

Stream Maintenance Program Draft Environmental Impact Report

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LIST OF ACRONYMS

°C	Celsius
°F	Fahrenheit
µg/m ³	micrograms per cubic meter
AB	Assembly Bill
ACHP	Advisory Council on Historic Preservation
APE	area of potential effects
ARM	Agreement for Routine Maintenance
ARPA	Archaeological Resources Protection Act
BAAQMD	Bay Area Air Quality Management District
BMP	Best Management Practices
BO	Biological Opinion
CAA	Clean Air Act
CAAQs	California Ambient Air Quality Standards
Cal/OSHA	California Occupational Safety and Health Administration
Caltrans	California Department of Transportation
CARB	California Air Resources Board
CBC	California Building Code
CBSC	California Building Standards Code
CCR	California Code of Regulations
CDF	California Department of Forestry and Fire Protection
CDFG, or DFG	California Department of Fish and Game
CEQA	California Environmental Quality Act
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CESA	California Endangered Species Act
CFWS	California Freshwater Shrimp
CIP	capital improvement project
City	City of Santa Rosa
CMP	corrugated metal pipe
CNDDB	California Natural Diversity Database
CNEL	community noise equivalent level
CNPS	California Native Plant Society
CO	carbon monoxide
CO ₂	carbon dioxide
CoIWMP	Countywide Integrated Waste Management Plan
County	Sonoma County
CRHP	California Register of Historic Places
CRHR	California Register of Historic Resources
CRLF	California red-legged Frog
CSC	California species of special concern
CTIP	Citywide Traffic Improvement Plan
CTS	California tiger salamander
CVC	California Vehicle Code
CWA	Clean Water Act
dB	decibel
dBA	A weighted decibel
DEIR	Draft Environmental Impact Report

DES	Department of Emergency Services
DES	Sonoma County Department of Emergency Services
DO	dissolved oxygen
DPS	Distinct Population Segment
DTSC	California Department of Toxic Substances Control
EA	Environmental Assessment
EFH	Essential Fish Habitat
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
EMS	Emergency Management System
ESA	Endangered Species Act
FCDC	Sonoma County Flood Control Design Criteria
FEIR	Final Environmental Impact Report
FESA	Federal Endangered Species Act,
FHWA	Federal Highway Administration
FIFRA	Federal Insecticide, Rodenticide, and Fungicide Act
ft	feet
FTA	Federal Transit Administration
GGT	Golden Gate Transit
GHG	greenhouse gas
GIS	geographic information system
H ₂ S	hydrogen sulfide
HMP	Sonoma County's Hazard Mitigation Plan
HSP	health and safety plan
Hwy	highway
IAWG	Inter-Agency Working Group
IPCC	Intergovernmental Panel on Climate Change
K(f)	Soil Erodibility Factor
Km	kilometer
L _{dn}	day-night level
L _{eq}	equivalent sound level
LID	low impact development
L _{max}	maximum sound level
L _{min}	minimum sound level
LOS	level of service
LUFT	leaking underground fuel tank
LUST	leaking underground storage tank
L _{xx}	percentile-exceeded sound level
MBTA	Migratory Bird Treaty Act
MCRRFCD	Mendocino County Russian River Flood Control and Water Conservation Improvement District
mph	miles per hour
MTC	Metropolitan Transportation Commission
N ₂ O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NAGPRA	Native American Graves Protection and Repatriation Act
NAHC	Native American Heritage Commission
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service

NOP	notice of preparation
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
NWIC	Northwest Information Center
OES	California Office of Emergency Services
OHP	California Office of Historic Preservation
PM ₁₀	Particulate matter less than 10 microns in diameter
PM _{2.5}	particulate matter less than 2.5 microns in diameter
ppb	parts per billion by volume
ppm	parts per million by volume
PRC	California Public Resources Code
RCNM	Roadway Construction Noise Model
RCRA	Resource Conservation and Recovery Act
RUSLE	Revised Universal Soil Loss Equation
RWQCB or Regional Board	Regional Water Quality Control Board
SARA	Superfund Amendments and Reauthorization Act
SCTA	Sonoma County Transportation Authority
SCWA or Agency	Sonoma County Water Agency
SHPO	State Historic Preservation Officer
SMP, Program or Proposed Program	Stream Maintenance Program
sq. mi.	square miles
SR	state route
SRPCS	Santa Rosa Plain Conservation Strategy
SSURGO	Soil Survey Geographic Database
SWRCB	State Water Resources Control Board
TMDL	Total Maximum Daily Load
U.S.	United States
U.S. EPA or USEPA	United States Environmental Protection Agency
UBC	Uniform Building Code
USACE	U.S. Army Corps of Engineers
USC	U.S. Government Code
USDOT	U.S. Department of Transportation
USFS	U.S. Department of Agriculture, Forest Service
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
USSCS	U.S. Soil Conservation Service
UST	underground storage tank

EXECUTIVE SUMMARY

Introduction

The Sonoma County Water Agency (SCWA) has developed the Stream Maintenance Program (SMP) to improve the management of streams and channels under SCWA's authority through establishing programmatic guidance. The SMP provides the organizational framework to oversee routine stream and channel maintenance activities.

SCWA has prepared this draft program environmental impact report (DEIR) to provide the public, responsible agencies, and trustee agencies with information about the potential environmental effects of implementation of the Proposed Program. This DEIR was prepared in compliance with the California Environmental Quality Act (CEQA) of 1970 (as amended) and the State CEQA Guidelines (14 California Code of Regulations [CCR] 15000 et seq.). SCWA is the lead agency on this Program.

Program Overview

The Stream Maintenance Program (SMP) has been developed by the Sonoma County Water Agency to improve the management of streams and channels in SCWA's maintenance authority through establishing programmatic guidance. The SMP Manual provides the organizational framework to oversee routine stream and channel maintenance activities. The SMP Manual will be used by SCWA to guide and implement routine stream maintenance activities. The SMP is envisioned to be a flexible program subject to periodic revisions that reflect updates on resource conditions, maintenance technologies, or management practices. The SMP Manual and DEIR are meant to be read as companion volumes. The DEIR references or summarizes information (including figures and tables) presented in the SMP Manual to avoid repeating information. The reader is encouraged to review the SMP Manual while reviewing the DEIR.

Program Area

The SMP Program Area is located in Sonoma County, California as shown in Figure 2-1 (SCWA Flood Control Zones and Program Area). As shown in Figure 2-1, flood control operations at SCWA are organized into nine flood control zones. The majority of SMP activities would occur in Zone 1A (Laguna de Santa Rosa watershed), Zone 2A (Petaluma River watershed), and Zone 3A (Sonoma Creek watershed). Cities within the Program Area which contain SCWA-owned or maintained channels include: Cotati, Healdsburg, Petaluma, Rohnert Park, Santa Rosa, Sebastopol, Sonoma, and the Town of Windsor.

Program Background

Under its authority, SCWA maintains flood control channels that it owns. SCWA also has hydraulic easements on other flood control channels and creeks. These easements authorize but do not require SCWA to conduct activities to maintain hydraulic capacity. The

SMP will be used by SCWA to guide and implement routine stream maintenance activities. The SMP is envisioned to be a flexible program subject to periodic revisions reflecting updates on resource conditions, maintenance technologies, or management practices. SCWA operation and maintenance activities occur in four types of channels:

Engineered Channel–Owned in Fee: These channels are owned and maintained by SCWA through limited zone-specific property taxes. SCWA maintains the flood control channels that it owns. SCWA maintains approximately 61 miles of owned in fee-engineered channels. Engineered channels are channels that were designed and built to convey a design discharge. In the Program Area, engineered channels have typically been built with a trapezoidal cross-sectional shape. Most of the engineered channels have earthen banks and streambeds; however some channels have hardened banks and beds. Road and culvert crossings are locations where typically the stream banks and beds have been hardened for engineered channels. Maintenance activities in these engineered channels include bank stabilization, landscaping, fencing, mowing, sediment removal, debris removal, and vegetation thinning and spraying. Structures such as access roads, drop inlet culverts, outfalls, flap gates, and road crossing culverts constructed in association with the engineered channels also require routine maintenance.

Engineered Channel–Easement Maintained: These channels are not owned by SCWA, but SCWA performs channel maintenance on them through permissive easement agreements. For example, cities such as Petaluma or Rohnert Park may own such channels and may have entered into easement agreements with SCWA to conduct maintenance. These easement agreements authorize SCWA to conduct maintenance, but do not require or obligate SCWA to maintain any specific level of hydraulic capacity or conduct any maintenance. SCWA performs some maintenance activities within approximately 15 miles of easement engineered channels. Maintenance activities in these channels are similar to the activities described above for SCWA owned engineered channels with the exception that for the easement engineered channels, SCWA works only within the channel banks (from top-of-bank to top-of-bank) and does not maintain roads, ditches, fences, or other structures outside the channel.

Modified Channel–Easement Maintained: Modified channels are natural channels with existing earthen beds and banks that have been modified either through vegetation removal, in-channel grading, channel widening or straightening, or debris clearing to improve flow conveyance. Though modified, these channels are not engineered or constructed according to specific design criteria to convey a discharge of a particular magnitude. These are permissive easements where another jurisdiction, authority, or private landowner owns the modified channel feature. SCWA is not obligated to conduct maintenance and has no responsibility to perform any specific level of maintenance in easement modified channels. However, SCWA may perform limited maintenance on these channels. SCWA holds hydraulic easements (for work within the channel) for over approximately 49 miles of modified channels. Maintenance activities in modified channels typically include the removal of log jams, debris jams, and the clearance of vegetation to remove significant flow obstructions. The most common type of work conducted in these channels is the removal of blackberry thickets or fallen trees that significantly increase the potential for flood damage to structures. Trash or vegetation debris may also cause a blockage and require removal. SCWA does not perform sediment removal or bank

stabilization work in modified channels. Work in modified channels occurs only on an as-needed basis, usually at the request of an adjacent land-owner during or following a large storm event.

Natural Channel-Easement Maintained: Natural channels are non-engineered and non-modified creek systems with a permissive clearing easement. SCWA holds hydraulic easements to work within the channel banks for over approximately 80 miles of natural channels. Natural channels have several maintenance similarities to the modified channels. Natural channels may still require maintenance activities to maintain flow conveyance and reduce the flooding hazard. Maintenance work in natural channels typically involves clearing debris or vegetation that is causing a flow obstruction. In this way, maintenance activities for natural channels are similar to modified channels. Work in natural channels is infrequent and typically occurs at the request of an adjacent landowner who has observed a problem. Similar to modified channels, SCWA does not conduct sediment removal or bank stabilization activities in natural channels.

Program Objectives and Need

The SMP has been designed to achieve the following objectives:

- Provide adequate flood protection and channel conveyance capacity for channels under SCWA authority;
- Use an informed, consistent, systemic, and scientific understanding of the watershed and individual stream reaches to guide maintenance activities and avoid and minimize environmental impacts;
- Improve communication, coordination, and permitting efficiency between regulatory agencies and SCWA through an open and collaborative process;
- Develop an adaptable and sustainable program that can respond to changing environmental, maintenance, and regulatory conditions;
- Provide an administratively stable program that provides consistency in oversight and implementation of annual program activities;
- Obtain and maintain 10-year programmatic permits that regulate program activities;
- Adhere and comply with California Environmental Quality Act (CEQA) requirements.

Program Description

Overview of SMP Approach

The vision for SCWA's engineered channels is to provide a balance between flood control management and habitat support whereby over time, channels provide both functions with reduced maintenance needs. The central tenet of the SMP approach is that management activities are conducted using an informed and systemic approach to minimize stream

impacts while providing necessary flow conveyance. The management approach to achieve this vision recognizes each reach's existing functional condition, but also looks forward towards improving each reach's ecologic condition. A thorough understanding of the physical and biological stream system is at the core of this informed approach. As described in the full SMP Manual, the SMP utilizes an analytic and targeted approach to understand the degree of maintenance work actually required for a given situation.

While the analysis of maintenance problems may be focused, the development of solutions is watershed-wide in perspective. This informed approach of the SMP not only requires a clear understanding of the location, extent, and specifics of maintenance activities; it also requires an understanding of the stream system's natural and aquatic resources. Reaches are also considered within their sub-basin and watershed context. Understanding these complex interactions influences the method and timing of maintenance activities and also how best to avoid, minimize, and mitigate environmental impacts.

As envisioned, the SMP will be a "living program" that is updated and modified as needed. The SMP manual, as currently drafted, presents baseline conditions for natural resources and describing planned management activities. As conditions change or are updated, or as environmental regulations evolve, the SMP will also evolve to keep pace. SCWA is committed to administering and maintaining the SMP for the long-term planning horizon (20-30 years).

Maintenance Activities

The SMP has three primary activities: sediment management, vegetation management, and bank stabilization. These core maintenance activities occur mainly in engineered flood control channels, but may also occur in other facilities including other in-channel engineered structures, and sediment basins on an as-needed basis. In addition to the three core SMP activities, the SMP also involves other smaller and infrequent maintenance activities such as road maintenance, sediment removal around reservoir inlet structures, and debris removal, as described below. The SMP also includes the transport and disposal of collected sediment and vegetation. The SMP activities are described in more detail below.

Sediment Management

In general, sediment management refers to the removal of excess accumulated sediment from engineered flood control channels and facilities. This accumulated sediment reduces flow capacity and increases the potential for flooding. SMP sediment management activities seek to provide flow capacity while also providing geomorphic and ecologic channel functions, through such means as shaping a two-stage channel form within the original engineered flood control channel (Figure 6-5 of SMP Manual).

Sediment management activities are generally conducted from June 15th to October 31st when streams are typically at their driest. The number of sediment removal projects undertaken annually and the quantity of sediment removed in a given year depend on recent weather and hydrologic conditions, as well as the frequency and extent of past maintenance activities.

There are three general types of sediment removal projects: (1) reach scale projects where sediment is removed from an entire reach (typically 1,000-3,000 ft long); (2) smaller localized sediment removal projects (typically 100-200 ft long) where sediment is removed from individual crossings, culverts, or other in-channel facilities; and (3) intermediate scale sediment removal projects (typically 500-750 ft long) that involve individual bar grading or geomorphic shaping activities to remove sediment, reduce flow deflection, and enhance channel habitat features.

Bank Stabilization

Bank stabilization involves the repair and stabilization of stream or reservoir banks when a weakened, unstable, or failing stream bank causes or threatens damage to an adjacent property; increases the flood hazard; threatens public safety; impairs roads, transportation, or access; generates erosion, increases downstream sediment yields; or impacts riparian habitat and/or other natural resource values.

These activities occur in engineered channels and other facilities including culvert outlets along stream banks or banks around reservoirs. Bank stabilization activities are generally conducted June 15th to October 31st when streams are at their driest.

Vegetation Management

Vegetation management refers to the trimming, mowing, and removal of flow-constricting vegetation within flood control channels and other constructed facilities. These activities are conducted to maintain flow conveyance capacity, establish a canopy of riparian trees, and control invasive vegetation. Vegetation management and removal activities are relatively consistent from year to year, though locations change depending on recent growth and blockages. Vegetation management also includes the planting of new trees and shrubs in engineered channels in accordance with the SMP's restoration and mitigation program. The SMP's mitigation program is described in Chapter 8 of the SMP Manual, Sections 8-2 and 8-3 and summarized below

Other Activities

Other maintenance activities proposed under the SMP include: maintaining channel access roads for accessibility; maintaining proper drainage along channel access roads (usually provide by a small v-ditch that runs parallel with the access roads); maintaining proper functioning of drop-inlet culverts which direct flow from v-ditches toward the flood control channels; maintaining culverts free of sediment and vegetative blockages; sediment removal around reservoir inlet structures; repairing fences along the channels, trash and debris removal, and removing or covering graffiti on Agency facilities. The majority of these activities are considered to be minor and small in scale.

Sediment Disposal

SCWA anticipates that on average, the SMP will involve removing between 10,000 and 25,000 cubic yards of sediment per year. Sediment removed from SCWA facilities is hauled off-site using 10- or 20-cubic-yard dump trucks. Under the SMP, disposal sites will be

identified and permitted for use in accordance with federal, state, and local regulations, and appropriate landowner permits or agreements.

The City of Santa Rosa (City) is a partner with SCWA in the SMP in providing valuable long-term sediment disposal opportunities. The North Coast Regional Water Quality Control Board (North Coast RWQCB) developed the Santa Rosa Nutrient Offset Policy in coordination with the City in 2006 to reduce net nutrient loading to the Laguna de Santa Rosa by 2011. The disposal of SMP sediments to suitable sites owned by the City will provide an effective means to support the nutrient offset program, due to the nutrients sequestered in sediment removed under the SMP. As such, the City is a responsible agency for CEQA purposes.

Activities Not Covered in the SMP

Activities not covered under the SMP, and therefore not analyzed in this EIR include:

- maintenance activities on the main stems of the Russian River and Dry Creek in Zone 4A and 6A related to management of Lake Mendocino and Lake Sonoma;
- maintenance activities on streams outside of SCWA authority for which no maintenance agreement exists;
- capital improvement projects (CIPs); 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 (Public Resource Code Section 21060.3). Although emergency situations will not be covered in the SMP, SCWA will make every effort to follow the guidance provided in the SMP when implementing activities under emergency conditions.

Routine stream maintenance does not include projects that would alter the designed flood conveyance capacity of a channel. Large construction projects and CIPs are not considered routine stream maintenance and are not included in the SMP. However, future CIPs may consider using, or adapting, the SMP to cover their maintenance needs and mitigation once their project becomes operational and requires maintenance.

Implementation and Oversight

SMP Work Cycle

Implementation and oversight of the SMP occurs as an annual cycle of activities which begins each year with a field-based stream reconnaissance and assessment in late winter. The annual assessment informs the development of that cycle’s workplan. Routine maintenance activities, such as vegetation maintenance, localized sediment removal at culverted crossings, and minor bank repairs do not generally require additional engineering or design consideration. Larger-scale projects and activities may require detailed

engineering drawings that are informed by physical site conditions and an understanding of the cause of the maintenance need.

During the spring months, the year's maintenance projects are further refined and described, appropriate mitigation will be identified (following the guidelines presented below), and the relevant regulatory agencies overseeing permitting are notified. Regulators also go on a field tour of the sites. Projects are then implemented during the summer season, when the channels are at their driest. During the fall, an annual summary report of the year's maintenance, mitigation, and monitoring activities is distributed to the permitting agencies.

Timing of Work

The core SMP maintenance activities of sediment management, vegetation management, and bank stabilization can be classified either as causing ground disturbance or not. All ground-disturbing maintenance activities occurring in the channel (including sediment removal and bank stabilization) will take place during the low-flow period, between June 15 and October 31. Exceptions may be made for emergencies or on a project-by-project basis with advance approval of federal and state regulatory agencies as appropriate. Ground-disturbing activities will only be conducted during periods of dry weather. For non ground-disturbing work (vegetation thinning/pruning) may be conducted in the channel zone beyond the primary maintenance work window of June 15 to October 31, if the channel is dry (and with notification and approval by the relevant agencies).

Construction Methods

SCWA's preferred approach for construction activities is to use the least environmentally impacting approach that is reasonable, not prohibitive in cost, and time-efficient.

For sediment removal projects, different types of equipment are used to achieve these goals. For reach scale sediment removal projects, an excavator or bulldozer may be used. Using an excavator avoids the need for equipment access ramps and reduces direct in-channel impacts such as reductions in water quality or disturbances to aquatic habitat. For project areas where using an excavator from the top-of-bank is not possible, or would cause major vegetation impacts, sediment removal equipment is used within the channel. For larger equipment, this requires the construction of temporary access ramps. Smaller equipment is often lowered directly into the channel from a stream crossing. For smaller scale localized sediment removal or culvert clearing projects small Bobcats® or small hand-led power-shovels are used within the culvert. Whether small or large projects, sediment removed from the channel is placed in 10- or 20- cubic yard dump trucks (typically parked on the access road adjacent to the channel or on the stream crossing) and prepared for off-site hauling and disposal.

Vegetation management techniques include hand removal using small tools and hand-held equipment, mechanical removal using heavy equipment, and spot chemical control. Heavy equipment used for vegetation removal may include a flail mower attachment on an excavator or Bobcat® that is used to cut cattails or blackberries; or a backhoe or rubber-tracked excavator that is used for removing material from the channel. In addition,

herbicides may be used in SCWA-maintained channels and on unpaved access roads. In-channel use of herbicides is limited to direct application, using a paintbrush, on stumps of trees that have been removed during maintenance. On unpaved access roads, herbicides would be sprayed from a truck-mounted rig during the spring to remove weeds from the roadway and to protect the integrity of the road. Spraying usually occurs very early in the morning (beginning at approximately two or three o'clock AM) and concludes around nine o'clock AM to reduce the possibility of recreational users at the sites that are also recreational facilities. During the application, roads are closed to the public and remain so until the application dries to reduce the risk of incidental exposure.

Bank stabilization activities draw upon a palette of bioengineering techniques addressing slope stability. These approaches include using engineered back filled soils, erosion control fabric, and planting of native riparian trees at the top-of-bank and the toe-of-slope to provide additional bank stability, increased canopy in the channel, and if the situation requires it, use of riprap to anchor the toe of the bank. Riprap is typically used if a bank is eroded at a culvert outfall and requires additional strengthening. Where soil compaction, erosion control fabrics, and revegetation are not adequate in providing a stable slope on their own, other bioengineered solutions would be prioritized over the use of hardscape installations. Equipment used for bank stabilization activities may include excavators, bulldozers, and front-end loaders for bank grading and earth moving activities. Staging occurs on adjacent access roads. Soil and riprap is staged in areas that have been previously disturbed (i.e., service road, turn-outs, etc).

Program Tracking

A key element of the SMP is to establish and maintain a comprehensive data management system. Data management is required throughout the SMP work cycle including: organizing the initial stream assessment and inventory, characterizing reach conditions, identifying maintenance needs, identifying sensitive habitats, weed populations, or other environmental considerations, documenting the implemented maintenance activities, documenting and tracking the implementation of restoration and mitigation activities, monitoring the on-going status of mitigation activities; and tracking all regulatory reporting requirements. The SMP database organizes all of this information and other data including reach assessment sheets, GIS mapping, habitat assessment sheets, and aerial photography. This SMP database provides a consistent and transparent way to monitor overall Program activities, permitting compliance, and track habitat and canopy development.

Program Reporting

At the conclusion of each year's maintenance season a summary report is developed, posted to the Program website, and submitted to the appropriate regulatory agencies. This report includes: a summary of the year's maintenance projects describing what activities occurred and where; a description and confirmation of the restoration and mitigation activities implemented during the current year mitigation; a status and monitoring report of on-going mitigation activities initiated during previous seasons; and other Program updates as necessary. The report may include additional information on project area conditions, activities employed, the effectiveness of certain activities, possible recommendations for

future maintenance, or suggestions to improve the Program's implementation and management.

Program Review

Following the submittal of the annual maintenance report, regulatory agency staff are invited to a review meeting to discuss the events, maintenance activities, and lessons learned over the past work cycle. The SMP data system, GIS system, and BMP Manual is also updated and revised (if necessary) at the conclusion of the annual work cycle. These meetings and data updates help adaptively manage the SMP and improve Program effectiveness.

In addition, every 5 years, SCWA and the permitting agencies will review the SMP for its overall effectiveness. This review will include an assessment of maintenance activities conducted to date, BMPs employed, adequacy of the SMP Mitigation Program, SMP data management, adequacy of SMP adaptive updates and revisions, and overall Program coordination and communication between SCWA and the regulatory permitting agencies.

Programmatic Avoidance and Minimization Measures

Maintenance Principles

The following maintenance principals were developed as planning guidelines to avoid and minimize environmental impacts of the Program. As planning principles, these approaches are used in the development of each year's maintenance workplan, prior to any work occurring. The SMP Manual provides additional detail on how these principles are used.

- No Unnecessary Intervention
- Understand the System and its Processes
- Consider Adjacent Land Uses
- Apply System Understanding to Maintenance Actions
- Manage for Incremental Ecologic Improvement
- Integrate Maintenance Activities Towards Sustainability (reduced frequency of maintenance)

When applied, these principles determine when action is needed, consider the natural function of the system, provide an understanding of local physical constraints, identify sensitive habitats, consider watershed processes, identify the maintenance activities needed at the reach and site scale, and seek solutions to minimize the on-going need for maintenance activities at a particular site or reach.

Best Management Practices

The maintenance activities undertaken under this SMP incorporate a range of measures to minimize undesired effects on the environment and ensure consistency with SCWA's sustainability policy and goals. Specific Best Management Practices (BMPs) were created

for the SMP that encompass the Program's range of activities and the environmental conditions of the Program Area. Program BMPs are included in Table 2-1. Included are measures to protect natural resources, as well as "good-neighbor" policies intended to reduce effects of maintenance activities on neighboring land uses. Table 2-1 organizes the BMPs at a programmatic and activity-specific scale.

Program Mitigation

The mitigation planning approach follows a three-tiered system where mitigation opportunities are sought sequentially. Tier 1 mitigation is implemented on-site at the specific project reach where the maintenance work was conducted. Mitigation approaches on-site seek to enhance and restore the stream and aquatic functions and resources (in-kind) that were impacted through the maintenance activities.

Tier 2 mitigation is similar to Tier 1 mitigation in seeking in-kind mitigation in stream channels that had undergone maintenance. However, Tier 2 mitigation is applied at other stream channels, and is therefore not specifically on-site. Tier 2 mitigation is sought when there are no suitable opportunities for enhancement or restoration on-site at a specific channel reach and the next best opportunity is to pursue in-kind mitigation at a neighboring reach that does afford an opportunity for mitigation.

Tier 3 mitigation is off-site mitigation that provides compensating watershed based functions and values to SMP program impacts. Tier 3 mitigation addresses residual impacts from SMP activities that are not adequately avoided or minimized as described above or mitigated through Tier 1 and 2 mitigation actions. The Tier 2 and Tier 3 off-site mitigation address the temporary loss of Beneficial Uses and ecological functions and values during the time gap between SMP maintenance activities and when Tier 1 mitigation occurs, and the time when Tier 1 mitigation has become fully functional and the temporary impacts have been eliminated. Tier 3 mitigation provides restorative and mitigating watershed solutions for SMP impacts. Tier 3 mitigation is not only different in its geographic scope, it is also different in that it is not solely a SCWA effort, but is a collaborative effort with partnering agencies. This is accomplished through the off-site watershed mitigation program, whereby SCWA funds Tier 3 projects to be implemented with local non-profit agencies, municipalities, restoration organizations, creek groups, schools and Resource Conservation Districts.

Public Involvement Process

Scoping Comment Period

In accordance with State CEQA Guidelines (14 CCR 15082[a], 15103, 15375), SCWA circulated a Notice of Preparation (NOP) of an EIR for the Proposed Program on August 31, 2004 (see Appendix A). The NOP, in which SCWA was identified as lead agency for the Proposed Program, was circulated to the public; to local, state, and federal agencies; and to other interested parties. The purpose of the NOP was to inform responsible agencies and the public that the Proposed Program could have significant effects on the environment and

to solicit their comments. Concerns raised in response to the NOP were considered during preparation of this DEIR (see Appendix B).

Public and Agency Review of PEIR

This document will be circulated to local, state, and federal agencies and to interested organizations and individuals who may wish to review and comment on the report. Its publication marks the beginning of a 45-day public review period. Written comments or questions concerning this DEIR should be directed to the name and address listed below.

Submittal of written comments via e-mail (Microsoft Word format) would be greatly appreciated.

Keenan Foster, Senior Environmental Specialist Sonoma County Water Agency
P.O. Box 11628
Santa Rosa, CA 95406
(707) 547-1941
fax: (707) 524-3782
e-mail: keenan.foster@scwa.ca.gov

All documents mentioned herein or related to this Program can be reviewed any SCWA business day between the hours of 8:00 a.m. and 5:00 p.m. at SCWA offices, located at the following address:

Sonoma County Water Agency
404 Aviation Blvd.
Santa Rosa, CA 95403

Preparation of Final PEIR and Public Hearing

Written and oral comments received in response to the DEIR will be addressed in a Response to Comments addendum document which, together with the DEIR, will constitute the entire EIR. After review of the Program and the EIR, SCWA staff will recommend to the SCWA Board of Directors whether to approve or deny the Program. The Board of Directors will then review the Program, the EIR, staff recommendations, and public testimony and decide whether to certify the EIR and whether to approve or deny the Program.

If the Board of Directors approves the Proposed Program in spite of significant impacts identified by the EIR that cannot be mitigated, it must state in writing the reasons for its actions. A Statement of Overriding Considerations must be included in the record of the Program approval and mentioned in the Notice of Determination (14 CCR 15093[c]).

Areas of Known Controversy

Based on input during the scoping period (see *Public Involvement Process*, above), several areas of public concern have been identified regarding the SMP. Some of the issues raised

might be considered controversial. These issues are discussed below. The intent is not to provide a comprehensive discussion of issues and concerns, rather, to highlight the issues of apparent greatest concern raised in comment to date. The following areas of public concern have been identified regarding the SMP.

- Homelessness in SCWA-maintained channels, and associated issues
- Trash, feces, and debris in SCWA-maintained channels
- Emergency vehicle access onto SCWA-maintained channels (access road maintenance)
- Fire risk at SCWA-maintained channels
- Recreational access in channels
- Herbicide use in channels
- Consideration of the entire watershed and riparian ecosystem in SMP development
- Ecological values of SMP channels, and habitat restoration and enhancement
- Ecological maintenance approaches and use of BMPs
- Use of a technical/public advisory committee in development and review of the SMP and EIR
- Leveraging other existing documents, such as those associated with the Santa Clara Valley Water District's Stream Maintenance Program
- Flood Control Design Criteria updates and related standards
- SMP consistency with relevant General Plans
- Development and implementation of landscaping standards
- Land acquisition and conservation easements
- Use of community/citizen groups and non-profits in SMP maintenance

Key Issues and Significant Impacts

This section discusses key issues of concern relative to the Proposed Program and the conclusions of this document regarding those issues, as well as any significant impacts that were identified. This is not a comprehensive discussion of impacts of the Proposed Program, for which the reader is directed to Table ES-1, Summary of Impacts and Mitigation Measures, at the end of this chapter.

Environmental factors potentially affected by the SMP include:

- aesthetics,
- air quality,

- biological resources,
- cultural resources,
- geology, soils and seismicity,
- hazardous materials,
- hydrology and water quality,
- noise,
- public services and facilities,
- recreation, and
- transportation and traffic.

Chapters 3 and 4 of this EIR document address each of these environmental topics and the impacts of the SMP.

Specific issues that were determined in this EIR to have significant and unavoidable impacts relate to aesthetics, noise, and cumulative air quality impacts. See Chapters 3.1 *Aesthetics*, 3.9 *Noise*, and Chapter 4 *Other Statutory Considerations* (which discusses cumulative air quality impacts) for a detailed discussion of these impacts.

Temporary Impacts from Maintenance Activities

In general, the primary adverse impacts of SMP activities are short-term, occurring during maintenance, and the period immediately following maintenance. Temporary impacts include adverse effects on aesthetics, dust and emissions from maintenance vehicles, degradation of riparian habitat and associated species, potential exposure to sites of existing chemical contamination, potential for accidental releases of hazardous materials associated with maintenance vehicles and herbicide use, releases of sediment and related effects on water quality, interference with emergency access and response, reduced recreational opportunities or quality during or after maintenance, and effects on local traffic from maintenance vehicles and hauling of sediment and other debris.

However, the SMP includes a multi-tiered program to avoid, minimize and compensate for impacts. First, the SMP involves pre-maintenance impact avoidance through the use of maintenance principles. These principles include conducting no unnecessary maintenance or intervention, and to target maintenance activities to reduce their impact. Second, during maintenance activities, a variety of BMPs would be implemented. Following maintenance, revegetation and other on-site mitigation would be implemented to shorten the duration of site recovery. Finally, the SMP includes a compensatory mitigation program to offset residual impacts related to biological resources and water quality (e.g., those impacts not mitigated to a level of insignificance by BMPs and on-site mitigation). With the exception of noise impact in the City of Santa Rosa and the cumulative air quality impact, both discussed below, all short-term impacts of the SMP would be reduced to a level of insignificance.

Long-Term Impacts from Maintenance Activities

Over the long term, SMP activities are anticipated to provide a variety of beneficial impacts. Not only does the SMP provide channel maintenance, it will help establish a developed riparian corridor along the maintained channels, resulting in incrementally improved conditions over time (i.e., ecological lift). This will result in enhanced habitat values, improved water quality, and better aesthetic quality and recreational value.

Several long-term adverse impacts have also been identified. First, there is a small possibility that SMP activities could result in harm to existing archeological deposits. Since the natural streams have been modified from their original form into flood control channels, and have been maintained for several decades, this is unlikely, but remains possible. BMPs have been identified to address cultural resource treatment and data recovery. In addition, reconstruction of certain SMP facilities, such as culverts, could be exposed to seismic or other geologic/geotechnical hazards; however, all facilities will be designed in accordance with accepted engineering practices such that the risk posed to new structures would be the same as, or less than, that related to existing conditions.

Significant and Unavoidable Impacts

Aesthetic Impacts of Maintenance Activities

Overall, the long-term effect of maintenance activities would result in a beneficial impact on the aesthetic conditions in the Program Area. However, temporary degradation of visual quality due to site disturbance from maintenance activities could affect sensitive viewer groups. Although BMPs and revegetation activities would be implemented, these short-term adverse impacts would still be considered to be significant. In order to achieve the longer-term goals of the Program, these temporary adverse visual impacts are unavoidable. As such, this is considered a significant and unavoidable impact. For a more complete discussion of this impact, please refer to the discussion under Impact AES-2 (Chapter 3.1 *Aesthetics*).

Aesthetic Impacts of Sediment Disposal

Generally, sediment disposal activities have less than significant impacts. However, in cases where SCWA gives the sediment to another entity, SCWA would not necessarily have control over what is done with the sediment. This could potentially result in adverse aesthetic impacts. For instance, sediment could be used by private land developers to build berms or building pads which could have adverse visual effects. Such adverse visual impacts would be unlikely and infrequent. However, because they are possible, and because SCWA does not have the authority to require mitigation in all cases, this impact was identified as significant and unavoidable. For a more complete discussion of this impact, please refer to the discussion under Impact AES-4 (Chapter 3.1 *Aesthetics*).

Temporary Noise Impacts in the City of Santa Rosa

Maintenance activities would be temporary, short-term, and would only occur during business hours on weekdays. As such, maintenance activities would conform to the noise ordinances associated with most jurisdictions, which restrict the hours of construction

noise. Further, modeled noise levels from maintenance activities would be below the numeric standards of most jurisdictions which have such standards. However, the City of Santa Rosa has a stringent noise control standard, which requires that noise from machinery does not exceed ambient noise levels by more than 5 A-weighted decibels (dBA). Ambient noise levels in the City range between 55 and 70 dBA, depending upon land use. Because the noise from maintenance equipment would exceed 70 dBA in proximity to the work sites, the SMP has the potential to violate the City of Santa Rosa's noise control standard. Additional mitigation beyond that identified, such as temporary noise barriers, is not considered feasible. As such, this impact was identified as significant and unavoidable. For a more complete discussion of this impact, please refer to the discussion under Impact NZ-1 (Chapter 3.9 *Noise*).

Cumulative Emissions of PM10 and Ozone Precursors

Channel maintenance activities would involve ground disturbance and vehicle usage that would emit both particulates and ozone precursors. Given the non-attainment status for these pollutants in the San Francisco Bay Air Basin, any contribution to these significant cumulative impacts would be considerable. While implementation of BMPs AQ-1 and AQ-2 would reduce PM₁₀ emissions, they would not address the emissions of ozone precursors, nor would they fully eliminate PM₁₀ emissions. No other feasible mitigation has been identified to further reduce emissions of these pollutants. As such, this cumulative impact is considered significant and unavoidable. For a more complete discussion of this impact, please refer to the discussion under Impact CUM-1 (Chapter 4, *Other Statutory Considerations*).

Alternatives Considered

The purpose of the alternatives analysis in an EIR is to describe a range of reasonable alternatives to the Program that could feasibly attain most of the objectives of the Program. Section 15126.6 (b) of the CEQA Guidelines requires that the alternatives reduce or eliminate significant adverse environmental effects of the Proposed Program; such alternatives may be more costly or otherwise impede to some degree the attainment of the Program's objectives. The range of alternatives considered must include those that offer substantial environmental advantages over the Proposed Program and may be feasibly accomplished in a successful manner considering economic, environmental, social, technological, and legal factors. The analysis evaluates the comparative merits of the alternatives (CEQA Guidelines, Section 15126.6[a]).

The following alternatives have been evaluated for their feasibility and their ability to achieve most of the Program objectives while avoiding, reducing, or minimizing significant impacts identified for the Proposed Program:

- No Program Alternative
- Programmatic Alternatives
 - Reduced Maintenance Alternative
 - Increased Maintenance Alternative

- Expanded Maintenance in Modified and Natural Channels Alternative
- Alternative Methods
 - Alternative Bank Stabilization Approach
 - Alternative Vegetation Management Approach
 - Alternative Sediment Removal Approach

These alternatives (with the exception of the No Program Alternative) were determined to be feasible or potentially feasible and would generally meet the Program objectives.

No Program Alternative

Under the No Program Alternative, SCWA would not implement a programmatic approach to channel maintenance, as identified under the Proposed Program. Under the reasonably foreseeable No Program scenario, current maintenance practices would continue annually and would be permitted on a project-by-project basis. Because the activities are similar under the No Program Alternative compared to the Proposed Program, the impacts under this alternative would be somewhat comparable. However, stream maintenance activities would not necessarily benefit from the use of a consistent and comprehensive set of BMPs or programmatic on-site and off-site mitigation approaches. As such, the impacts of stream maintenance could be greater under this alternative, if appropriate mitigation or BMPs were not implemented.

In addition, obtaining necessary regulatory permits on a project-by-project basis can be a lengthy process, and it is likely that certain projects would not obtain permits in a timely manner (i.e., to allow work to be completed during the first dry season following the identification of the need for the project). As such, the impacts caused by the failure to conduct maintenance may persist for one or more additional storm seasons. In the case of sediment and vegetation management projects, the primary impact is flooding, with corresponding potential for loss of life and property. SCWA has documented cases where flooding has occurred when work was delayed by the permitting process. In the case of bank stabilization, impacts include damage to infrastructure should the bank failure worsen, as well as continued sediment inputs and corollary impacts to water quality and instream habitat.

Programmatic Alternatives

Reduced Maintenance Alternative

The Reduced Maintenance Alternative would set a reduced limit to the annual volume of sediment to be removed from the Program's channels. The Reduced Maintenance Alternative would establish a maximum annual sediment removal volume at 10,000 cubic yards. The reduced sediment removal volume would require SCWA to prioritize sediment removal at the most threatened and impacted channels, where conveyance capacity is most greatly reduced. Based on sediment removal records from recent years (2006-2008), establishing an annual sediment removal limit at 10,000 cubic yards could reduce sediment removal activities by more than 50%.

Activities conducted would consist of those requiring minimal work effort and the least invasive methods to restore the flood recurrence interval. Depending on channel requirements and conditions, preference for vegetation management would generally be given over sediment removal.

Under this alternative, stream maintenance activities, to the extent that they are conducted, would have similar impacts to those of the Proposed Program, although to a reduced extent due to the reduced extent of stream maintenance. This alternative may result in reduced impacts related to dewatering, truck hauling and sediment disposal. This would include impacts to traffic on local roadways, air emissions and noise from maintenance vehicles, and potential impacts to biological resources, cultural resources, and water resources at the dewatering and sediment disposal sites. Similar to the Proposed Program, BMPs would be implemented as part of this alternative which would mitigate all of these impacts to a less than significant level.

However, this alternative, in limiting the extent of sediment removal activities, would also considerably increase the risk of flooding in the Program Area. An increased flood risk could occur following particularly wet years when more sediment has been deposited in area channels and maintenance needs are greater. When a series of wet years occurs in progression, this impact is magnified. Under such conditions, having such a limit on sediment removal activities, compared to the flexibility of the Proposed Program, would increase the flood risk.

Increased Maintenance Alternative

Under this alternative, the channels with the most severe and chronic flooding and sediment/vegetation buildup would be maintained to original as-built conditions, while other channels less affected by sediment and vegetation would be maintained according to the more environmentally sensitive approaches of the SMP. Channels requiring the most intensive management would likely encompass approximately 30% of the SCWA-maintained channels, and include creeks such as Hinebaugh, Santa Rosa, Adobe, East Washington, and Washington. Streams with chronic problems but significant resource concerns, such as Copeland Creek or the Laguna, would not be returned to as-built conditions.

By proactively maintaining certain channels to as-built condition, this alternative could reduce flood risk compared to the Proposed Program. This could reduce the risks to life and property associated with flooding. However, during initial stages of activity under this alternative, the additional amount of work would mean that air emissions from maintenance vehicles, dust from maintenance sites, potential water quality impacts, impacts to aquatic resources from dewatering, and impacts to traffic, noise, and recreation along SMP channels, would be more intense. Similarly, the need for additional sediment disposal would result in increased impacts at sediment disposal sites.

In addition, over the long term, maintenance of the channels in a denuded state with reduced instream channel complexity would result in reduced aesthetic quality (and associated effects on recreation activities), reduced habitat quality, and the loss of water quality benefits compared to the condition of the channels under SMP-style maintenance.

Expanded Maintenance in Modified and Natural Channels Alternative

The Expanded Maintenance in Modified and Natural Channels Alternative (Expanded Maintenance Alternative) would be the same as the Proposed Program, except that natural and modified channels would be maintained using the same methods and extent of activities as engineered channels. The inclusion of natural channels would further promote a watershed-wide approach to flood management, with less regard to habitat concerns associated with modified and natural channels.

By proactively conducting sediment and vegetation management in modified and natural channels, this alternative could reduce flood risk compared to the Proposed Program. This could reduce the risks to life and property associated with flooding. However, the additional amount of work conducted would mean that air emissions from maintenance vehicles, dust from maintenance sites, potential water quality impacts, and impacts to traffic, noise, and recreation along SMP channels, would be more intense, and in new and different locations. Similarly, the need for additional sediment disposal would result in increased impacts at sediment disposal sites.

In addition, the modified and natural streams often represent the locations in the SMP with the greatest ecological value. Many of these streams possess a developed riparian corridor and complex instream structure, providing amenities such as maintenance/treatment of water quality and habitat for both common and special-status species. While maintenance activities would be as non-invasive as possible, some of the ecological value of these channels would inevitably be compromised.

Alternative Methods

Alternative Bank Stabilization Approach

This alternative method proposes an expanded use of riprap and other bank hardening methods instead of biotechnical stabilization techniques to repair and stabilize bank slopes. Installation of additional riprap would reduce future bank slope failures and instabilities due to soil erosion and wildlife activity that can occur over time with the use of biotechnical methods. Because this alternative method for bank stabilization would reduce the need for future maintenance at these sites, it is likely to reduce the costs and resources required to implement these activities within the Program Area. In addition, the use of rocks for bank stabilization would impede unwanted vegetation growth, thereby reducing the need for vegetation management at these sites.

Under this alternative, the ecological and aesthetic benefits associated with biotechnical bank stabilization techniques would not be realized. These include establishment of native soil and vegetative cover which can shade the channel and provide habitat for birds and other species. Installation of boulders and rootwads or other structures can provide bank protection and additional habitat complexity while the vegetation establishes. Overall, the locations of bank stabilization under this alternative would exhibit reduced aesthetic quality (and associated effects on recreation activities), reduced habitat quality, and the loss of water quality benefits compared to the biotechnical approaches as included in the Proposed Program.

Alternative Vegetation Management Approach

Two options are proposed under the Vegetation Management Alternative. Under the first option, Option A, no revegetation activities would be implemented. This would mean that once vegetation was removed as part of management activities, Tier 1 revegetation or canopy development planting would not be implemented. Option B vegetation management would be implemented without herbicide use.

Option A would reduce the amount of effort needed to implement the overall SMP. Air emissions and traffic associated with transport of materials for revegetation, as well as the site-specific effects of revegetation activities (such as noise impacts), would be reduced. However, this alternative would greatly increase the recovery time of channels following maintenance. While natural recruitment would occur over time, it is likely that vegetation would be dominated by undesirable species such as invasive, (non-native and ruderal) annual grasses and forbs, cattails, ludwigia, blackberries, and non-native tree species such as *Ailanthus* spp. In some cases, channel or bank stability may be compromised by the lack of vegetation, and features such as low-flow channels may not persist. The channels would be less likely to experience ecological lift over time, and overall, these streams would experience reduced habitat quality, reduced aesthetic quality (and associated effects on recreation activities), and the loss of water quality benefits compared to their condition under the Proposed Program.

Option B would eliminate adverse impacts associated with use of herbicides, including effects on human health, non-target species, and water quality. However, without use of herbicides, additional effort would be needed by maintenance crews using hand tools and mechanized equipment in support of vegetation management. Certain types of vegetation would be difficult, if not impossible, to control, resulting in persistent degraded habitat conditions. Air emissions and traffic associated with maintenance worker trips and mowing equipment, as well as the site-specific effects of vegetation management such as noise impacts, would be increased.

Alternative Sediment Removal Approach

Under this alternative, sediment removal would be entirely conducted from the top-of-bank, without use of heavy equipment placed in the channel. Sediment removal activities would avoid direct in-channel impacts resulting from the presence of heavy equipment in the channel. Damage to riparian vegetation might result where few clear access points exist. In such cases, equipment and staging sites for sediment removal would be selected to maximize efficiency and minimize environmental impacts given the specific constraints at the site. In many locations, due to the presence of vegetation, sediment removal from top of bank may be difficult or impossible, and would result in expanded effort for maintenance, or an absence of maintenance in those locations. In these cases, increased flood risk would result compared to the Proposed Program, with corresponding risks to life and property.

Comparison of Alternatives and the Environmentally Superior Alternative

Weighing all issues, the Proposed Program is considered to be environmentally superior. Compared to any of the alternatives, it strikes the most appropriate balance between

managing flood risk, protecting the ecological integrity of the SMP channels, and addressing other short- and long-term impacts associated with stream channel maintenance.

This fact notwithstanding, CEQA requires that an environmentally superior alternative be selected from among the alternatives to the Proposed Program. The Reduced Maintenance Alternative is considered the environmentally superior alternative, since by limiting the amount of work it would limit the impacts associated with such work. However, while the Reduced Maintenance Alternative would lessen potential Program impacts, it does not provide the same level of flood management as the Proposed Program. Providing up to 10,000 cubic yards of sediment removal annually would provide a certain level of maintenance, and in many years this may be adequate to address flood risk. However, observations and sediment removal records from recent years indicate that maintenance requirements for the Program's channels may require up to 25,000 cubic yards of sediment removal annually. It is useful to note that the 25,000 cubic yard annual sediment removal limit of the proposed SMP Program is already a much reduced volume compared to what the *Return to As-Built Alternative* as described above would require.

The other programmatic alternatives were not selected as the environmentally superior alternative for the following reasons:

- ***No Program Alternative.*** While this alternative would ultimately achieve flood protection goals, maintenance would not necessarily be conducted in a timely manner to avoid flood hazards. Further, maintenance activities would not benefit from the use of a comprehensive mitigation approach and consistent set of BMPs. As such, flood risk would be greater, while at the same time, more residual impacts would remain.
- ***Increased Maintenance and Expanded Maintenance in Modified and Natural Channel Alternatives.*** These alternatives would reduce flood risk. However, this factor was overwhelmed by the substantially greater short-term impacts from the increased amount of maintenance, as well as greater long-term impacts from maintaining channels in their as-built condition (Increased Maintenance Alternative) or conducting extensive maintenance activities in natural and modified streams (Expanded Geographic Scope Alternative).

The alternative maintenance methods were not selected as the environmentally superior alternative for the following reasons:

- ***Alternative Bank Stabilization Approach.*** Compared to biotechnical techniques, the increased durability of riprap and bank hardening approaches were not considered advantageous enough to outweigh their reduced ecological benefits.
- ***Alternative Vegetation Management Approach, Option A – No Revegetation.*** While this alternative would reduce the amount of maintenance work necessary, reducing associated short-term impacts, this was outweighed by the long-term impacts to channel ecology.

- ***Alternative Vegetation Management Approach, Option B - No Herbicides.*** The ecological and human health impacts associated with proper use of herbicides would be minimal. Additionally, the difficulty or inability to control certain types of vegetation without herbicide use would increase the level of effort and short-term impacts associated with maintenance work, as well as reduce the long-term integrity of channel ecology.
- ***Alternative Sediment Removal Approach.*** While use of equipment exclusively from top-of-bank would eliminate the impacts from use of in-channel equipment, this would be outweighed by the riparian impacts associated with use of such equipment, and the inability to provide adequate flood protection in certain locations.

Summary of Impacts and Levels of Significance

The impacts of the Proposed Program, proposed mitigation, and significance conclusions are discussed in detail in Chapters 3 and 4. Table ES-1 summarizes the impacts, mitigation measures, and levels of significance identified in this document.

Table ES-1. Summary of Potential Impacts and Mitigation Measures

Potential Impact	Level of Significance before Mitigation	Mitigation Measures (BMPS from Table 2-1)	Level of Significance after Mitigation
3.1 Aesthetics			
AES-1: Alteration to a Scenic Vista	NI	-	-
AES-2: Alteration to Scenic Resources within a State Scenic Highway	PS	BMP GN-1: Work Site Housekeeping	LTS
AES-3: Temporary Alteration of Visual Character or Quality from Maintenance Activities	PS	BMP VEG-1: Removal of Existing Vegetation BMP VEG-2: Use of Herbicides BMP VEG-3: Planting and Revegetation After Soil Disturbance BMP GN-1: Work Site Housekeeping	SU
AES-4: Permanent Alteration of Visual Character or Quality from Maintenance Activities	B	-	-
AES-5: Alteration to Visual Character or Quality from Sediment Disposal Activities	PS	BMP GEN-2: Staging and Stockpiling of Materials	SU
AES-6: Substantial Alteration to Day or Nighttime Views due to Additional Light or Glare	NI	-	-
3.2 Air Quality			
AIR- 1: Temporary Increase in Emissions During Maintenance Activities	PS	BMP AQ-1: Dust Management (based on Bay Area Air Quality Management District's basic dust control measures for all sites) BMP AQ-2: Enhanced Dust Management (based on Bay Area Air Quality Management District's enhanced dust control measures for sites greater than 4 acres)	LTS
AIR- 2: Construction-Related Diesel Health Risk	LTS	-	-

Table ES-1. Summary of Potential Impacts and Mitigation Measures

Potential Impact	Level of Significance before Mitigation	Mitigation Measures (BMPS from Table 2-1)	Level of Significance after Mitigation
AIR-3: Creation of Objectionable Odors	PS	BMP GN-5: Odors	LTS
3.3 Biological Resources			
BIO-1: Temporary Loss or Disturbance of Aquatic Natural Communities	PS	<p><i>Maintenance Principles</i> See Chapter 5 of the SMP Manual</p> <p><i>Relevant BMPS</i> General Impact Avoidance and Minimization Biological Resources Protection Vegetation Management Water Quality and Channel Protection</p> <p><i>Programmatic Mitigation Tier 1, 2, 3</i> See Chapter 8 of the SMP Manual</p>	LTS
BIO-2: Temporal Disturbance to Upland Natural Communities	PS	<p>BMP GEN-3: Channel Access</p> <p>BMP BR-1: Area of Disturbance</p> <p>BMP BR-3: Biotechnical Bank Stabilization</p> <p>BMP VEG-1: Removal of Existing Vegetation</p> <p>BMP VEG-2: Use of Herbicides</p> <p>BMP VEG-3: Planting and Revegetation After Soil Disturbance</p>	LTS
BIO-3: Temporary Disturbance to Potential Habitat and Loss of Individual Populations of Special-Status Plants	PS	BMP BR-7: Special-Status Plants	LTS
BIO-4: Temporary Disturbance to Potential Habitat and Loss of Individual California Freshwater Shrimp	PS	BMP BR-9: California Freshwater Shrimp Avoidance and Impact Minimization for Vegetation Management	LTS
BIO-5: Temporary Disturbance to Potential Habitat and Loss of Individual Special-Status Fish	PS	<p>BMP BR-4: Impact Avoidance and Minimization During Dewatering</p> <p>BMP BR-5: Fish and Amphibian Species</p>	LTS

Table ES-1. Summary of Potential Impacts and Mitigation Measures

Potential Impact	Level of Significance before Mitigation	Mitigation Measures (BMPS from Table 2-1)	Level of Significance after Mitigation
BIO-6: Temporary Disturbance to Potential Upland Habitat and Loss of Individual California Tiger Salamander	PS	Relocation Plan BMP BR-6: On-Call Wildlife Biologist	LTS
		BMP BR-5: Fish and Amphibian Species Relocation Plan BMP BR-12: California Tiger Salamander Avoidance and Impact Minimization Measures for Sediment and Debris Removal	
		BMP BR-13: California Tiger Salamander Avoidance and Impact Minimization Measures for Bank Stabilization	
		BMP BR-14: California Tiger Salamander Avoidance and Impact Minimization Measures for Vegetation Management	
BIO-7: Temporary Disturbance to Potential Aquatic and Upland Habitat and Loss of Individual California Red-legged Frog	PS	BMP BR-5: Fish and Amphibian Species Relocation Plan	LTS
		BMP BR-10: California Red-legged Frog Avoidance and Impact Minimization Measures for Ground-Disturbing Activities	
		BMP BR-11: California Red-legged Frog Avoidance and Impact Minimization Measures for Vegetation Management	
BIO-8: Temporary Disturbance to Potential Aquatic Habitat and Loss of Individual Foothill Yellow-legged Frog	PS	BMP BR-5: Fish and Amphibian Species Relocation Plan	LTS
		BMP BR-15: Foothill Yellow-legged Frog Avoidance and Impact Minimization Measures for Ground-Disturbing Activities	
		BMP BR-16: Foothill Yellow-legged Frog Avoidance and Impact Minimization Measures for Vegetation Management	

Table ES-1. Summary of Potential Impacts and Mitigation Measures

Potential Impact	Level of Significance before Mitigation	Mitigation Measures (BMPS from Table 2-1)	Level of Significance after Mitigation
BIO-9: Temporary Disturbance to Potential Habitat and Loss of Individual Western Pond Turtle	PS	BMP BR-17: Western Pond Turtle Pre-maintenance Surveys for Ground-Disturbing Activities	LTS
BIO-10: Temporary Disturbance to Potential Nesting Habitat for Migratory Birds and Raptors	PS	BMP BR-8: Nesting Migratory and Raptor Pre-maintenance Surveys	LTS
BIO-11: Disturbance to Potential Roosting and Foraging Habitat for Special-Status Bat Species	PS	BMP BR-1: Area of Disturbance BMP BR-2: Pre-Maintenance Educational Training BMP BR-3: Biotechnical Bank Stabilization BMP BR-6: On-Call Wildlife Biologist	LTS
BIO-12: Control of Invasive Plant Species	B	-	-
BIO-13: Improve Water Quality and Aquatic Conditions for Special Status-Species	B	-	-
3.4 Cultural Resources			
CR-1: Disturbance to a Known Archeological or Historic Site	PS	BMP CR-1: Cultural Investigation and Report	LTS
CR-2: Disturbance to Unknown Archeological or Historic Sites, or Human Remains	PS	BMP CR-1: - Cultural Investigation and Report BMP CR-2: Previously Undiscovered Cultural Resources	LTS
CR-3: Impacts to Sensitive Paleontological Resources as a Result of Maintenance Activities	PS	BMP CR-3: Previously Undiscovered Paleontological Resources	LTS
3.5 Geology, Soils, and Seismicity			
GEO-1: Substantial Adverse Effects Resulting from Fault Rupture, Strong Seismic Ground Shaking, or Earthquake-Induced Liquefaction	LTS	-	-

Table ES-1. Summary of Potential Impacts and Mitigation Measures

Potential Impact	Level of Significance before Mitigation	Mitigation Measures (BMPS from Table 2-1)	Level of Significance after Mitigation
GEO-2: Substantial Adverse Effects Resulting from Unstable Geologic Units	PS	BMP GEN-3: Channel Access	LTS
3.6 Hazards and Hazardous Materials			
HAZ-1: Use, Transport, or Accidental Release of Hazardous Materials such that a Significant Hazard to the Public or Environment Would Result	PS	BMP HAZ-1: Spill Prevention and Response Plan BMP HAZ-2: Equipment and Vehicle Maintenance BMP HAZ-3: Equipment and Vehicle Cleaning BMP HAZ-4: Refueling BMP HAZ-5: On-Site Hazardous Materials Management BMP HAZ-6: Existing Hazardous Sites or Waste BMP HAZ-7: Fire Prevention BMP HAZ-8: Testing and Disposal of Spoils BMP VEG-2: Use of Herbicides	LTS
HAZ-2: Potential to Interfere with Emergency Response	PS	BMP GN-4: Traffic Flow, Pedestrians, and Safety Measures	LTS
HAZ-3: Be Located on a Known Existing Contaminated Site	PS	BMP HAZ-6: Existing Hazardous Sites or Waste	LTS
HAZ-4: Be Located on a Previously Undiscovered Contaminated Site	PS	BMP HAZ-1: Spill Prevention and Response Plan BMP HAZ-6: Existing Hazardous Sites or Waste BMP HAZ-8: Testing and Disposal of Spoils	LTS
HAZ-5: Create Safety Hazards from Public Access to Maintenance Sites	PS	BMP HAZ-1: Spill Prevention and Response Plan BMP HAZ-2: Equipment and Vehicle Maintenance	LTS

Table ES-1. Summary of Potential Impacts and Mitigation Measures

Potential Impact	Level of Significance before Mitigation	Mitigation Measures (BMPS from Table 2-1)	Level of Significance after Mitigation
		BMP HAZ-3: Equipment and Vehicle Cleaning BMP HAZ-4: Refueling BMP HAZ-5: On-Site Hazardous Materials Management BMP HAZ-6: Existing Hazardous Sites or Waste BMP HAZ-7: Fire Prevention BMP HAZ-8: Testing and Disposal of Spoils BMP VEG-2: Use of Herbicides BMP GN-4: Traffic Flow, Pedestrians, and Safety Measures	
HAZ-6: Create Safety Hazards or Releases of Hazardous Materials in Proximity to a School or Airport	PS	BMP HAZ-1: Spill Prevention and Response Plan BMP HAZ-2: Equipment and Vehicle Maintenance BMP HAZ-3: Equipment and Vehicle Cleaning BMP HAZ-4: Refueling BMP HAZ-5: On-Site Hazardous Materials Management BMP HAZ-6: Existing Hazardous Sites or Waste BMP HAZ-7: Fire Prevention BMP HAZ-8: Testing and Disposal of Spoils	LTS
HAZ-7: Exacerbation of Wildland Fires	PS	BMP HAZ-7: Fire Prevention	LTS
HAZ-8: Disposal of Contaminated Sediments	PS	BMP HAZ-8: Testing and Disposal of Spoils	LTS
HAZ-9: Mosquito Abatement	LTS	-	-
3.7 Hydrology, Geomorphology, and Water Quality			
HYD-1: Water Quality Degradation Resulting in Violation of Water Quality Standards or	PS	BMP GEN-1: Work Window BMP GEN-2: Staging and Stockpiling of	LTS

Table ES-1. Summary of Potential Impacts and Mitigation Measures

Potential Impact	Level of Significance before Mitigation	Mitigation Measures (BMPS from Table 2-1)	Level of Significance after Mitigation
Waste Discharge Requirements due to Ground Disturbance		Materials BMP BR-1: Area of Disturbance BMP BR-3: Biotechnical Bank Stabilization BMP VEG-3: Planting and Revegetation After Soil Disturbance BMP WQ-1: Apply Erosion Control Fabric to Exposed Soils BMP WQ-2: Prevent Scour Downstream of Sediment Removal	
HYD-2: Water Quality Degradation Resulting in Violation of Water Quality Standards or Waste Discharge Requirements due to Dewatering	PS	BMP BR-4: Impact Avoidance and Minimization During Dewatering	LTS
HYD-3: Water Quality Degradation Resulting in Violation of Water Quality Standards or Waste Discharge Requirements due to Accidental Release of Hazardous Materials	PS	BMP HAZ-1: Spill Prevention and Response Plan BMP HAZ-2: Equipment and Vehicle Maintenance BMP HAZ-3: Equipment and Vehicle Cleaning BMP HAZ-4: Refueling BMP HAZ-5: On-Site Hazardous Materials Management	LTS
HYD-4: Water Quality Degradation Resulting in Violation of Water Quality Standards or Waste Discharge Requirements due to Use of Herbicides	PS	BMP VEG-2: Use of Herbicides	LTS
HYD-5: Temporary Water Quality Degradation Resulting in Violation of Water Quality Standards or Waste Discharge Requirements due to Disturbance of Existing Contamination	PS	BMP HAZ-8: Testing and Disposal of Spoils	LTS

Table ES-1. Summary of Potential Impacts and Mitigation Measures

Potential Impact	Level of Significance before Mitigation	Mitigation Measures (BMPS from Table 2-1)	Level of Significance after Mitigation
HYD-6: Long-Term Water Quality Degradation Resulting in Violation of Water Quality Standards or Waste Discharge Requirements due to Disturbance of Existing Contamination	B	-	-
HYD-7: Temporary Water Quality Degradation Resulting in Violation of Water Quality Standards or Waste Discharge Requirements due to Sediment Handling and Disposal	PS	BMP HAZ-8: Testing and Disposal of Spoils	LTS
HYD-8: Temporary Erosion, Siltation, or Flooding due to Alternations to Drainage Patterns	PS	BMP VEG-3: Planting and Revegetation after Soil Disturbance BMP WQ-1: Apply Erosion Control Fabric to or Hydroseeding of Exposed Soils	LTS
HYD-9: Permanent Erosion, Siltation, or Flooding due to Alternations to Drainage Patterns	B	-	-
HYD-10: Permanent Water Quality Degradation Resulting in Violation of Water Quality Standards or Waste Discharge Requirements due to Sediment Handling and Disposal	B	-	-
HYD-11: Reducing Nutrient Loading to 303(d)-listed Waterbodies	B	-	-
HYD-12: Create or Contribute Runoff Water That Would Provide Substantial Additional Sources of Polluted Runoff	B	-	-
HYD-13: Harm to People, Structures, or Water Quality due to Flooding	B	-	-
HYD-14: Alterations to the Recharge, Quality, or Quantity of Groundwater	B	-	-
HYD-15: Seiche, Tsunami or Mudflow	NI	-	-

Table ES-1. Summary of Potential Impacts and Mitigation Measures

Potential Impact	Level of Significance before Mitigation	Mitigation Measures (BMPS from Table 2-1)	Level of Significance after Mitigation
3.8 Land Use and Planning			
LU-1: Disruption or Division of Existing Land Uses or Neighborhoods	LTS	-	-
LU-2: Incompatibility with Adjacent Land Uses and Inconsistencies with Applicable Land Use Designations and Zoning	LTS	-	-
LU-3: Conflicts with Habitat Conservation Plans or other Land Conservation Plans	LTS	-	-
3.9 Noise			
NZ-1: Exposure of the Public to Noise Levels in Excess of City or County Standards	PS	BMP GN-3: Noise Control	SU (in Santa Rosa)/ LTS (all other areas)
NZ-2: Result in a Temporary Significant Increase in Noise Above Ambient Levels	PS	BMP GN-3: Noise Control	LTS
3.10 Public Services and Utilities			
PSU-1: Disruption to Utilities, Schools, Parks, or Other Public Facilities	LTS	-	-
PSU-2: Effects of Construction Activities on Police, Fire, and Emergency Services Response Times	PS	BMP GN-4: Traffic Flow, Pedestrians, and Safety Measures	LTS
PSU-3: Disposal of Excavated Sediment at Off-Site Locations, Including Landfills	PS	BMP HAZ-8: Testing and Disposal of Spoils	LTS
3.11 Recreation			
REC-1: Temporary Disturbance of Recreational Quality	PS	BMP GN-1: Work Site Housekeeping BMP GN-2: Public Outreach BMP GN-3: Noise Control BMP GN-4: Traffic Flow, Pedestrians, and	LTS

Table ES-1. Summary of Potential Impacts and Mitigation Measures

Potential Impact	Level of Significance before Mitigation	Mitigation Measures (BMPS from Table 2-1)	Level of Significance after Mitigation
		Safety Measures BMP GN-5: Odors	
REC-2: Permanent Changes on Recreational Quality	B	-	-
REC-3: Temporary Disruption of Use of, or Access to, Recreational Facilities	PS	BMP GN-2: Public Outreach BMP GN-4: Traffic Flow, Pedestrians, and Safety Measures	LTS
REC-4: Long-term Use or Access Disruption of Recreational Facilities	NI	-	-
REC-5: Changes in Recreational Facility Use	PS	BMP GN-2: Public Outreach BMP GN-4: Traffic Flow, Pedestrians, and Safety Measures	LTS
3.12 Traffic			
TR-1: Increase in Area Traffic Volumes and Degradation of LOS Due to SMP-Generated Traffic	PS	BMP GN-2: Public Outreach BMP GN-4: Traffic Flow, Pedestrians, and Safety Measures	LTS
TR-2: Increase in Safety Hazards	PS	BMP GN-4: Traffic Flow, Pedestrians, and Safety Measures	LTS
TR-3: Interference with Emergency Access and Circulation	PS	BMP GN-4: Traffic Flow, Pedestrians, and Safety Measures	LTS
TR-4: Increase in Parking Demand	PS	BMP GN-4: Traffic Flow, Pedestrians, and Safety Measures	LTS
TR-5: Conflicts with Alternative Transportation	PS	BMP GN-2: Public Outreach BMP GN-4: Traffic Flow, Pedestrians, and Safety Measures	LTS
Cumulative Impacts			

Table ES-1. Summary of Potential Impacts and Mitigation Measures

Potential Impact	Level of Significance before Mitigation	Mitigation Measures (BMPS from Table 2-1)	Level of Significance after Mitigation
CUM-1: Emissions of PM10 and Ozone Precursors	PS	BMPs AQ-1 and AQ-2	SU
CUM-2: Emissions of Greenhouse Gases	LTS	-	-
CUM-3: Effects on Biological Resources	PS	BMPs BR-1 through BR-19	LTS
CUM-4: Effects on Cultural Resources	PS	BMPs CR-1 through CR-3	LTS
CUM-5: Project-Related Energy Use	LTS	-	-
CUM-6: Geologic Hazards	LTS	-	-
CUM-7: Land Use Conflicts	NI	-	-
CUM-8: Program-Related Noise Emissions	PS	BMP GN-3	LTS
CUM-9: Disruption to Automobile Traffic Patterns	PS	BMP GN-4	LTS
CUM-10: Effects on Utilities and Service Systems	B	-	-
CUM-11: Effects on Water Quality	PS	BMPs GEN-1 and GEN-2, BR-1, BR-3, BR-4, WQ-1 and WQ-2, HAZ-1 through HAZ-5, HAZ-8, and VEG-3	LTS
CUM-12: Sediment Reuse by the City of Santa Rosa	B	-	-
CUM-13: Sediment Reuse by Entities other than SCWA	NI	-	-

Definitions

- B Beneficial
- LTS Less-than-Significant
- NI No Impact
- PS Potentially Significant
- SU Significant and Unavoidable

Chapter 1

INTRODUCTION

The Sonoma County Water Agency (Agency or SCWA) has prepared this Draft Environmental Impact Report (DEIR) to provide the public, responsible agencies, and trustee agencies with information about the potential environmental effects of the proposed Stream Maintenance Program (SMP, Program or Proposed Program). This DEIR was prepared in compliance with the California Environmental Quality Act (CEQA) of 1970 (as amended) and the State CEQA Guidelines (14 California Code of Regulations [CCR] 15000 et seq.).

1.1 Program Background

Within its authority, SCWA provides maintenance for the flood control channels that it owns. SCWA also has hydraulic easements on other flood control channels and creeks. These easements authorize but do not require SCWA to conduct activities to maintain hydraulic capacity. The Stream Maintenance Program has been developed by SCWA to improve the management of streams and channels under SCWA's authority through establishing programmatic guidance. The SMP Manual provides the organizational framework to oversee routine stream and channel maintenance activities. More details regarding the SMP are provided in Chapter 2, Program Description. The SMP Manual and DEIR are meant to be read as complimentary volumes. As such, the DEIR references or summarizes information presented in the SMP Manual frequently to avoid repeating information. The reader is encouraged to review the SMP Manual while reviewing the DEIR.

1.2 Overview of CEQA Requirements

CEQA is the cornerstone of environmental law and policy in California. CEQA's primary objectives are to:

- ensure that the significant environmental effects of proposed activities are disclosed to decision makers and the public;
- identify ways to avoid or reduce environmental damage; prevent environmental damage by requiring implementation of feasible alternatives and/or mitigation measures;
- make public the reasons for agency approval of projects with significant environmental effects;
- foster multidisciplinary interagency coordination in the review of projects; and
- enhance public participation in the planning process.

With certain strictly limited exceptions, CEQA requires all state and local government agencies to consider the environmental consequences of projects over which they have

discretionary authority before taking action on those projects. It establishes both procedural and substantive requirements that agencies must satisfy to meet CEQA's objectives. For example, the agency with decision-making authority (the lead agency) must first assess whether a proposed project would result in significant environmental impacts. If the project could result in significant environmental impacts, CEQA requires that the agency prepare an Environmental Impact Report (EIR), analyzing both the proposed project and a range of feasible alternatives.

As described in the CEQA Guidelines, Section 15121(a), an EIR is a public information document that assesses potential environmental effects of a proposed project as well as identifies mitigation measures and alternatives to the project that could reduce or avoid adverse environmental impacts (14 CCR 15121[a]). Other key requirements include developing a plan for implementing and monitoring the success of the identified mitigation measures, and carrying out specific noticing and distribution steps to facilitate public involvement in the environmental review process.

The EIR is an informational document used in the planning and decision-making process. It is not the purpose of an EIR to recommend either approval or denial of a project.

1.3 Scope and Intent of this Document

This DEIR has been prepared in accordance with CEQA, under which the SMP constitutes a "project." The Agency will use the analyses presented in this DEIR, and the public response to them, to evaluate the Proposed Program's environmental impacts and to further modify, approve, or deny approval of the Proposed Program based on the analyses provided herein.

1.3.1 Type of EIR: Program EIR

When an agency proposes a program of related activities that are geographically linked, would take place as logical parts of a series of events, or would be carried out under the same authorizing statutory or regulatory authority, the agency can choose to prepare a program EIR. The program EIR, sometimes described as the "first tier" of a multi-tiered CEQA analysis, analyzes the program as a whole, including all of its constituent activities. When a later activity is determined by the lead agency to be within the scope of a program EIR, no new environmental document is required unless changes in the project, changed circumstances, or significant new information indicate that the later activity would have a new or more severe environmental impact relative to the impacts identified in the program EIR (14 CCR 15168; 14 CCR 15162). For later activities that are not within the scope of the Program EIR, a "second-tier" environmental review is required at the project level to implement individual program components or activities.

The intent of this DEIR is to adequately capture the impacts of the Program such that tiered CEQA documentation is not necessary. However, it is possible that changes to the Program, or specific aspects of implementation of the Program, could result in new, different, or more significant impacts than have been disclosed. Such impacts would be evaluated in a subsequent or tiered environmental document.

1.4 Public Involvement Process

As described above, public disclosure and dialogue are priorities under CEQA. Accordingly, CEQA mandates two periods during the EIR process when public and agency comments on the impacts of the Proposed Program are solicited: during the scoping comment period, and during the review period for the DEIR. CEQA and the state's CEQA implementation guidelines also encourage lead agencies to hold public meetings or hearings to review both the draft and final versions of an EIR. Brief descriptions of these milestones are provided below, as they apply to this document.

1.4.1 Scoping Comment Period

Scoping refers to the public outreach process used under CEQA to determine the coverage and content of an EIR. The scoping comment period offers an important opportunity for public review and comment in the early phases of a project. The scoping process for an EIR is typically initiated by publication of the notice of preparation (NOP) required by CEQA, which provides formal notice to the public and to interested agencies and organizations that a DEIR is in preparation. During the scoping period, agencies and the public are invited to comment on the project, the approach to environmental analysis, and any issues of concern. CEQA does not require public meetings during the scoping phase.

In accordance with State CEQA Guidelines (14 CCR 15082[a], 15103, 15375), the Agency circulated a NOP of an EIR for the Proposed Project on August 31, 2005 (see Appendix A). The NOP, in which the Agency was identified as lead agency for the Proposed Program, was circulated to the public; to local, state, and federal agencies; and to other interested parties. Comments received in response to the NOP are included in Appendix B. The purpose of the NOP was to inform responsible agencies and the public that the Proposed Program could have significant effects on the environment and to solicit their comments. Concerns raised in response to the NOP were considered during preparation of this DEIR.

1.4.2 Draft EIR Comment Period

Once a DEIR is complete, the lead agency must issue a notice of availability, providing agencies and the public formal notification that the document is available for review. The notice is sent to all responsible and trustee agencies, any person or organization requesting a copy, and the county clerk's office for posting. The notice must also be published in a general-circulation newspaper, posted on and off the project site, or directly mailed to residents of properties adjacent to the project site. CEQA then requires a minimum 30- to 45-day public review period, during which the lead agency receives and collates public and agency comments on the project and the document.

The Agency is now circulating this DEIR for a 45-day public review and comment period and will host a public hearing 30-days after release of the document. The purpose of public circulation and the public hearings are to provide agencies and interested individuals with opportunities to comment on or express concerns regarding the contents of the DEIR.

For those interested, written comments or questions concerning this DEIR should be submitted within this review period and directed to the name and address listed below.

Submittal of written comments via e-mail (Microsoft Word format) would be greatly appreciated.

Keenan Foster, Senior Environmental Specialist
Sonoma County Water Agency
404 Aviation Blvd.
Santa Rosa, CA 95403
(707) 547-1941
fax: (707) 524-3782
e-mail: keenan.foster@scwa.ca.gov

All documents mentioned herein or related to this project can be reviewed any Sonoma County business day between the hours of 8:00 a.m. and 5:00 p.m. Monday through Friday at SCWA offices, located at the address above.

Written comments received in response to the DEIR will be addressed in a Response to Comments addendum document (the Final EIR [FEIR]), which, together with the DEIR, will constitute the entire EIR.

1.4.3 Preparation of Final EIR and Public Hearing

CEQA requires the lead agency to prepare a FEIR addressing all substantive comments received on the DEIR before approving a project. The FEIR must include a list of all individuals, organizations, and agencies that provided comments, and must contain copies of all comments received during the public review period along with the lead agency's responses.

After review of the Program and the FEIR, Agency staff will recommend to the County Board of Supervisors whether to approve or deny the project. This governing body will then review the FEIR, consider Agency recommendations and public testimony, and then decide whether to certify the final EIR and whether to authorize the SMP.

If significant impacts are identified by the EIR that cannot be mitigated, a statement of overriding considerations must be included in the record of the Program approval and mentioned in the notice of determination (14 CCR 15093[c]).

1.5 Organization of this EIR

This DEIR contains the following components.

Executive Summary. A summary of the Program, a description of the issues of concern, Program alternatives, and a summary of environmental impacts are provided in this chapter.

Chapter 1, *Introduction.* This chapter describes the purpose and organization of the EIR and its preparation, review and certification process.

Chapter 2, *Program Description*. This section summarizes the Program, including: a description of the Program purpose and goals; a brief description of the Program area and facilities where the SMP is implemented; the Program approach and activities; Program implementation and oversight; programmatic avoidance and minimization measures; alternatives considered; and related permits and approvals.

Chapter 3, *Environmental Setting and Impact Analysis*. This chapter begins with an introductory section which identifies resource areas determined not to be affected by the Program. Chapter 3 includes twelve subchapters which describe existing environmental conditions and the Proposed Program's anticipated environmental impacts. The following resource topics are addressed in Chapter 3:

3.1 Aesthetics,

3.2 Air Quality,

3.3 Biological Resources,

3.4 Cultural Resources,

3.5 Geology, Soils, and Seismicity

3.6 Hazards and Hazardous Materials,

3.7 Hydrology, Geomorphology, and Water Quality,

3.8 Land Use and Planning,

3.9 Noise,

3.10 Public Service and Utilities,

3.11 Recreation, and

3.12 Transportation and Traffic.

The above resource sections also identify mitigation strategies and measures to address (where feasible) all impacts evaluated as significant.

Chapter 4, *Other Statutory Considerations*, addresses the Proposed Program's potential to contribute to cumulative impacts in the Program region. Chapter 4 outlines the Proposed Program's potential to induce growth; and identifies significant, irreversible environmental changes resulting from the Program.

Chapter 5, *Alternatives Analysis*, describes the process through which alternatives to the Proposed Program were developed and screened; evaluates their likely environmental impacts; and identifies the environmentally superior alternative.

Chapter 6, *Report Preparation*, lists the individuals involved in preparing this EIR and their responsibilities.

Chapter 7, *References*, provides a bibliography of printed references, web sites, and personal communications used in preparing this DEIR.

Appendix A contains the NOP issued by the Agency.

Appendix B contains comments received on the NOP.

Appendix C contains a list of Federal endangered and threatened species that occur in or may be affected by projects in Sonoma County.

Appendix D provides the full text of the existing easements which apply to various SMP channels. A full discussion of these easements is provided in Chapter 3.8, Land Use.

1.6 Impact Terminology

This DEIR uses the following terminology to describe environmental effects of the Proposed Program.

A finding of *no impact* is made when the analysis concludes that the Program would not affect the particular environmental resource or issue.

An impact is considered *less than significant* if the analysis concludes that there would be no substantial adverse change in the environment and that no mitigation is needed.

An impact is considered *less than significant with mitigation* if the analysis concludes that there would be no substantial adverse change in the environment with the inclusion of the mitigation measures described.

An impact is considered *significant* or *potentially significant* if the analysis concludes that there could be a substantial adverse effect on the environment.

An impact is considered *significant and unavoidable* if the analysis concludes that there could be a substantial adverse effect on the environment and no feasible mitigation measures are available to reduce the impact to a less-than-significant level.

An impact is considered *beneficial* if the analysis concludes that there would be a positive change in the environment.

Mitigation refers to specific measures or activities adopted to avoid an impact, reduce its severity, or compensate for it.

A *cumulative impact* can result when a change in the environment results from the incremental impact of a project when added to other related past, present, or reasonably foreseeable future projects. Significant cumulative impacts may result from individually minor but collectively significant projects.

2.1 Introduction

2.1.1 Program Purpose

The Stream Maintenance Program (SMP) has been developed by the Sonoma County Water Agency (SCWA) to improve the management of streams and channels under SCWA's authority through establishing programmatic guidance. The SMP Manual provides the organizational framework to oversee routine stream and channel maintenance activities. The SMP Manual will be used by SCWA to guide and implement routine stream maintenance activities. The SMP is envisioned to be a flexible program subject to periodic revisions that reflect updates on resource conditions, maintenance technologies, or management practices. As stated previously, the SMP Manual and DEIR are meant to be read as companion volumes. The DEIR references or summarizes information (including figures and tables) presented in the SMP Manual to avoid repeating information. The reader is encouraged to review the SMP Manual while reviewing the DEIR.

2.1.2 Program Objectives

The Stream Maintenance Program has been designed to achieve the following objectives:

- Provide adequate flood protection and channel conveyance capacity for channels under SCWA authority;
- Use an informed, consistent, systemic, and scientific understanding of the watershed and individual stream reaches to guide maintenance activities and avoid and minimize environmental impacts;
- Improve communication, coordination, and permitting efficiency between regulatory agencies and SCWA through an open and collaborative process;
- Develop an adaptable and sustainable program that can respond to changing environmental, maintenance, and regulatory conditions;
- Provide an administratively stable program that provides consistency in oversight and implementation of annual program activities;
- Obtain and maintain 10-year programmatic permits that regulate program activities;
- Adhere and comply with California Environmental Quality Act (CEQA) requirements.

2.1.3 Program Area

The SMP Program Area is located in Sonoma County, California as shown in Figure 2-1 (SCWA Flood Control Zones and Program Area). As shown in Figure 2-1, flood control operations at SCWA are organized into nine flood control zones. The majority (over 95%) of SMP activities would occur in Zone 1A (Laguna de Santa Rosa watershed, Figure 2-2), Zone 2A (Petaluma River watershed, Figure 2-3), and Zone 3A (Sonoma Creek watershed, Figure 2-4). The remaining 6 zones within the Program Area are shown in Figures 2-5 through 2-9. Cities within the Program Area which contain SCWA-owned or maintained channels include: Cotati, Healdsburg, Petaluma, Rohnert Park, Santa Rosa, Sebastopol, Sonoma, and the Town of Windsor.

2.1.4 Program Channel Types

SCWA operation and maintenance activities occur in four types of channels:

Engineered Channel–Owned in Fee (Red Channels): These channels are owned and maintained by SCWA through limited zone-specific property taxes. SCWA maintains the flood control channels that it owns. SCWA maintains approximately 61 miles of owned in fee-engineered channels. Engineered channels are channels that were designed and built to convey a design discharge. In the Program Area, engineered channels have typically been built with a trapezoidal cross-sectional shape. Most of the engineered channels have earthen banks and streambeds, however some channels have hardened banks and beds. Road and culvert crossings are locations where typically the stream banks and beds have been hardened for engineered channels. Maintenance activities in these engineered channels include bank stabilization, landscaping, fencing, mowing, sediment removal, debris removal, and vegetation thinning and spraying. Structures such as access roads, drop inlet culverts, outfalls, flap gates, and road crossing culverts constructed in association with the engineered channels also require routine maintenance. Owned in fee-engineered channels are shown in red in the zone maps of Figures 2-2 through 2-9.

Engineered Channel–Easement Maintained (Orange Channels): These channels are not owned by SCWA, but SCWA performs channel maintenance on them through permissive easement agreements. For example, cities such as Petaluma or Rohnert Park may own such channels and may have entered into easement agreements with SCWA to conduct maintenance. These easement agreements authorize SCWA to conduct maintenance, but do not require or obligate SCWA to maintain any specific level of hydraulic capacity or conduct any maintenance. SCWA performs some maintenance activities within approximately 15 miles of easement engineered channels. Maintenance activities in these channels are similar to the activities described above for SCWA-owned engineered channels with the exception that for the easement engineered channels, SCWA works only within the channel banks and does not maintain roads, ditches, fences, or other structures outside the channel. Easement engineered channels are shown in orange in the zone maps of Figures 2-2 through 2-9.

Modified Channel–Easement Maintained (Blue Channels): Modified channels are natural channels with existing earthen beds and banks that have been modified either through vegetation removal, in-channel grading, channel widening or straightening, or debris

clearing to improve flow conveyance. Though modified, these channels are not engineered or constructed according to specific design criteria to convey a discharge of a particular magnitude. These are permissive easements where another jurisdiction, authority, or private landowner owns the modified channel feature. SCWA is not obligated to conduct maintenance and has no responsibility to perform any specific level of maintenance in easement modified channels. However, SCWA may perform limited maintenance on these channels. SCWA holds hydraulic easements (for work within the channel) for over approximately 49 miles of modified channels. Maintenance activities in modified channels typically include the removal of log jams, debris jams, and the clearance of vegetation to remove significant flow obstructions. The most common type of work conducted in these channels is the removal of blackberry thickets or fallen trees that significantly increase the potential for flood damage to structures. Trash or vegetation debris may also cause a blockage and require removal. SCWA does not perform sediment removal or bank stabilization work in modified channels. Work in modified channels occurs only on an as-needed basis, usually at the request of an adjacent land-owner during or following a large storm event. Modified channels are shown as blue streams in the maps of Figures 2-2 through 2-9.

Natural Channel-Easement Maintained (Green Channels): Natural channels are non-engineered and non-modified creek systems with a permissive clearing easement. SCWA holds hydraulic easements to work within the channel banks for over approximately 80 miles of natural channels. Natural channels have several maintenance similarities to the modified channels. Natural channels may still require maintenance activities to maintain flow conveyance and reduce the flooding hazard. Maintenance work in natural channels typically involves clearing debris or vegetation that is causing a flow obstruction. In this way, maintenance activities for natural channels are similar to modified channels. Work in natural channels is infrequent and typically occurs at the request of an adjacent landowner who has observed a problem. Similar to modified channels, SCWA does not conduct sediment removal or bank stabilization activities in natural channels. Natural channels are shown as green creeks in the zone maps of Figures 2-2 through 2-9.

