determine if additional' protective measures are required. All salmonid mortalities shall be retained, placed in an appropriately-sized sealable plastic bag, labeled with the date and location of collection, fork length measured, and frozen as soon as possible. Frozen samples shall be retained by the biologist until specific instructions are provided by NMFS. The biologist may not transfer biological samples to anyone other than the NMFS North Central Coast Office without obtaining prior written approval from the North Central Coast Office, Supervisor of the Protected Resources Division. Any such transfer will be subject to such conditions as NMFS deems appropriate.

- Intakes and outlets shall be designed to minimize turbidity and the potential to wash contaminants into the stream.

- If a work site is to be temporarily dewatered by pumping, intakes shall be completely screened with wire mesh not larger than 5 millimeters to prevent amphibians from entering the pump system. On salmonid streams, the intake pipe shall be fitted with fish screens meeting CDFW and NOAA Fisheries' criteria to prevent entrainment or impingement of small fish (National Marine Fisheries Service 1997: http://swr.nmfs.noaa.gov/hcdlfishscm.pdf).

- A filtration/settling system must be included to reduce downstream turbidity (i.e. filter fabric, turbidity curtain). The selection of an appropriate system is based on the rate of discharge. If feasible, water that is pumped into a pipe shall discharge onto the top of bank into a densely vegetated area, which may require extra hose length.

- Once the project work is complete, water shall be slowly released back into the work area to prevent erosion and increased turbidity.

- The channel and soil surface shall be restored to its original or design configuration after the work is complete. Any material added to the channel or basin to provide support for the work approved under this provision shall be removed unless required for erosion control or habitat enhancement and/or restoration.

- For minor actions where the disturbance to construct cofferdams to isolate the work site would be greater than that which would occur in completing the proposed action, measures will be put in place immediately downstream of the work site to capture suspended sediment. This may include installation of silt catchment fences across the drainage or placement of a straw wattle or filter berm of clean river gravel. Silt fences

and other non-native materials will be removed from the stream following completion of the activity. Gravel berms may be left in place after breaching, provided they do not impede the stream flow.

1.2 Avoidance and Minimization Measures for Amphibians

AMPH-1: California Red-legged Frog (CRLF)

CRLF absence is presumed for all project sites in eastern Marin. Therefore, impacts are avoided, and no further surveys, studies or CRLF protection measures are required and the maintenance activities can proceed.

For the Easkoot Creek sites, 5-EAS-1, 5-EAS-2 and 5-EAS-3, where there is potential for California red-legged frog to occur, pre-construction aquatic surveys should be conducted by a qualified biologist prior to the onset of any disturbance related activities, following the protocol outlined in the Revised Guidelines on Site Assessments and Field Surveys for the California Red-legged Frog (USFWS 2005):

- At least 15 days prior to the onset of activities, the applicant or project proponent shall submit the name(s) and credentials of biologists who would conduct activities specified in the following measures. No project activities shall begin until proponents have received written approval from the Service that the biologist(s) is qualified to conduct the work.

- A Service-approved biologist shall survey the work site two weeks before the onset of activities. If California red-legged frogs, tadpoles, or eggs are found, the approved biologist shall contact the Service to determine if moving any of these life-stages is appropriate. In making this determination the Service shall consider if an appropriate relocation site exists. If the Service approves moving animals, the approved biologist shall be allowed sufficient time to move California red-legged frogs from the work site before work activities begin. Only Service-approved biologists shall participate in activities associated with the capture, handling, and monitoring of California red-legged frogs.

- Before any construction activities begin on a project, a Service-approved biologist shall conduct a training session for all construction personnel. At a minimum, the training shall include a description of the California red-legged frog and its habitat, the importance of the California red-legged frog and its habitat, the general measures that are being implemented to conserve the California red-legged frog as they relate to the project, and the boundaries within which the project may be accomplished. Brochures, books and briefings may be used in the training session provided that a qualified person is on hand to answer any questions.

- A Service-approved biologist shall be present at the work site until such time as all removal of California red-legged frogs, instruction of workers, and habitat disturbance have been completed. After this time, the contractor or permittee shall designate a person to monitor on-site compliance with all minimization measures. The Service-approved biologist shall ensure that this individual receives training outlined above in measure 3 and in the identification of California red-legged frogs. The monitor and the Service- approved biologist shall have the authority to halt any action that might result in impacts that exceed the levels anticipated by the Corps and Service during review of the proposed action. If work is stopped. The Corps and Service shall be notified immediately by the Service-approved biologist or on-site biological monitor.

- Pre-construction surveys should consist of two separate daytime and nighttime surveys extending 300 ft. upstream and downstream (where feasible) of the proposed work sites. If special-status species are found, CDFG and/or USFWS should be contacted to determine what actions are to be taken. The 2005 Guidance recommends a total of up to eight (8) surveys to determine the presence of CRLF at or near a project site. Two (2) day surveys and four (4) night surveys are recommended during the breeding season; one (1) day and one (1) night survey is recommended during the non-breeding season. Each survey must take place at least seven (7) days apart. At least one survey must be conducted prior to August 15th. The survey period must be over a minimum period of 6 weeks (i.e., the time between the first and last survey must be at least 6 weeks). Throughout the species' range, the non-breeding season is defined as between July 1st and September 30th.

- If a maintenance activity site is to be temporarily dewatered by pumping, intakes shall be completely screened with wire mesh no larger than five millimeters to prevent CRLF from entering the pump system.

Flood Control Zone 5 - Stinson Beach

Site: 5-EAS-1 (a-e)
Easkoot Creek

Site Description:

The site is tidally-influenced and generally parallels Highway 1 between Calle del Ribera and Calle de Pinos.

Surrounding land use is residential.

Wetlands and other Waters, including Waters of the State:

Subject to USACE jurisdiction.

Vegetation communities:

Even though there is tidal influence, the dominant vegetation type is north coast riparian scrub/forest, with dominant tree species include bays, buckeyes, willows and a few alders. Shrubs include Himalayan blackberry, cape ivy, broom and pampas grass.