Figure 2-10 provides photograph examples of each channel type. Figure 2-11 shows a typical cross-section of a SCWA-maintained engineered channel (owned in fee or easement maintained as described above) in the Program Area. This figure illustrates many of the channel features (e.g., top-of-bank, toe-of-slope, etc.) that are referred to throughout the program description.

During the SMP Manual development and review process, representatives from the National Marine Fisheries Service (NMFS), the U.S. Fish and Wildlife Service (USFWS), CDFG, and Regional Boards identified concerns about maintenance activities conducted in natural channels (where SCWA maintains easements) that support listed salmonids and/or California freshwater shrimp. Through discussions with these agencies, SCWA agreed to remove these channels of concern from coverage under the SMP. As a result, potential direct impacts to these species and their habitat are avoided. The streams supporting sensitive habitats that were removed from the SMP are shown in Figure 2-12. These channels are also represented by green dashed lines in the maps of Figures 2-2 through 2-9.

2.1.5 Overview of SMP Approach

The vision for SCWA's engineered channels is to provide a balance between flood control management and habitat support whereby over time, channels provide both functions with reduced maintenance needs. The central tenet of the SMP approach is that management activities are conducted using an informed and systemic approach to minimize stream impacts while providing necessary flow conveyance. The management approach to achieve this vision recognizes each reach's existing functional condition, but also looks forward towards improving each reach's ecologic condition. Figure 2-13 illustrates this process of managing the channel toward reaching an improved ecologic condition.

A thorough understanding of the physical and biological stream system is at the core of this informed approach. As described in the SMP Manual document and shown in Figure 2-14, the SMP utilizes an analytic and targeted approach to understand the degree of maintenance work actually required for a given situation.

While the analysis of maintenance problems may be focused, the development of solutions is watershed-wide in perspective. This informed approach of the SMP not only requires a clear understanding of the location, extent, and specifics of maintenance activities; it also requires an understanding of the stream system's natural and aquatic resources. Reaches are also considered within their sub-basin and watershed context. Understanding these complex interactions influences the method and timing of maintenance activities and also how best to avoid, minimize, and mitigate environmental impacts.

As envisioned, the SMP will be a "living program" that is updated and modified as needed. The SMP Manual, as currently drafted, presents baseline conditions for natural resources and describing planned management activities. As conditions change or are updated, or as environmental regulations evolve, the SMP will also evolve to keep pace. SCWA is committed to administering and maintaining this program for the long-term planning horizon (20-30 years).

2.2 Maintenance Activities

The Stream Maintenance Program has three primary activities: sediment management, vegetation management, and bank stabilization. These core maintenance activities occur mainly in engineered flood control channels, but may also occur in other facilities including other in-channel engineered structures, and sediment basins on an as-needed basis. In addition to the three core SMP activities, the SMP involves other smaller and infrequent maintenance activities such as road maintenance, sediment removal around reservoir inlet structures, and debris removal. The SMP also includes the transport and disposal of collected sediment and vegetation. The SMP activities are described in more detail below.

2.2.1 Sediment Management

In general, sediment management refers to the removal of excess accumulated sediment from engineered flood control channels and facilities. This accumulated sediment reduces flow capacity and increases the potential for flooding. SMP sediment management activities seek to provide flow capacity while also providing geomorphic and ecologic channel

functions, through such means as shaping a two-stage channel form within the original engineered flood control channel (see Figure 6-5 of SMP Manual). The SMP involves only sediment removal within the as-built design of the engineered channel. The SMP does not include any expansion of channel capacity beyond the original channel design.

Sediment management activities are generally conducted from June 15th to October 31st when streams are typically at their driest. The number of sediment removal projects undertaken annually and the quantity of sediment removed in a given year depend on recent weather and hydrologic conditions, as well as the frequency and extent of past maintenance activities.

There are three general types of sediment removal projects: (1) reach scale projects where sediment is removed from an entire reach (typically 1,000-3,000 ft long); (2) smaller localized sediment removal projects (typically 100-200 ft long) where sediment is removed from individual crossings, culverts, or other in-channel facilities; and (3) intermediate scale sediment removal projects (typically 500-750 ft long) that involve individual bar grading or geomorphic shaping activities to remove sediment, reduce flow deflection, and enhance channel habitat features.

2.2.2 Bank Stabilization

Bank stabilization involves the repair and stabilization of stream or reservoir banks when a weakened, unstable, or failing stream bank causes or threatens damage to an adjacent property; increases the flood hazard; threatens public safety; impairs roads, transportation, or access; generates erosion, increases downstream sediment yields; or impacts riparian habitat and/or other natural resource values.

These activities occur in engineered channels and other facilities including culvert outlets along stream banks or banks around reservoirs. Bank stabilization activities are generally conducted June 15th to October 31st when streams are at their driest.

2.2.3 Vegetation Management

Vegetation management refers to the trimming, mowing, and removal of flow-constricting vegetation within flood control channels and other constructed facilities. Vegetation management activities are conducted to maintain flow conveyance capacity, establish a canopy of riparian trees, and control invasive vegetation. Vegetation management and removal activities are relatively consistent from year to year, though locations change depending on recent growth and blockages. Vegetation management also includes the planting of new trees and shrubs in engineered channels in accordance with the SMP's restoration and mitigation program. The SMP's mitigation program is described in Chapter 8 of the SMP Manual, Sections 8-2 and 8-3 and summarized in this chapter in Section 2-4 below.

2.2.4 Other Activities

Other maintenance activities proposed under the Program include: maintaining channel access roads for accessibility; maintaining proper drainage along channel access roads

(usually provide by a small V-ditch that runs parallel with the access roads); maintaining proper functioning of drop-inlet culverts which direct local surface flow toward the flood control channels; maintaining culverts free of sediment and vegetative blockages; sediment removal around reservoir inlet structures; repairing fences along the channels, trash and debris removal, and removing or covering graffiti on Agency facilities. The majority of these activities are considered to be minor and small in scale.

2.2.5 Sediment Disposal

SCWA anticipates that on average, the SMP will involve removing between 10,000 and 25,000 cubic yards of sediment per year. Sediment removed from SCWA facilities is hauled off-site using 10- or 20- cubic yard dump trucks. Under the SMP, disposal sites will be identified and permitted for use in accordance with federal, state, and local regulations, and appropriate landowner permits or agreements.

The City of Santa Rosa (City) is a partner with SCWA in the SMP in providing valuable long-term sediment disposal opportunities. The North Coast Regional Water Quality Control Board (North Coast RWQCB) developed the Santa Rosa Nutrient Offset Policy in coordination with the City in 2006 to reduce net nutrient loading to the Laguna de Santa Rosa by 2011. The disposal of SMP sediments to suitable sites owned by the City will provide an effective means to support the nutrient offset program, due to the nutrients sequestered in sediment removed under the SMP. As such, the City is a responsible agency for CEQA purposes.

2.2.6 Activities Not Covered in the SMP

Activities not covered under the SMP, and therefore not analyzed in this EIR include:

- maintenance activities on the main stems of the Russian River and Dry Creek in Zone 4A and 6A related to management of Lake Mendocino and Lake Sonoma;
- maintenance activities on streams outside of SCWA authority for which no maintenance agreement exists;
- capital improvement projects (CIPs); 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 (Public Resource Code Section 21060.3). Although emergency situations will not be covered in the SMP, SCWA will make every effort to follow the guidance provided in the SMP when implementing activities under emergency conditions.

Routine stream maintenance does not include projects that would alter the designed flood conveyance capacity of a channel. Large construction projects and CIPs are not considered routine stream maintenance and are not included in the SMP. However, future CIPs may consider using, or adapting, the SMP to cover their maintenance needs and mitigation once their project becomes operational and requires maintenance.

2.3 Implementation and Oversight

2.3.1 SMP Work Cycle

Implementation and oversight of the SMP occurs as an annual cycle of activities as shown in Figure 2-15, which begins each year with a field-based stream reconnaissance and assessment in late winter. The annual assessment then informs the development of that cycle's workplan. Routine maintenance activities, such as vegetation maintenance, localized sediment removal such as at culverted crossings, and minor bank repairs do not generally require additional engineering or design consideration. Larger-scale projects and activities may require site assessment and/or detailed engineering drawings that are informed by physical site conditions and an understanding of the cause of the maintenance need.

Stream reconnaissance and assessment begins in late winter or early spring, followed by the development of the project workplan in the spring. During the spring months, the year's maintenance projects are further refined and described, appropriate mitigation will be identified (following the guidelines presented below), and the relevant regulatory agencies overseeing program permitting are notified. Regulators also go on a field tour of the sites. Projects are then implemented during the summer season, when the channels are at their driest. During the fall, an annual summary report of the year's maintenance, mitigation, and monitoring activities is distributed to the permitting agencies.

2.3.2 Timing of Work

The core SMP maintenance activities of sediment management, vegetation management, and bank stabilization can be classified either as causing ground disturbance or not. All ground-disturbing maintenance activities occurring in the channel (including sediment removal and bank stabilization) will take place during the low-flow period, between June 15 and October 31. Exceptions may be made for emergencies or on a project-by-project basis with advance approval of RWQCB, CDFG, NMFS, and/or USFWS as appropriate. In particularly dry years when channels remain dry earlier than June 15 or later than October 31, SCWA may request approval to conduct ground-disturbing type maintenance work prior to June 15 or later than October 31. Ground-disturbing activities will only be conducted during periods of dry weather. In the fall season, once the first significant rainfall occurs, all in-channel equipment and/or diversion structures shall be removed. Exposed soils in upland channel areas will be stabilized via hydroseeding or with erosion control fabric/blankets. Significant rainfall is defined as 0.5 inch of rain in a 24-hour period. Non ground-disturbing work on the upper banks of stream channels (e.g., vegetation, road, and v-ditch maintenance) may be conducted year round. For non ground-disturbing work (vegetation thinning/pruning) may be conducted in the channel zone beyond the primary maintenance work window of June 15 to October 31, if the channel is dry (and with notification and approval by the relevant agencies).

2.3.3 Construction Methods

SCWA's preferred approach for construction activities is to use the least environmentally impacting approach that is reasonable, not prohibitive in cost, and time-efficient.

For sediment removal projects, different types of equipment are used to achieve these goals. For reach scale sediment removal projects, an excavator or bulldozer may be used. Using an excavator avoids the need for equipment access ramps and reduces direct in-channel impacts such as reductions in water quality or disturbances to aquatic habitat. For project areas where using an excavator from the top-of-bank is not possible, or would cause major vegetation impacts, sediment removal equipment is used within the channel. For larger equipment, this requires the construction of temporary access ramps. Smaller equipment is often lowered directly into the channel from a stream crossing. For smaller scale localized sediment removal or culvert clearing projects small Bobcats® or small hand-led push excavators are used within the culvert. Whether small or large projects, sediment removed from the channel is placed in 10- or 20- cubic yard dump trucks (typically parked on the access road adjacent to the channel or on the stream crossing) and prepared for off-site hauling and disposal. Examples of equipment, access, and staging for sediment removal projects are presented in Figure 2-16 and 2-17.

Vegetation management techniques include hand removal using small tools and hand-held equipment, mechanical removal using heavy equipment, and spot chemical control. Heavy equipment used for vegetation removal may include a flail mower attachment on an excavator or Bobcat® that is used to cut cattails or blackberries; or a backhoe or rubber-tracked excavator that is used for removing material from the channel. In addition, herbicides may be used in SCWA-maintained channels and on unpaved access roads. In-channel use of herbicides is limited to direct application, using a paintbrush, on stumps of trees that have been removed during maintenance. On unpaved access roads, herbicides would be sprayed from a truck-mounted rig during the spring to remove weeds from the roadway and to protect the integrity of the road. Spraying usually occurs very early in the morning (beginning at approximately two or three o'clock AM) and concludes around nine o'clock AM to reduce the possibility of recreational users at the sites that are also recreational facilities. During the application, roads are closed to the public and remain so until the application dries to reduce the risk of incidental exposure. See Chapter 6 of the SMP Manual for photos of these management techniques.

Bank stabilization activities use bioengineering approaches to stabilize eroding streambanks. These approaches include using engineered back filled soils, erosion control fabric, and planting of native riparian trees at the top-of-bank and the toe-of-slope to provide additional bank stability and increased vegetative canopy for the channel. These approaches (shown in Figures 2-18 through 2-20 typically involve grading the eroded bank slope back to a stable grade, using engineered soil to regrade the slope as needed, using plants and other bioengineering techniques to provide additional stability. If the situation requires it, riprap may be used at the base of the rebuilt bank to provide additional strength. Riprap is typically used if a bank is eroded at a culvert outfall and requires additional strengthening. However, bioengineered solutions are first considered and prioritized before using hardscape or riprap. Equipment used for bank stabilization activities may include excavators, bulldozers, and front-end loaders for bank grading and earth moving activities. Staging occurs on adjacent access roads. Soil and riprap is staged in areas that have been previously disturbed (i.e., service road, turn-outs, etc).

2.3.4 Program Tracking

A key element of the SMP is to establish and maintain a comprehensive data management system. Data management is required throughout the SMP work cycle including: organizing the initial stream assessment and inventory, characterizing reach conditions, identifying maintenance needs, identifying sensitive habitats, weed populations, or other environmental considerations, documenting the implemented maintenance activities, documenting and tracking the implementation of restoration and mitigation activities, monitoring the on-going status of mitigation activities; and tracking all regulatory reporting requirements. The SMP database organizes all of this information and other data including reach assessment sheets, GIS mapping, habitat assessment sheets, and aerial photography. This SMP database provides a consistent and transparent way to monitor overall program activities, permitting compliance, and track habitat and canopy development.

2.3.5 Program Reporting

At the conclusion of each year's maintenance season a summary report is developed, posted to the program website, and submitted to the appropriate regulatory agencies. This report includes: a summary of the year's maintenance projects describing what activities occurred and where; a description and confirmation of the restoration and mitigation activities implemented during the current year mitigation; a status and monitoring report of on-going mitigation activities initiated during previous seasons; and other program updates as necessary. The report may include additional information on project area conditions, activities employed, the effectiveness of certain activities, possible recommendations for future maintenance, or suggestions to improve the program's implementation and management.

2.3.6 Program Review

Following the submittal of the annual maintenance report, regulatory agency staff are invited to a review meeting to discuss the events, maintenance activities, and lessons learned over the past work cycle. The SMP data system, GIS system, and Best Management Practices (BMP) Manual is also updated and revised (if necessary) at the conclusion of the annual work cycle. These meetings and data updates help adaptively manage the SMP and improve program effectiveness.

In addition, every 5 years, SCWA and the permitting agencies will review the Stream Maintenance Program for its overall effectiveness. This review will include an assessment of maintenance activities conducted to date, BMPs employed, adequacy of the SMP Mitigation Program, SMP data management, adequacy of SMP adaptive updates and revisions, and overall program coordination and communication between SCWA and the regulatory permitting agencies.

2.4 Programmatic Avoidance and Minimization Measures

2.4.1 Maintenance Principles

The following maintenance principals were developed as planning guidelines to avoid and minimize environmental impacts of the program. As planning principles, these approaches are used in the development of each year's maintenance workplan, prior to any work occurring. The SMP Manual provides additional detail on how these principles are used.

- No Unnecessary Intervention
- Understand the System and its Processes
- Consider Adjacent Land Uses
- Apply System Understanding to Maintenance Actions
- Manage for Incremental Ecologic Improvement
- Integrate Maintenance Activities Towards Sustainability (reduced frequency of maintenance)

When applied, these principles determine when action is needed, consider the natural function of the system, provide an understanding of local physical constraints, identify sensitive habitats, consider watershed processes, identify the maintenance activities needed at the reach and site scale, and seek solutions to minimize the on-going need for maintenance activities at a particular site or reach.

2.4.2 Best Management Practices

The maintenance activities undertaken under this SMP incorporate a range of measures to minimize undesired effects on the environment and ensure consistency with SCWA's sustainability policy and goals. Specific BMPs were created for the SMP that encompass the program's range of activities and the environmental conditions of the Program Area. Program BMPs are included in Table 2-1. This table is exactly the same as Table 7-1 of the SMP Manual. Included in the table are measures to protect natural resources, as well as "good-neighbor" policies intended to reduce effects of maintenance activities on neighboring land uses. Table 2-1 organizes the BMPs at a programmatic and activity-specific scale.

2.4.3 Program Mitigation

The mitigation planning approach follows a three-tiered system where mitigation opportunities are sought sequentially. Tier 1 mitigation is implemented on-site at the specific project reach where the maintenance work was conducted. Mitigation approaches on-site seek to enhance and restore the stream and aquatic functions and resources (in-kind) that were impacted through the maintenance activities.

Tier 2 mitigation is similar to Tier 1 mitigation in seeking in-kind mitigation in stream channels that had undergone maintenance. However, Tier 2 mitigation is applied at other

stream channels, and is therefore not specifically on-site. Tier 2 mitigation is sought when there are no suitable opportunities for enhancement or restoration on-site at a specific channel reach and the next best opportunity is to pursue in-kind mitigation at a neighboring reach that does afford an opportunity for mitigation.

Tier 3 mitigation is off-site mitigation that provides compensating watershed based functions and values to SMP program impacts. Tier 3 mitigation addresses residual impacts from SMP activities that are not adequately avoided or minimized as described above or mitigated through Tier 1 and 2 mitigation actions. The Tier 2 and Tier 3 off-site mitigation address the temporary loss of Beneficial Uses and ecological functions and values during the time gap between SMP maintenance activities and when Tier 1 mitigation occurs, and the time when Tier 1 mitigation has become fully functional and the temporary impacts have been eliminated. Tier 3 mitigation provides restorative and mitigating watershed solutions for SMP impacts. Tier 3 mitigation is not only different in its geographic scope, it is also different in that it is not solely a SCWA effort, but is a collaborative effort with partnering agencies. This is accomplished through the off-site watershed mitigation program, whereby SCWA funds Tier 3 projects to be implemented with local non-profit agencies, municipalities, restoration organizations, creek groups, schools and Resource Conservation Districts.

2.5 Permits and Approvals

SCWA is seeking approval of long-term permits for routine stream maintenance activities in channels and streams under the jurisdiction of the U.S. Army Corps of Engineers (USACE), including Waters of the United States and special aquatic sites (wetlands) pursuant to Section 404 of the Clean Water Act. An Individual Permit will grant general authorization and set conditions for routine stream maintenance activities subject to jurisdiction of the USACE for a 10 year period. As part of this, SCWA and USACE are required to comply with requirements under Section 7 of the federal Endangered Species Act. For listed salmonids within the Russian River watershed, these requirements are met through the National Marine Fisheries Service (NMFS) Russian River Biological Opinion (BO). For activities outside of the Russian River watershed, a separate BO is being sought from NMFS. A BO is also being sought for federally listed species under the jurisdiction of the U.S. Fish and Wildlife Service. Compliance with Section 106 of the National Historic Preservation Act will be accomplished on a project-level basis.

The California Regional Water Quality Control Boards (RWQCBs), Region 1 (North Coast) and Region 2 (San Francisco Bay) oversee compliance with the Porter-Cologne Water Quality Control Act and Section 401 of the Clean Water Act. For activities within each region, each RWQCB will issue a combined Water Quality Certification and Waste Discharge Requirements in a 5-year permit with a defined process for renewal for another 5-year term.

SCWA will also revise and update its existing Agreement for Routine Maintenance (ARM) with the California Department of Fish and Game (CDFG) for stream maintenance activities in compliance with Section 1600 of the Fish and Game Code. The typical duration of an ARM is 5 years, and the current agreement between SCWA and CDFG extends through the

year 2010. In addition, CDFG will review the SMP for consistency with California Endangered Species Act.

The City of Santa Rosa is a partner agency with SCWA in providing locations for sediment disposal. Therefore, the City of Santa Rosa is recognized as a responsible agency under CEQA.

After the Program's initial 10-year permitting period SCWA expects to apply for permit renewals.

Table 2-1. Stream Maintenance Program Best Management Practices

BMP ID	Name	BMP
General Impact Avoidance and Minimization		
GEN-1	Work Window	<ol style="list-style-type: none"> 1. All ground-disturbing maintenance activities occurring in the channel (i.e., from top-of-bank to top-of-bank) will take place during the low-flow period, between June 15 and October 31. Exceptions may be made for emergencies or on a project-by-project basis with advance approval of RWQCB, CDFG, NMFS, and/or USFWS as appropriate. 2. Once the first significant rainfall occurs, all in-channel equipment and/or diversion structures shall be removed. Exposed soils in upland areas will be stabilized via hydroseeding or with erosion control fabric/blankets. Significant rainfall is defined as 0.5 inch of rain in a 24-hour period. 3. Work on the upper banks of stream channels (e.g., vegetation, road, and v-ditch maintenance) may be conducted year round. Ground disturbing activities will only be conducted during periods of dry weather.
GEN-2	Staging and Stockpiling of Materials	<ol style="list-style-type: none"> 1. Staging will occur on access roads, surface streets, or other disturbed areas that are already compacted and only support ruderal vegetation to the extent feasible. Similarly, to the extent practical, all maintenance equipment and materials (e.g., road rock and project spoil) will be contained within the existing service roads, paved roads, or other pre-determined staging areas. Staging areas for equipment, personnel, vehicle parking, and material storage shall be sited as far as possible from major roadways. 2. All maintenance-related items including equipment, stockpiled material, temporary erosion control treatments, and trash, will be removed within 72 hours of project completion. All residual soils and/or materials will be cleared from the project site. 3. As necessary, to prevent sediment-laden water from being released back into the channel during transport of spoils to disposal locations, truck beds will be lined with an impervious material (e.g., plastic), or the tailgate blocked with wattles, hay bales, or other appropriate filtration material. If appropriate, trucks may drain excess water by slightly tilting the loads and allowing the water to drain out through the applied filter. 4. Building materials and other maintenance-related materials, including chemicals and sediment, will not be stockpiled or stored where they could spill into water

Table 2-1. Cont.

BMP ID	Name	BMP
		<p>bodies or storm drains or where they will cover aquatic or riparian vegetation.</p> <ol style="list-style-type: none"> 5. No runoff from the project or staging areas, including from stockpiled spoils, may be allowed to enter the creek channel or storm drains without being subjected to filtration (e.g., vegetated buffer, hay wattles or bales, silt screens). 6. During dry season, no stockpiled soils shall remain exposed and unworked for more than 30 days. During wet season, no stockpiled soils shall remain exposed, unless surrounded by properly installed and maintained silt fencing or other means of erosion control. 7. All spoils will be disposed of in an approved location. Selection of the disposal location will be determined after the spoils have been tested for hazardous chemicals (see BMP HAZ-8).
GEN-3	Channel Access	<ol style="list-style-type: none"> 1. Access points to the channel for the purposes of stream maintenance will be minimized according to need. Access points should avoid large mature trees, native vegetation, or other significant habitat features as possible. Temporary access points shall be sited and constructed to minimize tree removal. 2. In considering channel access routes, slopes of greater than 20 percent shall be avoided if possible. Any sloped access points will be examined for evidence of instability and either revegetated or filled with compacted soil, seeded, and stabilized with erosion control fabric as necessary to prevent future erosion. 3. Personnel will use the appropriate equipment for the job that minimizes disturbance to and compaction of the stream bottom. Appropriately-tired vehicles, either tracked or wheeled, will be used depending on the site and maintenance activity.
Air Quality Protection		
AQ-1	Dust Management (based on Bay Area Air Quality Management District's basic dust control measures for all sites)	<ol style="list-style-type: none"> 1. Water all active maintenance areas as necessary to reduce dust emissions. In dry areas, this may be twice daily or more, while in already wet areas, no watering may be needed. 2. Cover all trucks hauling soil, sand, and other loose materials or require all trucks to maintain freeboard as necessary to prevent transported material from blowing from the trucks. 3. Sweep as necessary (with water sweepers or dry sweepers, as appropriate) all

Table 2-1. Cont.

BMP ID	Name	BMP
		<p>paved access roads, parking areas and staging areas at construction sites.</p> <p>4. Sweep streets as necessary (with water sweepers or dry sweepers, as appropriate) if visible soil material is carried onto adjacent public streets.</p>
AQ-2	<p>Enhanced Dust Management (based on Bay Area Air Quality Management District's enhanced dust control measures for sites greater than 4 acres)</p>	<p>1. As necessary, enclose, cover, water, or apply (non-toxic) soil binders to exposed stockpiles.</p> <p>2. Limit traffic speeds on unpaved roads to 15 mph.</p> <p>3. Install sandbags or other erosion control measures to prevent silt runoff to public roadways.</p>
Biological Resources Protection		
<i>General Measures</i>		
BR-1	Area of Disturbance	<p>1. Activities will avoid damage to or loss of native vegetation to the maximum extent feasible.</p> <p>2. Soil disturbance shall not exceed the minimum area necessary to complete the operations as described.</p>
BR-2	Pre-Maintenance Educational Training	<p>1. At the beginning of each maintenance season and before conducting stream maintenance activities, all personnel will participate in an educational training session conducted by a qualified biologist.¹ This training will include instruction on how to identify bird nests, recognize special-status species that may occur in the work areas, and the appropriate protocol if any nests or listed species are found during project implementation.</p> <p>2. Personnel who miss the first training session or are hired later in the season must participate in a make-up session before conducting maintenance activities.</p>
BR-3	Biotechnical Bank Stabilization	<p>If hydraulic conditions allow, the natural bank will be retained or a biotechnical repair technique will be used rather than, or along with, a hardscape repair.</p>

¹ A qualified biologist (including those specializing in botany, wildlife, and fisheries) is determined by a combination of academic training and professional experience in biological sciences and related resource management activities. SCWA may also utilize appropriately experienced and/or trained environmental staff. Resumes will be submitted to CDFG, USFWS and/or NFMS for approval prior to commencement of biological surveys, as stated in CDFG, USFWS and NMFS permit conditions.

Table 2-1. Cont.

BMP ID	Name	BMP
BR-4	Impact Avoidance and Minimization During Dewatering	<ol style="list-style-type: none"> 1. All dewatering activities conducted in streams bearing state- or federally-listed salmonids shall comply with the terms and conditions of the Russian River Biological Opinion (summarized in BMP BR-18), and any other Biological Opinions and associated Consistency Determinations issued by NOAA or DFG for the SMP. 2. Prior to dewatering, the best means to bypass flow through the work area will be determined to minimize disturbance to the channel and avoid direct mortality of fish and other aquatic vertebrates. The area to be dewatered will encompass the minimum area necessary to perform the maintenance activity. The period of dewatering will extend for the minimum amount of time needed to perform the maintenance activity. Where feasible and appropriate, dewatering will occur via gravity driven systems. Where feasible and appropriate, diversion structures shall be installed on concrete sections of the channels, such as concrete box culverts often used at road crossings. 3. A species relocation plan (BMP BR-5) shall be implemented as a reasonable best effort to ensure that native fish and other native aquatic vertebrates and macroinvertebrates are not stranded. 4. Instream cofferdams shall only be built from materials such as sandbags, clean gravel, or rubber bladders which will cause little or no siltation or turbidity. Visqueen shall be placed over sandbags to minimize water seepage into the maintenance areas. The visqueen shall be firmly anchored to the streambed to minimize water seepage. If necessary, the footing of the dam shall be keyed into the channel bed at an appropriate depth to capture the majority of subsurface flow needed to dewater the streambed. 5. When use of gravity fed dewatering is not feasible and pumping is necessary to dewater a work site, a temporary siltation basin and/or use of silt bags may be required to prevent sediment from re-entering the wetted channel. 6. Downstream flows adequate to prevent fish or vertebrate stranding will be maintained at all times during dewatering activities. Bypass pipe diameter will be sized to accommodate, at a minimum, twice the summer baseflow. 7. Diverted and stored water will be protected from maintenance activity-related pollutants, such as soils or equipment lubricants or fuels. 8. If necessary, discharged water will pass over some form of energy dissipater to

Table 2-1. Cont.

BMP ID	Name	BMP
		<p>keep erosion of the downstream channel to a minimum. Silt bags will be equipped to the end of discharge hoses and pipes to remove sediment from discharged water.</p> <p>9. For full channel dewatering, filtration devices or settling basins will be provided as necessary to ensure that the turbidity of discharged water is not visibly more turbid than in the channel upstream of the maintenance site. If increases in turbidity are observed, additional measures shall be implemented such as a larger settling basin or additional filtration. If increases in turbidity persist, turbidity measurements will be taken on a regular (i.e., at least daily) basis up- and downstream of the cofferdam enclosure. Data recorded will be compared against Regional Water Quality Control Board Basin Plan water quality standards. If Basin Plan standards are being exceeded, additional measures shall be installed and monitored to ensure Basin Plan standards are met.</p> <p>10. When maintenance is completed, the flow diversion structure shall be removed as soon as possible. Impounded water will be released at a reduced velocity to minimize erosion, turbidity, or harm to fish or amphibians downstream. Cofferdams will be removed so surface elevations of water impounded above the cofferdam will not be reduced at a rate greater than one inch per hour.</p> <p>11. The area disturbed by flow bypass mechanisms will be restored at the completion of the project. This may include, but is not limited to, recontouring the area and planting of riparian vegetation as appropriate.</p>
BR-5	Fish and Amphibian Species Relocation Plan	<p>1. All fish relocation conducted in streams bearing state- or federally-listed salmonids shall comply with the terms and conditions of the Russian River Biological Opinion (summarized in BMP BR-18), and any other Biological Opinions and associated Consistency Determinations issued by NOAA or DFG for the SMP. This measure will also apply to relocation of other special status species aquatic species (i.e., foothill yellow-legged frog and western pond turtle), and native aquatic species that could be relocated. Relocation for California red-legged frog will be conducted in accordance with BMPs BR-10 and BR-11 and any additional measures contained in the forthcoming SMP Biological Opinion issued by the USFWS.</p> <p>2. Prior to and during dewatering activities, native fish, tadpoles, and other vertebrates will be excluded from the work area by blocking the stream channel above and below the work area with fine-meshed net or screens. The bottom of</p>

Table 2-1. Cont.

BMP ID	Name	BMP
		<p>the screens will be completely secured to the channel bed. Exclusion screening will be placed in areas of low water velocity to minimize fish impingement. Screens will be checked periodically and cleaned of debris to permit free flow of water.</p> <ol style="list-style-type: none"> 3. The most efficient means for capturing fish will be determined and implemented. Complex stream habitat generally requires the use of electrofishing equipment, whereas in deep pools, fish may be concentrated by pumping-down the pool and then removing the fish by seining or dipnetting. Ample time will be scheduled to allow for a reasonable fish removal effort to be conducted. 4. Initial fish relocation efforts will be conducted several days prior to the start of maintenance activities. This provides the biologist an opportunity to return to the work area and perform additional electrofishing passes immediately prior to maintenance activities. 5. All native captured fish will be allowed to recover from electrofishing before being returned to the stream. 6. During dewatering, a qualified biologist will direct and monitor activities as necessary to net and rescue any additional fish and/or amphibians that may have become stranded throughout the dewatering process. 7. Prior to capturing fish and/or amphibians, the most appropriate release location(s) will be identified and used. The following issues will be considered when selecting release site(s): <ul style="list-style-type: none"> ▪ proximity to the project area; ▪ similar water temperature as capture location; ▪ ample habitat availability prior to release of captured fish; ▪ presence of other same species so that relocation of new individuals will not upset the existing prey/predation function; ▪ low potential for relocated individual to transport disease; and ▪ low likelihood of fish reentering work site or becoming impinged on exclusion net or screen. 8. In areas where aquatic vertebrates are abundant, to increase survival rates and

Table 2-1. Cont.

BMP ID	Name	BMP
BR-6	On-Call Wildlife Biologist	<p>ensure captured vertebrates are not held overly long, capture will be periodically ceased, and release will occur at predetermined locations.</p> <p>A qualified biologist will be on-call in southern Sonoma County and available to visit a project site at any point during maintenance activities in the event a special status species is encountered.</p>
<i>Species-Related Measures</i>		
BR-7	Special Status Plants	<ol style="list-style-type: none"> 1. For projects located in areas where federally-listed plant species have been identified as potentially occurring (see SMP Manual Table 7-3), a qualified botanist will conduct appropriately timed focused botanical surveys of the project site for these species. If these species is observed in or near the project site, SCWA will follow the measures below as well as any additional measures contained in the forthcoming Biological Opinion issued by the USFWS for the SMP. 2. For projects located in areas where special status plant populations have been identified as potentially occurring (see SMP Manual Table 7-3), a qualified botanist will conduct appropriately timed focused botanical surveys of the project site for special status plant occurrences. A qualified botanist will also assess habitat suitability for the potential occurrence of special status plant species at any newly identified sediment disposal sites or previously unidentified staging areas. 3. If discovered, special-status plant populations identified during the field surveys and with potential to be impacted will be enumerated, photographed and conspicuously flagged to maximize avoidance, as well as to determine the total number of individuals affected. If feasible, the project shall be redesigned or modified to avoid direct and indirect impacts on special-status plant species. 4. Special-status plant species near the project site will be protected from temporary disturbance by installing environmentally sensitive area fencing (orange construction barrier fencing) around special-status plant species populations. Protective fencing will be installed under the direction of the botanist as necessary to protect the plant and its habitat; where feasible, the environmentally sensitive area fencing will be installed at least 50 ft. from the edge of the population. Where special-status plant populations are located in wetlands, silt fencing will also be installed. The location of the fencing will be shown on the maintenance design drawings and marked in the field with stakes and flagging. The design specifications will contain clear language that prohibits maintenance-related activities, vehicle operation, material and equipment storage, and other surface-

Table 2-1. Cont.

BMP ID	Name	BMP
		<p>disturbing activities within the fenced environmentally sensitive area.</p> <ol style="list-style-type: none"> 5. Vegetation management activities in sensitive plant areas will be conducted under the guidance of the botanist. These activities should be timed following the blooming periods of potentially occurring listed species, after the month of June. 6. If impacts to state or federally listed plants are unavoidable, then the Agency shall coordinate with the appropriate resource agencies and local experts to determine whether transplantation of special-status plant species is feasible. If the agencies concur that it is a feasible mitigation measure, the botanist shall develop and implement a transplantation plan in coordination with the appropriate agencies. As part of the plan, the Agency, in conjunction with a qualified restoration ecologist and DFG and/or USFWS, shall identify a suitable on- or off-site location for mitigation and appropriate methods for seed collection, propagation, relocation, maintenance and monitoring. If the impacted species are annuals, it is expected that the current seed crop from the individuals to be lost will be collected (as well as immediate soils making up the dormant seed bed) and then sown on appropriate habitat located on the mitigation site. If the species is a perennial, it is expected that both the seed and the plants themselves will be salvaged and relocated to the mitigation site. Seed from the populations that will be impacted may be collected and propagated at a native plant nursery, prior to planting to increase the potential for establishment and survival. Annual monitoring of the mitigation site shall be conducted for 5 years to assess vegetative density, population size, natural recruitment, and plant health and vigor. Monitoring results may trigger management actions such as collection and sowing of additional seed, tillage/disturbance within existing populations to induce establishment, installation of container plants, and control of exotic invasive vegetation such as yellow star thistle to ensure successful plant establishment and survival. The site shall be evaluated at the end of the 5-year monitoring period to determine whether the mitigation has met the success criteria identified in the rare plant relocation, management, and protection plan. 7. If appropriately timed focused botanical surveys cannot be conducted in areas identified as suitable for listed plants prior to vegetation management activities, then the Agency shall assume presence of the plant species in question and coordinate with the appropriate resource agencies and local experts to develop appropriate mitigation for the impact.

Table 2-1. Cont.

BMP ID	Name	BMP
BR-8	Nesting Migratory Bird and Raptor Pre-maintenance Surveys	<ol style="list-style-type: none"> 1. To the extent feasible, maintenance activities, including tree trimming, will take place outside the migratory bird and raptor nesting period (February 15 through August 15 for most birds). During the nesting bird season, work sites that are less densely vegetated will be prioritized, to facilitate pre-maintenance surveys and decrease the likelihood of disturbing undiscovered nests. 2. If maintenance activities must be scheduled to occur during the nesting season, a qualified wildlife biologist, familiar with the species and habitats in the Program Area, will be retained to conduct pre-maintenance surveys for raptors and nesting birds within suitable nesting habitat within 300 feet of SMP activities. The surveys should be conducted within one week before initiation of maintenance activities within those habitats. If no active nests are detected during surveys, activities may proceed. Vegetation removal activities will be conducted under the guidance of a biologist. If active nests are detected then measure 3 would be implemented. 3. If active nests are identified within the SMP area, non-disturbance buffers shall be established at a distance sufficient to minimize disturbance based on the nest location, topography, cover and species' tolerance to disturbance. Buffer size shall be determined in cooperation with the CDFG. If active nests are found within 300 feet of the project area, a qualified biologist shall be on site as necessary to monitor the nests for signs of nest disturbance. If it is determined that maintenance activity is resulting in nest disturbance, work shall cease immediately and CDFG shall be contacted. Buffers will be developed through consultation with CDFG. Buffers will remain in place until biologists determine that the young have successfully fledged or nests have been otherwise abandoned.
BR-9	California Freshwater Shrimp Avoidance and Impact Minimization for Vegetation Management	<p>Maintenance activities occurring along streams supporting California freshwater shrimp will be restricted to only conducting vegetation management and/or debris removal above the water level. In addition, vegetation or debris overhanging into pools or glides (slow or slack water) within the natural reaches of Sonoma Creek will not be removed or altered.</p> <p><i>Note: The only stream maintained under the SMP that supports California freshwater shrimp is Sonoma Creek. This creek has natural and modified channels along its length, and does not have any engineered channels. Therefore, the only type of activity that will be conducted along Sonoma Creek is vegetation management for hydraulic easement purposes. Applying this BMP will ensure that stream channels which support California freshwater shrimp will retain habitat elements (e.g., undercut banks with exposed, fine roots of willows or alders, trailing vines and overhanging woody vegetation) and</i></p>

Table 2-1. Cont.

BMP ID	Name	BMP
BR-10	California Red-legged Frog Avoidance and Impact Minimization Measures for Ground-Disturbing Activities	<p><i>continue to provide habitat for this species.</i></p> <ol style="list-style-type: none"> 1. For ground-disturbing maintenance activities occurring in areas where California red-legged frog (CRLF) has been identified as potentially occurring (see SMP Manual Table 7-3), a qualified biologist will conduct pre-maintenance surveys to assess habitat within the proposed maintenance area. 2. If suitable breeding or foraging habitat is present then focused surveys using the USFWS CRLF survey protocol will be completed or CRLF presence will be assumed. The USFWS will be contacted and any site-specific recommendations will be implemented. 3. If CRLF are present or assumed present, a qualified biological monitor, or a biologist with an Incidental Take Permit, will inspect the area daily before the start of work and will be present during maintenance activities in sensitive habitats. If appropriate, SCWA will install exclusionary fencing. 4. In the event that a CRLF is encountered within the maintenance area, the USFWS Sacramento Field Office will be contacted within 48 hours of any CRLF observations, and a qualified biologist will move the frog to a safe location outside of the project area. Actions taken to move CRLF will be consistent with applicable USFWS and CDFG regulations and permits. The biological monitor will have the authority to stop work if a CRLF is encountered until such a time as the frog may be moved to an area outside of the project area fencing. 5. If dewatering of a creek is required, dipnet and seine surveys for CRLF tadpoles will be completed prior to initiation of dewatering. Captured tadpoles will be moved to a safe location elsewhere in the creek.
BR-11	California Red-legged Frog Avoidance and Impact Minimization Measures for Vegetation Management	<ol style="list-style-type: none"> 1. For vegetation maintenance activities occurring in areas where CRLF frog has been identified as potentially occurring (see SMP Manual Table 7-3), a qualified biologist will conduct pre-maintenance surveys of aquatic habitats and identify potential CRLF breeding and foraging areas. These areas will be flagged and avoided by maintenance crews. 2. In areas where CRLF could potentially occur, field crews conducting hand trimming of vegetation will access channel banks by foot only and will avoid entering open water. Vehicles will be restricted to existing access roads. 3. In work sites where potential CRLF breeding and foraging areas were identified during the pre-maintenance survey, a qualified biological monitor or a biologist

Table 2-1. Cont.

BMP ID	Name	BMP
		<p>with an Incidental Take Permit, will be on-site during project activity in sensitive habitats. The biological monitor will have the authority to stop work if a CRLF (or any of its life stages) is encountered until such a time as the frog may be moved to an area away from the project site.</p> <p>4. The USFWS Sacramento Field Office will be contacted within 48 hours of any CRLF observations.</p>
BR-12	California Tiger Salamander Avoidance and Impact Minimization Measures for Sediment and Debris Removal	<p>1. For sediment and debris removal maintenance activities occurring in areas where California tiger salamander (CTS) has been identified as potentially occurring (see SMP Manual Table 7-3), a qualified biologist will conduct pre-maintenance surveys of upland habitats and identify areas with small mammal burrows. Areas with an abundance of small mammal burrows will be flagged and avoided by maintenance crews.</p> <p>2. Maintenance activities will be restricted to the streambed and avoid disturbance to adjacent upland habitat.</p> <p>3. Sediment and debris removal activities shall minimize removal of upland vegetation and soil compaction.</p> <p>4. If upland banks must be traversed by heavy equipment to access a streambed, the route will be located where no small mammal burrows are present and will be delineated by temporary fencing to minimize upland habitat disturbance.</p> <p>5. If burrows or other suitable aestivation habitat are present where sediment or debris removal activities are proposed, a qualified biological monitor or a biologist with an Incidental Take Permit will be on call during project activity in proximity to upland CTS habitat. The biological monitor will have the authority to stop work if a CTS is encountered until such a time as the animal is moved to an area away from the project site.</p> <p>6. Maintenance activities located in proximity to upland CTS habitat will be scheduled to avoid the CTS migration season (October 15 – June 30). If work must be completed during the migration season, barrier fencing will be installed to exclude CTS from maintenance areas.</p> <p>7. In the event that a California tiger salamander is encountered within the maintenance area, a biologist with an Incidental Take Permit, or biologist approved by the USFWS, will move the salamander to a safe location with suitable underground refugia (e.g., open burrow of appropriate depth) outside of the</p>

Table 2-1. Cont.

BMP ID	Name	BMP
BR-13	California Tiger Salamander Avoidance and Impact Minimization Measures for Bank Stabilization	<p>maintenance area. Actions taken to move CTS will be consistent with applicable USFWS and CDFG regulations and permits.</p> <p>8. The USFWS Sacramento Field Office will be contacted within 48 hours of any California tiger salamander observations.</p> <p>1. For bank stabilization activities occurring in areas where California tiger salamander has been identified as potentially occurring (see SMP Manual Table 7-3), a qualified biologist will conduct pre-maintenance surveys of upland habitats and identify areas with burrows and/or other suitable aestivation habitat.</p> <p>2. If burrows or other suitable aestivation habitat are present where bank stabilization activities are proposed, a qualified biological monitor or a biologist with an Incidental Take Permit, will be on call during project activity in proximity to upland CTS habitat. The biological monitor will have the authority to stop work if a CTS is encountered until such a time as the animal is moved to an area away from the project site.</p> <p>3. Maintenance activities located in proximity to upland CTS habitat will be scheduled to avoid the CTS migration season (October 15 – June 30). If work must be completed during the migration season, barrier fencing will be installed to exclude CTS from maintenance areas.</p> <p>4. In the event that a California tiger salamander is encountered within the maintenance area, a biologist with an Incidental Take permit, or biologist approved by the USFWS, will move the salamander to a safe location with suitable underground refugia (e.g., open burrow of appropriate depth) outside of the fenced maintenance area. Actions taken to move CTS will be consistent with applicable USFWS and CDFG regulations and permits.</p> <p>5. The USFWS Sacramento Field Office will be contacted within 48 hours of any California tiger salamander observations.</p>
BR-14	California Tiger Salamander Avoidance and Impact Minimization Measures for Vegetation Management	<p>1. For vegetation management activities occurring in areas where California tiger salamander has been identified as potentially occurring (see SMP Manual Table 7-3), a qualified biologist will conduct pre-maintenance surveys of upland habitats and identify areas with small mammal burrows. Areas with an abundance of small mammal burrows will be flagged and avoided by maintenance crews.</p> <p>2. Based on surveys, if California tiger salamander is identified as potentially present, then access across upland channel banks and adjacent upland habitats will be by</p>

Table 2-1. Cont.

BMP ID	Name	BMP
		<p>foot only. Vehicles will be restricted to existing access roads.</p> <ol style="list-style-type: none"> 3. A qualified biological monitor, or biologist with an Incidental Take Permit, will be on call during project activity in proximity to upland CTS habitat. The biological monitor will have the authority to stop work if a CTS is encountered until such a time as the animal is moved to an area away from the project site. 4. In the event that a California tiger salamander is encountered within the maintenance area, a biologist with an Incidental Take Permit, or biologist approved by the USFWS, will move the salamander to a safe location with suitable underground refugia (e.g., open burrow of appropriate depth) outside of the fenced maintenance area. Actions taken to move CTS will be consistent with applicable USFWS and CDFG regulations and permits. 5. The USFWS Sacramento Field Office will be contacted within 48 hours of any California tiger salamander observations.
BR-15	Foothill Yellow-legged Frog Avoidance and Impact Minimization Measures for Ground-Disturbing Activities	<ol style="list-style-type: none"> 1. For ground-disturbing activities occurring in areas where foothill yellow-legged frog has been identified as potentially occurring (see SMP Manual Table 7-3), a qualified biologist will conduct pre-maintenance surveys to assess habitat within the proposed maintenance area. 2. A qualified biologist will inspect the maintenance area daily before the start of work. If appropriate, SCWA will install exclusionary fencing. In the event that foothill yellow-legged frogs are encountered within the maintenance area, a qualified biologist will move the frog to a safe location outside of the maintenance area. Actions taken to move foothill yellow-legged frog will be consistent with applicable CDFG regulations and permits. 3. If dewatering a creek segment is required, a qualified biologist will conduct visual and dipnet surveys and move captured frogs and tadpoles to a safe location in the creek. Actions taken to move foothill yellow-legged frog will be consistent with applicable CDFG regulations and permits. 4. CDFG will be notified within 48 hours of any foothill yellow-legged frog observations.
BR-16	Foothill Yellow-legged Frog Avoidance and Impact Minimization Measures for	<ol style="list-style-type: none"> 1. For vegetation maintenance activities occurring in areas where foothill yellow-legged frog has been identified as potentially occurring (see SMP Manual Table 7-3), a qualified biologist will conduct pre-maintenance surveys of aquatic habitats and identify potential foothill yellow-legged frog breeding and foraging areas.

Table 2-1. Cont.

BMP ID	Name	BMP
	Vegetation Management	<p>These areas will be flagged and avoided by maintenance crews.</p> <ol style="list-style-type: none"> Based on surveys, if foothill yellow-legged frog is identified as potentially present, then field crews will access channel banks by foot only and will avoid entering open water. Vehicles will be restricted to existing access roads.
BR-17	Western Pond Turtle Pre-maintenance Surveys for Ground-Disturbing Activities	<ol style="list-style-type: none"> For projects located in areas where western pond turtle has been identified as potentially occurring (see SMP Manual Table 7-3), a qualified biologist will conduct pre-maintenance surveys to assess habitat within the proposed maintenance area. If suitable instream habitat for the western pond turtle is present in the maintenance area, a qualified biologist will inspect the maintenance area daily before the start of work. In the event that a western pond turtle is encountered before or during the maintenance activity, a qualified biologist will move the turtle to a safe location outside of the work area. Actions taken to move western pond turtle will be consistent with applicable CDFG regulations and permits. If dewatering of a creek segment is required, a qualified biologist will be present and will move turtles – if found – to a safe location in the creek. Actions taken to move western pond turtle will be consistent with applicable CDFG regulations and permits. CDFG will be notified within 48 hours of any western pond turtle observations.
BR-18	Zone 1A Salmonid Avoidance and Impact Minimization Measures (based on NMFS Russian River BO issued on September 24, 2008)	<p>These conditions apply to steelhead-bearing streams identified in the BO as: Laguna de Santa Rosa, Copeland Creek, Santa Rosa Creek, and Windsor Creek.</p> <p>SCWA will not perform any flood control maintenance activities in the Mark West Creek mainstem or tributaries of Mark West Creek upstream of the confluence with its largest tributary, the Laguna de Santa Rosa. As such, maintenance activities conducted on Wikiup or Fulton Creeks are not covered under the Zone 1A BO and will require a separate consultation with NMFS.</p> <p>Sediment maintenance activities conducted in steelhead-bearing streams will comply with the terms and conditions of Reasonable and Prudent Measure 5 of the Russian River BO for Zone 1A, which states:</p> <ol style="list-style-type: none"> Term and Condition A: SCWA shall isolate work areas located in aquatic habitat from the flowing stream and relocate listed salmonids prior to proceeding with in-channel work for food control maintenance or habitat enhancement:

Table 2-1. Cont.

BMP ID	Name	BMP
		<ul style="list-style-type: none"> ▪ retain a qualified biologist with expertise in anadromous salmonid biology; ▪ the biologist shall be onsite during all dewatering events; ▪ all captured salmonids will be properly cared for; ▪ if any salmonids are found dead or injured, the Santa Rosa Area NMFS office will be contacted immediately; and ▪ NMFS staff or persons designated by NMFS will be allowed on-site during dewatering activities.
		<p>2. Term and Condition B: at all channel maintenance sites in Zone 1A, SCWA will:</p> <ul style="list-style-type: none"> ▪ check construction equipment for leaks each day prior to conducting work in the channel; ▪ ensure that all fill material for cofferdams is fully contained; ▪ ensure that all diversion pumps are screened in compliance with NMFS' and CDFG's fish screening criteria; ▪ ensure that coffer dams are properly sized and maintained throughout the duration of maintenance activities; and ▪ ensure that all material is removed after completion of the project.
		<p>3. Term and Condition C: SCWA will provide NMFS and DFG with reports on construction-related and fish relocation activities by February 15 of the year following maintenance.</p>
		<p>4. Term and Condition D: SCWA will reduce impacts on habitat complexity:</p> <ul style="list-style-type: none"> ▪ all work in natural channels, except for revegetation activities, will be conducted between June 15 and October 15; ▪ no work will be started that cannot be completed before the onset of a storm event; ▪ vehicles may be driven in the dry streambed only as necessary to accomplish work; ▪ all exposed/disturbed areas on upper stream banks within the project site

Table 2-1. Cont.

BMP ID	Name	BMP
		<p>will be stabilized;</p> <ul style="list-style-type: none"> ▪ install erosion control measures to divert runoff to stable areas; ▪ all new riprap will be planted with willows or other native trees; ▪ no grouted riprap shall be installed; ▪ bioengineering techniques shall be incorporated into all bank stabilization projects; ▪ when grading gravel bars, a buffer of 25 feet or 10 percent of the maximum bar width, whichever is greater, shall be maintained; ▪ SCWA will construct a low flow channel at sediment removal sites in Zone 1A to provide enhanced migration habitat through sediment removal areas. <p>5. Sediment removal project designs will be submitted to NMFS and DFG 60 days prior to implementation for approval.</p> <p>6. The low flow channel shall be monitored at least two times in-between large storm events during the winter period to assess its function as a migration corridor and impact on stream stability.</p>
BR-19	Zone 2A and 3A Salmonid Avoidance and Minimization Measures	<i>[placeholder for forthcoming NMFS BO for Zone 2/3A. Until then, BR-18 will be utilized for salmonid-bearing streams.]</i>
Cultural Resources Protection		
CR-1	Cultural Resources Investigation	<p>For maintenance activities which require excavation into native soils (e.g., bank stabilization, culvert replacement, etc.), and for all new sediment disposal sites, a cultural resources investigation shall be conducted prior to performing the maintenance activity. The cultural resources investigation shall include the following elements:</p> <ol style="list-style-type: none"> 1. Background Research and Native American Consultation. An updated records search shall be conducted at locations planned for maintenance that have not had a records search completed within the previous five years. Sediment disposal sites shall only require an initial records search. Investigations should begin with a review of the data acquired for this document to determine whether the proposed activity will occur within a previously-known culturally-sensitive area. An

Table 2-1. Cont.

BMP ID	Name	BMP
		<p>addendum records search at the NWIC will also be necessary to determine if any cultural resources have been recorded since the creation of this document. The records search will identify resources within or near the project location and determine whether that location has been previously surveyed up to current standards.</p> <p>In conjunction with the background research, the appropriate Native American organization will be contacted to provide comments or concerns about a maintenance activity location.</p> <p>2. Pedestrian Survey. If an adequate survey has not been completed for a project location within a ten-year period from the date of scheduled maintenance, a pedestrian survey is required. Sediment disposal sites shall only require an initial pedestrian survey. All areas of exposed ground should be closely inspected for the presence of cultural materials. Areas of dense vegetation should be inspected as closely as possible and any exposed channel banks should be carefully examined for the presence of buried cultural resources. Depending on the likelihood for encountering subsurface remains, based on an analysis of site distribution and geomorphology of the project location, a series of small, hand-auger borings may be excavated, with all sediments passed through 1/4-inch screen, to assure that no subsurface archaeological materials are present. The auger borings would also provide an initial assessment of the surface integrity of the landform (e.g., is a substantial amount of imported or redeposit fill material present?) and provide additional information about the potential for buried archaeological material. If the limited subsurface testing does not reveal buried cultural material, there will be less likelihood that unexpected discoveries will delay activities.</p> <p>If an archaeological deposit is encountered, a preliminary assessment of site boundaries should be made. Any archaeological material recovered in auger holes will be recorded, cataloged, and re-deposited. A map should be prepared depicting site boundaries in relation to the project area, and the site should be recorded on a standard archaeological site record (DPR 523 form).</p> <p>3. Documentation. If findings are negative, these results will be presented in the SMP annual notification package. If findings are positive, a positive Archaeological Survey Report (ASR)/Historic Property Survey Report (HPSR) will be prepared that includes appropriate background research, site records, and recommendations for additional work. The report will include results of</p>

Table 2-1. Cont.

BMP ID	Name	BMP
		<p>background research, descriptions of field work, findings, appropriate maps and photos, and a record of Native American consultation. A cover letter will detail management recommendations, which could include archaeological and Native American monitoring, site avoidance, or test excavations to determine site significance. The report will be submitted to SCWA and the NWIC.</p> <p>4. Management Requirements. If a cultural resource is located within an area of maintenance activity the following steps shall be implemented. The following are examples of management requirements regarding the treatment of known or unknown cultural resources; other measures may be implemented instead, provided they are at least as protective of the cultural resource in question.</p> <ul style="list-style-type: none"> ▪ Archaeological and Native American Monitoring: SCWA shall retain the services of a Native American monitor and a qualified archaeological consultant that has expertise in California prehistory to monitor ground-disturbing activities within 200 feet of known archaeological sites or in areas designated as having a high potential for encountering archaeological sites. If an intact archaeological deposit is encountered, all soil disturbing activities in the vicinity of the deposit should stop until the deposit is evaluated. The archaeological monitor shall immediately notify SCWA of the encountered archaeological deposit. The monitors shall, after making a reasonable effort to assess the identity, integrity, and significance of the encountered archaeological deposit, present the findings of this assessment to SCWA. During the course of the monitoring, the archaeologist may adjust the frequency—from continuous to intermittent—of the monitoring based on the conditions and professional judgment regarding the potential to impact resources. ▪ Cultural Resources Monitoring Plan: If monitoring is the preferred recommendation, a cultural resources monitoring plan shall be prepared by a qualified professional archaeologist. The plan should address (but not be limited to) the following issues: <ul style="list-style-type: none"> - Training program for all construction involved in site disturbance and field workers; - Person(s) responsible for conducting monitoring activities, including Native American monitors; - How the monitoring shall be conducted and the required format and

Table 2-1. Cont.

BMP ID	Name	BMP
		<p>content of monitoring reports, including any necessary archaeological re-survey;</p> <ul style="list-style-type: none"> - Person(s) responsible for overseeing and directing the monitors; - Schedule for submittal of monitoring reports and person(s) responsible for review and approval of monitoring reports; - Procedures and construction methods to avoid sensitive cultural resource areas; - Clear delineation and fencing of sensitive cultural resource areas requiring monitoring; - Physical monitoring boundaries (e.g., 200-foot radius of a known site); - Protocol for notifications and stop-work guidelines in case of encountering of cultural resources, as well as methods of dealing with the encountered resources (e.g., collection, identification, curation); - Methods to ensure security of cultural resources sites; - Protocol for notifying local authorities (i.e. Sheriff, Police) should site looting and other illegal activities occur during construction. - If SCWA, in consultation with the monitors, determines that a significant archaeological resource is present and that the resource could be adversely affected by the proposed Project, SCWA shall: - Re-design the proposed project to avoid any adverse effect on the significant resource; or, - Implement an archaeological data recovery program (ADRP) (unless the archaeologist determines that the archaeological resource is of greater interpretive than research significance, and that interpretive use of the resource is feasible). The project archaeologist and SCWA shall meet and consult to determine the scope of the ADRP. The archaeologist will prepare a draft ADRP and submit it to SCWA for review and approval. The ADRP will identify how the proposed data recovery program will preserve the significant information the archaeological resource is expected to contain. The ADRP will identify the scientific/historic research questions applicable to the expected resource, the data classes

Table 2-1. Cont.

BMP ID	Name	BMP
CR-2	Previously Undiscovered Cultural Resources	<p>the resource is expected to possess, and how the expected data classes will address the applicable research questions. Data recovery, in general, shall be limited to the portions of the historic property that could be adversely affected by the proposed Project. Destructive data recovery methods shall not be applied to portions of the archaeological resources if nondestructive methods are practical.</p> <p>Inadvertent Discoveries: If discovery is made of items of historical or archaeological interest, activity will immediately cease in the project location (within approximately 50-feet) of discovery. Prehistoric archaeological materials might include obsidian and chert flaked-stone tools (e.g., projectile points, knives, scrapers) or toolmaking debris; culturally darkened soil (“midden”) containing heat-affected rocks, artifacts, or shellfish remains; and stone milling equipment (e.g., mortars, pestles, handstones, or milling slabs); and battered stone tools, such as hammerstones and pitted stones. Historic-period materials might include stone, concrete, or adobe footings and walls; filled wells or privies; and deposits of metal, glass, and/or ceramic refuse. After cessation of excavation the contractor shall immediately contact SCWA. Maintenance will not resume until authorization is received from the SCWA.</p> <ul style="list-style-type: none"> ▪ In the event of unanticipated discovery of archaeological indicators during construction, SCWA will retain the services of a qualified professional archaeologist to evaluate the significance of the items prior to resuming any activities that could impact the site. ▪ In the case of an unanticipated archaeological discovery that is determined to be potentially eligible for listing in the National and/or California Register, and the site cannot be avoided, SCWA will implement an ADRP, prepared by a qualified archaeologist, as outlined under BMP CR-1. <p>Discovery of Human Remains: If potential human remains are encountered, SCWA shall halt work in the vicinity of the find and contact the county coroner in accordance with Public Resources Code Section 5097.98 and Health and Safety Code Section 7050.5. If the coroner determines the remains are Native American, the coroner will contact the NAHC. As provided in Public Resources Code Section 5097.98, the NAHC will identify the person or persons believed to be most likely descended from the deceased Native American. The Most Likely Descendent makes recommendations for means of treating or disposing of, with appropriate dignity, the human remains and any associated grave goods as provided in Public Resources Code Section 5097.98.</p>

Table 2-1. Cont.

BMP ID	Name	BMP
CR-3	Previously Undiscovered Paleontological Resources	If fossil remains are encountered during maintenance, the maintenance activity will be stopped until a qualified professional paleontologist can assess the nature and importance of the find and recommend appropriate treatment. SCWA shall retain a consultant who meets the Society for Vertebrate Paleontology’s criteria for a “qualified professional paleontologist” (Society of Vertebrate Paleontology Conformable Impact Mitigation Guidelines Committee 1995). Treatment may include preparation and recovery of fossil materials so that they can be housed in an appropriate museum or university collection, and may also include preparation of a report for publication describing the finds. SCWA shall be responsible for ensuring that the recommendations of the paleontologist regarding treatment and reporting are implemented.
Hazardous Materials Safety		
HAZ-1	Spill Prevention and Response Plan	<p>The Agency will develop a Spill Prevention and Response Plan prior to commencement of maintenance activities. The plan will summarize the measures required under BMPs HAZ-2 through HAZ-6. It will also require that:</p> <ol style="list-style-type: none"> 1. Equipment and materials for cleanup of spills be available on site and that spills and leaks will be cleaned up immediately and disposed of properly; 2. Prior to entering the work site, all field personnel shall be appropriately trained in spill prevention, hazardous material control, and clean-up of accidental spills. 3. Field personnel shall implement measures to ensure that hazardous materials are properly handled and the quality of water resources is protected by all reasonable means. 4. Spill prevention kits shall always be in close proximity when using hazardous materials (e.g., crew trucks and other logical locations). All field personnel shall be advised of these locations and trained in their appropriate use. <p>The Agency will routinely inspect the work site to verify that the Spill Prevention and Response Plan is properly implemented and maintained. The Agency will notify contractors immediately if there is a noncompliance issue and will require compliance.</p> <p>Absorbent materials will be used on small spills located on impervious surface rather than hosing down the spill; wash waters shall not discharge to the storm drainage system or surface waters. For small spills on pervious surfaces such as soils, wet materials will be excavated and properly disposed rather than burying it. The</p>

Table 2-1. Cont.

BMP ID	Name	BMP
HAZ-2	Equipment and Vehicle Maintenance	<p>absorbent materials will be collected and disposed of properly and promptly.</p> <p>As defined in 40 CFR 110, a federal reportable spill of petroleum products is the spilled quantity that:</p> <ul style="list-style-type: none"> ▪ violates applicable water quality standards; ▪ causes a film or sheen on, or discoloration of, the water surface or adjoining shoreline; or ▪ causes a sludge or emulsion to be deposited beneath the surface of the water or adjoining shorelines. <p>If a spill is reportable, the contractor’s superintendent will notify the Agency, and the Agency will take action to contact the appropriate safety and cleanup crews to ensure that the Spill Prevention and Response Plan is followed. A written description of reportable releases must be submitted to the appropriate RWQCB and the California Department of Toxic Substances Control (DTSC). This submittal must contain a description of the release, including the type of material and an estimate of the amount spilled, the date of the release, an explanation of why the spill occurred, and a description of the steps taken to prevent and control future releases. The releases will be documented on a spill report form.</p> <p>If an appreciable spill has occurred, and results determine that project activities have adversely affected surface water or groundwater quality, a detailed analysis will be performed to the specifications of DTSC to identify the likely cause of contamination. This analysis will include recommendations for reducing or eliminating the source or mechanisms of contamination. Based on this analysis, the Agency or contractors will select and implement measures to control contamination, with a performance standard that surface and groundwater quality must be returned to baseline conditions. These measures will be subject to approval by the Agency, DTSC, and the RWQCB.</p> <ol style="list-style-type: none"> 1. All vehicles and equipment will be kept clean. Excessive build-up of oil or grease will be avoided. 2. All equipment used in the creek channel will be inspected for leaks each day prior to initiation of work. Action will be taken to prevent or repair leaks, if necessary. 3. Vehicle and equipment maintenance activities will be conducted off-site or in a designated, protected area away from the channel where vehicle fluids and spills

Table 2-1. Cont.

BMP ID	Name	BMP
		<p>can be handled with reduced risk to water quality.</p> <ol style="list-style-type: none"> 4. If maintenance must occur on-site, designated areas will not directly connect to the ground, surface waters, or the storm drainage system to prevent the run-on of stormwater and runoff of spills. The service area will be clearly designated with berms, sandbags, or other barriers. 5. Secondary containment, such as a drain pan or drop cloth, to catch spills or leaks will be used when removing or changing fluids. Fluids will be stored in appropriate containers with covers, and properly recycled or disposed of off-site. 6. Cracked batteries will be stored in a non-leaking secondary container and removed from the site. 7. Spill clean-up materials will be stockpiled where they are readily accessible. 8. Incoming vehicles and equipment will be checked for leaking oil and fluids (including delivery trucks, and employee and subcontractor vehicles). Leaking vehicles or equipment will not be allowed on-site.
HAZ-3	Equipment and Vehicle Cleaning	<ol style="list-style-type: none"> 1. Equipment will be cleaned of any sediment or vegetation before transferring and using in a different watershed to avoid spreading pathogens or exotic/invasive species between watersheds. 2. Vehicles and equipment will not be washed on-site. Vehicle and equipment washing will occur on an appropriate wash rack at SCWA's maintenance center.
HAZ-4	Refueling	<ol style="list-style-type: none"> 1. No fueling shall be done in the channel (top-of-bank to top-of-bank) unless equipment stationed in these locations cannot be readily relocated (e.g., pumps and generators). 2. All off-site fueling sites (e.g., on access roads above the top-of-bank) shall be equipped with secondary containment and avoid a direct connection to underlying soil, surface water, or the storm drainage system. 3. For stationary equipment that must be fueled on-site, secondary containment, such as a drain pan or drop cloth, shall be provided in such a manner to prevent accidental spill of fuels to underlying soil, surface water, or the storm drainage system.
HAZ-5	On-Site Hazardous Materials Management	<ol style="list-style-type: none"> 1. The products used and/or expected to be used and the end products that are produced and/or expected to be produced after their use will be inventoried.

Table 2-1. Cont.

BMP ID	Name	BMP
		<ol style="list-style-type: none"> 2. As appropriate, containers will be properly labeled with a “Hazardous Waste” label and hazardous waste will be properly recycled or disposed of off-site. 3. Contact of chemicals with precipitation will be minimized by storing chemicals in watertight containers or in a storage shed (completely enclosed), with appropriate secondary containment to prevent any spillage or leakage. 4. Quantities of equipment fuels and lubricants greater than 55 gallons shall be provided with secondary containment that is capable of containing 110% of the primary container(s). 5. Petroleum products, chemicals, cement, fuels, lubricants, and non-storm drainage water or water contaminated with the aforementioned materials shall not be allowed to enter receiving waters or the storm drainage system. 6. Sanitation facilities (e.g., portable toilets) will be surrounded by a berm, and a direct connection to the storm drainage system or receiving water will be avoided. 7. Sanitation facilities will be regularly cleaned and/or replaced, and inspected regularly for leaks and spills. 8. Waste disposal containers will be covered when they are not in use, and a direct connection to the storm drainage system or receiving water will be avoided. 9. All trash that is brought to a project site during maintenance activities (e.g., plastic water bottles, plastic lunch bags) will be removed from the site daily.
HAZ-6	Existing Hazardous Sites or Waste	<p>Upon selection of maintenance project locations, the Agency will conduct a search for existing known contaminated sites on the State Water Resource Control Board’s GeoTracker website (http://www.geotracker.waterboards.ca.gov). For any proposed maintenance sites located within 1,500 feet of any “open” sites where contamination has not been remediated, the Agency will contact the RWQCB case manager listed in the database. The Agency will work with the case manager to ensure maintenance activities would not affect cleanup or monitoring activities or threaten the public or environment.</p> <p>If hazardous materials, such as oil or paint cans, are encountered at the maintenance sites, the Agency will carefully remove and dispose of them according to the Spill Prevention and Response plan. Agency staff will wear proper protective gear and store the waste in an appropriate hazardous waste container until it can be disposed at a hazardous waste facility.</p>

Table 2-1. Cont.

BMP ID	Name	BMP
HAZ-7	Fire Prevention	<ol style="list-style-type: none"> 1. All earthmoving and portable equipment with internal combustion engines will be equipped with spark arrestors. 2. During the high fire danger period (April 1–December 1), work crews will have appropriate fire suppression equipment available at the work site. 3. On days when the fire danger is high and a burn permit is required (as issued by the relevant Air Pollution Control District), flammable materials, including flammable vegetation slash, will be kept at least 10 feet away from any equipment that could produce a spark, fire, or flame. 4. On days when the fire danger is high and a burn permit is required, portable tools powered by gasoline-fueled internal combustion engines will not be used within 25 feet of any flammable materials unless at least one round-point shovel or fire extinguisher is within immediate reach of the work crew (no more 25 feet away from the work area).
HAZ-8	Testing and Disposal of Spoils	<p>As specified in the Sediment Sampling and Analysis Guidelines (SMP Manual Appendix B), after selecting potential sediment disposal locations and prior to disposing of excavated sediment, the Agency will test the sediment to determine the suitability for disposal based on presence of contaminants. Criteria for sediment disposal at the selected locations will dictate the concentrations of contaminants such as metals, pesticides, organic compounds, total organic carbon, asbestos, total sulfides, ammonia, and toxicity which are acceptable at the disposal locations. As specified in the Sediment Sampling and Analysis Guidelines, samples will be compared against federal and state environmental screening levels (ESLs) for protection of human health, groundwater quality, and terrestrial receptors.</p> <p>If hazardous levels of contaminants are present such that disposal at the preferred locations is not feasible, the material will be taken to a permitted hazardous waste facility.</p>
Vegetation Management		
VEG-1	Removal of Existing Vegetation	<ol style="list-style-type: none"> 1. Vegetation pruning and removal activities will be conducted under the guidance of a staff biologist or certified arborist. For tree relocation activities, a botanist, certified arborist, or other vegetation specialist will be on site to help direct maintenance activities and to consult if questions and/or issues arise. 2. Only vegetation that is noxious, invasive, hazardous, or could obstruct channel

Table 2-1. Cont.

BMP ID	Name	BMP
		<p>flows will be removed. Herbaceous layers that provide erosion protection and habitat value will be left in place. Invasive plant species that inhibit the health and/or growth of native riparian trees will be targeted for removal.</p> <ol style="list-style-type: none"> <li>3. Where a choice between species that may be removed to maintain flood conveyance is feasible, slower-growing species such as oaks (<i>Quercus</i> spp.) that develop large canopies will be preferentially preserved, because these species take longer to establish, and provide essential nesting habitat for cavity nesters and food sources for a variety of resident and migratory animals and birds. Faster-growing species such as alders (<i>Alnus</i> spp.) and cottonwoods (<i>Populus</i> spp.) are the second priority for preservation; these single-trunked species offer the benefit of improved flood conveyance and reduced roughness by comparison with multi-trunked species. <li>4. Vegetation will be removed and/or pruned in such a manner that channel roughness is reduced while allowing the maximum amount of vegetation to remain in place. Trees will be trimmed or pruned to reduce impedance of floodflows while allowing the canopy to develop. Specifics for each site will differ, but typical options include limbing up to remove lower branches that have potential to interfere with floodflows, and pruning into a “fan” roughly parallel to flow direction. In areas where extensive vegetation removal is desirable to maintain flood flow capacity, <i>phasing of removal</i> shall be considered so that some vegetation may remain in place to provide habitat to birds. <li>5. Vegetation management will emphasize the preservation of large mature trees that provide well developed overstory for bird habitat, canopy closure for stream shading, and add vertical complexity to the riparian corridor. Vegetation management will be conducted in such a manner that maximizes shading over the active channel. Larger trees will be retained on both sides of north-south flowing streams and on the south side of east-west flowing streams. Where vegetation is removed from the active channel, removal will target nonnative species and removal of native species that are stiff and/or multi-trunked such as arroyo willow (<i>Salix lasiolepis</i>). Trees will never be topped as this encourages shrubby growth and weak branch attachments <li>6. Large woody debris, stumps, or root wads that are fully or partially buried and do not present a flood hazard shall be allowed to remain in place to provide habitat and to maintain bank stability.

Table 2-1. Cont.

BMP ID	Name	BMP
		<ol style="list-style-type: none"> 7. If vegetation requires removal for access to project site, non-native species and/or quick growing species shall be targeted first for removal. Removal of native, mature trees will be avoided whenever possible. 8. To the extent feasible, removed native vegetation shall be saved to replant after maintenance or plant in other nearby sites. This includes the reuse of mulch and willow sprigs where possible.
VEG-2	Use of Herbicides	<ol style="list-style-type: none"> 1. All herbicide use shall be consistent with all Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) label instructions and any use conditions issued by the Sonoma County Agricultural Commissioner. 2. Herbicide use will be restricted to the minimum amount needed to ensure adequate control of vegetation. 3. Application of herbicides to upland areas shall not be made within 72 hours of predicted rainfall. 4. Herbicides will not be directly applied to waters of the U.S., such as for ludwigia eradication. 5. Herbicides, including AquaMaster© and Renovate©, will not be used within 60 feet of areas identified in the Court-Ordered Stipulated Injunction for the protection of California red-legged frogs. This includes areas in Zones 1A and 3A, as well as Zones 8A and 9A (see SMP Manual Figure 3-29 for detail on where these areas are located.) The Agency will review the details and exceptions in the court order and comply with the herbicide use buffers as appropriate. 6. As required by the Court-Ordered Stipulated Injunction for pesticide use near Pacific salmon-supporting waters in Sonoma County, pesticides specified in the injunction including triclopyr (Renovate©) will not be used within 20 yards of salmon-supporting waters. The Agency will review the details and exceptions in the court order and comply with the herbicide use buffers as appropriate.
VEG-3	Planting and Revegetation After Soil Disturbance	<ol style="list-style-type: none"> 1. Sites where maintenance activities result in exposed soil will be stabilized to prevent erosion and revegetated with native vegetation as soon as feasible after maintenance activities are complete. 2. Revegetation will occur at a ratio of at least 1½: 1 to account for initial mortality of plantings.

Table 2-1. Cont.

BMP ID	Name	BMP
		<ol style="list-style-type: none"> 3. If soil moisture is deficient, new vegetation will be supplied with supplemental water until vegetation is firmly established. 4. To the extent possible, native grass seed will be used when seeding a project site. 5. Erosion control fabric, hydromulch, or other mechanism will be applied as appropriate to provide protection to seeds, hold them in place, and help retain moisture. 6. Revegetation shall be regularly monitored for survival for at five years or until minimum survival/cover is achieved. If invasive species colonize the area, action shall be taken to control their spread; options include hand and mechanical removal and replanting with native species.
Water Quality and Channel Protection		
WQ-1	Apply Erosion Control Fabric to or Hydroseeding of Exposed Soils	<ol style="list-style-type: none"> 1. Upland soils exposed due to maintenance activities will be seeded and stabilized using erosion control fabric or hydroseeding. The channel bed and other areas below ordinary high water mark are exempt from this BMP. 2. Erosion control fabric will consist of natural fibers that will biodegrade over time. No plastic or other non-porous material will be used as part of a permanent erosion control approach. Plastic sheeting may be used to temporarily protect a slope from runoff, but only if there are no indications that special-status species would not be impacted by the application. 3. The site will be properly prepared to make sure the fabric/mat has complete contact with the soil. Sites can be prepared by grading and shaping the installation area; removing all rocks, dirt clods, vegetation, etc.; preparing the seedbed by loosening the top 2- to 3-inches of soil; and applying soil amendments as directed by soil tests, the seeding plan, and manufacturer's recommendations. 4. The area will be seeded before installing the fabric. All areas disturbed during installation will be re-seeded. 5. Erosion control fabric will be anchored in place. Anchors can include U-shaped wire staples, metal geotextiles stake pins or triangular wooden stakes. 6. The manufacturer's installation recommendations will be followed. 7. Other erosion control measures shall be implemented as necessary to ensure that sediment or other contaminants do not reach surface water bodies for stockpiled

Table 2-1. Cont.

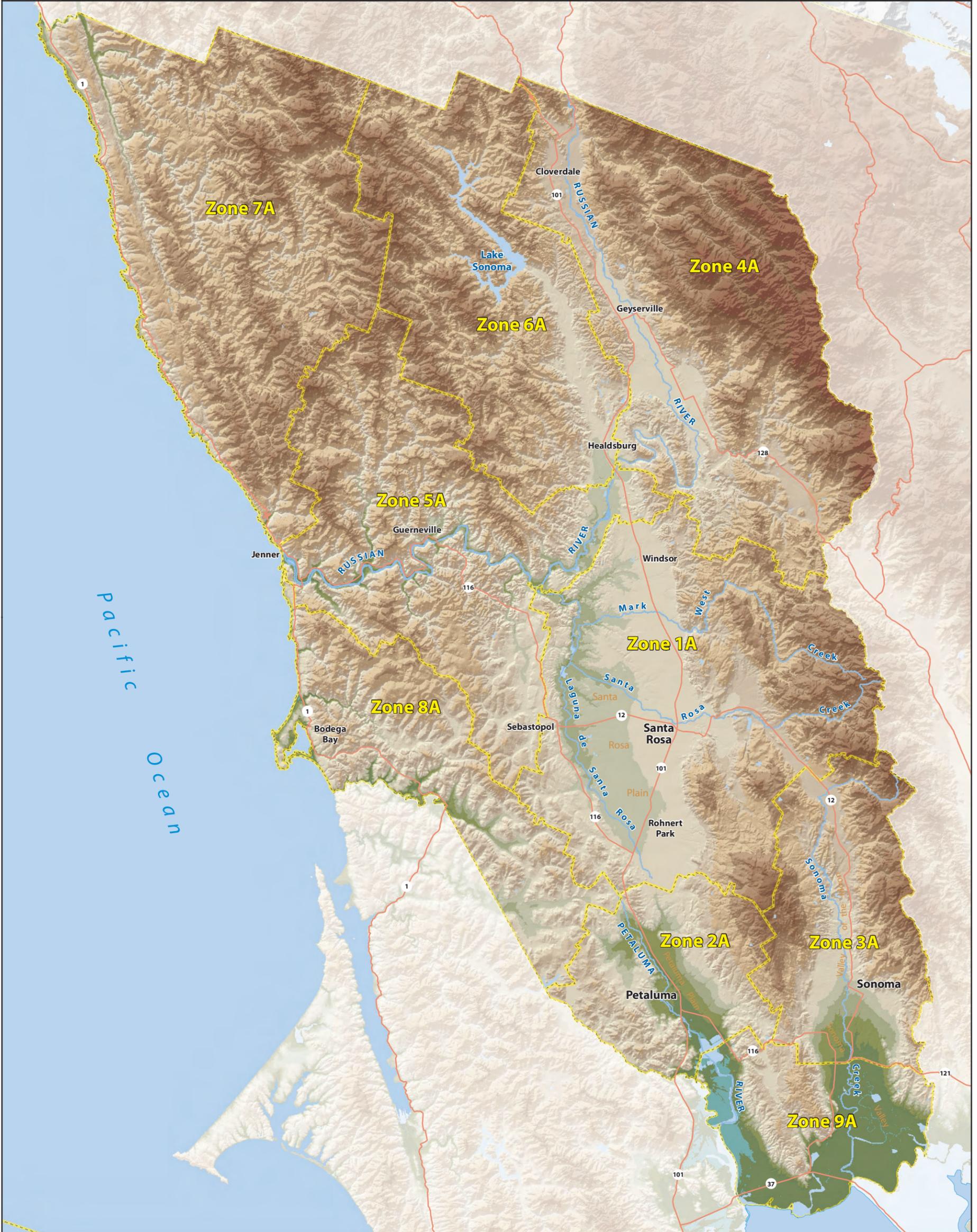
BMP ID	Name	BMP
WQ-2	Prevent Scour Downstream of Sediment Removal	<p>or reused/disposed sediments.</p> <p>After sediment removal, the channel shall be graded so that the transition between the existing channel both upstream and downstream is smooth and continuous between the maintained and non-maintained areas and does not present a “wall” of sediment or other blockage that could erode once flows are restored to the channel.</p>
WQ-3	In-Channel Grading	<ol style="list-style-type: none"> 1. Where pre-maintenance channel form exhibited desirable features, the channel bed will be regraded to mimic the channel form before work was conducted. 2. Where possible, grading may include channel enhancements such as excavation of a low-flow channel, development of a meander, or riffle/pool configurations. No channel grading will occur below the as-built design for the flood control channels. 3. If gravels that have the potential to be utilized for spawning are removed to conduct maintenance activities, the gravels will be carefully removed and stored where maintenance activities will not impact the quality of the gravel. The gravel shall be replaced as close to original conditions as possible upon completion of the maintenance activities. 4. Where in-stream gravel and gravel (or cobble) bars are encountered, sediment removal activities will aim to preserve the overall shape and form of the existing bar or gravel feature. Sediment removal activities will aim to retain the form of the gravel or cobble bar feature, while reducing bar elevations as necessary to accommodate flood conveyance capacity.
Good Neighbor Policies		
GN-1	Work Site Housekeeping	<ol style="list-style-type: none"> 1. SCWA will maintain the work site in a neat and orderly condition, and will leave the site in a neat, clean, and orderly condition when work is complete. To the extent feasible, slash, sawdust, cuttings, etc. will be removed to clear the site of vegetation debris. Paved access roads will be swept and cleared of any residual vegetation or dirt resulting from the maintenance activity. 2. For activities that last more than one day, materials or equipment left on the site overnight will be stored as inconspicuously as possible, and will be neatly arranged.
GN-2	Public Outreach	<ol style="list-style-type: none"> 1. In efforts to keep the public informed about stream maintenance work, why it is necessary, when it occurs, and what a neighborhood can expect when crews arrive to conduct maintenance work, SCWA will post and update information about the

Table 2-1. Cont.

BMP ID	Name	BMP
		<p>SMP and maintenance activities on their website (http://www.scwa.ca.gov/about_your_water/).</p> <ol style="list-style-type: none"> 2. Each spring, once maintenance sites have been selected for the annual work season, a newspaper notice will be published with information on the maintenance sites, approximate work dates, and contact information. This information will also be posted on SCWA’s website. 3. For high profile projects, at SCWA’s discretion, signs will be posted in the neighborhood to notify the public at least one week in advance of maintenance schedules, trail closures, and road/land closures as necessary and as possible. Signage used at work sites will provide contact information for lodging comments and/or complaints regarding the activities.
GN-3	Noise Control	<ol style="list-style-type: none"> 1. With the exception of emergencies, normal work will be limited to normal business hours (8:00 a.m.–5:00 p.m.). Routine activities in residential areas will not occur on Saturdays, Sundays, or SCWA observed state holidays except during emergencies, or with approval by the local jurisdiction and advance notification of surrounding residents. 2. SCWA will ensure that power equipment (vehicles, heavy equipment, and hand equipment such as chainsaws) is equipped with original manufacturer’s sound-control devices, or alternate sound control that is no less effective than those provided as original equipment. Equipment will be operated and maintained to meet applicable standards for construction noise generation. No equipment will be operated with an unmuffled exhaust.
GN-4	Traffic Flow, Pedestrians, and Safety Measures	<ol style="list-style-type: none"> 1. To the extent feasible, work will be staged and conducted in a manner that maintains two-way traffic flow on public roadways in the vicinity of the work site. If temporary lane closures are necessary, they will be scheduled outside of peak traffic hours (7:00-10:00 a.m. and 3:00-6:00 p.m.) to the maximum extent practicable, and advance warning signage, a detour route, and flaggers will be provided in both directions. 2. When work is conducted on public roads and may have the potential to affect traffic flow, work will be coordinated with local emergency service providers as necessary to ensure that emergency vehicle access and response is not impeded. 3. Public transit access and routes shall be maintained to the extent feasible. If public transit would be affected by temporary road closures and require detours, affected

Table 2-1. Cont.