Potentially-occurring special-status species:

Point Reyes bird's beak, coho salmon and steelhead trout, California red-legged frog, California black rail, and California clapper rail, and monarch butterfly.

Avoidance and Minimization Measures:

GAMM-1 through GAMM-6, PLA-1, FISH-1, INV-1, AMPH-1, BIRD-1.

Maintenance Activities:

Vegetation maintenance and sediment removal.

Best Management Practices:

A-43; A-67;A-69; A-73; A-109; A-113; A-117; A-141; A-151; A-157; A-161; A163; A-167; A-179; A-229; EV-1; EV-2; NR-1; NR-3; SC-1 through SC-6; SS-1 through SS-4; VDM-1 through VDM-4; VR-1; VR4b; VR-5; WD-4; WD-5.

5-EAS-1d-Sediment Removal Easkoot Creek at Calle del Pradero; Stinson Beach

Project Description: Remove accumulated sediment between 20 ft US and 20 ft DS of bridge crossing and 10 ft. beneath bridge. Work performed from top of bank using logn reach excavator.

Project Location: Easkoot Creek; Calle del Pradero intersection with Shoreline Highway.

Lat/Long: 37°53'57.80" N .19" N ; 122°38'35.21" W

Channel Description: Engineered flood control channel with earthen channel

Tidal: Yes

Vegetation/Habitat Types: Riparian

Geomorphic Codes: Debris or vegetation obstruction, sediment aggradation at bridge

Sediment Issue Severity: Low;

Chronic Sediment Issues: Low gradient stream with heavy sediment input from landslide son NPS lands in the upper watershed. Used to be more chronic until County Flood Control built the off-channel sediment trap upstream; now frequency of sediment removal is much less (see attached monitoring report).

Dimensions of Work Area: 20 ft. up and downstream plus 10 ft. under bridge; 25 feet wide

Work Days: 1 day;

Equipment: Long-reach excavator, hauler

Equipment Location During Sediment Removal: Top of levee

Heavy Equipment Access and Staging: across-off road area no veg to remove

Temporary Stockpile Locations: On off-road area- no vegetation removal

Dewatering: Yes

Permits Needed: DFW 1600 RMA, RWQCB;

Potentially Occurring Special Status Species: Steelhead; California Red-legged Frog

Avoidance and Minimization Measures

AMM-1: Environmental Compliance Coordinator, Buffers and Work Stoppages

- Before commencement of a maintenance activity, The District shall designate an Environmental Compliance Coordinator (ECC) who will determine the appropriate AMMs, to implement during operations based on the site fact sheets.

- The ECC shall distribute a work order to maintenance staff and contractors with a list of the AMMs and BMPs applicable to each site. The work order must be completed in a timely manner to allow time for pre-construction surveys.

- The ECC shall assess field conditions at the start of each work day. If any special status species or nesting birds are observed, the ECC shall establish buffers areas, if sufficient, or stop any activity the ECC deems may result in take or destruction of habitat. Stopped work shall not be allowed to resume until appropriate corrective measures have been completed or it has been determined that nesting is complete. The ECC shall immediately report any unauthorized impacts to the appropriate trustee agency (i.e. USFWS, NMFS, USACE, and/or CDFW). The ECC shall coordinate with Maintenance Supervisors to stop any activity the ECC or agencies deems may cause take of a listed species or their habitat. Work shall not be allowed to resume until appropriate corrective measures have been completed.

- All on-site maintenance activity personnel shall receive instruction regarding the presence of listed species and the importance of avoiding impacts to these species and their habitat before the start of work.

GAMM-2: Site Preparation/Wildlife Reconnaissance

The ECC shall walk the site each day before maintenance activities commence to locate wildlife; if any special status wildlife species are noted, work will not commence until all individuals have left the work site on their own and/or it has been determined that they are not nesting within the project site.

When maintenance activities require dewatering, a qualified fisheries biologist with appropriate permits shall be on-site to move fish.

All habitat improvements on salmon and steelhead streams shall be done in accordance with techniques in the California Salmonid Stream Habitat Restoration Manual (CDFW 2010d).

GAMM-3: Work Windows

To avoid impacts to special status species, the maintenance activities carried out shall typically occur during the summer low flow season. In addition, species-specific work windows shall be

followed to avoid impacts. Table below shows the work windows for species that may be impacted by the proposed maintenance activities. Additional information can be found within the species-specific AMMS.

GAMM-4: Trash Removal

During all activities at project sites, all construction trash that may attract predators shall be properly contained, removed from the work site, and disposed of regularly. Following maintenance activities, all construction trash and maintenance debris shall be removed from work sites and disposed of properly.

GAMM-5: Equipment Staging

Staging/storage areas for equipment, materials, fuels, lubricants, and solvents, shall be located outside of the stream's high water channel and associated riparian area. Stationary equipment such as motors, pumps, generators, compressors, and welders located within the dry portion of the steam channel or adjacent to the stream, shall be positioned over drip-pans. Equipment shall be moved out of the normal high water area of the stream prior to refueling and lubricating. The ECC or Maintenance Supervisor shall ensure that contamination of habitat does not occur during such operations. Best Management Practices covering Chemical Use (Spill Prevention and Control); contained in the BASMAA Flood Control Facility Maintenance Best Management Practices Manual (BAASMA 2000) shall be followed. These BMPs are designed to prevent the discharge of chemicals to flood control channels and storm drain systems and allow prompt and effective response to any accidental spills. All workers shall be informed of the importance of preventing spills and of the appropriate measures to take should a spill occur.

The number of access routes, number and size of staging areas, and the total area of the work site activity shall be limited to the minimum necessary to complete the proposed activity.

GAMM-6: Invasive Species

The ECC shall ensure that the spread or introduction of invasive exotic plants shall be avoided to the maximum extent possible. When practicable, invasive exotic plants at the work site shall be removed.

For all activities in creeks and bay, all gear exposed to water shall be allowed to dry for three days before being used again. Some disinfectants are OK to use per DFG and USFWS (users should check with those agencies). As a precaution against invasive quagga and zebra mussels, if kayaks or any other vessels are used in maintenance activities, crew will wash and dry them off-site prior to using them in another creek or tributary.