BMP ID	Name	BMP
		<p>transit authorities will be consulted and kept informed of project activities.</p> <ol style="list-style-type: none"> 4. Heavy equipment and haul traffic will be prohibited in residential areas, except when no other route to and from the site is available. 5. Roadway segments or intersections in the vicinity of project sites will be assessed to determine if they are at, or approaching an LOS that exceeds local standards. Maintenance traffic will avoid these locations to the extent feasible, either by traveling different routes or by traveling at non-peak times of day. 6. Adequate off-street parking will be provided or designated public parking areas will be used for maintenance workers' personal vehicles and maintenance-related vehicles not in use through the maintenance period. 7. Access for driveways and private roads will be maintained to the extent feasible. If brief periods of maintenance would temporarily block access, property owners will be notified prior to maintenance activities.
GN-5	Odors	<p>Sediment that is rich in decaying organic matter that could generate assorted malodorous gases such as reduced sulfur compounds shall be handled to minimize impacts on sensitive receptors such as nearby residents. In general, such materials will be hauled off of the site at the time of excavation. Where it needs to be temporarily stockpiled, maintenance personnel shall stockpile potentially odorous sediments as far as possible from residential areas or other odor sensitive land uses.</p>



Elevation (feet)

	Below Sea level		250 - 500
	0 - 25		500 - 1,000
	25 - 50		1,000 - 1,500
	50 - 75		1,500 - 2,000
	75 - 100		2,000 - 2,500
	100 - 250		Above 2,500

Highways

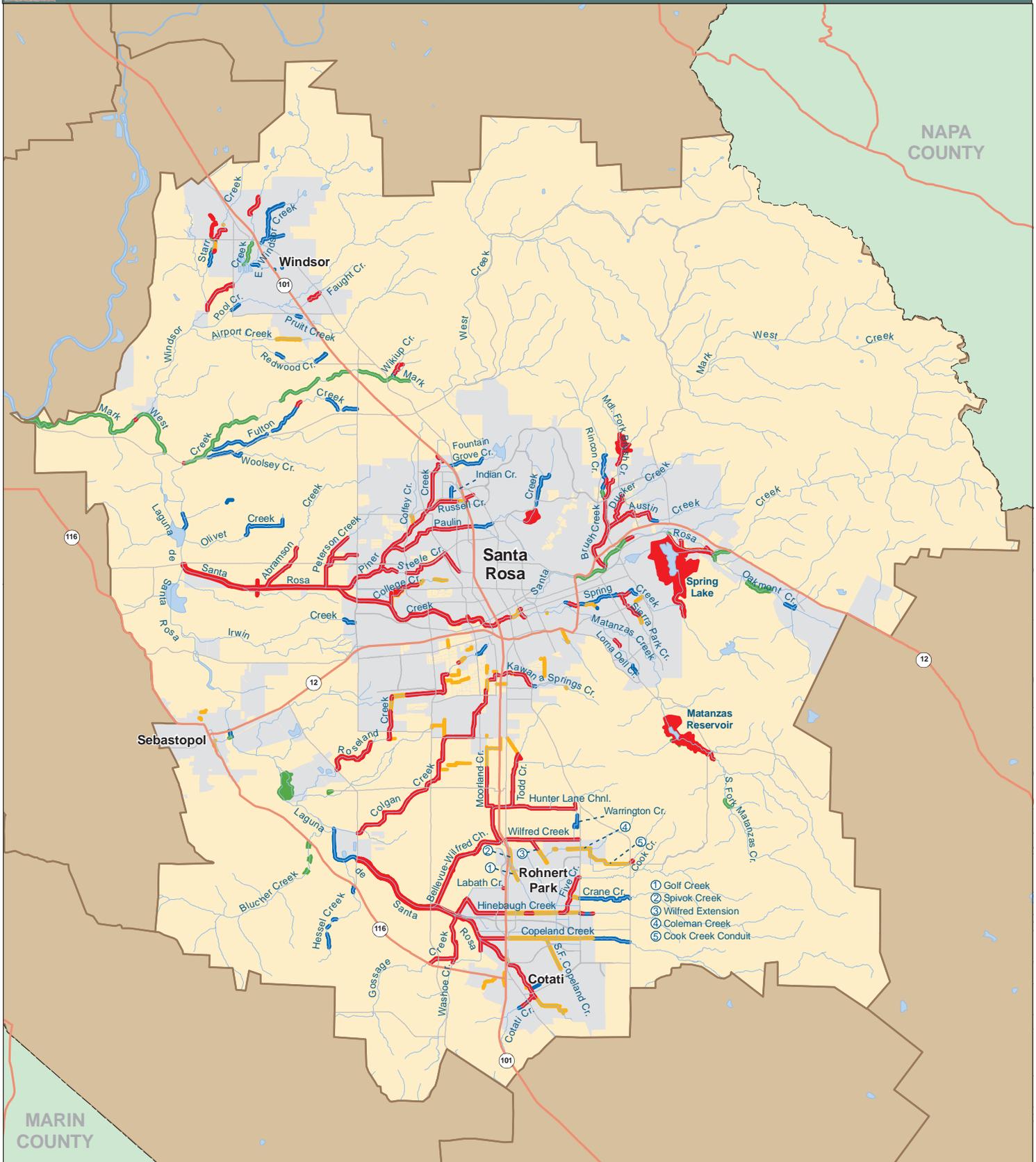
SCWA Flood Control Zone Boundary

Figure 2-1

Program Area



Sources:
 Sonoma County Water Agency
 County of Sonoma
 California Spatial Information Library
 U.S. Geological Survey



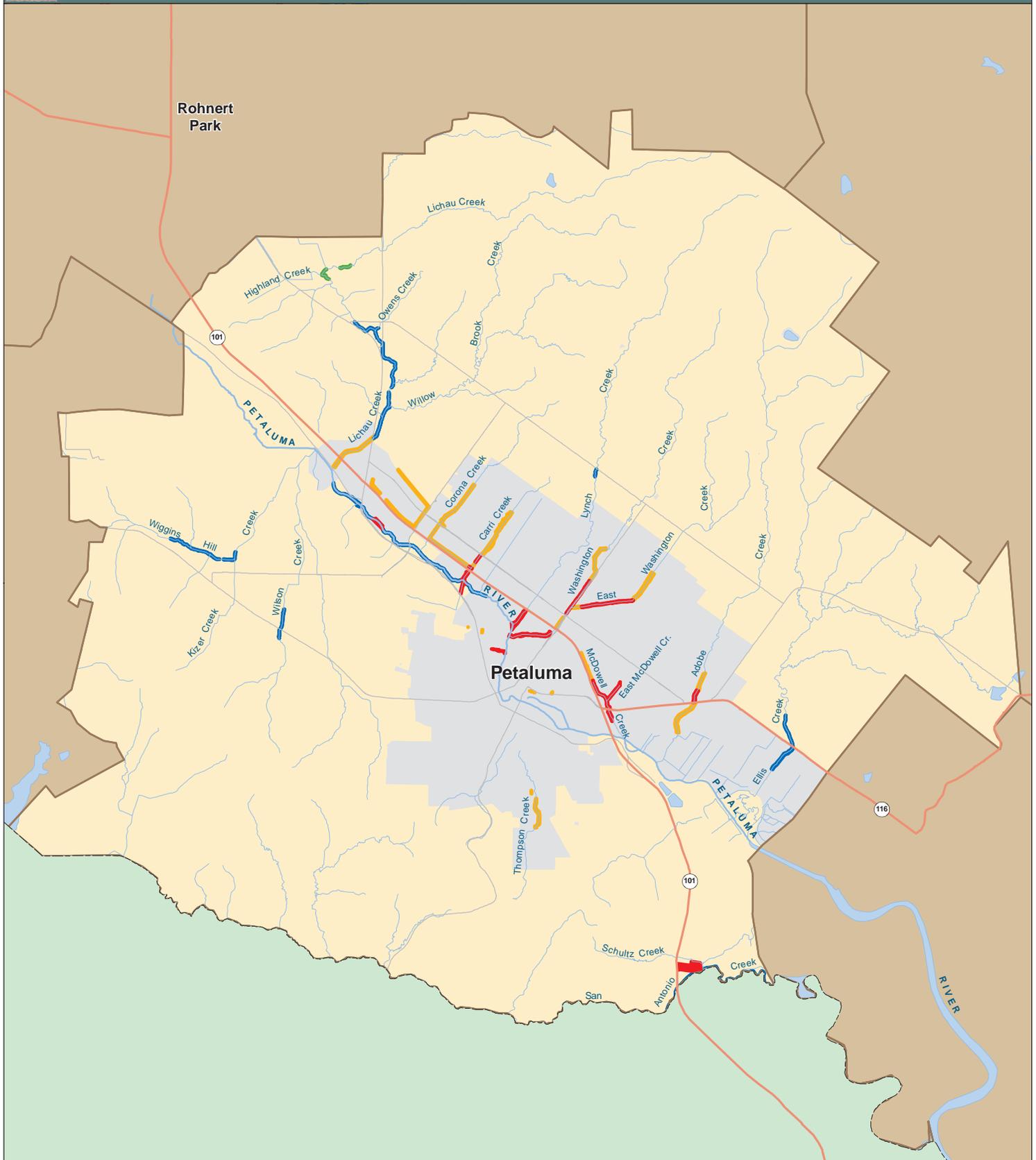
SCWA Easements

- █ Owned in Fee-Engineered Channel
- █ Easement Engineered Channel
- █ Easement Modified Channel
- █ Easement Natural Channel
- █ Easement Natural Channel, Not Maintained Under SMP *
- ~ Streams
- ~ Highways
- ~ Roads
- █ Water Bodies
- █ Incorporated Area

* Following guidance provided by NMFS and FWS regarding sensitive species habitat, certain natural channels were removed from maintenance activities and coverage of the SMP. These creeks and reaches are indicated in Figure 1-12.

Figure 2-2
Zone 1A





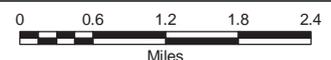
SCWA Easements

- █ Owned in Fee-Engineered Channel
- █ Easement Engineered Channel
- █ Easement Modified Channel
- █ Easement Natural Channel
- █ Easement Natural Channel, Not Maintained Under SMP *
- ~ Streams
- ~ Highways
- ~ Roads
- Water Bodies
- Incorporated Area

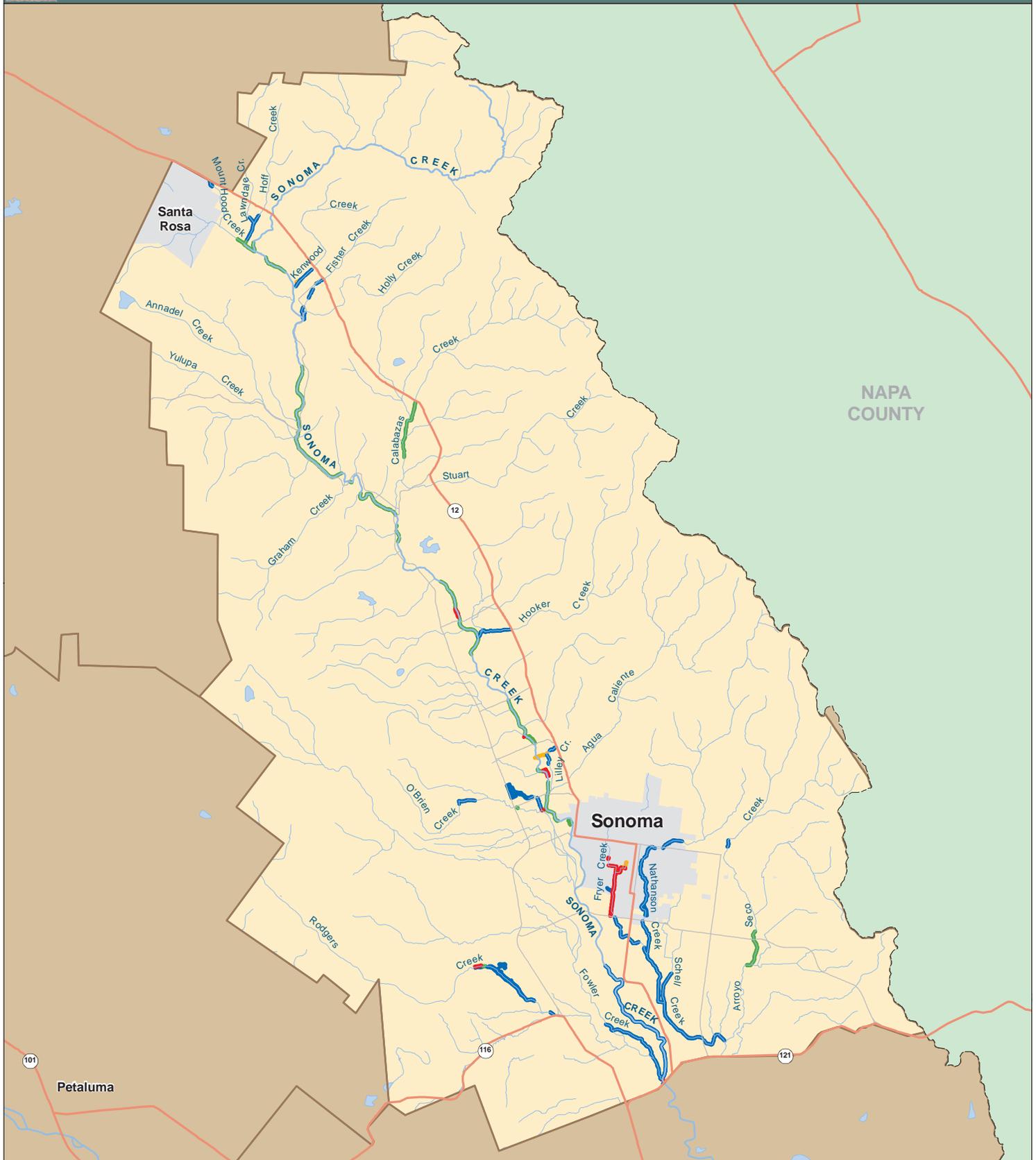
* Following guidance provided by NMFS and FWS regarding sensitive species habitat, certain natural channels were removed from maintenance activities and coverage of the SMP. These creeks and reaches are indicated in Figure 1-12.

Figure 2-3

Zone 2A



Sources: Sonoma County Water Agency
County of Sonoma
California Spatial Information Library



NAPA COUNTY



SCWA Easements

- █ Owned in Fee-Engineered Channel
- █ Easement Engineered Channel
- █ Easement Modified Channel
- █ Easement Natural Channel
- - - Easement Natural Channel, Not Maintained Under SMP *
- Streams
- Highways
- Roads
- Water Bodies
- Incorporated Area

* Following guidance provided by NMFS and FWS regarding sensitive species habitat, certain natural channels were removed from maintenance activities and coverage of the SMP. These creeks and reaches are indicated in Figure 1-12.

Figure 2-4
Zone 3A



Sources:
Sonoma County Water Agency
County of Sonoma
California Spatial Information Library





SCWA Easements

- | | | | |
|--|--|--|-------------------|
| | Owned in Fee-Engineered Channel | | Streams |
| | Easement Engineered Channel | | Highways |
| | Easement Modified Channel | | Roads |
| | Easement Natural Channel | | Water Bodies |
| | Easement Natural Channel, Not Maintained Under SMP * | | Incorporated Area |

* Following guidance provided by NMFS and FWS regarding sensitive species habitat, certain natural channels were removed from maintenance activities and coverage of the SMP. These creeks and reaches are indicated in Figure 1-12.

Figure 2-5

Zone 4A



Sources:
Sonoma County Water Agency
County of Sonoma
California Spatial Information Library



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SCWA Easements

— Owned in Fee-Engineered Channel	— Streams
— Easement Engineered Channel	— Highways
— Easement Modified Channel	— Roads
— Easement Natural Channel	— Water Bodies
- - - Easement Natural Channel, Not Maintained Under SMP *	 Incorporated Area

* Following guidance provided by NMFS and FWS regarding sensitive species habitat, certain natural channels were removed from maintenance activities and coverage of the SMP. These creeks and reaches are indicated in Table X-X of the SMP manual.

Figure 2-6
Zone 5A

Miles

Sources:
Sonoma County Water Agency
County of Sonoma
California Spatial Information Library
Geografika Consulting



MENDOCINO COUNTY

101

128

RUSIAN RIVER

Cloverdale

LAKE SONOMA

Vines Creek

RIVER

Geyserville

116

101

DRY

Healdsburg

West South Creek

Sonoma County
Detail Area

Pacific
Ocean

SCWA Easements

- █ Owned in Fee-Engineered Channel
- █ Easement Engineered Channel
- █ Easement Modified Channel
- █ Easement Natural Channel
- █ Easement Natural Channel, Not Maintained Under SMP *

- Streams
- Highways
- Roads
- Water Bodies
- Incorporated Area

* Following guidance provided by NMFS and FWS regarding sensitive species habitat, certain natural channels were removed from maintenance activities and coverage of the SMP. These creeks and reaches are indicated in Figure 1-12.

Figure 2-7

Zone 6A



Sources:
Sonoma County Water Agency
County of Sonoma
California Spatial Information Library





SCWA Easements

- Owned in Fee-Engineered Channel
- Easement Engineered Channel
- Easement Modified Channel
- Easement Natural Channel
- - - Easement Natural Channel, Not Maintained Under SMP *
- ~ Streams
- Highways
- Roads
- Water Bodies
- Incorporated Area

* Following guidance provided by NMFS and FWS regarding sensitive species habitat, certain natural channels were removed from maintenance activities and coverage of the SMP. These creeks and reaches are indicated in Figure 1-12.

Figure 2-8

Zone 8A



Sources:
 Sonoma County Water Agency
 County of Sonoma
 California Spatial Information Library





SCWA Easements

- █ Owned in Fee-Engineered Channel
- █ Easement Engineered Channel
- █ Easement Modified Channel
- █ Easement Natural Channel
- █ Easement Natural Channel, Not Maintained Under SMP *
- ~ Streams
- ~ Highways
- ~ Roads
- █ Water Bodies
- █ Incorporated Area

* Following guidance provided by NMFS and FWS regarding sensitive species habitat, certain natural channels were removed from maintenance activities and coverage of the SMP. These creeks and reaches are indicated in Figure 1-12.

Figure 2-9

Zone 9A



Sources:
 Sonoma County Water Agency
 County of Sonoma
 California Spatial Information Library





Photo a. Owned in Fee - Engineered Channel -- Adobe Creek at Sartori Drive looking downstream (Zone 2A).



Photo b. Easement Engineered Channel -- Coleman Creek at Hillview Way looking upstream (Zone 1A).



Photo c. Easement Modified Channel -- Nathanson Creek north of Napa Road looking upstream (Zone 3A).

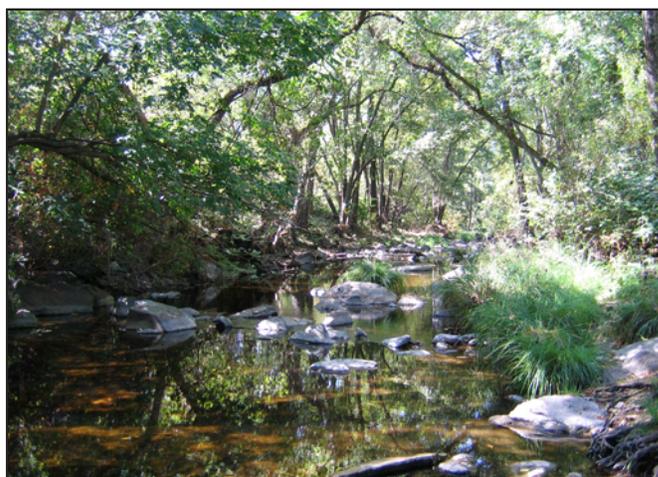
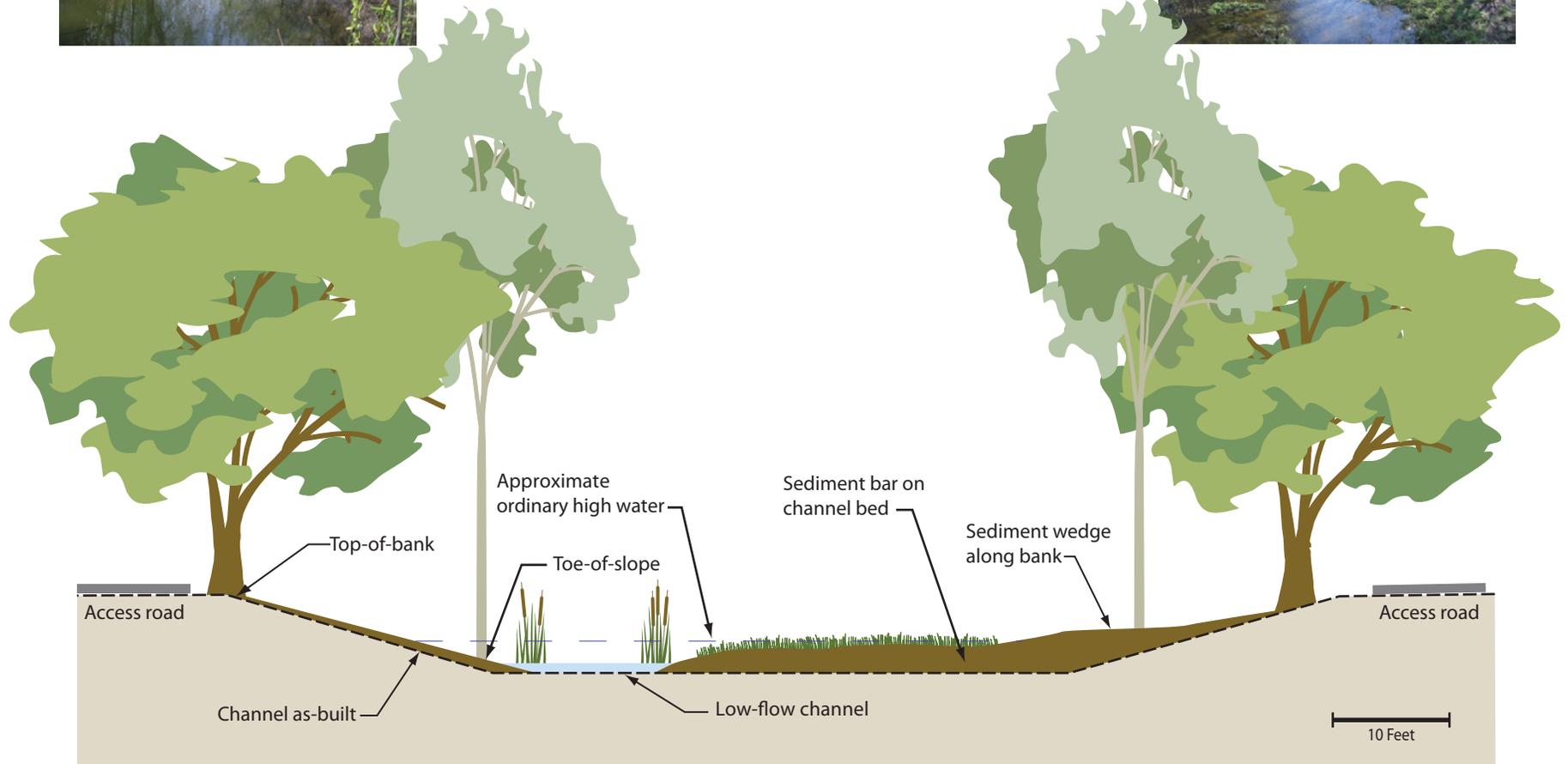
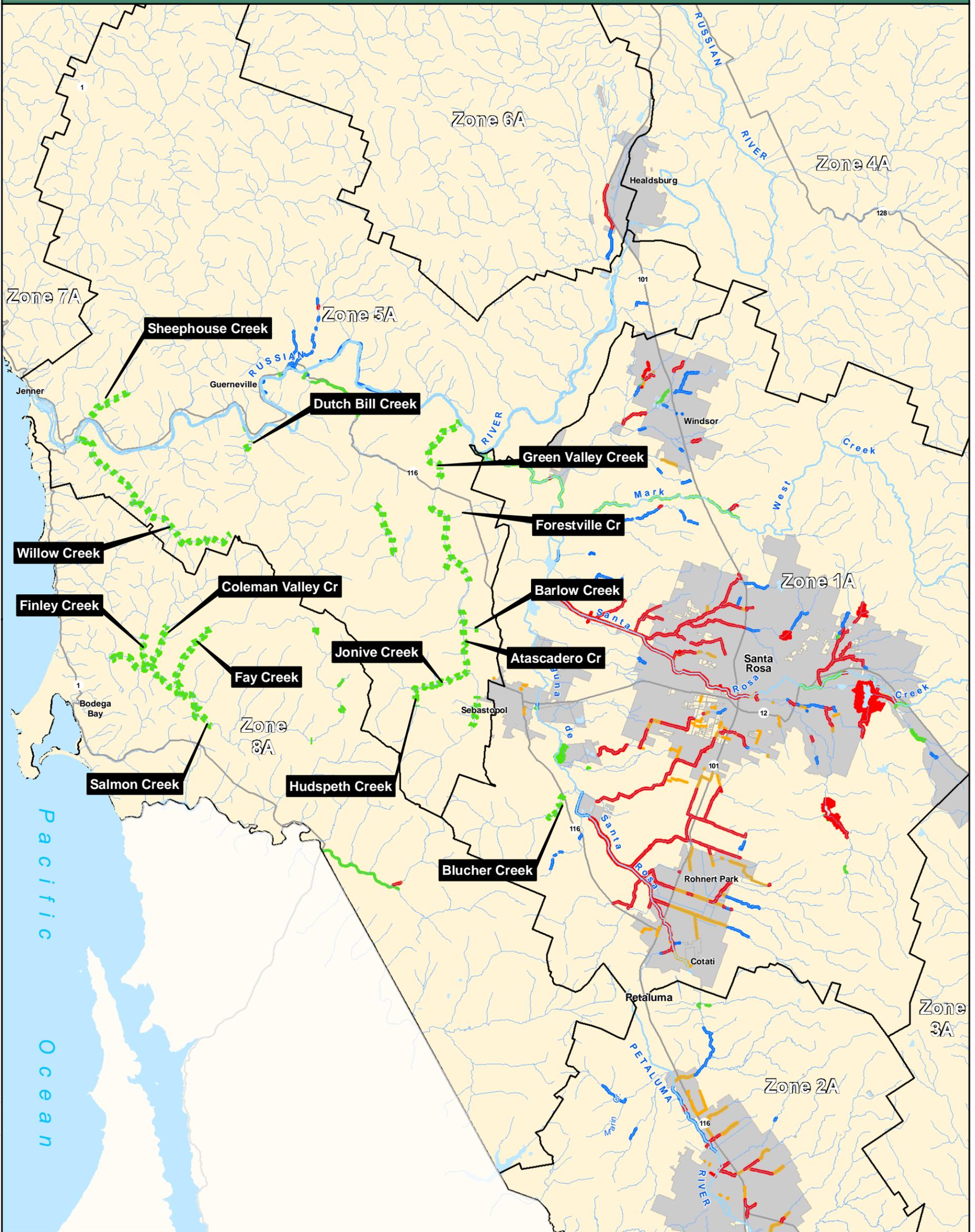


Photo d. Easement Natural Channel -- Santa Rosa Creek at Brush Creek confluence looking downstream (Zone 1A).

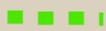


Vegetation just above toe-of-slope
Sediment bar
Low flow-channel





Natural Channels Not Included in the SMP due to Resource Sensitivity - Specifically for Coho and Chinook Salmon



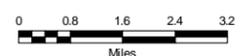
- Owned in Fee-Engineered Channel
- Easement Engineered Channel
- Easement Modified Channel
- Easement Natural Channel

- SCWA Flood Control Zone Boundary
- Incorporated Areas

- Streams
- Highways

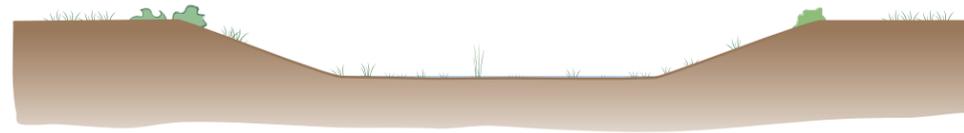
Figure 2-12

Natural Channels Not Included in the SMP Due to Resource Sensitivity



Sources:
 Sonoma County Water Agency
 County of Sonoma
 California Spatial Information Library
 U.S. Geological Survey
 California Dept. of Fish & Game





Cross-section of trapezoidal flood control channel with minimal in-channel complexity or riparian vegetation. Overall habitat function is low.



A Straightened channel, minimal vegetation (Bellevue-Wilfred Channel)



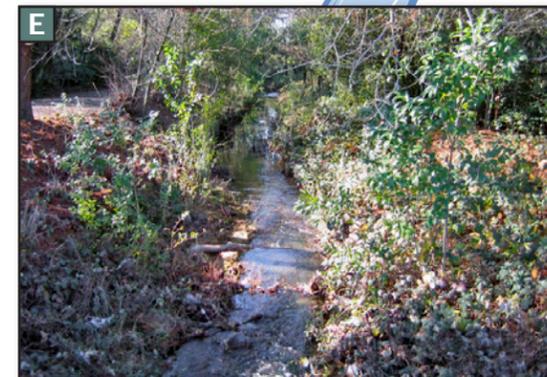
C Straightened channel, low in-channel complexity (small riffles and bars), low canopy closure (Lower Santa Rosa Creek)



B Straightened and incised channel, in-channel cattail/willow vegetation (Gossage Creek)



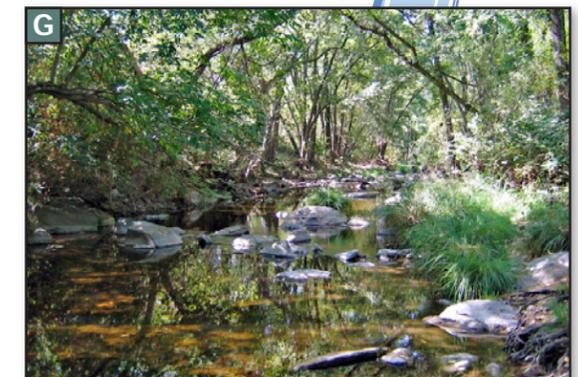
D Increased channel sinuosity, in-channel complexity (point bars, shallow pools), riparian woodland with low canopy closure (Colgan Creek)



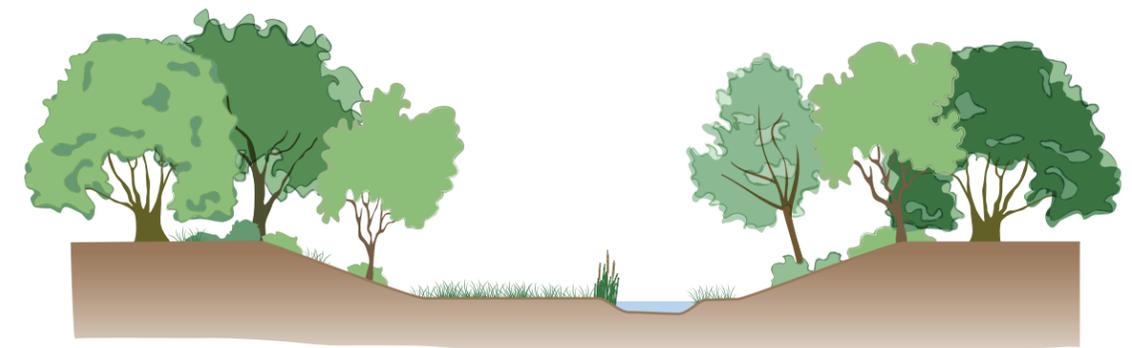
E Increased channel complexity (riffle-bar-pool sequence), riparian forest, high canopy closure (College Creek)



F In-channel complexity (alternating bar features, low flow sinuosity, woody debris, pools), riparian forest with moderate canopy closure (Windsor Creek)

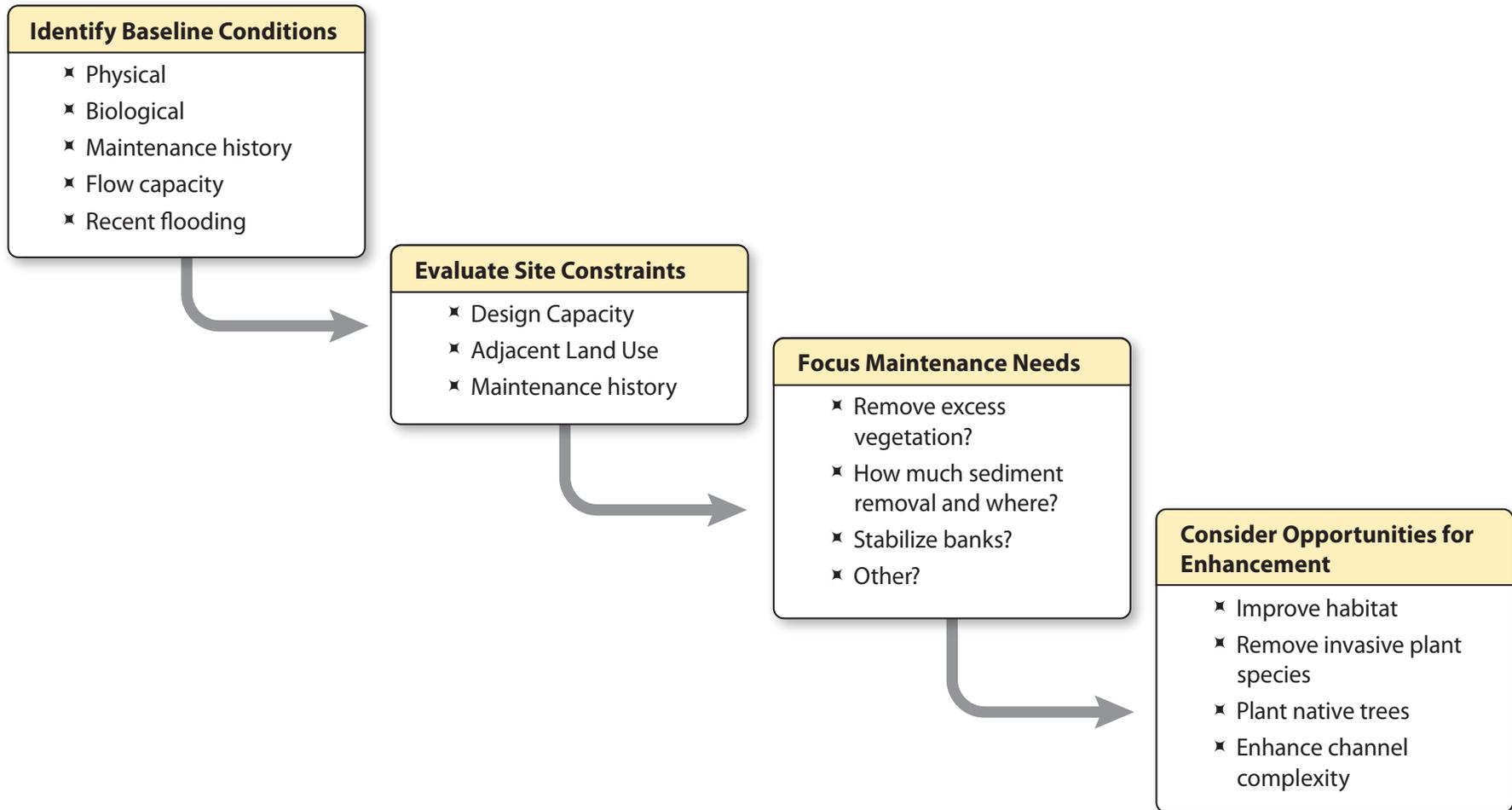


G High in-channel complexity (pool-riffle sequence, cascades), mature riparian forest with closed canopy, few invasive/exotic species (Upper Santa Rosa Creek)



Cross-section of trapezoidal flood control channel managed for in-channel complexity (low-flow channel sinuosity, in-channel bars/benches, occasional in-channel woody debris, riffle-pool sequence) with mature riparian forest and closed canopy. Overall habitat function is improved.

Integrated Maintenance Approach at a Reach Scale



SMP Work Cycle

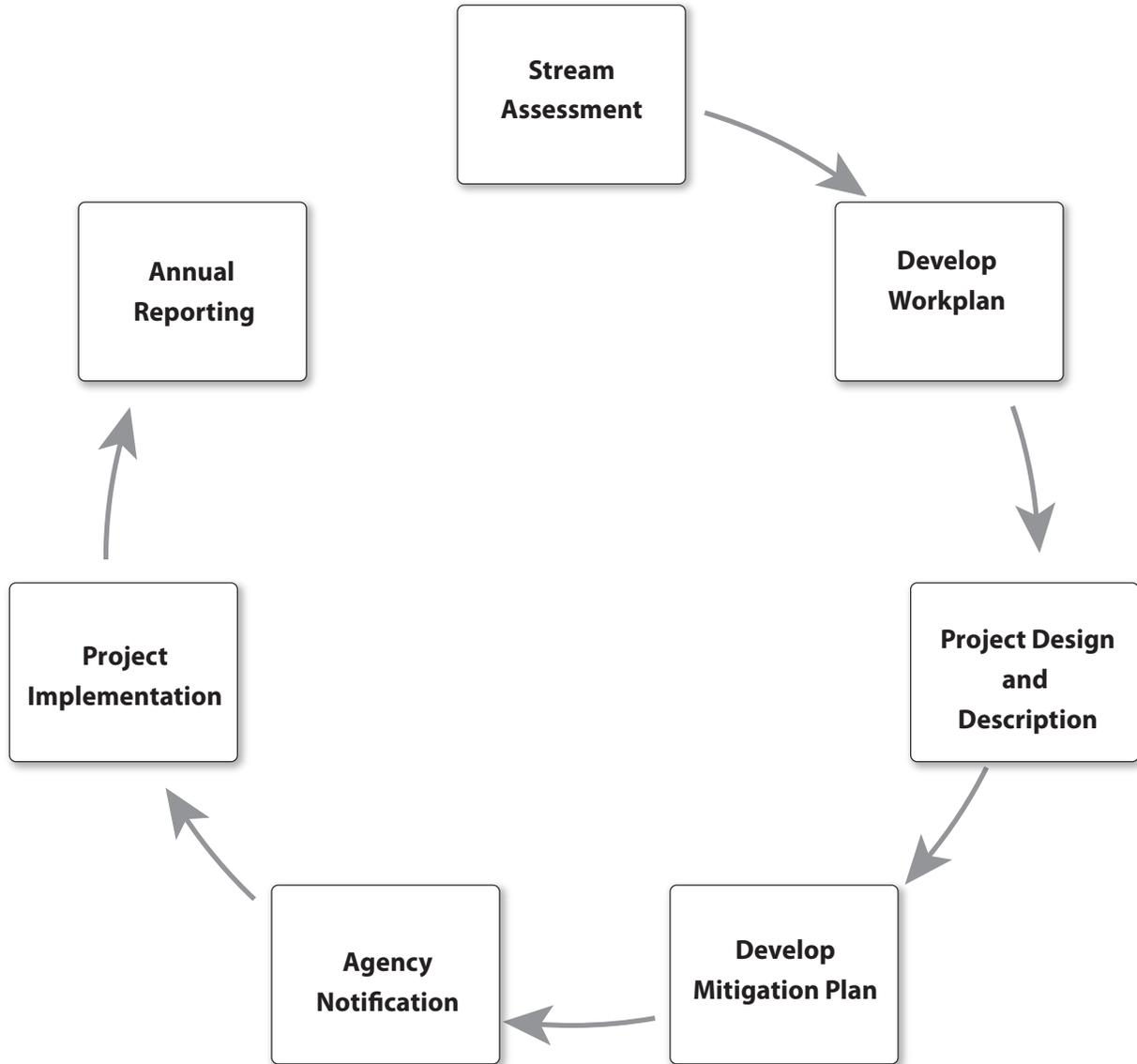




Photo a. East Washington Creek, looking downstream from Garfield Drive, before sediment removal project (Zone 2A).



Photo b. Maintenance crew clearing vegetation by hand.



Photo c. Excavator positioned on access road on the top of the stream bank. Long-arm reaching into channel.



Photo d. Removed sediment placed into dump truck by excavator.



Photo e. Box culvert sediment removal staged from road crossing above.



Photo f. East Washington Creek, looking upstream at Garfield Drive, after sediment removal project.



Photo a. Looking upstream at Bloomfield Channel (Zone 8A) filled with sediment.

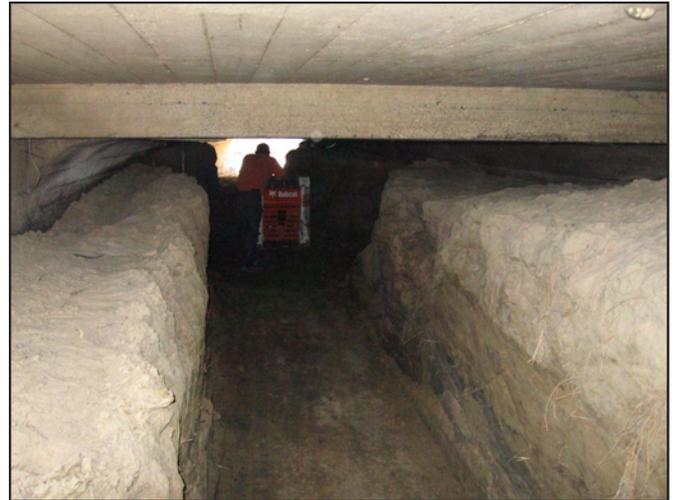


Photo b. Using a front loader to clear sediment in box culvert.

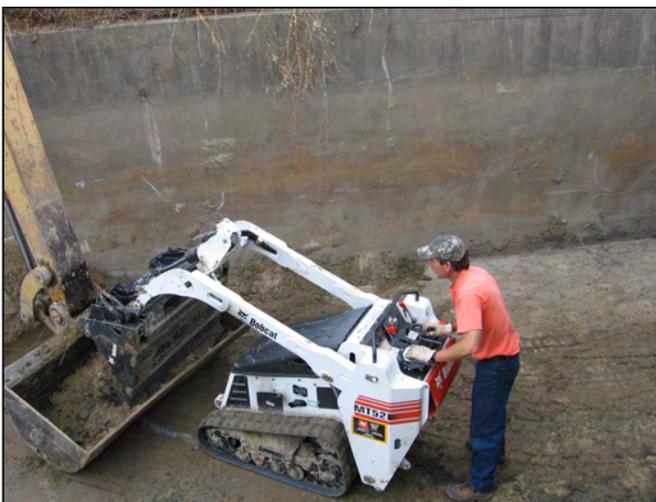


Photo c. Loading sediment onto an excavator.



Photo d. Excavator staged on road above culvert.

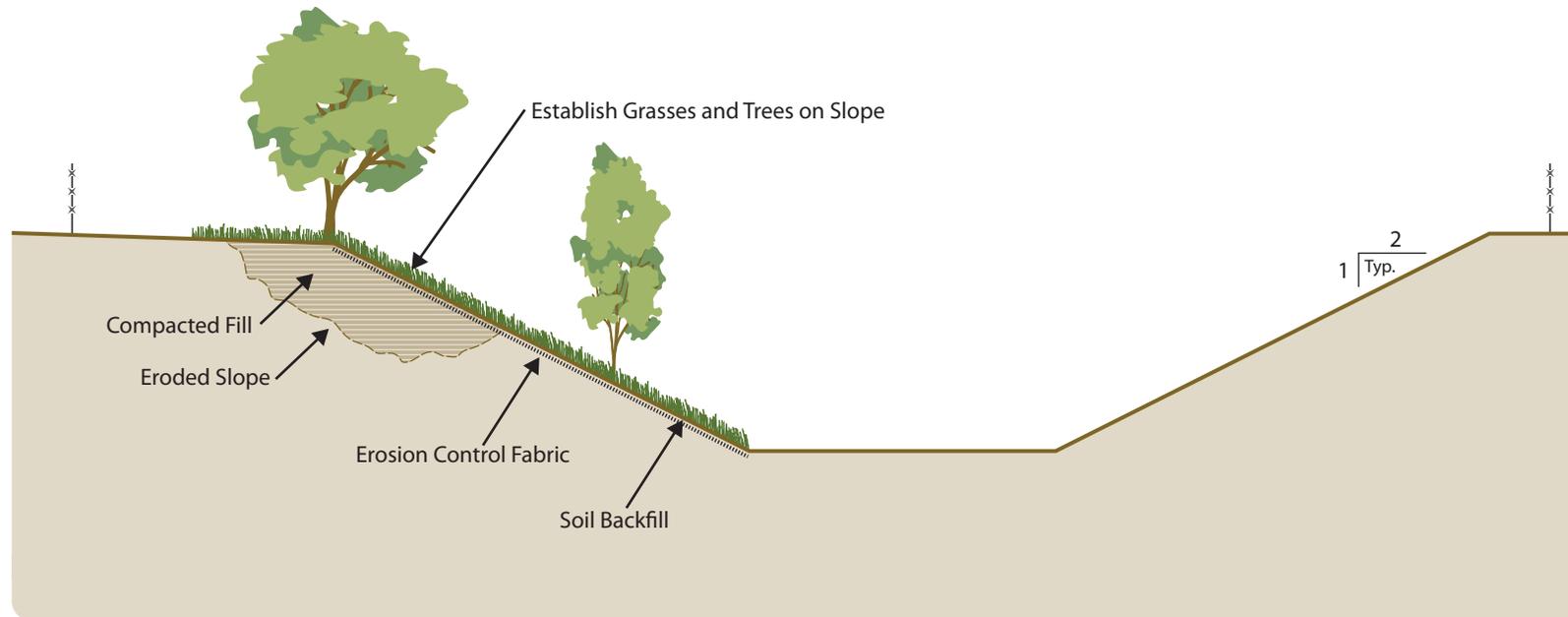


Photo a. Bank failure on Peterson Creek (Zone 1A).



Photo b. Same site as Photo (a) after bank repair using no rock-rip rap.

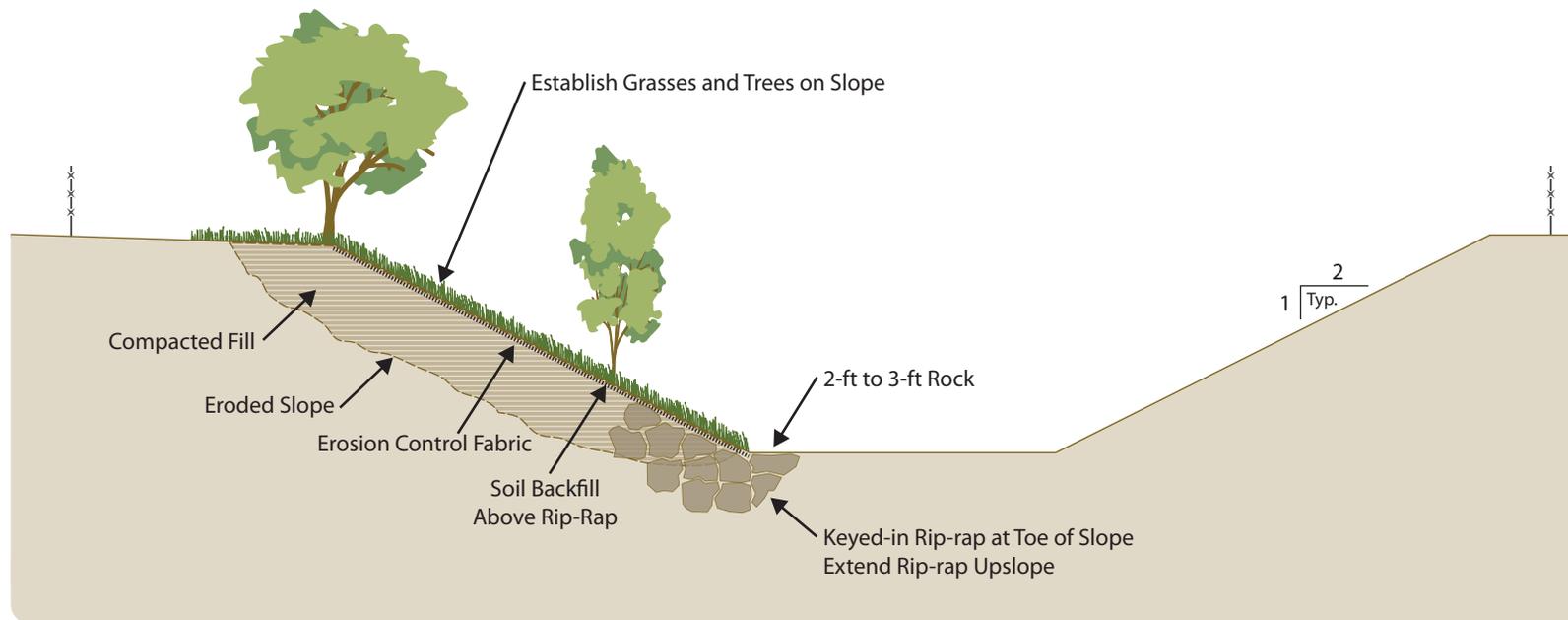


Photo a. Bank failure on Gossage Creek (Zone 1A).



Photo b. Same site as Photo (a) after bank repair, prior to revegetation.

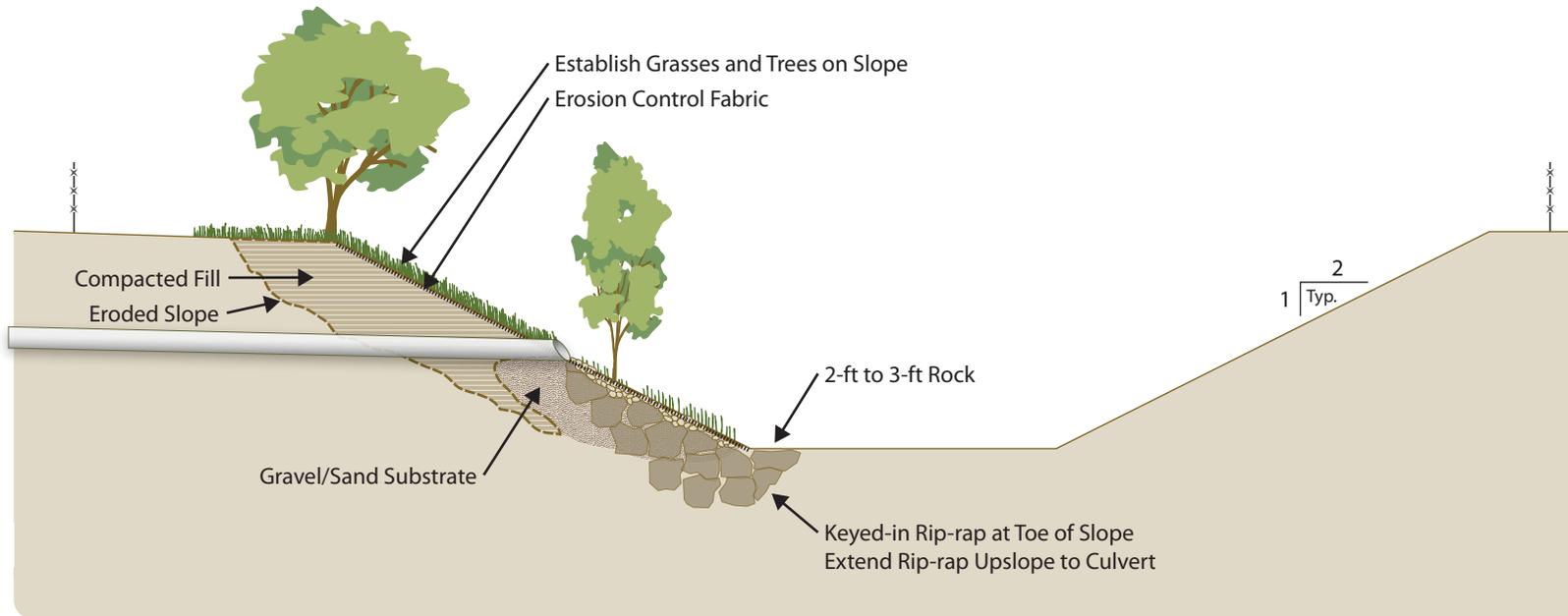


Photo a. Culvert failure on Piner Creek (Zone 1A).



Photo b. Same site as Photo (a) after bank repair using minimum necessary rock rip-rap.

Chapter 3

ENVIRONMENTAL IMPACTS

3.0.1 Introduction to the Analysis

Chapter 3 of this Draft Environmental Impact Report (EIR) contains individual subchapters that describe the environmental resources and potential environmental impacts of the Proposed Program. Each section (3.1 through 3.12) describes the existing setting and background information for the resource to help the reader understand the conditions that could be affected by the Program. In addition, each section includes a discussion of the criteria used in determining the significance levels of the Program's environmental impacts. Finally, each section recommends mitigation measures (in the form of Best Management Practices [BMPs]) to reduce, where possible, the adverse effects of significant impacts.

3.0.2 Significance of Environmental Impacts

According to the California Environmental Quality Act (CEQA), an EIR should define the threshold of significance and explain the criteria used to determine whether an impact is above or below that threshold. Significance criteria are identified for each environmental category to determine whether implementation of the project would result in a significant environmental impact when evaluated against the environmental setting baseline conditions. The significance criteria vary depending on the environmental category. In general, effects can be either significant (above threshold) or less than significant (below threshold). In some cases a significant impact may be identified as significant and unavoidable if no feasible mitigation measure(s) is/are available to reduce the impact to a less-than-significant level. If a project is subsequently adopted despite identified significant impacts that would result from the project, CEQA requires the lead agency to prepare and disclose a statement of overriding considerations describing the social, economic, and other reasons for adoption.

3.0.3 Sections Eliminated from Further Analysis

Three CEQA checklist resource areas have been eliminated from further analysis based on the nature and scope of the Proposed Program activities. A brief summary and description of these resource areas follows below.

Agricultural Resources

The Program Area covers a large portion of Sonoma County. Farmland and agricultural uses may be located in proximity to the maintenance sites, however all Program activities would take place within flood control channels maintained by the Sonoma County Water Agency. These maintained flood control channels do not contain lands designated or used for agriculture. In addition, Program activities are limited to maintenance and repair activities, which are temporary and would not result in more intensive land development.

No Prime Farmland, Unique Farmland, or Farmland of Statewide Importance, or lands under a Williamson Act contract would be converted by or conflict with SMP activities. Therefore, these impacts are not applicable.

Mineral Resources

The Program Area includes a variety of stream and channels maintained for flood control. No aggregate mining facilities are currently operating within the SCWA-maintained channels. Although mines or mineral resource areas may be located in proximity to SMP activity areas, the SMP would not involve any activities that could directly affect these mineral production sites.

Sediment excavated under the SMP may be reused, with potential to offset demand for mineral resources such as aggregate. However, the total volume of reused material under the SMP in any given year would be small (less than 25,000 cubic yards), and would not represent an appreciable fraction of the total aggregate resources used annually in the County.

For these reasons, the proposed SMP activities would have no impact on the availability or use of a known, valuable mineral resource in Sonoma County.

Population and Housing

A project would have an effect on population and housing if it induces growth directly (through the construction of new housing or increasing population) or indirectly (by increasing employment opportunities or eliminating existing constraints on development).

As a maintenance program, the SMP would not involve new development or infrastructure installation that could directly induce population growth in the project area. Additionally, the Program would not involve construction of new housing or create a demand for additional housing. No additional staff would be required to carry out the proposed activities under the SMP. Furthermore, the Proposed Program would not displace any existing housing units or persons, as no housing exists within the maintenance reaches.

Therefore, the proposed SMP would have no impact on population growth or housing demand.

Chapter 3.1

AESTHETICS

3.1.1 Introduction

This section describes the setting and potential impacts of the Proposed Program on visual resources. Sources of data used in the preparation of this section include the Sonoma County General Plan adopted in 2008 and general plans from the cities of Cotati, Petaluma, Rohnert Park, Santa Rosa, Sebastopol, Sonoma, and the Town of Windsor.

Concepts and Terminology

Visual Character

Both natural and artificial landscape features make up the character of a view. Character is influenced by geologic, hydrologic, botanical, wildlife, recreational, and urban features. Urban features include aspects of landscape settlement and development, such as roads, utilities, structures, earthworks, and the results of other human activities. The perception of visual character can vary significantly among viewers depending on their level of sensitivity and interest. Among sensitive viewers, perception can vary seasonally and even hourly as weather, light, shadow, and the elements that compose the viewshed change. Form, line, color, and texture are the basic components used to describe visual character and quality for most visual assessments (USFS 1974; FHWA 1983). The appearance of the viewshed is described in terms of the dominance of each of these components.

Visual Quality

Visual quality is evaluated using the well-established approach to visual analysis adopted by the Federal Highway Administration (FHWA) (Jones, et al. 1975; FHWA 1983), employing the concepts of vividness, intactness, and unity, as defined below:

- Vividness is the visual power or memorability of landscape components as they combine in striking or distinctive visual patterns.
- Intactness is the visual integrity of the natural and human-built landscape and its freedom from encroaching elements; this factor can be present in well-kept urban and rural landscapes, as well as in natural settings.
- Unity is the visual coherence and compositional harmony of the landscape considered as a whole; it frequently attests to the careful design of individual components in the artificial landscape.

Visual quality is evaluated based on the relative degree of vividness, intactness, and unity, as modified by its visual sensitivity. High-quality views are highly vivid, relatively intact, and exhibit a high degree of visual unity. Low-quality views lack vividness, are not visually intact, and possess a low degree of visual unity.

Visual Sensitivity and Viewer Response

The measure of the quality of a view must be tempered by the overall sensitivity of the viewer. Viewer sensitivity is based on the visibility of resources in the viewshed, the proximity of viewers to the visual resource, the elevation of viewers relative to the visual resource, the frequency and duration of viewing, the number of viewers, and the type and expectations of individuals and viewer groups.

The criteria for identifying importance of views are related in part to the position of the viewer relative to the resource. An area of the landscape that is visible from a particular location (e.g., an overlook) or series of points (e.g., a road or trail) is defined as a viewshed. To identify the importance of views of a resource, a viewshed may be broken into distance zones of foreground, middleground, and background. Generally, the closer a resource is to the viewer, the more dominant it is and the greater is its importance to the viewer. Although distance zones in viewsheds may vary between different geographic regions or types of terrain, a commonly used set of criteria identifies the foreground zone as 0.25–0.5 mile from the viewer, the middleground zone as extending from the foreground zone to 3–5 miles from the viewer, and the background zone as extending from the middleground zone to infinity (USFS 1974).

Judgments of visual quality and viewer response must be made based in a regional frame of reference (USSCS 1978). The same type of visual resource in different geographic areas could have a different degree of visual quality and sensitivity in each setting. For example, a small hill may be a significant visual element in a flat landscape but have very little significance in mountainous terrain.

Generally, visual sensitivity is higher for views seen by people who are driving for pleasure; people engaging in recreational activities such as hiking, biking, or camping; and homeowners. Sensitivity tends to be lower for views seen by people driving to and from work or as part of their work (USFS 1974, USSCS 1978, FHWA 1983). Commuters and non-recreational travelers have generally fleeting views and tend to focus on commute traffic and not on surrounding scenery, and therefore are generally considered to have low visual sensitivity. Residential viewers typically have extended viewing periods and are concerned about changes in the views from their homes; therefore, they generally are considered to have moderate to high visual sensitivity. Viewers using recreation trails and areas, scenic highways, and scenic overlooks are usually assessed as having high visual sensitivity.

3.1.2 Regulatory Setting

State Regulations

California Department of Transportation State Scenic Highway System

Maintenance of channels under the Proposed Program that are in proximity to designated State Scenic Highways could affect views from these highways. The State Scenic Highways relevant to the program are described under Environmental Setting section below. The California Scenic Highway Program was established in 1963 under Sections 260 through 263 of the Streets and Highways Code. The Scenic Highway Program includes a list of highways that are either designated or eligible for designation as scenic highways

(California Department of Transportation 2008). In order for an eligible state scenic highway to become officially designated, the local jurisdiction must adopt a scenic corridor protection program and apply to the California Department of Transportation (Caltrans) for scenic highway approval, identifying and defining the scenic corridor of the highway. Once approved by Caltrans, the jurisdiction will receive notification that the highway has been designated a Scenic Highway. The jurisdiction must then adopt ordinances to preserve the scenic quality of the corridor or document the regulations that already exist in various portions of local codes, creating the scenic corridor protection program. Scenic corridors are defined as land that is visible from the highway right of way, and is comprised primarily of scenic and natural features. Scenic corridor boundaries are determined by topography, vegetation, viewing distance, and/or jurisdictional lines. Officially designated Scenic Highways are marked with a California poppy, the logo for the Scenic Highway Program.

Local Regulations

Sonoma County General Plan 2020

The Open Space Element of the County's General Plan (Sonoma County 2008) identifies scenic resources according to three types of open spaces: community separators, scenic landscape units, and scenic highway corridors. Of these three, community separators and scenic highway corridors are relevant to the Proposed Program, as SMP activities could potentially affect these policies where SCWA-maintained creeks intersect with these features.

Community separators are open spaces that may not necessarily be highly scenic, but provide scenic relief between communities and discourages corridor-style urbanization. The County has identified and mapped the locations of these open spaces and its General Plan contains the following policies to protect and enhance them, of which could be affected by the Proposed Program:

- | | |
|---------------------------|--|
| <i>Goal OSRC-1</i> | Preserve the visual identities of communities by maintaining open space areas between cities and communities. |
| <i>Objective OSRC-1.1</i> | Preserve important open space areas in the community separators shown on Figures OSRC-5a through OSRC-5i of the Open Space and Resource Conservation Element. |
| <i>Objective OSRC-1.4</i> | Preserve existing specimen trees and tree stands within community separator areas. |
| <i>Policy OSRC-1f</i> | Unless there are existing design guidelines that have been adopted for the affected area, require that new structures within Community Separators meet the following criteria:
<ol style="list-style-type: none">1) Site and design structures to take maximum advantage of existing topography and vegetation in order to substantially screen them from view from public roads.2) Minimize cuts and fills on hills and ridges. |

- 3) Minimize the removal of trees and other mature vegetation; avoid removal of specimen trees, tree groupings, and windbreaks.
- 4) Where existing topography and vegetation would not screen structures from view from public roads, install landscaping consisting of native vegetation in natural groupings that fits with the character of the area in order to substantially screen structures from view. Screening with native, fire retardant plants may be required.
- 5) Design structures to use building materials and color schemes that blend with the natural landscape and vegetation.
- 6) To the extent feasible, cluster structures on each parcel within existing built areas, and near existing natural features such as tree groupings.
- 7) Utilities are underground where economically practical.
- 8) On hills and ridges, avoid structures that project above the silhouette of the hill or ridge against the sky as viewed from public roads, and substantially screen driveways from view where practical.

Exempt agricultural accessory structures proposed on parcels in the Diverse Agriculture, Land Extensive Agriculture, Land Intensive Agriculture, and Resources and Rural Development land use categories, and on parcels in the Rural Residential land use category with Agriculture and Residential (AR) Zoning, from this policy if their use does not require a use permit in the Development Code. If compliance with these standards would make a parcel unbuildable, site structures where minimum visual impacts would result.

Scenic corridors in Sonoma County include orchard and forest covered hills, rolling dairy lands, and scenic valleys planted in vineyards. These corridors, as viewed from rural roadways, are highly valued by residents and tourists. As such, the County has identified and mapped the locations of these open spaces and its General Plan contains the following policies:

- | | |
|---------------------------|--|
| <i>Goal ORCS-3</i> | Identify and preserve roadside landscapes that have a high visual quality as they contribute to the living environment of local residents and to the County's tourism economy. |
| <i>Objective OSRC-3.1</i> | Designate the Scenic Corridors on Figures OSRC-5a through OSRC-5i along roadways that cross highly scenic areas, provide visual links to major recreation areas, give access to historic areas, or serve as scenic entranceways to cities. |
| <i>Policy OSRC-3h</i> | Design public works projects to minimize tree damage and removal along scenic corridors. Where trees must be removed, design replanting programs so as to accommodate ultimate planned |

highway improvements. Require revegetation following grading and road cuts.

Policy OSRC-3i

Recognize Highway 116 from Highway 1 to the southern edge of Sebastopol as an official State Scenic Highway. The unique scenic qualities of this portion of Highway 116 shall be protected as generally outlined in the 116 Scenic Highway Corridor Study, September 1988. Consider requesting official State Scenic Highway designations for Highways 1 and 37. Upon the request of local residents, the County may pursue similar state status for other scenic corridors.

City of Cotati Municipal Code

The City of Cotati's Municipal Code, Title 17 Land Use Code (City of Cotati 2005), includes requirements for tree removal, watercourse setbacks, public and visual access to watercourses, and public rights to views and sunlight. The City's Municipal Code and General Plan support planting of native plant species within watercourse areas and preservation of scenic views of surrounding hillsides.

City of Petaluma General Plan 2025

The City's General Plan (City of Petaluma 2008) identifies sensitive views as those to the hillsides and Petaluma River Valley and its creek corridors. The General Plan contains policies to preserve and enhance these views through restrictions on hillside development and development within scenic corridors.

City of Rohnert Park General Plan

The City of Rohnert Park's General Plan: Urban Forms, Views, and Edges element includes the following policies to protect and enhance scenic views along Petaluma Hill Road (City of Rohnert Park 2000). At locations where Agency-maintained creeks intersect the city's scenic corridor, Proposed SMP maintenance activities could affect these policies.

- | | |
|-------------|--|
| <i>CD-4</i> | Designate Petaluma Hill Road as a scenic corridor throughout its stretch along Rohnert Park. |
| <i>CD-5</i> | Ensure that any landscape treatment along Petaluma Hill Road does not obstruct views of the eastern ridgelines from the street. |
| <i>CD-6</i> | As part of any development along Petaluma Hill Road, ensure planting, if any, does not obstruct views of the ridges from the city's eastern neighborhoods. In no case shall trees or shrubs that exceed 25 feet in height upon maturity be used. |

City of Santa Rosa 2020 General Plan

The following policies contained in the City of Santa Rosa's General Plan, Urban Design Element are applicable to the Proposed Program (City of Santa Rosa 2002).

- | | |
|-------------|--|
| <i>UD-A</i> | Preserve and enhance Santa Rosa's scenic character, including its natural waterways, hillsides, and distinctive districts. |
|-------------|--|

<i>UD-A-1</i>	Maintain view corridors to natural ridgelines and landmarks, such as Taylor Mountain and Bennett Mountain.
<i>UD-A-10</i>	Relate landscape design to the natural setting. Require that graded areas within new development be revegetated.
<i>UD-C</i>	Enhance and strengthen the visual quality of major entry routes into the City, as well as major corridors that link neighborhoods with downtown.
<i>UD-C-5</i>	Work with Sonoma County to retain and improve the scenic qualities of Highway 101 and Highway 12, including the planting of trees in the back of developments and along the edge of the Caltrans rights-of-way.
<i>UD-E-1</i>	Provide for new open space opportunities throughout the city, especially in neighborhoods that have less access to open spaces. This includes exploring potential for creek corridors, bicycle and pedestrian ways, as well as new pocket parks and conservation areas.
<i>UD-E-2</i>	Provide an open space network that is linked by pedestrian and bicycle paths, and that preserves and enhances Santa Rosa's significant visual and natural resources.
<i>UD-E-3</i>	Restore Santa Rosa Creek as a linear park throughout the City for pedestrians and cyclists.
<i>UD-E-4</i>	Enhance pedestrian activity and safety by designing streets, buildings, pathways, and trails to provide a visual connection with public spaces such as parks and Santa Rosa Creek. Review and revise the Zoning Code and Subdivision Guidelines to support this policy.

City of Sebastopol General Plan

The City of Sebastopol's General Plan, Chapter 5 Community Identity (City of Sebastopol 1994), contains policies to preserve and enhance scenic view corridors along the Laguna de Santa Rosa, Atascadero Creek, and the hills west of Sebastopol.

City of Sonoma 2020 General Plan

Surrounding hills and the rural character of the City of Sonoma are valuable characteristics to residents of the city. As such, the City's General Plan (City of Sonoma 2006) seeks to preserve scenic views and natural resources, especially along creeks.

Town of Windsor General Plan – 2015

The Town of Windsor's General Plan (Town of Windsor 1996) contains policies to preserve and enhance scenic corridors and landforms west of the city.

Santa Rosa Creek Design Guidelines Manual

The City of Santa Rosa's design guidelines for Santa Rosa Creek (City of Santa Rosa 1997) include the following objectives and recommendations relevant to proposed Program activities near Santa Rosa Creek:

12. Landscaping and Plant Materials

Recommendation 12.10 Maintain safe sight distances for vehicles, bikes, pedestrian and equestrian traffic.

Recommendation 12.13 Provide selective pruning and tree removal to create views into the creek from roadways/bridges and overlooks.

3.1.3 Environmental Setting

Regional Character

The Program Area includes all of Sonoma County but is focused on the Laguna de Santa Rosa, Petaluma River, and Sonoma Creek watersheds of the southern County. The physiography of southern Sonoma County is generally defined by a sequence of northwest to southeast aligned valleys and ridgelines. The regional character of the study area is defined by mountain ranges, valleys, grazing fields, grape vineyards, and urban centers. Rolling hillside views in the study area range from bright green annual grasslands with wildflowers in the spring, to golden brown grasslands with valley oaks in the summer and fall. The study area is characterized by a mix of industrial, commercial, residential, agricultural, and public open space uses.

The Mayacamas Mountains separate Sonoma and Napa counties. The westward draining slopes of the Mayacamas Mountains provide headwater drainage areas to the northern Laguna de Santa Rosa and eastern Sonoma Creek watershed areas. The Sonoma Mountains separate the southern Laguna de Santa Rosa, northern Petaluma River, and western Sonoma Creek watershed areas. Natural vegetation patterns change from higher to lower elevations. Higher elevations generally have more coniferous forests, transitioning to oak woodlands at lower elevations, and then mixed oak woodland and grassland interfaces at the lowest elevations.

Areas of higher elevations on the east side of the Laguna de Santa Rosa watershed are encompassed by public lands, rural residential, agriculture (vineyards), and open ranchlands and woodlands. As the elevation levels towards the west, residential and commercial land uses intensifies, particularly at the urban areas of Santa Rosa and Rohnert Park. Land use shifts to rural residential and more intensive agriculture use moving further west across the watershed. Mount Saint Helena serves as a prominent landform to the north of this Program Area.

The Petaluma Valley in the central watershed forms a wide basin with characteristic rolling hills and grasslands that stretches from Cotati southeast to San Pablo Bay. Predominant land uses in the Petaluma River watershed are comprised of agriculture, rural residential, and the urban center of Petaluma. The primary urban area in the valley, the City of

Petaluma, sits squarely in the middle of the watershed surrounded by almost exclusive agricultural lands to the east and a buffer of rural residential to the west before agricultural lands begin again.

The Sonoma Creek valley is generally symmetrical with dendritic canyons descending from the Mayacamas Mountains to the east and the Sonoma Mountains to the west. Land uses in the Sonoma Creek watershed are mixed, but contain a high percentage of both agriculture and rangeland/woodland land uses. The town of Sonoma forms the main urban center and is located at the southern end of the valley.

Public open spaces with scenic vistas of the study area include Annadel State Park, Hood Mountain Regional Park, Sugarloaf Ridge State Park, Jack London State Park, Lake Sonoma Recreational Area, and numerous smaller regional and local parks.

Scenic Highways and Corridors

Where scenic highways and corridors intersect with SCWA-maintained channels, views from these highways and corridors could be affected by SMP maintenance activities. Two stretches of highways within the SMP Area have been officially designated by Caltrans as Scenic Highways: the 28-mile stretch of State Route (SR) 116 from SR 1 east to the Sebastopol city limit; and the 12-mile stretch of SR 12 (Valley of the Moon Highway) from Danielli Avenue east of Santa Rosa to London Way near Agua Caliente (California Department of Transportation 2008). There are six reaches of highway within the SMP Area that have been identified as eligible for designation as Scenic Highways: SR 1 from Bodega Bay north to Point Arena; SR 116 from Sebastopol east to U.S. Highway 101; SR 12 from U.S. Highway 101 east to Danielli Avenue; SR 12 from Agua Caliente south to SR 121; SR 121 from Big Bend south to Sears Point; and SR 37 Guadalupe Village west to the Petaluma River bridge.

Sonoma County has designated an extensive network of roadways as Scenic Corridors. This network includes unincorporated areas of the County, offering a diversity of viewsheds to travelers. State Highways 1, 12, 37, 101, 116, 121, and 128 and County roadways, such as Skaggs Springs Road, River Road, Chalk Hill Road, Lakeville Highway, Bennett Valley Road, Dry Creek Road, Mark West Springs Road, Arnold Drive, Petaluma Hill Road, Bodega Avenue, and Fulton Road are identified as Scenic Corridors.

The incorporated cities of Sonoma County have equally identified scenic corridors and aesthetic resources. Overall, these are located around waterways and roadways identified by the County with views to the hillsides surrounding the cities.

Unique landforms and scenic vistas are described in the Chapters 3 and 4 of the SMP Manual. Unique characteristics of the Program Area are described in the SMP Manual according to the three main watersheds where maintenance activities would occur; Laguna de Santa Rosa, Petaluma, and Sonoma. The most prominent features which offer viewing points to these watersheds are located in the Mayacamas Mountains and Sonoma Mountain where many public trails and roadways provide scenic viewing opportunities. The SMP Manual describes the influence of these mountains and other topographic features on aesthetic resources in the Program Area.

Aesthetic Quality at SMP Channels

The aesthetic quality of SCWA-maintained channels varies from reaches nearly devoid of vegetation to reaches supporting a full riparian canopy (see photos in SMP Manual Figure 5-1). Many of the creek reaches that would be maintained under the SMP are located along public roadways or trails. In urbanized areas, such as within the City of Santa Rosa and Rohnert Park, efforts have been made to use creeks as the center focus of development, thus elevating the scenic value provided by creeks and their riparian vegetation. The City of Santa Rosa, in particular, has strived to protect the aesthetic value of Santa Rosa Creek by conducting restoration projects and maintaining public multi-use trails along its banks. The public value of creeks in the Program Area is evidenced by the policies included in the local general plans, as listed above.

Depending on their location, creeks maintained under the SMP would be viewed by recreationalists, such as bicyclists, hikers, horseback riders, residents, and other pedestrians, and motorists. Though public accesses to SMP channels is provided by trails located along the top of creek banks and at creek crossings, direct access into the creek channel, such as for swimming, is not allowed.

Viewer Groups and Viewer Responses

Viewer groups in the vicinity of the Program Area and their sensitivity to visual changes in the area are characterized below. Viewer groups who have visual access to SCWA-maintained facilities were divided into the categories of recreational users, residents, workers, and motorists.

Recreational Users

Recreational use in the Program Area includes a variety of activities, such as walking, jogging, biking, dog-walking, and bird watching. Many hiking trails within Annadel State Park, Hood Mountain Regional Park, Sugarloaf Ridge State Park, and Jack London State Park provide panoramic views of the Laguna, Petaluma, and Sonoma valleys. In addition, SMP channels are used by recreationalists for many of the activities described above.

Viewer sensitivity is moderately high among recreationists because they are more likely to value the natural environment highly, appreciate the visual experience, and be more sensitive to changes in views.

Residents

Residents are individuals whose homes are in proximity to SCWA-maintained facilities in the Program Area. Similar to recreationalists, viewer sensitivity is moderately high amongst residents because they are likely to value their local visual resources highly, appreciate the visual experience, and be more sensitive to changes in views.

Workers

Workers are individuals whose place of employment is in proximity to SCWA-maintained facilities in the Program Area, or who may come into contact with such facilities as part of their work activities (e.g., delivery persons). Viewer sensitivity is moderate among workers

because they generally are not highly focused on the visual resources surrounding their workplace, and will be less sensitive to changes in views.

Motorists

Motorists use roadways at varying speeds; normal highway and roadway speeds differ based on the traveler's familiarity with the route and roadway conditions (e.g., presence/absence of rain). Single views typically are of short duration, except on straighter stretches where views last slightly longer. Motorists who frequently travel these routes generally possess low to moderate visual sensitivity to their surroundings. The passing landscape becomes familiar to these viewers, and their attention typically is not focused on the passing views but on the roadway, roadway signs, and surrounding traffic. Motorists who travel local routes for sight-seeing purposes generally possess a higher visual sensitivity to their surroundings because they are likely to respond to the natural environment with higher regard and as a holistic visual experience.

Viewer sensitivity is moderately low among most roadway travelers anticipated to view the Program Area. The passing viewshed becomes familiar to frequent viewers; further, at standard roadway speeds, views are of short duration and roadway users are fleetingly aware of surrounding traffic, road signs, their immediate surroundings within the automobile, and other visual features.

3.1.4 Impact Analysis

Methodology

This section describes the methods used to determine the Proposed Program's impacts and lists the thresholds used to conclude whether an impact would be significant. Best Management Practices (BMPs) to mitigate (avoid, minimize, rectify, reduce, eliminate, or compensate for) significant impacts accompany each impact discussion.

The methodology used to assess visual resources impact from the Program include the following:

- 1) Objectively identify the visual features (visual resources) within the Program Area.
- 2) Assess the character and quality of those resources relative to overall regional visual character.
- 3) Identify the importance to people, or *sensitivity*, of views of visual resources in the viewshed.

By establishing the baseline (existing) conditions, the Proposed Program or other change to the viewshed can be objectively evaluated for its degree of impact. The degree of impact depends both on the magnitude of change in the visual resource (i.e., visual character and quality) and on viewers' responses to and concern for those changes. This general process is similar for all established federal procedures of visual assessment (Smardon, et al. 1986) and represents a suitable methodology of visual assessment for other projects and areas.

Implementation of the Program was evaluated based on the potential to impact the following viewer groups: recreationalists (pedestrians and cyclists), residents, workers, and motorists (drivers and passengers in cars or motorcycles).

Criteria for Determining Significance

Based on Appendix G of the State CEQA Guidelines and professional expertise, it was determined that the Proposed Program would result in a significant impact on aesthetics if it would:

- Have a substantial adverse effect on a scenic vista;
- Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway;
- Substantially degrade the existing visual character or quality of the site and its surroundings; or
- Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area.

Environmental Impacts

Impact AES-1: Alteration to a Scenic Vista (No Impact)

Scenic viewpoints within the Program Area are generally located at high elevations along mountain ranges. The SMP channels are a part of the vistas viewed from these locations. SMP Manual Chapter 3, Section 3.2 Topography and Landforms describes unique vistas in the SMP Area. In addition, within or adjacent to the SMP channels themselves, scenic vistas of nearby mountains may also be visible.

The proposed SMP maintenance activities would be conducted within creek corridors at lower elevations in the watershed. Due to their distance from the scenic viewpoints at higher elevations, it is unlikely that stream maintenance activities would result in alteration to scenic vistas as viewed from these locations. Similarly, SMP activities are not anticipated to reduce the quality of views within the SMP channels or from nearby adjacent lands. There would be no impact on scenic vistas as a result of implementation of the Proposed Program.

Level of Significance: No Impact

Impact AES-2: Alteration to Scenic Resources within a State Scenic Highway (Less than Significant with Mitigation)

The two designated Scenic Highways (SRs 12 and 116) in Sonoma County would intersect Zones 1A, 3A, and 5A of the SMP Area (as shown in SMP Manual Figures 1-2, 1-4, and 1-6, respectively). The designated reach of SR 116 extends from Atascadero Creek along the Russian River to Jenner in Zone 5A. The creeks in proximity to this reach of SR 116 would not be maintained under the SMP. As such, there would be no impact on scenic resources along this Scenic Highway.

The reach of SR 12 which is designated as a Scenic Highway extends from Agua Caliente Creek (Zone 3A) north to the intersection of Oakmont Creek with Santa Rosa Creek (Zone 1A). Several creeks which intersect SR 12 are modified or natural creeks with permissive clearing easements, and may be maintained under the SMP. Maintenance activities conducted in these creeks are minimal, occur on an as-needed basis, and typically include the removal of log jams, debris jams, and the clearance of vegetation to remove significant flow obstructions. While the presence of construction equipment at these creeks would temporarily disrupt scenic views, such disruption would be temporary. In addition, the physical changes to the creeks would not substantially affect their aesthetic quality, since such changes would be infrequent, of limited spatial extent, and would quickly return to a “natural” appearance over the course of a growing season. As a result, there would be no substantial or long-term degradation of the scenic resources as viewed by the various viewer groups.

Additionally, maintenance activities would include implementation of SMP BMP GN-1 *Work Site Housekeeping* to ensure the work site is kept in a neat and orderly appearance during maintenance activities.

With implementation of BMP GN-1, impacts are considered less than significant.

Level of Significance: Less than significant with mitigation

Mitigation Measures:

BMP GN-1: Work Site Housekeeping

1. SCWA will maintain the work site in a neat and orderly condition, and will leave the site in a neat, clean, and orderly condition when work is complete. To the extent feasible, slash, sawdust, cuttings, etc. will be removed to clear the site of vegetation debris. Paved access roads will be swept and cleared of any residual vegetation or dirt resulting from the maintenance activity.
2. For activities that last more than one day, materials or equipment left on the site overnight will be stored as inconspicuously as possible, and will be neatly arranged.

Impact AES-3: Temporary Alteration of Visual Character or Quality from Maintenance Activities (Significant and Unavoidable)

The visual character and quality of creek channels potentially maintained under the Proposed Program vary widely, from unvegetated channels lined with rock, to channels with a dense riparian corridor (see representative photos of land cover types in Chapter 3 of the SMP Manual, Figures 3-18 to 3-24). Similarly, the public has a variety of ways to view the channels. Viewing opportunities range from creek side trails, roadways which parallel or cross the channels, and more restricted areas from public access (that are not visible from any public location). The Sonoma County community highly values the creeks and creek corridors maintained by the Agency, as is evident by the policies included in General Plans for the County and its incorporated cities summarized in the Regulatory Setting section above. Degradation of the aesthetic value of Agency-maintained channels, particularly those reaches which are viewable by the public, would adversely affect sensitive user groups, such as recreationalists and residents.

Proposed SMP maintenance activities could involve vegetation removal, grading of channel banks, and sediment and debris clearing at various scales (localized or reach-scale) and locations. Over the long-term these activities are intended to be aesthetically beneficial through providing an improved and sustainable visual quality to the majority of Program Area channels including improved riparian corridors and greater presence of native riparian species. However, as described below, in the short-term maintenance activities may create impacts to the visual character of the channels.

Vegetation Management

As described in Chapters 5 and 6 of the SMP Manual, the majority of vegetation removed from Agency-maintained channels would consist of non-native species, such as blackberry and cattails, and some trees. Some native trees which impede flow would be removed, but would be relocated or else offset by replanting in a new location within the channel corridor. In all cases, vegetation and trees would be evaluated for their beneficial influence on the channel (i.e., riparian cover and habitat) and efforts such as pruning or relocation would be explored to support these benefits prior to removal.

Removal of vegetation would potentially reduce the aesthetic quality of the channels on a temporary basis, as these areas would appear somewhat denuded. However, revegetation activities would help to offset these impacts (please refer to the planting plan described in SMP Manual Chapter 8 and shown on SMP Manual Figures 8-2 and 8-3). Additionally, implementation of SMP Vegetation Management BMPs (VEG-1 through VEG-3) would ensure maintenance activities would protect, enhance, and restore native vegetation at Agency-maintained sites.

Sediment Removal and Bank Stabilization

Sediment removal and bank stabilization activities would result in exposed and unvegetated channels at the maintenance location. Though the banks at these sites would be stabilized and revegetated, there would be a temporary reduction in the aesthetic quality of the sites until the planted vegetation establishes. It would take approximately three to five years before the aesthetic character of the site would return, as shown in the figures in SMP Manual Chapter 6 which include before and after illustrations of the various maintenance activities proposed at Agency-maintained channels. As mentioned above, many reaches of Agency-maintained channels are inaccessible or not visible to the public. Maintenance activities conducted at publicly accessible and visible sites would be announced in the local newspaper and on signage nearby the site to explain the temporary effects and reasoning for alterations to the channels. Additionally, implementation of SMP BMP Measure GN-1 *Work Site Housekeeping* would ensure the work sites are kept in a neat and orderly appearance during construction.

Other Maintenance Activities

Debris removal, fence maintenance, and graffiti removal activities proposed in the SMP Manual would result in an immediate improvement to the visual character and quality of Agency-maintained channels, particularly at sites which are visible to the public such as roadway crossings and trails.

Conclusions

In summary, while long-term maintenance activities seek to improve the visual character of the channels through increased riparian trees and canopy development and a greater presence of native riparian species, in the short-term maintenance activities could result in temporary degradation of visual quality due to site disturbance, which would particularly affect sensitive viewer groups. Although BMPs and revegetation activities would be implemented, these short-term adverse impacts would still be considered to be significant. In order to achieve the longer-term goals of the Program, these temporary adverse visual impacts on the aesthetics of the site and channels are unavoidable. As such, this is considered a significant and unavoidable impact.

Level of Significance: Significant and unavoidable

Mitigation Measures:

BMP VEG-1 Removal of Existing Vegetation

1. Vegetation pruning and removal activities will be conducted under the guidance of a staff biologist or certified arborist. For tree relocation activities, a botanist, certified arborist, or other vegetation specialist will be on site to help direct maintenance activities and to consult if questions and/or issues arise.
2. Only vegetation that is noxious, invasive, hazardous, or could obstruct channel flows will be removed. Herbaceous layers that provide erosion protection and habitat value will be left in place. Invasive plant species that inhibit the health and/or growth of native riparian trees will be targeted for removal.
3. Where a choice between species that may be removed to maintain flood conveyance is feasible, slower-growing species such as oaks (*Quercus* spp.) that develop large canopies will be preferentially preserved, because these species take longer to establish, and provide essential nesting habitat for cavity nesters and food sources for a variety of resident and migratory animals and birds. Faster-growing species such as alders (*Alnus* spp.) and cottonwoods (*Populus* spp.) are the second priority for preservation; these single-trunked species offer the benefit of improved flood conveyance and reduced roughness by comparison with multi-trunked species.
4. Vegetation will be removed and/or pruned in such a manner that channel roughness is reduced while allowing the maximum amount of vegetation to remain in place. Trees will be trimmed or pruned to reduce impedance of floodflows while allowing the canopy to develop. Specifics for each site will differ, but typical options include limbing up to remove lower branches that have potential to interfere with floodflows, and pruning into a "fan" roughly parallel to flow direction. In areas where extensive vegetation removal is desirable to maintain flood flow capacity, phasing of removal shall be considered so that some vegetation may remain in place to provide habitat to birds.
5. Vegetation management will emphasize the preservation of large mature trees that provide well developed overstory for bird habitat, canopy closure for stream shading, and add vertical complexity to the riparian corridor. Vegetation management will be conducted in such a manner that maximizes shading over the active channel. Larger trees will be retained on both sides of north-south flowing streams and on the south side of east-west flowing streams. Where vegetation is removed from the active channel, removal will target nonnative species and removal of native species that are stiff and/or multi-trunked such as arroyo willow (*Salix lasiolepis*). Trees will never be topped as this encourages shrubby growth and weak branch attachments.