AMMs per Special Status Species

1.1 Avoidance and Minimization Measures for Fish

The AMM described below is designed to protect fishery resources. Coho may potentially be found in Easkoot Creek in West Marin, although they aren't known to be breeding there. Steelhead trout are known to occur within Novato Creek, Ross Valley, Miller Creek and Richardson Bay, and these measures will also protect other fish species such as Chinook salmon, sturgeon, lampreys, and Sacramento splittail.

FISH-1: Salmonids

If steelhead and/or coho salmon are known to be absent from the project site based on CEMAR/CDFW surveys and there are long-standing natural or artificial downstream barriers sufficient to prevent upstream migration, then avoidance has been accomplished and no further actions are necessary.

If Coho salmon are observed in the project area during winter months or during pre-construction fish capture and relocation activities, all project activities shall cease and DFW and NMFS shall immediately be notified.

If steelhead are determined or presumed to be present in the project site, then the following Avoidance and Minimization Measures shall be implemented:

- All in-stream maintenance activities will be restricted to the low-flow period of June 15th through October 15th. Work above the top of bank or outside of the channel will not be subject to this modified work period.

- To minimize turbidity and stress to special status species, personnel shall avoid walking through stream pools and the thalweg of the channel, and shall instead walk across riffles or outside of the stream bed to access a project site.

- No equipment is to be operated from within the active stream channel unless the stream has been dewatered and fish have been relocated by a qualified and permitted biologist.

- If anadromous salmonids are present, a fisheries biologist with appropriate licenses and equipment (buckets, aerators, etc.) must be on-site to catch and move fish downstream as dewatering proceeds.

- Captured fish shall be handled with extreme care and kept in water to the maximum extent possible during relocation activities. All captured fish shall be kept in cool, shaded, aerated water protected from excessive noise, jostling, or overcrowding any time they are not in the stream and fish shall not be removed from this water except when released. To avoid predation, the biologist shall have at least two containers and segregate young-of-year fish from larger age-classes and other potential aquatic

predators. Captured salmonids will be relocated, as soon as possible, to a suitable instream location in which habitat condition are present to allow for adequate survival of transported fish and fish already present. Cofferdams used to divert water shall be constructed with clean river gravel or sand bags and sealed with sheet plastic.

- If any salmonids are found dead or injured, the biologist shall contact NMFS biologist Rick Rogers by phone immediately at (707) 578-8552 or the NMFS North Central Coast Office at (707) 575-6050. The purpose of the contact is to review the activities resulting in take and to determine if additional' protective measures are required. All salmonid mortalities shall be retained, placed in an appropriately-sized sealable plastic bag, labeled with the date and location of collection, fork length measured, and frozen as soon as possible. Frozen samples shall be retained by the biologist until specific instructions are provided by NMFS. The biologist may not transfer biological samples to anyone other than the NMFS North Central Coast Office without obtaining prior written approval from the North Central Coast Office, Supervisor of the Protected Resources Division. Any such transfer will be subject to such conditions as NMFS deems appropriate.

- Intakes and outlets shall be designed to minimize turbidity and the potential to wash contaminants into the stream.

- If a work site is to be temporarily dewatered by pumping, intakes shall be completely screened with wire mesh not larger than 5 millimeters to prevent amphibians from entering the pump system. On salmonid streams, the intake pipe shall be fitted with fish screens meeting CDFW and NOAA Fisheries' criteria to prevent entrainment or impingement of small fish (National Marine Fisheries Service 1997: http://swr.nmfs.noaa.gov/hcdlfishscm.pdf).

- A filtration/settling system must be included to reduce downstream turbidity (i.e. filter fabric, turbidity curtain). The selection of an appropriate system is based on the rate of discharge. If feasible, water that is pumped into a pipe shall discharge onto the top of bank into a densely vegetated area, which may require extra hose length.

- Once the project work is complete, water shall be slowly released back into the work area to prevent erosion and increased turbidity.

- The channel and soil surface shall be restored to its original or design configuration after the work is complete. Any material added to the channel or basin to provide support for the work approved under this provision shall be removed unless required for erosion control or habitat enhancement and/or restoration.

- For minor actions where the disturbance to construct cofferdams to isolate the work site would be greater than that which would occur in completing the proposed action, measures will be put in place immediately downstream of the work site to capture suspended sediment. This may include installation of silt catchment fences across the drainage or placement of a straw wattle or filter berm of clean river gravel. Silt fences

and other non-native materials will be removed from the stream following completion of the activity. Gravel berms may be left in place after breaching, provided they do not impede the stream flow.

1.2 Avoidance and Minimization Measures for Amphibians

AMPH-1: California Red-legged Frog (CRLF)

CRLF absence is presumed for all project sites in eastern Marin. Therefore, impacts are avoided, and no further surveys, studies or CRLF protection measures are required and the maintenance activities can proceed.

For the Easkoot Creek sites, 5-EAS-1, 5-EAS-2 and 5-EAS-3, where there is potential for California red-legged frog to occur, pre-construction aquatic surveys should be conducted by a qualified biologist prior to the onset of any disturbance related activities, following the protocol outlined in the Revised Guidelines on Site Assessments and Field Surveys for the California Red-legged Frog (USFWS 2005):

- At least 15 days prior to the onset of activities, the applicant or project proponent shall submit the name(s) and credentials of biologists who would conduct activities specified in the following measures. No project activities shall begin until proponents have received written approval from the Service that the biologist(s) is qualified to conduct the work.

- A Service-approved biologist shall survey the work site two weeks before the onset of activities. If California red-legged frogs, tadpoles, or eggs are found, the approved biologist shall contact the Service to determine if moving any of these life-stages is appropriate. In making this determination the Service shall consider if an appropriate relocation site exists. If the Service approves moving animals, the approved biologist shall be allowed sufficient time to move California red-legged frogs from the work site before work activities begin. Only Service-approved biologists shall participate in activities associated with the capture, handling, and monitoring of California red-legged frogs.