6. Large woody debris, stumps, or root wads that are fully or partially buried and do not present a flood hazard shall be allowed to remain in place to provide habitat and to maintain bank stability.
7. If vegetation requires removal for access to project site, non-native species and/or quick growing species shall be targeted first for removal. Removal of native, mature trees will be avoided whenever possible.
8. To the extent feasible, removed native vegetation shall be saved to replant after maintenance or plant in other nearby sites. This includes the reuse of mulch and willow sprigs where possible.

BMP VEG-2 Use of Herbicides

1. All herbicide use shall be consistent with all Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) label instructions and any use conditions issued by the Sonoma County Agricultural Commissioner.
2. Herbicide use will be restricted to the minimum amount needed to ensure adequate control of vegetation.
3. Application of herbicides to upland areas shall not be made within 72 hours of predicted rainfall.
4. Herbicides will not be directly applied to waters of the U.S., such as for ludwigia eradication.
5. Herbicides, including AquaMaster© and Renovate©, will not be used within 60 feet of areas identified in the Court-Ordered Stipulated Injunction for the protection of California red-legged frogs. This includes areas in Zones 1A and 3A, as well as Zones 8A and 9A (see SMP Manual Figure 3-29 for detail on where these areas are located.) The Agency will review the details and exceptions in the court order and comply with the herbicide use buffers as appropriate.
6. As required by the Court-Ordered Stipulated Injunction for pesticide use near Pacific salmon-supporting waters in Sonoma County, pesticides specified in the injunction including triclopyr (Renovate©) will not be used within 20 yards of salmon-supporting waters. The Agency will review the details and exceptions in the court order and comply with the herbicide use buffers as appropriate.

BMP VEG-3 Planting and Revegetation after Soil Disturbance

1. Sites where maintenance activities result in exposed soil will be stabilized to prevent erosion and revegetated with native vegetation as soon as feasible after maintenance activities are complete.
2. Revegetation will occur at a ratio of at least 1½: 1 to account for initial mortality of plantings.
3. If soil moisture is deficient, new vegetation will be supplied with supplemental water until vegetation is firmly established.
4. To the extent possible, native grass seed will be used when seeding a project site.
5. Erosion control fabric, hydromulch, or other mechanism will be applied as appropriate to provide protection to seeds, hold them in place, and help retain moisture.
6. Revegetation shall be regularly monitored for survival for at five years or until minimum survival/cover is achieved. If invasive species colonize the area, action shall be taken to control their spread; options include hand and mechanical removal and replanting with native species.

BMP GN-1 Work Site Housekeeping

See Impact AES-2

Impact AES-4: Permanent Alteration of Visual Character or Quality from Maintenance Activities (Beneficial)

As discussed above for Impact AES-3, Proposed SMP maintenance activities would involve vegetation removal, grading of channel banks, and sediment and debris clearing at various scales (localized or reach-scale) and locations. Impact AES-3 addressed these activities on a temporary scale, while this impact discussion focuses on the long-term effects of the Program. Over the long-term, the Program will provide visual benefits through establishing a more complete and higher quality riparian corridor along the Program Area channels and through the replacement of non-native species with more appropriate native riparian species.

Vegetation Management

The revegetation activities that would be implemented shortly after vegetation management activities (please refer the discussion in Impact AES-3), would improve the aesthetic character of the sites affected by maintenance activities. Over the long term, the goal of vegetation management activities in the Proposed Program is to develop a mature riparian canopy and corridor that offers substantial habitat, shading of the creek, and aesthetic value while minimizing future understory maintenance requirements (refer to SMP Manual Figure 5-1, which shows the progression of SMP channels towards increased aesthetic quality over time). As such, proposed vegetation management activities would result in overall, long-term beneficial impacts to the visual character and quality of Agency-maintained channels. SMP Manual Figure 5-4 depicts this improvement over a ten-year period in Santa Rosa Creek.

Sediment Removal and Bank Stabilization

As discussed above, the aesthetic character of the sites subject to sediment removal or bank stabilization would improve within three to five years. SMP Manual Chapter 6 provides figures which include before and after illustrations of the various maintenance activities proposed at Agency-maintained channels. As shown, there would be an overall improvement in aesthetics of the site and channels as a result of the Proposed Program.

Other Maintenance Activities

Debris removal, fence maintenance, and graffiti removal activities would result in a similar improvement to the visual character and quality of Agency-maintained channels, as described in Impact AES-3.

Conclusions

Over the long-term, visual quality of the channels in the Program Area would increase as the riparian condition of channels is improved over time. This is considered a long-term beneficial impact.

Level of Significance: Beneficial

Impact AES-5: Alteration to Visual Character or Quality from Sediment Disposal Activities (Significant and Unavoidable)

Sediment removed from SCWA-maintained channels would be reused in one of several ways, depending on the quality of the excavated material:

- Temporary stockpiling prior to reuse
- Onsite reuse for bank stabilization
- Off-site reuse at SCWA-owned or maintained property, including placement within another channel reach.
- Off-site restoration or enhancement of ecologic functioning
- Upland agricultural or commercial reuse by private or public landowners
- Disposal at a landfill

When necessary, temporary stockpiling of the sediment would occur within staging areas associated with the work site or at other SCWA-owned properties. The stockpiles could be located within close proximity to residential and recreational viewers who may be sensitive to changes in the visual character of the site. SMP BMP GEN-2 *Staging and Materials Stockpiling* would ensure that any stockpiled sediment would be screened from public view, to the extent practical, for the duration that the sediment is stored. The duration with which stockpiles would be present would vary by SMP activity. For reach-scale sediment removal projects, stockpiles could be present for up to several weeks; localized sediment removal and bank stabilization projects would have shorter durations, with stockpiles present for 2-4 days; and vegetation management would not result in storage of material for longer than one day in any particular reach. Impacts from stockpiling would be temporary and considered less than significant.

Reuse of sediment would follow the approach described in SMP Manual Chapter 5. On-site reuse would have impacts as described above under Impact AES-3. Off-site reuse options associated with placement of sediment at other SCWA-maintained channel reaches or to support other ecologic functions, such as floodplain habitat, would also be likely to have similar impacts as described under Impact AES-3. These disposal options would utilize sediment in a manner that enhances the natural aesthetics of a stream channel or other aquatic habitat, such as floodplain areas.

The majority of excavated sediment would be given to local landowners or public agencies for agricultural or commercial reuse offsite. The sediment could be used for soil augmentation to grow vegetable crops, construction of foundation pads for houses or other structures, or construction of berms to provide visual screens. Once the sediment is given to a landowner or agency, the exact use of the sediment would not be managed by SCWA. Thus, the level of impact on visual resources from sediment reuse is difficult to predict. However, it is reasonably foreseeable that sediment reuse in these settings could significantly alter the visual character or quality of the reuse site such that viewer groups would negatively respond to the action. This would result in a significant impact. While

mitigation measures may be available to reduce the impact, such mitigation would be within the responsibility and jurisdiction of another public agency and not SCWA, since SCWA would not have approval authority for the actions of private landowners or other public agencies. Because mitigation cannot be guaranteed, the potential for sediment reuse on private property to result in alteration of the visual character and quality of disposal site is considered significant and unavoidable.

Finally, if on-site or off-site disposal locations are unavailable or if the sediment is considered hazardous, it would be taken to a general waste or hazardous waste landfill. The amount of sediment generated from the maintenance activities and disposed at a landfill would not exceed the landfills' current permitted capacities. Disposal of sediment at a landfill would therefore not noticeably change the aesthetic quality of the landfill compared to existing conditions. Impacts from disposal at a landfill would be considered less than significant.

In summary, the aesthetic impacts of sediment reuse/disposal would generally be less-than-significant. However, reuse by private landowners or other public agencies could result in significant impacts. Because SCWA cannot require mitigation of these parties, impacts are identified as significant and unavoidable.

Level of Significance: Significant and unavoidable

Mitigation Measures:

BMP GEN-2: Staging and Stockpiling of Materials

1. Staging will occur on access roads, surface streets, or other disturbed areas that are already compacted and only support ruderal vegetation to the extent feasible. Similarly, to the extent practical, all maintenance equipment and materials (e.g., road rock and project spoil) will be contained within the existing service roads, paved roads, or other pre-determined staging areas. Staging areas for equipment, personnel, vehicle parking, and material storage shall be sited as far as possible from major roadways.
2. All maintenance-related items including equipment, stockpiled material, temporary erosion control treatments, and trash, will be removed within 72 hours of project completion. All residual soils and/or materials will be cleared from the project site.
3. As necessary, to prevent sediment-laden water from being released back into the channel during transport of spoils to disposal locations, truck beds will be lined with an impervious material (e.g., plastic), or the tailgate blocked with wattles, hay bales, or other appropriate filtration material. If appropriate, trucks may drain excess water by slightly tilting the loads and allowing the water to drain out through the applied filter.
4. Building materials and other maintenance-related materials, including chemicals and sediment, will not be stockpiled or stored where they could spill into water bodies or storm drains or where they will cover aquatic or riparian vegetation.
5. No runoff from the project or staging areas, including from stockpiled spoils, may be allowed to enter the creek channel or storm drains without being subjected to filtration (e.g., vegetated buffer, hay wattles or bales, silt screens).
6. During dry season, no stockpiled soils shall remain exposed and unworked for more than 30 days. During wet season, no stockpiled soils shall remain exposed, unless surrounded by properly installed and maintained silt fencing or other means of erosion control.

7. All spoils will be disposed of in an approved location. Selection of the disposal location will be determined after the spoils have been tested for hazardous chemicals (see HAZ-8).

Impact AES-6: Substantial Alteration to Day or Nighttime Views due to Additional Light or Glare (No Impact)

SMP maintenance activities would be conducted during daylight hours only, thus no nighttime lighting would be needed. The Proposed Program would not involve construction of new facilities or modifications to existing facilities that would result in new reflective surfaces or installation of lighting. Consequently, there would be no impact.

Level of Significance: No impact

Chapter 3.2

AIR QUALITY

3.2.1 Introduction

This section describes the setting and potential impacts of the Proposed Program on air quality. Data sources used in the preparation of this section include state and federal regulations and reference materials from the Bay Area Air Quality Management District (BAAQMD).

Concepts and Terminology

Sensitive Receptors

Sensitive receptors are those who are particularly susceptible to the adverse effects of air pollution. These include children, the elderly, the sick, and even plants, forests, and certain crops including grapes. Air pollution can cause adverse health effects in humans including aggravating asthma conditions and other respiratory problems. Plants are susceptible in particular to the effects of ozone, including foliage discoloration, leaf, needle, and fruit drop, and failure of fruit to ripen (BAAQMD 1999).

Sensitive receptors adjacent to stream reaches in the Program Area are numerous, and include residential areas, schools, elder care facilities, and hospitals.

3.2.2 Regulatory Setting

Federal Regulations

The United States Environmental Protection Agency (USEPA) carries out the provisions of the federal Clean Air Act (CAA), originally passed in 1963 and amended six times, most recently in 1990. USEPA implements programs under the CAA that focus on reducing ambient air pollutant concentrations, reducing emissions of toxic pollutants, and phasing out production and use of chemicals that destroy stratospheric ozone. USEPA sets ambient air limits, the National Ambient Air Quality Standards (NAAQS) for six criteria pollutants: particulate matter, carbon monoxide, nitrogen oxides, sulfur oxides, ground-level ozone, and lead. The NAAQS are presented in Table 3.2-1. Primary standards are set for protection of human health and secondary standards are set for environmental protection. Areas which meet the primary standards are considered in “attainment” while areas with air quality not meeting the primary standards are in “nonattainment.”

Of the six criteria pollutants, particulate matter and ground-level ozone pose the most widespread threat to human health. Particle pollution includes very fine soot and dust which is formed when fuels such as wood, oil, and coal are burned. Construction activities including excavation and grading are also sources of particle pollution. Particle pollution impairs lung function. It poses the greatest threat to sensitive receptors including children,

Table 3.2-1. State and Federal Ambient Air Quality Standards

Contaminant	Averaging Time	State Standards ¹	Primary Federal Standards ²	Secondary Federal Standards ²
Ozone	1 hour	0.09 ppm (180 µg/m ³)	-	-
	8 hour	0.070 ppm ⁴	0.075 ppm	0.075 ppm
Respirable Particulate Matter (PM ₁₀)	24 hour	50 µg/m ³	150 µg/m ³	Same as primary standard
	Annual arithmetic mean	20 µg/m ³	-	-
Fine Particulate Matter (PM _{2.5})	24 hour	-	35 µg/m ³ (See footnote 5)	Same as primary standard
	Annual arithmetic mean	12 µg/m ³	15 µg/m ³	Same as primary standard
Carbon Monoxide	8 hour	9.0 ppm	9 ppm	None
	1 hour	20 ppm	35 ppm	None
Nitrogen dioxide	Annual arithmetic mean	0.030 ppm	0.053 ppm	Same as primary standard
	1 hour	0.18 ppm	-	-
Sulfur dioxide	Annual arithmetic mean	-	0.030 ppm	-
	24 hour	0.04 ppm	0.14 ppm	-
	3 hour	-	-	0.5 ppm
	1 hour	0.25 ppm	-	-
Lead	30 day average	1.5 µg/m ³	-	-
	Calendar quarter	-	1.5 µg/m ³	Same as primary standard
Visibility reducing particles	8 hour	See footnote 3	-	-
Sulfates	24 hour	25 µg/m ³	-	-
Hydrogen Sulfide	1 hour	0.03 ppm	-	-
Vinyl Chloride	24 hour	0.01 ppm	-	-

ppm – parts per million by volume

µg/m³ – micrograms per cubic meter

PM₁₀ – particulate matter less than 10 microns in diameter.

PM_{2.5} – particulate matter less than 2.5 microns in diameter.

Footnotes:

- California standards for ozone, carbon monoxide, sulfur dioxide (1-hour and 24-hour), nitrogen dioxide, suspended particulate matter – PM₁₀, and visibility reducing particles are values that are not to be exceeded. The standards for sulfates, lead, hydrogen sulfide, and vinyl chloride are not to be equaled or exceeded. If the standard is for a 1-hour, 8-hour, or 24-hour average then some measurements may be excluded. In particular, measurements that the Air Resources Board determines would occur less than once per year on average are excluded.
- National standards other than for ozone, particulates, and those based on annual averages are not to be exceeded more than once per year. The 1-hour ozone standard is attained if, during the most recent three-year period, the average number of days per year with maximum hourly concentrations above the standard is equal to or less than one. The 8-hour ozone standard is attained when the 3-year average of the 4th highest daily concentrations is 0.075 ppm (75 ppb) or less. The 24-hour PM₁₀ standard is attained when the 3-year average of the 99th percentile of monitored concentrations is less than 150 µg/m³. The 24-hour PM_{2.5} standard is attained when the 3-year average of 98th percentiles is less than 35 µg/m³.

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- Except for the national particulate standards, annual standards are met if the annual average falls below the standard at every site. The national annual particulate standard for PM₁₀ is met if the 3-year average falls below the standard at every site. The annual PM_{2.5} standard is met if the 3-year average of annual averages spatially-averaged across officially designed clusters of sites falls below the standard.
3. Statewide VRP Standard (except Lake Tahoe Air Basin): Particles in sufficient amount to produce an extinction coefficient of 0.23 per kilometer when the relative humidity is less than 70 percent. This standard is intended to limit the frequency and severity of visibility impairment due to regional haze and is equivalent to a 10-mile nominal visual range.
 4. The 8-hour CA ozone standard was approved by the Air Resources Board on April 28, 2005 and became effective on May 17, 2006.
 5. U.S EPA lowered the 24-hour PM_{2.5} standard from 65 µg/m³ to 35 µg/m³ in 2006. EPA is required to designate the attainment status of BAAQMD for the new standard by December 2009.
-

the elderly, and asthmatics. Sources of particulate matter include ground disturbing activity (such as construction grading), motor vehicles, power generation activities, industrial operations, wood stoves, fireplaces, unpaved roads, and crushing and grinding operations. Particle pollution can be carried by the wind and impair air quality far from its source. To reduce particle levels, USEPA regulates emissions from motor vehicles and point sources.

Ground-level ozone is the primary component of smog. Ozone is formed from the interaction of volatile organic compounds and nitrogen oxides. Volatile organic compounds are emitted by motor vehicles, industrial activities, and consumer products such as paints, inks, and adhesives. Nitrogen oxides are formed with the burning of gasoline, coal, and oil. Weather and topography influence the formation and location of ground-level ozone. Hot temperatures spur the reaction between volatile organic compounds and nitrogen oxides to form ozone. Sensitive receptors to ozone are the same as those listed for particulate matter with the addition of forests and agricultural crops. Ground-level ozone settles into valleys when winds are calm and temperatures are warm.

Hydrogen sulfide (H₂S) is found in nature around some hot springs, geothermal sources, and oil fields (sour gas). It is also produced by anaerobic decomposition, and is sometimes called swamp gas. The human nose can detect H₂S at concentrations well below toxic levels. Heavier than air, this gas is considered obnoxious and unpleasant. At higher levels, it desensitizes the nose, and can be fatal because it blocks oxygen uptake by the blood. Mainly a health threat to industrial workers, H₂S is usually regulated to eliminate nuisance for nearby residents or property owners.

State Regulations

California Air Resources Board

The California Air Resources Board (CARB) was established in 1967. CARB has set California Ambient Air Quality Standards (CAAQs), presented in Table 3.2-1, that are more stringent than the NAAQS for most contaminants. These include standards for additional contaminants not covered in the NAAQS, including visibility reducing particles, sulfates, hydrogen sulfide, and vinyl chloride. The California Clean Air Act was passed in 1988 and requires nonattainment areas to achieve and maintain the CAAQs by the earliest time practicable, and local air districts to develop attainment plans for state standards.

CARB regulates motor vehicle emissions in the State, while local air quality management district's permit stationary sources.

Climate Change/Greenhouse Gas Emissions

In 2002, Assembly Bill 1493 (AB 1493) launched an innovative and pro-active approach to dealing with GHG emissions and climate change at the state level. AB 1493 requires CARB to develop and implement regulations to reduce automobile and light truck GHG emissions; these regulations will apply to automobiles and light trucks beginning with the 2009 model year.

AB 1493 cited several potential risks that California faces from climate change, including reduction in the state's water supply, increased air pollution creation by higher temperatures, harm to agriculture, and increase in wildfires, damage to the coastline, and economic losses caused by higher food, water, energy, and insurance prices. Further, the legislature stated that implementing technological solutions to reduce greenhouse gas emissions would stimulate California economy and provide jobs.

On June 1, 2005, Governor Arnold Schwarzenegger signed Executive Order S-3-05. The goal of this Executive Order is to reduce California's GHG emissions to: (1) 2000 levels by 2010; (2) 1990 levels by the 2020; and (3) 80% below the 1990 levels by the year 2050. In 2006, this goal was further reinforced with the passage of Assembly Bill 32 (AB 32), the Global Warming Solutions Act of 2006. AB 32 sets the same overall GHG emissions reduction goals while further mandating that CARB create a plan (including market mechanisms), and implement rules to achieve "real, quantifiable, cost-effective reductions of greenhouse gases." Executive Order S-20-06 further directs state agencies to begin implementing AB 32, including the recommendations made by the state's Climate Action Team.

Climate change and GHG reduction is also a concern at the federal level; however, at this time, no legislation or regulations have been enacted specifically addressing GHG emissions reductions and climate change. Please refer to Chapter 4, Cumulative Impacts, for a full discussion of climate change and its relationship to the Proposed Program.

Local Regulations

CARB has designated 15 air basins in the State. Thirty-five local air quality management districts are responsible for attainment and permitting in each basin and subbasin area. Southern Sonoma County is located in the San Francisco Bay Air Basin, and northern Sonoma County is in the North Coast Air Basin. The BAAQMD oversees planning and permitting in the nine county Bay Area including southern Sonoma County. This includes most of the cities within the County, with the exception of Healdsburg. The Northern Sonoma County Air Pollution Control District oversees permitting in the northern half of the county, including the City of Healdsburg.

The BAAQMD published California Environmental Quality Act (CEQA) guidelines to aid assessment of air quality impacts in 1999. The guidelines address evaluating air quality impacts and their significance, and developing mitigation measures for significant impacts.

3.2.3 Environmental Setting

This section discusses existing climate and air quality conditions in the Program Area.

Climate and Topography

Climate and topography dictate the potential for air pollution to build up or concentrate in geographic areas. Wind speed, inversions, atmospheric stability, solar radiation, and terrain all influence air pollution potential. The actual air quality is a function of the air pollution potential and the existing emissions at any given time.

Wind speed affects air quality because faster winds carry pollutants away from the source. Low wind speeds allow more pollutants to be emitted into the air mass per unit of time, leading to a buildup of pollutant concentration. Similarly, inversions influence the mass of air available for dilution by vertically limiting the distance pollutants can travel. An inversion occurs when the typical atmospheric condition of temperature decrease with elevation is reversed, or “inversed”. Inversions may result in a layer of warmer air resting over a layer of cooler air. The denser cooler air is trapped below the less dense warm air. In this inversion situation, pollutants emitted are trapped beneath the warmer air aloft within the cooler air lower to the ground. This situation, in combination with reduced circulation, reduces opportunities for mixing and dispersion, potentially leading to higher pollutant concentrations and poorer air quality. Inversions in the Bay Area may limit the pollutant mixing depth of the lower air mass to as little as 50 to 100 meters above the ground surface. In the Bay Area, inversions can occur in the winter under conditions of cold, clear nights, with damp ground and little wind. Inversions also happen under warmer weather conditions when the fog systems keep ground temperatures cooler than the air above them.

Atmospheric stability also influences the ability of pollutants to move vertically. Stability is defined as the atmosphere’s resistance to vertical motions (BAAQMD 1999). The more stable the air, the slower the mixing of pollutants into the air mass. Stability is dependent upon the temperature gradient with elevation. A stronger standard temperature gradient (with temperatures decreasing with elevation increases) increases atmospheric instability and mixing. Atmospheric stability can cause reduced pollutant mixing and therefore increase air pollution potential.

Solar radiation is necessary for formation of ozone in the atmosphere. Ultraviolet sunlight and warm temperatures catalyze the chemical reaction between reactive organic gases and nitrogen oxides which forms ozone. The frequent hot, sunny days in the Bay Area in the summer months promote ozone air pollution, particularly in the inland valleys where temperatures are warmest. Insufficient ultraviolet light and warmth in the winter reduce the likelihood of forming ozone (BAAQMD 1999).

Topography influences air pollution principally through wind and circulation patterns. The lee side of mountains may be sheltered from the predominant winds, reducing turbulence and downward transport. Elevated terrains can create temperature and density driven circulations, with up-valley wind flows during daytime heating and down-valley flows during nighttime cooling (BAAQMD 1999). In the Bay Area, typical on-shore regional wind patterns from the west and northwest can be reversed by seasonal off-shore flows generating northeasterly and easterly winds. Winter cyclonic storms may bring southerly winds.

The BAAQMD divides the San Francisco Bay Air Basin into subbasins with distinct climate and topography. Three subbasins occupy southern Sonoma County – the Cotati, Petaluma, and Sonoma Valley subbasins. The Cotati and Petaluma Valleys stretch from Santa Rosa to San Pablo Bay. The valleys are bordered by the Mayacama and Sonoma Mountains to the east and the coastal low hills and Estero Lowlands to the west. The Petaluma Gap stretches from the Estero Lowlands to San Pablo Bay. The Petaluma Gap allows wind to flow from the Pacific Ocean into both valleys. Winds move marine air through the Cotati Valley up to Santa Rosa, where the prevailing wind is from the south and southeast (BAAQMD 1999). Marine air travels east through the Petaluma Valley across San Pablo Bay and through the Carquinez Strait. Winds are typically stronger in the Petaluma Valley because it is directly in line with the Petaluma Gap. Air temperatures are similar in the two valleys with summer maximums in the 80's Fahrenheit (F) and minimums in the 50's F. Winter maximum temperatures are in the high 50's F to low 60's F and minimums are in the high 30's F. Generally, air pollution potential is low in the Petaluma Valley because of its orientation with the Petaluma Gap. Air pollution potential is slightly higher in the Cotati Valley because it is more enclosed and has a higher population and more industrial users in Santa Rosa (BAAQMD 1999).

The Sonoma Valley is east of the Cotati Valley. It is bordered by Sonoma Mountains on the west and the Mayacamas Mountains on the east, and stretches from Santa Rosa in the northwest to San Pablo Bay in the south. It is long and narrow, approximately 5 miles wide at its southern end and less than a mile wide at its northern end (BAAQMD 1999). Winds typically flow along the valley axis, northwest/southeast, with the strongest up-valley winds occurring during summer afternoons and strongest down-valley winds during winter nights, being driven by temperature and density gradients. Temperatures are similar to those for the Cotati and Petaluma Valleys. The air pollution potential in the Sonoma Valley is high as winds can carry pollutants north and trap them in the narrow northern valley (BAAQMD 1999). However, pollution sources are minimal with little industry and low population density.

Air Quality Attainment Status

Existing air quality is a function of the climate, topography, and emissions in any area or upwind of that area. Table 3.2-2 presents the attainment status of the state and federal standards in the Bay Area. Northern Sonoma County is in attainment status for all of the standards. The Bay Area including southern Sonoma County is in attainment for most of the critical contaminants. The Bay Area is in nonattainment of the ozone and particulate matter national and state standards. The BAAQMD has completed an ozone strategy to implement all feasible measures to reduce ozone and is currently preparing a 2009 Clean Air Plan to update the ozone strategy.

3.2.4 Impact Analysis

Methodology

For the purposes of analyzing impacts to air quality, maintenance activities can be treated as construction activities since they involve similar methods and reflect similar potential for

Table 3.2-2. Bay Area Attainment Status of the State and Federal Ambient Air Quality Standards

Contaminant	Averaging Time	State Standards Attainment Status	Federal Standards Attainment Status
Ozone	1 hour	N	See footnote 2
	8 hour	N ⁵	N ¹
Respirable Particulate Matter (PM ₁₀)	24 hour	N	U
	Annual Arithmetic Mean	N ⁴	
Fine Particulate Matter (PM _{2.5})	24 hour		U ⁶
	Annual arithmetic mean	N ⁴	A
Carbon Monoxide	8 hour	A	A ³
	1 hour	A	A
Nitrogen Dioxide	Annual arithmetic mean		A
	1 hour	A	
Sulfur Dioxide	Annual arithmetic mean		A
	24 hour	A	A
	3 hour		
	1 hour	A	
Lead	30 day average	A	
	Calendar quarter		A
Visibility Reducing Particles	8 hour	U	
Sulfates	24 hour	A	
Hydrogen Sulfide	1 hour	U	
Vinyl Chloride	24 hour	No information available	

Source: BAAQMD (2008)

A = attainment

N = nonattainment

U = unclassified

Footnotes:

1. In June 2004, the Bay Area was designated as a marginal nonattainment area of the national 8-hour ozone standard. US EPA lowered the national 8-hour ozone standard from 0.80 to 0.75 ppm effective May 27, 2008. EPA will issue final designations based upon the new 0.75 ppm ozone standard by March 2010.
2. The national 1-hour ozone standard was revoked by U.S. EPA on June 15, 2005.
3. In April 1998, the Bay Area was redesignated to attainment for the national 8-hour carbon monoxide standard.
4. In June 2002, CARB established new annual standards for PM_{2.5} and PM₁₀.
5. The 8-hour CA ozone standard was approved by the Air Resources Board on April 28, 2005 and became effective on May 17, 2006.
6. U.S EPA lowered the 24-hour PM_{2.5} standard from 65 µg/m³ to 35 µg/m³ in 2006. EPA is required to designate the attainment status of BAAQMD for the new standard by December 2009.

air pollutant emissions. BAAQMD does not require quantification of construction emissions. Instead, it requires implementation of effective and comprehensive feasible control measures to reduce PM₁₀, particulate matter less than 10 microns in diameter, emissions (BAAQMD 1999). PM₁₀ emitted during construction activities varies greatly depending on the level of activity, the specific operations taking place, the equipment being operated, local soils, and weather conditions. Despite this variability in emissions, experience has shown that there are a number of feasible control measures that can be reasonably implemented to reduce PM₁₀ emissions during construction. The control measures aimed at controlling PM₁₀ emissions are BMPs AQ-1 and AQ-2. According to BAAQMD, if all control measures indicated in these BMPs are implemented (as appropriate, depending on the size of the project area), air pollutant emissions from construction activities are considered less than significant (BAAQMD 1999).

Construction equipment also emits CO and ozone precursors. Construction-related emissions of these pollutants were not estimated, however, because they are already included in the emission inventory that forms the basis for BAAQMD's regional air quality plans and because those emissions are not expected to impede attainment or maintenance of ozone and CO standards in the Bay Area (Bay Area Air Quality Management District 1999), the impact is considered less than significant and is not discussed further.

GHG emissions and contributions to global climate change were considered as cumulative impacts, and are discussed in Chapter 4, Impact CUM-2. These impacts were considered qualitatively, considering the emissions from vehicles and other equipment associated with maintenance activities, and other Stream Maintenance Program (SMP) activities which may affect sources or sinks of carbon (e.g., revegetation activities).

Criteria for Determining Significance

Based on Appendix G of the State CEQA Guidelines and professional expertise, it was determined that the Proposed Program would result in a significant impact on air quality if it would:

- Conflict with or obstruct implementation of the applicable air quality plan;
- Violate any air quality standard or contribute substantially to an existing or projected air quality violation;
- Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is within non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors);
- Expose sensitive receptors to substantial pollutant concentrations; or
- Create objectionable odors affecting a substantial number of people.

Environmental Impacts

Impact AIR-1: Temporary Increase in Emissions during Maintenance Activities (Less than Significant with Mitigation)

SMP activities include excavation and removal of deposited sediments from the Program Area channels, as well as, bank stabilization, vegetation removal, and sediment disposal activities. These activities may increase particulate matter in the ambient air as soils are disturbed. Operation of heavy equipment and trucking to dispose of debris will also release particulate matter and other contaminants associated with motor vehicle operation including CO and ozone precursors. The proposed activities are classified as construction activities for the purposes of this analysis, similar to grading at a land development site. The primary concern associated with construction activities is the increase of fine particulate matter (BAAQMD 1999). Carbon monoxide and ozone precursor emissions associated with operation of the construction equipment are included in the emissions inventories completed during development of regional plans and therefore are not considered impediments to attainment of ozone and carbon monoxide standards in the Bay Area (BAAQMD 1999). The BAAQMD has completed analysis of air pollution impacts due to construction activities on PM₁₀. They have selected control measures to mitigate particulate matter impacts to air quality, which will be implemented as BMPs AQ-1 and AQ-2.

With implementation of these BMPs, impacts are considered less than significant.

Level of Significance: Less than significant with mitigation

Mitigation Measures:

BMP AQ-1: Dust Management (based on Bay Area Air Quality Management District's basic dust control measures for all sites)

1. Water all active maintenance areas as necessary to reduce dust emissions. In dry areas, this may be twice daily or more, while in already wet areas, no watering may be needed.
2. Cover all trucks hauling soil, sand, and other loose materials or require all trucks to maintain freeboard as necessary to prevent transported material from blowing from the trucks.
3. Sweep as necessary (with water sweepers or dry sweepers, as appropriate) all paved access roads, parking areas and staging areas at construction sites.
4. Sweep streets as necessary (with water sweepers or dry sweepers, as appropriate) if visible soil material is carried onto adjacent public streets.

BMP AQ-2: Enhanced Dust Management (based on Bay Area Air Quality Management District's enhanced dust control measures for sites greater than 4 acres)

1. As necessary, enclose, cover, water, or apply (non-toxic) soil binders to exposed stockpiles.
2. Limit traffic speeds on unpaved roads to 15 mph.
3. Install sandbags or other erosion control measures to prevent silt runoff to public roadways.

Impact AIR-2: Construction-Related Diesel Health Risk (Less than Significant)

BAAQMD has no guidance or interim guidance on construction-related diesel emissions. It is anticipated that individual maintenance activities would be anywhere from one day to several weeks in duration. The assessment of cancer risk is typically based on a 70-year exposure period. Maintenance activities are sporadic, transitory, and short term in nature, and once maintenance activities have ceased, so too have emissions from maintenance equipment. Because exposure to diesel exhaust would be well below the 70-year exposure period, the SMP is not anticipated to result in an elevated cancer risk to exposed persons due to the short-term nature of maintenance-related diesel exposure. In addition, estimates of PM₁₀ from diesel emissions from the program are relatively low and well below BAAQMD's daily threshold of 150 pounds per day and quarterly threshold of 6.75 tons per quarter. Consequently, the estimation of diesel risks associated with maintenance activities is considered to be less than significant. No mitigation is necessary.

Level of Significance: Less than significant

Mitigation Measures: None required

Impact AIR-3: Creation of Objectionable Odors (Less than Significant with Mitigation)

Excavated sediment from the Program channels may contain high levels of organic material. Natural decomposition of organic material depletes oxygen in the subsurface environment, leading to anaerobic conditions and the generation of hydrogen sulfide. H₂S gas may then be released when sediment is excavated. The potential concentration of H₂S gas released is not substantial enough to adversely affect human health; however, it could create an objectionable odor in the vicinity of a specific maintenance/stockpile area. Implementation of BMP GN-5 *Odors* will avoid odor impacts to sensitive receptors including residential areas. With implementation of management practice GN-5, this impact is considered less than significant.

Level of Significance: Less than significant with mitigation

Mitigation Measures:

BMP GN-5: Odors

Sediment that is rich in decaying organic matter that could generate assorted malodorous gases such as reduced sulfur compounds shall be handled to minimize impacts on sensitive receptors such as nearby residents. In general, such materials will be hauled off of the site at the time of excavation. Where it needs to be temporarily stockpiled, maintenance personnel shall stockpile potentially odorous sediments as far as possible from residential areas or other odor sensitive land uses.

Chapter 3.3

BIOLOGICAL RESOURCES

Chapter 3.3

BIOLOGICAL RESOURCES

3.3.1 Introduction

This chapter describes the existing biological resources located within the SCWA maintained SMP channels and the surrounding area. Biological resources that are evaluated include wetland, aquatic and terrestrial environments, and special-status plant and animal species. An overview of applicable federal and state regulations is also provided. This chapter describes potential impacts that may occur to biological resources in the Proposed Program Area as a result of SMP activities. This chapter also proposes mitigation measures to offset the potential impacts and describes the beneficial impacts of SMP activities on biological resources. Much of the information addressed in this impact analysis is provided in more detail in Chapter 3 of the SMP Manual, which is referenced throughout this chapter.

3.3.2 Regulatory Setting

This EIR evaluates the biological resources in the SMP Area in accordance with the provisions of federal, state, county, and city environmental laws, policies and regulations including:

- Clean Water Act of 1972 (CWA) (Section 404);
- Federal Endangered Species Act of 1973 (FESA), as amended;
- Magnuson-Stevens Fishery Conservation and Management Act;
- California Fish and Game Code (Sections 1600 et seq., 2080, and 3503);
- California Endangered Species Act (CESA) of 1985;
- California Native Plant Protection Act;
- Executive Order 11990: Protection of Wetlands;
- Executive Order 13112 of February 3, 1999: Invasive Species;
- California Porter-Cologne Water Quality Control Act of 2006 (Section 401);
- National Environmental Policy Act (NEPA);
- Migratory Bird Treaty Act (MBTA);
- California Environmental Quality Act (CEQA); and
- local tree ordinances.

Before implementation of the proposed program SCWA will be required to obtain and comply with regulatory permits including:

- CWA 404 Permit from the U.S. Army Corps of Engineers (USACE);
- CWA 401 Water Quality Certification from the Regional Water Quality Control Board (RWQCB);
- Section 7 Incidental Take Permit from the U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS);
- Fish and Game Code Section 1602 Lake and Streambed Alteration Agreement from the California Department of Fish and Game (CDFG); and
- Fish and Game Code Section 2080.1 Consistency Determination or Section 2081 Incidental Take Permit from CDFG;

The following section provides a brief summary of the federal, state and local regulatory permits associated with biological resources in the SMP Area. A detailed discussion of local, federal and state regulations associated with implementation of the Proposed Program is provided in Chapter 2 of the SMP Manual.

Federal Regulations

U.S. Army Corps of Engineers

Pursuant to CWA Section 404, the USACE regulates fill that would be discharged to waters of the United States (U.S.), including wetlands and special aquatic sites. Waters of the U.S. are defined as waters or wetlands that are hydrologically connected to navigable waters. SCWA is currently conducting a wetland delineation survey and report for the SMP Area. The report will be submitted to USACE San Francisco District for verification prior to 404 permitting. Anticipated impacts on waters of the U.S. and wetlands will be summarized and included in a programmatic individual permit application.

U.S. Fish and Wildlife Service

As part of the CWA Section 404 permitting process, and in compliance with FESA, SCWA will be required to coordinate and consult with the USFWS to obtain a Biological Opinion (BO) summarizing effects of the Proposed Project on federally threatened and endangered plants, animals and fish. Engineered, modified and natural channels – and their surrounding lands – may support, among other flora and fauna, the endangered California freshwater shrimp (*Syncaris pacifica*), the endangered California tiger salamander (*Ambystoma californiense*), and the threatened California red-legged frog (*Rana draytonii*), as well as six endangered plant species: Sonoma alopecurus (*Alopecurus aequalis* var. *sonomensis*), Sonoma sunshine (*Blennosperma bakerii*), Sonoma white sedge (*Carex albida*), Burke's goldfields (*Lasthenia burkei*), Sebastopol meadowfoam (*Limnanthes vinculans*), and many-flowered navarretia (*Navarretia leucocephala* ssp. *plieantha*). Consultation between USACE and the USFWS will be initiated by submittal of a Programmatic Biological Assessment that describes potential program effects on these nine federally listed plants and animals. The outcome of the consultation process will be a BO and Incidental Take Statement that identify reasonable and prudent measures necessary or appropriate to minimize the impacts along with the terms and conditions that implement them.

Migratory Bird Treaty Act (MBTA)

The Migratory Bird Treaty Act (16 U.S.C. 703-712; MBTA), administered by the U.S. Fish and Wildlife Service, implements four treaties between the United States and Canada, Mexico, Japan and Russia, respectively, to manage and conserve migratory birds that cross national borders. The MBTA makes it unlawful in any manner, unless expressly authorized by permit pursuant to federal regulations, to pursue, hunt, take, capture, kill, attempt to take, capture or kill, possess, offer for sale, sell, offer to barter, barter, offer to purchase, purchase, deliver for shipment, ship, export, import, cause to be shipped, exported, or imported, deliver for transportation, transport or cause to be transported, carry or cause to be carried, or receive for shipment, transportation, carriage, or export at any time, or in any manner, any migratory bird, or any part, nest, or egg of any such bird. The definition of “take” is defined as any act to “pursue, hunt, shoot, wound, kill, trap, capture or collect, or attempt to pursue, hunt, shoot, wound, kill, trap, capture or collect.” This includes most actions, direct and indirect, that could result in “take” or possession, whether it is temporary or permanent, of any protected species (USFWS 2005a). Although harassment and habitat modification do not constitute a take in themselves under the MBTA or Fish and Game Code, such actions that result in direct loss of birds, nests or eggs including nest abandonment or failure are considered take under such regulations. The list of migratory birds protected under the MBTA, available in Section 10.13 of Title 50 of the Code of Federal Regulation, excludes nonnative species that have not been introduced into the U.S. or its territories, and species that belong to the families not listed in any of the four treaties underlying the MBTA, such as wrenit (*Chamaea fasciata*), European starling (*Sturnus vulgaris*), California quail (*Callipepla californica*), Ring-necked Pheasant (*Phasianus colchicus*) and Chukar (*Alectoris chukar*), among other species less common in California.

On December 8, 2004 the U.S. Congress passed the Migratory Bird Treaty Reform Act (Division E, Title I, Section 143 of the Consolidated Appropriations Act, 2005, PL 108-447; MBTRA), which excludes all migratory birds nonnative or have been human introduced to the U.S. or its territories. It defines a native migratory bird as a species present within the U.S. and its territories as a result of natural biological or ecological processes. The USFWS published a list of the bird species excluded from the MBTA on March 15, 2005 (70 FR 12710), which included two species commonly observed in the U.S., the rock pigeon (*Columba livia*) and domestic goose (*Anser anser 'domesticus'*).

Santa Rosa Plain Conservation Strategy

In 2005 the Santa Rosa Plain Conservation Strategy (SRPCS) was formed by a team of biologists and regulators to establish a means of managing threatened and endangered species associated with the unique ecology of the Santa Rosa Plain. The team included USFWS, CDFG, USACE, U.S. Environmental Protection Agency, North Coast RWQCB, the County of Sonoma, Cities of Cotati, Rohnert Park, Santa Rosa, and Windsor, the Laguna de Santa Rosa Foundation and members of the environmental and private landowner community. The SRPCS issued by this team became final on December 1, 2005 (USFWS 2005b).

The SRPCS was designed as a habitat conservation strategy to address management of the region’s seasonal wetland resources, including habitat for the federally listed California tiger salamander and four federally endangered plant species. The four federally listed

plants are Sonoma sunshine, Burke's goldfields, Sebastopol meadowfoam, and many-flowered navarretia. All projects within the boundary of the SRPCS study area are required to comply with specific survey methodology and impact assessment guidelines (USFWS 2005b). Portions of the Program Area occur within or adjacent to the SRPCS boundary as depicted in SMP Manual Figure 2-1.

Programmatic Biological Opinion for Listed Plants

In 1998 the USFWS drafted a Programmatic BO for projects that may affect four endangered plant species on the Santa Rosa Plain (USFWS 1998a). The purpose of the BO is to expedite formal consultations for limited effects to listed species in "low quality" seasonal wetlands. Based on the general guidelines of the SRPCS and the Programmatic BO for that document, USFWS requires mitigation for direct and indirect effects to affected currently suitable and restorable suitable listed plant habitat. The BO's general guidelines suggest that mitigation for occupied habitat or habitat that has not been surveyed per protocols can be accomplished by preserving existing occupied habitat on a 2:1 ratio in a preservation bank or other site with comparable habitat values. The requirement for restoration and/or construction of seasonal wetlands can be accomplished through purchase of created wetland habitat from a mitigation bank at a ratio of 1:1. Though not required to comply with this BO, SCWA considered the survey requirements and mitigation ratios when evaluating habitat for special-status plants.

National Marine Fisheries Service

The effects of SMP activities on federally threatened and endangered fish in the Russian River watershed are addressed by the recently completed Russian River Watershed BO, discussed in more detail below. For activities outside of the Russian River watershed, SCWA has worked with NMFS as part of the Inter-Agency Working Group (IAWG) to determine that a second, but similar, consultation for this area will be the most efficient and practical method for addressing effects to listed salmonids from SMP activities not covered by the Russian River BO.

Some of the channels within the SMP Area with resource sensitivity are known to support the federally threatened Central California Coast steelhead trout (*Oncorhynchus mykiss*) and federally threatened California Coastal Chinook salmon (*Oncorhynchus tshawytscha*). After careful consideration and discussion with NMFS, SCWA removed all creeks and/or creek reaches from the SMP Area known to support the federally endangered Central California Coast coho salmon (*Oncorhynchus kisutch*).

Consultation between USACE and NMFS for areas outside the Russian River watershed will be initiated by submittal of a Programmatic Biological Assessment (in preparation) that describes potential Program effects on federally listed fish. The outcome of the consultation process will be a BO and Incidental Take Statement that identify reasonable and prudent measures necessary or appropriate to minimize the impacts along with the terms and conditions that implement them.

The 1996 Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) set forth Essential Fish Habitat (EFH) provisions to identify and protect important habitats of federally managed marine and anadromous fish species. Under these

provisions, federal agencies that fund, permit, or undertake activities that may adversely impact EFH of commercially important species, are required to consult with NMFS regarding the potential effects of their actions on EFH.

The Pacific Fishery Management Council manages the fisheries for coho, Chinook, and Puget Sound Pink salmon and has defined EFH for these three species. When the EFH needs of all these species at each life stage is considered as a whole, the EFH for the Pacific coast salmon fishery is broad, covering freshwater, estuarine, and marine environments. Because it is not a managed fish species, EFH has not been defined for Central California Coast (CCC) Distinct Population Segment (DPS) steelhead. Therefore, this EIR does not need to consider project effects on EFH.

Russian River Programmatic Biological Opinion

USACE, SCWA, and the Mendocino County Russian River Flood Control and Water Conservation Improvement District (MCRRFCD) have completed a consultation with NMFS in accordance with Section 7 of the ESA. The ESA Section 7 consultation evaluates the effects of a variety of operations and maintenance activities conducted by USACE, SCWA and MCRRFCD, including SCWA's SMP, on listed salmonid species and their habitats in the Russian River watershed. The consultation covers the Russian River and associated tributary watersheds, including the Laguna de Santa Rosa watershed, which largely falls within SCWA's Flood Control Zone 1A. As part of the ESA Section 7 consultation, USACE, SCWA, and MCRRFCD prepared a BA for NMFS describing actions subject to consultation including SMP activities. The final BO from NMFS was released in September 2008 and provides incidental take coverage for SMP activities within Zone 1A as well as the other flood control zones within the Russian River watershed (Zones 4A, 5A, and 6A).

State Regulations

California Endangered Species Act

CESA generally parallels the main provisions of FESA, but unlike its federal counterpart, CESA applies the take prohibitions to species proposed for listing (called "candidates" by the state). Section 2080 of the California Fish and Game Code prohibits the taking, possession, purchase, sale, and import or export of endangered, threatened, or candidate species, unless otherwise authorized by permit or in the regulations. Take is defined in Section 86 of the Fish and Game Code as "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill." CESA allows for take incidental to otherwise lawful development projects. State lead agencies are required to consult with CDFG to ensure that any action they undertake is not likely to jeopardize the continued existence of any endangered or threatened species or result in destruction or adverse modification of essential habitat.

There are two state-listed species that could be affected by program activities: Central California Coast coho salmon and California freshwater shrimp. A permit or agreements under the CESA may be required for these species. However, a subset of the natural channels, of which SCWA holds maintenance easements, has been removed from the SMP Area due to presence of these two species. Under the SMP, SCWA will not remove debris or clear vegetation in the following natural channels: Blucher Creek (Zone 1A), Willow Creek

(Zone 5A), Sheephouse Creek (Zone 5A), Dutch Bill Creek (Zone 5A), Green Valley Creek (Zone 5A), Jonive Creek (Zone 5A), and Salmon Creek (Zone 8A) (see Figure 2-12). In addition, SCWA maintenance activities for the Russian River (mainstem) and Dry Creek (mainstem) would not be covered under the SMP, as actions in these systems are governed by existing agreements between SCWA and USACE.

Regional Water Quality Control Boards

The RWQCBs have jurisdiction over protection of Beneficial Uses of waters of the state as defined in the Porter-Cologne Water Quality Control Act. Waters of the state are generally defined as any surface water within the SMP Area. The RWQCBs are the regulatory agencies responsible for implementing CWA Sections 303, 401 and 402. The Proposed Program is within the boundaries of two RWQCBs: the North Coast RWQCB and the San Francisco Bay RWQCB. The Proposed Program would require Water Quality Certification under CWA Section 401 and Waste Discharge Requirements under the Porter-Cologne Water Quality Control Act. See Chapter 3.7 *Hydrology, Geomorphology, and Water Quality* for more information.

California Department of Fish and Game

California Fish and Game Code

The California Fish and Game Code provides protection for California's plant and wildlife species and precludes taking of species listed as fully protected by the CDFG. Section 86 defines take as any action to hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill. Unless expressly authorized under Chapter 1.5, Article 3, Section 2081, which outlines exceptions for taking of endangered and threatened species, endangered, threatened and fully protected species shall not be taken for any purpose. Section 3503 prohibits the take, possession, or needless destruction of the nest or eggs of any bird; §3503.5 prohibits the take, possession, or needless destruction of any nests, eggs or birds in the orders Falconiformes (new world vultures, hawks, eagles, ospreys and falcons, among others) or Strigiformes (owls); §3511 prohibits the take or possession of fully protected birds; and §3513 prohibits the take or possession of any migratory nongame bird or part thereof as designated in the Migratory Bird Treaty Act. Section 4700 provides protection for fully protected mammals unless expressly authorized under §2081.7.

The State of California first began to designate species as "Fully Protected" prior to the creation of CESA and FESA. Lists of fully protected species were initially developed to provide protection to those animals that were rare or faced possible extinction, and included fish, mammals, amphibians and reptiles, birds and mammals. Most fully protected species have since been listed as threatened or endangered under CESA and/or FESA. The regulations that implement the Fully Protected Species Statute (Fish and Game Code Section 4700) provide that fully protected species may not be taken or possessed at any time. Furthermore, CDFG prohibits any state agency from issuing incidental take permits for fully protected species, except for necessary scientific research.

California Streambed Alteration Notification/Agreement

Sections 1600 through 1616 of the California Fish and Game Code require that an application for a Streambed Alteration Agreement be submitted to the CDFG for “any activity that may substantially divert or obstruct the natural flow or substantially change the bed, channel, or bank of any river, stream, or lake.” The CDFG reviews the proposed actions and, if necessary, provides the applicant with proposed measures to protect affected fish and wildlife resources. The final proposal that is mutually agreed upon by CDFG and the applicant is the Streambed Alteration Agreement.

Project improvements within the bed and bank of creeks, encompassing and including the edge of the riparian canopy, would be included in the Streambed Alteration Agreement. Trees found along creeks or streams are considered part of the riparian canopy. CDFG, as a state trustee agency, would require mitigation for the loss of native habitat, and likely also for the loss of landscaped vegetation that is habitat for native wildlife species.

Local Regulations

General Plans are long-range comprehensive plans developed for cities and counties that govern growth and development. The SMP Program Area is located in Sonoma County. Although Sonoma County includes many cities and towns, this analysis focuses on those municipalities directly affected by proposed SMP activities. The following section reviews key land use policies from Sonoma County, as well as policies for the cities of Cotati, Petaluma, Rohnert Park, Santa Rosa, Sebastopol, Sonoma, and the town of Windsor. Policies or regulations specifically associated with hydrology, biological resources, and other resources are analyzed in the corresponding chapters of this EIR.

Sonoma County Ordinance No. 3836R

Under Ordinance No. 3836R, the County of Sonoma issues roiling permits for work conducted within riparian corridors. Activities proposed in the SMP would occur with riparian areas of the county, thus SCWA will comply with this ordinance. See Chapter 2 of the SMP Manual for more information.

Sonoma County General Plan 2020

The following policies from the Sonoma County General Plan are relevant to the Proposed Program:

<i>GOAL OSRC-7</i>	Protect and enhance the County's natural habitats and diverse plant and animal communities.
<i>Objective OSRC-7.1</i>	Identify and protect native vegetation and wildlife, particularly occurrences of special-status species, wetlands, sensitive natural communities, woodlands, and areas of essential habitat connectivity.
<i>Objective OSRC-7.4</i>	Where appropriate, support regulatory efforts by other agencies to protect biotic habitat.

- Objective OSRC-7.5* Maintain connectivity between natural habitat areas.
- Objective OSRC-7.7* Support use of native plant species and removal of invasive exotic species.
- Objective OSRC-7.9* Preserve and restore the Laguna de Santa Rosa, San Pablo Bay and Petaluma marshes and other major marshes and wetlands.
- Policy OSRC-7b* Rezone to the Biotic Resources combining district all lands designated as Biotic Habitat Areas. Prepare and adopt an ordinance that provides for protection of designated Biotic Habitat Areas in conformance with the following principles. Until the ordinance is adopted, require that land use and development in designated areas comply with these principles:
- (1) For discretionary projects, notify applicants of protected habitats and species and possible requirements of Federal and State regulatory agencies, request identification of known protected habitats and species, and:
 - (a) In designated Biotic Habitat Areas, require site assessment and adequate mitigation. The priorities for adequate mitigation are, in order of highest to lowest priority:
 - Avoid the habitat.
 - Mitigate on site to achieve no net loss.
 - Mitigate off site to achieve no net loss.
 - Create replacement habitat off site to achieve no net loss.

To the extent feasible, the mitigation required by the County should be consistent with permit requirements of Federal and State regulatory agencies.
 - (b) In designated Marshes and Wetlands, require a setback of 100 feet from the delineated edges of wetlands. The setback may be reduced based upon site assessment and appropriate mitigation.
 - (c) In designated Habitat Connectivity Corridors, encourage property owners to consult with CDFG, install wildlife friendly fencing, and provide for roadway undercrossings and oversized culverts and bridges to allow movement of terrestrial wildlife.
 - (d) The acreage required for adequate mitigation and replacement habitat shall be at least two times the acreage affected unless a lower level is acceptable to the applicable State and Federal agencies, with the amount depending on the habitat affected and the applicable mitigation priority value.

- (2) For discretionary projects in all designated Biotic Habitat Areas, send referrals to appropriate regulatory agencies and, where such agencies' comments or other agency information indicates biotic resources could be adversely affected, require site assessment, compliance with agency requirements and adequate mitigation pursuant to the priorities in (1) (a).

Policy OSRC-7k

Require the identification, preservation and protection of native trees and woodlands in the design of discretionary projects, and, to the maximum extent practicable, minimize the removal of native trees and fragmentation of woodlands, require any trees removed to be replaced, preferably on the site, and provide permanent protection of other existing woodlands where replacement planting does not provide adequate mitigation.

Policy OSRC-7o

Encourage the use of native plant species in landscaping. For discretionary projects, require the use of native or compatible non-native species for landscaping where consistent with fire safety. Prohibit the use of invasive exotic species.

Goal OSRC-8

Protect and enhance Riparian Corridors and functions along streams, balancing the need for agricultural production, urban development, timber and mining operations, and other land uses with the preservation of riparian vegetation, protection of water resources, flood control, bank stabilization, and other riparian functions and values.

Objective OSRC-8.3

Recognize and protect riparian functions and values of undesignated streams during review of discretionary projects.

Policy OSRC-8a

Classify "Riparian Corridors" designated in the Open Space and Resource Conservation Element as follows:

- (1) "Russian River Riparian Corridor" is the corridor adjacent to the main stem of the Russian River, excluding lands located within the Urban Residential, Commercial, Industrial, or Public-Quasi Public land use categories or within the jurisdiction of a city.
- (2) "Flatland Riparian Corridors" are the corridors adjacent to designated streams in the 1989 General Plan that flow through predominantly flat or very gently sloping land, generally with alluvial soil. This classification excludes areas located within the "Russian River Riparian Corridor" or within the Urban Residential, Commercial, Industrial, or Public/Quasi-Public land use categories.
- (3) "Other Riparian Corridors" are the corridors adjacent to all designated streams not included in (1) or (2) above.

Policy OSRC-8b

Establish streamside conservation areas along both sides of designated Riparian Corridors as follows, measured from the top of

the higher bank on each side of the stream as determined by PRMD:

- (1) Russian River Riparian Corridor: 200'
- (2) Flatland Riparian Corridors: 100'
- (3) Other Riparian Corridors: 50'

Policy OSRC-8c

Continue to utilize the Biotic Resources combining district for all lands within the designated streamside conservation areas. Develop and adopt regulations establishing standards applicable to Riparian Corridors along designated streams consistent with Policies OSRC-8d and OSRC-8e. Until the regulations are adopted, require that land use and development comply with Policies OSRC-8d and OSRC-8e.

Policy OSRC-8d

Allow or consider allowing the following uses within any streamside conservation area:

- (1) Timber harvest operations conducted in accordance with an approved timber harvest plan.
- (2) Streamside maintenance and restoration.
- (3) Fire fuel management where vegetation removal is limited to the minimum required for fire safety purposes and where there are no feasible alternative development locations or designs that do not require vegetation removal.
- (4) Road crossings, street crossings, utility line crossings.
- (5) Mining operations conducted in accordance with the County Surface Mining and Reclamation Ordinance.
- (6) Stream dams and stream-related water storage approved by applicable agencies.
- (7) Grazing and similar agricultural production activities not involving structures or cultivation, except as defined by (8) below, and conducted in accordance with water quality protection guidelines of the Agricultural Commissioner, Resource Conservation Districts, or Regional Water Quality Control Boards.
- (8) Agricultural cultivation and related planting, seeding, fertilizing, weeding, irrigation, and harvesting.
 - a. located no closer than 100' from the top of the bank in the "Russian River Riparian Corridor".

b. located no closer than 50' from the top of the bank in the "Flatland Riparian Corridors" or in upland areas of "Other Riparian Corridors".

c. located no closer than 25' from the top of the bank in the "Other Riparian Corridors" not in upland areas.

d. The upland areas in (b) and (c) above shall be determined using information on streamside slopes from USGS topographic maps and soil types from the Soil Conservation Service "Soil Survey of Sonoma County".

- (9) Equipment turnaround and access roads associated with agricultural cultivation, provided that the affected area is the minimum necessary for these turnaround and access roads and that a minimum 25' vegetative filter strip is provided and maintained between the affected area and the top of the bank.
- (10) Vegetation removal as part of an integrated pest management program administered by the Agricultural Commissioner.
- (11) Creekside bikeways, trails, and parks within Urban Residential, Commercial, Industrial, or Public-Quasi Public land use categories.
- (12) Development authorized by exception under Policy OSRC-8e.

Policy OSRC-8e

Prohibit, except as otherwise allowed by Policy OSRC-8d, grading, vegetation removal, agricultural cultivation, structures, roads, utility lines, and parking lots within any streamside conservation area. Consider an exception to this prohibition if:

- (1) It makes a lot unbuildable and vegetation removal is minimized,
- (2) The use involves the minor expansion of an existing structure where it is demonstrated that the expansion will be accomplished with minimum damage to riparian functions,
- (3) The use involves only the maintenance or restoration of an existing structure or a non-structural use,
- (4) It can be clearly demonstrated through photographs or other information that the affected area has no substantial value for riparian functions, or
- (5) A conservation plan is approved that provides for the appropriate protection of the biotic resources, water quality, flood management, bank stability, groundwater recharge, and other applicable riparian functions. Until the County adopts mitigation standards and procedures for specific uses and riparian functions, prior to approving the conservation plan,

consult on areas of concern with the Resource Conservation District, Agricultural Commissioner, and resource agencies that are applicable to the proposed plan.

City of Cotati City Code

The City of Cotati has not updated their General Plan since 1990. An update was underway as of the fall of 2005 but these updates were not available for review (City of Cotati 2008). However Title 5, Article 4 *Resource Management* of the City's Municipal Code provides standards for the protection of watercourse and riparian resources within the city, including provisions for adequate buffer areas between watercourses and adjacent development on sites adjacent to or crossed by Copeland, Cotati, or Washoe Creeks, and/or Laguna de Santa Rosa (Chapter 17.50 Watercourse and Riparian Resource Protection); Chapter 17.54 Tree Preservation provides policies for the protection removal or relocation of any tree with a circumference of twelve inches or more, measured at fifty-four inches above natural grade; and Chapter 17.56 Wetland Protection and Restoration provides procedures and standards for identifying and protecting wetland resources, and for permitting wetland restoration, enhancement, and mitigation projects.

City of Petaluma General Plan 2025

The City of Petaluma General Plan 2025 contains the following adopted goals and policies applicable to the SMP:

<i>Goal 1-G-5</i>	Petaluma River - Develop land uses in proximity to the Petaluma River that insure the restoration of the natural river corridor, provide for adequate storm flow capacities, and enable public access and stewardship.
1-P-49	Preserve existing tree resources and add to the inventory and diversity of native/indigenous species.
2-P-61	Protect existing agricultural uses, wildlife, historic and cultural resources, and natural vegetation.
2-P-85	Preserve existing and plant additional trees in the Washington Creek area between North McDowell Boulevard and Sonoma Mountain Parkway.
2-P-102	Encourage neighborhood adoption and participation in the restoration of natural habitats (e.g. creeks and urban separator). <ul style="list-style-type: none">▪ Preserve the natural habitat and trees along creek corridors.
2-P-106	Preserve and improve open space resources by enhancing creek ecology along East Washington and Adobe creeks.
<i>Goal 4-G-1</i>	Biology & Natural Resources - Protect and enhance biological and natural resources within the UGB.
4-P-1D	Create setbacks for all tributaries to the Petaluma River extending a minimum of 50 feet outward from the top of each bank, with

extended buffers where significant habitat areas, vernal pools, or wetlands exist. Development shall not occur within this setback, except as part of greenway enhancement (for example, trails and bikeways). Where there is degradation within the zone, restoration of the natural creek channels and riparian vegetation is mandatory at time of adjacent development.

- 4-P-1G* Expand the planting and retention of trees along the upper banks of the river and creeks to reduce ambient water temperature and shade out invasive, non-native species.
- 4-P-2* Conserve wildlife ecosystems and sensitive habitat areas in the following order of protection preference: 1) avoidance, 2) on-site mitigation, and 3) off-site mitigation.
- 4-P-3* Protect special-status species and supporting habitats within Petaluma, including species that are State or Federal listed as endangered, threatened, or rare.
- Goal 4-G-2* Biology & Natural Resources - Promote resource protection within the Petaluma Watershed to conserve grassland habitats, oak woodlands, and other natural resources that are found in areas between the UGB and the Planning Area boundary.
- 4-P-5* Support wetland mitigation and oak woodlands restoration in the unincorporated areas outside the UGB.
- 6-P-20* Where trees, larger than 8" in diameter, must be removed to accommodate development, they shall be replaced at a ratio established in the Development Code. Replacement trees may be planted on, or in the vicinity of, the development site, subject to approval by the Community Development Department or through the discretionary approval process.

Petaluma River Access and Enhancement Plan

The Petaluma River Access and Enhancement Plan (City of Petaluma 1996) is a tool to implement the vision for the Petaluma River corridor by maintaining setbacks; creating natural flood terraces where appropriate; and enhancing floodplain and habitat conservation areas and other open spaces along the river utilizing an ecologically-based design approach.

City of Rohnert Park General Plan

The Rohnert Park General Plan contains the following relevant policies:

- EC-B* Protect special-status species and supporting habitats within Rohnert Park, including species that are State or federally listed as Endangered, Threatened, or Rare.

- EC-C Protect sensitive habitat areas and wetlands in the following order of protection preference: 1) avoidance, 2) on-site mitigation, and 3) off-site mitigation.
- EC-D Maintain existing native vegetation and encourage planting of native plants and trees.
- EC-4 Cooperate with State and federal agencies to ensure that development does not substantially affect special-status species appearing on any State or federal list of rare, endangered, or threatened species. Require assessments of biological resources prior to approval of any development within 300 feet of any creeks, high potential wetlands, or habitat areas of identified special-status species, as depicted in Figure 6.2-1.
- EC-5 Require development in areas with high and moderate wetlands potential and habitat areas delineated in Figure 6.2-1, as well as other areas where wetland or habitat for special-status species is present, to complete assessments of biological resources.”
- EC-7 Encourage planting of native vegetation in new development sites, parks, public areas, and open space.
- EC-13 Maintain creek protection zones extending a minimum of 50 feet (measured from the tops of the banks and a strip of land extending laterally outward from the top of each bank) for creeks, with extended buffers where significant habitat areas or high potential wetlands exist (Figure 6.2-2). Where high potential wetland or other biological resources exist, require appropriately wide buffers to encompass and protect the resource. Development shall not occur within this zone, except as part of greenway enhancement (for example, trails and bikeways). Require City approval for the following activities within the creek protection zones:
- Construction, alteration, or removal of any structure;
 - Excavation, filling, or grading;
 - Removal or planting of vegetation (except for removal of invasive plant species); or
 - Alteration of any embankment.

City of Santa Rosa 2020 General Plan

The City of Santa Rosa’s 2020 General Plan contains the following goals and policies applicable to the SMP:

- OSC-A-6 Protect the Annadel and Spring Lake regional parks from intrusion by inappropriate uses. Conserve the biotic systems in those parks.
- OSC-B-4 Require that graded areas within new developments be revegetated.

- OSC-D-1* Utilize existing regulations and procedures, including Subdivision Guidelines, Zoning, Design Review, and environmental law, to conserve wetlands and rare plants. Comply with the federal policy of no net loss of wetlands using mitigation measures such as:
- Avoidance of sensitive habitat,
 - Clustered development,
 - Transfer of development rights, and/or
 - Compensatory mitigation, such as restoration or creation.
- OSC-D-2* Protect high quality wetlands and vernal pools from development or other activities as determined by the Vernal Pool Ecosystem Preservation Plan.
- OSC-D-3* Preserve and restore the elements of wildlife habitats and corridors throughout the Planning Area.
- OSC-D-8* Restore channelized waterways to a more natural condition which allows for more natural hydraulic functioning, including development of meanders, pools, riffles, and other stream features. Restoration should also allow for growth of riparian vegetation which effectively stabilizes banks, screens pollutants from runoff entering the channel, enhances fisheries, and provides other opportunities for natural habitat restoration.
- OSC-D-9* Ensure that construction adjacent to creek channels is sensitive to the natural environment. Ensure that natural topography and vegetation is preserved along the creek, and that construction activities do not disrupt or pollute the waterway.
- OSC-E-1* Preserve trees and other vegetation, including wildflowers, both as individual specimens and as parts of larger plant communities.
- OSC-E-2* Preserve and regenerate native oak trees.
- OSC-E-4* Require incorporation of native plants into landscape plans for new development, where appropriate and feasible, especially in areas adjacent to open space areas or along waterways.

City of Santa Rosa Citywide Creek Master Plan

The Santa Rosa Citywide Creek Master Plan, adopted by City Council on March 27, 2007, implements General Plan policies and provides guidelines for the care, management, restoration and enhancement of nearly ninety miles of creeks in Santa Rosa. The following policies and objectives are relevant to the SMP:

- Objective HA-1* Preserve healthy and/or environmentally sensitive creek areas.
- Policy HA-1-2* Meet or exceed the required creek setback to provide ecological buffers, recognize the 100 year floodplain, and allow for stream

	corridor restoration. Development shall locate outside the creek setback, as defined within the Santa Rosa Zoning Code.
<i>Objective HA-2</i>	Enhance creek areas that require some remediation to reach a healthy condition.
<i>Policy HA-2-1</i>	Remove non-native invasive species from riparian corridors and adjacent areas.
<i>Policy HA-2-2</i>	Revegetate riparian corridors with native species to enhance aquatic and terrestrial habitat. Select native, locally available, and genetically appropriate riparian plant materials for enhancement projects. This is discussed further in Chapter 3.
<i>Policy HA-2-3</i>	Allow streambank and waterway stability repairs as necessary and reasonable to protect the integrity of adjacent properties and public health and safety. Repairs should be sensitive to the natural environment. Use bioengineering techniques, where possible.
<i>Policy HA-2-4</i>	Utilize in-stream habitat structures including large branches, logs, root wads, and boulders where appropriate to improve aquatic habitat substrate complexity. Large scale or restoration project-level changes to the creek cross-section are discussed under Objective HA-3.
<i>Objective HA-3</i>	Restore creek areas that have become degraded due to channelization, erosion, or removal of creekside vegetation.
<i>Policy HA-3-1</i>	Restore channelized waterways to a more natural condition which allows for more natural hydraulic functioning, including development of meanders, pools, riffles, and other stream features. Remove concrete linings where feasible to allow for a connection with the stream channel and the natural water table.
<i>Objective HA-4</i>	Maintain creek areas using practices that protect and support fish and wildlife as well as help retain hydraulic capacity.
<i>Policy HA-4-1</i>	Plan and perform stream maintenance activities that respect the balance of flood protection and environmental protection.
<i>Policy HA-5-1</i>	Protect habitat for Endangered Species, through preservation, enhancement, and restoration of riparian corridors and prevention of storm water pollution.
<i>Policy HA-6-2</i>	Consistent with federal, state, and local regulations, impacts to existing habitat will be avoided if possible. Minimization and mitigation of any unavoidable impacts will be required.
<i>Objective HA-7</i>	Use the 'best available science' when planning and implementing a creek project.

<i>Objective HA-8</i>	Conduct pre-and post-project physical and biological habitat monitoring to measure success as part of preservation, enhancement, and restoration projects.
<i>Policy HA-8-2</i>	Collect existing conditions data for later comparison with post-project conditions. Utilize repeatable, scientifically sound methods for measurements.
<i>Policy HA-8-3</i>	Projects should be monitored on an annual basis for the first few years after construction, and on a less often but still regular basis thereafter.
<i>Policy SW-1-3</i>	Balance habitat restoration and hydraulic capacity. Provide a detailed hydraulic analysis for every project component affecting flood conveyance prior to implementation to identify allowable “roughness” values and to interpret those values in the form of a vegetation planting and monitoring plan. (Where restoration is proposed as part of the Master Plan, hydraulic capacity of the existing channel versus proposed channel condition was evaluated, see Appendix F [of the Master Plan]). Consider use of detention basins and diversion channels where appropriate to maintain hydraulic capacity.
<i>Objective SW-3</i>	Perform channel maintenance in an environmentally sensitive manner and only where needed.
<i>Policy SW-3-1</i>	Maintain channels and vegetation with hand tools, where possible.
<i>Policy SW-3-2</i>	Maintain the channel by performance, not schedule.
<i>Policy OS-2-1</i>	Maintain connectivity of corridors to protect natural resources and support fish and wildlife populations.

City of Sebastopol General Plan

The following Conservation, Parks and Open Space Goals and Policies from the City of Sebastopol General Plan are relevant to the SMP:

<i>Goal 1</i>	Preserve areas with important biotic resources such as wetlands, riparian corridors, and areas with scenic features.
<i>P.2</i>	Specific use objectives for Open Space: Leave and/or restore open space areas in their natural state; limit uses to those with minimal environmental impact.
<i>P6</i>	Protect environmentally sensitive areas
<i>P7</i>	Preserve and enhance the Laguna de Santa Rosa and Atascadero creeks.
<i>Goal 3</i>	Protect, restore and enhance wetland areas

<i>Goal 5</i>	Conserve, protect and enhance trees and native vegetation.
<i>P12</i>	Encourage Planting of Native Trees and Native Vegetation: Encourage the planting of native and drought-resistant trees and vegetation in new developments and in City owned parks, trails, and recreational facilities.
<i>P13</i>	Preserve and Plant Trees: Facilitate the preservation of existing trees, the planting of additional street trees, and the replanting of trees lost through disease, new construction, or other means.
<i>Goal 14</i>	Preserve and enhance existing sensitive habitats in the Laguna.
<i>Goal 15</i>	Restore and enhance Laguna habitats.
<i>P51</i>	Riparian Woodland: Revegetate and enhance those areas identified as “Restored Riparian Habitat” in Figure 2d in the Laguna Park Master Plan.
<i>P54</i>	Restore and Enhance Oak Woodland: Restore and enhance oak woodland in the Laguna.
<i>P55. Protect Oaks</i>	Protect all oaks on City owned land from grazing and irrigation impacts.

City of Sonoma General Plan 2020

The City of Sonoma General Plan contains the following relevant goals and policies:

<i>Goal ER-2</i>	Identify, preserve, and enhance important habitat areas and significant environmental resources.
<i>2.2</i>	Preserve habitat that supports threatened, rare, or endangered species identified by State or federal agencies.
<i>2.3</i>	Protect and, where necessary, enhance riparian corridors.
<i>2.6</i>	Preserve existing trees and plant new trees.
<i>2.9</i>	Require development to avoid potential impacts to wildlife habitat, air quality, and other significant biological resources, or to adequately mitigate such impacts if avoidance is not feasible.

Town of Windsor General Plan - 2015

The following Environmental Resource Policies from the Windsor General Plan are applicable to the SMP:

<i>A.1</i>	Preserve open space land for the continuation of commercial agricultural and productive uses, the protection and use of natural resources, the enjoyment of scenic beauty and recreation, and protection from natural hazards.
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- A.1.1* The Town shall seek to preserve open spaces resources (i.e., productive farmlands, outdoor recreation areas, biological habitats, visually prominent landforms, Alquist-Priolo Special Study Zones, and flood hazard areas) using the techniques identified in Table 6-1. The first option for properly managing these resources should be avoidance of development in these open space resources.
- A.1.2* The Town shall encourage the preservation of sensitive environmental resource areas, such as oak woodlands, productive farmlands, riparian (creekside) corridors, and visually prominent hillsides and ridgelines through measures such as clustering development and conservation easements.
- C.2* Promote design guidelines to maintain creeks in their natural conditions.
- C.2.1* Windsor's natural creek system should be managed as an important natural, fishery, and visual resource by maintaining the creeks in their natural state, establishing appropriate setbacks for development, encouraging their incorporation into a trail system, and keeping them free and clear of debris and refuse.
- C.2.4* Whenever possible, creeks should be conserved in, or restored to, their natural states to carry storm waters, to maintain a natural appearance, and to protect fisheries. Portions of the channels that have been significantly altered for flood control should still be used for urban open space as landscaped paths.
- D.1* Protect unique and sensitive biotic features such as rare and endangered plants, dense oak woodlands, and vernal pools, and encourage sensitive design in these areas.
- D.1.1* Significant biological and ecological resources in the Windsor Planning Area should be protected. These include wetlands; rare, threatened and endangered species and their habitats; vernal pools, oak groves and heritage trees (see Figure 6-2 [of the Windsor General Plan]). Other sensitive resources, as shown in Figure 6-2, include oak and riparian woodlands. To accomplish this, development proposals for projects in these areas must include a detailed inventory of the sensitive resources conducted by an independent, professionally qualified biologist, plant ecologist, arborist, or appropriately qualified specialist. If sensitive resources are identified on the project site, proposals to protect them shall conform with applicable state and federal regulations regarding their protection and may include avoidance of the resource, installing vegetative buffers, providing setbacks, clustering development onto less sensitive areas, preparing restoration plans, and offsite mitigation.
- D.1.3* Development projects, which would fill wetlands or vernal pools, shall be required to conform with applicable state and federal regulations regarding the protection of these resources.

- D.1.4* Protection or restoration of sensitive biological resources that is required as a condition or mitigation of a development project should be closely monitored at the cost of the project applicant to determine compliance with the condition or mitigation and to evaluate the effectiveness of the measure.
- D.1.5* In significant riparian areas (including the watercourse itself and an area of land extending laterally at least 50 feet from each bank), the Town should prohibit dumping or disposal of refuse; confinement of livestock; and structural improvements except necessary water supply projects, flood control projects, fish and wildlife enhancement projects, trail projects, road and bridge projects, and utility projects.
- D.1.6* The Town should encourage the preservation of oak woodlands and significant stands of oaks and heritage trees. Development plans should indicate preservation of these resources to the fullest extent feasible and restrict pavement and other encroachments within the root zones of oak trees to ensure their long-term survival. Should removal be necessary, the project applicant should be required to plant replacement trees.
- D.1.7* During construction activities, the Town should require proper measures be implemented to assure the long-term survival of oaks and heritage trees. Fencing around individual trees or groups of trees shall be required to protect them from compaction and mechanical injury.

3.3.3 Environmental Setting

The SMP Program Area includes all of Sonoma County, with the exception of the mainstem Russian River, Dry Creek, and a number of particularly biologically sensitive creeks (excluded from routine maintenance in consultation with NMFS, USFWS, CDFG, and the RWQCBs, as described above), but is focused on the Laguna de Santa Rosa, Petaluma River, and Sonoma Creek watersheds in the southern portion of the County. The physiography of southern Sonoma County is generally defined by a sequence of northwest to southeast aligned valleys and ridgelines which follow the regional tectonic and geologic structure. Sources used to map and describe the physical setting of the Program Area included U.S. Geological Survey (USGS) data on topography and hydrology; geologic maps of the area (California Department of Conservation 1990; USGS 1994; Sloan 2006); soil survey information (Soil Conservation Service 1972); and other published information (Hickman 1993; Alt and Hyndman 2000). Topography, hydrology, geology, and soil data were downloaded from agency web sites and imported into ArcInfo, where files were clipped and converted into the projection for the Program Area.

In Flood Control Zones 1A and 2A, many of the engineered channels begin in the historic alluvial fan zone, most often in the lower fan areas (SMP Manual Figures 3-1 and 3-2). Historically these were reaches that received abundant sediment from upstream sources. Over time these reaches variably stored this sediment, distributed and deposited it along the fan surface, or carried some of it downstream depending upon the location of the active

stream channel on the fan. Under existing conditions with developed land uses adjacent to the creek, the streams have been channelized and are now operated and maintained for flood control purposes. Streams that previously migrated and deposited their materials across a broad fan or plain surface are now contained in generally linear channels with gradients that are typically governed by hardened road crossings.

The result of the current engineered channel system is that sediments that historically would have been deposited and spread across the larger plain and alluvial fan area now accumulate inside the engineered channels. Identifying, managing, and sometimes removing this sediment is a key aspect of the SMP.

The Program Area's lowlands are formed near the outlet of the Laguna de Santa Rosa watershed. Similarly, lowlands of the Petaluma River and Sonoma Creek watersheds are found in the floodplains, marshes, and tidal areas near to the edge of the San Pablo Bay. These lowlands and baylands are part of important regional ecosystems including many sensitive habitats. In particular, the Laguna is a key hydrologic feature and ecologic resource in the Program Area as it supports a mosaic of channels, oxbows, ponds, and wetlands. As shown in Figure 2-1, the Laguna extends nearly 12 miles from its northern confluence with the Russian River to its southern origin with the creeks of the Rohnert Park and Cotati area. The Laguna is nearly a mile wide at its downstream end, approximately three-quarters to one-half mile wide through most of its length, and tapers to a few hundred yards towards its southern limit.

In the winter, a natural basin at the confluence of the Laguna and Mark West Creek receives surplus (or carryover) storm flows from the Russian River. This inflow from the Russian River causes a hydraulic backwatering and detainment of other Laguna watershed flows providing flood storage and peak attenuation benefits for the lower Russian River valley. The Laguna can detain and store a maximum of 80,000 acre-feet of water that would otherwise flow directly to the lower Russian River (Honton and Sears 2006). Although this natural flood storage is advantageous for managing flood waters in the lower Russian River watershed, the backwatering effects often ripple up through the Laguna system and impact flood conveyance to many of its tributaries.

Natural Communities

Natural communities are communities that are dominated by species native to the area, and that are diverse, regionally uncommon, or of special concern to local, state, and federal agencies. Natural communities within the SMP Area are divided into upland communities and aquatic communities. The upland natural communities include willow scrub, riparian forest and woodland, mixed riparian scrub, blackberry scrub, ruderal, and developed communities. The aquatic communities include emergent wetland, perennial and intermittent creeks (or channels). Included in the ruderal communities are V-ditches. V-ditches are typically located above and beyond the top-of-bank zone, on the outer edge of the access road. These facilities were designed to collect runoff from the access roads and adjacent slopes. Flow from V-ditches is conveyed beneath the access roads and discharged into the adjacent channel via culverted outlets. Due to excessive rodent activity along many of SCWA's service roads, V-ditches, and banks; water is sometimes captured by rodent burrows instead of entering the V-ditch culverts.

Information on the dominant plant associates and typical wildlife species that inhabit or use these communities is provided in Chapter 3 of the SMP Manual. Information on the special-status plants and wildlife species that may inhabit the natural communities in and adjacent to the SCWA-maintained flood control channels is discussed in Chapter 3 of the SMP Manual and below.

Invasive Species

Invasive species are common in the nine natural communities in the Program Area and are commonly found in the surrounding residential and agricultural areas. Seeds and vegetative fragments from these invasive species are carried into the Program Area by tributary flows, wind, animals, and by residents using the Program Area for recreation. Monitoring and controlling invasive species is an important ongoing maintenance activity that is an integral part of the SMP. Vegetation maintenance activities include methods for controlling, removing and managing invasive species. Controlling the spread of invasive species in the SMP channels is necessary to maintain and enhance habitat value and flood control in the Program Area.

Special-Status Species

For the purposes of this EIR, a special-status species refers to those species that meet one or more of the following criteria:

- Species that are listed or proposed for listing as threatened or endangered under the FESA (50 CFR 17.12 for listed plants, 50 CFR 17.11 for listed animals, and various notices in the Federal Register for proposed species);
- Species that are candidates for possible future listing as threatened or endangered under FESA (64 FR 57534, October 25, 1999);
- Species that are listed or proposed for listing by the State of California as threatened or endangered under CESA (14 CCR 670.5);
- Plants listed as rare under the California Native Plant Protection Act of 1977 (California Fish and Game Code, Section 1900 et seq);
- Plants considered by the California Native Plant Society (CNPS) to be “rare, threatened, or endangered in California”;
- Species that meet the definitions of rare or endangered under CEQA (State CEQA Guidelines, Section 15380);
- Animals fully protected in California (California Fish and Game Code, Section 3511 [birds], 4700 [mammals], and 5050 [reptiles and amphibians]); and
- Nesting raptors protected in California (California Fish and Game Code, Section 3503.5)

Methodology

Background information on special-status plant and animal species with potential to occur in the SMP Area was compiled through a review of the following resources:

U.S. Fish and Wildlife Service

- Endangered and Threatened Wildlife and Plants (USFWS 1999, 2006).
- Federal Endangered and Threatened Species that Occur in or May Be Affected by Projects in Sonoma County (USFWS 2008b, Appendix C).

National Marine Fisheries Service

- Endangered and Threatened Species; Establishment of Species of Concern List, Addition of Species to Species of Concern List, Description of Factors for Identifying Species of Concern, and Revision of Candidate Species List Under the Endangered Species Act (NOAA 2004).

California Department of Fish and Game

- California Natural Diversity Database (CNDDDB) Database Query for the Cazadero, Cotati, Geyserville, Glen Ellen, Guerneville, Healdsburg, Jintown, Kenwood, Petaluma, Petaluma River, Santa Rosa, Sebastopol, Sonoma, and Two Rock USGS 7-½ minute Quadrangles (quadrangles) including a 1-mile buffer (CDFG 2008a).
- State and Federally Listed Endangered, Threatened and Rare Plants of California (CDFG 2008b).
- State and Federally Listed Endangered and Threatened Animals of California (CDFG 2008c).
- Special Vascular Plants, Bryophytes, Lichens List (CDFG 2008d).
- Special Animals (CDFG 2008d).

Other Sources

- The Jepson Manual: Higher Plants of California (Hickman 1993).
- The California Native Plant Society's Inventory of Rare and Endangered Plants of California (CNPS 2001, 2008).
- Specimen Management System for California Herbaria (CCH 2008).

A list of federally endangered and threatened species that may be affected by activities within the Cazadero, Cotati, Geyserville, Glen Ellen, Guerneville, Healdsburg, Jintown, Kenwood, Petaluma, Petaluma River, Santa Rosa, Sebastopol, Sonoma, and Two Rock USGS quadrangles was obtained online from the USFWS website (USFWS 2008b, Appendix C). SMP Manual Figures 3-25 and 3-26 depict special-status species occurrence data from CDFG's CNDDDB (CNDDDB 2008) for the 14 quadrangles located in Sonoma County and a 1-mile buffer around these quadrangles. CNPS electronic inventory was also queried for the 14 quadrangles and a 1-mile buffer around these quadrangles.