- Before any construction activities begin on a project, a Service-approved biologist shall conduct a training session for all construction personnel. At a minimum, the training shall include a description of the California red-legged frog and its habitat, the importance of the California red-legged frog and its habitat, the general measures that are being implemented to conserve the California red-legged frog as they relate to the project, and the boundaries within which the project may be accomplished. Brochures, books and briefings may be used in the training session provided that a qualified person is on hand to answer any questions.

- A Service-approved biologist shall be present at the work site until such time as all removal of California red-legged frogs, instruction of workers, and habitat disturbance have been completed. After this time, the contractor or permittee shall designate a person to monitor on-site compliance with all minimization measures. The Service-approved biologist shall ensure that this individual receives training outlined above in measure 3 and in the identification of California red-legged frogs. The monitor and the Service- approved biologist shall have the authority to halt any action that might result in impacts that exceed the levels anticipated by the Corps and Service during review of the proposed action. If work is stopped. The Corps and Service shall be notified immediately by the Service-approved biologist or on-site biological monitor.

- Pre-construction surveys should consist of two separate daytime and nighttime surveys extending 300 ft. upstream and downstream (where feasible) of the proposed work sites. If special-status species are found, CDFG and/or USFWS should be contacted to determine what actions are to be taken. The 2005 Guidance recommends a total of up to eight (8) surveys to determine the presence of CRLF at or near a project site. Two (2) day surveys and four (4) night surveys are recommended during the breeding season; one (1) day and one (1) night survey is recommended during the non-breeding season. Each survey must take place at least seven (7) days apart. At least one survey must be conducted prior to August 15th. The survey period must be over a minimum period of 6 weeks (i.e., the time between the first and last survey must be at least 6 weeks). Throughout the species' range, the non-breeding season is defined as between July 1st and September 30th.

- If a maintenance activity site is to be temporarily dewatered by pumping, intakes shall be completely screened with wire mesh no larger than five millimeters to prevent CRLF from entering the pump system.

5-EAS-1e-Sediment Removal Easkoot Creek at Calle del Pinos; Stinson Beach

Project Description: Remove accumulated sediment between 20 ft US and 20 ft DS of bridge crossing and 10 ft. beneath bridge. Work performed from top of bank using logn reach excavator.

Project Location: Easkoot Creek; Calle del Pradero intersection with Shoreline Highway.

Lat/Long: 37°53'56.19" N ; 122°38'33.64" W

Channel Description: Engineered flood control channel with earthen channel

Tidal: Yes

Vegetation/Habitat Types: Riparian

Geomorphic Codes: Debris or vegetation obstruction, sediment aggradation at bridge

Sediment Issue Severity: Low;

Chronic Sediment Issues: Low gradient stream with heavy sediment input from landslide son NPS lands in the upper watershed. Used to be more chronic until County Flood Control built the off-channel sediment trap upstream; now frequency of sediment removal is much less (see attached monitoring report).

Dimensions of Work Area: 20 ft. up and downstream plus 10 ft. under bridge; 25 feet wide

Work Days: 1 day;

Equipment: Long-reach excavator, hauler

Equipment Location During Sediment Removal: Top of levee

Heavy Equipment Access and Staging: across-off road area no veg to remove

Temporary Stockpile Locations: On off-road area- no vegetation removal

Dewatering: Yes

Permits Needed: DFW 1600 RMA, RWQCB;

Potentially Occurring Special Status Species: Steelhead; California Red-legged Frog

Avoidance and Minimization Measures

AMM-1: Environmental Compliance Coordinator, Buffers and Work Stoppages

- Before commencement of a maintenance activity, The District shall designate an Environmental Compliance Coordinator (ECC) who will determine the appropriate AMMs, to implement during operations based on the site fact sheets.

- The ECC shall distribute a work order to maintenance staff and contractors with a list of the AMMs and BMPs applicable to each site. The work order must be completed in a timely manner to allow time for pre-construction surveys.

- The ECC shall assess field conditions at the start of each work day. If any special status species or nesting birds are observed, the ECC shall establish buffers areas, if sufficient, or stop any activity the ECC deems may result in take or destruction of habitat. Stopped work shall not be allowed to resume until appropriate corrective measures have been completed or it has been determined that nesting is complete. The ECC shall immediately report any unauthorized impacts to the appropriate trustee agency (i.e. USFWS, NMFS, USACE, and/or CDFW). The ECC shall coordinate with Maintenance Supervisors to stop any activity the ECC or agencies deems may cause take of a listed species or their habitat. Work shall not be allowed to resume until appropriate corrective measures have been completed.

- All on-site maintenance activity personnel shall receive instruction regarding the presence of listed species and the importance of avoiding impacts to these species and their habitat before the start of work.

GAMM-2: Site Preparation/Wildlife Reconnaissance

The ECC shall walk the site each day before maintenance activities commence to locate wildlife; if any special status wildlife species are noted, work will not commence until all individuals have left the work site on their own and/or it has been determined that they are not nesting within the project site.

When maintenance activities require dewatering, a qualified fisheries biologist with appropriate permits shall be on-site to move fish.

All habitat improvements on salmon and steelhead streams shall be done in accordance with techniques in the California Salmonid Stream Habitat Restoration Manual (CDFW 2010d).

GAMM-3: Work Windows

To avoid impacts to special status species, the maintenance activities carried out shall typically occur during the summer low flow season. In addition, species-specific work windows shall be

followed to avoid impacts. Table below shows the work windows for species that may be impacted by the proposed maintenance activities. Additional information can be found within the species-specific AMMS.

GAMM-4: Trash Removal

During all activities at project sites, all construction trash that may attract predators shall be properly contained, removed from the work site, and disposed of regularly. Following maintenance activities, all construction trash and maintenance debris shall be removed from work sites and disposed of properly.