Tables 3.3-1 and 3.3-2 provide a summary of the status, habitat requirements, habitat suitability, local distribution and potential for occurrence for each of the special-status species with potential to occur in the SMP Area. These lists are a compilation of those

species obtained from CNDDB, CNPS, and the USFWS lists. In evaluating the occurrence potential of federally-listed plant and wildlife species in the SMP Area, relevant literature, knowledge of regional biota, and observations made during the field investigations were applied as analysis criteria. Using these criteria, the potential for each species to occur in the Program Area was evaluated, and each species was placed into one of four categories defined as:

- **None** indicates that the area contains a complete lack of suitable habitat, the local range for the species is restricted, and/or the species is extirpated in this region.
- **Not Expected** indicates situations where suitable habitat or key habitat elements may be present but may be of poor quality or isolated from the nearest extant occurrences. Habitat suitability refers to factors such as elevation, soil chemistry and type, vegetation communities, microhabitats, and degraded/significantly altered habitats. For the SMP, habitat suitability also included consideration of stream processes occurring in the flood control channels. For the “not expected” class, these factors create unsuitable ecological conditions for even a low occurrence potential within the SMP Area.
- **Possible** indicates the presence of suitable habitat or key habitat elements that potentially support the species.
- **Present** indicates the target species was either observed directly or its presence was confirmed by diagnostic signs (i.e. tracks, scat, burrows, carcasses, castings, prey remains, etc.) during field investigations.

Some of the special-status species have existed historically in the Program Area or only exist in isolated areas of adjacent quadrangles. Much of the historical habitat no longer exists in the Program Area due to agricultural, residential and commercial development, infrastructure, and road development.

Special-Status Plants

Based on the site reconnaissance, a review of available databases and literature (CDFG 2008 a,b,d; CNPS 2001, 2008; Consortium of California Herbaria 2008, Hickman 1993; and Best et al. 1996) and familiarity with the regional flora, a total of 105 special-status plant species have the potential to occur within the vicinity of the SMP Area (Table 3.3-1). Of the 105 target species, 92 were ruled out based on the lack of suitable habitat, range restrictions, or the fact that they would have been previously observed during field reconnaissance work. The 13 remaining species were determined to have at least some potential to occur within the SMP Area based on either the presence of suitable habitat (i.e. willow scrub, mixed riparian scrub, or emergent wetlands) or the fact that the timing of the field investigations did not correspond with the remaining target species peak flowering phenology.

These remaining plants are discussed in detail in Chapter 3, Section 3.10 of the SMP Manual. Potential impacts on special-status plants in SCWA maintained channels and surrounding habitats are evaluated below in the Impact Analysis section of this chapter.

It should also be noted that reaches and their access roads within the SMP Area have, in most cases, been altered due to flood control management and are separated by cyclone fencing from surrounding uplands. This alteration along with the prevalence of weedy native and non-native plant species may reduce the potential of target plant species to occur on site. However, in some locations, small areas of suitable habitat for special-status plants do persist adjacent to SCWA rights-of-way.

Special-Status Wildlife

Based on the site reconnaissance, a review of available databases and literature (USFWS 1999, 2006, 2008; CDFG 2008a,b,c) and familiarity with the regional fauna, a total of 54 special-status wildlife species have the potential to occur within the vicinity of the SMP Area (Table 3.3-2). Of the 54 target species, 25 were ruled out based on the lack of suitable habitat or range restrictions. The remaining 29 species were determined to have at least some potential to occur within the SMP Area based on the presence of suitable habitat or because they have been documented from the SMP Area. The California freshwater shrimp, California tiger salamander, California red-legged frog, foothill yellow-legged frog (*Rana boylei*), and western pond turtle (*Actinemys marmorata*) are all special-status species that have been documented from the SMP Area and could potentially be impacted by maintenance activities. These species are discussed in detail in Chapter 3 of the SMP Manual. In addition, potential program effects to the federally listed California freshwater shrimp, California tiger salamander and California red-legged frog are covered under the Programmatic Biological Assessment for the proposed program.

Other terrestrial wildlife with potential to occur in the riparian and scrub habitat within the SMP Area includes special-status birds, including raptors and migratory birds. In addition to the above, the riparian communities within the SMP Area could support special bat species. These two groups of animals are discussed below.

Special-Status Birds

Natural communities in the SMP Area support suitable nesting habitat for many special-status birds. During 2006 and 2007 approximately 80 bird species were observed in the SMP Area including four special-status species: double-crested cormorant (*Phalacrocorax auritus*), Vaux's swift (*Chaetura vauxi*), white-tailed kite (*Elanus leucurus*), and yellow warbler (*Dendroica petechia brewsteri*) (SCWA Annual Bird Survey Report, Martini-Lamb 2007). Table 3.3-2 identifies several additional special-status birds with potential to occur in the SMP Area either foraging or nesting. A more detailed account of the surveys and the results, including a species list and a characterization of migratory bird nesting habitat along each reach, can be found in Martini-Lamb (2007).

SCWA has been working to avoid impacts to nesting birds during stream maintenance activities by providing training to employees, scheduling maintenance activities outside of the nesting season whenever possible, performing pre-construction surveys for active nests during the nesting season, and establishing procedures to avoid impacts to active nests (Martini-Lamb 2007).

Special-Status Bats

Natural communities in the SMP Area may support suitable roosting habitat for special-status bats. In general, bats exhibit a wide range of habitat usage depending on the species, season, time of day, resource availability, level of disturbance, and other factors, but often exhibit a high site fidelity and specificity for roost selection. Roost sites consist of maternity (nursery colonies), bachelor, day, night and feeding sites within caves, mines, cliffs, rock crevices, tree hollows, stumps, foliage, under exfoliating bark, and in man-made structures such as buildings and bridges, among others. Some species require a complex network of habitat characteristics that fulfill foraging, water intake, shelter, and thermoregulatory requirements that vary seasonally. The survey effort necessary to document presence of some species, particularly those that roost and forage high off the ground, may require several weeks of monitoring based on a species roost selection, solitary roosting and foraging behaviors during non-breeding periods, rarity within the region, and current limitations of monitoring methods (Weller and Lee 2007).

Table 3.3-2 identifies nine bat species with potential to roost or forage in the SMP Area. Pallid bat (*Antrozous pallidus*) is considered a state species of special concern and has been documented from the SMP Area (CDFG 2008). In general, bat habitat should be managed on a temporal and spatial scale that accounts for each species' specific habitat requirements, resource availability, and sensitivity to disturbance (Ball 2002).

Special-Status Fish

Some of the channels within the SMP Area are known to support the federally threatened Central California Coast steelhead and federally threatened California Coastal Chinook salmon and could potentially be impacted by maintenance activities. The Russian River has been designated critical habitat for these species, though the Laguna de Santa Rosa subwatershed was excluded from the final critical habitat designation for the Central California Coast Steelhead Distinct Population Segment (DPS) (USFWS 2005c). These species are discussed in detail in Chapter 3 of the SMP Manual. In addition, potential effects to the federally listed fish are covered under the Programmatic Biological Assessment for the Proposed Program. After careful consideration and discussion with NMFS, SCWA removed all creeks and/or creek reaches from the SMP Area known to support the federally endangered Central California Coast coho salmon. Figure 2-12 in Chapter 2 provides a map showing the 15 streams that were removed from SMP permit coverage due to their resource sensitivity. Figures 3-32, 3-33, and 3-34 in the SMP Manual depict critical habitat for these three species.

California fish species of special concern that occur within the Program Area are Russian River tule perch (*Hysterothorax traskii pomom*) and hardhead (*Mylopharodon conocephalus*). The river lamprey (*Lampetra ayresii*) is listed as a species of concern by USFWS and CDFG has included river lamprey on its Watch List. Pacific lamprey (*Lampetra tridentata*) is included on USFWS' list of species of concern. See Chapter 3 of the SMP Manual for more information on these species.

3.3.4 Impact Analysis

This section describes the potential impacts on special-status species in SCWA maintained channels and surrounding habitats that may result from Program activities. Also provided are recommended mitigation measures for reducing impacts on biological resources during implementation of SMP activities.

Methodology

Direct impacts on existing biological resources were evaluated by comparing the quantity and quality of habitats present in the SMP Area under baseline conditions to anticipated conditions after implementation of the maintenance activities. For this evaluation, direct impacts on special-status species were assessed based on the potential for the species or their habitat to be disturbed during implementation of maintenance activities. Also included in this evaluation is a discussion of the anticipated beneficial impacts of SMP activities on biological resources.

SMP activities may impact biological resources through the direct or indirect disturbance, modification, or destruction of habitat such that it results in death, injury or harassment of individuals or populations of plant or animal species, or impedes or prevents the dispersal of individuals or populations of special-status species. For example, sediment removal activities may directly impact fish or amphibian species or their habitats through temporary loss, fragmentation, and degradation of habitat, and have the potential to injure or kill individuals during earthmoving activities. Sediment removal activities may also indirectly affect a species by temporarily increasing the amount of sediment in the downstream water. Bank stabilization activities conducted in frog and salamander upland habitat can directly kill or injure individuals by crushing them under heavy equipment or by burying them alive in a burrow system. Vegetation management activities may indirectly remove suitable nesting habitat for migratory birds.

Table 2-1 outlines the general and species-specific mitigation measures that will be followed in their entirety, as applicable, in order to avoid and minimize program impacts. All standardized Best Management Practices (BMPs) that are recommended or required by regulatory agencies are identified in Table 2-1. Incorporation of the General Biological Resource Protection Measures BR-1 through BR-6 (as described in Table 2-1) will specifically reduce Program-wide impacts on biological resources. Regulatory agency staff helped develop the species specific conservation measures (BMPs BR-7 through BR-19) shown in Table 2-1. These species measures consider and integrate actions from USFWS and NMFS BOs relevant to the SMP.

SCWA will provide compensatory mitigation for residual impacts that remain after impact avoidance and minimization measures and BMP implementation. SCWA may meet species specific mitigation obligations through protection of appropriate habitat in consultation with USFWS, NMFS, and CDFG. Species effects and subsequent mitigation will be evaluated and quantified on an annual basis. Implementation of mitigation will occur either during the same season, or the season following the effect. Chapter 8 of the SMP Manual describes the Program's mitigation approach in greater detail.

SMP Table 7-3 identifies special-status plant, fish, and wildlife species of the Program Area and shows in which SMP maintenance reaches these species may occur. Species-specific conservation measures for these biological resources are described in Table 2-1. These conservation measures will be applied when conducting maintenance activities in those reaches containing potential habitat for special-status species. SMP Table 7-2 identifies the appropriate conservation measure to implement for each maintenance activity. Table 2-1 (which duplicates SMP Manual Table 7-1), and SMP Manual Tables 7-2 and 7-3 will function as the source of information used by SCWA staff to ensure biological resources are protected during implementation of program activities.

On-going and proposed SMP activities are temporary and in many cases result in beneficial effects on special-status species habitat through reduction of sediment in creeks, removal of sediment barriers and creation of more natural stream channels and stream corridors. In addition to identifying adverse impacts, the impact discussion below describes beneficial impacts on biological resources that would be achieved through implementation of the SMP.

Criteria for Determining Significance

The following significance criteria were used to evaluate the impact of SMP maintenance activities on biological resources. Proposed activities would adversely affect biological resources in the SMP Area if they would:

- Cause the substantial loss of the population of a federally- or state-listed, proposed, or candidate species, either through direct or indirect loss, as a result of modification of the breeding or foraging habitat of such a species resulting in increased mortality or decreased reproductive success;
- Cause the substantial loss or long-term degradation of any environmentally sensitive habitat;
- Cause a substantial disturbance to wildlife species resulting from human activities;
- Result in avoidance by wildlife of biologically important habitat for substantial periods, which may increase mortality or reduce reproductive success;
- Interfere with the movement of any resident or migratory fish or wildlife species;
- Cause a change in species distribution or abundance of a sensitive community;
or
- Cause a change in local and regional distribution and extent of the biological resource.

Program activities were considered to have a beneficial impact if implementation would result in an increase in the quantity or quality of habitat that supports special-status species or sensitive biological resources. Beneficial impacts of SMP activities are described at the end of this chapter.

Environmental Impacts

Impact BIO-1: Temporary Loss or Disturbance of Aquatic Natural Communities (Less than Significant with Mitigation)

Maintenance activities associated with the SMP could result in the disturbance or temporary loss of aquatic communities delineated as waters of the U.S. or waters of the state. SMP activities with potential to disturb aquatic communities include sediment removal, bank stabilization and vegetation management activities. These three maintenance activities could result in the placement of fill, hydrological interruption (including dewatering), alteration of bed and bank, and other direct impacts. Aquatic communities in the SMP Area include emergent wetlands, and perennial and intermittent streams. SMP activities would not result in permanent loss of aquatic communities; however, these habitats could be temporarily impacted through maintenance activities.

This impact is considered to be potentially significant because it could result in short-term degradation of a sensitive plant or animal community, fragmentation or isolation of an important wildlife habitat, and disruption of natural wildlife movement corridors.

SCWA will implement several measures to address the environmental impact of SMP activities on the loss or disturbance of waters of the U.S. First, SCWA will identify areas that could qualify as waters of the U.S., including wetlands or waters of the state. SCWA will use qualified wetland scientists and botanists to identify and assess potential waters of the U.S. USACEs jurisdictional wetlands are being delineated using the methods outlined in the USACE's 1987 manual, as modified to use accepted methodology at the time of permitting. State waters and streams are being designated based on appropriate state standards. This information is being mapped and documented in a wetland delineation report.

SCWA will use the information gained through the programmatic delineation to avoid and minimize potential disturbance to waters of the U.S., including wetlands, due to SMP activities to the extent possible. Chapter 5 of the SMP Manual describes several pre-maintenance planning approaches that will be implemented to avoid and minimize impacts. The approach to planning for maintenance includes implementation of six Maintenance Principles to identify, understand, and protect the Program Area's resources through sound project planning prior to conducting maintenance activities. The Maintenance Principles which guide the SMP are:

1. No Unnecessary Intervention;
2. Understand the System and its Processes;
3. Consider Adjacent Land Uses;
4. Apply System Understanding to Maintenance Activities;
5. Manage for Incremental Ecologic Improvement; and
6. Integrate Maintenance Activities Towards Sustainability.

Details on how these Maintenance Principles provide guidance for avoiding and minimizing impacts from SMP activities are included in Chapter 5 of the SMP Manual. Through implementation of the SMP Maintenance Principles, evaluation of the need for and extent of maintenance will reduce impacts on aquatic resources prior to identification of maintenance projects. In addition, SCWA will implement the relevant BMPs, listed below, during maintenance activities. Implementation of the SMP's pre-maintenance planning approach and these measures will reduce potential impacts on wetlands and other waters of the U.S. and waters of the state to a less-than-significant level.

If wetlands are filled or disturbed due to program activities, SCWA will mitigate for the loss of wetland habitat to ensure there is no net loss of habitat functions and values. Chapter 8 *Program Mitigation* of the SMP Manual describes the program's approach to mitigating impacts to biological resources. The mitigation approach includes three tiers of compensating beneficial activities as described in Chapter 8 of the SMP Manual and briefly summarized as follows.

Tier 1 mitigation includes on-site at the specific project reach where the maintenance work was conducted. On-site impact mitigation is the highest priority SMP mitigation and is implemented on-site at the specific project reach where the maintenance work was conducted. The general approach is to restore habitat that is affected by the sediment removal or bank stabilization activities in the same reach in which the disturbance has occurred. Tier 1 on-site mitigation activities include a robust planting program to develop a fuller riparian corridor, the removal of exotic and invasive species, and the construction of low-flow channels and other geomorphic features to enhance instream habitat and remove migration barriers. This approach seeks in-kind or functional agreement between impacts and mitigation. If riparian habitats are affected, then the mitigation strategy is to re-establish riparian habitat. If instream aquatic habitats are impacted, then instream aquatic habitat will be the mitigation target. For each affected reach a specific site-based restoration plan is developed similar to Figures 8-2 and 8-3 in the SMP Manual. Tier 1 restoration activities result in a 1:1 ratio of mitigation area to area disturbed by maintenance.

In addition to the Tier 1 on-site mitigation, the SMP includes Tier 2 and Tier 3 off-site mitigation. Tier 2 mitigation provides in-kind mitigation at neighboring SMP reaches that afford an opportunity for mitigation, but were not necessarily worked on as maintenance reaches. Tier 2 mitigation is very similar to Tier 1 on-site mitigation in that the focus is to provide reach-based in-kind habitat, stream function, or water quality benefits. The key difference is that the mitigation occurs at a SCWA reach which is not the subject of SMP maintenance activities during a given year. Tier 3 mitigation occurs off-site and provides compensating watershed based functions and values to SMP program impacts. Tier 3 mitigation addresses residual impacts from SMP activities that are not adequately avoided or minimized as described above or mitigated through Tier 1 and 2 mitigation actions. Tier 3 mitigation provides restorative and mitigating watershed solutions for SMP impacts. This is accomplished through the off-site watershed mitigation program, whereby SCWA funds Tier 3 projects to be implemented with local non-profit agencies, municipalities, restoration organizations, creek groups, schools and Resource Conservation Districts (RCDs).

The Tier 2 and Tier 3 off-site mitigation address the temporary loss of Beneficial Uses and ecological functions and values during the time gap between SMP maintenance activities and when Tier 1 mitigation occurs, and the time when Tier 1 mitigation has become fully functional and the temporary impacts have been eliminated. Off-site mitigation will be funded at a rate of 10% of the maintenance cost for the given year, and will provide a mitigation ratio of at least 1.1:1 of restored areas to impacted areas. As described in Chapter 8 of the SMP Manual, this approach will typically result in mitigation ratios that are greater than 1.1:1. Refer to Chapter 8 of the SMP Manual for a full discussion of the restoration and monitoring plans, including performance standards and remedial actions should the mitigation projects fail to be successful.

With implementation of the measures described in the SMP Manual, this impact is considered less than significant, and no further mitigation is necessary.

Level of Significance: Less than significant with mitigation

Mitigation Measures:

Relevant BMPs

See BMP details in Table 2-1:

General Impact Avoidance and Minimization

BMP GEN-1: Work Window

BMP GEN-1: Staging and Stockpiling of Materials

BMP GEN-3: Channel Access

Biological Resources Protection

BMP BR-1: Area of Disturbance

BMP BR-2: Pre-Maintenance Educational Training

BMP BR-4: Impact Avoidance and Minimization during Dewatering

BMP BR-5: Fish and Amphibian Species Relocation Plan

BMP BR-6: On-Call Wildlife Biologist

BMP BR-7: Special Status Plants

BMPs BR-9 through BR-19: Special Status Wildlife and Salmonids

Vegetation Management

BMP VEG-1: Removal of Existing Vegetation

BMP VEG-2: Use of Herbicides

BMP VEG-3: Planting and Revegetation after Soil Disturbance

Water Quality and Channel Protection

BMP WQ-1: Apply Erosion Control Fabric to or Hydroseeding of Exposed Soils

BMP WQ-2: Prevent Scour Downstream of Sediment Removal

BMP WQ-3: In-Channel Grading

Impact BIO-2: Temporal Disturbance to Upland Natural Communities (Less than Significant with Mitigation)

Upland natural communities in the SMP Area include both sensitive communities such as riparian scrub and non-sensitive communities such as blackberry scrub. Removal of willows and blackberry scrub, as well as tree removal and pruning associated with SMP vegetation management activities would temporarily disrupt upland habitat in the SMP Area. Bank stabilization activities temporarily disrupt upland communities from use of heavy equipment to repair failed banks in the SMP Area. Implementation of BMPs GEN-3, BR-1, BR-2, BR-3, VEG-1, VEG-2, and VEG-3 will minimize potential impacts of vegetation removal and bank stabilization activities on upland natural communities. With implementation of these measures, temporary disturbance to upland natural communities is considered less than significant. Furthermore, programmatic mitigation incorporated into the Proposed Program includes on-site and off-site restoration and planting programs that will beneficially protect and restore upland natural communities throughout the Program Area.

Level of Significance: Less than significant with mitigation

Mitigation Measures:

BMP GEN-3: Channel Access

1. Access points to the channel for the purposes of stream maintenance will be minimized according to need. Access points should avoid large mature trees, native vegetation, or other significant habitat features as possible. Temporary access points shall be sited and constructed to minimize tree removal.
2. In considering channel access routes, slopes of greater than 20 percent shall be avoided if possible. Any sloped access points will be examined for evidence of instability and either revegetated or filled with compacted soil, seeded, and stabilized with erosion control fabric as necessary to prevent future erosion.
3. Personnel will use the appropriate equipment for the job that minimizes disturbance to and compaction of the stream bottom. Appropriately-tired vehicles, either tracked or wheeled, will be used depending on the site and maintenance activity.

BMP BR-1: Area of Disturbance

1. Activities will avoid damage to or loss of native vegetation to the maximum extent feasible.
2. Soil disturbance shall not exceed the minimum area necessary to complete the operations as described.

BMP BR-2: Pre-Maintenance Educational Training

1. At the beginning of each maintenance season and before conducting stream maintenance activities, all personnel will participate in an educational training session conducted by a qualified biologist. This training will include instruction on how to identify bird nests, recognize special-status species that may occur in the work areas, and the appropriate protocol if any nests or listed species are found during project implementation.

2. Personnel who miss the first training session or are hired later in the season must participate in a make-up session before conducting maintenance activities.

BMP BR-3: Biotechnical Bank Stabilization

If hydraulic conditions allow, the natural bank will be retained or a biotechnical repair technique will be used rather than, or along with, a hardscape repair.

BMP VEG-1: Removal of Existing Vegetation

1. Vegetation pruning and removal activities will be conducted under the guidance of a staff biologist or certified arborist. For tree relocation activities, a botanist, certified arborist, or other vegetation specialist will be on site to help direct maintenance activities and to consult if questions and/or issues arise.
2. Only vegetation that is noxious, invasive, hazardous, or could obstruct channel flows will be removed. Herbacious layers that provide erosion protection and habitat value will be left in place. Invasive plant species that inhibit the health and/or growth of native riparian trees will be targeted for removal.
3. Where a choice between species that may be removed to maintain flood conveyance is feasible, slower-growing species such as oaks (*Quercus spp.*) that develop large canopies will be preferentially preserved, because these species take longer to establish, and provide essential nesting habitat for cavity nesters and food sources for a variety of resident and migratory animals and birds. Faster-growing species such as alders (*Alnus spp.*) and cottonwoods (*Populus spp.*) are the second priority for preservation; these single-trunked species offer the benefit of improved flood conveyance and reduced roughness by comparison with multi-trunked species.
4. Vegetation will be removed and/or pruned in such a manner that channel roughness is reduced while allowing the maximum amount of vegetation to remain in place. Trees will be trimmed or pruned to reduce impedance of floodflows while allowing the canopy to develop. Specifics for each site will differ, but typical options include limbing up to remove lower branches that have potential to interfere with floodflows, and pruning into a “fan” roughly parallel to flow direction. In areas where extensive vegetation removal is desirable to maintain flood flow capacity, phasing of removal shall be considered so that some vegetation may remain in place to provide habitat to birds.
5. Vegetation management will emphasize the preservation of large mature trees that provide well developed overstory for bird habitat, canopy closure for stream shading, and add vertical complexity to the riparian corridor. Vegetation management will be conducted in such a manner that maximizes shading over the active channel. Larger trees will be retained on both sides of north-south flowing streams and on the south side of east-west flowing streams. Where vegetation is removed from the active channel, removal will target nonnative species and removal of native species that are stiff and/or multi-trunked such as arroyo willow (*Salix lasiolepis*). Trees will never be topped as this encourages shrubby growth and weak branch attachments
6. Large woody debris, stumps, or root wads that are fully or partially buried and do not present a flood hazard shall be allowed to remain in place to provide habitat and to maintain bank stability.
7. If vegetation requires removal for access to project site, non-native species and/or quick growing species shall be targeted first for removal. Removal of native, mature trees will be avoided whenever possible.

8. To the extent feasible, removed native vegetation shall be saved to replant after maintenance or plant in other nearby sites. This includes the reuse of mulch and willow sprigs where possible.

BMP VEG-2: Use of Herbicides

1. All herbicide use shall be consistent with all Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) label instructions and any use conditions issued by the Sonoma County Agricultural Commissioner.
2. Herbicide use will be restricted to the minimum amount needed to ensure adequate control of vegetation.
3. Application of herbicides to upland areas shall not be made within 72 hours of predicted rainfall.
4. Herbicides will not be directly applied to waters of the U.S., such as for ludwigia eradication.
5. Herbicides, including AquaMaster© and Renovate©, will not be used within 60 feet of areas identified in the Court-Ordered Stipulated Injunction for the protection of California red-legged frogs. This includes areas in Zones 1A and 3A, as well as Zones 8A and 9A (see Figure 3-29 for detail on where these areas are located.) The Agency will review the details and exceptions in the court order and comply with the herbicide use buffers as appropriate.
6. As required by the Court-Ordered Stipulated Injunction for pesticide use near Pacific salmon-supporting waters in Sonoma County, pesticides specified in the injunction including triclopyr (Renovate©) will not be used within 20 yards of salmon-supporting waters. The Agency will review the details and exceptions in the court order and comply with the herbicide use buffers as appropriate.

BMP VEG-3: Planting and Revegetation After Soil Disturbance

1. Sites where maintenance activities result in exposed soil will be stabilized to prevent erosion and revegetated with native vegetation as soon as feasible after maintenance activities are complete.
2. Revegetation will occur at a ratio of at least 1½: 1 to account for initial mortality of plantings.
3. If soil moisture is deficient, new vegetation will be supplied with supplemental water until vegetation is firmly established.
4. To the extent possible, native grass seed will be used when seeding a project site.
5. Erosion control fabric, hydromulch, or other mechanism will be applied as appropriate to provide protection to seeds, hold them in place, and help retain moisture.
6. Revegetation shall be regularly monitored for survival for at five years or until minimum survival/cover is achieved. If invasive species colonize the area, action shall be taken to control their spread; options include hand and mechanical removal and replanting with native species.

Impact BIO-3: Temporary Disturbance to Potential Habitat and Loss of Individual Populations of Special-Status Plants (Less than Significant with Mitigation)

Habitat for special-status plants is present in natural communities in the SMP Area. Most of the suitable habitat for potentially occurring special status plant species has been initially identified by SCWA botanists and the majority of suitable habitat is located outside of the SCWA maintained rights-of-way. However, there are some suitable habitat areas for special status plants located within the SMP Area, as listed in SMP Manual Table 7-3 which identifies all reaches in SCWA maintained channels (in Zone 1A, Zone 2A, and Zone 3A) that contain potential habitat for special-status species.

SMP activities involving removal of vegetation or ground disturbance within the channel or on access roads in reaches identified in Table 7-3 would potentially harm special status plant species. Sediment removal within the channel would not only remove invasive species, such as cattails and ludwigia, but could potentially remove special status wetland species (listed in Table 2-3 in the SMP Manual) in the SMP Area. Similarly, bank stabilization, upland vegetation management, and access road maintenance activities would involve ground disturbance within sensitive special status plant habitat identified in SMP Manual Table 7-3. Disturbance to special status plant habitat would be temporary; however the potential for permanent loss of special status plants as a result of SMP activities would be considered a significant impact.

Implementation of BMP BR-7 will ensure that program-related impacts to special-status plants will be mitigated. Implementation of this measure combined with appropriate compensatory mitigation would reduce impacts to a less-than-significant level.

Level of Significance: Less than significant with mitigation

Mitigation Measures:

BMP BR-7: Special-Status Plants

1. For projects located in areas where federally-listed plant species have been identified as potentially occurring (see SMP Manual Table 7-3), a qualified botanist will conduct appropriately timed focused botanical surveys of the project site for these species. If these species is observed in or near the project site, SCWA will follow the measures below as well as any additional measures contained in the forthcoming Biological Opinion issued by the USFWS for the SMP.
2. For projects located in areas where special-status plant populations have been identified as potentially occurring (see SMP Manual Table 7-3), a qualified botanist will conduct appropriately timed focused botanical surveys of the project site for special status plant occurrences. A qualified botanist will also assess habitat suitability for the potential occurrence of special status plant species at any newly identified sediment disposal sites or previously unidentified staging areas.
3. If discovered, special-status plant populations identified during the field surveys and with potential to be impacted will be enumerated, photographed and conspicuously flagged to maximize avoidance, as well as to determine the total number of individuals affected. If feasible, the project shall be redesigned or modified to avoid direct and indirect impacts on special-status plant species.

4. Special-status plant species near the project site will be protected from temporary disturbance by installing environmentally sensitive area fencing (orange construction barrier fencing) around special-status plant species populations. Protective fencing will be installed under the direction of the botanist as necessary to protect the plant and its habitat; where feasible, the environmentally sensitive area fencing will be installed at least 50 ft. from the edge of the population. Where special-status plant populations are located in wetlands, silt fencing will also be installed. The location of the fencing will be shown on the maintenance design drawings and marked in the field with stakes and flagging. The design specifications will contain clear language that prohibits maintenance-related activities, vehicle operation, material and equipment storage, and other surface-disturbing activities within the fenced environmentally sensitive area.
5. Vegetation management activities in sensitive plant areas will be conducted under the guidance of the botanist. These activities should be timed following the blooming periods of potentially occurring listed species, after the month of June.
6. If impacts to state or federally listed plants are unavoidable, then the Agency shall coordinate with the appropriate resource agencies and local experts to determine whether transplantation of special-status plant species is feasible. If the agencies concur that it is a feasible mitigation measure, the botanist shall develop and implement a transplantation plan in coordination with the appropriate agencies. As part of the plan, the Agency, in conjunction with a qualified restoration ecologist and DFG and/or USFWS, shall identify a suitable on- or off-site location for mitigation and appropriate methods for seed collection, propagation, relocation, maintenance and monitoring. If the impacted species are annuals, it is expected that the current seed crop from the individuals to be lost will be collected (as well as immediate soils making up the dormant seed bed) and then sown on appropriate habitat located on the mitigation site. If the species is a perennial, it is expected that both the seed and the plants themselves will be salvaged and relocated to the mitigation site. Seed from the populations that will be impacted may be collected and propagated at a native plant nursery, prior to planting to increase the potential for establishment and survival. Annual monitoring of the mitigation site shall be conducted for 5 years to assess vegetative density, population size, natural recruitment, and plant health and vigor. Monitoring results may trigger management actions such as collection and sowing of additional seed, tillage/disturbance within existing populations to induce establishment, installation of container plants, and control of exotic invasive vegetation such as yellow star thistle to ensure successful plant establishment and survival. The site shall be evaluated at the end of the 5-year monitoring period to determine whether the mitigation has met the success criteria identified in the rare plant relocation, management, and protection plan.
7. If appropriately timed focused botanical surveys cannot be conducted in areas identified as suitable for listed plants prior to vegetation management activities, then the Agency shall assume presence of the plant species in question and coordinate with the appropriate resource agencies and local experts to develop appropriate mitigation for the impact.

Impact BIO-4: Temporary Disturbance to Potential Habitat and Loss of Individual California Freshwater Shrimp (CFWS) (Less than Significant with Mitigation)

Freshwater shrimp are known to occur in the Sonoma Creek watershed in SCWA Flood Control Zone 3A (CNDDDB 2008a), and in Blucher Creek, a tributary of the upper Laguna in

Zone 1A (Martini-Lamb 2007). There are also records for tributaries of the Russian River (Big Austin, East Austin, Green Valley, and Jonive Creeks) within Zone 5A, as well as in Salmon Creek in Zone 8A (Martini-Lamb 2007). Now extirpated, this species also historically occurred in the Santa Rosa Creek (Zone 1A) (SMP Manual Figure 3-27).

Based on this information, a subset of the natural channels has been removed from the SMP Area due to resource sensitivity, specifically presence of suitable habitat for CFWS and coho salmon. SCWA has removed the following natural channels from all SMP activities: Blucher Creek (Zone 1A), Willow Creek (Zone 5A), Sheephouse Creek (Zone 5A), Dutch Bill Creek (Zone 5A), Green Valley Creek (Zone 5A), Jonive Creek (Zone 5A), and Salmon Creek (Zone 8A). These creeks are identified in Figure 2-12 in Chapter 2. In addition, SCWA maintenance activities for the Russian River (mainstem) and Dry Creek (mainstem) are not covered under the SMP, as actions in these systems are governed by existing agreements between SCWA and USACE.

The only stream maintained under the SMP that supports CFWS is Sonoma Creek. This creek has natural and modified channel reaches along its length, and does not have any engineered channels. Vegetation management activities in natural reaches along Sonoma Creek may significantly impact known populations of CFWS by removing overhanging vegetation or debris from the creek channel (especially near pools and glide features). Implementation of the following mitigation measure from Table 2-1 will reduce this impact to less than significant.

Level of Significance: Less than significant with mitigation

Mitigation Measures:

BMP BR-9: California Freshwater Shrimp Avoidance and Impact Minimization for Vegetation Management Activities

Maintenance activities occurring along streams supporting California freshwater shrimp will be restricted to only conducting vegetation management and/or debris removal above the water level. In addition, vegetation or debris overhanging into pools or glides (slow or slack water) within the natural reaches of Sonoma Creek will not be removed or altered.

Impact BIO-5: Temporary Disturbance to Potential Habitat and Loss of Individual Special-Status Fish (Less than Significant with Mitigation)

Activities that would result in potential impacts include sediment removal, vegetation clearing, and bank stabilization. Impacts will vary depending on the specific fish species, its life history and habitat requirements. For example, low gradient streams, such as those that make up the majority of the channels maintained under the SMP, tend to provide little spawning and rearing habitat for steelhead, and generally function as migration corridors. On the other hand, species status fish that are not anadromous and prefer warm water such as the Russian River tule perch or hardhead, may permanently reside in the low gradient, warm conditions common to many of the SMP Area channels.

As such, stream maintenance activities have the potential to directly and indirectly impact potential and occupied habitat for Central California Coast steelhead, California Coastal Chinook salmon, Russian River tule perch, hardhead, and both Pacific and river lamprey in

several of the SCWA maintained channels (see Table 7-3 in the SMP Manual for salmonid distributions and Table 3.3-2 of the SMP Manual for distribution of other special-status fish). Increases in turbidity and sediment input from maintenance activities may cause stress to juvenile steelhead as well as tule perch and hardhead, due to feeding difficulties and/or displacement. Sediment disruption during maintenance could also impact spawning gravels for fish that prefer to spawn in low gradient areas, such as Chinook salmon and both species of lamprey. Although this impact is possible, it should be noted that spawning gravels and spawning beds are rare within SCWA maintained channels. In-stream maintenance activities could also inflict direct injury or mortality from equipment use in the channels. This impact will be minimized by implementation of BMPs BR-4 and BR-5, which require fish removal and dewatering of sites where maintenance will take place in the within the wetted channel.

In-stream maintenance activities that focus on removing accumulated silt and maintenance activities within slack water environments could impact lamprey ammocoetes (juveniles) feeding in silt laden slow-flowing areas. Although this impact is possible, both lamprey species are thought to have very limited distributions within the SMP Area (presence has been documented in Santa Rosa and Mark West creeks only). The frequency and manner in which maintenance activities can occur within Santa Rosa and Mark West creeks is restricted by the terms and conditions of the Russian River BO (three maintenance events between 2008 and 2023). Implementation of BMPs BR-4, BR-5, BR-6, and BR-18 will ensure compliance with the Russian River BO and reduce the potential for impacts on lampreys during sediment removal and associated dewatering activities. Though maintenance activities in lamprey habitat will be infrequent, long-term impacts on feeding habitat for lamprey ammocoetes will be naturally mitigated by continual sediment accumulation in slack water environments within Santa Rosa and Mark West creeks.

Another concern is loss of in-stream cover such as rocks and vegetation that provide refugia for migrating adult and over-summering juvenile salmonids, as well as resident fish, tule perch, and hardhead. To the extent feasible, given flood control requirements, such cover should be allowed to remain in place. In situations where flood control requirements allow for it, habitat elements may be added to the system as a part of maintenance activities (e.g., meandering low flow channels, riparian plantings, etc).

Removal of in-stream emergent vegetation could impact spawning and feeding for resident tule perch, especially if large tule beds or other submerged vegetation beds are removed. Santa Rosa Creek is the only stream known to support Russian River tule perch. As mentioned previously, maintenance activities within Santa Rosa Creek are restricted by the terms and conditions of the Russian River BO (see BMP BR-18). Thus, maintenance activities within tule perch habitat will be infrequent and limited in scale. Implementation of the SMP is not anticipated to significantly impact the habitat for or population of tule perch in the Program Area.

Removal of riparian vegetation has the potential to reduce cover, increase water temperatures, and reduce the amount of aquatic invertebrates, which are the primary food source for the salmonids and provide important habitat for hardhead and tule perch. Additionally, application of herbicides for vegetation removal could result in potential

injury to fish or other aquatic species. However, targeted application can be effective without harming aquatic environments.

When performing any type of work that necessitates work within the active channel, general BMPs and sediment control practices identified in Table 2-1 will be implemented. Applying mitigation measures BMPs BR-4, BR-5, BR-6 and compliance with the Russian River BO (described under BMP BR-18) will ensure that Program-related impacts to special-status fish will be mitigated. Implementation of these measures combined with any appropriate compensatory mitigation required by NMFS through the Section 7 consultation process (forthcoming BMP BR-19) would reduce impacts to a less than significant level.

Furthermore, the SMP includes compensatory mitigation for residual and temporary impacts utilizing three tiers of mitigation throughout the Program Area. Tier 1 mitigation, at a minimum, will restore the Beneficial Uses and ecological functions and values that were provided by a site in its original (pre-maintenance) condition. Tier 1 mitigation also addresses the long-term impacts of SMP activities, and is conducted at a 1:1 ratio of acres restored to acres disturbed.

Mitigation opportunities will also be considered at other SWCA reaches (Tier 2) and off-site locations within the watershed (Tier 3). These two tiers of mitigation address the temporary loss of Beneficial Uses and ecological functions and values during the temporal gap between implementation of SMP activities and implementation of Tier 1 mitigation, and the time the Tier 1 mitigation has become fully functional and the temporary impacts have been eliminated. Tiers 2 and 3 are funded through a contribution by SCWA of 10% of the total cost of maintenance activities, and will provide a 0.1:1 ratio of acres restored to acres disturbed, at a minimum. Additional details regarding funding of the mitigation program and mitigation ratios are provided in Sections 8.7 and 8.8 in Chapter 8 of the SMP Manual.

Level of Significance: Less than significant with mitigation

Mitigation Measures:

BMP BR-4: Impact Avoidance and Minimization During Dewatering

1. All dewatering activities conducted in streams bearing state- or federally-listed salmonids shall comply with the terms and conditions of the Russian River Biological Opinion (summarized in BMP BR-18), and any other Biological Opinions and associated Consistency Determinations issued by NOAA or DFG for the SMP.
2. Prior to dewatering, the best means to bypass flow through the work area will be determined to minimize disturbance to the channel and avoid direct mortality of fish and other aquatic vertebrates. The area to be dewatered will encompass the minimum area necessary to perform the maintenance activity. The period of dewatering will extend for the minimum amount of time needed to perform the maintenance activity. Where feasible and appropriate, dewatering will occur via gravity driven systems. Where feasible and appropriate, diversion structures shall be installed on concrete sections of the channels, such as concrete box culverts often used at road crossings.
3. A species relocation plan (BMP BR-5) shall be implemented as a reasonable best effort to ensure that native fish and other native aquatic vertebrates and macroinvertebrates are not stranded.

4. Instream cofferdams shall only be built from materials such as sandbags, clean gravel, or rubber bladders which will cause little or no siltation or turbidity. Visqueen shall be placed over sandbags to minimize water seepage into the maintenance areas. The visqueen shall be firmly anchored to the streambed to minimize water seepage. If necessary, the footing of the dam shall be keyed into the channel bed at an appropriate depth to capture the majority of subsurface flow needed to dewater the streambed.
5. When use of gravity fed dewatering is not feasible and pumping is necessary to dewater a work site, a temporary siltation basin and/or use of silt bags may be required to prevent sediment from re-entering the wetted channel.
6. Downstream flows adequate to prevent fish or vertebrate stranding will be maintained at all times during dewatering activities. Bypass pipe diameter will be sized to accommodate, at a minimum, twice the summer baseflow.
7. Diverted and stored water will be protected from maintenance activity-related pollutants, such as soils or equipment lubricants or fuels.
8. If necessary, discharged water will pass over some form of energy dissipater to keep erosion of the downstream channel to a minimum. Silt bags will be equipped to the end of discharge hoses and pipes to remove sediment from discharged water.
9. For full channel dewatering, filtration devices or settling basins will be provided as necessary to ensure that the turbidity of discharged water is not visibly more turbid than in the channel upstream of the maintenance site. If increases in turbidity are observed, additional measures shall be implemented such as a larger settling basin or additional filtration. If increases in turbidity persist, turbidity measurements will be taken on a regular (i.e., at least daily) basis up- and downstream of the cofferdam enclosure. Data recorded will be compared against Regional Water Quality Control Board Basin Plan water quality standards. If Basin Plan standards are being exceeded, additional measures shall be installed and monitored to ensure Basin Plan standards are met.
10. When maintenance is completed, the flow diversion structure shall be removed as soon as possible. Impounded water will be released at a reduced velocity to minimize erosion, turbidity, or harm to fish or amphibians downstream. Cofferdams will be removed so surface elevations of water impounded above the cofferdam will not be reduced at a rate greater than one inch per hour.
11. The area disturbed by flow bypass mechanisms will be restored at the completion of the project. This may include, but is not limited to, recontouring the area and planting of riparian vegetation as appropriate.

BMP BR-5: Fish and Amphibian Species Relocation Plan

1. All fish relocation conducted in streams bearing state- or federally-listed salmonids shall comply with the terms and conditions of the Russian River Biological Opinion (summarized in BMP BR-18), and any other Biological Opinions and associated Consistency Determinations issued by NOAA or DFG for the SMP. This measure will also apply to relocation of other special status species aquatic species (i.e., foothill yellow-legged frog and western pond turtle), and native aquatic species that could be relocated. Relocation for California red-legged frog will be conducted in accordance with BMPs BR-10 and BR-11 and any additional measures contained in the forthcoming SMP Biological Opinion issued by the USFWS.
2. Prior to and during dewatering activities, native fish, tadpoles, and other vertebrates will be excluded from the work area by blocking the stream channel above and below the work area with fine-meshed net or screens. The bottom of the screens will be

completely secured to the channel bed. Exclusion screening will be placed in areas of low water velocity to minimize fish impingement. Screens will be checked periodically and cleaned of debris to permit free flow of water.

3. The most efficient means for capturing fish will be determined and implemented. Complex stream habitat generally requires the use of electrofishing equipment, whereas in deep pools, fish may be concentrated by pumping-down the pool and then removing the fish by seining or dipnetting. Ample time will be scheduled to allow for a reasonable fish removal effort to be conducted.
4. Initial fish relocation efforts will be conducted several days prior to the start of maintenance activities. This provides the biologist an opportunity to return to the work area and perform additional electrofishing passes immediately prior to maintenance activities.
5. All native captured fish will be allowed to recover from electrofishing before being returned to the stream.
6. During dewatering, a qualified biologist will direct and monitor activities as necessary to net and rescue any additional fish and/or amphibians that may have become stranded throughout the dewatering process.
7. Prior to capturing fish and/or amphibians, the most appropriate release location(s) will be identified and used. The following issues will be considered when selecting release site(s):
 - proximity to the project area;
 - similar water temperature as capture location;
 - ample habitat availability prior to release of captured fish;
 - presence of other same species so that relocation of new individuals will not upset the existing prey/predation function;
 - low potential for relocated individual to transport disease; and
 - low likelihood of fish reentering work site or becoming impinged on exclusion net or screen.
8. In areas where aquatic vertebrates are abundant, to increase survival rates and ensure captured vertebrates are not held overly long, capture will be periodically ceased, and release will occur at predetermined locations.

BMP BR-6: On-Call Wildlife Biologist

A qualified biologist will be on-call in southern Sonoma County and available to visit a project site at any point during maintenance activities in the event a special-status species is encountered.

Impact BIO-6: Temporary Disturbance to Potential Upland Habitat and Loss of Individual California Tiger Salamander (CTS) (Less than Significant with Mitigation)

Most aquatic features within the SMP Area consist of channelized creeks that do not contain suitable CTS breeding habitat due to presence of native and non-native predators (i.e. red crayfish, three-spine stickleback, mosquito fish, sunfish, bullfrog, etc.) and high flows during winter when CTS breed. The V-ditches adjacent to access roads in the SMP Area do not hold

water long enough to support CTS breeding. Implementation of SMP activities would have no impact on suitable aquatic habitat for CTS within the Program Area (Cook 2008a).

Potential CTS upland/refuge habitat occurs along channel banks and along access roads and road shoulders. Gopher activity along channels is variable but occurs throughout the SMP Area. Potential impacts on suitable upland habitat may occur during sediment or debris removal, bank stabilization, and/or vegetation management activities. If ground disturbance within potential upland habitat occurs during the dry season, when CTS are typically underground, there is the potential for individuals to be crushed in burrows or excavated out of burrows. During any time of year, excavation of ground squirrel or pocket gopher burrows could adversely affect upland habitat for this species.

During early winter rains there is the potential for road mortality of migrating CTS. However, SCWA maintenance activities are unlikely to impact migrating salamanders because CTS movement occurs almost exclusively at night during rainfall and SCWA crews work during daylight hours due to safety concerns, and all activities except for planting occur outside of the rainy season.

Implementation of the following species specific measures would reduce the program impacts on CTS to a less-than-significant level.

Level of Significance: Less than significant with mitigation

Mitigation Measures:

BMP BR-5: Fish and Amphibian Species Relocation Plan

See Impact BIO-5.

BMP BR-12: California Tiger Salamander Avoidance and Impact Minimization Measures for Sediment and Debris Removal

1. For sediment and debris removal maintenance activities occurring in areas where California tiger salamander (CTS) has been identified as potentially occurring (see SMP Manual Table 7-3), a qualified biologist will conduct pre-maintenance surveys of upland habitats and identify areas with small mammal burrows. Areas with an abundance of small mammal burrows will be flagged and avoided by maintenance crews.
2. Maintenance activities will be restricted to the streambed and avoid disturbance to adjacent upland habitat.
3. Sediment and debris removal activities shall minimize removal of upland vegetation and soil compaction.
4. If upland banks must be traversed by heavy equipment to access a streambed, the route will be located where no small mammal burrows are present and will be delineated by temporary fencing to minimize upland habitat disturbance.
5. If burrows or other suitable aestivation habitat are present where sediment or debris removal activities are proposed, a qualified biological monitor or a biologist with an Incidental Take Permit will be on call during project activity in proximity to upland CTS habitat. The biological monitor will have the authority to stop work if a CTS is

encountered until such a time as the animal is moved to an area away from the project site.

6. Maintenance activities located in proximity to upland CTS habitat will be scheduled to avoid the CTS migration season (October 15 – June 30). If work must be completed during the migration season, barrier fencing will be installed to exclude CTS from maintenance areas.
7. In the event that a CTS is encountered within the maintenance area, a biologist with an Incidental Take Permit, or biologist approved by the USFWS, will move the salamander to a safe location with suitable underground refugia (e.g., open burrow of appropriate depth) outside of the maintenance area. Actions taken to move CTS will be consistent with applicable USFWS and CDFG regulations and permits.
8. The USFWS Sacramento Field Office will be contacted within 48 hours of any California tiger salamander observations.

BMP BR-13: California Tiger Salamander Avoidance and Impact Minimization Measures for Bank Stabilization

1. For bank stabilization activities occurring in areas where California tiger salamander has been identified as potentially occurring (see SMP Manual Table 7-3), a qualified biologist will conduct pre-maintenance surveys of upland habitats and identify areas with burrows and/or other suitable aestivation habitat.
2. If burrows or other suitable aestivation habitat are present where bank stabilization activities are proposed, a qualified biological monitor or a biologist with an Incidental Take Permit, will be on call during project activity in proximity to upland CTS habitat. The biological monitor will have the authority to stop work if a CTS is encountered until such a time as the animal is moved to an area away from the project site.
3. Maintenance activities located in proximity to upland CTS habitat will be scheduled to avoid the CTS migration season (October 15 – June 30). If work must be completed during the migration season, barrier fencing will be installed to exclude CTS from maintenance areas.
4. In the event that a California tiger salamander is encountered within the maintenance area, a biologist with an Incidental Take Permit, or biologist approved by the USFWS, will move the salamander to a safe location with suitable underground refugia (e.g., open burrow of appropriate depth) outside of the fenced maintenance area. Actions taken to move CTS will be consistent with applicable USFWS and CDFG regulations and permits.
5. The USFWS Sacramento Field Office will be contacted within 48 hours of any California tiger salamander observations.

BMP BR-14: California Tiger Salamander Avoidance and Impact Minimization Measures for Vegetation Management

1. For vegetation management activities occurring in areas where California tiger salamander has been identified as potentially occurring (see SMP Manual Table 7-3), a qualified biologist will conduct pre-maintenance surveys of upland habitats and

identify areas with small mammal burrows. Areas with an abundance of small mammal burrows will be flagged and avoided by maintenance crews.

2. Based on surveys, if California tiger salamander is identified as potentially present, then access across upland channel banks and adjacent upland habitats will be by foot only. Vehicles will be restricted to existing access roads.
3. A qualified biological monitor, or biologist with an Incidental Take Permit, will be on call during project activity in proximity to upland CTS habitat. The biological monitor will have the authority to stop work if a CTS is encountered until such a time as the animal is moved to an area away from the project site.
4. In the event that a California tiger salamander is encountered within the maintenance area, a biologist with an Incidental Take Permit, or biologist approved by the USFWS, will move the salamander to a safe location with suitable underground refugia (e.g., open burrow of appropriate depth) outside of the fenced maintenance area. Actions taken to move CTS will be consistent with applicable USFWS and CDFG regulations and permits.
5. The USFWS Sacramento Field Office will be contacted within 48 hours of any California tiger salamander observations.

Impact BIO-7: Temporary Disturbance to Potential Aquatic and Upland Habitat and Loss of Individual California Red-legged Frog (CRLF) (Less than Significant with Mitigation)

SCWA may conduct maintenance activities in natural, modified, and engineered channels within the range of this species.

Natural channels in the SMP Area provide potential aquatic habitat for CRLF. Some channels in the lower gradient areas have in-channel vegetation and slow moving, backwater areas that provide microhabitat features essential for this species. Instream vegetation provides habitat for securing egg masses and refuge for tadpoles and adults. Debris removal activities could impact suitable aquatic habitat for California red-legged frog through disturbance of instream vegetation. However, CRLFs have not been documented in natural channels maintained by SCWA (CDFG 2008a).

Engineered and modified channels may provide potential movement habitat for CRLF especially during summer months when sources of perennial water are scarce. However, due to their modified condition, these channels do not contain the complexity necessary to support breeding habitat for CRLF.

Potential upland/refuge habitat occurs along channel banks and along access roads and road shoulders. As with CTS, potential impacts on suitable upland or estivation habitat may occur during sediment or debris removal, bank stabilization, and/or vegetation management activities. If ground disturbance within potential upland habitat occurs during the dry season, when CRLF are typically underground, there is the potential for individuals to be crushed in burrows or excavated out of burrows. During any time of year, excavation of ground squirrel or pocket gopher burrows could adversely affect upland habitat for this species.

During early winter rains there is the potential for road mortality of migrating CRLF. However, SCWA maintenance activities are unlikely to affect migrating amphibians because movements occur almost exclusively at night during rainfall and SCWA crews work during daylight hours due to safety concerns, and all activities except for planting occur outside of the rainy season.

Vegetation management, bank stabilization and sediment removal activities could impact suitable habitat for CRLF in the SMP Area. Implementation of the following species specific measures would reduce the program impacts on CRLF to a less-than-significant level.

Level of Significance: Less than significant with mitigation

Mitigation Measures:

BMP BR-5: Fish and Amphibian Species Relocation Plan

See Impact BIO-5.

BMP BR-10: California Red-legged Frog Avoidance and Impact Minimization Measures for Ground-Disturbing Activities

1. For ground-disturbing maintenance activities occurring in areas where California red-legged frog (CRLF) has been identified as potentially occurring (see SMP Manual Table 7-3), a qualified biologist will conduct pre-maintenance surveys to assess habitat within the proposed maintenance area.
2. If suitable breeding or foraging habitat is present then focused surveys using the USFWS CRLF survey protocol will be completed or CRLF presence will be assumed. The USFWS will be contacted and any site-specific recommendations will be implemented.
3. If CRLF are present or assumed present, a qualified biological monitor, or a biologist with an Incidental Take Permit, will inspect the area daily before the start of work and will be present during maintenance activities in sensitive habitats. If appropriate, SCWA will install exclusionary fencing.
4. In the event that a CRLF is encountered within the maintenance area, the USFWS Sacramento Field Office will be contacted within 48 hours of any CRLF observations, and a qualified biologist will move the frog to a safe location outside of the project area. Actions taken to move CRLF will be consistent with applicable USFWS and CDFG regulations and permits. The biological monitor will have the authority to stop work if a CRLF is encountered until such a time as the frog may be moved to an area outside of the project area fencing.
5. If dewatering of a creek is required, dipnet and seine surveys for CRLF tadpoles will be completed prior to initiation of dewatering. Captured tadpoles will be moved to a safe location elsewhere in the creek.

BMP BR-11: California Red-legged Frog Avoidance and Impact Minimization Measures for Vegetation Management

1. For vegetation maintenance activities occurring in areas where CRLF frog has been identified as potentially occurring (see SMP Manual Table 7-3), a qualified biologist will conduct pre-maintenance surveys of aquatic habitats and identify potential CRLF

breeding and foraging areas. These areas will be flagged and avoided by maintenance crews.

2. In areas where CRLF could potentially occur, field crews conducting hand trimming of vegetation will access channel banks by foot only and will avoid entering open water. Vehicles will be restricted to existing access roads.
3. In work sites where potential CRLF breeding and foraging areas were identified during the pre-maintenance survey, a qualified biological monitor or a biologist with an Incidental Take Permit, will be on-site during project activity in sensitive habitats. The biological monitor will have the authority to stop work if a CRLF (or any of its life stages) is encountered until such a time as the frog may be moved to an area away from the project site.
4. The USFWS Sacramento Field Office will be contacted within 48 hours of any CRLF observations.

Impact BIO-8: Temporary Disturbance to Potential Aquatic Habitat and Loss of Individual Foothill Yellow-legged Frog (Less than Significant with Mitigation)

The potential impact on the foothill yellow-legged frog, although present, is low due to the geographic separation of this frog and most SCWA maintenance activities. Foothill yellow-legged frog occurs primarily in natural moderate-gradient streams in mountainous areas. In the Program Area, these areas are typically higher in the watershed than where SMP maintenance activities occur on the lower alluvial plains.

Vegetation management and sediment removal in natural moderate-gradient channels have the potential to impact suitable habitat for foothill yellow-legged frogs. Since foothill yellow-legged frogs have high site fidelity and are sometimes reluctant to move far, these maintenance activities also have the potential to impact individuals. Deposited eggs and tadpoles could be lost during in-channel work that requires excavation of sediment, and adults and juveniles could be lost during in-stream dredging or vegetation clearing activities. Overall the temporary or permanent removal of vegetative cover and in-stream cobblestone sediment will reduce the habitat quality for this species in reaches where maintenance activities occur.

Implementation of the following species specific mitigation measures would reduce the program impacts on foothill yellow-legged frog to a less-than-significant level.

Level of Significance: Less than significant with mitigation

Mitigation Measures:

BMP BR-5: Fish and Amphibian Species Relocation Plan

See Impact BIO-5.

BMP BR-15: Foothill Yellow-legged Frog Avoidance and Impact Minimization Measures for Ground-Disturbing Activities

1. For ground-disturbing activities occurring in areas where foothill yellow-legged frog has been identified as potentially occurring (see SMP Manual Table 7-3), a qualified

biologist will conduct pre-maintenance surveys to assess habitat within the proposed maintenance area.

2. A qualified biologist will inspect the maintenance area daily before the start of work. If appropriate, SCWA will install exclusionary fencing. In the event that foothill yellow-legged frogs are encountered within the maintenance area, a qualified biologist will move the frog to a safe location outside of the maintenance area. Actions taken to move foothill yellow-legged frog will be consistent with applicable CDFG regulations and permits.
3. If dewatering a creek segment is required, a qualified biologist will conduct visual and dipnet surveys and move captured frogs and tadpoles to a safe location in the creek. Actions taken to move foothill yellow-legged frog will be consistent with applicable CDFG regulations and permits.
4. CDFG will be notified within 48 hours of any foothill yellow-legged frog observations.

BMP BR-16: Foothill Yellow-legged Frog Avoidance and Impact Minimization Measures for Vegetation Management

1. For vegetation maintenance activities occurring in areas where foothill yellow-legged frog has been identified as potentially occurring (see SMP Manual Table 7-3), a qualified biologist will conduct pre-maintenance surveys of aquatic habitats and identify potential foothill yellow-legged frog breeding and foraging areas. These areas will be flagged and avoided by maintenance crews.
2. Based on surveys, if foothill yellow-legged frog is identified as potentially present, then field crews will access channel banks by foot only and will avoid entering open water. Vehicles will be restricted to existing access roads.

Impact BIO-9: Temporary Disturbance to Potential Habitat and Loss of Individual Western Pond Turtle (Less than Significant with Mitigation)

Vegetation management and sediment removal activities have the potential to affect western pond turtles in the SMP Area. Western pond turtles will typically move out of harm's way by avoiding areas where work is occurring. Although the chance of encountering a turtle nest is very low, nests could be lost during near-channel work that requires mobilizing equipment off-road. Overall the removal of vegetative cover or in-channel woody debris could reduce the habitat quality for this species by removing basking sites and escape cover in reaches where maintenance activities occur. Western pond turtles may benefit from sediment removal in high sediment-loaded urban creeks where deep, open water habitat is limited. However, sediment removal activities may also temporarily alter or remove underwater refugia.

Stream maintenance activities will incorporate measures to reduce potential impacts to western pond turtle. Vegetation removal activities should allow for a percentage of instream vegetation and woody debris to remain in the stream channel and riparian zone.

Implementation of the following species specific measures would reduce the program impacts on western pond turtle to a less-than-significant level.

Level of Significance: Less than significant with mitigation

Mitigation Measures:

BMP BR-17: Western Pond Turtle Pre-maintenance Surveys for Ground-Disturbing Activities

1. For projects located in areas where western pond turtle has been identified as potentially occurring (see SMP Manual Table 7-3), a qualified biologist will conduct pre-maintenance surveys to assess habitat within the proposed maintenance area.
2. If suitable instream habitat for the western pond turtle is present in the maintenance area, a qualified biologist will inspect the maintenance area daily before the start of work. In the event that a western pond turtle is encountered before or during the maintenance activity, a qualified biologist will move the turtle to a safe location outside of the work area. Actions taken to move western pond turtle will be consistent with applicable CDFG regulations and permits.
3. If dewatering of a creek segment is required, a qualified biologist will be present and will move turtles – if found – to a safe location in the creek. Actions taken to move western pond turtle will be consistent with applicable CDFG regulations and permits.
4. CDFG will be notified within 48 hours of any western pond turtle observations.

Impact BIO-10: Temporary Disturbance to Potential Nesting Habitat for Migratory Birds and Raptors (Less than Significant with Mitigation)

Riparian, woodland, emergent wetland and shrub communities in the SMP Area may provide potential nesting habitat for special-status birds, including raptors protected under California Fish and Game Code 3503, and other nesting birds protected under the MBTA. Most maintenance activities, if conducted during the bird nesting season (February 15th through August 15th) have the potential to impact nesting migratory birds and/or special-status birds and raptors. This is due to the widespread nature of migratory bird and raptor breeding habitat. Trimming or removal of trees, shrubs, and other vegetation may result in direct impacts to these species due to the loss of possible nests and any associated eggs and/or nestlings. Noise and maintenance activities within the channels may preclude or disrupt nesting in these areas throughout the duration of the maintenance period. Any activities that require ground excavation or vegetation removal have the potential to remove or disturb migratory bird nests during the breeding season. Other activities, particularly those that require mobilizing large equipment, have the potential to disturb nesting birds due to excessive noise.

To reduce the impact of the Proposed Program on nesting bird habitat within and adjacent to SCWA maintained channels the following mitigation measures will be implemented.

Level of Significance: Less than significant with mitigation

Mitigation Measures:

BMP BR-2: Pre-Maintenance Educational Training

See Impact BIO-2

BMP BR-8: Nesting Migratory Bird and Raptor Pre-maintenance Surveys

1. To the extent feasible, maintenance activities, including tree trimming, will take place outside the migratory bird and raptor nesting period (February 15 through August 15 for most birds). During the nesting bird season, work sites that are less densely vegetated will be prioritized, to facilitate pre-maintenance surveys and decrease the likelihood of disturbing undiscovered nests.
2. If maintenance activities must be scheduled to occur during the nesting season, a qualified wildlife biologist, familiar with the species and habitats in the Program Area, will be retained to conduct pre-maintenance surveys for raptors and nesting birds within suitable nesting habitat within 300 feet of SMP activities. The surveys should be conducted within one week before initiation of maintenance activities within those habitats. If no active nests are detected during surveys, activities may proceed. Vegetation removal activities will be conducted under the guidance of a biologist. If active nests are detected then measures 3 and 4 would be implemented.
3. If active nests are identified within the SMP Area, non-disturbance buffers shall be established at a distance sufficient to minimize disturbance based on the nest location, topography, cover and species' tolerance to disturbance. Buffer size shall be determined in cooperation with the CDFG. If active nests are found within 300 feet of the project area, a qualified biologist shall be on site as necessary to monitor the nests for signs of nest disturbance. If it is determined that maintenance activity is resulting in nest disturbance, work shall cease immediately and CDFG shall be contacted. Buffers will be developed through consultation with CDFG. Buffers will remain in place until biologists determine that the young have successfully fledged or nests have been otherwise abandoned.

Impact BIO-11: Disturbance to Potential Roosting and Foraging Habitat for Special-Status Bat Species (Less Than Significant with Mitigation)

Vegetation and debris removal activities in the SMP Area may represent a temporary impact to suitable roosting and foraging habitat for special-status bat species. Maintenance activities would not result in long-term direct impacts to suitable habitat for these species. There are no specific mitigation measures required for this potential impact because it is unlikely that the proposed maintenance activities would have any long-term adverse impacts on bat species of concern. However incorporation of the General Biological Resource BMPs BR-1, BR-2, BR-3, and BR-6 will minimize impacts on potential roosting and foraging habitat in the SMP work areas by reducing the project footprint, conducting pre-maintenance educational training for contractors, retaining as much native vegetation as possible, and retaining an on-call biologist for surveys, monitoring, and guidance in the event special-status species (including bats) are encountered during program activities.

Level of Significance: Less than significant with mitigation

Mitigation Measures:

BMP BR-1: Area of Disturbance

See Impact BIO-2

BMP BR-2: Pre-Maintenance Educational Training

See Impact BIO-2

BMP BR-3: Biotechnical Bank Stabilization

See Impact BIO-2

BMP BR-6: On-Call Wildlife Biologist

See Impact BIO-5

Impact BIO-12: Control of Invasive Plant Species (Beneficial)

Invasive species include species that are non-native to California and were introduced after European settlement as a direct result of human activity. Non-native invasive plant species are typically distinguished from common weeds by the threats they pose to wildland habitats. The SMP Area contains several invasive species that pose threats to wildland habitats and degrade habitat quality for special-status plants and wildlife (particularly water primrose [*Ludwigia* spp.], giant reed (*Arundo donax*), French broom (*Genista monspessulana*), Pampas grass (*Cortaderia jubata*, and *C. selloana*), and slough mustard (*Lepidium latifolium*)). Controlling spread of invasive plant species will facilitate enhancement of riparian canopy and aquatic understory where currently there is none or where it is poorly developed.

SCWA incorporates different methods to control and manage invasive species in and around SMP channels depending on resource sensitivity. Vegetation management techniques include hand removal using small tools and hand-held gas-powered equipment, mechanical removal using heavy equipment, and spot chemical control. Heavy equipment used for vegetation removal may include a flail mower attachment on an excavator or Bobcat® that is used to cut cattails or blackberries; or a backhoe or rubber-tracked excavator that is used for removing material from the channel. Increases in riparian canopy cover will also shade out certain invasive species (such as ludwigia). In addition, the SMP involves extensive planting of native species, which would reduce the potential for invasive species to become established. Implementation of SMP vegetation management activities would result in an overall reduction and long-term elimination of invasive species. A beneficial impact would result through the overall long-term increase of special-status species diversity or abundance through routine removal of invasive species and planting of appropriate native species. SMP vegetation removal activities complement on-going efforts to remove the non-native *Ludwigia* spp. from natural habitats within the Santa Rosa Plain; specifically the CDFG managed Laguna Wildlife Area and implementation of a Ludwigia Control Project in the worst affected areas of the Laguna de Santa Rosa, which began in April 2007.

Level of Significance: Beneficial

Impact BIO-13: Improve Water Quality and Aquatic Conditions for Special-Status Species (Beneficial)

In Chapter 4 of the Laguna Plan (Enhancing and Caring for The Laguna De Santa Rosa by Honton and Sears 2006), sediment removal from flood control channels is described as a solution towards downstream natural resource protection. The Laguna Plan also states that abundant sediment deposition from upstream watershed sources impacts habitat

conditions and stream integrity (Honton and Sears 2006). Reduction of sediment delivery to and infilling of valuable downstream aquatic resources of the Laguna de Santa Rosa, Petaluma Marsh, and Sonoma Marsh through targeted sediment capture and removal activities will provide a long-term benefit to the special-status species that rely on these aquatic habitats for part or all of their life history requirements. Special-status invertebrates, fish and amphibians addressed in this chapter will benefit from SMP sediment removal activities in the following ways:

- reduction of erosion and sediment loading through repair of destabilized banks;
- development of naturalized and sustainable low-flow channels within the original as-built channel; and
- reduction of future in-channel maintenance and the related temporary effects to aquatic and riparian resources.

Additionally, as part of the SMP SCWA will address the loss of wetland habitat to ensure no net loss of habitat functions and values. As described above for *Impact BIO-1* and in Chapter 8 of the SMP Manual, mitigation will include on-site (Tier 1) restoration at a 1:1 ratio (acres restored to acres disturbed), which will return a maintenance site to, or improve upon, its original (pre-maintenance) condition. In addition, Tier 2 and Tier 3 off-site mitigation will be developed to address the temporary loss of Beneficial Uses and ecological functions and values during the time gap between SMP maintenance activities and when Tier 1 mitigation occurs, and the time when Tier 1 mitigation has become fully functional and the temporary impacts have been eliminated. Off-site mitigation will be funded at a rate of 10% of the maintenance cost for the given year, and will supply mitigation at a minimum rate of 0.1:1, for a total mitigation ratio of at least 1.1:1. As described in Chapter 8 of the SMP Manual, this approach will typically result in mitigation ratios that are greater than 1.1:1. The combination of on-site and regional restoration efforts will beneficially impact biological resources in the Program Area.

As a result, implementation of the Proposed Program will contribute to the protecting the long-term ecological health of biological resources in Sonoma County.

Level of Significance: Beneficial

Table 3.3-1. Special Status Plant Species with Potential to Occur in the SMP Area

SPECIES NAME COMMON NAME	FEDERAL, STATE, & CNPS LISTING ¹	HABITAT PREFERENCES, DISTRIBUTION INFORMATION, & ADDITIONAL NOTES ¹	FLOWERING PHENOLOGY/ LIFE FORM	HABITAT SUITABILITY & LOCAL DISTRIBUTION	POTENTIAL FOR OCCURRENCE
FEDERAL/STATE ENDANGERED OR THREATENED AND CALIFORNIA RARE SPECIES					
<i>Alopecurus aequalis</i> var. <i>sonomensis</i> Sonoma <i>Alopecurus</i>	FE CEQA 1B.1	Occurs in freshwater marshes and swamps and riparian scrub. Known from MRN and SON counties between 5-365 meters. Known from fewer than ten occurrences. Recognized as <i>A. aequalis</i> in TJM. Not clearly distinct (SCF).	May-July perennial herb	Suitable vegetation associations and hydrology present within SMP work areas. Taxon has been recorded from Zones 1A, 3A, 5A, and 8A. The nearest CNDDDB record to a reach is a non-specific occurrence (EONDX #22479) located near Llano Road near Highway 116 northwest of Cotati approximately 0.5 miles southwest of Laguna de Santa Rosa (Laguna 1 Reach).	Possible: In Zones 1A, 3A, 5A, and 8A where reaches support Willow Scrub, Mixed Riparian Scrub, and emergent wetlands.
<i>Arctostaphylos bakeri</i> ssp. <i>bakeri</i> Baker's manzanita	None CR 1B.1	Occurs in broadleaved upland forest and chaparral often on serpentine. Known only from SON County between 75-300 meters from fewer than ten occurrences.	February-April evergreen shrub	No suitable vegetation associations or preferred bedrock present within SMP work areas. Taxon restricted to uplands near Camp Meeker and Pocket Canyon in Zone 5A.	None
<i>Arctostaphylos bakeri</i> ssp. <i>sublaevis</i> The Cedars manzanita	None CR 1B.2	Occurs on serpentine in closed-cone coniferous forest and chaparral. Known only from SON County between 185-760 meters.	February-May evergreen shrub	No suitable vegetation associations or preferred bedrock present within SMP work areas. Taxon restricted to uplands in The Cedars, near Austin Creek State Recreation Area, and Palmer Creek in Zones 5A and 6A.	None
<i>Arctostaphylos densiflora</i> Vine Hill manzanita	None Endangered 1B.1	Occurs on acid marine sand supporting chaparral. Known only from SON County between 50-120 meters from only one occurrence on the Sonoma Barren near Forestville.	February-April evergreen shrub	No suitable vegetation associations or preferred substrate present within SMP work areas. Taxon restricted to uplands in the vicinity of Vine Hill in Zones 1A.	None

Table 3.3-1. Special Status Plant Species with Potential to Occur in the SMP Area

SPECIES NAME COMMON NAME	FEDERAL, STATE, & CNPS LISTING ¹	HABITAT PREFERENCES, DISTRIBUTION INFORMATION, & ADDITIONAL NOTES ¹	FLOWERING PHENOLOGY/ LIFE FORM	HABITAT SUITABILITY & LOCAL DISTRIBUTION	POTENTIAL FOR OCCURRENCE
<i>Astragalus claranus</i> Clara Hunt's milk-vetch	FE ST 1B.1	Occurs on serpentinitic, volcanic, rocky, or clayey sites in openings of chaparral, cismontane woodland, and valley and foothill grassland. Known from NAP and SON counties between 75-275 meters from only five occurrences.	March-May annual herb	No suitable vegetation associations or preferred volcanic or serpentinitic bedrock present within SMP work areas. Taxon has been recorded from uplands east of Alpine School near Calistoga Road and the confluence of Weeks and Mark West creeks in Zone 1A.	None
<i>Blennosperma bakeri</i> Sonoma sunshine	FE SE 1B.1	Occurs in mesic valley and foothill grassland and vernal pools. Known only from SON County from the Laguna de Santa Rosa and Sonoma area between 10-110 meters.	March-May annual herb	Suitable vegetation associations and hydrology present within SMP work areas. Taxon has been recorded from Zones 1A and 3A. The nearest CNDDDB record to a reach is a specific occurrence (EONDX #5298) located north of Four Corners and south of Newcomb Street approximately 0.15 miles east of Fryer Creek (Fryer 1 Reach).	Possible: In Zones 1A and 3A where reaches support areas functioning as seasonal wetlands and in access routes near vernal pool habitat and/or plant conservation areas.

Table 3.3-1. Special Status Plant Species with Potential to Occur in the SMP Area

SPECIES NAME COMMON NAME	FEDERAL, STATE, & CNPS LISTING ¹	HABITAT PREFERENCES, DISTRIBUTION INFORMATION, & ADDITIONAL NOTES ¹	FLOWERING PHENOLOGY/ LIFE FORM	HABITAT SUITABILITY & LOCAL DISTRIBUTION	POTENTIAL FOR OCCURRENCE
<i>Carex albida</i> Sonoma white sedge	FE SE 1B.1	Occurs in bogs and fens and freshwater marshes and seeps. Known only from SON County at one confirmed extant occurrence at Pitkin Marsh. Has been recorded as occurring between 15-90 meters.	May-July rhizomatous herb	Suitable vegetation associations and hydrology present within SMP work areas. Taxon has been recorded from Zones 1A and 5A. The nearest CNDDDB record to a reach is a non-specific occurrence (EONDX #47272) located south east of the intersection of College Avenue and Wright Road approximately 0.10 miles southwest of the confluence of Laguna de Santa Rosa (Santa Rosa 3 Reach) and College Creek (College 1 Reach).	Possible: In Zones 1A and 5A where reaches support emergent wetlands.
<i>Castilleja uliginosa</i> Pitkin Marsh Indian paintbrush	None SE 1A	Occurs in freshwater marshes and swamps. Known only from SON County from Pitkin Marsh and Trembley's Marsh however the last known remaining plant died in 1987 and now only exists in the UC Botanical Garden. Recognized as <i>C. miniata</i> ssp. <i>miniata</i> in TJM.	June-July perennial herb hemiparasitic	Although marginally suitable vegetation associations are present within SMP work areas, this taxon was highly restricted in its distribution at Pitkin and Trembley's marshes in Zone 5A. However, this taxon no longer grows in the wild and is considered extirpated from its native habitat.	Not Expected
<i>Chorizanthe valida</i> Sonoma spineflower	FE SE 1B.1	Occurs in sandy coastal prairie. Known only from MRN County. Presumed extirpated from SON County. Has been recorded as occurring between 10-305 meters. Only extant occurrence was rediscovered in 1980 at Pt. Reyes. Closely related to <i>C. pungens</i> .	June-August annual herb	No suitable vegetation associations or preferred substrate present within SMP work areas. Taxon was historically collected from uplands in the vicinity of Fort Ross, Petaluma, and Sebastopol Vine Hill in Zones 1A, 2A, and 7A.	None

Table 3.3-1. Special Status Plant Species with Potential to Occur in the SMP Area

SPECIES NAME COMMON NAME	FEDERAL, STATE, & CNPS LISTING ¹	HABITAT PREFERENCES, DISTRIBUTION INFORMATION, & ADDITIONAL NOTES ¹	FLOWERING PHENOLOGY/ LIFE FORM	HABITAT SUITABILITY & LOCAL DISTRIBUTION	POTENTIAL FOR OCCURRENCE
<i>Clarkia imbricata</i> Vine Hill Clarkia	FE SE 1B.1	Occurs on acidic sandy loam soils in chaparral and valley and foothill grassland. Known only from SON County from two extant occurrences between 50-75 meters.	June-August annual herb	No suitable vegetation associations or preferred bedrock present within SMP work areas. Taxon is also highly restricted in its distribution to the immediate vicinity of uplands of Vine Hill in Zone 1A.	None
<i>Cordylanthus mollis</i> ssp. <i>mollis</i> soft bird's beak	FE CR 1B.2	Occurs in coastal salt marshes and swamps. Known from CCA, NAP, and SOL counties. Presumed extirpated from MRN, SAC, and SON counties. Has been recorded from 0-3 meters. Known from fewer than 15 occurrences.	July-November annual herb hemiparasitic	No suitable vegetation associations, appropriate pH, or tidally influenced lands present within SMP work areas. Taxon has only been recorded in near Bently Wharf and Petaluma Marsh in Zone 9A.	None
<i>Cordylanthus tenuis</i> ssp. <i>capillaris</i> Pennell's bird's-beak	FE CR 1B.2	Occurs on serpentine in closed-cone coniferous forest and chaparral. Known only from SON County from fewer than five occurrences between 45-305 meters.	June-September annual herb hemiparasitic	No suitable vegetation associations or preferred bedrock present within SMP work areas. Taxon has been recorded from uplands near Camp Meeker and the lower reach of Porter Creek in Zone 5A.	None
<i>Delphinium bakeri</i> Baker's larkspur	FE SE 1B.1	Occurs often on mesic sites and decomposed shale in broadleaved upland forest, coastal scrub, and valley and foothill grassland. Known from MRN County from only one extant occurrence along Salmon Creek. Presumed extirpated from SON County. Has been recorded from between 80-305 meters.	March-May perennial herb	No suitable vegetation associations or preferred bedrock present within SMP work areas. Taxon recorded only from uplands of Coleman Valley in Zone 8A.	None

Table 3.3-1. Special Status Plant Species with Potential to Occur in the SMP Area

SPECIES NAME COMMON NAME	FEDERAL, STATE, & CNPS LISTING ¹	HABITAT PREFERENCES, DISTRIBUTION INFORMATION, & ADDITIONAL NOTES ¹	FLOWERING PHENOLOGY/ LIFE FORM	HABITAT SUITABILITY & LOCAL DISTRIBUTION	POTENTIAL FOR OCCURRENCE
<i>Delphinium luteum</i> yellow larkspur	FE CR 1B.1	Occurs on rocky sites in chaparral, coastal prairie, and coastal scrub. Known from MRN and SON counties between 0-100 meters from only four occurrences. This taxon hybridizes with <i>D. nudicaule</i> .	March-May perennial herb	No suitable vegetation associations or preferred bedrock present within SMP work areas. Taxon has been recorded from uplands of Coleman Hill, Cheney Gulch, Graton, and west of Petaluma in Zones 2A, 5A, and 8A.	None
<i>Dichanthelium lanuginosum</i> var. <i>thermale</i> Geysers dichanthelium	None Endangered	Occurs on geothermally-altered soils, sometimes streamside, in closed-cone coniferous forest, riparian forest, and valley and foothill grassland. Known only from SON County from The Geysers geothermal area from between 305-825 meters. Recognized as <i>Panicum acuminatum</i> var. <i>acuminatum</i> in TJM.	June-August perennial herb	No suitable vegetation associations or preferred substrate present within SMP work areas. Taxon is highly restricted in its spatial and elevational distribution in The Geysers area in Zone 4A.	None
<i>Eryngium constancei</i> Loch Lomond button-celery	FE SE 1B.1	Occurs in vernal pools. Known from LAK, NAP, and SON counties between 460-855 meters. Identification of this collection was verified by Lincoln Constance.	April-June annual/perennial herb	Although suitable vegetation associations may be present adjacent to SMP work areas this taxon has only been recorded from one location in SON County at higher elevations near Diamond Mountain in Zone 1A.	Not Expected
<i>Fritillaria roderickii</i> Roderick's fritillary	None SE 1B.1	Occurs in coastal bluff scrub, coastal prairie, and valley and foothill grassland. Known from MEN and SON counties between 15-400 meters from fewer than ten occurrences. Recognized as <i>F. biflora</i> var. <i>biflora</i> in TJM.	March-May bulbiferous herb	No suitable vegetation associations present within SMP work areas. Taxon has only been recorded from one location in SON County in Gualala Point County Park in Zone 7A.	None

Table 3.3-1. Special Status Plant Species with Potential to Occur in the SMP Area

SPECIES NAME COMMON NAME	FEDERAL, STATE, & CNPS LISTING ¹	HABITAT PREFERENCES, DISTRIBUTION INFORMATION, & ADDITIONAL NOTES ¹	FLOWERING PHENOLOGY/ LIFE FORM	HABITAT SUITABILITY & LOCAL DISTRIBUTION	POTENTIAL FOR OCCURRENCE
<i>Lasthenia burkei</i> Burke's goldfields	FE SE 1B.1	Occurs in mesic meadows and seeps and vernal pools. Known from LAK, MEN, NAP, and SON counties between 15-600 meters.	April-June annual herb	Suitable vegetation associations and hydrology present within SMP work areas. Taxon has been recorded from Zones 1A and 4A. The nearest CNDDDB record to a reach is a specific occurrence (EONDX #4769) located south of Saunders Avenue and east of Sonoma County Airport approximately 0.15 miles west of Airport Creek (Airport 2 Reach).	Possible: In Zones 1A and 4A where reaches support areas functioning as seasonal wetlands and in access routes near vernal pool habitat and/or plant conservation areas.
<i>Lasthenia conjugens</i> Contra Costa goldfields	FE CEQA 1B.1	Occurs on mesic sites in cismontane woodland, alkaline playas, valley and foothill grassland, and vernal pools. Known from ALA, CCA, MNT, MRN, NAP, SOL, and SON counties from between 0-470 meters. Presumed extirpated from MEN and SBA counties.	March-June annual herb	Although suitable vegetation associations and hydrology may be present adjacent to SMP work areas this taxon has only been recorded from one location in SON County near the junction of Petaluma and Adobe Roads above Champlin Creek in Zone 9A.	Not Expected
<i>Lilium pardalinum</i> <i>ssp. pitkinense</i> Pitkin Marsh lily	FE SE 1B.1	Occurs on mesic and sandy sites in cismontane woodland, meadows and seeps, and freshwater marshes and swamps. Known only from SON County from two occurrences near Sebastopol between 35-65 meters.	June-July bulbiferous herb	Although marginally suitable vegetation associations are present within SMP work areas, this taxon is highly restricted in its distribution at Pitkin and Cunningham marshes in Zones 1A and 5A.	Not Expected

Table 3.3-1. Special Status Plant Species with Potential to Occur in the SMP Area

SPECIES NAME COMMON NAME	FEDERAL, STATE, & CNPS LISTING ¹	HABITAT PREFERENCES, DISTRIBUTION INFORMATION, & ADDITIONAL NOTES ¹	FLOWERING PHENOLOGY/ LIFE FORM	HABITAT SUITABILITY & LOCAL DISTRIBUTION	POTENTIAL FOR OCCURRENCE
<i>Limnanthes vinculans</i> Sebastopol meadowfoam	FE SE 1B.1	Occurs on vernal mesic sites in meadows and seeps, valley and foothill grassland, and vernal pools. Known from SON County. Possibly occurs in NAP County. Has been recorded between 15-305 meters.	April-May annual herb	Suitable vegetation associations and hydrology present within SMP work areas. Taxon has been recorded from Zones 1A, 4A and 5A. The nearest record to a reach is a specific occurrence (Laguna Foundation) located within the Santa Rosa Air Center approximately 100 feet east of Roseland Creek (Roseland 3 Reach).	Possible: In Zones 1A, 4A and 5A where reaches support areas functioning as seasonal wetlands and in access routes near vernal pool habitat and/or plant conservation areas.
<i>Lupinus tdestromii</i> Tidestrom's lupine	FE SE 1B.1	Occurs on coastal dunes. Known from MNT, MRN, and SON counties between 0-100 meters from fewer than 20 occurrences. This taxon includes <i>L. tdestromii</i> var. <i>layneae</i> .	April-June rhizomatous herb	No suitable vegetation associations present within SMP work areas. Taxon is restricted to upland and coastal habitat near the mouth of the Russian River and Bodega Head in Zones 5A and 8A.	None

Table 3.3-1. Special Status Plant Species with Potential to Occur in the SMP Area

SPECIES NAME COMMON NAME	FEDERAL, STATE, & CNPS LISTING ¹	HABITAT PREFERENCES, DISTRIBUTION INFORMATION, & ADDITIONAL NOTES ¹	FLOWERING PHENOLOGY/ LIFE FORM	HABITAT SUITABILITY & LOCAL DISTRIBUTION	POTENTIAL FOR OCCURRENCE
<i>Navarretia leucocephala</i> ssp. <i>plieantha</i> many-flowered navarretia	FE SE 1B.2	Occurs in volcanic ash flow vernal pools. Known from LAK and SON counties from approximately seven occurrences between 30-950 meters. This taxon is state-listed as <i>N. plieantha</i> and it rarely intergrades with ssp. <i>pauciflora</i> .	May-June annual herb	Suitable vegetation associations and hydrology present within SMP work areas. Taxon has been recorded from Zones 1A. The nearest CNDDDB record to a reach is a specific occurrence (EONDX #4676) located south of Saunders Avenue and east of Sonoma County Airport approximately 500 feet west of Airport Creek (Airport 2 Reach).	Possible: In Zone 1A where reaches support areas functioning as seasonal wetlands and in access routes near vernal pool habitat and/or plant conservation areas.
<i>Pleuropogon hooverianus</i> Hoover's semaphore grass	None ST 1B.1	Occurs in open and mesic areas in broadleafed upland forest, meadows and seeps, and North Coast coniferous forest. Known only from MEN, MRN, and SON counties between 10-671 meters.	April-August rhizomatous herb	No suitable vegetation associations present within SMP work areas. Taxon has been recorded from uplands near Freestone and along Pressley Road in Zones 1A and 8A.	None
<i>Potentilla hickmanii</i> Hickman's cinquefoil	FE SE 1B.1	Occurs in coastal bluff scrub, closed-cone coniferous forest, vernal mesic meadows and seeps, and freshwater marshes and swamps. Known from MNT and SMT counties. Presumed extirpated from SON County. Has been recorded from 10-135 meters.	April-August perennial herb	Although suitable vegetation associations and hydrology may be present within SMP work areas this taxon has only been recorded from one location in SON County at Cunningham Marsh in Zone 1A. The taxonomy of this occurrence is also in question as it may be a variant of <i>P. hickmanii</i> .	Not Expected

Table 3.3-1. Special Status Plant Species with Potential to Occur in the SMP Area

SPECIES NAME COMMON NAME	FEDERAL, STATE, & CNPS LISTING ¹	HABITAT PREFERENCES, DISTRIBUTION INFORMATION, & ADDITIONAL NOTES ¹	FLOWERING PHENOLOGY/ LIFE FORM	HABITAT SUITABILITY & LOCAL DISTRIBUTION	POTENTIAL FOR OCCURRENCE
<i>Sidalcea oregana</i> <i>ssp. valida</i> Kenwood Marsh checkerbloom	FE SE 1B.1	Occurs in freshwater marshes and swamps. Known only from SON county from three small occurrences at Knights Valley and Kenwood Marsh between 115-150 meters.	June-September rhizomatous herb	Although marginally suitable vegetation associations are present within SMP work areas, this taxon is highly restricted in its distribution at Knights Valley and Kenwood Marsh in Zones 3A and 4A.	Not Expected
<i>Trifolium</i> <i>amoenum</i> two-fork clover	FE CEQA 1B.1	Occurs in coastal bluff scrub and valley and foothill grassland that can be serpentinitic. Rediscovered in 1993. Currently only known from MRN County. Presumed extirpated from NAP, SCL, SOL, and SON counties. Has been recorded from 5-415 meters.	April-June annual herb	Although suitable vegetation associations may be present adjacent to SMP work areas, this taxon is only currently extant in MRN County. Historically it has been recorded from Zones 1A, 2A, 5A, and 8A.	Not Expected
CALIFORNIA NATIVE PLANT SOCIETY LISTED AND LOCALLY RARE SPECIES					
<i>Abronia umbellata</i> <i>ssp. breviflora</i> pink sand verbna	None CEQA 1B.1	Occurs on coastal dunes. Known from DNT, HUM, and MEN counties between 0-10 meters. Presumed extirpated from SON County.	June-October perennial herb	No suitable vegetation associations present within SMP work areas.	None
<i>Agrostis blasdalei</i> Blasdale's bent grass	None CEQA 1B.2	Coastal bluff scrub, coastal dunes and coastal prairie. Known from MEN, MRN, SCR, SON and SMT counties from fewer than fifteen occurrences between 5-150 meters. Includes <i>A. blasdalei</i> var. <i>marinensis</i> which is state-listed Rare.	May-July perennial herb (rhizomatous)	No suitable vegetation associations present within SMP work areas.	None

Table 3.3-1. Special Status Plant Species with Potential to Occur in the SMP Area

SPECIES NAME COMMON NAME	FEDERAL, STATE, & CNPS LISTING ¹	HABITAT PREFERENCES, DISTRIBUTION INFORMATION, & ADDITIONAL NOTES ¹	FLOWERING PHENOLOGY/ LIFE FORM	HABITAT SUITABILITY & LOCAL DISTRIBUTION	POTENTIAL FOR OCCURRENCE
<i>Allium peninsulare</i> var. <i>franciscanum</i> Franciscan onion	None CEQA 1B.2	Occurs on clay in cismontane woodland and valley and foothill grassland often on serpentinitic sites. Known from SCL, SMT, and SON counties between 100-300 meters.	May-June perennial herb (bulbiferous)	No suitable vegetation associations with preferred substrate present within SMP work areas.	None
<i>Amorpha californica</i> var. <i>napensis</i> Napa false indigo	None CEQA 1B.2	Occurs in openings in broadleaved upland forest, chaparral, and cismontane woodland. Known from MNT, MNR, NAP, and SON counties from 150-2,000 meters.	April-July shrub (deciduous)	No suitable vegetation associations present within SMP work areas.	None
<i>Anomobryum julaceum</i> slender silver moss	None CEQA 2.2	Occurs on damp rock and soil on outcrops, usually on roadcuts in broadleaved upland forest, lower montane coniferous forest, and North Coast coniferous forest. Known from BUT, CCA, HUM, LAX, MPA, SBA, SCR, SHA, and SON counties between 100-1,000 meters.	Moss	No suitable vegetation associations present within SMP work areas.	None
<i>Arctostaphylos canescens</i> ssp. <i>sonomensis</i> Sonoma manzanita	None CEQA 1B.3	Chaparral, lower montane coniferous forest sometimes on serpentine. Known from HUM, LAK, MEN, SON and TEH counties between 180-1,675 meters.	January-April shrub (evergreen)	No suitable vegetation associations with preferred substrate present within SMP work areas.	None
<i>Arctostaphylos manzanita</i> ssp. <i>elegans</i> Konocti manzanita	None CEQA 1B.3	On volcanic substrates in chaparral, cismontane woodland and lower montane coniferous forest. Known from COL, GLE, LAK, MEN, NAP, SON and THE counties between 395-1,615 meters. Rare in Napa County	March-May shrub (evergreen)	No suitable vegetation associations with preferred substrate present within SMP work areas.	None

Table 3.3-1. Special Status Plant Species with Potential to Occur in the SMP Area

SPECIES NAME COMMON NAME	FEDERAL, STATE, & CNPS LISTING ¹	HABITAT PREFERENCES, DISTRIBUTION INFORMATION, & ADDITIONAL NOTES ¹	FLOWERING PHENOLOGY/ LIFE FORM	HABITAT SUITABILITY & LOCAL DISTRIBUTION	POTENTIAL FOR OCCURRENCE
<i>Arctostaphylos stanfordiana</i> ssp. <i>decumbens</i> Rincon manzanita	None CEQA 1B.1	Rhyolitic chaparral and cismontane woodland. Known only from SON County between 75-370 meters from fewer than ten occurrences.	February-April shrub (evergreen)	No suitable vegetation associations with preferred substrate present within SMP work areas.	None
<i>Astragalus tener</i> var. <i>tener</i> alkali milk-vetch	None CEQA 1B.2	Occurs in playas, valley and foothill grassland on adobe clay, and alkaline vernal pools. Known from ALA NAP, SOL, and YOL counties from 1-60 meters. Presumed extirpated from CCA, MNT, SBT, SCL, SFO, SJQ, SON, and STA counties.	March-June annual herb	Although suitable vegetation associations may be present in SMP work areas the only known CNDDDB occurrence (EOND# #9269) in SON County is from a location where natural habitat is presumed to no longer exist. The record is from a Congdon herbarium record collected in 1880.	Not Expected
<i>Balsamorhiza macrolepis</i> var. <i>macrolepis</i> big-scale balsamroot	None CEQA 1B.2	Chaparral, cismontane woodland, valley and foothill grassland, sometimes on serpentinite. Known from ALA, BUT, COL, LAK, MPA, NAP, PLA, SCL, SOL, SON and TEH counties between 90-1,400 meters.	March-June perennial herb	No suitable vegetation associations with preferred substrate present within SMP work areas.	None
<i>Brodiaea californica</i> var. <i>leptandra</i> narrow-anthered California brodiaea	None CEQA 1B.2	Broadleaved upland forest, chaparral, lower montane coniferous forest. Known from LAK, NAP and SON counties between 110-915 meters.	May-July perennial herb (bulbiferous)	No suitable vegetation associations present within SMP work areas.	None

Table 3.3-1. Special Status Plant Species with Potential to Occur in the SMP Area

SPECIES NAME COMMON NAME	FEDERAL, STATE, & CNPS LISTING ¹	HABITAT PREFERENCES, DISTRIBUTION INFORMATION, & ADDITIONAL NOTES ¹	FLOWERING PHENOLOGY/ LIFE FORM	HABITAT SUITABILITY & LOCAL DISTRIBUTION	POTENTIAL FOR OCCURRENCE
<i>Calamagrostis crassiglumis</i> Thurber's reed grass	None CEQA 2.1	Mesic coastal scrub and freshwater marshes and swamps. Known from DNT, MEN, MRN and SON counties between 10-45 meters from fewer than ten occurrences in California. Possibly occurs in HUM County Recognized as <i>C. stricta</i> ssp. <i>inexpansa</i> .	May-July perennial herb (rhizomatous)	Although marginally suitable vegetation associations are present within SMP work areas, this taxon was highly restricted in its distribution at Pitkin Marsh.	Not Expected
<i>California macrophylla</i> round-leaved filaree	None CEQA 1B.1	Occurs in cismontane woodland, valley and foothill grassland on clay soils. Known from ALA, CCA, COL, FRE, GLE, KNG, KRN, LAK, LAS, LAX, MER, MNT, NAP, RIV, SBA, SBT, SDG, SJQ, SLO, SMT, SOL, STA, TEH, VEN, and YOL counties between 15-1,200 meters. Presumed extirpated from BUT County. Recognized as <i>Erodium macrophyllum</i> in TJM.	March-May Annual Herb	Although suitable vegetation associations may be present in SMP work areas the only known CNDDDB occurrence (EONDX #45846) in SON County is from a location where natural habitat is presumed to no longer exist. The record is also from a Congdon herbarium record collected in 1880.	None
<i>Calitropsis pygmaea</i> pygmy cypress	None CEQA 1B.2	Usually occurs on podozol-like soil in closed-cone coniferous forest. Known from MEN and SON counties between 30-600 meters. Recognized as <i>Cupressus goveniana</i> ssp. <i>pygmaea</i> .	Evergreen tree	No suitable vegetation associations with preferred substrate present within SMP work areas.	None
<i>Calochortus raichei</i> The Cedars fairy-lantern	None CEQA 1B.2	Occurs on serpentine in closed-cone coniferous forest and chaparral. Known only from SON County between 200-490 meters.	May-August bulbiferous herb	No suitable vegetation associations with preferred substrate present within SMP work areas.	None

Table 3.3-1. Special Status Plant Species with Potential to Occur in the SMP Area

SPECIES NAME COMMON NAME	FEDERAL, STATE, & CNPS LISTING ¹	HABITAT PREFERENCES, DISTRIBUTION INFORMATION, & ADDITIONAL NOTES ¹	FLOWERING PHENOLOGY/ LIFE FORM	HABITAT SUITABILITY & LOCAL DISTRIBUTION	POTENTIAL FOR OCCURRENCE
<i>Calystegia purpurata</i> ssp. <i>saxicola</i> coastal bluff morning glory	None CEQA 1B.2	Coastal dunes and coastal scrub. Known from MEN, MRN and SON counties between 15-105 meters.	May-August perennial herb	No suitable vegetation associations present within SMP work areas.	None
<i>Campanula californica</i> swamp harebell	None CEQA 1B.2	Bogs and fens, mesic closed-cone coniferous forest, mesic coastal prairie, meadows and seeps, freshwater marshes and swamps. Known from MEN, MRN, and SON counties between 1-405 meters. Many occurrences have few plants. Extirpated from SCR County.	June-October perennial herb (rhizomatous)	Suitable vegetation associations with preferred hydrology present within SMP work areas.	Possible: In Zones 1A, 5A, and 8A where reaches support emergent wetlands.
<i>Carex comosa</i> bristly sedge	None CEQA 2.1	Coastal prairie, lake margins of marshes and swamps and valley and foothill grassland. Known from CCA, LAK, MEN, SAC, SHA, SJQ and SON counties between 0-425 meters. Presumed extirpated from SBD, SCR and SFO counties. Location, rarity and endangerment information needed.	May-September perennial herb (rhizomatous)	Although suitable vegetation associations are present within SMP work areas the only herbarium record (Accession # UC1227) places this taxon on a flat within the Russian River which is not included as a part of the SMP. This record is considered extirpated.	Not Expected.
<i>Carex saliniformis</i> deceiving sedge	None CEQA 1B.2	Occurs on mesic sites in coastal prairie, coastal scrub, meadows and seeps, and coastal marshes and swamps. Known from HUM, MEN, and SCR counties between 3-230 meters. Presumed extant in SCR County.	June-July rhizomatous herb	Suitable vegetation associations with preferred hydrology present within SMP work areas.	Possible: In Zone 5A where reaches support emergent wetlands.

Table 3.3-1. Special Status Plant Species with Potential to Occur in the SMP Area

SPECIES NAME COMMON NAME	FEDERAL, STATE, & CNPS LISTING ¹	HABITAT PREFERENCES, DISTRIBUTION INFORMATION, & ADDITIONAL NOTES ¹	FLOWERING PHENOLOGY/ LIFE FORM	HABITAT SUITABILITY & LOCAL DISTRIBUTION	POTENTIAL FOR OCCURRENCE
<i>Castilleja mendocinensis</i> Mendocino Coast paintbrush	None CEQA 1B.2	Occurs in costal bluff scrub, closed-cone coniferous forest, coastal dunes, coastal prairie, and coastal scrub. Known from MEN and HUM counties between 0-160 meters. Related to <i>C. affinis</i> ssp. <i>litoralis</i> .	April-August perennial herb (hemiparasitic)	No suitable vegetation associations present within SMP work areas.	None
<i>Ceanothus confusus</i> Rincon Ridge ceanothus	None CEQA 1B.1	Closed-cone coniferous forest, chaparral, cismontane woodland on volcanic or serpentinitic substrates. Known from LAK, MEN, NAP and SON counties between 75-1065 meters. Closely related to <i>C. prostratus</i> .	February-April shrub (evergreen)	No suitable vegetation associations with preferred substrate present within SMP work areas.	None
<i>Ceanothus divergens</i> Calistoga ceanothus	None CEQA 1B.2	Serpentine or volcanic chaparral. Known from LAK, NAP and SON counties between 170-950 meters. Closely related to <i>C. purpureus</i> .	February-March shrub (evergreen)	No suitable vegetation associations with preferred substrate present within SMP work areas.	None
<i>Ceanothus foliosus</i> var. <i>vineatus</i> Vine Hill ceanothus	None CEQA 1B.1	Chaparral. Nearly extirpated from SON County. Known from SON County from only one occurrence between 45-305 meters. One historical occurrence known from MEN County.	March-May shrub (evergreen)	No suitable vegetation associations present within SMP work areas.	None
<i>Ceanothus purpureus</i> holly-leaved ceanothus	None CEQA 1B.2	Occurs in chaparral and cismontane woodland on volcanic and rocky substrates. Known from NAP, SOL and SON counties between 120-640 meters.	February-June shrub (evergreen)	No suitable vegetation associations with preferred substrate present within SMP work areas.	None

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SPECIES NAME COMMON NAME	FEDERAL, STATE, & CNPS LISTING ¹	HABITAT PREFERENCES, DISTRIBUTION INFORMATION, & ADDITIONAL NOTES ¹	FLOWERING PHENOLOGY/ LIFE FORM	HABITAT SUITABILITY & LOCAL DISTRIBUTION	POTENTIAL FOR OCCURRENCE
<i>Ceanothus sonomensis</i> Sonoma ceanothus	None CEQA 1B.2	Occurs in chaparral on sandy, serpentinitic, or volcanic substrates. Known from SON and NAP counties between 215-800 meters. Approximately ten occurrences with only one from NAP County.	February-April shrub (evergreen)	No suitable vegetation associations with preferred substrate present within SMP work areas.	None
<i>Chlorogalum pomeridianum</i> var. <i>Minus</i> dwarf soaproot	None CEQA 1B.2	Serpentinitic chaparral. Known from COL, LAK, SLO, SON and THE counties between 305-1,000 meters.	May-August perennial herb (bulbiferous)	No suitable vegetation associations with preferred substrate present within SMP work areas.	None
<i>Chorizanthe cuspidata</i> var. <i>cuspidata</i> San Francisco Bay Spineflower	None CEQA 1B.2	Occurs in coastal bluff scrub, coastal dunes, coastal prairie and coastal scrub on sandy substrates. Known from MRN, SFO and SMT counties between 3-215 meters. Presumed extirpated from ALA. Possibly occurs in SCL and SON counties. Closely related to <i>C. pungens</i> . Recognized as <i>C. cuspidata</i> in TJM.	April-August annual herb	No suitable vegetation associations with preferred substrate present within SMP work areas.	None
<i>Chorizanthe cuspidata</i> var. <i>villosa</i> woolly-headed spineflower	None CEQA 1B.2	Occurs in coastal dunes, coastal prairie and coastal scrub on sandy substrates. Known from MRN and SON counties between 3-60 meters from fewer than ten occurrences. Recognized as <i>C. cuspidata</i> in TJM.	May-August annual herb	No suitable vegetation associations with preferred substrate present within SMP work areas.	None

Table 3.3-1. Special Status Plant Species with Potential to Occur in the SMP Area

SPECIES NAME COMMON NAME	FEDERAL, STATE, & CNPS LISTING ¹	HABITAT PREFERENCES, DISTRIBUTION INFORMATION, & ADDITIONAL NOTES ¹	FLOWERING PHENOLOGY/ LIFE FORM	HABITAT SUITABILITY & LOCAL DISTRIBUTION	POTENTIAL FOR OCCURRENCE
<i>Cirsium andrewsii</i> Franciscan thistle	None CEQA 1B.2	Broadleaved upland forest, coastal bluff scrub, coastal prairie, and coastal scrub. Often found on mesic and sometimes serpentine sites. Known from CCA, MRN, and SFO counties. Presumed extirpated from SMT and SON counties.	March-July perennial herb	No suitable vegetation associations present within SMP work areas.	None
<i>Cordylanthus maritimus</i> ssp. <i>palustris</i> Point Reyes bird's-beak	None CEQA 1B.2	Coastal salt marshes and swamps. Once common in proper habitat. Known from HUM MRN, and SON counties between 0-10 meters. Presumed extirpated from ALA, SCL and SMT counties.	June-October annual herb (hemiparasitic)	Although a single occurrence of this taxon is located in Petaluma Marsh in Zone 9A it is an area not maintained by SCWA.	None
<i>Cryptantha clevelandii</i> var. <i>dissita</i> serpentine cryptantha	None CEQA 1B.1	Serpentine chaparral. Known from LAK, NAP and SON counties between 395-580 meters. Recognized as <i>C. clevelandii</i> in TJM.	April-June annual herb	No suitable vegetation associations present within SMP work areas.	None
<i>Dirca occidentalis</i> western leatherwood	None CEQA 1B.2	Occurs in broadleaved upland forest, closed-cone coniferous forest, chaparral, cismontane woodland, North Coast Coniferous forest, riparian scrub, and riparian woodland. On mesic sites. Known from ALA, CCA, MRN, SCL, SMT, and SON counties between 50-395 meters. Populations are declining (low fecundity).	January-April shrub (deciduous)	Although two occurrences of this taxon are located along Salmon Creek in Zone 8A this creek is a Natural Easement and is not maintained.	None

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<i>Downingia pusilla</i> dwarf downingia	None CEQA 2.2	Mesic sites in valley and foothill grassland and vernal pools. Known from MER, MPA, NAP, PLA, SAC, SOL, SON, STA, THE, and YUB counties between 1-445 meters.	March-May annual herb	Suitable vegetation associations with preferred hydrology present within SMP work areas.	Possible: In Zones 1A, 3A, and 9A where reaches support areas functioning as seasonal wetlands and in access routes near vernal pool habitat and/or plant conservation areas.
<i>Erigeron greenei</i> Greene's narrow-leaved daisy	None CEQA 1B.2	Occurs on serpentinitic or volcanic chaparral. Known from LAK, NAP, and SON counties between 80-290 meters.	May-September perennial herb	No suitable vegetation associations present within SMP work areas.	None
<i>Erigeron supplex</i> supple daisy	None CEQA 1B.2	Occurs on coastal bluff scrub and coastal prairie. Known from MEN and SON counties between 10-50 meters. Presumed extirpated from HUM and MRN counties.	May-July perennial herb	No suitable vegetation associations present within SMP work areas.	None
<i>Erigeron serpentinus</i> serpentine daisy	None CEQA 1B.3	Occurs on serpentine seeps in chaparral. Known only from The Cedars and along Porter Creek in SON County between 60-670 meters. Similar to <i>E. angustatus</i> .	May-August perennial herb	No suitable vegetation associations with preferred substrate present within SMP work areas.	None

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<i>Eriogonum nervulosum</i> Snow Mountain Buckwheat	None CEQA 1B.2	Serpentine Chaparral. Known from COL, LAK, NAP, SON and YOL counties between 300-2105 meters from approximately 20 occurrences. Possibly occurs in GLE County.	June-September Annual herb	No suitable vegetation associations are present and SMP work areas are lower than preferred elevation for this taxon.	None
<i>Fritillaria liliacea</i> fragrant fritillary	None CEQA 1B.2	Cismontane woodland, Coastal prairie, coastal scrub, valley and foothill grassland near the coast, on clay or serpentinite. Known from ALA, CCA, MNT, MRN, SBT, SCL, SFO, SMT, SOL, and SON counties between 3-410 meters.	February-April perennial herb (bulbiferous)	No suitable vegetation associations present within SMP work areas.	None
<i>Gilia capitata</i> ssp. <i>chamissonis</i> dune gilia	None CEQA 1B.1	Coastal dunes and coastal scrub. Known from MRN, SFO, and SON counties between 2-200 meters.	April-July annual herb	No suitable vegetation associations with preferred substrate present within SMP work areas.	None
<i>Gilia capitata</i> ssp. <i>tomentosa</i> wooly-headed gilia	None CEQA 1B.1	Rocky outcrops on coastal bluff scrub. Known from MRN County from only three occurrences near Tomales and Salt Point State Parks. May have occurred in SON County. Intergrades with ssp. <i>capitata</i> in northeastern San Francisco Bay area.	May-July annual herb	No suitable vegetation associations with preferred substrate present within SMP work areas.	None
<i>Gilia millefoliata</i> dark-eyed gilia	None CEQA 1B.2	Occurs on coastal dunes. Known from DNT, HUM, MEN, MRN, and SON between 2-30 meters. Presumed extirpated from SFO County.	April-July annual herb	No suitable vegetation associations with preferred substrate present within SMP work areas.	None

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<i>Hesperevax sparsiflora</i> var. <i>brevifolia</i> short-leaved evax	None CEQA 1B.2	Occurs on sandy coastal bluff scrub and coastal dunes. Known from HUM, MEN, MRN, SCR, and SON counties between 0-215 meters. Presumed extirpated from SFO County. May intergrade with var. <i>sparsiflora</i> in the San Francisco Bay area.	March-June annual herb	No suitable vegetation associations with preferred substrate present within SMP work areas.	None
<i>Hesperolinon bicarpellatum</i> two-carpellate western flax	None CEQA 1B.2	Serpentine Chaparral. Previously confused with <i>H. serpentinum</i> which also occurs on serpentinite soils in the same general area. Known from LAK, NAP and SON counties between 60-1,105 meters.	May-July annual herb	No suitable vegetation associations with preferred substrate present within SMP work areas.	None
<i>Horkelia marinensis</i> Point Reyes horkelia	None CEQA 1B.2	Occurs in coastal dunes, coastal prairie and coastal scrub on sandy substrates. Populations from Ft. Bragg, Mendocino County may be varetally distinct. Known from MEN, MRN, SCCR and SMT counties from fewer than 20 occurrences between 5-350 meters.	May-September perennial herb	No suitable vegetation associations with preferred substrate present within SMP work areas.	None
<i>Horkelia tenuiloba</i> thin-lobed horkelia	None CEQA 1B.2	Occurs in broadleaved upland forest and chaparral on mesic openings and sandy substrates. Known from MEN, MRN and SON counties between 50-500 meters.	May-July perennial herb	No suitable vegetation associations with preferred substrate present within SMP work areas.	None

Table 3.3-1. Special Status Plant Species with Potential to Occur in the SMP Area

SPECIES NAME COMMON NAME	FEDERAL, STATE, & CNPS LISTING ¹	HABITAT PREFERENCES, DISTRIBUTION INFORMATION, & ADDITIONAL NOTES ¹	FLOWERING PHENOLOGY/ LIFE FORM	HABITAT SUITABILITY & LOCAL DISTRIBUTION	POTENTIAL FOR OCCURRENCE
<i>Lasthenia californica</i> ssp. <i>bakeri</i>	None CEQA 1B.2	Occurs in closed-cone coniferous forest, coastal scrub, meadows and seeps, and marshes and swamps. Known from MEN and MRN counties between 60-520 meters. Presumed extirpated from SON counties.	April-October perennial herb	Although suitable vegetation associations are present within SMP work areas this taxon occurs much closer to the coast.	Not Expected
<i>Lasthenia californica</i> ssp. <i>macrantha</i>	None CEQA 1B.	Occurs in coastal bluff scrub, coastal dunes, and coastal scrub. Known from MEN, MRN, SLO, SMT, and SON counties between 5-520 meters.	January- November perennial herb	No suitable vegetation associations present within SMP work areas.	None
<i>Lathyrus jepsonii</i> var. <i>jepsonii</i> Delta tule pea	None CEQA 1B.2	Occurs in fresh and brackish water marshes and swamps. Known from CCA, NAP, SAC, SJQ, SOL, and SON counties between 0-4 meters.	May-September perennial herb	Although suitable vegetation associations present no CNDDB occurrences or herbarium specimens have been recorded from SON County.	Not Expected
<i>Layia septentrionalis</i> Colusa layia	None CEQA 1B.2	Occurs in chaparral, cismontane woodland and valley and foothill grassland on sandy and serpentinitic substrates. Known from COL, GLE, LAK, MEN, NAP, SON, SUT, THE, and YOL counties between 100-1095 meters.	April-May annual herb	No suitable vegetation associations with preferred substrate present within SMP work areas.	None

Table 3.3-1. Special Status Plant Species with Potential to Occur in the SMP Area

SPECIES NAME COMMON NAME	FEDERAL, STATE, & CNPS LISTING ¹	HABITAT PREFERENCES, DISTRIBUTION INFORMATION, & ADDITIONAL NOTES ¹	FLOWERING PHENOLOGY/ LIFE FORM	HABITAT SUITABILITY & LOCAL DISTRIBUTION	POTENTIAL FOR OCCURRENCE
<i>Legenere limosa</i> legenere	None CEQA 1B.1	Vernal pools. Known from LAK, NAP, PLA, SAC, SCL, SHA, SMT, SOL, SON, THE, and YUB counties. Presumed extirpated from STA County.	April-June Annual herb	Suitable vegetation associations with preferred hydrology present within SMP work areas.	Possible: In Zone 1A where reaches support areas functioning as seasonal wetlands and in access routes near vernal pool habitat and/or plant conservation areas.
<i>Leptosiphon jepsonii</i> Jepson's linanthus	None CEQA 1B.2	Occurs in chaparral and cismontane woodland usually on volcanic substrates. Known from LAK, NAP, and SON counties between 100-500 meters. Recognized as <i>L. liniflorus</i> in TJM.	April-May annual herb	No suitable vegetation associations with preferred substrate present within SMP work areas.	None
<i>Leptosiphon rosaceus</i> rose Leptosiphon	None CEQA 1B.1	Occurs in coastal bluff scrub. Known from MRN and SMT counties between 0-100 meters. Presumed extirpated from SFO and SON counties.	April-July annual herb	No suitable vegetation associations present within SMP work areas.	None
<i>Lessingia arachnoidea</i> Crystal springs lessingia	None CEQA 1B.2	Occurs in cismontane woodland, coastal scrub and valley and foothill grassland on serpentine substrates. Only positively identified from SMT County between 60-200 meters from seven occurrences near Crystal Springs Reservoir. Occurrences from SON need verification.	July-October annual herb	No suitable vegetation associations with preferred substrate present within SMP work areas.	None

Table 3.3-1. Special Status Plant Species with Potential to Occur in the SMP Area

SPECIES NAME COMMON NAME	FEDERAL, STATE, & CNPS LISTING ¹	HABITAT PREFERENCES, DISTRIBUTION INFORMATION, & ADDITIONAL NOTES ¹	FLOWERING PHENOLOGY/ LIFE FORM	HABITAT SUITABILITY & LOCAL DISTRIBUTION	POTENTIAL FOR OCCURRENCE
<i>Lilium maritimum</i> coast lily	None CEQA 1B.1	Occurs in broadleaved upland forest, closed-cone coniferous forest, coastal prairie, coastal scrub, freshwater marshes and seeps, and North Coast coniferous forest. Sometimes it also occurs on roadsides. Known from MEN, MRN, and SON counties between 5-475 meters.	May-August bulbiferous herb	Although suitable vegetation associations are present within SMP work areas this taxon occurs much closer to the coastline.	Not Expected
<i>Lupinus sericatus</i> Cobb Mountain lupine	None CEQA 1B.1	Broadleaved upland forest, chaparral, cismontane woodland and lower montane coniferous forest. Will colonize disturbed sites. Known from COL, LAK, NAP and SON counties between 275-1,525 meters.	March-June perennial shrub	No suitable vegetation associations present within SMP work areas.	None
<i>Microseris paludosa</i> marsh microseris	None CEQA 1B.2	Closed-cone coniferous forest, cismontane woodland, coastal scrub, and valley and foothill grassland. Known from MEN, MNT, MRN, SCR, SLO, and SON counties between 5-300 meters. Similar to <i>M. lacinata</i> ssp. <i>leptosepala</i> .	April-June perennial herb	No suitable vegetation associations present within SMP work areas.	None
<i>Monardella villosa</i> ssp. <i>globosa</i> robust monardella	None CEQA 1B.2	Occurs in openings of chaparral, cismontane woodland and coastal scrub. Known from ALA, CCA, HUM, LAK, MEN, NAP, SCL, SMT and SON counties between 185-600 meters.	June-July perennial herb (rhizomatous)	No suitable vegetation associations present within SMP work areas.	None

Table 3.3-1. Special Status Plant Species with Potential to Occur in the SMP Area

SPECIES NAME COMMON NAME	FEDERAL, STATE, & CNPS LISTING ¹	HABITAT PREFERENCES, DISTRIBUTION INFORMATION, & ADDITIONAL NOTES ¹	FLOWERING PHENOLOGY/ LIFE FORM	HABITAT SUITABILITY & LOCAL DISTRIBUTION	POTENTIAL FOR OCCURRENCE
<i>Navarretia leucocephala</i> ssp. <i>bakeri</i> Baker's navarretia	None CEQA 1B.1	Occurs in cismontane woodland, lower montane coniferous forest, meadows and seeps, and valley and foothill grassland on mesic sites. Known from COL, LAK, MEN, MRN, NAP, SOL, SON, and THE counties between 15-1,740 meters.	May-July annual herb	Suitable vegetation associations with preferred hydrology present within SMP work areas.	Possible: In Zones 1A and 3A where reaches support areas functioning as seasonal wetlands and in access routes near vernal pool habitat and/or plant conservation areas.
<i>Penstemon newberryi</i> var. <i>sonomensis</i> Sonoma beardtongue	None CEQA 1B.3	Rocky chaparral. Known from LAK, NAP and SON counties from fewer than twenty occurrences between 700-1,370 meters.	April-August perennial herb	No suitable vegetation associations with preferred substrate present within SMP work areas.	None
<i>Piperia candida</i> white-flowered rein orchid	None CEQA 1B.2	Occurs in broadleafed upland forest, lower montane coniferous forest, and North Coast coniferous forest. Can tolerate serpentine. Known from DNT, HUM, MEN, SCL, SCR, SIS, SMT, SON, and TRI counties between 30-1,310 meters.	May-September perennial herb	No suitable vegetation associations present within SMP work areas.	None

Table 3.3-1. Special Status Plant Species with Potential to Occur in the SMP Area

SPECIES NAME COMMON NAME	FEDERAL, STATE, & CNPS LISTING ¹	HABITAT PREFERENCES, DISTRIBUTION INFORMATION, & ADDITIONAL NOTES ¹	FLOWERING PHENOLOGY/ LIFE FORM	HABITAT SUITABILITY & LOCAL DISTRIBUTION	POTENTIAL FOR OCCURRENCE
<i>Plagiobothrys mollis</i> var. <i>vestitus</i> Petaluma popcorn-flower	None CEQA 1A	Occurs in mesic valley and foothill grassland and possibly in coastal salt marsh and swamps. Known only from SON County between 10-50 meters, however this species is presumed extirpated.	June-July perennial herb	Although suitable vegetation associations are present within SMP work areas this taxon has not been recorded in SON County since 1880 when it was collected by Congdon from Petaluma.	Not Expected
<i>Polygonum marinense</i> Marin knotweed	None CEQA 3.1	Occurs in coastal salt or brackish water marshes and swamps. Known from MRN, NAP, SOL, and SON counties between 0-10 meters from fewer than fifteen occurrences. Taxonomic status uncertain, related to <i>P. aviculare</i> possibly a synonym of the non-native <i>P. robertii</i> .	April-October annual herb	No suitable vegetation associations present within SMP work areas.	None
<i>Rhynchospora alba</i> white beaked-rush	None CEQA 2.2	Bogs and fens, meadows and seeps and freshwater marshes and swamps. Known from LAS, MEN, PLU, SON and TRI counties between 60-2,040 meters. Possibly occurs in DNT, INY and MPA counties.	July-August perennial herb (rhizomatous)	Although marginally suitable vegetation associations are present within SMP work areas, this taxon was highly restricted in its distribution at Pitkin Marsh.	Not Expected
<i>Rhynchospora californica</i> California beaked-rush	None CEQA 1B.1	Bogs and fens, lower montane coniferous forest, meadows and seeps, and freshwater marshes and seeps. Known from BUT, MPA, MRN, and SON counties from fewer than ten occurrences between 45-1,010 meters.	May-July perennial herb (rhizomatous)	Suitable vegetation associations with preferred hydrology present within SMP work areas.	Possible: In Zones 1A and 5A where reaches support emergent wetlands.

Table 3.3-1. Special Status Plant Species with Potential to Occur in the SMP Area

SPECIES NAME COMMON NAME	FEDERAL, STATE, & CNPS LISTING ¹	HABITAT PREFERENCES, DISTRIBUTION INFORMATION, & ADDITIONAL NOTES ¹	FLOWERING PHENOLOGY/ LIFE FORM	HABITAT SUITABILITY & LOCAL DISTRIBUTION	POTENTIAL FOR OCCURRENCE
<i>Rhynchospora capitellata</i> brownish beaked-rush	None CEQA 2.2	Occurs on mesic sites in lower montane coniferous forest, meadows and seeps, marshes and swamps, and upper montane coniferous forest. Known from BUT, ELD, MPA, NEV, PLU, THE, TRI, and YUB counties between 455-2,000 meters. Presumed extirpated from SON County.	July-August perennial herb	Although marginally suitable vegetation associations are present within SMP work areas, this taxon was highly restricted in its distribution at Pitkin and Perry marshes.	Not Expected
<i>Rhynchospora globularis</i> var. <i>globularis</i> round-headed beaked-rush	None CEQA 2.1	Freshwater marshes and swamps. Known from SON county and elsewhere.	July-August perennial herb (rhizomatous)	Although marginally suitable vegetation associations are present within SMP work areas, this taxon was highly restricted in its distribution at Pitkin and Perry marshes.	Not Expected
<i>Sidalcea calycosa</i> ssp. <i>rhizomata</i> Point Reyes checkerbloom	None CEQA 1B.2	Freshwater marshes and swamps near the coast. Known from MEN, MRN, and SON counties between 3-75 meters.	April-September perennial herb (rhizomatous)	Although suitable vegetation associations are present within SMP work areas this taxon occurs much closer to the coastline.	Not Expected
<i>Sidalcea hickmanii</i> ssp. <i>viridis</i> Marin checkerbloom	None CEQA 1B.3	Serpentine Chaparral. Known from MRN, NAP, SMT and SON counties between 50-430 meters.	May-June perennial herb	No suitable vegetation associations with preferred substrate present within SMP work areas.	None
<i>Sidalcea malviflora</i> ssp. <i>purpurea</i> purple-stemmed checkerbloom	None CEQA 1B.2	Occurs in broadleafed upland forest and coastal prairie. Known from MEN and SON counties between 15-85 meters. Possibly occurs in MRN County.	May-June rhizomatous herb	No suitable vegetation associations present within SMP work areas.	None

Table 3.3-1. Special Status Plant Species with Potential to Occur in the SMP Area

SPECIES NAME COMMON NAME	FEDERAL, STATE, & CNPS LISTING ¹	HABITAT PREFERENCES, DISTRIBUTION INFORMATION, & ADDITIONAL NOTES ¹	FLOWERING PHENOLOGY/ LIFE FORM	HABITAT SUITABILITY & LOCAL DISTRIBUTION	POTENTIAL FOR OCCURRENCE
<i>Sidalcea oregana</i> ssp. <i>hydrophila</i> march checkerbloom	None CEQA 1B.2	Occurs in meadows and seeps and riparian scrub on mesic sites. Intergrades with ssp. <i>valida</i> . Known from GLE, LAK, MEN and NAP counties between 1,100-2,300 meters.	July-August perennial herb	Although suitable vegetation associations are present SMP work areas are lower than preferred elevation for this taxon.	None
<i>Streptanthus</i> <i>brachiatus</i> ssp. <i>brachiatus</i> Socrates Mine jewel-flower	None CEQA 1B.2	Occurs in closed-cone coniferous forest and chaparral on serpentine. Known from NAP and SON counties from fewer than ten occurrences between 545-1,000 meters. Plants from Lake County are more appropriately assigned to <i>S. brachiatus</i> ssp. <i>hoffmanii</i> .	May-June perennial herb	No suitable vegetation associations with preferred substrate present within SMP work areas.	None
<i>Streptanthus</i> <i>brachiatus</i> ssp. <i>hoffmanii</i> Freed's jewel- flower	None CEQA 1B.2	Occurs in chaparral and cismontane woodland on serpentinite. Known from LAK and SON counties from approximately ten occurrences between 490-1,220 meters	May-July perennial herb	No suitable vegetation associations with preferred substrate present within SMP work areas.	None
<i>Streptanthus</i> <i>breweri</i> var. <i>hesperidis</i> green jewel- flower	None CEQA 1B.2	Occurs in chaparral openings and cismontane woodland on serpentinitic and rocky sites. Known from LAK and NAP counties between 130-760 meters.	May-July annual herb	No suitable vegetation associations with preferred substrate present within SMP work areas.	None
<i>Streptanthus</i> <i>glandulosus</i> var. <i>hoffmanii</i> Hoffman's bristly jewel-flower	None CEQA 1B.3	Occurs on rocky sites in chaparral, cismontane woodland, and serpentinitic valley and foothill grassland. Known only from SON County between 120-475 meters. Recognized as <i>S. glandulosus</i> ssp. <i>secundus</i> in TJM	March-July annual herb	No suitable vegetation associations with preferred substrate present within SMP work areas.	None

Table 3.3-1. Special Status Plant Species with Potential to Occur in the SMP Area

SPECIES NAME COMMON NAME	FEDERAL, STATE, & CNPS LISTING ¹	HABITAT PREFERENCES, DISTRIBUTION INFORMATION, & ADDITIONAL NOTES ¹	FLOWERING PHENOLOGY/ LIFE FORM	HABITAT SUITABILITY & LOCAL DISTRIBUTION	POTENTIAL FOR OCCURRENCE
<i>Streptanthus morrisonii</i> ssp. <i>elatus</i>	None CEQA 1B.2	Serpentine Chaparral. Known from LAK, NAP and SON counties between 90-815 meters. Recognized as <i>S. morrisonii</i> in TJM.	June-September perennial herb	No suitable vegetation associations with preferred substrate present within SMP work areas.	None
<i>Streptanthus morrisonii</i> ssp. <i>kruckebergii</i>	None CEQA 1B.2	Occurs in cismontane woodland on serpentine. Known from LAK, NAP and SON counties between 215-1,035 meters.	April-July perennial herb	No suitable vegetation associations with preferred substrate present within SMP work areas.	None
<i>Tracyina rostrata</i> beaked tracyina	None CEQA 1B.1	Occurs in cismontane woodland and valley and foothill grassland. Known from HUM, LAK, MEN, SON, and TRI counties between 90-790 feet	May-June annual herb	Although suitable vegetation associations present within SMP work areas this taxon has only been recorded from west of Cloverdale.	Not Expected
<i>Trifolium buckwestiorum</i> Santa Cruz clover	None CEQA 1B.1	Occurs in broadleaved upland forest, cismontane woodland, and margins of coastal prairies. Known from MNT, SCR, and SON counties between 105-610 meters from approximately ten small occurrences.	April-October annual herb	No suitable vegetation associations present within SMP work areas.	None

Table 3.3-1. Special Status Plant Species with Potential to Occur in the SMP Area

SPECIES NAME COMMON NAME	FEDERAL, STATE, & CNPS LISTING ¹	HABITAT PREFERENCES, DISTRIBUTION INFORMATION, & ADDITIONAL NOTES ¹	FLOWERING PHENOLOGY/ LIFE FORM	HABITAT SUITABILITY & LOCAL DISTRIBUTION	POTENTIAL FOR OCCURRENCE
<i>Trifolium depauperatum</i> var. <i>hydrophilum</i> saline clover	None CEQA 1B.2	Marshes and swamps, and valley and foothill grassland, and vernal pools. Occurs on mesic and alkaline sites. Known from ALA, MNT, NAP, SBT, SCL, SCR, SLO, SMT, SLO, and SON counties between 0-300 meters. Possibly occurs in COL County.	April-June Annual herb	Suitable vegetation associations with preferred hydrology present within SMP work areas.	Possible: In Zones 1A, 3A, and 9A where reaches support areas functioning as seasonal wetlands and in access routes near vernal pool habitat and/or plant conservation areas.
<i>Viburnum ellipticum</i> oval-leaved viburnum	None CEQA 2.3	Chaparral, cismontane woodland and lower montane coniferous forest. Known from CCA, FRE, ELD, GLE, HUM, MEN, NAP, PLA, SHA and SON counties between 215-1,400 meters.	May-June Shrub (deciduous)	No suitable vegetation associations present within SMP work areas.	None

Table 3.3-1. Special Status Plant Species with Potential to Occur in the SMP Area

SPECIES NAME COMMON NAME	FEDERAL, STATE, & CNPS LISTING ¹	HABITAT PREFERENCES, DISTRIBUTION INFORMATION, & ADDITIONAL NOTES ¹	FLOWERING PHENOLOGY/ LIFE FORM	HABITAT SUITABILITY & LOCAL DISTRIBUTION	POTENTIAL FOR OCCURRENCE
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¹Explanation of State and Federal Listing Codes

Federal listing codes:

- FE Federally listed as Endangered
- FT Federally listed as Threatened
- FPE Federally proposed for listing as Endangered
- FPT Federally proposed for listing as Threatened
- FPD Federally proposed for delisting
- FC Federal candidate species (former Category 1 candidates)
- SC *Species of Concern – No longer maintained by USFWS*
- SLC *Species of local concern or conservation importance – No longer maintained by USFWS*

California listing codes:

- SE State listed as Endangered
- ST State listed as Threatened
- SR State listed as Rare
- SCE State candidate for listing as Endangered
- SCT State candidate for listing as Threatened

California Native Plant Society codes:

- 1A Presumed extinct in California
- 1B Rare or Endangered in California and elsewhere
- 2 Rare or Endangered in California, more common elsewhere
- 3 Plants for which we need more information - Review list
- 4 Plants of limited distribution - Watch list

California Native Plant Society Threat Codes:

- .1 Seriously Endangered in California (over 80% of occurrences Threatened / high degree and immediacy of threat)
- .2 Fairly Endangered in California (20-80% occurrences Threatened)
- .3 Not very Endangered in California (<20% of occurrences Threatened or no current threats known)

Notes: *CNPS List 1A and some List 3 plant species lacking any threat information receive no threat code extension. CNPS R-E-D Codes have been discontinued*

Survey Recommendation Determinations Based On

- Observed phenology at the time of reconnaissance
- Seasonal weather patterns
- Collection dates of herbarium specimens
- Blooming times given by the CNPS Inventory

Abbreviations:

AMA Amador	GLE Glenn	MER Merced	RIV Riverside	SDG San Diego	SOL Solano
BUT Butte	HUM Humboldt	MNT Monterey	SAC Sacramento	SFO San Francisco	SON Sonoma
CAL Calaveras	KRN Kern	MPA Mariposa	SBA Santa Barbara	SHA Shasta	SRO Santa Rosa Island
CCA Contra Costa	LAK Lake	MRN Marin	SBD San Bernardino	SIE Sierra	TEH Tehama
CNPS CA Native Plant Society	LAS Lassen	NAP Napa	SBT San Benito	SIS Siskiyou	TJM The Jepson Manual
COL Colusa	LAX Los Angeles	NEV Nevada	SCF Sonoma County Flora	SJQ San Joaquin	TRI Trinity
DNT Del Norte	LCP Local Coastal Plan	ORA Orange	SCL Santa Clara	SMI San Miguel Island	TUL Tulare
ELD El Dorado	MAD Madera	PLA Placer	SCR Santa Cruz	SMT San Mateo	VEN Ventura
FRE Fresno	MOD Modoc	PLU Plumas	SCT Santa Catalina Island	SNI San Nicolas Island	YOL Yolo
	MEN Mendocino		SCZ Santa Cruz Island		YUB Yuba

Table 3.3-2. Special Status Wildlife Species with Potential to Occur in the SMP Area

COMMON & SCIENTIFIC NAME	FEDERAL & STATE LISTING	HABITAT REQUIREMENTS	HABITAT SUITABILITY AND LOCAL DISTRIBUTION	POTENTIAL FOR OCCURRENCE
INVERTEBRATES				
Behren's silverspot butterfly <i>Speyeria zerene behrensii</i>	FE --	Occupies early successional coastal terrace prairie habitat that contains the caterpillar's host plant, early blue violet (<i>Viola adunca</i>), adult nectar sources, and adult courtship areas. Additionally, Behren's silverspot butterflies may also inhabit coastal sand dune systems (USFWS 2003).	Single extant population known from Mendocino County. Adult butterflies that are intermediate in appearance between Behren's silverspots and Myrtle's silverspots have been observed near Jenner and south of Stewart's Point in Sonoma County, California. No occurrences within the SMP Area. No suitable habitat for this species within the SMP channels and surrounding areas.	Not Expected
Myrtle's silverspot butterfly <i>S. z. myrtleae</i>	FE --	Larval food plant <i>Viola adunca</i> . Restricted to the foggy, coastal dunes/hills of the Point Reyes peninsula; currently considered the subspecies that occupies coastal terrace prairie habitat south of the Behren's silverspot butterfly's distribution, generally meeting in the area of the Russian River, Sonoma County.	One occurrence in SMP Area from 1968 located NE of Bodega Bay (CDFG 2008a). No suitable habitat for this species within the SMP channels and surrounding areas.	Not Expected
San Bruno elfin butterfly <i>Callophrys mossii bayensis</i>	FE --	Coastal, mountainous areas with grassy ground cover, near San Bruno mountain. Steep, north facing slopes within fog belt.	No occurrences within the SMP Area. No suitable habitat for this species within the SMP channels and surrounding areas.	None

Table 3.3-2. Special Status Wildlife Species with Potential to Occur in the SMP Area

COMMON & SCIENTIFIC NAME	FEDERAL & STATE LISTING		HABITAT REQUIREMENTS	HABITAT SUITABILITY AND LOCAL DISTRIBUTION	POTENTIAL FOR OCCURRENCE
California freshwater shrimp <i>Syncaris pacifica</i>	FE	SE	Low elevation, low gradient perennial streams with undercut banks where riparian cover is moderate to heavy in Marin, Sonoma and Napa counties.	Known from the Sonoma Creek watershed in SCWA Flood Control Zone 3A, and in Blucher Creek, a natural channel tributary of the upper Laguna de Santa Rosa in Zone 1A (Martini-Lamb 2007 and CDFG 2008a). There are also records for tributaries of the Russian River (Big Austin, East Austin, Green Valley, and Jonive Creeks) within Zone 5A, as well as in Salmon Creek in Zone 8A. None of these channels or Blucher Creek are included in the SMP due to either a lack of flood control responsibility or high levels of resource sensitivity. This species also historically occurred in Santa Rosa Creek (Zone 1A), but it is currently considered extirpated from that system (B. Cox pers com).	Present
Monarch butterfly <i>Danaus plexippus</i> (wintering sites)	--	--	Winter roost sites extend along the coast from northern Mendocino to Baja California, Mexico. Host plant is the milkweed (<i>Asclepius</i> spp.). Lifespan reaches >9 months. Fall migration occurs from August-October. Overwintering roosts in California commonly occur on Eucalyptus tree.	No known roost sites from SMP Area. Suitable wintering habitat is not present in the SMP Area.	Not Expected

Table 3.3-2. Special Status Wildlife Species with Potential to Occur in the SMP Area

COMMON & SCIENTIFIC NAME	FEDERAL & STATE LISTING		HABITAT REQUIREMENTS	HABITAT SUITABILITY AND LOCAL DISTRIBUTION	POTENTIAL FOR OCCURRENCE
FISH					
Tidewater goby <i>Eucyclogobius newberryi</i>	FE	CSC	Inhabits brackish water along the California coast from Agua Hedionda Lagoon, San Diego County to the mouth of the Smith River.	There is no habitat for this species within SCWA maintained channels. Tidewater goby are no longer found in the San Francisco Bay and have never been collected in the Russian River.	Not Expected
Green sturgeon <i>Acipenser medirostris</i>	FT	--	North American green sturgeon are widely distributed along the Pacific Coast and have been documented offshore from Ensenada Mexico to the Bering Sea and found in rivers from British Columbia to the Sacramento River. As is the case for most sturgeon, North American green sturgeon are anadromous; however, they are the most marine-oriented of the sturgeon species (Moyle 2002).	Pacific coast populations of green sturgeon are divided into two Distinct Population Segments (DPS). The SMP Area is within the Southern Pacific DPS, which was listed as threatened under the ESA in 2006. Spawning populations of green sturgeon are currently found in only the Sacramento River within this DPS. Adults and juveniles are known to use the delta and have been observed in the tidal sections of both Sonoma Cr and the Petaluma River, below any SMP reaches. Critical Habitat was proposed by NMFS in September 2008. The SMP Area does not overlap with proposed critical habitat areas.	Not Expected

Table 3.3-2. Special Status Wildlife Species with Potential to Occur in the SMP Area

COMMON & SCIENTIFIC NAME	FEDERAL & STATE LISTING		HABITAT REQUIREMENTS	HABITAT SUITABILITY AND LOCAL DISTRIBUTION	POTENTIAL FOR OCCURRENCE
Russian River tule perch <i>Hysteroecarpus traskii pomo</i>	--	CSC	Inhabits low elevation streams of the Russian River system. This species requires clear, flowing water with abundant cover, and deep runs or pools (>0.5m). Tule perch are rarely found in streams warmer than 25°C for extended periods and generally are known to prefer temperatures below 22°C. Cover is especially important for near-term females and young because it serves as refuge from predators. Key types of cover include tule beds, dense instream vegetation, and/or submerged branches.	This subspecies is known from a number of locations along the mainstem Russian River and potentially occurs in low elevation tributaries that support habitat requirements such as lower Santa Rosa Creek where the species has been observed by SCWA biologists.	Present
Navarro roach <i>Lavinia symmetricus navarroensis</i>	--	CSC	Habitat generalists. Found in warm intermittent streams as well as cold, well-aerated streams.	Navarro roach are known from the Navarro River and possibly the Russian River. No SMP activities will be conducted on either the Navarro River or Mainstem Russian River.	Not Expected
Tomales roach <i>Lavinia symmetricus ssp. 2</i>	--	CSC	Habitat generalists. Found in warm intermittent streams as well as cold, well-aerated streams. Known from Walker Creek and other tributaries to Tomales Bay	Tomales Bay and its local tributaries are outside of the SMP Area.	Not Expected
Hardhead <i>Mylopharodon conocephalus</i>	--	WL	Hardhead are generally found in clear, deep pools and runs with sand, gravel, and boulder substrates and slow velocities. Most streams in which they occur have summer temperatures in excess of 20°C.	Hardhead are widely distributed in low to medium elevation streams within Sacramento-San Joaquin drainage and are also known from a number of other drainages including the Russian River. This species is occasionally captured in low numbers within the SMP Area.	Present

Table 3.3-2. Special Status Wildlife Species with Potential to Occur in the SMP Area

COMMON & SCIENTIFIC NAME	FEDERAL & STATE LISTING		HABITAT REQUIREMENTS	HABITAT SUITABILITY AND LOCAL DISTRIBUTION	POTENTIAL FOR OCCURRENCE
Central California Coast coho salmon <i>Oncorhynchus kisutch</i>	FE	SE	The Central California Coast coho salmon ESU extends from Punta Gorda in northern California south to and including the San Lorenzo River in central California. Spawning occurs in well oxygenated streams with riffles, loose, silt-free gravel substrate. Preferred rearing habitat consists of slow water pools or cool back water areas where fish are hidden from predators and waters are cool and productive.	Coho are known from the mainstem Russian River, Dry Creek and a number of tributaries to Russian River. Based on guidance from NMFS, all reaches that are known to support coho have been removed from the SMP and routine maintenance activities will no longer be conducted in reaches known to support coho.	Not Expected
Central California Coast steelhead <i>Oncorhynchus mykiss</i>	FT	--	From Russian River, south to Aptos Creek, but the ESU does not include the Pajaro River. The ESU also includes San Francisco and San Pablo Bay basins. Adult holding and migration requirements include cool water temperatures, adequate pool and riffle depths, moderate stream velocities and clean spawning gravel. Juvenile rearing habitat includes appropriate depths, velocities, and substrate size, cool water temperatures, and cover.	Steelhead are known from many of the SMP reaches including Copeland Cr, Windsor Creek, Santa Rosa Cr, Austin Cr, Piner Cr, Paulin Cr, and the Laguna de Santa Rosa in Zone 1A, as well as Adobe Cr in Zone 2A, and Sonoma Cr in Zone 3A.	Present

Table 3.3-2. Special Status Wildlife Species with Potential to Occur in the SMP Area

COMMON & SCIENTIFIC NAME	FEDERAL & STATE LISTING		HABITAT REQUIREMENTS	HABITAT SUITABILITY AND LOCAL DISTRIBUTION	POTENTIAL FOR OCCURRENCE
Central California Coastal Chinook salmon <i>Oncorhynchus tshawytscha</i>	FT	--	The ESU includes all naturally spawned populations of Chinook salmon from rivers and streams south of the Klamath River to the Russian River, California. This species also requires cold, clear, freshwater streams and estuaries with gravel substrate for spawning. Rearing requirements are less rigorous for this species of salmonid as juveniles smolt and leave the system by the late spring of each year, so this run does not require rearing over the summer. Chinook also use larger, lower gradient streams for spawning than do steelhead.	Central California Coastal Chinook salmon are known from the lower Laguna de Santa Rosa and Santa Rosa Creek. They are rarely found in these systems, but appear to use Santa Rosa Creek for spawning on occasion in years with significant early rainfall (Cook 2005, pers. comm.). They are not known from any other SMP reaches. It should also be noted that spawning Chinook, when present in Santa Rosa Cr, would be entering at the end of the maintenance season and juveniles leave the system in the spring (before the maintenance season). Thus, this species would not be directly affected by dewatering operations.	Present

Table 3.3-2. Special Status Wildlife Species with Potential to Occur in the SMP Area

COMMON & SCIENTIFIC NAME	FEDERAL & STATE LISTING		HABITAT REQUIREMENTS	HABITAT SUITABILITY AND LOCAL DISTRIBUTION	POTENTIAL FOR OCCURRENCE
<p>Pacific lamprey <i>Lampetra tridentata</i></p>	<p>SC</p>	<p>--</p>	<p>Pacific lamprey are anadromous and adults generally move into spawning streams between March and June and are known to migrate in freshwater for up to a year prior to spawning. Migrations of 500-600 km are thought to have been normal prior to habitat loss and barriers. Lamprey need cool water (12-18°C) to spawn and, like salmon, use riffles with clean gravel/cobble substrates. Young lampreys, called ammocoetes, generally require cold water (~15°C) to emerge. After emerging from gravels, ammocoetes move to muddy or silty slack water areas to feed on detritus and spend up to seven years in freshwater before undergoing metamorphosis that allows them to survive in the ocean.</p>	<p>Pacific lamprey are the most common and largest lamprey in California and are found in coastal rivers and stream throughout the state as well as in the Sacramento-San Joaquin drainages. In the Russian River watershed, Pacific lamprey have been found in the mainstem, as well as in Santa Rosa Creek.</p>	<p>Present</p>
<p>River lamprey <i>Lampetra ayresi</i></p>	<p>SC</p>	<p>WL</p>	<p>The biology of river lamprey has not been well studied in California and most information about their habitat requirements has been gleaned from research in British Columbia. This species is anadromous with lamprey spawning in freshwater riffles. Young lampreys, called ammocoetes, feed on detritus, algae and microorganisms in slack water environments for 3-5 years before undergoing a 9-10 month metamorphosis that allows them to survive in the ocean. Timing of outmigration and adult spawning is not well known in California, but it is thought to occur between February and May.</p>	<p>River Lamprey are known from as far north as Alaska to the southern extent of their known range in the SF Bay. Most California populations are known from the lower Sacramento and San Joaquin Rivers and their tributaries. Populations are also known from the Russian River, Sonoma Cr, Napa River, and Alameda Cr. Within the SMP Area river lamprey have been identified in Mark West Creek, are considered likely to occur in Santa Rosa Creek and occur in Sonoma Creek.</p>	<p>Present</p>

Table 3.3-2. Special Status Wildlife Species with Potential to Occur in the SMP Area

COMMON & SCIENTIFIC NAME	FEDERAL & STATE LISTING		HABITAT REQUIREMENTS	HABITAT SUITABILITY AND LOCAL DISTRIBUTION	POTENTIAL FOR OCCURRENCE
Sacramento splittail <i>Pogonichthys macrolepidotus</i>	--	CSC	Endemic to the lakes and rivers of the central valley, but now confined to the delta, Suisun Bay, associated marshes, lower Sacramento River and the Sutter and Yolo bypasses.	Local distributions of splittail are largely confined to the Delta, Suisun Bay, Suisun Marsh, lower Napa River, and lower Petaluma River. The Petaluma River estuary apparently supports a self-sustaining population, but it is not clear if the same is true of the Napa River. There are no records of splittail in any of the tributaries to the Petaluma River that are included in the SMP.	Not Expected
Longfin smelt <i>Spirinchus thaleichthys</i>	--	CSC	Open water estuaries, prefers salinities of 15-30 parts per thousand (ppt), but can be found in freshwater. The preference of larval smelt for the upper part of the water column is an adaptation that allows them to be swept quickly into food-rich nursery areas downstream, mainly Suisun and San Pablo bays.	In the Sacramento-San Joaquin estuary, longfin smelt are rarely found upstream of Rio Vista or Medford Island in the Delta. Adults occur seasonally as far downstream as South Bay but they are concentrated in Suisun, San Pablo, and North San Francisco bays. They are rarely collected outside the estuary (Moyle, et al. 1995). Adults and juveniles could be found within the wetland complexes of either the lower Petaluma River or lower Sonoma Creek.	Not Expected

Table 3.3-2. Special Status Wildlife Species with Potential to Occur in the SMP Area

COMMON & SCIENTIFIC NAME	FEDERAL & STATE LISTING	HABITAT REQUIREMENTS	HABITAT SUITABILITY AND LOCAL DISTRIBUTION	POTENTIAL FOR OCCURRENCE	
AMPHIBIANS / REPTILES					
California Tiger Salamander <i>Ambystoma californiense</i>	FE	CSC	A large terrestrial salamander that inhabits seasonal/semi-permanent water sources (3 to 4 months in duration) and adjacent upland habitat with small fossorial mammal activity in lowland grasslands, oak savannah and mixed woodlands. Range includes the Central Valley and Central Coast ranges from Colusa County south to San Luis Obispo and Kern Counties, (sea level to 1,054 meters [3,460 feet] in elevation) with two disjunct populations within Sonoma County and Santa Barbara County. CTS have been documented traveling distances up to 1.6 kilometer (km) (Austin and Shaffer 1992). The active season follows the onset of autumn rains and continues through early spring.	There are 69 extant localities (and 4 presumed extirpated localities) for this species within the SMP Area and a 1-mile buffer (CDFG 2008a). There are no known reports of CTS within the program area channels, although nearly all of the known CTS occurrences are in ponds, vernal pools, or other wetlands, within 1.3 miles of program area channels (Cook 2007a). Most of the aquatic habitats in the program area consist of channelized creeks that do not provide potential CTS breeding habitat. These channels typically have high winter flood flows, contain fish and other aquatic predators, such as bullfrog and crayfish, and are degraded (Cook 2007a). Suitable upland refuge habitat is present in the SMP Area.	Present
Foothill yellow-legged frog <i>Rana boylei</i>	--	CSC	A medium-sized frog that inhabits rocky, cascading streams in woodland, chaparral and coniferous forests from the Oregon border to San Luis Obispo County and the western foothills of the Sierra Nevada below 6,000 feet.	Suitable habitat is present in a few natural channels in the SMP Area. This species has been documented from Adobe Creek (Cook 2008, pers. comm.).	Present

Table 3.3-2. Special Status Wildlife Species with Potential to Occur in the SMP Area

COMMON & SCIENTIFIC NAME	FEDERAL & STATE LISTING		HABITAT REQUIREMENTS	HABITAT SUITABILITY AND LOCAL DISTRIBUTION	POTENTIAL FOR OCCURRENCE
California red-legged frog <i>Rana draytonii</i>	FT	CSC	A medium-sized frog that inhabits lowlands & foothills in or near permanent sources of deep water with dense, shrubby or emergent riparian vegetation up to 1,500 meters in elevation (Jennings and Hayes 1994, Bulger et al. 2003, Stebbins 2003). Range extends from Redding to Baja California, Mexico. Breeding occurs between November and April in standing or slow moving water at least 0.7 meters (2.5 ft) in depth with emergent vegetation, such as cattails, tules, or overhanging willows (Hayes and Jennings 1988).	There are 15 localities for this species within the SMP Area and a 1-mile buffer (CDFG 2008a). Ellis creek, a modified channel where SCWA has an easement to maintain hydraulic capacity located southeast of downtown Petaluma, is the only project channel where California red-legged frog is known to occur (Cook 2007b).	Present
Coast "California" horned lizard	--		A dorsoventrally flattened lizard with several spiny dorsal scales and backward projecting spines on the head. Inhabits a variety of habitats including scrub, chaparral, grasslands and woodlands with sandy to gravelly substrate from Shasta County to Los Angeles County within the Sacramento and San Joaquin Valleys and neighboring foothills. Active from April-October, peaking in April/May. Diet consists of native ants and beetles, but may also feed on other insects that are seasonally abundant.	There are no documented occurrences of this species from the SMP. Marginal habitat is available for this species in scrub natural communities.	Not Expected

Table 3.3-2. Special Status Wildlife Species with Potential to Occur in the SMP Area

COMMON & SCIENTIFIC NAME	FEDERAL & STATE LISTING		HABITAT REQUIREMENTS	HABITAT SUITABILITY AND LOCAL DISTRIBUTION	POTENTIAL FOR OCCURRENCE
Western pond turtle <i>Actinemys marmorata</i>	--	CSC	A moderate sized freshwater turtle that inhabits permanent or nearly permanent bodies of water and low gradient slow moving streams below 6000 feet elevation. Range extends from Washington to Baja California, Mexico along the Pacific slope drainages.	Suitable habitat is present in several lowland creeks in the SMP Area. Species has been documented in several perennial creeks in Zones 1A, 2A and 3A (CNDDDB 2008a).	Present
BIRDS					
Double crested cormorant <i>(Phalacrocorax auritus)</i> (nesting colony)	--	CSC	Rocky coastlines, beaches, inland ponds, and lakes; needs open water for foraging, and nests in riparian forests or eucalyptus groves, usually in snags.	Winters along the entire California coast and inland over the Coast Ranges into the Central Valley from Tehama County to Fresno County; a permanent resident along the coast from Monterey County, and the islands off San Francisco; also breeds in the San Francisco Bay area and in Yolo and Sacramento Counties. Observed in SMP Area during 2006 – 2007 surveys.	Present <i>(not nesting)</i>
Osprey <i>Pandion haliaetus</i>	--	WL	Inhabits rivers, lakes and coastal habitats. Nest in tall trees near water bodies with sufficient prey. Range is almost cosmopolitan throughout California. Breeding begins in March; single-brooded (Baicich & Harrison 2005).	Suitable nesting and foraging habitat present in Sonoma County in perennial streams with surface feeding fish. Most SMP channels do not support prey-base necessary to support osprey.	Possible

Table 3.3-2. Special Status Wildlife Species with Potential to Occur in the SMP Area

COMMON & SCIENTIFIC NAME	FEDERAL & STATE LISTING		HABITAT REQUIREMENTS	HABITAT SUITABILITY AND LOCAL DISTRIBUTION	POTENTIAL FOR OCCURRENCE
White-tailed kite <i>Elanus leucurus</i>	--	FP	Inhabits grasslands, agriculture fields, oak woodlands, savannah and riparian habitats in rural and urban areas. Feeds primarily on California voles. Year-round resident of Central and Coastal California. Breeding begins in February; sometimes double-brooded (Baicich & Harrison 2005).	Lowland areas west of Sierra Nevada from head of Sacramento Valley south, including coastal valleys and foothills to western San Diego County at the Mexican border. Suitable habitat present in low foothills or valley areas with valley or live oaks, riparian areas, and marshes near open grasslands for foraging.	Possible
Bald eagle <i>Haliaeetus leucocephalus</i> (nesting & wintering)	FD	SE, FP	Nests high in trees near rivers, lakes, and reservoirs. Forages for waterfowl and fish in the same areas. In winter, takes carrion and small mammals as well as waterfowl. Tends to avoid human disturbance.	Not known to nest in Sonoma County but could forage over SMP Area in winter.	Possible (foraging only)
Ferruginous hawk <i>Buteo regalis</i> (wintering)	--	WL, BCC	Breeds in the northern states and Canada; winters south from California and Texas to Mexico. Wintering habitat consists of open grasslands, deserts and cultivated fields. Breeding begins in April; single-brooded (Baicich & Harrison 2005).	Suitable winter foraging habitat is present in open terrain in plains and foothills where ground squirrels and other prey are available.	Possible (foraging only)
American peregrine falcon <i>Falco peregrinus anatum</i>	FD	SE, FP	Nests in caves, potholes, and ledges of high cliffs preferably overlooking a large body of water such as a lake, river, or the ocean.	No occurrences within the SMP Area. No suitable nesting habitat and no preferred foraging habitats for this species within the SMP channels and surrounding areas.	Not Expected
California black rail <i>Laterallus jamaicensis coturniculus</i>	--	ST	Permanent resident in the San Francisco Bay area and eastward through the Delta into Sacramento and San Joaquin Counties; Small populations in Marin, Santa Cruz, San Luis Obispo, Orange, Riverside, and Imperial counties.	Permanent resident in the San Francisco Bay area and eastward through the Delta into Sacramento and San Joaquin Counties; Small populations in Marin, Santa Cruz, San Luis Obispo, Orange, Riverside, and Imperial counties.	Not Expected

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COMMON & SCIENTIFIC NAME	FEDERAL & STATE LISTING		HABITAT REQUIREMENTS	HABITAT SUITABILITY AND LOCAL DISTRIBUTION	POTENTIAL FOR OCCURRENCE
California clapper rail <i>Rallus longirostris obsoletus</i>	FE	SE	Marshes around the San Francisco Bay area and east to Suisun Marsh. Restricted to salt marshes and tidal sloughs; usually associated with heavy growth of pickleweed; feeds on mollusks removed from the mud in sloughs.	There are two CNNDDB occurrences for this species within the SMP Area (CDFG 2008a). Though documented from the late 1970s and early 1980s both localities are considered extant. No SMP activities would occur in salt marsh or tidal habitats.	Not Expected
Western snowy plover (coastal populations) <i>Coccyzus americanus occidentalis</i>	FT	CSC	(Nesting) Population defined as those birds that nest adjacent to or near tidal waters, including all nests along the mainland coast, peninsulas, offshore islands, and adjacent bays and estuaries. Twenty breeding sites are known in California from Del Norte to San Diego County. Inhabit coastal beaches above the normal high-tide limit in flat, open areas with sandy or saline substrates; vegetation and driftwood are usually sparse or absent.	No occurrences within the SMP Area. No suitable nesting habitat for this species within the SMP channels and surrounding areas.	None
California least tern (nesting colonies) <i>Sterna antillarum (=albifrons) browni</i>	FE	SE, FP	Nests colonially on open, undisturbed, sandy or gravelly shores near shallow-water feeding areas in estuaries.	No nesting colonies known from SMP Area. Marginally suitable nesting habitat within lowland portions of the SMP Area.	Not Expected
Marbled murrelet <i>Brachyramphus marmoratus</i>	FT	--	(Nesting) Seabird that nests inland along coast and in old-growth redwood-dominated forests, up to 6 mi (9.6 km) inland, often in Douglas firs. Feeds near shore.	No occurrences within the SMP Area. No suitable nesting habitat for this species within the SMP channels and surrounding areas.	None

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COMMON & SCIENTIFIC NAME	FEDERAL & STATE LISTING		HABITAT REQUIREMENTS	HABITAT SUITABILITY AND LOCAL DISTRIBUTION	POTENTIAL FOR OCCURRENCE
Western yellow-billed cuckoo <i>Coccyzus americanus occidentalis</i>	FC	SE	Open woodland (especially where undergrowth is thick), parks, deciduous riparian woodland; in the West, nests in tall cottonwood and willow riparian woodland. Nests in deciduous woodlands, moist thickets, orchards, overgrown pastures; in tree, shrub, or vine, an average of 1-3 meters above ground (Harrison 1979). Requires patches of at least 25 acres of dense riparian forest with a canopy cover of at least 50 percent in both the understory and overstory; nests typically in mature willows (Biosystems Analysis 1989).	Suitable habitat for nesting is present in SMP Area. Documented from Sonoma County (CDFG 2008c).	Possible
Burrowing owl <i>Athene cunicularia</i>	--	CSC	Valley bottoms and foothills with low vegetation and fossorial mammal activity. Listing includes wintering observations with/without a burrow in San Francisco, Ventura, Sonoma, Marin, Napa and Santa Cruz counties. Breeding begins in March; single-brooded (Baicich & Harrison 2005).	Limited suitable habitat present in banks and upland areas near SMP channels with burrowing mammal activity. Riprap lined channels in the SMP Area may also provide suitable burrows for this species.	Possible
Northern spotted owl <i>Strix occidentalis caurina</i>	FT	CSC	Moist, dense coniferous old-growth forests of redwood, Douglas fir, western red cedar and other conifers. Nest in old raptor nest cavities or natural cavities in trees.	No occurrences within the SMP Area. No suitable nesting habitat for this species within the SMP channels and surrounding areas.	None
Vaux's swift (<i>Chaetura vauxi</i>) (nesting)	--	CSC	Nests in redwood and Douglas fir forests in old snags or tall, burned-out stubs, also occasionally in chimneys.	No occurrence within SMP Area but suitable nesting habitat is present in riparian and woodland habitats in SMP.	Possible

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COMMON & SCIENTIFIC NAME	FEDERAL & STATE LISTING		HABITAT REQUIREMENTS	HABITAT SUITABILITY AND LOCAL DISTRIBUTION	POTENTIAL FOR OCCURRENCE
<p>Loggerhead shrike <i>Lanius ludovicianus</i> (nesting)</p>	<p>--</p>	<p>CSC, BCC</p>	<p>Year-round resident in California. Inhabits shrublands and open woodlands associated with grasslands with areas bare ground and impaling sites such as thorny vegetation, multi-stemmed plants or barbed wire (Shuford and Gardali 2008). Breeds from early February through July; double- to triple-brooded (Baicich & Harrison 2005, Shuford and Gardali 2008).</p>	<p>Suitable habitat is present in woodland and riparian scrub areas throughout the SMP Area.</p>	<p>Possible</p>
<p>Bank swallow <i>Riparia riparia</i> (nesting)</p>	<p>--</p>	<p>ST</p>	<p>Nests in colonies in vertical banks with friable soils. Breeds from April to August. Most of California's nesting colonies occur along the upper Sacramento River. Breeding begins in April; double-brooded (Baicich & Harrison 2005).</p>	<p>Marginal habitat available in SMP Area. This species has not been documented from the SMP area.</p>	<p>Not Expected</p>
<p>Salt marsh common yellowthroat <i>Geothlypis trichas sunuosa</i></p>	<p>--</p>	<p>CSC</p>	<p>Freshwater marshes in summer and salt or brackish marshes in fall and winter; requires tall grasses, tules, and willow thickets for nesting and cover</p>	<p>Found only in the San Francisco Bay area in Marin, Napa, Sonoma, Solano, San Francisco, San Mateo, Santa Clara, and Alameda Counties. Documented from SMP Area (CDFG 2008a)</p>	<p>Possible</p>

Table 3.3-2. Special Status Wildlife Species with Potential to Occur in the SMP Area

COMMON & SCIENTIFIC NAME	FEDERAL & STATE LISTING		HABITAT REQUIREMENTS	HABITAT SUITABILITY AND LOCAL DISTRIBUTION	POTENTIAL FOR OCCURRENCE
Yellow-breasted chat <i>Icteria virens</i>	--	CSC	A large, secretive wood warbler that inhabits early successional riparian area, pond margins, marshes, hedgerows, old pastures and edge habitats with dense shrub understories and an open canopy (Shuford and Gardali 2008). Occurs in forests especially regenerating burned and logged areas (Eckerle and Thompson 2001, Baicich & Harrison 2005). Distributed throughout northern California and the Central Valley. Nests in dense shrubs up to eight feet in height; breeds from late April through early August; double-brooded (Baicich & Harrison 2005, Shuford and Gardali 2008).	Suitable nesting habitat is present in riparian areas throughout the SMP Area. No documented occurrences of this species from the SMP.	Possible
San Pablo song sparrow <i>Melospiza melodia samuelis</i>	--	CSC	Uses tidal sloughs in pickleweed marshes; requires tall bushes (usually grindelia) along sloughs for cover, nesting, and songposts; forages over mudbanks and in the pickleweed.	Distributed throughout San Pablo Bay. No suitable tidal marsh habitat within SMP channels proposed for maintenance. Documented from Sonoma County (CDFG 2008c).	Not Expected
Yellow warbler <i>Dendroica petechia</i>	--	CSC	Nests in riparian habitats with a dominant vegetation of willows. Lengthy stretches of streams are favored, though observed in patches of willow where small creeks empty into reservoirs (Berner, et al 2003).	Suitable nesting habitat present in riparian areas throughout the SMP Area. Summer visitor with known occurrences from Sonoma County. Observed in the SMP Area during 2006 – 2007 surveys.	Present

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COMMON & SCIENTIFIC NAME	FEDERAL & STATE LISTING		HABITAT REQUIREMENTS	HABITAT SUITABILITY AND LOCAL DISTRIBUTION	POTENTIAL FOR OCCURRENCE
Tricolored blackbird <i>Agelaius tricolor</i>	--	CSC	Highly colonial species, most numerous in central valley & vicinity. Largely endemic to California. Nest in emergent vegetation within aquatic and riparian habitats. Breeds from mid-March through early August; double-brooded (Baicich & Harrison 2005, Shuford and Gardali 2008).	Found at scattered coastal locations from Marin County south to San Diego County; breeds at scattered locations in Lake, Sonoma, and Solano Counties. Documented from Sonoma County (CDFG 2008c).	Possible
MAMMALS					
Pallid bat <i>Antrozous pallidus</i>	--	CSC WBWG -H	Inhabits rocky terrain in open areas in lowlands, foothills and mountainous areas near water throughout California below 2,000 meters. Roost in caves, rock crevices, mines, hollow trees, buildings and bridges in arid regions in low numbers (<200). Active from March-November; migrates in some areas, but may hibernate locally.	Suitable habitat is present in bridges, riparian and woodland vegetation throughout the SMP Area. Documented from SMP Area (CDFG 2008c).	Possible
Townsend's big-eared bat <i>Corynorhinus (=Plecotus) townsendii townsendii</i>	--	CSC WBWG -H	An obligate cave rooster and moth specialist. Inhabits caves and mines, but may also use bridges, buildings, rock crevices and tree hollows in coastal lowlands, cultivated valleys and nearby hills characterized by mixed vegetation throughout California below 3,300 meters. Exhibits high site fidelity and is highly sensitive to disturbance. Forages along edge habitats near water; may travel long distances during foraging bouts.	Suitable roost habitat is not present in SMP but species may be found foraging near SMP channels.	Possible

Table 3.3-2. Special Status Wildlife Species with Potential to Occur in the SMP Area

COMMON & SCIENTIFIC NAME	FEDERAL & STATE LISTING		HABITAT REQUIREMENTS	HABITAT SUITABILITY AND LOCAL DISTRIBUTION	POTENTIAL FOR OCCURRENCE
Greater western mastiff bat <i>Eumops perotis californicus</i>	--	CSC	Roosts primarily in cliff faces and rock walls but can adapt to manmade shelters (tunnels); forages primarily over open areas, meadows, oak savannah, and desert washes. Favor rugged, rocky areas.	Suitable foraging habitat present. Occurs along the western Sierra primarily at low to middle elevations and widely distributed throughout the southern coast ranges. Recent surveys have detected the species north to the Oregon border	Possible
Western red bat <i>Lasiurus blossevillii</i>	--	CSC WBWG -H	Primarily a riparian obligate species that is ubiquitous throughout most of California except the northern Great Basin region. Roosts individually in foliage within trees along riparian areas, orchards and suburban areas. Favors cottonwoods, willows, sycamores, and walnut trees (Bolster 2005). Feeds primarily on moths, but will eat a variety of other insects.	Suitable roost habitat present in the riparian, orchard and suburban areas.	Possible
Hoary bat <i>Lasiurus cinereus</i>	--	CSC WBWG -H	Ubiquitous throughout California. A solitary foliage rooster that prefers evergreens, but will use deciduous trees in forested habitats, particularly in edge habitat (Bolster 2005). May forage in small to large groups. Feeds primarily on moths, but will eat a variety of other insects. Migrates great distances.	Suitable roost habitat is present in oak woodlands and riparian areas. Documented from western Sonoma County (CDFG 2008c).	Possible
Long-eared myotis bat <i>Myotis evotis</i>	--	CSC WBWG -H	Typically inhabits brushy woodland habitats and coniferous forests up to 2,800 meters throughout California except the Central Valley and deserts. Roosts in a variety of habitats including exfoliating bark, tree hollows, caves, rotten stumps, snags, cliff crevices and bridges. A foliage gleaner that requires nearby water.	Suitable roost habitat is present in oak woodlands and riparian areas.	Possible

Table 3.3-2. Special Status Wildlife Species with Potential to Occur in the SMP Area

COMMON & SCIENTIFIC NAME	FEDERAL & STATE LISTING	HABITAT REQUIREMENTS	HABITAT SUITABILITY AND LOCAL DISTRIBUTION	POTENTIAL FOR OCCURRENCE
Fringed myotis bat <i>Myotis thysanodes</i>	-- CSC WBWG -H	Exhibits a strong roosting preference for large trees and snags, but will use buildings, caves, rock crevices, etc. if necessary. Inhabits a variety of woodland, scrub and grassland habitats up to 2,850 meters throughout California except for Central Valley and southern deserts. Forages great distances and is active during winter months. Highly sensitive to human disturbance.	Suitable roost habitat is present in oak woodlands and riparian areas.	Possible
Yuma myotis bat <i>Myotis yumanensis</i>	-- WBWG -LM	A riparian obligate species. Ubiquitous throughout California. Inhabits riparian areas near permanent water sources. Roosts in a variety of habitats including bridges, buildings, caves, mines, cliff crevices and trees. Forages above water and in riparian areas	Suitable roost habitat is present in oak woodlands and riparian areas.	Possible
Big free-tailed bat <i>Nyctinomops macrotis</i>	-- CSC WBWG -MH	Inhabits rugged and rocky arid landscapes in desert scrub, woodland and evergreen habitats (Navo 2006). Roosts primarily in cliff crevices, but will also use buildings, caves and tree cavities (Navo 2006). A member of the Molossidae (free-tailed bat) family ranging from sea level to 2,600 meters (8,500 feet) in southern Utah, Nevada, and California, southern and western Texas, north and central Colorado, Arizona and New Mexico southward to South America (Navo 2006).	Marginal roost habitat is present in the open woodlands in the SMP Area.	Possible

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COMMON & SCIENTIFIC NAME	FEDERAL & STATE LISTING		HABITAT REQUIREMENTS	HABITAT SUITABILITY AND LOCAL DISTRIBUTION	POTENTIAL FOR OCCURRENCE
Salt marsh harvest mouse <i>Reithrodontomys raviventris</i>	FE	SE	Endemic to San Francisco, San Pablo and Suisun Bays. Inhabit salt marshes with dense plant cover of pickleweed and fat hen; adjacent to an upland site.	There are two CNNDDB occurrences for this species within the SMP Area (CDFG 2008a). No SMP activities would occur in salt marsh or tidal habitats.	Not Expected
Sonoma tree vole <i>Arborimus pomo</i>	--	CSC	Occurs in North Coast fog belt from Oregon border to Sonoma County. Inhabits Douglas-fir, redwood, montane hardwood-conifer forests. Feeds almost exclusively on Doug fir needles and will occasionally take needles of grand fir, hemlock or spruce.	No suitable forest habitat in SMP Area. Documented from Sonoma County (CDFG 2008c).	Not Expected
American badger <i>Taxidea taxus</i>	--	CSC	A large mustelid that inhabits open areas with friable soils within woodland, grassland, savannah and desert habitats. A fossorial mammal that preys predominately on ground squirrels (<i>Ammospermophilus</i> and <i>Spermophilus</i> spp.) and pocket gophers (<i>Thomomys</i> spp.). Mating occurs in late summer; young are born in March and April (Jameson and Peeters 2004).	Marginal habitat is present in the woodland communities surrounding SMP channels. Known from Sonoma County (CDFG 2008c).	Not Expected

¹ **Explanation of State and Federal Listing Codes**

Federal listing codes:

- FE Federally listed as Endangered
- FT Federally listed as Threatened
- FPE Federally proposed for listing as Endangered
- FPT Federally proposed for listing as Threatened
- FPD Federally proposed for delisting
- FC Federal candidate species (former Category 1 candidates)
- FSC Species of Concern (fish species only)
- CH Critical Habitat (Proposed or Final) is designated
- SSC Species of Special Concern designated by the Marine Mammal Commission
- FSC *Federal Species of Concern – No longer maintained by USFWS Sacramento Regional Office*
- SLC *Species of local concern or conservation importance – No longer maintained by USFWS*

California listing codes:

- SE State listed as Endangered
- ST State listed as Threatened
- SCE State candidate for listing as Endangered
- SCT State candidate for listing as Threatened
- SCD State candidate for delisting
- CSC California Species of Special Concern
- FP Fully Protected
- WL Watch List

Table 3.3-2. Special Status Wildlife Species with Potential to Occur in the SMP Area

ABC	The American Bird conservancy maintains a Green List of all the highest priority birds for conservation in the continental United States and Canada. Based off the species assessments prepared by Partners in Flight (PIF) and has been expanded to include shorebirds, waterbirds and waterfowl.
AFS	American Fisheries Society identifies marine, estuarine and diadromous fish species that are at risk of extinction in North America. The AFS has designated the following four classifications in order of conservation importance E – Endangered, T – Threatened, V – Vulnerable, and CD – Conservation Dependent.
BCC	U.S. Fish and Wildlife Service Birds of Conservation Concern. List of migratory and nonmigratory bird species (beyond those already designated as federally threatened or endangered) that represent the Service’s highest conservation priorities.
BLM	Bureau of Land Management. Species designated as “Sensitive Species” are treated with the same level of protection that is given to federal candidate species.
CDFGC	California Department of Fish and Game Code: §3503 prohibits the taking, possession or needless destruction of the nest or eggs of any bird; §3503.5 prohibits the taking, possession or destruction of any bird in the order Falconiformes or Strigiformes (birds-of-prey) or the taking, possession or destruction of the nest or eggs of any such bird; §3511 outlines protection for fully protected birds; and §3513 prohibits the taking or possession of any migratory non-game bird as designated in the Migratory Bird Treaty Act.
WBWG	The Western Bat Working Group. H – High Priority indicates species that are imperiled or are at high risk of imperilment based on available information on distribution, status, ecology and known threats; M – Medium Priority indicates a lack of information to assess the species’ status; L – Low Priority indicates relatively stable populations based on available data. The WBWG also uses intermediary designations including MH – Medium-High and LM – Low-Medium priorities.

Chapter 3.4

CULTURAL RESOURCES

Chapter 3.4

CULTURAL RESOURCES

3.4.1 Introduction

This chapter reviews the existing conditions related to cultural resources in the Program Area and presents the Proposed Program's potential effects on cultural and paleontological resources. It also describes federal, state, and local regulations related to cultural and paleontological resources that would apply to the Proposed Program.