GAMM-5: Equipment Staging

Staging/storage areas for equipment, materials, fuels, lubricants, and solvents, shall be located outside of the stream's high water channel and associated riparian area. Stationary equipment such as motors, pumps, generators, compressors, and welders located within the dry portion of the steam channel or adjacent to the stream, shall be positioned over drip-pans. Equipment shall be moved out of the normal high water area of the stream prior to refueling and lubricating. The ECC or Maintenance Supervisor shall ensure that contamination of habitat does not occur during such operations. Best Management Practices covering Chemical Use (Spill Prevention and Control); contained in the BASMAA Flood Control Facility Maintenance Best Management Practices Manual (BAASMA 2000) shall be followed. These BMPs are designed to prevent the discharge of chemicals to flood control channels and storm drain systems and allow prompt and effective response to any accidental spills. All workers shall be informed of the importance of preventing spills and of the appropriate measures to take should a spill occur.

The number of access routes, number and size of staging areas, and the total area of the work site activity shall be limited to the minimum necessary to complete the proposed activity.

GAMM-6: Invasive Species

The ECC shall ensure that the spread or introduction of invasive exotic plants shall be avoided to the maximum extent possible. When practicable, invasive exotic plants at the work site shall be removed.

For all activities in creeks and bay, all gear exposed to water shall be allowed to dry for three days before being used again. Some disinfectants are OK to use per DFG and USFWS (users should check with those agencies). As a precaution against invasive quagga and zebra mussels, if kayaks or any other vessels are used in maintenance activities, crew will wash and dry them off-site prior to using them in another creek or tributary.

AMMs per Special Status Species

1.1 Avoidance and Minimization Measures for Fish

The AMM described below is designed to protect fishery resources. Coho may potentially be found in Easkoot Creek in West Marin, although they aren't known to be breeding there. Steelhead trout are known to occur within Novato Creek, Ross Valley, Miller Creek and Richardson Bay, and these measures will also protect other fish species such as Chinook salmon, sturgeon, lampreys, and Sacramento splittail.

FISH-1: Salmonids

If steelhead and/or coho salmon are known to be absent from the project site based on CEMAR/CDFW surveys and there are long-standing natural or artificial downstream barriers sufficient to prevent upstream migration, then avoidance has been accomplished and no further actions are necessary.

If Coho salmon are observed in the project area during winter months or during pre-construction fish capture and relocation activities, all project activities shall cease and DFW and NMFS shall immediately be notified.

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- All in-stream maintenance activities will be restricted to the low-flow period of June 15th through October 15th. Work above the top of bank or outside of the channel will not be subject to this modified work period.

- To minimize turbidity and stress to special status species, personnel shall avoid walking through stream pools and the thalweg of the channel, and shall instead walk across riffles or outside of the stream bed to access a project site.

- No equipment is to be operated from within the active stream channel unless the stream has been dewatered and fish have been relocated by a qualified and permitted biologist.

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predators. Captured salmonids will be relocated, as soon as possible, to a suitable instream location in which habitat condition are present to allow for adequate survival of transported fish and fish already present. Cofferdams used to divert water shall be constructed with clean river gravel or sand bags and sealed with sheet plastic.

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- Intakes and outlets shall be designed to minimize turbidity and the potential to wash contaminants into the stream.

- If a work site is to be temporarily dewatered by pumping, intakes shall be completely screened with wire mesh not larger than 5 millimeters to prevent amphibians from entering the pump system. On salmonid streams, the intake pipe shall be fitted with fish screens meeting CDFW and NOAA Fisheries' criteria to prevent entrainment or impingement of small fish (National Marine Fisheries Service 1997: http://swr.nmfs.noaa.gov/hcdlfishscm.pdf).

- A filtration/settling system must be included to reduce downstream turbidity (i.e. filter fabric, turbidity curtain). The selection of an appropriate system is based on the rate of discharge. If feasible, water that is pumped into a pipe shall discharge onto the top of bank into a densely vegetated area, which may require extra hose length.

- Once the project work is complete, water shall be slowly released back into the work area to prevent erosion and increased turbidity.

- The channel and soil surface shall be restored to its original or design configuration after the work is complete. Any material added to the channel or basin to provide support for the work approved under this provision shall be removed unless required for erosion control or habitat enhancement and/or restoration.

- For minor actions where the disturbance to construct cofferdams to isolate the work site would be greater than that which would occur in completing the proposed action, measures will be put in place immediately downstream of the work site to capture suspended sediment. This may include installation of silt catchment fences across the drainage or placement of a straw wattle or filter berm of clean river gravel. Silt fences

and other non-native materials will be removed from the stream following completion of the activity. Gravel berms may be left in place after breaching, provided they do not impede the stream flow.

1.2 Avoidance and Minimization Measures for Amphibians

AMPH-1: California Red-legged Frog (CRLF)

CRLF absence is presumed for all project sites in eastern Marin. Therefore, impacts are avoided, and no further surveys, studies or CRLF protection measures are required and the maintenance activities can proceed.

For the Easkoot Creek sites, 5-EAS-1, 5-EAS-2 and 5-EAS-3, where there is potential for California red-legged frog to occur, pre-construction aquatic surveys should be conducted by a qualified biologist prior to the onset of any disturbance related activities, following the protocol outlined in the Revised Guidelines on Site Assessments and Field Surveys for the California Red-legged Frog (USFWS 2005):

- At least 15 days prior to the onset of activities, the applicant or project proponent shall submit the name(s) and credentials of biologists who would conduct activities specified in the following measures. No project activities shall begin until proponents have received written approval from the Service that the biologist(s) is qualified to conduct the work.

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- Before any construction activities begin on a project, a Service-approved biologist shall conduct a training session for all construction personnel. At a minimum, the training shall include a description of the California red-legged frog and its habitat, the importance of the California red-legged frog and its habitat, the general measures that are being implemented to conserve the California red-legged frog as they relate to the project, and the boundaries within which the project may be accomplished. Brochures, books and briefings may be used in the training session provided that a qualified person is on hand to answer any questions.

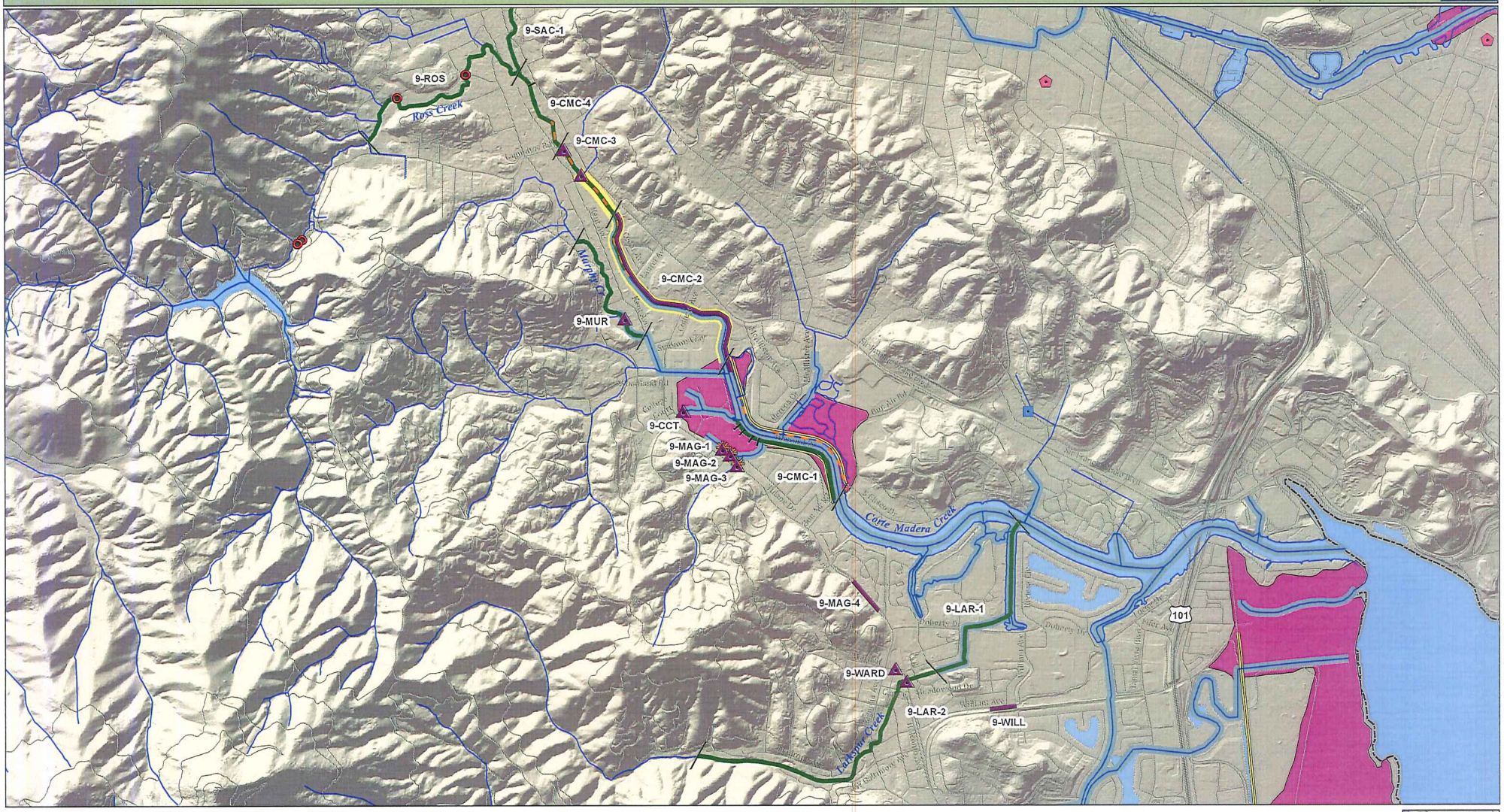
- A Service-approved biologist shall be present at the work site until such time as all removal of California red-legged frogs, instruction of workers, and habitat disturbance have been completed. After this time, the contractor or permittee shall designate a person to monitor on-site compliance with all minimization measures. The Service-approved biologist shall ensure that this individual receives training outlined above in measure 3 and in the identification of California red-legged frogs. The monitor and the Service- approved biologist shall have the authority to halt any action that might result in impacts that exceed the levels anticipated by the Corps and Service during review of the proposed action. If work is stopped. The Corps and Service shall be notified immediately by the Service-approved biologist or on-site biological monitor.

- Pre-construction surveys should consist of two separate daytime and nighttime surveys extending 300 ft. upstream and downstream (where feasible) of the proposed work sites. If special-status species are found, CDFG and/or USFWS should be contacted to determine what actions are to be taken. The 2005 Guidance recommends a total of up to eight (8) surveys to determine the presence of CRLF at or near a project site. Two (2) day surveys and four (4) night surveys are recommended during the breeding season; one (1) day and one (1) night survey is recommended during the non-breeding season. Each survey must take place at least seven (7) days apart. At least one survey must be conducted prior to August 15th. The survey period must be over a minimum period of 6 weeks (i.e., the time between the first and last survey must be at least 6 weeks). Throughout the species' range, the non-breeding season is defined as between July 1st and September 30th.

- If a maintenance activity site is to be temporarily dewatered by pumping, intakes shall be completely screened with wire mesh no larger than five millimeters to prevent CRLF from entering the pump system.

Marin County Flood Control and Water Conservation District - Stream Maintenance Program

Marin County
Flood Control and
Water Conservation District
April 2017



Map	Flood Control Zone 9 - Ross Valley Corte Madera, Larkspur, Murphy, and Ross Creeks
7	

- Fish Passage Barrier
- Vegetation Maintenance
- Levee
- Tidal Stream
- Streams
- Sediment Removal
- Sediment Removal
- Erosion Control
- Fuels Reduction

Site Limit

- California clapper rail
- Northern spotted owl

Restoration Site

- Complete
- Ongoing
- Proposed

1:20,000

0 0.25 0.5 1 Mi

Flood Control Zone 9 - Ross Valley

Site: 9-MAG-3
965 Magnolia Ave

Site Description:

The site is located behind the commercial building at 965 Magnolia Avenue in Larkspur.

The surrounding land use is predominantly commercial and residential development.

Wetlands and other Waters, including Waters of the State:

Exempt from USACE jurisdiction.

Vegetation communities:

The predominant vegetation type in the area is northern coastal salt marsh however the creek is dense cattails covering the channel.