Cultural resources are the remains and sites associated with past human activities and include prehistoric and ethnohistoric Native American archaeological sites, historic archaeological sites, historic buildings, and elements or areas of the natural landscape which have traditional cultural significance. A paleontological resource is defined as fossilized remains of vertebrate and invertebrate organisms, fossil tracks, and plant fossils.

The majority of this chapter has been derived from two sources:

- A Cultural Resources Constraints Report prepared for the Stream Maintenance Program (SMP) by Environmental Science Associates (ESA) (ESA 2008). Note that while an environmental impact report (EIR) is an informational disclosure document, information about the specific location of archaeological sites and sacred lands is specifically restricted from disclosure under the State California Environmental Quality Act (CEQA) Guidelines section 15120(d) pursuant to Government Code section 6254. Because the ESA report identifies the locations of cultural resources in the vicinity of the Program Area, it has not been made public; rather, this chapter provides a more a general summary of the cultural resources in the Program Area.
- The EIR for the Sonoma County General Plan 2020 (Sonoma County 2007).

Study Area

The study area for the cultural resources evaluation is a 1-mile radius from Program channels, access roads, and other features under the maintenance authority of the Sonoma County Water Agency (SCWA). The study area was used to help determine general areas of sensitivity and identify locations where previous cultural resources management studies have been conducted.

Area of Potential Effects

The Area of Potential Effects (APE) includes Program channels, access roads, and other features under the maintenance authority of SCWA. A 100-ft. buffer from the top of bank was included in the APE to account for access and staging areas. The purpose of the APE was to determine site sensitivity in relation to specific watercourses and facilities under the SMP. If present, a large number of previously-identified cultural resources located within

the APE would indicate an elevated level of sensitivity, suggesting increased likelihood that Program activities could cause adverse impacts to historic properties. The APE was established in consultation with the U.S. Army Corps of Engineers (Ungvarsky 2008).

Methodology for Assessment of Existing Conditions

Previous Investigations

Previous research was conducted by Tom Origer and Associates in 2005 for the Santa Rosa Citywide Creek Master Plan. This cultural resources study included review of several of the same stream channels under SCWA maintenance authority. Origer's approach was programmatic, focusing on the distribution of archaeological sites in the plan area and analyzing potential impacts from proposed projects. The records search revealed 64 sites recorded in the plan area. By comparing the percentage of area formally surveyed for cultural resources (20%) to the number of resources already identified, Origer projected that an additional 150 archaeological sites could be found within non-surveyed portions of the plan area. Recommendations included additional survey effort to identify cultural resources in the non-surveyed areas (80%).

Current Investigations

The cultural investigation for the SMP was completed in two phases. Jones & Stokes (J&S) performed an initial investigation which addressed the Program Area as a whole, but focused more specifically on locations where SCWA planned to perform routine maintenance activities in 2006. This investigation was conducted to support permitting for stream maintenance activities during the interim period while the SMP was in development. In the second phase, ESA used the information collected by J&S and the previous Origer investigation described above, and conducted additional research in order to complete the investigation for the Program.

The J&S study (Jones & Stokes 2006) focused on 40 proposed project-specific locations within the greater SCWA SMP Program Area. The 2006 study addressed maintenance locations at Copeland and Hinebaugh creeks in Rohnert Park; East Washington, Lynch, Corona, Adobe creeks and Holms Ditch in Petaluma; segments of Piner, Laguna de Santa Rosa, Austin, Colgan, Cook, Peterson, Gossage, Russell, and Steele creeks in Santa Rosa; Bloomfield Creek in Bloomfield, and Dry Creek in Healdsburg.

As part of the J&S effort, a records search for the greater SMP study area was conducted by a staff member of the Northwest Information Center (NWIC) of the California Historical Resources Information System at Sonoma State University on March 29, 2006 (File No. 05-947). To ensure currency of the information, an update was completed by J&S on January 8, 2008 (File No. 07-969). These records searches of the study area were completed in order to: (1) determine whether known cultural resources had been recorded within or adjacent to the Program Area; (2) assess the likelihood of unrecorded cultural resources based on historical references and the distribution of environmental settings of nearby sites; and (3) develop a context for identification and preliminary evaluation of cultural resources.

Included in the review were the California Inventory of Historical Resources (California Department of Parks and Recreation 1976), California Historical Landmarks (1990), California Points of Historical Interest (1992), and the Historic Properties Directory Listing

(2008). The Historic Properties Directory includes listings of the National Register of Historic Places (NRHP) and the California Register of Historical Resources (CRHR), and the most recent listing (March 7, 2008) of the California Historical Landmarks and California Points of Historical Interest.

Using the 2006 research results, J&S evaluated the location of previously-identified cultural resources in relation to specific stream maintenance projects (Jones & Stokes 2006). Projects were also mapped and compared with aerial photographs to identify whether the type of modern development adjacent to the watercourse would be likely to contain cultural resources. Six project locations were appraised based on records search results and aerial photography exclusively.

One previously recorded cultural resource (CA-SON-676, a prehistoric archaeological site on the banks of Gossage Creek) was located within the specific footprint of one of the 40 proposed projects. On-foot reconnaissance survey was conducted at that location as well as at 11 additional locations. CA-SON-676 was not relocated and no additional cultural resources were recorded.

ESA completed the subsequent phase of the cultural resources investigation, building on the previous investigations and associated documentation. ESA archaeologists began a thorough evaluation of all previous cultural resources documentation including prior technical reports, EIRs, and a comprehensive review of archival record search results obtained from the NWIC. Because J&S (2006) had only focused on the 40 project-specific locations it was necessary to expand the archival search to incorporate all potential maintenance areas in the Program.

The study area and APE were established to quantify recorded cultural resources that could be impacted by Program activities. ESA plotted the locations of cultural resources in or adjacent to the APE in order to determine areas of high cultural sensitivity. ESA archaeologists further analyzed SMP activities and their potential for disturbing native soils and impacting historic properties, either known or unknown.

Native American Consultation

Cultural institutions, lifeways, culturally-valued viewsheds, places of cultural association, and other sacred places and trust assets must also be considered under the National Environmental Policy Act (NEPA) (40 CFR 1501.2), Section 106 of the NHPA, Executive Order 12898, and sometimes other authorities (Executive Order 13175, Executive Order 13007, and the Native American Graves Protection and Repatriation Act). Although it basically provides additional rationale for consultation with tribes, Executive Order 13007 specifically deals with sacred sites.

The Native American Heritage Commission (NAHC) was contacted by J&S on April 20, 2006 to request a database search for sacred lands or other cultural properties of significance within or adjacent to the APE. The NAHC responded that the sacred lands survey did not have record of specific cultural resources in the APE and provided a list of Native American contacts that might have further knowledge of the project area with respect to cultural resources. People and organizations identified by the NAHC were contacted by J&S in May 2006. Further consultation was initiated by ESA via letter on July 31, 2008. Each Native

American group was asked to comment about the project area with any potential concerns. The following two individuals responded to this request.

Mr. Reno Franklin, Cultural Resources Coordinator for the Kashia Band of Pomo Indians, contacted ESA on August 19, 2008 with comments about the SMP. Mr. Franklin had reviewed the project area maps and concluded that three zones contain locations traditionally within the tribe's territory. He also noted that the NWIC does not contain the information pertaining to Kashia Pomo cultural resources. Mr. Franklin requested that any additional cultural resources investigations for the SMP within traditional territory (Flood Control Zones 5A, 7A, and the northern section of Zone 8A) include consultation with the tribe and that this contact information be provided in the SMP Constraints Report. The tribe also requested a meeting between the Tribal Council, the Cultural Resource Staff of the Kashia Pomo Tribe, and SCWA to discuss ways for SCWA and the Kashia Pomo Tribal Government to communicate and coordinate with each other to mutually support preservation goals.

Ms. Brenda Tomaras, Representative of the Lytton Band of Pomo Indians, responded by telephone on August 25, 2008. Ms. Tomaras believed that certain activities proposed under the SMP could impact cultural resources, including culturally-significant plants. Continued consultation prior to ground-disturbing activities was requested to ensure that the Lytton Band was appropriately incorporated into the planning process in their traditional territory (sections of Flood Control Zones 1A, 4A, 5A, and 6A).

Native American contact information is provided in Table 3.4-1. The table outlines the Native American organizations and general affiliated zones for contact during future cultural resources assessment.

3.4.2 Regulatory Setting

Federal Regulations

Archaeological and architectural resources (buildings and structures) are protected through the National Historic Preservation Act (NHPA) of 1966, as amended (16 USC 470f) and its implementing regulation, Protection of Historic Properties (36 CFR Part 800), the Archaeological and Historic Preservation Act of 1974, and the Archaeological Resources Protection Act of 1979. Prior to implementing an "undertaking" (e.g., issuing a federal permit), Section 106 of the NHPA requires federal agencies (e.g., Bureau of Indian Affairs, Bureau of Land Management, U.S. Bureau of Reclamation, U.S. Army Corps Of Engineers, etc.), to consider the effects of the undertaking on historic properties and to afford the Advisory Council on Historic Preservation (ACHP) and the State Historic Preservation Officer (SHPO) a reasonable opportunity to comment on any undertaking that would adversely affect properties eligible for listing on the NRHP. Section 101(d)(6)(A) of the NHPA allows properties of traditional religious and cultural importance to a tribe to be determined eligible for inclusion in the NRHP. Under the NHPA, a find is significant if it meets the NRHP listing criteria at 36 CFR 60.4, as stated below:

Table 3.4-1. Native American Contacts

Native American Organization	SCWA Flood Control Zone	Contact
Cloverdale Rancheria of Pomo Indians	4A, 6A	Patricia Hermosillo, Chairperson
Dry Creek Rancheria of Pomo Indians	4A, 6A	Harvey Hopkins, Chairperson DEP Contact: Tom Keegan
Lytton Band of Pomo Indians	1A, 4A, 5A, 6A	Margie Mejia, Chairperson Lisa Miller, Tribal Administrator Dianne Albright, Environmental Planner
Mishewal-Wappo Tribe of Alexander Valley	5A	Earl Couey, Cultural Resources Manager
Stewarts Point Rancheria – Kashia Band of Pomo Indians	5A, 7A, 8A	Eric Wilder, Chairperson Lynne Rosselli, Environmental Planning Department Reno Franklin, Cultural Resources Coordinator
Federated Indians of Graton Rancheria	1A, 2A, 3A, 5A, 8A, 9A	Greg Sarris, Chairperson Gene Bevulot, Council Member

The quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association and:

- a) That are associated with events that have made a significant contribution to the broad patterns of our history, or
- b) That are associated with the lives of persons significant in our past, or
- c) That embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction, or
- d) That have yielded, or may be likely to yield, information important in prehistory or history.

The American Indian Religious Freedom Act of 1978 allows access to sites of religious importance to Native Americans.

Federal review of projects is normally referred to as the Section 106 process. The Section 106 review normally involves a four-step procedure described in detail in the implementing regulations (36 CFR Part 800):

- identify and evaluate historic properties in consultation with the SHPO and interested parties;

- assess the effects of the undertaking on properties that are eligible for inclusion in the NRHP;
- consult with the SHPO, other agencies, and interested parties to develop an agreement that addresses the treatment of historic properties and notify the ACHP; and
- proceed with the project according to the conditions of the agreement.

State Regulations

The State of California implements the NHPA through its statewide comprehensive cultural resource surveys and preservation programs. The California Office of Historic Preservation (OHP), as an office of the California Department of Parks and Recreation, implements the policies of the NHPA on a statewide level. The OHP also maintains the California Historic Resources Inventory. The SHPO is an appointed official who implements historic preservation programs within the state's jurisdictions as well as serving as a consulting party in the federal process described above.

California Register of Historic Resources

The CRHR is "an authoritative listing and guide to be used by state and local agencies, private groups, and citizens in identifying the existing historical resources of the state and to indicate which resources deserve to be protected, to the extent prudent and feasible, from substantial adverse change" (California Public Resources Code [PRC] Section 5024.1[a]). The criteria for eligibility to the CRHR are based on NRHP criteria (PRC Section 5024.1[b]). Certain resources are determined by the statute to be automatically included in the California CRHR, including California properties formally determined eligible for, or listed in, the NRHP.

To be eligible for the CRHR, a prehistoric or historical-period property must be significant at the local, state, and/or federal level under one or more of the following criteria:

- 1) Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;
- 2) Is associated with the lives of persons important in our past;
- 3) Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or
- 4) Has yielded, or may be likely to yield, information important in prehistory or history.

For a resource to be eligible for the CRHR, it must also retain enough of its character or appearance (integrity) to be recognizable as a historical resource and to convey the reason for its significance. A historic resource that does not retain sufficient integrity to meet the NRHP criteria may still be eligible for listing in the CRHR.

The CRHR consists of resources that are listed automatically as well as those that must be nominated through an application and public hearing process. The CRHR automatically includes the following:

- California properties listed on the NRHP and those formally determined to be eligible for the NRHP;
- California Historical Landmarks from No. 770 onward;
- California Points of Historical Interest that have been evaluated by the OHP and have been recommended to the State Historical Resources Commission for inclusion on the CRHR; and
- Other resources that may be nominated to the CRHR include:
 - Historical resources with a significance rating of Category 3 through 5 (i.e., properties identified as eligible for listing in the NRHP, the CRHR, and/or a local jurisdiction register)
 - Individual historical resources
 - Historical resources contributing to historic districts
 - Historical resources designated or listed as local landmarks, or designated under any local ordinance, such as a historic preservation overlay zone.

California Environmental Quality Act

CEQA, as codified at PRC Sections 21000 et seq., requires lead agencies to determine if a proposed project would have a significant effect on archaeological resources. As defined in PRC Section 21083.2, a “unique” archaeological resource is an archaeological artifact, object, or site about which it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria:

- Contains information needed to answer important scientific research questions and there is a demonstrable public interest in that information;
- Has a special and particular quality such as being the oldest of its type or the best available example of its type;
- Is directly associated with a scientifically recognized important prehistoric or historic event or person.

In addition, the CEQA Guidelines define historical resources as: (1) a resource in the CRHR; (2) a resource included in a local register of historical resources, as defined in PRC Section 5020.1(k) or identified as significant in a historical resource survey meeting the requirements of PRC Section 5024.1(g); or (3) any object, building, structure, site, area, place, record, or manuscript that a lead agency determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California, provided the lead agency’s determination is supported by substantial evidence in light of the whole record.

If a lead agency determines that an archaeological site is a historical resource, the provisions of PRC Section 21084.1 and CEQA Guidelines Section 15064.5 would apply. If an

archaeological site does not meet the CEQA Guidelines criteria for a historical resource, then the site is to be treated in accordance with the provisions of PRC Section 21083 regarding unique archaeological resources. The CEQA Guidelines note that if a resource is neither a unique archaeological resource nor a historical resource, the effects of a project on that resource shall not be considered a significant effect on the environment (CEQA Guidelines Section 15064[c][4]).

California Public Resources and Administrative Codes

Several sections of the California PRC protect paleontological resources. Section 5097.5 prohibits “knowing and willful” excavation, removal, destruction, injury, and defacement of any paleontological feature on public lands (lands under state, county, city, district, or public authority jurisdiction, or the jurisdiction of a public corporation), except where the agency with jurisdiction has granted express permission. Section 30244 requires reasonable mitigation for impacts on paleontological resources that occur as a result of development on public lands.

Local Regulations

The various general plans within the SMP Area contain a variety of goals, objectives, policies, programs, and implementation measures which address cultural resources. Only those that are relevant to the SMP have been presented below. Information from general plans was considered relevant where it may affect the manner in which SMP activities are conducted, or provide insight and guidance regarding the relationship between the local planning process and the potential effects of the SMP on cultural resources.

Sonoma County General Plan 2020

The following goals, objectives, and implementation measures related to cultural resources are included in the County’s general plan are applicable to the Proposed Program:

- | | |
|----------------------------|--|
| <i>Goal OSRC-19</i> | Protect and preserve significant archaeological and historical sites that represent the ethnic, cultural, and economic groups that have lived and worked in Sonoma County, including Native American populations. Preserve unique or historically significant heritage or landmark trees. |
| <i>Objective OSRC-19.1</i> | Encourage the preservation and conservation of historic structures by promoting their rehabilitation or adaptation to new uses. |
| <i>Objective OSRC-19.2</i> | Encourage preservation of historic building or cemeteries by maintaining a Landmarks Commission to review projects which may affect historic structures or other cultural resources. |
| <i>Objective OSRC-19.4</i> | Identify and preserve heritage and landmark trees. |
| <i>Objective OSRC-19.5</i> | Encourage the identification, preservation, and protection of Native American cultural resources, sacred sites, places, features, and objects, including historic or prehistoric ruins, burial grounds, cemeteries, and ceremonial sites. Ensure appropriate treatment of Native American and other human remains discovered during a project. |

Implementation Measures

<i>OSRC-19a</i>	Designate the County Landmarks Commission to review projects within designated historic districts.
<i>OSRC-19e</i>	Refer applications that involve the removal, destruction or alteration of a structure or cemetery identified in a historic building survey to the Landmarks Commission for mitigation. Measures may include reuse, relocation, or photo-documentation.
<i>OSRC-19f</i>	Use the Heritage or Landmark Tree Ordinance and the design review process to protect trees.
<i>Policy OSRC-19j</i>	Develop an archaeological and paleontological resource protection program that provides: <ul style="list-style-type: none">■ Guidelines for land uses and development on parcels identified as containing such resources,■ Standard project review procedures for protection of such resources when discovered during excavation and site disturbance, and■ Educational materials for the building industry and the general public on the identification and protection of such resources.
<i>Policy OSRC-19k</i>	Refers applications for discretionary permits to the Northwest Information Center to determine if the project site might contain archaeological or historical resources. If a site is likely to have these resources, require a field survey and preparation of an archaeological report containing the results of the survey and include mitigation measures if needed.
<i>Policy OSRC-19l</i>	If a project site is determined to contain Native American cultural resources, such as sacred sites, places, features, or objects, including historic or prehistoric ruins, burial grounds, cemeteries, and ceremonial sites, notify and offer to consult with the tribe or tribes that have been identified as having cultural ties and affiliation with that geographic area.
<i>Policy OSRC-19m</i>	Develop procedures for consulting with appropriate Native American tribes during the General Plan adoption and amendment process.
<i>Policy OSRC-19n</i>	Develop procedures for complying with the provisions of State Health and Safety Code Section 7050.5 and Public Resources Code Section 5097.98, if applicable, in the event of the discovery of a burial or suspected human bone. Develop procedures for consultation with the Most Likely Descendant as identified by the California Native American Heritage Commission, in the event that the remains are determined to be Native American.

City of Santa Rosa 2020 General Plan

The following goals, objectives, and implementation measures related to cultural resources are included in the City of Santa Rosa's general plan are applicable to the Proposed Program:

<i>HP-A</i>	<i>Protect Native American heritage</i>
<i>HP-A-1</i>	Review proposed developments and work in conjunction with Sonoma State University's Northwest Information Center to determine whether sites contain known Native American resources or have the potential for such resources.
<i>HP-A-2</i>	Require that areas found to contain significant artifacts be examined by a qualified consulting archaeologist for recommendations concerning protection and preservation.
<i>HP-A-3</i>	If cultural resources are encountered during grading, avoid altering the materials and their context until a qualified cultural resource consultant has evaluated the situation, and recorded identified cultural resources.
<i>HP-B</i>	<i>Preserve Santa Rosa's historic structures and neighborhoods</i>
<i>HP-B-2</i>	Preserve significant historic structures. Consider various alternatives to demolition of these structures, including the adaptive reuse of historic buildings for contemporary uses.
<i>HP-B-8</i>	Preserve sites that are eligible for the National Register of Historic Places, and pursue listing eligible sites in the Register.

City of Rohnert Park General Plan

The following goals, objectives, and implementation measures related to cultural resources are included in the City of Rohnert Park's general plan are applicable to the Proposed Program:

<i>EC-A</i>	Conserve historic and archaeological resources for the aesthetic, educational, economic, and scientific contribution they make to Rohnert Park's identity and quality of life.
<i>EC-2</i>	Ensure the protection of known archaeological resources in the city by requiring a records review for any development proposed in areas that are considered archaeologically sensitive for Native American and/or historic remains. Require construction activities and development adjacent to sites of historic or archaeological resources to avoid degradation by studying the potential effects of development and construction in the resource; requiring pre-construction surveys and monitoring during any ground disturbance for all development in areas of historical and archaeological sensitivity; and implementing appropriate measures to avoid the identified impacts.

Portions of Rohnert Park's eastside are considered to have the potential to contain additional archaeological resources. Since these areas are designated for future development, adequate policies and measures for protection of known and unknown archaeological resources that can supplement CEQA requirements may need to be incorporated into future plans (including the University District Specific Plan) and development activities. The City should collaborate with SSU to conduct searches, monitor sites, and take appropriate steps.

EC-3

In accordance with CEQA and the State Public Resources Code, require the preparation of a resource mitigation plan and monitoring program by a qualified archaeologist in the event that archaeological resources are discovered.

CEQA requires assessment of a project's potential impact on archaeological resources. In the event that historical or unique archaeological resources are accidentally discovered during construction, materials and their surroundings shall not be altered or collected. A qualified archaeologist must make an immediate evaluation and avoidance measures or appropriate mitigation should be completed, according to CEQA Guidelines § 15064.5 (f). Public Resources Code § 21083.2 includes additional provisions protecting these resources. City involvement in the identification, mitigation, and monitoring of project impacts on these resources will ensure the protection of Rohnert Park's cultural heritage and compliance with State law.

City of Petaluma General Plan 2025

The following goals, objectives, and implementation measures related to cultural resources are included in the City of Petaluma's general plan are applicable to the Proposed Program:

3-P-1

Protect historic and archaeological resources for the aesthetic, cultural, educational, environmental, economic, and scientific contribution they make to maintaining and enhancing Petaluma's character, identity and quality of life.

- The loss of designated and eligible historic resources shall be minimized through strict enforcement of City policies requiring proposed demolition to be reviewed by the Historic and Cultural Preservation Committee. All means shall be used to encourage preservation of eligible historic resources (Resolution 2005-198 N.C.S. as thereafter amended).
- Ensure the protection of known and unrecorded archaeological resources in the city by requiring a records review for any development proposed in areas that are considered archeologically sensitive for Native American and/or historic remains.
- In accordance with CEQA and the State Public Resources Code, require the preparation of a resource mitigation plan and

monitoring program by a qualified archaeologist in the event that archaeological remains are discovered.

3-P-5

The protection of historic resources shall be a key consideration and an equal component in the development review process.

- Develop procedures to ensure that historic resource reports and similar background materials be submitted to Historic SPARC during preliminary review of projects involving historic or cultural resources in order to resolve potential conflicts between preservation and proposed development early in the planning process.
- Ensure that future plans, ordinances, and City programs are complimentary to the historic preservation goals and policies contained within this plan.
- Develop standards for historical review.

City of Sonoma 2020 General Plan

The following goals, objectives, and implementation measures related to cultural resources are included in the City of Sonoma's general plan are applicable to the Proposed Program:

5.8 Encourage the designation and preservation of local historic structures and landmarks, and protect cultural resources.

5.8.2 Refer development proposals to the California Archaeological Inventory at Sonoma State University to ensure that important archeological sites are identified and protected.

City of Healdsburg General Plan

The following goals, objectives, and implementation measures related to cultural resources are included in the City of Healdsburg's general plan are applicable to the Proposed Program:

Goal D To preserve and enhance Healdsburg's historical heritage

- The City shall set as a high priority the protection and enhancement of Healdsburg's historically and architecturally significant buildings.
- The City shall continue to implement Healdsburg's Historical Preservation Ordinance.

Goal E To protect Healdsburg's Native American heritage

- The City shall not knowingly approve any public or private project that may adversely affect an archeological site without consulting the California Archeological Inventory, Northwest Information Center, conducting a site evaluation as may be indicated, and attempting to mitigate any adverse impacts according to the recommendations of a qualified archeologist.

City implementation of this policy shall be guided by the State and local CEQA Guidelines.

- The City shall refer development proposals that may adversely impact archeological sites to the California Archeological Inventory, Northwest Information Center, at Sonoma State University.

Town of Windsor General Plan

The following goals, objectives, and implementation measures related to cultural resources included in the Town of Windsor's general plan are applicable to the Proposed Program:

- E.1* Identify and preserve significant cultural or historical sites or structures within the Town
- E.1.1* The Town shall continue to encourage efforts, both public and private, to preserve its historical and cultural heritage. Property owners shall be encouraged to nominate eligible properties for listing in local, state, and federal registers of historic places.
- E.1.2* Significant archaeological and historical resources should be identified and protected from destruction. If evidence of such resources appears after development begins, the developer shall prepare an assessment of appropriate actions to preserve or remove the resources, subject to review and approval of the actions by the Town.

City of Sebastopol General Plan

The following goals, objectives, and implementation measures related to cultural resources are included in the City of Sebastopol's general plan are applicable to the Proposed Program:

- Goal 11* Preserve archaeological and historic resources.
- P.38* Preserve Archaeological Resources: Continue to protect archaeological resources.
- Program 38.1* Require that areas found to contain significant historic or prehistoric artifacts be examined by a qualified consulting archaeologist.
- P.39 Historic Buildings, Sites, and Districts* Identify, recognize and protect sites, buildings, structures, and districts with significant cultural, aesthetic and social characteristics which are part of Sebastopol's heritage.

3.4.3 Environmental Setting

The environmental setting is divided into three primary sections. The first section, Cultural History, summarizes the cultural history of the Sonoma County region. Because archaeological and historic regions can represent large geographic areas and display some

cultural homogeneity throughout, a discussion of the prehistoric, ethnographic, and historic contexts is useful in order to evaluate the impacts to cultural resources in the APE. The second section addresses the geologic formations in the Program Area and their potential to contain paleontological resources. The final section discusses the results of the records search conducted for the Proposed Program.

Cultural History

Prehistoric Context

An analytic framework for the interpretation of the San Francisco Bay and North Coast Ranges prehistory is provided by Fredrickson (1974), who divided human history in California into three broad periods: the Paleoindian period, the Archaic period, and the Emergent period. This scheme used sociopolitical complexity, trade networks, population, and the introduction and variations of artifact types to differentiate between cultural units. The significance of prehistoric sites rests partly on their ability to help archaeologists explain the reasons for these changes in different places and at different times in prehistory. The scheme, with minor revisions (Fredrickson 1994), remains the dominant framework for prehistoric archaeological research in this region.

The Paleoindian period (10,000 to 6000 B.C.) was characterized by small, highly mobile groups occupying broad geographic areas. During the Archaic period, consisting of the Lower Archaic period (6000 to 3000 B.C.), Middle Archaic (3000 to 500 B.C.), and Upper Archaic (500 B.C. to A.D. 1000), geographic mobility may have continued, although groups began to establish longer-term base camps in localities from which a more diverse range of resources could be exploited. The addition of milling tools, obsidian and chert concave-base points, and the occurrence of sites in a wider range of environments suggests that the economic base was more diverse. By the Upper Archaic, mobility was being replaced by a more sedentary adaptation in the development of numerous small villages, and the beginnings of a more complex society and economy began to emerge. During the Emergent Period (A.D. 1000 to 1700), social complexity developed toward the ethnographic pattern of large, central villages where political leaders resided, with associated hamlets and specialized activity sites. Artifacts associated with the period include the bow and arrow, small corner-notched points, mortars and pestles, and a diversity of beads and ornaments (Fredrickson 1994; Gerike et al. 1996, 3.11–3.17).

Archaeological sites in the Bay Area that date to the Middle Archaic Period (about 3000 to 500 B.C.) reveal an almost exclusive use of cobble mortars and pestles, which is often associated with a heavy reliance on acorns in the economy (Moratto 1984). Such unusually intensive reliance on one food source indicates that a shift away from the earlier reliance on a broad spectrum of dietary sources to supply food was needed by around 1000 years ago. The abundance of available food along lakeshores and estuaries during the late Pleistocene/early Holocene likely led to overutilization of the resources, which subsequently resulted in population increases. This utilization may explain the shift toward exploiting a readily available yet less-favored food resource like acorns or seeds (Jones 1991). Nevertheless, given the burgeoning size of Middle Archaic Period settlements, the populations were probably denser and more sedentary, yet continued to exploit a diverse resource base—from woodland, grassland, and marshland to shoreline resources throughout the Bay Area (King 1974).

The population increases and larger, more complex settlements that began in the late-Middle Archaic Period typify the Upper Archaic Period (about 500 B.C. to A.D. 1000). The sociopolitical climate also appears to have become more elaborate, with clear differentiations in wealth. During the Emergent Period (about A.D. 1000 to 1700), however, there was a decline in new sites and large shell mounds were abandoned. The population also declined during the Emergent Period, along with associated changes in resource use that were likely caused by humans depleting some terrestrial food sources during the Archaic Period (Broughton 1994).

Ethnographic Setting

The Program Area is located within the ethnographic territory of four distinct Native American tribes: Coast Miwok, Southern Pomo, Kashia (Kashaya), and Wappo. For all of these tribes, areas around streams were frequently settled and/or heavily used, and represent locations of generally high sensitivity for archeological deposits.

Coast Miwok

Coast Miwok territory encompasses all of present-day Marin County and parts of Sonoma County, from Duncan's Point on the coast east to between the Sonoma and Napa rivers (Barrett 1908; Kelly 1978; Kroeber 1925). The Coast Miwok language, a member of the Miwokan subfamily of the Penutian family, is divided into two dialects: Western, or Bodega, and Southern, or Marin, which in turn is subdivided into valley and coast. *Miwok* refers to the entire language family that was spoken by Coast Miwok, as well as Lake, Valley, and Sierra Miwok. Each large village had a tribal leader but there does not appear to have been a defined larger organization (Kelly 1978, 414).

Much of the information about post-contact Coast Miwok material cultural and lifestyles was gathered from two informants, Tom Smith (Bodega dialect) and María Copa (Marin dialect) (based on Kelly's field notes from 1931–1932). Settlements focused on bays and estuaries, or along perennial interior watercourses. The economy was based on fishing, hunting, and gathering, revolving around a seasonal cycle during which people traveled throughout their territory to make use of resources as they became available. Marine foods, including kelp, clams, crabs, and especially fish, were a year-round staple. Acorns were gathered in season and stored for use throughout the year. Tobacco was generously used by most men.

Dwellings were conical in shape and grass-covered. Each large village had a circular, dug-out sweathouse. Basketry techniques included both coiled and twined forms often with the use of multicolored motifs and patterns. Beginning as early as 1600 A.D. the Coast Miwok began to produce and use clamshell disk beads as money (Stewart and Praetzellis 2003,177). The obsidian trading network was established in the Early Holocene period. Coast Miwok had a powerful sense for the value of property. Some Coast Miwok villages defended their territory against trespassers. Although land was not considered privately owned certain food-producing trees as well as hunting, fishing, and clam-digging locations were (Kelly 1978,418).

By the mid-1800s Spanish missionization, diseases, raids by Mexican slave traders, and dense immigrant settlement had disrupted Coast Miwok culture, dramatically reducing the population, and displacing the native people from their villages and land-based resources.

By the time of California's initial integration into the United States in the late 1840s, the Coast Miwok population had dwindled from a pre-European contact population of approximately 2,000 individuals to approximately 250 individuals (Kelly 1978,414).

In 1920 the Bureau of Indian Affairs purchased a 15.45 acre tract of land in Graton for the Marshall, Bodega, Tomales, and Sebastopol Indians. This land was put into a federal trust and these neighboring peoples that included both Coast Miwok and Southern Pomo were consolidated into one recognized group called the Graton Rancheria. In 1958 the U.S. government enacted the Rancheria Act of 1958, transferring tribal property into private ownership. Forty-four Rancherias in California were affected, including the Graton Rancheria.

Throughout the 20th century, tribal members continued to protect their cultural heritage and identity despite being essentially landless. On December 27, 2000 President Clinton signed into law legislation restoring federal recognition to the Federated Indians of Graton Rancheria. The tribe currently has approximately 1,100 members.

Southern Pomo

The Southern Pomo are one of a group of seven distinct languages (Southern, Kashia, Central, Northern, Eastern, Southeastern, and Northeastern) that have been associated with the larger Pomoan linguistic family (McLendon and Oswalt 1978,279). The territory of the Southern Pomo-speaking peoples, also called Mihilakawna or Makahmo, extends from approximately 5 miles south of Santa Rosa northward to approximately the Sonoma-Mendocino County border, and from the eastern drainage of the Russian River westward to Southwestern Pomo, or Kashia territory (Barrett 1908; Kroeber 1925; McLendon and Oswalt 1978).

The primary sociopolitical unit was the village community, or tribelet. Pomo village communities consisted of a principal village, at which the chief resided, surrounded by several secondary settlements. Each village community averaged around 100 to 2,000 people. Within Southern Pomo tribelet territories, people were allowed to freely hunt, fish, and gather plant foods. Tribelet boundaries, however, were clearly defined in regards to rights of utilization of their territory by other groups (Kroeber 1925, 228-230).

Beginning around 1800, the Southern Pomo people were significantly diminished through missionization, Mexican slave raids, disease, and immigrant settlement in their territory (McLendon and Oswalt 1978, 279). By 1910 the recorded total Southern Pomo population was 1,200.

Four current federally-recognized tribes in Sonoma County have Southern Pomo members: Cloverdale, Lytton, Dry Creek, and Graton (partial, see above). The Dry Creek Band was first officially recognized by the U.S. government in 1915. A Rancheria was established on steep-sloped 75-acres in Alexander Valley. In 1921, the Cloverdale Band was recognized and the U.S. government purchased 27.5 acres of land south of Cloverdale for the "Cloverdale Band of Homeless Indians." Their population at the time was about 40 individuals. The Lytton Band of Pomo Indians was first established in 1937 when Bert Steele, who was part Achomawi and part Nomlaki, and his Bodega Pomo wife, petitioned the government for a 50-acre parcel north of Healdsburg. As described above, in 1958 the U.S. government

enacted the Rancheria Act of 1958, transferring tribal property into private ownership. The Dry Creek, Cloverdale, and Lytton Rancherias were affected by this action.

Throughout the remaining century, tribal members continued to protect their cultural heritage and identity despite being essentially landless. It took nearly 25 years before Pomo recognition was restored when a lawsuit, led by Pomo Tillie Hardwick, forced the U.S. government to re-establish all terminated Rancherias. The Dry Creek, Cloverdale, and Lytton Rancherias currently have approximately 1,200 members.

Kashia

The Kashia (Kashaya), or Southwestern Pomo, territory is along the Pacific Coast from Duncan's Point north to Stewarts Point and inland to the Austin Creek watershed (McLendon and Oswalt 1976, 277). The principle village *Metini* was located near Fort Ross where the main residences of the headmen and women were located. Other large principle villages and smaller subsidiary villages supported an estimated 1,500 people. During the summer the communities moved to the coast where they gathered abalone, mussels, fish, and marine mammals as well as sea plants and sea salt. In the late fall they journeyed back inland to sheltered village locations. Kashia basketry is a ritual art and incorporates stone, bone, shell, horn, fibers and feathers in unique designs.

The history of the Kashia differs from other Pomo-speaking tribes in that their first direct contact with non-Native peoples was not with Spaniards, Mexicans, or Euroamericans, but rather with Russians. The Russian colony at Fort Ross operated from 1812 to 1842 and as a result many Kashia Pomo escaped missionization. Russians, native Alaska Aleuts, Kashia, and Bodega Coast Miwok cooperated for nearly three decades. Many Kashia learned to speak Russian and even occasionally intermarried with both Russians and Aleuts.

When the Russians left, Mexican and Euroamericans began to settle the coast and forced changes to the Kashia's traditional way of life. Beginning in the 1870s they lived in three villages, two of which were located on property owned by Charles Haupt, who was married to a Kashia woman. In 1914 Haupt petitioned the U.S. government on behalf of the Kashia for a 40-acre parcel near Stewarts Point.

The current population is approximately 250 and many still live on the reservation; although the majority has moved to larger cities in Sonoma County. Because of the slower assimilation process, many Kashia can still speak their language. A grant from the Administration for Native Americans and the Department of Health and Human Services has helped establish the Kashia Band of Pomo Indians Language Website focused on increasing tribal member's knowledge of their language, history, and culture.

Wappo

The ethnographic territory of the Wappo, a population of Yukiian-speaking people with their own unique dialect and language, occupied the northern Napa Valley and portions of the north and eastern Russian River Valley within the Santa Rosa Plain. Geographically, the territorial area occupied by the Wappo stretched in a northwesterly direction from just north of the present-day cities of Napa and Sonoma to include the cities of Geysers, Cloverdale, and Middletown at its northern extent (Kroeber 1925, 218-219; Plate 27; Barrett 1908, 264). This territory included the broad northwest-southeast trending river

valleys and associated tributaries, as well as the flanking mountains of the Coastal Range and a small enclave along the southern shore of Clear Lake called *Lile'ek* by the Pomo, their neighbors to the west (Kroeber 1925, 219). Isolated from other Yukian-speaking peoples, this group was bound on all sides by other native groups, the Lake Miwok to the north, the Patwin (Wintun) to the south and east, the Pomo to the north and west, and the Coast Miwok to the southwest (Heizer and Whipple 1971, Map 1).

The settlement pattern for the Wappo included permanent villages in valleys, along rivers or other waterways, organized as districts of tribelets around “one larger and continuously inhabited town, the center of a community with some sense of political unity” (Kroeber 1925, 218). Tribelet chiefs were elected or appointed and resided at these major villages, responsible for maintaining relationships with other tribelets, as well as neighboring native tribes such as the Patwin, Pomo, and Miwok. The Wappo tribelet chief was also responsible for the management of his or her village, performing functions of ceremonial moderator, and the primary source for dispute resolution (Sawyer 1978, 256–263). The subsistence strategy for the Wappo was that of the hunter-gatherer, including a heavy dependence upon the acorn and other natively procured plants and the hunting of big and small game, which included bear, deer, elk, rabbits, and birds, among others.

Material culture traits for the Wappo are shared with their neighboring cultural groups, predominantly those of the Pomo. A wide variety of stone tools manufactured from locally accessible raw material sources were an important part of the Wappo assemblage. Common tool types are projectile points, drills, knives, and scrapers of chert, basalt, or preferably, obsidian. Napa Glass Mountain, “a regionally important obsidian site and quarry, and other local obsidian sources are situated within Wappo territory, a resource which greatly enhanced the trading power of this group. The basketry of the Wappo was of noted quality, made from a unique weaving technique utilizing a variety of locally accessible plant materials; this technique is believed to have originated with the Pomo, the western neighboring group of the Wappo. Houses of the Wappo were constructed of a domed framework of branches that were tied together, covered with leaves and smaller branches in the summer, and branches with mud in the winter. Animal bones as well as marine shells from coastal locations were used as a form of currency, to fashion jewelry, beads, awls, and other functional tools” (Sawyer 1978, 261–262).

It is surmised that the population of the Wappo prior to European contact may have exceeded 1,000 persons before falling drastically to 40 persons in 1908. During Spanish occupation, the Wappo were notably resistant to all attempts of subjugation. Despite this resistance, this native population was eventually brought under the control of the Mission at Sonoma, between 1823 and 1834. The remaining population was eventually moved to a reservation in Mendocino, where the majority perished, eventually leading to the closure of the reservation in 1867 (Kroeber 1925, 221; Sawyer 1978, 258–259).

Historic-Period Background

Sonoma County hosted Russian, Spanish, and other European settlers during the historic period, as well as a drastically impacted Native population. Beginning in 1806, Russian presence in the county increased along the coast, culminating in the establishment of a permanent trading outpost for the Russian-American Company at Fort Ross in 1812. Even with the increasing presence of other European citizenry, Spain controlled the Alta California territory, which included the northern San Francisco area, until the establishment

of the independent government of Mexico in 1821. In 1823 Francisco Castro and Father Jose Altamira led the first recorded expedition into the area in an effort to scout for potential mission sites, resulting in the founding of the mission at Sonoma (San Francisco-Solano Mission) that same year. For several years thereafter, the mission cultivated livestock while attempting to convert the local native population, albeit with little success. Secularization of mission lands soon followed the transfer of control to the Mexican government with the approval of a law in 1833. It was intended that secularized mission holdings be reverted to the Native Californian population, however most of the territory became the holdings of Mexican and American industrialists. Thus a period of large, private land-ownership known as *Ranchos* began, as the wealthy and privileged obtained tracts of former mission lands.

With the transition from Spanish to Mexican control, the Mexican government established various military outposts within Alta California one of which was the *El Presidio de Sonoma* (Sonoma Barracks), founded in 1836 to board troops under the direction of General Mariano Guadalupe Vallejo. This troop presence was strategically selected in an effort to counter Native American resistance as well as the slow matriculation of Russian control from the north. General Vallejo owned the large *Rancho Petaluma* and between 1834 and 1840 built the largest adobe in Northern California, the Petaluma Adobe, in the foothills of the Sonoma Mountains. Vallejo also owned *Rancho Agua Caliente* along Sonoma Creek, adjacent to the town of Sonoma. Following the end of the Mexican-American War in 1848, California was admitted to the Union (1850), becoming the 31st state within the United States of America. Sonoma County, along with neighboring Napa and Marin County, is one of the 27 original California counties established in 1850.

As the American Period began, an influx of new economies resulted in an increase in settlement and the development of farming, ranching, and businesses in Sonoma County. It was in the mid-nineteenth century that wine grapes from Europe were first successfully grown and today, Sonoma County is best known for its world-renowned wine production. Since its formation, Sonoma County has been a center for agriculture, shipping ventures, and larger commercial activities. Pivotal to the modern development of Sonoma County cities and economies has been the development of civil water services and the management of water resources.

Sonoma County Water History

By the late 1800s, several privately owned and operated water-works agencies were active in Sonoma County including the Petaluma Water Company (1868), which sold out to the Sonoma Water Company (incorporated in 1871), and the Santa Rosa Water Works (1873) (Thompson 1877).

In the 1940s Sonoma County began to manage the water resources for a county whose economy was heavily dependent upon agriculture and other agrarian industries. After a series of heavy winter floods between the later 1930s and the early 1940s, and after a short delay caused by World War II, an evaluation of the Russian River Basin was completed and as a result, construction of several water management facilities and flood control measures began. In order to implement this construction, the formation of a legal authority within Sonoma County was required and in 1949, the Sonoma County Flood Control and Water Conservation District was established, later to become the SCWA (SCWA 2006). Since its establishment, the SCWA has overseen the management and improvement of the County's

existing water supply and transmission system, as well as the implementation and continued flood protection of the County and its citizenry.

The engineered and modified channels maintained under the SMP were constructed at various points during the second half of the 20th century. Until recently, maintenance of these facilities consisted of returning them to the “as-built” condition, which involved removal of all accumulated sediment and vegetation. More recently, the maintenance approach has shifted towards increasingly ecologically-friendly techniques such as those associated with the SMP and described in the SMP Manual.

Paleontological Resources

Paleontology is the study of the forms of life existing in prehistoric or geologic times, as represented by the fossils of plants, animals, and other organisms. Paleontological remains are fairly common in Sonoma County. They include plants, invertebrates, and vertebrates ranging in age from approximately 140 million years to less than 8,000 years before the present. Within the county, paleontological remains have been primarily recovered from the following geologic formations:

- *Franciscan complex (Jurassic)* This formation largely covers the northern part of the county, with the exception of the Alexander Valley and northern Santa Rosa plain;
- *Wilson Grove Formation (Miocene-Pliocene)* This is a common location for Paleontological remains, and is largely located in the western part of the county, along with the Ohlson Ranch Formation (Miocene-Pliocene), and the Petaluma Formation. The boundaries of this area are Occidental, Sebastopol, Petaluma, and the Coast. These formations are also present around the base of the Sonoma Mountains; and
- *Sonoma Volcanics (Miocene-Pliocene)* This is the formation of the Sonoma Mountains and the Sonoma/ Napa Mountains which form the western border of the county.

Note that Program activities occur almost entirely in Quaternary alluvium; the source rocks for such alluvium may include the above formations, but it is unlikely that paleontological deposits found in such alluvium would be intact or cohesive.

Records Search Results

Cultural Resources within the Study Area

The records search indicated that there are 102 recorded cultural resources within the SMP study area (a 1-mile radius of SCWA maintenance reaches and facilities). Included are 63 prehistoric archaeological sites, 9 historic-period archaeological sites, 18 historic-period architectural/structural resources, and 5 multi-component sites that include both prehistoric and historic-period elements. Prehistoric archaeological sites include, but are not limited to, concentrations of obsidian and chert flaked-stone tools (e.g., projectile points, knives, scrapers) or toolmaking debris; culturally darkened soil (“midden”) containing heat-affected rocks, artifacts, or shellfish remains; and stone milling equipment (e.g., mortars, pestles, handstones, or milling slabs); and battered stone tools, such as hammerstones and pitted stones. Historic-period archaeological resources include stone walls; filled wells or

privies; deposits of metal, glass, and/or ceramic refuse, and out-of-use transportation features such as railroad berms and roads. Historic-period architectural/structural properties include standing structures, bridges, and in-use railroads or other transportation features.

Cultural Resource Studies in or adjacent to the APE

As described earlier, the Area of Potential Effects (APE) includes Program channels, access roads, and other features under the maintenance authority of the SCWA, as well as a 100-ft. buffer from the top of bank. The records search indicated that approximately less than 20% of the land in or immediately adjacent to the APE has been surveyed by a qualified archaeologist for cultural resources. This means that the majority of the APE has not been investigated for the presence of cultural resources.

Cultural Resources within the APE

Thirty-six archaeological resources (prehistoric and historic-period) have been recorded within the APE for channels in Zone 1A and Zone 3A (Table 3.4-2). No cultural resources have been recorded in the APE for Zones 2A or 4A-9A. No historic architectural or structural resources have been recorded within the APE. The majority (22) of the archaeological sites has been recorded in Owned-in fee Engineered Channels within Zone 1A (refer to Chapter 2 Figure 2-2 for a map of these channels).

For the thirty-six recorded sites, records describe their position in relation to watercourses or channels. Some recorded sites also include impacts from channel construction and maintenance. One example is CA-SON-518, located on the Gossage Creek channel in Cotati. Originally recorded in 1973, the site was comprised of a large shell midden with obsidian tools, clam disc beads, *Olivella* beads, and protohistoric trade beads (Upson 1973). Impending construction of the Gossage Creek channel in 1975 initiated an archaeological excavation that concluded portions of the site were buried beneath up to 2-1/2 feet of alluvium. Subsequent investigation in 1989 found intact surface indicators on the north side of the channel. A shovel-testing program concluded that most of the site remained buried and that the 1973 investigation had focused only on the upper levels (Stewart 1989). Site sensitivity at this location on the Gossage Creek channel is extremely high as indicated by the presence of several other prehistoric sites in this vicinity.

Another example is CA-SON-1384, located in Santa Rosa on the Paulin Creek channel. Only visible in the north bank of the channel, the site was recorded approximately 2-1/2 feet below ground surface (White and Mikkelsen 1982). The exposed bank exhibited a dark clay soil with charcoal, baked clay, and obsidian debitage. The straightening of Paulin Creek had destroyed portions of the site although its extent has still not been investigated.

An example of a historic-period archaeological site within the APE is CA-SON-1276H (Thompson 1980). The site is located immediately adjacent to the north bank of Santa Rosa Creek just southeast of the intersection of Second and Wilson streets in Santa Rosa. Formerly the location of the Santa Rosa/Grace Brothers Brewery, the site consists of a dense concentration of historic-period artifacts including numerous ceramic beer bottles, glass bottles, clay pipe stems, metal fragments, and horseshoes. The brewery was founded in 1872 and remained in business until the mid-twentieth century.

Current analysis suggests that within the small percentage of area that has been investigated for cultural resources there is a high degree of cultural sensitivity. Given the fact that a vast majority of the APE has yet to be investigated for cultural resources it is likely that there are a large number of sensitive areas that have yet to be identified. This relative uncertainty regarding the level of knowledge surrounding the presence of historic resources within the Program Area guided the approach and considerations for the following impact analysis.

3.4.4 Impact Analysis

Methodology

This analysis relied on standard professional practice for the assessment of Program impacts on cultural resources. CEQA requires project proponents to assess a project's potential effects on significant historical resources (i.e., those that are listed or eligible for listing in the CRHR or in a local register or survey that meets the requirements of Sections 5020.1[k] and 5024.1[g] of the California PRC). This entails the following steps.

- Identify potential historical resources.
- Evaluate the significance of identified historical resources.
- Evaluate the anticipated effects of a project on all significant historical resources.

Under CEQA, only effects on significant resources are considered potentially significant, so only these impacts need be analyzed in detail. Some of the cultural resources found in the project area may meet the significance criteria of the CRHR. In addition, there is always the potential for subsurface archaeological deposits.

Certain activities proposed by the SMP do not have the potential to disturb native soils and therefore do not have the potential to impact historic properties. On the other hand, other activities proposed by the SMP have the potential to disturb native soils. Due to the lack of information regarding the locations of buried deposits throughout much of the APE, and the generally high sensitivity of streams for such deposits, Program activities were evaluated for their potential to impact historic properties. For the purposes of this cultural resources assessment the SMP activities have been divided into two categories: (1) activities that will disturb native soils by excavation, construction, and sediment disposal and (2) activities that will not disturb native soils. An analysis of types of activities and their potential impact to historic properties is provided below. Note that these or similar activities have been occurring on SCWA-maintained channels for many years; however, prior maintenance activities were not guided by a programmatic approach to maintenance, oversight, mitigation, etc. By implementing such a programmatic approach, the SMP involves a more comprehensive methodology for evaluating and mitigating the potential effects on cultural resources.

Excavation, Construction, and Sediment Disposal

Some maintenance activities require disturbance of native soils by excavation and/or construction, such as bank stabilization or culvert replacement. Where cultural resources are present in native soils, disturbance of these native soils has the potential to impact such

Table 3.4-2. Recorded Cultural Resources within the SMP Area of Potential Effect

Channel Type	Quad Name	Site #	Study #	Type	Notes
ZONE 1A					
Easement Engineered	Healdsburg	49-002876		N/A	N/A
Easement Engineered	Santa Rosa	CA-SON-0014		N/A	N/A
Easement Modified	Cotati	CA-SON-1017	1171, 2582, 15565	PH	Scatter of mussel, clam, bone and charcoal
Easement Modified	Cotati	CA-SON-1018	2582, 15565	PH	Scatter of mussel and other shell fragments
Easement Modified	Two Rock	CA-SON-1058	1751, 447, 2458, 2332	PH	Midden with obsidian flakes and marine shell
Easement Modified	Two Rock	CA-SON-0978	7889, 477, 2043, 2458, 2356	PH	Moderate obsidian scatter on two low rises
Easement Modified	Two Rock	CA-SON-0979	7889, 477, 2043, 2458, 2356	PH	Large obsidian scatter probably associated with CA-SON-980
Easement Modified	Two Rock	CA-SON-0980	7889, 477, 2043, 2458, 2356	PH	Partially disturbed midden with shell, chert, obsidian and heat-affected rock
Easement Natural	Santa Rosa	CA-SON-0515		N/A	N/A
Owned in fee	Cotati	CA-SON-1029	279	PH	Midden characterized by several obsidian flakes
Owned in fee	Cotati	CA-SON-0447		N/A	N/A
Owned in fee	Cotati	CA-SON-0518	7889, 11709, 126, 279	PH	Shell midden site possibly used for bead manufacture. Destroyed by SCWA in 1974
Owned in fee	Cotati	CA-SON-0676		N/A	Across the street from CA-SON-159; no additional information
Owned in fee	Cotati	CA-SON-0705	2582	PH	Deep midden site with little shell, but lots of obsidian; Small corner notched points
Owned in fee	Santa Rosa	CA-SON-1182		PH	Sparse scatter of obsidian and chert debitage
Owned in fee	Santa Rosa	CA-SON-1270		PH	Moderate obsidian lithic scatter with one piece of chert and one piece of shell
Owned in fee	Santa Rosa	CA-SON-1276H		H	Dense deposit of historic-period material from the Santa Rosa/Grace Bros. Brewery
Owned in fee	Santa Rosa	CA-SON-1373H	16343	H	Historic-period rock foundations, stone walls and old dirt roads
Owned in fee	Santa Rosa	CA-SON-1384	2845	PH	Exposed portion of dark clay containing charcoal, baked clay and obsidian flakes
Owned in fee	Santa Rosa	CA-SON-0153		N/A	N/A

Table 3.4-2. Recorded Cultural Resources within the SMP Area of Potential Effect

Channel Type	Quad Name	Site #	Study #	Type	Notes
Owned in fee	Santa Rosa	CA-SON-2082	16343	PH	Obsidian scatter
Owned in fee	Santa Rosa	CA-SON-0362	16343	PH	Aboriginal red paint mine
Owned in fee	Santa Rosa	CA-SON-0006		N/A	N/A
Owned in fee	Santa Rosa	CA-SON-0084	2270, 1163, 950, 7889	PH	Possible midden with obsidian flaking waste and a slight quantity of shell
Owned in fee	Santa Rosa	CA-SON-0860/H	7037, 7451	PH/H	Surface indicators of shell, bone and obsidian; Historic-period component consists of a relocated Hoag house with trash pit
Owned in fee	Santa Rosa	CA-SON-0963, 0964, 0965H	7824, 6438	PH/H	Mound of midden; heat-affected rock visible on the surface with some obsidian flakes; historic-period component is a 19th century farmstead
Owned in fee	Sebastopol	CA-SON-1302	2272	PH	Large buried site characterized by obsidian and chert flakes and artifacts, fragments of groundstone, and possible leached midden
Owned in fee	Sebastopol	CA-SON-1463	7120	PH	Sparse surface scatter of obsidian flakes and tools
Owned in fee	Sebastopol	CA-SON-0728	442, 477	PH	Midden site with obsidian and chert flakes and shell
Owned in fee	Two Rock	CA-SON-1063		N/A	N/A
Owned in fee	Two Rock	CA-SON-1702	10167	PH	Light obsidian scatter with one biface fragment
ZONE 3A					
Easement Natural	Glen Ellen	CA-SON-0127		PH	Midden site with many obsidian and groundstone artifacts, including blades, points and pestles
Easement Natural	Glen Ellen	CA-SON-2311		PH	Large prehistoric midden site defined by soil, obsidian artifacts and heat-affected rock
Easement Natural	Glen Ellen	CA-SON-2312		PH	Medium-sized prehistoric midden defined by soil, obsidian artifacts and heat-affected rock
Easement Natural	Glen Ellen	P-49-002786		H	Medium-sized historic-period refuse scatter
Easement Natural	Glen Ellen	C-564		PH	Midden site with obsidian, chert and heat-affected rock

PH-Prehistoric; H-Historic-period; N/A-Not available

resources. Furthermore cultural resources that may be located at new sediment disposal sites could be impacted by the placement of foreign sediment on an exposed ground surface. When native soils will be disturbed or impacted from maintenance activities it should be determined whether those locations contain cultural resources. Implementation of BMP CR-1 is required for such activities to reduce impacts to less-than-significant.

Top of bank and/or Hand-held Equipment

Maintenance activities that are accomplished from the top of bank or with the use of hand-held equipment do not have the potential to disturb native soils and therefore would not impact cultural resources. These activities do not require additional cultural resource assessment; however, in the case of accidental discovery of cultural materials and the discovery of human or fossil remains, BMPs CR-2 and CR-3 would be implemented.

Criteria for Determining Significance

This analysis used criteria from CEQA Guidelines Section 15064.5(b)(1) and (2) that identify a significant impact as one with the potential to cause a substantial adverse change in the significance of a historical resource. Substantial adverse change in the significance of a resource means the physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of the resource would be materially impaired. The significance of a historical resource is materially impaired when a project results in the following:

- demolition or material alteration in an adverse manner of those physical characteristics of a historical significance and that justify its inclusion in, or eligibility for inclusion in, the CRHR;
- demolition or material alteration in an adverse manner of those physical characteristics that account for its inclusion in a local register of historical resources pursuant to Section 5020.1 (k) of the Public Resources Code or its identification in a historical resources survey meeting the requirements of Section 5024.1(g) of the Public Resources Code, unless the public agency reviewing the effects of the project establishes by a preponderance of evidence that the resource is not historically or culturally significant; or
- demolition or material alteration in an adverse manner of those physical characteristics of a historical resource that convey its historical significance and that justify its eligibility for inclusion in the CRHR as determined by a lead agency for purposes of CEQA.

In addition, a significant impact would also result if the program would:

- Directly or indirectly destroy a unique paleontological resource or site, or unique geologic feature; or
- Disturb any human remains, including those interred outside of formal cemeteries.

Environmental Impacts

Impact CR-1: Disturbance to a Known Archeological or Historic Site (Less than Significant with Mitigation)

As described in Existing Conditions above, the SMP Program Area contains multiple archeological and historic sites, which may be historically significant and eligible for listing in the CRHP. Program activities which result in the substantial adverse change in the significance of a historical resource would be considered a significant impact. Activities involving excavation within or sediment disposal on native soils, conducted in proximity to the resources identified in Table 3.4-2, would be required to implement BMP CR-1.

With implementation of this measure, this impact is considered less than significant.

Level of Significance: Less than significant with mitigation

Mitigation Measures:

BMP CR-1: Cultural Resources Investigation

For maintenance activities which require excavation into native soils (e.g., bank stabilization, culvert replacement, etc.), and for all new sediment disposal sites, a cultural resources investigation shall be conducted prior to performing the maintenance activity. The cultural resources investigation shall include the following elements:

1. **Background Research and Native American Consultation.** An updated records search shall be conducted at locations planned for maintenance that have not had a records search completed within the previous five years. Sediment disposal sites shall only require an initial records search. Investigations should begin with a review of the data acquired for this document to determine whether the proposed activity will occur within a previously-known culturally-sensitive area. An addendum records search at the NWIC will also be necessary to determine if any cultural resources have been recorded since the creation of this document. The records search will identify resources within or near the project location and determine whether that location has been previously surveyed up to current standards.

In conjunction with the background research, the appropriate Native American organization will be contacted to provide comments or concerns about a maintenance activity location.

2. **Pedestrian Survey.** If an adequate survey has not been completed for a project location within a ten-year period from the date of scheduled maintenance, a pedestrian survey is required. Sediment disposal sites shall only require an initial pedestrian survey. All areas of exposed ground should be closely inspected for the presence of cultural materials. Areas of dense vegetation should be inspected as closely as possible and any exposed channel banks should be carefully examined for the presence of buried cultural resources. Depending on the likelihood for encountering subsurface remains, based on an analysis of site distribution and geomorphology of the project location, a series of small, hand-auger borings may be excavated, with all sediments passed through 1/4-inch screen, to assure that no subsurface archaeological materials are present. The auger borings would also provide an initial assessment of the surface integrity of the landform (e.g., is a substantial amount of imported or redeposit fill material present?) and provide additional information about the potential for buried archaeological material. If the limited subsurface testing does not reveal buried cultural material, there will be less likelihood that unexpected discoveries will delay activities.

If an archaeological deposit is encountered, a preliminary assessment of site boundaries should be made. Any archaeological material recovered in auger holes will be recorded, cataloged, and re-deposited. A map should be prepared depicting site boundaries in relation to the project area, and the site should be recorded on a standard archaeological site record (DPR 523 form).

3. **Documentation.** If findings are negative, these results will be presented in the SMP annual notification package. If findings are positive, a positive Archaeological Survey Report (ASR)/Historic Property Survey Report (HPSR) will be prepared that includes appropriate background research, site records, and recommendations for additional work. The report will include results of background research, descriptions of field work, findings, appropriate maps and photos, and a record of Native American consultation. A cover letter will detail management recommendations, which could include archaeological and Native American monitoring, site avoidance, or test excavations to determine site significance. The report will be submitted to SCWA and the NWIC.
4. **Management Requirements.** If a cultural resource is located within an area of maintenance activity the following steps shall be implemented. The following are examples of management requirements regarding the treatment of known or unknown cultural resources; other measures may be implemented instead, provided they are at least as protective of the cultural resource in question.
 - **Archaeological and Native American Monitoring:** SCWA shall retain the services of a Native American monitor and a qualified archaeological consultant that has expertise in California prehistory to monitor ground-disturbing activities within 200 feet of known archaeological sites or in areas designated as having a high potential for encountering archaeological sites. If an intact archaeological deposit is encountered, all soil disturbing activities in the vicinity of the deposit should stop until the deposit is evaluated. The archaeological monitor shall immediately notify SCWA of the encountered archaeological deposit. The monitors shall, after making a reasonable effort to assess the identity, integrity, and significance of the encountered archaeological deposit, present the findings of this assessment to SCWA. During the course of the monitoring, the archaeologist may adjust the frequency—from continuous to intermittent—of the monitoring based on the conditions and professional judgment regarding the potential to impact resources.
 - **Cultural Resources Monitoring Plan:** If monitoring is the preferred recommendation, a cultural resources monitoring plan shall be prepared by a qualified professional archaeologist. The plan should address (but not be limited to) the following issues:
 - Training program for all construction involved in site disturbance and field workers;
 - Person(s) responsible for conducting monitoring activities, including Native American monitors;
 - How the monitoring shall be conducted and the required format and content of monitoring reports, including any necessary archaeological re-survey;
 - Person(s) responsible for overseeing and directing the monitors;
 - Schedule for submittal of monitoring reports and person(s) responsible for review and approval of monitoring reports;

- Procedures and construction methods to avoid sensitive cultural resource areas;
- Clear delineation and fencing of sensitive cultural resource areas requiring monitoring;
- Physical monitoring boundaries (e.g., 200-foot radius of a known site);
- Protocol for notifications and stop-work guidelines in case of encountering of cultural resources, as well as methods of dealing with the encountered resources (e.g., collection, identification, curation);
- Methods to ensure security of cultural resources sites;
- Protocol for notifying local authorities (i.e. Sheriff, Police) should site looting and other illegal activities occur during construction.
- If SCWA, in consultation with the monitors, determines that a significant archaeological resource is present and that the resource could be adversely affected by the proposed Project, SCWA shall:
 - Re-design the proposed project to avoid any adverse effect on the significant resource; or,
 - Implement an archaeological data recovery program (ADRP) (unless the archaeologist determines that the archaeological resource is of greater interpretive than research significance, and that interpretive use of the resource is feasible). The project archaeologist and SCWA shall meet and consult to determine the scope of the ADRP. The archaeologist will prepare a draft ADRP and submit it to SCWA for review and approval. The ADRP will identify how the proposed data recovery program will preserve the significant information the archaeological resource is expected to contain. The ADRP will identify the scientific/historic research questions applicable to the expected resource, the data classes the resource is expected to possess, and how the expected data classes will address the applicable research questions. Data recovery, in general, shall be limited to the portions of the historic property that could be adversely affected by the proposed Project. Destructive data recovery methods shall not be applied to portions of the archaeological resources if nondestructive methods are practical.

Impact CR-2: Disturbance to Unknown Archeological or Historic Sites, or Human Remains (Less than Significant with Mitigation)

As described in *Existing Conditions* above, the majority of the SMP Area has not been surveyed for culturally significant resources. The majority of SMP activities are conducted in modified or engineered channels; as such, any undiscovered resources may have been altered or destroyed during channel construction or historic maintenance activities. Regardless, stream channels are areas that are considered highly sensitive for presence of cultural resources, and native soils below the engineered channel could contain previously undiscovered deposits. As with known resources, program activities which result in the substantial adverse change in the significance of a previously undiscovered historical resource would be considered a significant impact. Similarly, disturbance of human remains would also be considered significant. Activities involving excavation or sediment disposal would be required to implement BMP CR-1 prior to implementation of maintenance activities in a particular location. In addition, BMP CR-2 would be implemented to address the inadvertent discovery of buried deposits or human remains

during maintenance activities. With implementation of these measures, this impact is considered less than significant.

Level of Significance: Less than significant with mitigation

Mitigation Measures:

BMP CR-1: Cultural Resources Investigation

See Impact CR-1

BMP CR-2: Previously Undiscovered Cultural Resources

Inadvertent Discoveries: If discovery is made of items of historical or archaeological interest, activity will immediately cease in the project location (within approximately 50-foot) of discovery. Prehistoric archaeological materials might include obsidian and chert flaked-stone tools (e.g., projectile points, knives, scrapers) or toolmaking debris; culturally darkened soil (“midden”) containing heat-affected rocks, artifacts, or shellfish remains; and stone milling equipment (e.g., mortars, pestles, handstones, or milling slabs); and battered stone tools, such as hammerstones and pitted stones. Historic-period materials might include stone, concrete, or adobe footings and walls; filled wells or privies; and deposits of metal, glass, and/or ceramic refuse. After cessation of excavation the contractor shall immediately contact SCWA. Maintenance will not resume until authorization is received from the SCWA.

- In the event of unanticipated discovery of archaeological indicators during construction, SCWA will retain the services of a qualified professional archaeologist to evaluate the significance of the items prior to resuming any activities that could impact the site.
- In the case of an unanticipated archaeological discovery that is determined to be potentially eligible for listing in the National and/or California Register, and the site cannot be avoided, SCWA will implement an ADRP, prepared by a qualified archaeologist, as outlined under BMP CR-1.

Discovery of Human Remains: If potential human remains are encountered, SCWA shall halt work in the vicinity of the find and contact the county coroner in accordance with Public Resources Code Section 5097.98 and Health and Safety Code Section 7050.5. If the coroner determines the remains are Native American, the coroner will contact the NAHC. As provided in Public Resources Code Section 5097.98, the NAHC will identify the person or persons believed to be most likely descended from the deceased Native American. The Most Likely Descendent makes recommendations for means of treating or disposing of, with appropriate dignity, the human remains and any associated grave goods as provided in Public Resources Code Section 5097.98.

Impact CR-3: Impacts to Sensitive Paleontological Resources as a Result of Maintenance Activities (Less than Significant with Mitigation)

Because of the majority of maintenance activities would be conducted in channels that have been modified from their natural condition, and do not contain geologic material with a high likelihood of containing paleontological resources, the discovery of paleontological resources during SMP activities is extremely unlikely. However, activities which would result in excavation of native soils, specifically bank stabilization, could uncover previously undiscovered paleontological resources. Implementation of BMP CR-3 would include stop-work and treatment measures in the event of such a discovery. With implementation of this measure, this impact is considered less than significant.

Level of Significance: Less than significant with mitigation

Mitigation Measures:

BMP CR-3: Previously Undiscovered Paleontological Resources

If fossil remains are encountered during maintenance, the maintenance activity will be stopped until a qualified professional paleontologist can assess the nature and importance of the find and recommend appropriate treatment. SCWA shall retain a consultant who meets the Society for Vertebrate Paleontology's criteria for a "qualified professional paleontologist" (Society of Vertebrate Paleontology Conformable Impact Mitigation Guidelines Committee 1995). Treatment may include preparation and recovery of fossil materials so that they can be housed in an appropriate museum or university collection, and may also include preparation of a report for publication describing the finds. SCWA shall be responsible for ensuring that the recommendations of the paleontologist regarding treatment and reporting are implemented.

Chapter 3.5

GEOLOGY, SOILS, AND SEISMICITY

Chapter 3.5

GEOLOGY, SOILS, AND SEISMICITY

3.5.1 Introduction

This chapter discusses existing conditions and evaluates the Proposed Program's effects related to geology, soils and seismicity. It also describes federal, state, and local regulations related to geology, soils, and seismicity that would apply to the Proposed Program.

Sources used to map and describe the physical setting of the Program Area included United States Geological Survey (USGS) data on topography and hydrology; geologic maps of the area (California Department of Conservation 1990; U.S. Geological Survey 1994; Sloan 2006); soil survey information (U.S. Department of Agriculture 1990); and other published information (Hickman 1993; Alt and Hyndman 2000).

3.5.2 Regulatory Setting

Federal Regulations

There are no federal regulations associated with geology, soils, and seismicity related to the Proposed Program.

State Regulations

Alquist-Priolo Earthquake Fault Zoning Act

California's Alquist-Priolo Earthquake Fault Zoning Act (Public Resources Code Sec. 2621 et seq.), originally enacted in 1972 as the Alquist-Priolo Special Studies Zones Act and renamed in 1994, is intended to reduce the risk to life and property from surface fault rupture during earthquakes. The Alquist-Priolo Act prohibits the location of most types of structures intended for human occupancy across the traces of active faults and strictly regulates construction in the corridors along active faults (*earthquake fault zones*). It also defines criteria for identifying active faults, giving legal weight to terms such as *active*, and establishes a process for reviewing building proposals in and adjacent to Earthquake Fault Zones.

Under the Alquist-Priolo Act, faults are zoned and construction along or across them is strictly regulated if they are "sufficiently active" and "well-defined." A fault is considered *sufficiently active* if one or more of its segments or strands shows evidence of surface displacement during Holocene time (defined for purposes of the Act as referring to approximately the last 11,000 years). A fault is considered *well-defined* if its trace can be clearly identified by a trained geologist at the ground surface or in the shallow subsurface, using standard professional techniques, criteria, and judgment (Hart and Bryant 1997).

Seismic Hazards Mapping Act

Like the Alquist-Priolo Act, the Seismic Hazards Mapping Act of 1990 (PRC Sections 2690–2699.6) is intended to reduce damage resulting from earthquakes. While the Alquist-Priolo Act addresses surface fault rupture, the Seismic Hazards Mapping Act addresses other earthquake-related hazards, including strong groundshaking, liquefaction, and seismically induced landslides. Its provisions are similar in concept to those of the Alquist-Priolo Act: the state is charged with identifying and mapping areas at risk of strong groundshaking, liquefaction, landslides, and other corollary hazards; and cities and counties are required to regulate development within mapped Seismic Hazard Zones.

Under the Seismic Hazards Mapping Act, permit review is the primary mechanism for local regulation of development. Specifically, cities and counties are prohibited from issuing development permits for sites within Seismic Hazard Zones until appropriate site-specific geologic and/or geotechnical investigations have been carried out, and measures to reduce potential damage have been incorporated into the development plans.

California Building Code

The State of California's minimum standards for structural design and construction are given in the California Building Code (CBC) (California Code of Regulations, Title 24). The CBC is based on the Uniform Building Code (UBC), which is used widely throughout United States (generally adopted on a state-by-state or district-by-district basis), and has been modified for California conditions with numerous, more detailed and/or more stringent regulations (California Building Standards Commission 2008).

The CBC requires that "classification of the soil at each building site ... be determined when required by the building official" and that "the classification ... be based on observation and any necessary test of the materials disclosed by borings or excavations." In addition, the CBC states that "the soil classification and design-bearing capacity shall be shown on the (building) plans, unless the foundation conforms to specified requirements." The CBC provides standards for various aspects of construction, including but not limited to excavation, grading, and earthwork construction; fill placement and embankment construction; construction on expansive soils; foundation investigations; resistance to ground shaking in various zones of the state; and liquefaction potential and soil strength loss. In accordance with California law, project design and construction will be required to comply with provisions of the CBC.

Local Regulations

The various general plans within the Stream Maintenance Program (SMP) Area contain a variety of goals, objectives, policies, programs, and implementation measures which address geologic hazards. Those that are relevant to the SMP have been presented below, specifically those that address construction of facilities (e.g., replacement of facilities such as culverts under the SMP). Some of these items would not directly apply to the SMP but provide important guidance for design and construction.

Sonoma County General Plan 2020

Figures PS-1a through PS-1i of the County General Plan show detailed maps which depict hazard data for the County planning area. Structures should not be placed on known landslides or faults and, when located close to these features, may need special design to withstand damage. All construction in the County must meet the standards of the Uniform Building Code for seismic resistance, site stability, grading and geologic studies.

The following goals, objectives, and policies for the designation and review of new public facilities are included in the County's general plan and are applicable to the Proposed Program:

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| <i>GOAL PS-1</i> | Prevent unnecessary exposure of people and property to risks of damage or injury from earthquakes, landslides and other geologic hazards. |
| <i>PS-1f</i> | Require and review geologic reports prior to decisions on any project which would subject property or persons to significant risks from the geologic hazards shown on Figures PS-1a through PS-1i and related file maps and source documents. Geologic reports shall describe the hazards and include mitigation measures to reduce risks to acceptable levels. Where appropriate, require an engineer's or geologist's certification that risks have been mitigated to an acceptable level and, if indicated, obtain indemnification or insurance from the engineer, geologist, or developer to minimize County exposure to liability. |
| <i>PS-1k</i> | Incorporate measures to mitigate identified geologic hazards for all County roads, public facilities, and other County projects to an acceptable level. |
| <i>OSRC-11a</i> | Design discretionary projects so that structures and roads are not located on slopes of 30 percent or greater. This requirement is not intended to make any existing parcel unbuildable if Health Department and Building Department requirements can be met. |

City of Petaluma General Plan 2025

Chapter 10 of the Petaluma General Plan contains the City's Health and Safety element. The following policies are applicable to the Proposed Program:

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| <i>10-P-1</i> | Minimize risks of property damage and personal injury posed by natural hazards.

A) Require geotechnical studies prior to development approval in geologic and/or seismic hazard areas. Require or undertake comprehensive geologic and engineering studies for critical structures regardless of location.

B) Regulate the grading and development of hillside areas for new urban land uses, by instituting a Hillside Overlay or other similar mechanism in the Development Code. Ensure that new development on hillsides is constructed to reduce erosion and landslide hazards and in compliance with any City hillside regulations, including, but not limited to: |
|---------------|--|

- Limit cut slopes to 3:1, except where an engineering geologist can establish that a steeper slope would perform satisfactorily over the long term.
- Encourage use of retaining walls or rock filled crib walls as an alternative to high cut slopes.
- Ensure revegetation of cut-and-fill slopes to control erosion. Plant materials for revegetation should not be limited to hydro-seeding and mulching with annual grasses. Trees add structure to the soil and take up moisture while adding color and diversity.
- Ensure blending of cut-and-fill slopes within existing contours, and provision of horizontal variation, in order to mitigate the artificial appearance of engineered slopes.
- Ensure structural integrity of sites previously filled before approving redevelopment.

City of Rohnert Park General Plan

Chapter 7 of the Rohnert Park General Plan contains the City's Health and Safety element. The following policies are applicable to the Proposed Program:

- HS-1* Require new construction to utilize site preparation, grading, and foundation designs in accordance with site specific soil conditions. Require submittal of a preliminary soils report, prepared by a registered civil engineer.
- HS-2* Continue requiring all new buildings in the city to be built under the seismic requirements of the Uniform Building Code and Uniform Plumbing Code.

City of Santa Rosa 2020 General Plan

The following policies contained in the City of Santa Rosa's General Plan, Noise and Safety Element, are applicable to the Proposed Program.

- NS-C-1* Prior to development approval, require appropriate geologic studies to identify fault trace locations within active fault zones as designated by the provisions of the Alquist-Priolo Earthquake Fault Zoning Act. California registered geologists or engineers must conduct these studies and investigation methodologies must comply with guidelines set forth by the Alquist-Priolo Earthquake Fault Zoning Act.
- NS-C-2* Require comprehensive geotechnical investigations prior to development approval, where applicable. Investigations shall include evaluation of landslide risk, liquefaction potential, settlement, seismically-induced landsliding, or weak and expansive soils. Evaluation and mitigation of seismic hazards, including ground shaking, liquefaction, and seismically-induced landslides, shall comply with guidelines set forth in the most recent version of the California Division of Mines and Geology (CDMG) Special Publication 117.

- NS-C-3* Restrict development from areas where people might be adversely affected by known natural or manmade geologic hazards. Hazards might include unstable slopes, liquefiable soils, expansive soils or weak poorly engineered fills, as determined by a California registered geologist or engineer.
- NS-C-7* Require inspection for structural integrity of water storage facilities, water conveyance facilities, electricity transmission lines, roadways, water detention facilities, levees, and other utilities after a major seismic event, especially on the San Andreas or Rodgers Creek faults.

City of Sebastopol General Plan

Chapter 7 of the General Plan addresses geological hazards and issues. The following policies and goals apply specifically to the Proposed Program:

- Goal 1* Reduce seismic hazards
- Program 1.1* Continue to require geotechnical reports by a state-registered geologist for development proposals on sites in seismically and geologically hazardous areas and for all critical structures. These reports should include but not be limited to: evaluation of and recommendations to mitigate the effects of fault displacement, ground shaking, landslides, expansive soils, and subsidence and settlement.
- Program 1.3* Continue to require, as conditions of approval, measures to mitigate potential seismic and geologic safety hazards for structures.
- Goal 2* Minimize the risk of personal injury and property damage resulting from slope instability.
- Program 3.1* Evaluate slopes over 15 percent and/or unstable land, areas susceptible to liquefaction, settlement, or containing expansive soils for safety hazards prior to issuance of any discretionary approvals and require appropriate mitigation measures.

City of Sonoma General Plan 2020

The following policies from the City of Sonoma General Plan are applicable to the Proposed Program:

- 1.1* Require development to be designed and constructed in a manner that reduces the potential for damage and injury from natural and human causes to the extent possible.
- 1.1.1* Require development to incorporate measures that mitigate risks associated with seismic, geologic, fire, or flood hazards to acceptable levels.
- 1.2.1* Require all development—including post-earthquake building replacement, reconstruction, and rehabilitation— to be constructed in accordance with the latest State and City-adopted seismic and building codes.

Town of Windsor General Plan - 2015

Chapter 7 of the General Plan the following policies which are applicable to the Proposed Program:

- A.2 *Geotechnical Hazards Reports* The Town shall require geologic investigations for any project proposed within designated seismic and geologic hazard areas, shown in Figure 7-1 and the extreme and heavy ground shaking intensity areas of Figure 7-2. Recommendations from these investigations, or equivalent measures deemed acceptable by the Town, shall be incorporated as conditions of any project approval.
- A.2.2 The Town shall not locate public improvements and utilities in areas with identified geologic or seismic hazards (see Figure 7-1 and the extreme and heavy ground shaking intensity areas of Figure 7-2) to avoid any extraordinary maintenance and operating expenses. When the location of public improvements and utilities in such areas cannot be avoided, effective measures should be implemented to minimize potential damage and public inconvenience.
- A.2.5 For parcels which partially lie within a designated seismic or geologic hazard area (see Figure 7-1 and the extreme and heavy ground shaking intensity areas of Figure 7-2), a geotechnical hazards report, prepared by a certified engineering geologist, shall be required to identify the most appropriate building areas and corrective measures to minimize potential hazards.

3.5.3 Environmental Setting

Geological resources are described in detail within Chapter 3, Section 3.4 of the SMP Manual. The following is an abbreviated discussion of the information contained within Chapter 3 of the SMP Manual.

As described in Chapter 1 of the SMP Manual, Section 1.2 *Program Area and SCWA Channel Types*, the SMP Program Area includes all of Sonoma County but is focused on the Laguna de Santa Rosa, Petaluma River, and Sonoma Creek watersheds of the southern County. The physiography of southern Sonoma County is generally defined by a sequence of northwest to southeast aligned valleys and ridgelines which follow the regional tectonic and geologic structure. The principal landforms in the Program Area are shown in Figure 3-1 of the SMP Manual. SMP Manual Figure 3-2 includes topographic profiles across central Zone 1A, southern Zone 1A, and central Zone 2A and 3A.

Regional Tectonism and Older Rocks

The geology and structure of the Program Area in southern Sonoma County has been shaped through a dynamic history of tectonism along the San Andreas Fault Zone. The northwest-southeast alignment of this fault zone with its characteristic right-lateral strike-slip tensional movement is reflected in the alignment and orientation of the region's ridgelines and valleys (see landform discussion above). Movement along the fault zone was not only lateral, but also included compression resulting in the mountain building of the Coast Ranges in the Program Area (Nilsen 1987). In geologic terms, this combination of

lateral-tension plus compression is known as transpression. In Sonoma County, the main artery of the San Andreas Fault roughly follows Highway 1 near the coast. In the focus area of the SMP (Zones 1A, 2A, and 3A) the Healdsburg-Roger's Creek and Mayacama faults represent more interior arms of the San Andreas system, sharing its same orientation (SMP Manual Figure 3-5). Some of the SMP channels intersect these faults.

The San Andreas Fault has been relatively quiet in Sonoma County since the historic 1906 earthquake (magnitude 8.3). The Healdsburg-Rogers Creek and Mayacama faults are considered active faults with known activity during the Holocene period (last 10,000 years). Of recent note, in 1969 two moderate earthquakes (magnitudes 5.6 and 5.7) along the Rogers Creek Fault caused moderate damage in Santa Rosa.

As shown in Figure 3-5 of the SMP Manual, the distribution and sequence of rock types in the Program Area reflect the area's geologic history (Norris and Webb 1990). The oldest rocks include the Great Valley Complex with its tilted marine sedimentary layers, mostly sandstones and shales. The Great Valley Complex underlays much of the project, but clearer exposures are found to the west and east. A bit more prevalent in the Program Area are rocks of the Franciscan Complex, a mixture of chert, basalt, shale, metamorphic rocks, and mélangé created by subduction zone processes. Franciscan rocks are seen in the upper Mark West and Santa Rosa creek watersheds, in the southern Petaluma watershed, and a few outcrops west of the Laguna.

However, the rocks that best define the crests and slopes of the upper watersheds in the Program Area belong to the Sonoma Volcanics (Sloan 2006). This rock grouping includes lavas, mudflows, and tuffs that erupted or spread in the Miocene epoch between about 9 and 3 million years ago. Compared to some of the sedimentary rocks in the region, these volcanics are more resilient and durable, which explains their prominence along ridgelines. Sonoma volcanics are observed in the headwaters for several of the Program Area's streams in the Mayacamas and Sonoma ranges (SMP Manual Figure 3-5). Around the time of the Sonoma volcanism (five million years ago), but further to the west, sandy sediments were deposited in a shallow marine environment. Now lithified, these rocks are seen today as the sandstones of the Gold Ridge Hills south and west of Sebastopol, Cotati, and Petaluma.

Quaternary and Surficial Geology

The large majority of engineered channels in the SMP Program Area are located in Quaternary and surficial geologic materials (SMP Manual Figure 3-6). The explanation for this parallels the landform discussion above which described how most channels of the SMP are found in depositional areas of alluvial fans, plains, or other lowlands where sediments have historically collected for many thousands of years.

Building on the landform discussion above, the distribution and patterns of materials shown in SMP Manual Figure 3-6 reveal much about the geomorphic processes which led to their deposition. For example, the Rohnert Park area demonstrates the fining sequence of alluvium from coarse-grained, to medium-grained, to fine-grained moving west from the Sonoma Mountains down into the alluvial fan. The Santa Rosa area shows the concentration of coarse grained materials along the pathways of the current channels and historic creeks, whereas the wider Santa Rosa plain consists of older Pleistocene alluvium. In the Laguna, the texture of sediments also becomes finer, moving north from the Sebastopol area where

stream cobbles and coarse sediments transition to medium textured materials. Further north into the more depositional basin of the Laguna (south of the Mark West Creek confluence), finer alluvium is found.

In the Petaluma River watershed, many of the channels of the SMP are built onto medium-textured alluvium of the Petaluma plain. In the Sonoma Creek watershed, the main arm of Sonoma Creek flows south along the coarser sediments of the valley floor. Several older Pleistocene terraces also run throughout the valley, but are located further from the creek. Interestingly, the east side of Sonoma Valley includes abundant colluvium. Colluvium is sediment or rock that is deposited at the base of a slope by gravity or sheetwash, but it is not transported by channelized flow like in the case of alluvium. Though dependent on specific site and land use conditions, colluvium is typically highly erosive and can often enter neighboring streams.

SMP Manual Figure 3-6 identifies several of the known and mapped larger landslides of the Program Area. Landslides are prominent in the headwaters to Copeland, Crane, Five, and Hinebaugh creeks in the Rohnert Park area. Not shown on this map, but observed in the field, are additional landslides and gulleying in the headwaters of Cook and Coleman creeks that have exacerbated downstream sedimentation. In the Petaluma River watershed there is also a large landslide at the common headwater areas to Lichau, Willow Brook, Lynch, Washington, and Adobe creeks.

Soils

Soils in the Program Area are varied and derived from diverse landform, geologic, climatic, and biologic conditions. The Soil Survey of Sonoma County (U.S. Department of Agriculture 1990) includes 15 soil associations. At the association level, soils are generally distinguished according to their geomorphic and topographic setting; whether they are located in basins, tidal flats, floodplains, terraces, alluvial fans, high terraces, foothills, uplands, and mountains. In general, the soils in the lowland basins, floodplains, and alluvial fans range from gravelly sandy loams to clays; most often composed of clays and clay loams that formed in alluvium from sedimentary and volcanic material. These soils vary in drainage capacity from poor to excessive, with the more clay-textured soils draining more poorly. The soils on the high terraces, foothills, uplands, and mountains consist of gravelly-to-stony sandy loams to clay loams and range in drainage capacity from moderate to excessive, with the coarser textured soils draining better. The Soil Survey can be used to identify more specific site or parcel soil series, types, and conditions.