Potentially-occurring special-status species:

California black rail; California clapper rail; and salt marsh harvest mouse lower in the channel out on the salt marsh but not near the sediment removal area.

Avoidance and Minimization Measures:

GAMM-1 through GAMM-6;

Maintenance Activities:

Vegetation maintenance (cattail removal) and sediment removal.

Best Management Practices:

A-67;A-69; A-73; A-109; A-113; A-117; A-141; A-151; A-157; A-161; A163; A-167; A-179; A-229; EV-1; EV-2; NR-1; NR-3; SC-1 through SC-6; SS-1 through SS-4; VDM-1 through VDM-4; VR-1; VR4b; VR-5; WD-4; WD-5.

9-MAG-3: Sediment Removal from Corte Madera Creek at 965 Magnolia Ave.

Location: The site is located across the street from 965 Magnolia Avenue in Larkspur. The surrounding land use is predominantly commercial and residential development.

Lat/Long: 37.946281, -122.544933

Project Description: Sediment removal from outfall of culvert

Channel Description: This is a narrow straightened channel between the outfall of two 40-inch concrete culverts and marsh 200 feet downstream. Vegetation adjacent to the channel is mowed grass or ornamental streetscape. The predominant in-channel vegetation type is cattails.

Tidal: Yes

Geomorphic Codes: Tidal backwater; road crossing width; sediment aggradation at outfall; sediment is from tidal backwater

Vegetation/Habitat Types: Cordgrass, cattails

Chronic Sediment Issues: Sediment deposition/aggradation at the culvert outlet due to grade change and channel widening.

Quantitative Metrics: Sediment removal will be triggered when either the outfall pipes become 50% or more occluded or when the channel thalweg between the pipe outfall and the downstream pipe crossing does not have a continuous gradient.

Dimensions of Work Area: 45 LF, 3 feet depth and 10 feet wide to clear the channel below a 36" culvert

Work Days:- 1-2; every 1-3 years

Equipment: Wheeled front end loader

Equipment Location During Sediment Removal: Adjacent Roadway or pull-out

Heavy Equipment Access and Staging: Across off-road area no vegetation removal

Temporary Stockpile Locations: On off-road area- no vegetation removal

Dewatering: No coffer dam or water diversion needed,

Permits Needed: DFW 1600 RMA, RWQCB WDR

Potentially Occurring Special Status Species: California black rail; California Ridgeway rail; and salt marsh harvest mouse.

Avoidance and Minimization Measures

AMM-1: Environmental Compliance Coordinator, Buffers and Work Stoppages

- Before commencement of a maintenance activity, The District shall designate an Environmental Compliance Coordinator (ECC) who will determine the appropriate AMMs, to implement during operations based on the site fact sheets.

- The ECC shall distribute a work order to maintenance staff and contractors with a list of the AMMs and BMPs applicable to each site. The work order must be completed in a timely manner to allow time for pre-construction surveys.

- The ECC shall assess field conditions at the start of each work day. If any special status species or nesting birds are observed, the ECC shall establish buffers areas, if sufficient, or stop any activity the ECC deems may result in take or destruction of habitat. Stopped work shall not be allowed to resume until appropriate corrective measures have been completed or it has been determined that nesting is complete. The ECC shall immediately report any unauthorized impacts to the appropriate trustee agency (i.e. USFWS, NMFS, USACE, and/or CDFW). The ECC shall coordinate with Maintenance Supervisors to stop any activity the ECC or agencies deems may cause take of a listed species or their habitat. Work shall not be allowed to resume until appropriate corrective measures have been completed.

- All on-site maintenance activity personnel shall receive instruction regarding the presence of listed species and the importance of avoiding impacts to these species and their habitat before the start of work.

GAMM-2: Site Preparation/Wildlife Reconnaissance

The ECC shall walk the site each day before maintenance activities commence to locate wildlife; if any special status wildlife species are noted, work will not commence until all individuals have left the work site on their own and/or it has been determined that they are not nesting within the project site.

When maintenance activities require dewatering, a qualified fisheries biologist with appropriate permits shall be on-site to move fish.

All habitat improvements on salmon and steelhead streams shall be done in accordance with techniques in the California Salmonid Stream Habitat Restoration Manual (CDFW 2010d).

GAMM-3: Work Windows

To avoid impacts to special status species, the maintenance activities carried out shall typically occur during the summer low flow season. In addition, species-specific work windows shall be

followed to avoid impacts. Table below shows the work windows for species that may be impacted by the proposed maintenance activities. Additional information can be found within the species-specific AMMS.

GAMM-4: Trash Removal

During all activities at project sites, all construction trash that may attract predators shall be properly contained, removed from the work site, and disposed of regularly. Following maintenance activities, all construction trash and maintenance debris shall be removed from work sites and disposed of properly.

GAMM-5: Equipment Staging

Staging/storage areas for equipment, materials, fuels, lubricants, and solvents, shall be located outside of the stream's high water channel and associated riparian area. Stationary equipment such as motors, pumps, generators, compressors, and welders located within the dry portion of the steam channel or adjacent to the stream, shall be positioned over drip-pans. Equipment shall be moved out of the normal high water area of the stream prior to refueling and lubricating. The ECC or Maintenance Supervisor shall ensure that contamination of habitat does not occur during such operations. Best Management Practices covering Chemical Use (Spill Prevention and Control); contained in the BASMAA Flood Control Facility Maintenance Best Management Practices Manual (BAASMA 2000) shall be followed. These BMPs are designed to prevent the discharge of chemicals to flood control channels and storm drain systems and allow prompt and effective response to any accidental spills. All workers shall be informed of the importance of preventing spills and of the appropriate measures to take should a spill occur.

The number of access routes, number and size of staging areas, and the total area of the work site activity shall be limited to the minimum necessary to complete the proposed activity.

GAMM-6: Invasive Species

The ECC shall ensure that the spread or introduction of invasive exotic plants shall be avoided to the maximum extent possible. When practicable, invasive exotic plants at the work site shall be removed.

For all activities in creeks and bay, all gear exposed to water shall be allowed to dry for three days before being used again. Some disinfectants are OK to use per DFG and USFWS (users should check with those agencies). As a precaution against invasive quagga and zebra mussels, if kayaks or any other vessels are used in maintenance activities, crew will wash and dry them off-site prior to using them in another creek or tributary.

Table 3-1. Work windows.

		SMP Work Season																							
		January		February		March		April		May		June		July		August		September		October		November		December	
Category	Species	1-15	16-31	1-15	16-28	1-15	16-31	1-15	16-30	1-15	16-31	1-15	16-30	1-15	16-31	1-15	16-31	1-15	16-30	1-15	16-31	1-15	16-30	1-15	16-31
General	In-stream - no salmonids																								
	In-stream - salmonids																								
Vegetation	Planting																								
Invertebrate	Monarch butterfly																								
Fish	Salmonids																								
Amphibian	CA red-legged frog																								
Reptile	Northwestern pond turtle																								
Bird	Black and clapper rails																								
	Northern spotted owl																								
	Raptors and wading birds																								
	Landbirds																								
	Burrowing owl																								
Mammal	Salt marsh harvest mouse																								
	Bats																								

Species work window
SMP work season

AMMs per Special Status Species

BIRD-1: Ridgway's rail and California black rail

Several of the sites are within (5-10 sites) or immediately adjacent (15-20 sites) to suitable habitat for Ridgway's rail and California black rails. The following measures apply to all sites in or near salt or brackish marshland and will also serve to protect other tidal-marsh dependent species such as saltmarsh common yellowthroat and San Pablo song sparrow.

When working within 250 ft. of salt or brackish marshland during the period February 1st through August 31st, presence for either rail species shall be assumed.

For all maintenance activities except for mowing of levees:

- Maintenance activities shall be scheduled to occur between September 1st and January 31st to avoid the rail breeding season.

- Work shall be scheduled to occur between 8:00 AM and 4:00 PM in order to avoid early morning and late afternoon/evening hours when rails are most active.

- Work shall be scheduled to avoid periods of high tides, as the high water reduces the amount of refugial habitat for the rails. No work shall occur near salt marsh habitats within two hours before or after predicted extreme high tides of 6.5 ft. above the National Geodetic Vertical Datum (NGVD), as measured at the Golden Gate Bridge, and adjusted to the timing of local extreme high tide events at the project sites.

- Activities shall proceed as quickly as possible to reduce disturbance from noise, dust, etc.

- Removal or disturbance of emergent tidal marsh vegetation shall be avoided, and removal or disturbance of vegetation at the tidal marsh/upland interface shall be avoided to provide a buffer of refugial habitat within as wide a swath as possible (3 meter minimum) from the Mean Higher High Water (MHHW) line. If removal is necessary, the work shall be scheduled outside of the breeding season (February 1 – August 31st); all vegetation shall be removed by hand, and shall be salvaged and retained for replacement after work is completed.

- If, for any reason other than fire fuel reduction levee mowing, the District must perform maintenance activities within 250 ft. of salt or brackish marshland during the rail breeding season, the District shall retain a qualified biologist to conduct clapper rail surveys in accordance to most currently available protocols from the Department of Fish and Game and the US Fish and Wildlife Service.

MAMM-1: Salt Marsh Harvest Mouse (SMHM)

The majority of the sites are not in, nor adjacent to, salt marsh harvest mouse habitat; avoidance has been achieved for those sites. At sites XXX which are adjacent to suitable habitat for salt marsh harvest mouse and include work which may require impact to salt marsh harvest mouse habitat by removal of pickleweed, the following AMMS shall be followed:

- When implementing maintenance activities in uplands adjacent to salt or brackish marshland, vehicles will be confined to existing roads where possible, and disturbed areas shall be re-vegetated with brackish marsh species. Crews shall use matting, pontoon boards or other comparable methods whenever feasible to minimize impacts to the existing vegetation. The placement of mats will be approved by CDFW before their placement. Crews shall work exclusively from mat boards and boardwalks to minimize trampling of vegetation.

- If maintenance activities are conducted outside the breeding season, in coordination with USFWS and CDFW, pre-construction surveys shall be conducted within 5 days of the start of maintenance activities to check for presence of mice within the project sites. In addition, the ECC shall be present during maintenance-related activities along and adjacent to all suitable nesting habitat areas to ensure that salt marsh harvest mice are not present.

- Work shall be scheduled to avoid periods of high tides, as the high water reduces the amount of refugial habitat for SMHM. Generally, work should not be scheduled to occur between 2 hours before high tide and two hours after high tide.

- Removal or disturbance of emergent tidal marsh vegetation shall be avoided, and removal or disturbance of vegetation at the tidal marsh/upland interface shall be avoided to provide a buffer of refugial habitat within as wide a swath as possible.

- Training sessions shall be given to all workers to inform them of protective measures, instruct them in identification of the salt marsh harvest mouse and its habitat requirements, and inform them of when work needs to be stopped and appropriate officials informed of species presence.

- For project sites where work will intrude into tidal marsh habitat, the ECC shall survey the site prior to beginning work in order to determine the presence/absence of SMHM, and the following measures shall be implemented:

- Under the supervision of the ECC, vegetation shall be removed only with non-mechanized hand tools; no motorized equipment shall be used. Vegetation removal may begin only when no mice are observed, or with CDFW approval, and shall start at

the edge farthest from the salt marsh and work its way towards the salt marsh. If a mouse of any species is observed within the areas being removed of vegetation, work shall stop and CDFW shall be notified. Unless otherwise approved by CDFW, the mouse shall be allowed to leave on its own volition. Removal of pickleweed will generally follow Zedler (2001).

- If trenching takes place within 50 ft. of pickleweed areas, visqueen fencing shall be installed around worksites within pickleweed before excavation activities begin. CDFW will approve the size and placement of fencing. An escape ramp shall be placed in any open trench at the end of the day to allow any entrapped animals to escape.

- The ECC shall be on-site and shall halt project activities if necessary to comply with these terms.

9-Mag-3: Pre-project photos, sediment removal to clear outfall constrictions and establish low-flow gradient to the downstream marsh.