Soils are mapped for their runoff potential according to their Hydrologic Soil Group, as follows:

Class A: soils have high infiltration rates and low runoff potential;

Class B: soils have moderate infiltration;

Class C: soils have slow infiltration; and

Class D: soils have very slow infiltration rates and high runoff potential.

Hydrologic Soil Groups for the Program Area are mapped in Figure 3-8 of the SMP Manual. The vulnerability of natural soil types to erosion (erodibility) was mapped by the Natural Resources Conservation Service (2005) and is available through the Soil Survey Geographic Database (SSURGO). While inherent erodibility is important in considering a soil's potential erosion; often it is the slope, type of land use, and intensity of land practices which are the more important determinant of potential erosion. SMP Manual Figure 3-8 maps soil erodibility in the Program Area according to the Soil Erodibility Factor K(f) used in the Revised Universal Soil Loss Equation (RUSLE). As shown in Figure 3-8 of the SMP Manual, most of the headwater source regions in the SMP Program Area have high erosion potential.

3.5.4 Impact Analysis

Methodology

Impacts related to geology, soils, and associated hazards were evaluated qualitatively, based on a review of soils and geologic information for the Program Area. Analysis focused on the Proposed Program's potential to increase the risk of personal injury, loss of life, and damage to property as a result of existing geologic conditions in the action area. The impact analysis assumes that the risk to, or posed by, existing SMP facilities from seismic hazards, landslides, expansive soils, or other geologic hazards are part of the baseline condition and would not be an impact of the Program. Remediating such hazards where they pose unacceptable risks would be considered capital improvements, and would be outside the scope of the SMP. This analysis does, however, consider risks associated with replacement of facilities (such as failed culverts). Analysis assumed that the Proposed Program would comply with the requirements of the current CBC, city and county codes, General Plan seismic safety standards and grading requirements, and perform appropriate geotechnical studies if/as necessary.

Criteria for Determining Significance

For the purposes of this analysis, an impact was considered to be significant and to require mitigation if it would result in any of the following:

- Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:
 - Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault;
 - Strong seismic ground shaking;
 - Seismic-related ground failure, including liquefaction;
- Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site lateral spreading, subsidence, liquefaction or collapse.

Issues related to soil erosion and sedimentation are addressed in Chapter 3.7, *Hydrology, Geomorphology, and Water Quality*, of this EIR.

Environmental Impacts

Impact GEO-1: Substantial Adverse Effects Resulting from Fault Rupture, Strong Seismic Ground Shaking, or Earthquake-Induced Liquefaction (Less than Significant)

As described in Existing Conditions above, the Program Area could be subject to groundshaking as a result of earthquake activity on any of a number of faults. Maximum ground accelerations and other earthquake induced hazards could be sufficient to damage SMP facilities. However, the Program does not propose to create any additional facilities which would be permanently or temporarily occupied. The vast majority of activities proposed under the Program are related to routine maintenance such as sediment and vegetation removal. These activities would not substantially affect, or be affected by risks related to seismic events or other geologic hazards.

Culvert replacement and repair is the only activity proposed under the Program which could potentially be affected by seismic and geological hazards. While no additional facilities would be constructed, the replacement or repair of these existing structures could be subject to damage if improperly designed or installed. However, damage resulting from seismic hazards can be routinely mitigated using one of the many techniques that are available to enable utilities to withstand the effects of seismic events.

Adherence to applicable CBC, city, and County requirements would reduce the potential for structural damage to replacement or repaired culvert infrastructure and corollary indirect impacts associated with seismic hazards. These are considered standard operating procedures which are protective of public health and property. This impact is less than significant and no mitigation is required.

Level of Significance: Less than significant

Mitigation Measures: None required

Impact GEO-2: Substantial Adverse Effects Resulting from Unstable Geologic Units (Less than Significant with Mitigation)

Replacement or repair of culverts and eroded banks could be subject to damage related to shrink-swell behavior if improperly designed or installed. Expansion and contraction of soils caused by seasonal moisture changes in areas with high expansion potential could damage the culverts and banks, unless they are properly designed and built to withstand such effects.

However, potential dangers associated with expansive and unstable soils is routinely mitigated using one of the many techniques that are available to identify unstable slopes and enable infrastructure to withstand these effects, and all facilities would be required to adhere to CBC requirements and relevant city and County standards. In addition, BMP GEN-3 which provides general provisions that to prevent land-sliding during and after construction activities requiring channel access would be implemented. Potential impacts related to unstable geologic units are considered less than significant.

Level of Significance: Less than significant with mitigation

Mitigation Measures:

BMP GEN-3: Channel Access

1. Access points to the channel for the purposes of stream maintenance will be minimized according to need. Access points should avoid large mature trees, native vegetation, or other significant habitat features as possible. Temporary access points shall be sited and constructed to minimize tree removal.
2. In considering channel access routes, slopes of greater than 20 percent shall be avoided if possible. Any sloped access points will be examined for evidence of instability and either revegetated or filled with compacted soil, seeded, and stabilized with erosion control fabric as necessary to prevent future erosion.
3. Personnel will use the appropriate equipment for the job that minimizes disturbance to and compaction of the stream bottom. Appropriately-tired vehicles, either tracked or wheeled, will be used depending on the site and maintenance activity.

Chapter 3.6

HAZARDS AND HAZARDOUS MATERIALS

Chapter 3.6

HAZARDS AND HAZARDOUS MATERIALS

3.6.1 Introduction

This section describes the setting and potential impacts of the Proposed Program associated with hazards and hazardous materials. Stream Maintenance Program (SMP) activities may involve the use of hazardous materials (such as those used for construction equipment), or could involve work within areas of existing contamination. This section considers the impacts associated with these issues. In addition, the potential for Program activities to affect other types of hazards such as wildfires and other issues such as emergency response is also addressed. Data sources used in the preparation of this section included the Sonoma County General Plan adopted in 1989 and general plans from the cities of Petaluma, Santa Rosa, Sonoma, and the Town of Windsor.

3.6.2 Regulatory Setting

Federal Regulations

Comprehensive Environmental Response, Compensation, and Liability Act

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA, also called the Superfund Act) (42 U.S. Government Code [USC] Sec. 9601 et seq.) is intended to protect the public and the environment from the effects of prior hazardous waste disposal and new hazardous material spills. Under CERCLA, the U.S. Environmental Protection Agency (USEPA) has the authority to seek the parties responsible for hazardous materials releases and to assure their cooperation in site remediation. CERCLA also provides federal funding (the "Superfund") for the remediation of hazardous materials contamination. The Superfund Amendments and Reauthorization Act of 1986 (Public Law [PL]-99-499) amends some provisions of CERCLA and provides for a Community Right-to-Know program.

Resource Conservation and Recovery Act

The Resource Conservation and Recovery Act (RCRA) (42 USC Sec. 6901 et seq.) was enacted in 1976 as an amendment to the Solid Waste Disposal Act to address the nationwide generation of municipal and industrial solid waste. RCRA gives USEPA the authority to control the generation, transportation, treatment, storage and disposal of hazardous waste, including underground storage tanks storing hazardous substances. RCRA also establishes a framework for the management of nonhazardous wastes. RCRA addresses only active and future facilities; it does not address abandoned or historical sites, which are covered by CERCLA (see preceding section).

Federal Insecticide, Rodenticide, and Fungicide Act

The Federal Insecticide, Rodenticide, and Fungicide Act (FIFRA) (7 USC 136 et seq.) was originally passed in 1947. The purpose of FIFRA is to establish federal jurisdiction over the distribution, sale, and use of pesticides. Key provisions of FIFRA require pesticide applicators to pass a licensing examination for status as “qualified applicators,” create a review and registration process for new pesticide products, and ensure thorough and understandable labeling that includes instructions for safe use.

State Regulations

California state regulations, which are equal to or more stringent than federal regulations, require planning and management to ensure that hazardous wastes are handled, stored, and disposed of properly to reduce risks to human health and the environment. Several key state laws pertaining to hazardous wastes are discussed below.

Hazardous Waste Control Act

The Hazardous Waste Control Act created the state Hazardous Waste Management Program, which is similar to, but more stringent than, the federal program under RCRA. The Hazardous Waste Control Act is implemented by regulations contained in Title 26 of the California Code of Regulations (CCR). Regulations in 26 CCR list more than 800 materials that may be hazardous and establish criteria for their identification, packaging, and disposal. Under the Hazardous Waste Control Act and 26 CCR, hazardous waste generators must complete a manifest that accompanies the waste from the generator to the transporter to the ultimate disposal location. Copies of the manifest must be filed with California Department of Toxic Substances Control.

Emergency Services Act

Under the Emergency Services Act, the State of California developed an emergency response plan to coordinate emergency services provided by federal, state, and local agencies. Rapid response to incidents involving hazardous materials or hazardous waste is an important part of the plan, which is administered by the California Office of Emergency Services. This office coordinates the responses of other agencies, including the USEPA, California Highway Patrol, the nine Regional Water Quality Control Boards (RWQCBs), the various air quality management districts, and county disaster response offices.

California Occupational Safety and Health Administration Standards

Worker exposure to contaminated soils, vapors that could be inhaled, or possibly groundwater containing hazardous levels of constituents would be subject to monitoring and personal safety equipment requirements that are established in California Occupational Safety and Health Administration (Cal/OSHA) regulations (Title 8) and specifically address airborne contaminants. The primary intent of the Title 8 requirements is to protect workers, but compliance with some of these regulations would also reduce potential hazards to non-construction workers and project area occupants because required site monitoring, reporting, and other controls would be in place.

Workers who are in direct contact with soil or groundwater containing hazardous levels of constituents would perform all activities in accordance with a hazardous operations site-specific health and safety plan, as outlined in Cal/OSHA standards.

Local Regulations

This section presents the local regulations relevant to hazards and hazardous materials. Goals, objectives, programs, policies and implementation measures from general plans are cited where they directly relate to the manner in which the SMP will be required to carry out its maintenance activities.

Sonoma County General Plan 2020

The following goals, objectives, and policies for the designation and review of new public facilities are included in the County's general plan and are applicable to the Proposed Program.

<i>Goal PS-4</i>	Prevent unnecessary exposure of people and property to risks of damage or injury from hazardous materials.
<i>Objective PS-4.1</i>	Maintain complete documentation and assessments of data on hazardous materials.
<i>Objective PS-4.2</i>	Regulate the handling, storage, use and disposal of hazardous materials in order to reduce the risks of damage and injury from hazardous materials.
<i>Policy PS-4e</i>	Continue to design and operate County owned solid waste disposal facilities to prevent disposal of and contamination by hazardous materials.
<i>Policy PS-4o</i>	Encourage reduction in the use of potentially hazardous pesticides and increased use of alternatives, such as best management practices, in County operations, including but not limited to maintenance of roads, parks, and facility grounds. Emphasize the use of alternatives to potentially hazardous pesticides in areas likely to drain to waterways. Coordinate with the cities in this effort.
<i>Goal PS-3</i>	Prevent unnecessary exposure of people and property to risks of damage or injury from wildland and structural fires.
<i>Objective PS-3.3</i>	Utilize the Sonoma County Hazard Mitigation Plan to help reduce damages from wildland fire hazards.
<i>PS-3b</i>	Consider the severity of natural fire hazards, potential damage from wildland and structural fires, adequacy of fire protection and mitigation measures consistent with this element in the review of projects.

Policy PS-3d Refer projects and code revisions to the Department of Emergency Services and responsible fire protection agencies for their review and comment.

PS-3e The Department of Fire Services shall offer assistance to local agencies in adoption and enforcement of fire safety regulations and shall work with local agencies to develop proposed improvements to county codes and standards.

Sonoma County Hazard Mitigation Plan

Sonoma County's Hazard Mitigation Plan (HMP) was adopted in 2006 (Natural Hazards Mitigation 2006). The HMP serves as the primary planning document for hazardous waste management within the County and contains goals, policies, and recommended programs for the management, recycling, and disposal of hazardous wastes. The hazards considered to be significant in Sonoma County include earthquakes, landslides, floods and wildland fires. The HMP examines these hazards by describing: their physical characteristics; past occurrences in the County; likelihood of future occurrence; vulnerability of the people and structures in the County, especially critical facilities; and potential impact of future events on the County's people, built environment, economy, and way of life. It is important to note that the SMP is designed to address one hazard in particular: flooding.

The HMP seeks to reduce the vulnerability of people and property exposed to earthquake, landslide, flood, and wildland fire hazards in Sonoma County through implementation of the following objectives:

- Assure that adequate and up to date natural hazard information and maps are available and utilized to guide decisions that impact risk.
- Update and enforce County codes to minimize the risks of natural hazards.
- Reduce vulnerability of public buildings at risk from natural hazards.
- Improve the ability of county infrastructure to withstand natural hazard events.
- Reduce natural hazard risk and increase the mitigation capability of Sonoma County residents, businesses and others who could be affected by hazards
- Increase the County capability to respond to and recover from emergencies and disasters caused by natural hazards.

City of Petaluma General Plan 2025

The following policies contained in the City of Petaluma's General Plan are applicable to the Proposed Program.

Policy 10-P-4 Minimize the risk to life and property from the production, use, storage, and transportation of hazardous materials and waste by complying with all applicable State and local regulations.

- A) Require compliance with Sonoma's Countywide Integrated Waste Management Plan (CoIWMP) as well as all of the

Consolidated Unified Protection Agency (CUPA) program elements.

- B) Prepare and maintain an inventory of environmentally contaminated sites to educate future landowners about contamination from previous uses. Work directly with landowners in the cleanup of these sites, particularly in areas with redevelopment potential.
- C) Establish special zoning designations and environmental review processes that limit the location of industry, research, and business facilities using hazardous materials. Require safe distances between these sites and residential areas, groundwater recharge areas, and waterways.

City of Santa Rosa 2020 General Plan

The following policies contained in the City of Santa Rosa's General Plan are applicable to the Proposed Program.

- | | |
|---------------|---|
| <i>NS-E-2</i> | Require that hazardous materials used in business and industry are transported, handled, and stored in accordance with applicable local regulations. |
| <i>NS-E-4</i> | Where applicable, identify and regulate appropriate regional and local routes for transportation of hazardous materials and hazardous waste. Require that fire and emergency personnel can easily access these routes for response to spill incidences. |
| <i>NS-E-5</i> | Where applicable, identify and regulate appropriate regional and local routes for transportation of hazardous materials and hazardous waste. Require that fire and emergency personnel can easily access these routes for response to spill incidences. |

City of Sonoma General Plan 2020

The following policies contained in the City of Sonoma's General Plan are applicable to the Proposed Program.

- | | |
|------------|---|
| <i>1.6</i> | Ensure that all operations that use, store, and/or transport hazardous materials to comply with all applicable regulations. |
|------------|---|

3.6.3 Environmental Setting

This section presents an overview of hazards in the Program Area, including: (1) the potential types and locations of hazardous materials contamination in the County, with specific attention to areas subject to SMP maintenance; (2) emergency response and transportation routes, and related considerations for routing of SMP vehicles; and (3) other types of hazards that could affect or be affected by the SMP, such as wildland fires, air traffic, and mosquito infestation.

Hazardous Waste Generating Sites

Numerous hazardous materials are found in Sonoma County. In 2000, Sonoma County generated 13,434 tons of hazardous waste, not counting waste oil. The number of large and small generators of hazardous waste has increased over the past decade from 31 large and 240 small generators in 1991, to 69 large and 862 small generators in 2000 (Sonoma County 2006). Business and industry generators include the automotive and transportation industries, which store and use petroleum fuels, chlorinated solvents, and paints for repairs; manufacturing industries that use solvents, paints, metals, compressed gases, and cleaning agents; and the agricultural industry, which uses pesticides and fertilizers. Improper use, transport, storage or disposal of these materials could result in releases to and contamination of the areas maintained under the SMP.

Businesses that store, generate, or dispose of hazardous waste are required to prepare and submit a Hazardous Materials Business Plan to the County. One primary location where hazardous waste materials are stored prior to disposal is the County's Household Toxics Facility located at the Central Disposal Site between Cotati and Petaluma. Residents and businesses can drop off household toxics for free or a small fee at this location.

Emergency Response

Hazardous materials emergency response is the responsibility of Sonoma County Department of Emergency Services (DES), Hazardous Materials Division. The Sonoma County Hazardous Materials Response Team is trained to respond to any level of hazardous materials incident in the county, including overturned tank trucks, fires involving hazardous materials and chemicals, incidents involving radioactive materials, downed electrical lines and ruptured natural gas lines, chlorine and toxic gas releases, fuel spills, and explosives and bombs. The County DES Hazardous Materials Division responds to hazardous materials incidents throughout the county and maintains contracts with some of the cities for hazardous materials releases within those cities.

There are two other hazardous emergency teams in the county: the City of Santa Rosa Fire Department and the City of Rohnert Park Department of Public Safety. The three teams in the county will respond to assist each other under the County's Mutual Aid agreement. The County DES coordinates with each of these city response teams when purchasing specialized equipment, upgrading equipment, and training. SCWA coordinates with emergency response providers as part of its routine maintenance activities.

Transportation Routes

Hazardous wastes are transported through the county by truck, primarily along the major arterials and highways, for disposal at treatment, storage, and disposal facilities in other counties or outside of California. County roads and city streets may be used to transport hazardous wastes from their sources to major highways. Haulers are required to use the most direct, safe route. Aside from low level nuclear sources used in some detection devices, no nuclear material is transported through Sonoma County. The selection of haul routes for SMP maintenance activities, especially for the transport of maintenance-related hazardous materials, considers hazardous waste transportation routes for incompatibilities or risks.

Contaminated Sites and Brownfields

Brownfields are properties that have a potential for redevelopment or reuse, but due to actual or suspected contamination are vacant. Former auto-wrecking yards, gas stations, computer-electronics industry sites with chlorinated solvent discharges, and lumber mills are examples of brownfields found in Sonoma County. Brownfield sites are regulated by the State Water Resources Control Board (SWRCB) and its nine regional boards.

According to the SWRCB's GeoTracker database, there are 1,008 sites in Sonoma County within North Coast RWQCB's jurisdiction which have been contaminated with hazardous waste. Of these, 274 sites have been remediated and are considered closed. The remaining 734 sites are considered open (i.e., still active) and currently being remediated or remain in need of remediation. Within the San Francisco Bay RWQCB's jurisdiction in Sonoma County, there are 65 sites which have been contaminated with hazardous waste. Of these, 25 sites have been remediated and are considered closed. The remaining 40 sites are still active and in need of remediation (State Water Resources Control Board 2008). Remediated sites could have resulted in legacy sources of contamination at SMP maintenance reaches; similarly, active sites have potential to result in active sources of contamination at maintenance locations.

Underground Storage Tanks and Other Hazardous Spills

Underground storage tanks are common throughout Sonoma County. They are most often used for the storage of gasoline and diesel fuels, while also used for the storage of new and used motor oil, solvents, chemicals, etc. Leaking underground fuel tanks (LUFTs), mainly those containing petroleum, are the leading cause of soil and groundwater contamination in the county. LUFTs occur in the urbanized areas of the county, along the Highway 101 corridor and other county highways. Contaminated sites are tracked in the State Water Resource Control Board's GeoTracker database. According to GeoTracker, there are 829 open LUFT sites in Sonoma County (721 in the North Coast Region and 108 in the San Francisco Bay Region). There are 1,666 closed or remediated LUFT sites in Sonoma County (1,469 in the North Coast Region and 197 in the San Francisco Bay Region). LUFTs have potential to cause contamination of SMP maintenance locations, similar to the discussion of brownfields and contaminated sites, above.

Wildland Fire Hazards

The primary fire season in the study area extends from late summer through fall. Fire hazards in Sonoma County are heavily influenced by topography and wind patterns. Dry off-shore winds occur in the fall when vegetation is driest, thus fire hazards increase. Fast-rising topography along the Coast Ranges encourages wildland fires to quickly spread uphill. According to the wildland fire threat area maps produced by the California Department of Forestry and Fire Protection, the wildfire threat is most extreme at the highest elevations while the fire threat is the least in the lowest elevations of the County (Sonoma County 2006). In Sonoma County, electrical equipment, such as power lines and transformers, has caused numerous fires. An emerging cause for concern is fires started by mowing and use of power equipment (such as that used under the SMP) around very dry vegetation.

Airports

The primary airport in the study area is the Sonoma County Airport, located in north Santa Rosa. Other small airports are located in Healdsburg, Petaluma, and Sonoma. These airports are open for general use, but are uncontrolled and aircrafts follow standard procedures instead of receiving instructions from a tower controller.

The Sonoma County Airport is located approximately half a mile from a segment of Airport Creek that would be maintained under the SMP. The Russian River would not be maintained under the SMP. The Healdsburg airport is located along West Slough, a tributary creek in Zone 6A. The Petaluma Airport is bisected by East Washington Creek. This reach within Zone 2A would be maintained under the SMP. The Sonoma airport is located near Arroyo Seco Creek in Zone 3A. No maintenance activities would be conducted on Arroyo Seco Creek.

Mosquito Abatement

Vector control in Sonoma County is managed by the Marin/Sonoma Mosquito & Vector Control District under the Mosquito Abatement Act of 1915. The district manages vectors such as rats, arthropods, mosquitoes, ticks, yellow jackets, and head lice to control the spread of vector-borne diseases including West Nile virus, Lyme disease, malaria, and plague. The district uses a variety of methods to control vectors, including mosquito fish, microbial insecticides, and larvicidal oils. Larval and adult mosquito surveys are conducted to monitor of the spread of vector-borne diseases.

Under the California Health and Safety Code, mosquito abatement districts are empowered to take all necessary and proper steps for elimination and extermination of mosquitoes. District personnel make routine inspections of mosquito sources, such as ditches, channels, lagoons, drain lines, marsh areas, creeks, lakes, flood control basins, utility vaults, catch basins and fish ponds. If mosquito production is found, they take action to control or eliminate the problem.

3.6.4 Impact Analysis

Methodology

Impacts of the proposed program were evaluated qualitatively, based on the potential for the proposed program to create a significant hazard to the public or environment during or after implementation.

Criteria for Determining Significance

Based on Appendix G of the State CEQA Guidelines and professional expertise, it was determined that the Proposed Program would result in a significant impact if it would:

- Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials;

- Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment;
- Emit hazardous emissions or handle hazardous or acutely hazardous material, substances, or waste within one-quarter mile of an existing or proposed school;
- Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, create a significant hazard to the public or the environment;
- Result in a safety hazard for people residing or working within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport or private airstrip;
- Impair implementation of or physically interfere within an adopted emergency response plan or emergency evacuation plan; or
- Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands.

Environmental Impacts

Impact HAZ-1: Use, Transport, or Accidental Release of Hazardous Materials such that a Significant Hazard to the Public or Environment Would Result (Less than Significant with Mitigation)

Maintenance activities would involve the use of fuels and lubricants for maintenance equipment and herbicides for vegetation management. If these materials were released into the water or ground during application or equipment refueling or maintenance, contamination and harm to people or wildlife could result. These hazardous materials would be transported to and from the maintenance site and would be removed once the project is complete; hazardous materials would not be permanently stored at any of the maintenance sites. Implementation of Best Management Practices (BMPs) HAZ-1 through HAZ-8 and VEG-2 would prevent and mitigate for potential impacts due to use, transport, or accidental release of hazardous materials for proposed maintenance activities.

Level of Significance: Less than significant with mitigation

Mitigation Measures:

BMP HAZ-1: Spill Prevention and Response Plan

The Agency will develop a Spill Prevention and Response Plan prior to commencement of maintenance activities. The plan will summarize the measures required under BMPs HAZ-2 through HAZ-6. It will also require that:

1. Equipment and materials for cleanup of spills be available on site and that spills and leaks will be cleaned up immediately and disposed of properly;
2. Prior to entering the work site, all field personnel shall be appropriately trained in spill prevention, hazardous material control, and clean-up of accidental spills.

3. Field personnel shall implement measures to ensure that hazardous materials are properly handled and the quality of water resources is protected by all reasonable means.
4. Spill prevention kits shall always be in close proximity when using hazardous materials (e.g., crew trucks and other logical locations). All field personnel shall be advised of these locations and trained in their appropriate use.

The Agency will routinely inspect the work site to verify that the Spill Prevention and Response Plan is properly implemented and maintained. The Agency will notify contractors immediately if there is a noncompliance issue and will require compliance.

Absorbent materials will be used on small spills located on impervious surface rather than hosing down the spill; wash waters shall not discharge to the storm drainage system or surface waters. For small spills on pervious surfaces such as soils, wet materials will be excavated and properly disposed rather than burying it. The absorbent materials will be collected and disposed of properly and promptly.

As defined in 40 CFR 110, a federal reportable spill of petroleum products is the spilled quantity that:

- violates applicable water quality standards;
- causes a film or sheen on, or discoloration of, the water surface or adjoining shoreline; or
- causes a sludge or emulsion to be deposited beneath the surface of the water or adjoining shorelines.

If a spill is reportable, the contractor's superintendent will notify the Agency, and the Agency will take action to contact the appropriate safety and cleanup crews to ensure that the Spill Prevention and Response Plan is followed. A written description of reportable releases must be submitted to the appropriate RWQCB and the California Department of Toxic Substances Control (DTSC). This submittal must contain a description of the release, including the type of material and an estimate of the amount spilled, the date of the release, an explanation of why the spill occurred, and a description of the steps taken to prevent and control future releases. The releases will be documented on a spill report form.

If an appreciable spill has occurred, and results determine that project activities have adversely affected surface water or groundwater quality, a detailed analysis will be performed to the specifications of DTSC to identify the likely cause of contamination. This analysis will include recommendations for reducing or eliminating the source or mechanisms of contamination. Based on this analysis, the Agency or contractors will select and implement measures to control contamination, with a performance standard that surface and groundwater quality must be returned to baseline conditions. These measures will be subject to approval by the Agency, DTSC, and the RWQCB.

BMP HAZ-2: Equipment and Vehicle Maintenance

1. All vehicles and equipment will be kept clean. Excessive build-up of oil or grease will be avoided.
2. All equipment used in the creek channel will be inspected for leaks each day prior to initiation of work. Action will be taken to prevent or repair leaks, if necessary.
3. Vehicle and equipment maintenance activities will be conducted off-site or in a designated, protected area away from the channel where vehicle fluids and spills can be handled with reduced risk to water quality.

4. If maintenance must occur on-site, designated areas will not directly connect to the ground, surface waters, or the storm drainage system to prevent the run-on of stormwater and runoff of spills. The service area will be clearly designated with berms, sandbags, or other barriers.
5. Secondary containment, such as a drain pan or drop cloth, to catch spills or leaks will be used when removing or changing fluids. Fluids will be stored in appropriate containers with covers, and properly recycled or disposed of off-site.
6. Cracked batteries will be stored in a non-leaking secondary container and removed from the site.
7. Spill clean-up materials will be stockpiled where they are readily accessible.
8. Incoming vehicles and equipment will be checked for leaking oil and fluids (including delivery trucks, and employee and subcontractor vehicles). Leaking vehicles or equipment will not be allowed on-site.

BMP HAZ-3: Equipment and Vehicle Cleaning

1. Equipment will be cleaned of any sediment or vegetation before transferring and using in a different watershed to avoid spreading pathogens or exotic/invasive species between watersheds.
2. Vehicles and equipment will not be washed on-site. Vehicle and equipment washing will occur on an appropriate wash rack at SCWA's maintenance center.

BMP HAZ-4: Refueling

1. No fueling shall be done in the channel (top-of-bank to top-of-bank) unless equipment stationed in these locations cannot be readily relocated (e.g., pumps and generators).
2. All off-site fueling sites (e.g., on access roads above the top-of-bank) shall be equipped with secondary containment and avoid a direct connection to underlying soil, surface water, or the storm drainage system.
3. For stationary equipment that must be fueled on-site, secondary containment, such as a drain pan or drop cloth, shall be provided in such a manner to prevent accidental spill of fuels to underlying soil, surface water, or the storm drainage system.

BMP HAZ-5: On-Site Hazardous Materials Management

1. The products used and/or expected to be used and the end products that are produced and/or expected to be produced after their use will be inventoried.
2. As appropriate, containers will be properly labeled with a "Hazardous Waste" label and hazardous waste will be properly recycled or disposed of off-site.
3. Contact of chemicals with precipitation will be minimized by storing chemicals in watertight containers or in a storage shed (completely enclosed), with appropriate secondary containment to prevent any spillage or leakage.
4. Quantities of equipment fuels and lubricants greater than 55 gallons shall be provided with secondary containment that is capable of containing 110% of the primary container(s).
5. Petroleum products, chemicals, cement, fuels, lubricants, and non-storm drainage water or water contaminated with the aforementioned materials shall not be allowed to enter receiving waters or the storm drainage system.

6. Sanitation facilities (e.g., portable toilets) will be surrounded by a berm, and a direct connection to the storm drainage system or receiving water will be avoided.
7. Sanitation facilities will be regularly cleaned and/or replaced, and inspected regularly for leaks and spills.
8. Waste disposal containers will be covered when they are not in use, and a direct connection to the storm drainage system or receiving water will be avoided.
9. All trash that is brought to a project site during maintenance activities (e.g., plastic water bottles, plastic lunch bags) will be removed from the site daily.

BMP HAZ-6: Existing Hazardous Sites or Waste

Upon selection of maintenance project locations, the Agency will conduct a search for existing known contaminated sites on the State Water Resource Control Board's GeoTracker website (<http://www.geotracker.waterboards.ca.gov>). For any proposed maintenance sites located within 1,500 feet of any "open" sites where contamination has not been remediated, the Agency will contact the RWQCB case manager listed in the database. The Agency will work with the case manager to ensure maintenance activities would not affect cleanup or monitoring activities or threaten the public or environment.

If hazardous materials, such as oil or paint cans, are encountered at the maintenance sites, the Agency will carefully remove and dispose of them according to the Spill Prevention and Response plan. Agency staff will wear proper protective gear and store the waste in an appropriate hazardous waste container until it can be disposed at a hazardous waste facility.

BMP HAZ-7: Fire Prevention

1. All earthmoving and portable equipment with internal combustion engines will be equipped with spark arrestors.
2. During the high fire danger period (April 1–December 1), work crews will have appropriate fire suppression equipment available at the work site.
3. On days when the fire danger is high and a burn permit is required (as issued by the relevant Air Pollution Control District), flammable materials, including flammable vegetation slash, will be kept at least 10 feet away from any equipment that could produce a spark, fire, or flame.
4. On days when the fire danger is high and a burn permit is required, portable tools powered by gasoline-fueled internal combustion engines will not be used within 25 feet of any flammable materials unless at least one round-point shovel or fire extinguisher is within immediate reach of the work crew (no more 25 feet away from the work area).

BMP HAZ-8: Testing and Disposal of Spoils

As specified in the Sediment Sampling and Analysis Guidelines (Appendix B of the SMP Manual), after selecting potential sediment disposal locations and prior to disposing of excavated sediment, the Agency will test the sediment to determine the suitability for disposal based on presence of contaminants. Criteria for sediment disposal at the selected locations will dictate the concentrations of contaminants such as metals, pesticides, organic compounds, total organic carbon, asbestos, total sulfides, ammonia, and toxicity which are acceptable at the disposal locations. As specified in the Sediment Sampling and Analysis Guidelines, samples will be compared against federal and state environmental screening

levels (ESLs) for protection of human health, groundwater quality, and terrestrial receptors.

If hazardous levels of contaminants are present such that disposal at the preferred locations is not feasible, the material will be taken to a permitted hazardous waste facility.

BMP VEG-2: Use of Herbicides

1. All herbicide use shall be consistent with all Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) label instructions and any use conditions issued by the Sonoma County Agricultural Commissioner.
2. Herbicide use will be restricted to the minimum amount needed to ensure adequate control of vegetation.
3. Application of herbicides to upland areas shall not be made within 72 hours of predicted rainfall.
4. Herbicides will not be directly applied to waters of the U.S., such as for ludwigia eradication.
5. Herbicides, including AquaMaster© and Renovate©, will not be used within 60 feet of areas identified in the Court-Ordered Stipulated Injunction for the protection of California red-legged frogs. This includes areas in Zones 1A and 3A, as well as Zones 8A and 9A (see Figure 3-29 for detail on where these areas are located.) The Agency will review the details and exceptions in the court order and comply with the herbicide use buffers as appropriate.
6. As required by the Court-Ordered Stipulated Injunction for pesticide use near Pacific salmon-supporting waters in Sonoma County, pesticides specified in the injunction including triclopyr (Renovate©) will not be used within 20 yards of salmon-supporting waters. The Agency will review the details and exceptions in the court order and comply with the herbicide use buffers as appropriate.

Impact HAZ-2: Potential to Interfere with Emergency Response (Less than Significant with Mitigation)

During maintenance activities, road closures may be necessary. If road closures or SMP-generated traffic (such as fill hauling) were to interfere with emergency response efforts such that response times were to be extended, a significant impact would result. However, implementation of BMP GN-4 *Traffic Flow, Pedestrians, and Safety Measures* would ensure that temporary lane closures are coordinated with local emergency response agencies, and that haul routes consider level of service and existing traffic. With implementation of this BMP, this would be a less-than-significant impact.

Level of Significance: Less than significant with mitigation

Mitigation Measures:

BMP GN-4: Traffic Flow, Pedestrians, and Safety Measures

1. To the extent feasible, work will be staged and conducted in a manner that maintains two-way traffic flow on public roadways in the vicinity of the work site. If temporary lane closures are necessary, they will be scheduled outside of peak traffic hours (7:00-10:00 a.m. and 3:00-6:00 p.m.) to the maximum extent practicable, and advance warning signage, a detour route, and flaggers will be provided in both directions.

2. When work is conducted on public roads and may have the potential to affect traffic flow, work will be coordinated with local emergency service providers as necessary to ensure that emergency vehicle access and response is not impeded.
3. Public transit access and routes shall be maintained to the extent feasible. If public transit would be affected by temporary road closures and require detours, affected transit authorities will be consulted and kept informed of project activities.
4. Heavy equipment and haul traffic will be prohibited in residential areas, except when no other route to and from the site is available.
5. Roadway segments or intersections in the vicinity of project sites will be assessed to determine if they are at, or approaching an LOS that exceeds local standards. Maintenance traffic will avoid these locations to the extent feasible, either by traveling different routes or by traveling at non-peak times of day.
6. Adequate off-street parking will be provided or designated public parking areas will be used for maintenance workers' personal vehicles and maintenance-related vehicles not in use through the maintenance period.
7. Access for driveways and private roads will be maintained to the extent feasible. If brief periods of maintenance would temporarily block access, property owners will be notified prior to maintenance activities.

Impact HAZ-3: Be Located on a Known Existing Contaminated Site (Less than Significant with Mitigation)

As discussed above, a number of brownfields and LUST sites have been identified in the study area. Information on these sites is tracked and made publically available on the state's GeoTracker online database. Because the proposed maintenance activities would vary each year and the status of existing contamination and cleanup efforts changes frequently, it is difficult to determine the degree to which SMP activities would impact (or be impacted by) existing contaminated sites. However, because the proposed maintenance activities sometimes require dewatering of baseflows in the channel and would involve excavation of sediment from channel bed and banks, and there are many known contaminated site in the study area, there is a high potential for maintenance activities to encounter existing contaminated groundwater or sediment. Handling or release of contaminated water or sediments during dewatering or maintenance activities could pose a significant health risk to people or the environment.

However, BMP HAZ-6 *Existing Hazardous Sites or Waste* requires that SCWA conduct a GeoTracker search for existing contaminated sites within 1,500 feet of the proposed maintenance site. SCWA would then contact the case manager listed on GeoTracker to discuss the actual potential for disturbance to existing contamination and means to avoid or minimize further contamination. The RWQCB recommends that a search of existing contaminated site be conducted within 1,500 feet of a proposed project (for new groundwater supply wells in particular) as the first step in identifying the potential impact on the project and cleanup efforts (Hunt 2008, pers. comm.).

As an example, in September 2008 there were four active cleanup sites within 1,500 feet of Steele Creek, Reach 2. LUSTs and solvents from a dry cleaner business have caused contamination of the underlying groundwater aquifer. The contamination is in various

stages of remediation and assessment. The plume of contamination may or may not cross Reach 2 of Steele Creek; this information is not provided in the GeoTracker database. In order to determine the potential level of exposure risk during maintenance activities, the RWQCB case managers for the sites listed in GeoTracker would need to be contacted to obtain more information and determine proper hazard avoidance and mitigation. Thus, on an annual basis, SCWA managers will work directly with the RWQCB case managers to obtain the most current information on the contaminated sites located near the maintenance sites. The RWQCB case managers would advise SCWA on the proper work procedures to ensure protection of human and environmental health. With implementation of BMP HAZ-6, this impact would be less than significant.

Level of Significance: Less than significant with mitigation

Mitigation Measures:

BMP HAZ-6: Existing Hazardous Sites or Waste

See Impact HAZ-1.

Impact HAZ-4: Be Located on a Previously Undiscovered Contaminated Site (Less than Significant with Mitigation)

As creeks are common locations for illegal dumping of trash containing hazardous waste, such as tires, oil filters and paint cans, Program activities could encounter hazardous waste. SMP channels also receive runoff from streets and urbanized areas which carry contaminants like oil and paint that are poured down storm drains. Thus indirect contamination of channels can occur when contaminants are transported through the storm drain network and deposited directly to the channels. Presence of these contaminants can sometimes be observed as an oily sheen, a discoloration of the soil, or an unnatural chemical odor. If presence of potential contaminants is observed at the site, the area will be treated as if a hazardous spill occurred. The site will be handled according to actions presented in the Spill Prevention and Response Plan described in BMP HAZ-1. To ensure protection of maintenance workers and the environment from existing pollutant spills at the site, all hazardous waste will be removed and properly disposed of as described in *BMP HAZ-6 Existing Hazardous Sites or Waste*.

Additionally, as discussed in Chapter 3.7 *Hydrology, Geomorphology, and Water Quality*, hazardous levels of contaminants could currently reside in sediment to be excavated or disturbed within the SMP channels. Handling and disposal of sediment containing hazardous levels of contaminants could threaten human or environmental health, which would constitute a significant impact. However, *BMP HAZ-8 Testing and Disposal of Spoils* and the Sediment Sampling and Analysis Guidelines discussed in SMP Manual Chapters 5 and 8 and included in SMP Manual Appendix B requires that sediment is tested for presence of hazardous levels of pollutants prior to the start of maintenance activities. The SMP Manual provides a step-by-step procedure to properly test, handle, and dispose of excavated sediment according to the level of pollutants present, if any. Therefore, potential impacts on human and environmental health due to previously undiscovered contamination would be less than significant.

Level of Significance: Less than significant with mitigation

Mitigation Measures:

BMP HAZ-1: Spill Prevention and Response Plan

See Impact HAZ-1.

BMP HAZ-6: Existing Hazardous Sites or Waste

See Impact HAZ-1.

BMP HAZ-8: Testing and Disposal of Spoils

See Impact HAZ-1.

Impact HAZ-5: Create Safety Hazards from Public Access to Maintenance Sites (Less than Significant with Mitigation)

Maintenance activities would be temporary and generally confined to a small area surrounding creek channels. Maintenance activities would be located in or in close proximity to public areas where residents could be exposed to hazardous materials, and/or channels which could sequester or transport chemicals in the water and sediment. If fuels, lubricants, or herbicides are released accidentally during use or transport a significant impact on humans or the environment could result. Implementation of BMPs HAZ-1 through HAZ-8 and VEG-2, as summarized above, would prevent and mitigate for potential impacts due to use, transport, or accidental release of hazardous materials for proposed maintenance activities. Additionally, BMP GN-4 *Traffic Flow, Pedestrians, and Safety Measures* would ensure that the public is protected against construction-related accidents by providing signage and detours around the work site. After maintenance activities are complete, there would be no additional safety hazards than currently exist at the project sites. With implementation of these measures, this impact is considered less than significant.

Level of Significance: Less than significant with mitigation

Mitigation Measures:

BMP HAZ-1: Spill Prevention and Response Plan

See Impact HAZ-1.

BMP HAZ-2: Equipment and Vehicle Maintenance

See Impact HAZ-1.

BMP HAZ-3: Equipment and Vehicle Cleaning

See Impact HAZ-1.

BMP HAZ-4: Refueling

See Impact HAZ-1.

BMP HAZ-5: On-Site Hazardous Materials Management

See Impact HAZ-1.

BMP HAZ-6: Existing Hazardous Sites or Waste

See Impact HAZ-1.

BMP HAZ-7: Fire Prevention

See Impact HAZ-1.

BMP HAZ-8: Testing and Disposal of Spoils

See Impact HAZ-1.

BMP VEG-2: Use of Herbicides

See Impact HAZ-1.

BMP GN-4: Traffic Flow, Pedestrians, and Safety Measures

See Impact HAZ-2.

Impact HAZ-6: Create Safety Hazards or Releases of Hazardous Materials in Proximity to a School or Airport (Less than Significant with Mitigation)

Numerous schools are located within one-quarter mile, and the Sonoma County and Petaluma airports are located within 2 miles of SCWA-maintained channels. SMP channels in these areas may also intersect with areas of existing soil or groundwater contamination. As such, proposed maintenance activities could occur in close proximity to an existing contaminated site or result in release of hazardous substances in close proximity to a school or airport. To ensure maintenance activities located in close proximity to a school or airport would not result in significant environmental impacts, implementation of BMP HAZ-1 through HAZ-8 would reduce impacts to a less-than-significant level.

Level of Significance: Less than significant with mitigation

Mitigation Measures:

BMP HAZ-1: Spill Prevention and Response Plan

See Impact HAZ-1.

BMP HAZ-2: Equipment and Vehicle Maintenance

See Impact HAZ-1.

BMP HAZ-3: Equipment and Vehicle Cleaning

See Impact HAZ-1.

BMP HAZ-4: Refueling

See Impact HAZ-1.

BMP HAZ-5: On-Site Hazardous Materials Management

See Impact HAZ-1.

BMP HAZ-6: Existing Hazardous Sites or Waste

See Impact HAZ-1.

BMP HAZ-7: Fire Prevention

See Impact HAZ-1.

BMP HAZ-8: Testing and Disposal of Spoils

See Impact HAZ-1.

Impact HAZ-7: Exacerbation of Wildland Fires (Less than Significant with Mitigation)

Proposed maintenance activities would not involve placement of people or habitable structures in areas without adequate fire protection. Additionally, the Proposed Program would not result in the creation of new wildland areas which could increase fire dangers. In the long term, management of riparian vegetation in Agency-maintained channels would reduce the risk of urban fires.

Nonetheless, because maintenance activities would be conducted during the dry summer months when fire danger is the highest and in locations along the urban/wildland interface, there is a potential for an accidental ignition of a wildland fire. To prevent significant impacts related to wildland fires, BMP HAZ-7 will be implemented. BMP HAZ-7 requires on-site fire suppression equipment, spark arrestors on all equipment with internal combustion engines, and restricts activities on high fire danger days. With implementation of this measure, impacts would be less than significant.

Level of Significance: Less than significant with mitigation

Mitigation Measures:

BMP HAZ-7: Fire Prevention

See Impact HAZ-1.

Impact HAZ-8: Disposal of Contaminated Sediments (Less than Significant with Mitigation)

Within the Program Area, SMP channels function to receive and transport stormwater runoff. Stormwater runoff carries urban contaminants, such as fuels, oils, pesticides, and fertilizers, to these channels. Many of these contaminants have a tendency to bind themselves to sediments in the channel bed, where they can accumulate. When sediment is removed from creeks, there is a potential for toxic concentrations of contaminants to be present in the removed sediment. If disposed on land, these contaminants could be hazardous if released into the environment and exposed to people or wildlife. BMP HAZ-8 and the Sediment Sampling and Analysis Guidelines discussed in SMP Manual Chapters 5 and 6 and included in SMP Manual Appendix B require testing and proper disposal of sediment removed as part of maintenance activities. Thus, disposal of contaminated sediments impacts would be less than significant.

Level of Significance: Less than significant with mitigation

Mitigation Measures:

BMP HAZ-8: Testing and Disposal of Spoils

See Impact HAZ-1.

Impact HAZ-9: Mosquito Abatement (Less than Significant)

Program maintenance activities would generally improve drainage, through removing sediment and vegetation blockages that create standing water conditions. These activities reduce the risk of mosquito breeding within SMP channels. In no event would SMP maintenance create areas of standing water that could foster mosquitoes. Finally, proposed maintenance activities would not interfere with mosquito abatement efforts conducted by the Marin/Sonoma Mosquito & Vector Control District. As such, this impact is considered less than significant. No mitigation is required.

Level of Significance: Less than significant

Mitigation Measures: None required

Chapter 3.7

HYDROLOGY, GEOMORPHOLOGY, AND WATER QUALITY

Chapter 3.7

HYDROLOGY, GEOMORPHOLOGY, AND WATER QUALITY

3.7.1 Introduction

This chapter describes the setting and potential impacts of the Proposed Program on hydrologic resources. Data sources used to prepare this section include the Sonoma County General Plan and general plans from the cities of Petaluma, Rohnert Park, Santa Rosa, Sebastopol, Sonoma, and the Town of Windsor. Other applicable regulations and background documents were also reviewed.

The Stream Maintenance Program (SMP or Proposed Program) activities focus on managing streams, flood control channels, and other flood management related facilities. Several Proposed Program activities are directly related to and influenced by hydrologic, geomorphic, and water quality processes.

3.7.2 Regulatory Setting

Federal Regulations

The Clean Water Act (CWA) is the primary federal regulation governing water quality. Key sections of the CWA which pertain to water quality regulation are Section 303, 401, and 402. These and other regulations applicable to flood management and herbicide use are discussed in more detail in Chapter 2 of the SMP Manual.

State Regulations

The State Porter-Cologne Water Quality Control Act, the primary state regulation governing water quality, is discussed in Chapter 2 of the SMP Manual. The water quality control plans or Basin Plans and policies established by the two Regional Water Quality Control Boards (RWQCBs) with jurisdiction in the Program Area, the North Coast and San Francisco Bay RWQCBs, are also discussed in Chapter 2 of the SMP Manual.

The CWA names states as responsible for implementation of CWA Sections 303, 401, and 402. Section 402 of the CWA is the National Pollutant Discharge Elimination System (NPDES) program, which is administered by the State Water Resources Control Board (SWRCB) and its nine RWQCBs. The SWRCB has established general NPDES permits for regulation of discharges from construction, municipal, and herbicide application activities, the terms of which are discussed in SMP Manual Chapter 2.

Local Regulations

The Sonoma County Water Agency (SCWA), Sonoma County, and incorporated cities within the Program Area have obtained NPDES permit coverage for municipal stormwater activities. As part of compliance with their permit conditions, Storm Water Management Plans and Standard Urban Storm Water Mitigation Plans have been developed. These plans

guide local regulation of construction, post-construction, industrial, commercial, and storm system operation and management operations within the permit areas. See Chapter 2 of the SMP Manual for more information.

Under Ordinance No. 3836R, the County of Sonoma issues roiling permits for work conducted within riparian corridors. Activities proposed in the SMP would occur with riparian areas of the county, thus SCWA will comply with this ordinance. See Chapter 2 of the SMP Manual for more information.

In addition, the North Coast RWQCB issued an NPDES permit (Order No. R1-2006-0045) to the City of Santa Rosa (City) in 2006 which includes a requirement that “in the absence of a TMDL (in 2011), the final effluent limitation for nitrogen and phosphorus will be zero, or no net loading.” Since TMDL completion is not expected prior to 2011, the RWQCB developed the Santa Rosa Nutrient Offset Policy (Resolution No. R1-2008-0061). This policy describes a process for recognizing the City’s nutrient reduction efforts and determining credit toward compliance with the 2011 zero net nutrient load requirement. SMP implementation jointly by SCWA and the City is intended to result in nutrient source control which qualifies for nutrient reduction credits under the Nutrient Offset Policy.

In support of the nutrient offset program, the City of Santa Rosa has partnered with SCWA to provide sediment disposal opportunities for the SMP. The disposal of SMP sediments at suitable City sites will provide important nutrient offset benefits through reducing the volume of organic nutrients reaching the Laguna de Santa Rosa.

The following goals and policies included in planning documents for Sonoma County and the cities of Healdsburg, Petaluma, Rohnert Park, Santa Rosa, Sebastopol, Sonoma, and Windsor, and relevant to SMP activities, are listed below.

Sonoma County 2020 General Plan

- | | |
|-------------------------|--|
| <i>GOAL WR-1</i> | Protect, restore and enhance the quality of surface and groundwater resources to meet the needs of all reasonable beneficial uses. |
| <i>Objective WR-1.2</i> | Avoid pollution of stormwater, water bodies and groundwater. |
| <i>Policy WR-1a</i> | Coordinate with the RWQCB, public water suppliers, Cities, Resource Conservation Districts (RCDs), watershed groups, stakeholders and other interested parties to develop and implement public education programs and water quality enhancement activities and provide technical assistance to minimize stormwater pollution, support RWQCB requirements and manage related County programs. Where appropriate, utilize watershed planning approaches to resolve water quality problems. |
| <i>Policy WR-1b</i> | Design, construct, and maintain County buildings, roads, bridges, drainage and other facilities to minimize sediment and other pollutants in stormwater flows. Develop and implement “best management practices” for ongoing maintenance and operation. |

<i>Policy WR-1c</i>	<p>Prioritize stormwater management measures in coordination with the RWQCB direction, focusing first upon watershed areas that are urbanizing and watersheds with impaired water bodies. Work cooperatively with the RWQCBs to manage the quality and quantity of stormwater runoff from new development and redevelopment in order to:</p> <ol style="list-style-type: none">(1) Prevent, to the maximum extent practicable, pollutants from reaching stormwater conveyance systems.(2) Ensure, to the maximum extent practicable, that discharges from regulated municipal storm drains comply with water quality objectives.(3) Limit, to the maximum extent practicable, stormwater from post development sites to pre-development quantities.(4) Conserve and protect natural areas to the maximum extent practicable.
<i>Policy WR-1e</i>	<p>Assist in the development of Total Maximum Daily Loads (TMDLs) for the impaired water bodies and pollutants of concern identified by the RWQCBs to achieve compliance with adopted TMDLs. Work with the RWQCB to develop and implement measures consistent with the adopted TMDLs.</p>
<i>Policy WR-1g</i>	<p>Minimize deposition and discharge of sediment, debris, waste and other pollutants into surface runoff, drainage systems, surface water bodies, and groundwater.</p>
<i>Policy WR-1h</i>	<p>Require grading plans to include measures to avoid soil erosion and consider upgrading requirements as needed to avoid sedimentation in stormwater to the maximum extent practicable.</p>
<i>Policy WR-1v</i>	<p>Request that the SCWA revise the SCWA flood control design criteria to include a section on stream geomorphic analysis and to update information on bank protection and erosion control to incorporate biotechnical bank stabilization methods for the purpose of preventing erosion and siltation in drainage swales and streams.</p>
<i>GOAL WR-6</i>	<p>Improve understanding, valuation and sound management of the water resources in Sonoma County's diverse watersheds.</p>
<i>GOAL OSRC-8</i>	<p>Protect and enhance Riparian Corridors and functions along streams, balancing the need for agricultural production, urban development, timber and mining operations, and other land uses with the preservation of riparian vegetation, protection of water resources, flood control, bank stabilization, and other riparian functions and values.</p>

- Objective OSRC-8.1* Designate all streams shown on USGS 7.5 minute quadrangle topographic maps as of March 18, 2003, as Riparian Corridors and establish streamside conservation areas along these designated corridors.
- Objective OSRC-8.2* Provide standards for land use and development in streamside conservation areas that protect riparian vegetation, water resources and habitat values while considering the needs of residents, agriculture, businesses and other land users.
- Objective OSRC-8.3* Recognize and protect riparian functions and values of undesignated streams during review of discretionary projects.
- Policy OSRC-8b* Establish streamside conservation areas along both sides of designated Riparian Corridors as follows, measured from the top of the higher bank on each side of the stream as determined by PRMD:
- (1) Russian River Riparian Corridor: 200'
 - (2) Flatland Riparian Corridors: 100'
 - (3) Other Riparian Corridors: 50'
- Policy OSRC-8d* Allow or consider allowing the following uses within any streamside conservation area:
- (1) Timber harvest operations conducted in accordance with an approved timber harvest plan.
 - (2) Streamside maintenance and restoration.
 - (3) Fire fuel management where vegetation removal is limited to the minimum required for fire safety purposes and where there are no feasible alternative development locations or designs that do not require vegetation removal.
 - (4) Road crossings, street crossings, utility line crossings.
 - (5) Mining operations conducted in accordance with the County Surface Mining and Reclamation Ordinance.
 - (6) Stream dams and stream-related water storage approved by applicable agencies.
 - (7) Grazing and similar agricultural production activities not involving structures or cultivation, except as defined by (8) below, and conducted in accordance with water quality protection guidelines of the Agricultural Commissioner, Resource Conservation Districts, or Regional Water Quality Control Boards.

(8) Agricultural cultivation and related planting, seeding, fertilizing, weeding, irrigation, and harvesting.

(a) located no closer than 100' from the top of the bank in the "Russian River Riparian Corridor".

(b) located no closer than 50' from the top of the bank in the "Flatland Riparian Corridors" or in upland areas of "Other Riparian Corridors".

(c) located no closer than 25' from the top of the bank in the "Other Riparian Corridors" not in upland areas.

The upland areas in (b) and (c) above shall be determined using information on streamside slopes from USGS topographic maps and soil types from the Soil Conservation Service "Soil Survey of Sonoma County".

(9) Equipment turnaround and access roads associated with agricultural cultivation, provided that the affected area is the minimum necessary for these turnaround and access roads and that a minimum 25' vegetative filter strip is provided and maintained between the affected area and the top of the bank.

(10) Vegetation removal as part of an integrated pest management program administered by the Agricultural Commissioner.

(11) Creekside bikeways, trails, and parks within Urban Residential, Commercial, Industrial, or Public-Quasi Public land use categories.

(12) Development authorized by exception under Policy OSRC-8e.

Policy OSRC-8e

Prohibit, except as otherwise allowed by Policy OSRC-8d, grading, vegetation removal, agricultural cultivation, structures, roads, utility lines, and parking lots within any streamside conservation area. Consider an exception to this prohibition if:

(1) It makes a lot unbuildable and vegetation removal is minimized,

(2) The use involves the minor expansion of an existing structure where it is demonstrated that the expansion will be accomplished with minimum damage to riparian functions,

(3) The use involves only the maintenance or restoration of an existing structure or a non-structural use,

(4) It can be clearly demonstrated through photographs or other information that the affected area has no substantial value for riparian functions, or

(5) A conservation plan is approved that provides for the appropriate protection of the biotic resources, water quality, flood management, bank stability, groundwater recharge, and other applicable riparian functions. Until the County adopts mitigation standards and procedures for specific uses and riparian functions, prior to approving the conservation plan, consult on areas of concern with the Resource Conservation District, Agricultural Commissioner, and resource agencies that are applicable to the proposed plan.

- Policy OSRC-8f* Develop and/or adopt, where appropriate, revised streamside specific standards, guidelines, and/or best management practices that provide for protection of Riparian Corridors by watershed, stream, or other geographic areas. Once adopted, the revised standards would replace the standards that are in effect at the time.
- Policy OSRC-8i* As part of the environmental review process, refer discretionary permit applications near streams to CDFG and other agencies responsible for natural resource protection.
- Policy OSRC-8l* In coordination with resource agencies, landowners and the affected public, regularly review Riparian Corridor designations, ephemeral drainages, the requests, approvals and required mitigation for setback reductions, any cumulative effect of the approved reductions, and other protection issues and, if warranted, develop recommendations for County policies that may be needed to ensure appropriate protection of riparian corridors.
- Policy OSRC-8m* Apply the SCWA Flood Control Design Criteria creek setback to development along streams where necessary to protect against streambank erosion.
- Objective OSRC-11.1* Ensure that permitted uses are compatible with reducing potential damage due to soil erosion.
- Objective OSRC-11.2* Establish ways to prevent soil erosion and restore areas damaged by erosion.
- Policy OSRC-11a* Design discretionary projects so that structures and roads are not located on slopes of 30 percent or greater. This requirement is not intended to make any existing parcel unbuildable if Health and Building requirements can be met.
- Policy OSRC-11b* Include erosion control measures for any discretionary project involving construction or grading near waterways or on lands with slopes over 10 percent.
- Policy OSRC-11d* Require a soil conservation program to reduce soil erosion impacts for discretionary projects that could increase waterway or hillside erosion. Design improvements such as roads and driveways to retain natural vegetation and topography to the extent feasible.

<i>Policy OSRC-11e</i>	Retain natural vegetation and topography to the extent economically feasible for any discretionary project improvements near waterways or in areas with a high risk of erosion as noted in the Sonoma County Soil Survey.
<i>Policy OSRC-11g</i>	Continue to enforce the Uniform Building Code to reduce erosion and slope instability problems.
<i>Goal PS-2.1</i>	Prevent unnecessary exposure of people and property to risks of damage or injury from flooding.
<i>GOAL PS-2</i>	Reduce existing flood hazards and prevent unnecessary exposure of people and property to risks of damage or injury from flood hazards.
<i>Objective PS-2.1</i>	Maintain complete data on flood hazards.
<i>Objective PS-2.3</i>	Utilize the Sonoma County Hazard Mitigation Plan to help reduce future damage from flood hazards.
<i>Policy PS-2h</i>	<p>Work cooperatively with each City to prepare a comprehensive analysis of the potential flood hazards and drainage impacts for the watersheds with major flood problems in the County (i.e., Russian River, Sonoma Creek, Petaluma River). Include the following in the analysis:</p> <ol style="list-style-type: none">(1) Identification of flood hazard areas,(2) Identification of historic drainage patterns and existing retention/detention characteristics serving each watershed,(3) Identification of impacts associated with placement of significant new impervious surfaces,(4) Identification of downstream impacts on existing development and land uses,(5) Identification of mitigation measures to reduce flood hazards,(6) Identification of significant water recharge areas,(7) Identification of sources of significant soil sedimentation and/or stream bank failures, and(8) Identification and adoption of regional mitigation measures to be applied to new development to address the proportionate fair share of flood hazard reduction.
<i>Policy PS-2m</i>	Regulate development, water diversion, vegetation removal, grading and fills to minimize any increase in flooding and related damage to people and property.

<i>Policy PS-2r</i>	Give priority to floodplain management over flood control structures for preventing damage from flooding except where the intensity of development requires a high level of protection and justifies the costs of structural measures. Where possible, maintain flood channel capacity.
<i>Policy PS-2t</i>	Avoid variances to building setbacks along streams and in 100-year flood plains without the review and approval of the Permit and Resource Management Department.
<i>Policy PS-2u</i>	Request that the Sonoma County Water Agency prioritize and undertake flood hazard mitigation projects on a continuous basis on selected waterways subject to the policies of the Open Space and Resource Conservation Element.

City of Healdsburg General Plan

Public Services and Facilities Element

Goal D To maintain an adequate level of service in the City's drainage system to accommodate runoff from existing and projected development and to prevent property damage due to flooding.

Health and Safety

Goal C To prevent loss of lives, injury, and property damage due to flooding.

C5 The City shall provide for channel improvements to and tree and brush clearance along Foss Creek and other watercourses to reduce flooding.

City of Petaluma General Plan 2025

4-P-1 Protect and enhance the Petaluma River and its tributaries through a comprehensive river management strategy of the following programs:

(E) Facilitate compliance with Phase II standards of the National Pollutant Discharge Elimination System (NPDES) to improve the water quality and aesthetics of the river and creeks.

(J) Utilize the Parks and Recreation, Water Resources & Conservation, Public Works departments, property owners (e.g. Landscape Assessment Districts) and/or other appropriate public agencies (e.g. Sonoma County Water Agency) to manage the long term operations, maintenance responsibilities, and stormwater capacity associated with the river and tributary greenways.

(K) Prohibit placement of impervious surfaces in the Floodway (i.e. Parking lots, roadways, etc.) with the exception of pathways and emergency access improvements.

- 8-P-20* Manage groundwater as a valuable and limited shared resource by protecting potential groundwater recharge areas and stream sides from urban encroachment within the Petaluma watershed.
- 8-P-29* The City of Petaluma, SCWA, Sonoma County and other responsible agencies shall be encouraged to work together in order to create and adopt a flood management plan, or plan amendment to the Petaluma River Watershed Master Drainage Plan, for the Petaluma River watershed implementing the following regional surface water solutions; or a reasonable segment thereof:
- A) Establish a Petaluma River and creek corridor setback for the design and construction of a flood terrace system to allow the Petaluma River (Corona and Denman Reaches), along with Willow Brook, Marin, and Liberty Creeks to accommodate a 1% (100-year) storm event within a modified channel section to the extent possible given existing natural and physical constraints.
 - B) Work with Sonoma County to create interim development standards for that setback area until such time as studies are concluded and approved by Sonoma County, the SCWA, the City of Petaluma, and other responsible agencies. Thereafter all lands affected shall set aside the necessary river and/or creek corridor areas and, as development occurs, shall undertake the identified surface water containment enhancement improvements to accommodate improvements envisioned in Program A, above.
 - C) The City will work with the County to ensure that zero net fill policies are enforced within the unincorporated area for areas within the regulatory floodplain of the Petaluma River and its tributaries.
 - D) Working with Sonoma County, the City shall develop a plan and identify funding opportunities to acquire and remove existing structures within the regulatory floodway of the Petaluma River and its tributaries. The Plan shall be updated as needed to maintain consistency with changes in regulatory mapping of the floodway.
 - E) Participate with the County in implementation of the regional components of the Petaluma River Watershed Master Drainage Plan (SCWA, June 2003), Petaluma River Floodplain Management Plan (City of Petaluma, October 2001, Petaluma River Access and Enhancement Plan (City of Petaluma, May 1006, Sonoma County General Plan 2020 (Public Safety Element) and the City of Petaluma General Plan 2025.
- 8-P-35* Protect private and public properties and capital investments including those designed to minimize flooding potential.

- A) Work with SCWA, regulatory agencies, and/ or property owners, as appropriate given maintenance authority, to insure maintenance of the engineered channels, natural creeks, and enclosed surface water system.
- B) Work with regulatory and advisory agencies to facilitate preservation and environmental enhancement of the natural corridor for species of importance and native to the area.
- C) Promote public education and stewardship of the riparian corridors.
- D) Work with the U.S. Army Corps of Engineers to dredge the river channel downstream of the transition weir to maintain the 100-year design conveyance capacity and navigable channel.
- E) Initiate the formation of an Assessment District, or other funding mechanism, to ensure periodic dredging occurs and the dredge materials disposal site is maintained.
- F) The City shall continue to inspect and maintain the conveyance capacity of open channels and the piped system within our authority.
- G) The City shall facilitate and advise property owners to ensure the maintenance of privately owned creeks and channels (e.g. Kelly Creek). Assistance may include facilitation of regulatory permitting and design standards.
- H) Continue to evaluate, and take appropriate action, to monitor and maintain the adequacy, safety, and strength of existing berms and levees and other flood protection/reduction facilities.
- I) The Development Code shall require the identification of any disposal site for excavated soil and require that any disposal be located outside the regulatory floodplain within the Planning Referral Area.
- J) Monitor changes in tide elevations and related effects on Petaluma River tidal levels over time in order to determine if there is a trend that increases the level of Mean Higher High Water, as determined by the Corps of Engineer.
 - a. Assess the effect of any such trend or changes on habitable structures in the regulatory floodplain.
- K) Require flood protection of new or significantly remodeled first floor habitable structures within the regulatory floodplain.
- L) Continue to monitor precipitation data in order to maintain current data in the XPSWMM model.

M) Improve the data available for the XPSWMM model. Add stream level gages at the following locations:

- a. Petaluma River at Petaluma Blvd. (southbound bridge)
- b. Petaluma River at the railroad trestle bridge downstream of Corona Creek
- c. Corona Creek at McDowell Blvd.
- d. Capri Creek at McDowell Blvd.
- e. Adobe Creek at Lakeville Road
- f. Lynch Creek at Maria Dr.
- g. Lynch Creek at McDowell Blvd. or HWY 101 (northbound)
- h. Washington Creek at McDowell Blvd. or HWY 101 (northbound)
- i. East Washington Creek at Washington St.
- j. Petaluma River at HWY 101 (southbound bridge)

8-P-31

In accordance with the studies undertaken for the Corps Flood Protection Project, existing areas subject to periodic surface water inundation and containment, within the Corona and Denman Reaches (Lynch Creek confluence with the Petaluma River upstream to the Old Redwood Highway over-crossing of Willow Brook Creek), shall be preserved and enhanced where feasible to reduce localized flooding.

B) Continue to work with SCWA for the on-going efforts to maintain or improve historic channel capacity for flood waters.

8-P-32

Areas within the Petaluma watershed, outside of the City of Petaluma, which are subject to periodic surface water inundation and containment, should not be modified in any manner to reduce the historic storage characteristics and capacity.

A) Department of Water Resources & Conservation shall work with Sonoma County, SCWA, and other responsible agencies to preserve and expand detention basin capacity within the Petaluma River watershed and maintain or reduce peak discharge volumes from Willow Brook, Marin, Liberty and Lichau Creeks.

B) The City shall work with the County of Sonoma to establish a zero net fill policy for detention basins and areas within the regulatory floodplain within the Petaluma River watershed in order to preserve and enhance basin capacity and to ensure no

detrimental impact to downstream flows, including the increase in peak discharge volumes in the downstream areas.

8-P-35

Protect private and public properties and capital investments including those designed to minimize flooding potential.

A) Work with SCWA, regulatory agencies, and or property owners, as appropriate given maintenance authority, to insure maintenance of the engineered channels, natural creeks, and enclosed surface water system.

City of Rohnert Park General Plan 2020

Goals

Drainage, Erosion, Stormwater, and Flooding

- Minimize the risk to life and property from flooding.
- Control erosion and sedimentation to provide flood protection and protect water quality.

HS-5

As part of the building permit process, require all development projects to comply with hydrology and drainage policies incorporated in the applicable Specific Plans. Require the project proponent to design and construct a storm drain system in accordance with the SCWA Flood Control Design Criteria (latest revision), specific to the project. Encourage the use of environmentally sensitive drainage improvements including flow reduction and flood bypass systems in order to ensure protection of surface water quality and stream integrity.

HS-6

As part of the building permit process, require new development greater than five acres in size to prepare and implement a site-specific storm water pollution prevention plan (SWPPP) that effectively reduces discharges of stormwater containing sediment and other pollutants resulting from site construction activities. In addition, require all projects, regardless of size, to comply with any other stormwater provisions of the specific plans for their respective areas.

HS-8

Systematically conduct maintenance, make repairs, or improve drainage facilities to minimize localized flooding during rainstorms. Provide treatment to first-flush runoff flows, street sweeping programs, and additional source controls to minimize nonpoint source pollution.

HS-11

In cooperation with the Sonoma County Water Agency, maintain flood plain areas, drainage channels, and other drainage structures and improve drainage channel capacity in ways that will preserve the natural character of habitat areas, riparian corridors, and waterways to the maximum extent feasible.

EC-E

Comply with the Regional Water Quality Control Board's regulations and standards to maintain and improve the quality of both surface water and groundwater resources.

- EC-F* Enhance the quality of surface water and groundwater resources and prevent their contamination.
- EC-H* Where feasible, given flood control requirements, maintain the natural condition of waterways and flood plains and protect watersheds to ensure adequate groundwater recharge and water quality.
- EC-J* Discourage use of insecticides, herbicides, or toxic chemical substances within the city and encourage development and use of pesticide and fertilizer management plans for landscaped areas.
- EC-13* Maintain creek protection zones extending a minimum of 50 feet (measured from the tops of the banks and a strip of land extending laterally outward from the top of each bank) for creeks, with extended buffers where significant habitat areas or high potential wetlands exist (Figure 6.2-2). Where high potential wetland or other biological resources exist, require appropriately wide buffers to encompass and protect the resource. Development shall not occur within this zone, except as part of greenway enhancement (for example, trails and bikeways). Require City approval for the following activities within the creek protection zones:
- Construction, alteration, or removal of any structure;
 - Excavation, filling, or grading;
 - Removal or planting of vegetation (except for removal of invasive plant species); or
 - Alteration of any embankment.
- EC-19* Require new construction to utilize site preparation, grading, and foundation designs for erosion control to prevent sedimentation and contamination of streams.

City of Santa Rosa 2020 General Plan

- PSF-I* Manage, Maintain, and Improve Stormwater Drainage and Capacity.
- PSF-I-3* Require erosion and sedimentation control measures to maintain an operational drainage system, preserve drainage capacity, and protect water quality.
- PSF-I-4* Require measures to maintain and improve the storm drainage system, consistent with goals of the Santa Rosa Waterways Plan, to preserve natural conditions of waterways and minimize paving of creek channels.
- PSF-I-5* Cooperate with the Sonoma County Water Agency and the Northern California Regional Water Quality Control Board to conduct regular assessment of stormwater drainage facilities, to ensure that adequate drainage capacity is maintained throughout

the system to accommodate increases in residential and commercial development.

- PSF-I-6* Require implementation of Best Management Practices to reduce drainage system discharge of non-point source pollutants originating from streets, parking lots, residential areas, businesses, industrial operations, and those open space areas involved with pesticide application.
- OSC-B-2* Minimize alteration of the topography, drainage patterns and vegetation of land with slopes of ten percent or more. Prohibit alteration of slopes greater than 25 percent.
- OSC-D-7* Rehabilitate existing channelized waterways, as feasible, to remove concrete linings and allow for a connection with the stream channel and the natural water table. Avoid creating additional channelized waterways, unless no other alternative is available to protect human health, safety, and welfare.
- OSC-D-8* Restore channelized waterways to a more natural condition which allows for more natural hydraulic functioning, including development of meanders, pools, riffles, and other stream features. Restoration should also allow for growth of riparian vegetation which effectively stabilizes banks, screens pollutants from runoff entering the channel, enhances fisheries, and provides other opportunities for natural habitat restoration.
- OSC-D-9* Ensure that construction adjacent to creek channels is sensitive to the natural environment. Ensure that natural topography and vegetation is preserved along the creek, and that construction activities do not disrupt or pollute the waterway.
- OSC-F* Conserve water and maintain water quality
- NS-D* Minimize hazards associated with storm flooding.
- NS-D-1* Ensure flood plain protection by retaining existing open areas and creating new open areas needed to retain stormwater, recharge aquifers, and prevent flooding.
- NS-D-2* Maintain current flood hazard data, and coordinate with the Army Corps of Engineers, FEMA, Sonoma County Water Agency, and other responsible agencies to coordinate flood hazard analysis and management activities.

City of Sebastopol General Plan

Conservation, Open Space, and Parks Element

- P.8* Floodwater Capacity and Creek Restoration. Preserve the existing and future floodwater carrying capacity of creeks and channels during creek restoration.

- Program 8.1* Develop maintenance guidelines for creeks and wetlands areas to reduce flooding, sedimentation, and erosion while maintaining and/or enhancing the riparian vegetation and wildlife.
- P.10* Control Soil Erosion: Control soil erosion to prevent flooding and destruction of waterways, to maintain water quality, and to reduce public costs for flood control and watercourse maintenance.
- P.7* Preserve and enhance the Laguna de Santa Rosa and Atascadero Creek
- Safety Element
- Goal 3* Reduce Flood Hazards
- P.4* Encourage enhanced Floodwater Storage in the Laguna: Support strong local and countywide measures to protect and increase the floodwater storage capacity in the Laguna de Santa Rosa.
- P.6* Cooperate with Sonoma County: Continue to work with Sonoma County Water Agency to ensure that additional storm drainage runoff resulting from development in unincorporated areas upstream from drainage channels in the Sebastopol planning area is adequately mitigated through improvements on site/or downstream.
- P.9* Reduce Flood Hazards: Reduce flood risks by maintaining effective flood drainage systems and regulating construction.
- Program 9.2* Continue to work with Sonoma County Water Agency in the project review process to ensure that adequate measures are implemented to prevent flooding, to establish and maintain effective storm drainage systems, and collect the required mitigation fees.
- P.10* Storm Drainage System: Maintain unobstructed water flow in the storm drainage system.
- Program 10.1* Enforce measures to minimize soil erosion and volume and velocity of surface runoff both during and after construction through implementation of the Grading Ordinance.

City of Sonoma 2020 General Plan

Environmental Resources Element

- 1.7* Reduce the potential for local flooding to the extent possible.
- 1.7.1* Upgrade and expand the storm drain system to provide added capacity that will alleviate flooding potential.

- 1.7.2 Work with the Sonoma County Water Agency to develop environmentally acceptable methods of reducing or preventing flooding.
- 2.4 Protect Sonoma Valley watershed resources, including surface and ground water supplies and quality.
- 2.5 Require erosion control and soil conservation practices that support watershed protection.

Town of Windsor General Plan – 2015

Public Services and Utilities Element

- E.4.10 The Town shall encourage the use of natural or nonstructural stormwater drainage systems, to preserve and enhance the natural features of a site and to assist with the replenishment of the area's groundwater basin.

Environmental Resources Element

- C.1.6 The Town should require that development activities along creeks be conducted using Best Management Practices that seek to minimize the discharge of sediments and urban pollutants into the waterways.
- C.2 Promote design guidelines to maintain creeks in their natural conditions.
- C.2.1 Windsor's natural creek system should be managed as an important natural, fishery, and visual resource by maintaining the creeks in their natural state, establishing appropriate setbacks for development, encouraging their incorporation into a trail system, and keeping them free and clear of debris and refuse.
- C.2.4 Whenever possible, creeks should be conserved in, or restored to, their natural states to carry storm waters, to maintain a natural appearance, and to protect fisheries. Portions of the channels that have been significantly altered for flood control should still be used for urban open space as landscaped paths.

Public Safety Element

- A.1.2 In all areas with steep slopes, grading practices for drainage purposes shall restore natural drainage patterns of surface water runoff so that any diversions will not induce or accelerate natural channel grading, sheet erosion, gullying, and other forms of erosion.
- B.1 Minimize the risks to lives and properties due to flood hazards.

B.1.4

The Town shall support floodplain management over flood control structures for preventing damage from flooding except where the intensity of development requires a high level of protection and justifies the costs of structural measures. Where flood control structures are necessary, the Town shall require appropriate mitigation for loss of riparian vegetation and habitat.

3.7.3 Environmental Setting

An overview of climate and surface water and groundwater resources in the SMP Area is presented in Chapter 3 of the SMP Manual, along with a discussion of water quality. Additionally, the subwatershed descriptions and channel characterizations (reach sheets) in Chapter 4 of the SMP Manual describe baseline physical and biological conditions in the channels of the Program Area. The descriptive reach sheets of Chapter 4 of the SMP Manual provide a fundamental understanding of how the channel systems operate. This understanding provides a basis to develop an informed approach to maintenance as described in the SMP Manual. The stream characterizations also provide a valuable resource baseline for the purposes of impact evaluation.

See Chapter 3.6 *Hazards and Hazardous Materials* for a discussion of existing groundwater contamination in the study area.

3.7.4 Impact Analysis

Methodology

The following water quality standards and requirements would apply to the proposed SMP:

- Beneficial uses and water quality objectives established by the North Coast and San Francisco RWQCBs
- Approved TMDLs
- Local discharge requirements as issued in NPDES permits (municipal and aquatic pesticide use general permit)
- Stream and Wetland Policy (when approved)
- Forthcoming programmatic permit requirements issued for the SMP

Potential impacts on water quality from the Proposed Program were assessed qualitatively, based on the degree to which the maintenance activities could result in violations of water quality standards, impairment of beneficial uses, or water quality conditions that could be harmful to aquatic life or human health. Alterations to flooding conditions were also considered, under the basic assumption that SMP activities would generally reduce flood risk.

Temporary impacts on water quality could result from the following SMP activities:

- Ground disturbance during and immediately after maintenance activities, including sediment removal, bank stabilization, and road and v-ditch maintenance
- Channel dewatering
- Spills or improper handling or use of hazardous chemicals from construction equipment
- Improper handling or use of herbicides
- Exposure or redistribution of contaminated soil/sediment and groundwater during excavation activities
- Sediment handling and disposal

Construction-related impacts, and associated erosion, have the potential to increase sediment delivery to water bodies with resulting adverse effects on turbidity and related parameters such as temperature, pH, and dissolved oxygen. In addition, the potential for the release of construction-related hazardous materials and disturbance of existing on-site hazardous materials was considered.

Each of these potential impacts, including additional beneficial outcomes, are discussed below. Potential temporary and permanent impacts due to the primary maintenance activities (sediment removal, vegetation removal, and bank stabilization) on beneficial uses established by the North Coast and San Francisco RWQCBs are shown in Table 3.7-1.

Immediately after construction, the loss of vegetation and the associated lack of shade and bare soils may result in temporary increases in temperature and turbidity of surface waters at the site. The potential magnitude of these effects were evaluated both for the period immediately after construction, and later in the evolution of the site after vegetation has become fully established. Finally, the long-term effects of maintenance activities on water quality and flooding were considered. All of these factors were used to evaluate the potential for water quality degradation.

Criteria for Determining Significance

Based on Appendix G of the State California Environmental Quality Act (CEQA) Guidelines and professional expertise, it was determined that the Proposed Program would result in a significant impact on hydrologic resources if it would:

- Violate any water quality standards or waste discharge requirements or otherwise substantially degrade water quality;
- Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level;
- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial flooding, erosion or siltation on- or off-site;

- Create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff;
- Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects;
- Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map;
- Place within a 100-year flood hazard area structures which would impede or redirect flood flows;
- Expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam; or
- Cause or be inundated by seiche, tsunami, or mudflow.

Environmental Impacts

Impact HYD-1: Water Quality Degradation Resulting in Violation of Water Quality Standards or Waste Discharge Requirements due to Ground Disturbance (Less than Significant with Mitigation)

Ground disturbing activities on the banks and within the beds of surface water bodies, such as in-channel sediment removal and bank stabilization, presents an opportunity for sediment to be eroded and transported to downstream areas. Adverse effects of accidental sediment releases could include increased turbidity and water temperature, and reduced dissolved oxygen (DO) levels, all of which would potentially exceed water quality standards and impair beneficial uses.

During the rainy season that immediately follows maintenance activities (which occur in the summer), sediment inputs to surface waters could also occur in pulses during and after storm events. During these events, higher levels of turbidity in the water column could result due to migration of sediment from exposed bare soils on channel banks where vegetation has not yet become established, or due to material eroded from the recently maintained channel. Increased turbidity and its secondary effects may impair beneficial uses related to fish or wildlife resources in the Program Area compared to existing conditions, resulting in an adverse impact.

Implementation of the following BMPs would ensure impacts would be less than significant.

Level of Significance: Less than significant with mitigation

Mitigation Measures:

BMP GEN-1: Work Window

1. All ground-disturbing maintenance activities occurring in the channel (i.e., from top-of-bank to top-of-bank) will take place during the low-flow period, between June 15 and

October 31. Exceptions may be made for emergencies or on a project-by-project basis with advance approval of RWQCB, CDFG, NMFS, and/or USFWS as appropriate.

2. Once the first significant rainfall occurs, all in-channel equipment and/or diversion structures shall be removed. Exposed soils in upland areas will be stabilized via hydroseeding or with erosion control fabric/blankets. Significant rainfall is defined as 0.5 inch of rain in a 24-hour period.
3. Work on the upper banks of stream channels (e.g., vegetation, road, and v-ditch maintenance) may be conducted year round. Ground disturbing activities will only be conducted during periods of dry weather.

BMP GEN-2: Staging and Stockpiling of Materials

1. Staging will occur on access roads, surface streets, or other disturbed areas that are already compacted and only support ruderal vegetation to the extent feasible. Similarly, to the extent practical, all maintenance equipment and materials (e.g., road rock and project spoil) will be contained within the existing service roads, paved roads, or other pre-determined staging areas. Staging areas for equipment, personnel, vehicle parking, and material storage shall be sited as far as possible from major roadways.
2. All maintenance-related items including equipment, stockpiled material, temporary erosion control treatments, and trash, will be removed within 72 hours of project completion. All residual soils and/or materials will be cleared from the project site.
3. As necessary, to prevent sediment-laden water from being released back into the channel during transport of spoils to disposal locations, truck beds will be lined with an impervious material (e.g., plastic), or the tailgate blocked with wattles, hay bales, or other appropriate filtration material. If appropriate, trucks may drain excess water by slightly tilting the loads and allowing the water to drain out through the applied filter.
4. Building materials and other maintenance-related materials, including chemicals and sediment, will not be stockpiled or stored where they could spill into water bodies or storm drains or where they will cover aquatic or riparian vegetation.
5. No runoff from the project or staging areas, including from stockpiled spoils, may be allowed to enter the creek channel or storm drains without being subjected to filtration (e.g., vegetated buffer, hay wattles or bales, silt screens).
6. During the dry season, no stockpiled soils shall remain exposed and unworked for more than 30 days. During wet season, no stockpiled soils shall remain exposed, unless surrounded by properly installed and maintained silt fencing or other means of erosion control.
7. All spoils will be disposed of in an approved location. Selection of the disposal location will be determined after the spoils have been tested for hazardous chemicals (see HAZ-8).

BMP BR-1: Area of Disturbance

1. Activities will avoid damage to or loss of native vegetation to the maximum extent feasible.
2. Soil disturbance shall not exceed the minimum area necessary to complete the operations as described.

BMP BR-3: Biotechnical Bank Stabilization

If hydraulic conditions allow, the natural bank will be retained or a biotechnical repair technique will be used rather than, or along with, a hardscape repair.

BMP VEG-3: Planting and Revegetation after Soil Disturbance

1. Sites where maintenance activities result in exposed soil will be stabilized to prevent erosion and revegetated with native vegetation as soon as feasible after maintenance activities are complete.
2. Revegetation will occur at a ratio of at least 1½: 1 to account for initial mortality of plantings.
3. If soil moisture is deficient, new vegetation will be supplied with supplemental water until vegetation is firmly established.
4. To the extent possible, native grass seed will be used when seeding a project site.
5. Erosion control fabric, hydromulch, or other mechanism will be applied as appropriate to provide protection to seeds, hold them in place, and help retain moisture.
6. Revegetation shall be regularly monitored for survival for at five years or until minimum survival/cover is achieved. If invasive species colonize the area, action shall be taken to control their spread; options include hand and mechanical removal and replanting with native species.

BMP WQ-1: Apply Erosion Control Fabric to or Hydroseeding of Exposed Soils

1. Upland soils exposed due to maintenance activities will be seeded and stabilized using erosion control fabric or hydroseeding. The channel bed and other areas below ordinary high water mark are exempt from this BMP.
2. Erosion control fabric will consist of natural fibers that will biodegrade over time. No plastic or other non-porous material will be used as part of a permanent erosion control approach. Plastic sheeting may be used to temporarily protect a slope from runoff, but only if there are no indications that special-status species would not be impacted by the application.
3. The site will be properly prepared to make sure the fabric/mat has complete contact with the soil. Sites can be prepared by grading and shaping the installation area; removing all rocks, dirt clods, vegetation, etc.; preparing the seedbed by loosening the top 2- to 3-inches of soil; and applying soil amendments as directed by soil tests, the seeding plan, and manufacturer's recommendations.
4. The area will be seeded before installing the fabric. All areas disturbed during installation will be re-seeded.
5. Erosion control fabric will be anchored in place. Anchors can include U-shaped wire staples, metal geotextiles stake pins or triangular wooden stakes.
6. The manufacturer's installation recommendations will be followed.
7. Other erosion control measures shall be implemented as necessary to ensure that sediment or other contaminants do not reach surface water bodies for stockpiled or reused/disposed sediments.

BMP WQ-2: Prevent Scour Downstream of Sediment Removal

After sediment removal, the channel shall be graded so that the transition between the existing channel both upstream and downstream is smooth and continuous between the maintained and non-maintained areas and does not present a "wall" of sediment or other blockage that could erode once flows are restored to the channel.

Impact HYD-2: Water Quality Degradation Resulting in Violation of Water Quality Standards or Waste Discharge Requirements due to Dewatering (Less than Significant with Mitigation)

Several water quality impacts could result during installation, operation, and removal of dewatering systems. Installation and removal of the flow diversion structure would involve streambed and bank disturbance which could result in increased turbidity in the water column surrounding the work site and migration of sediment to areas downstream. Temporary instream coffer dams constructed in the channel could fail, releasing sediment, sand, gravel, and water into the worksite and downstream. If not properly maintained, flow bypass mechanisms can displace sediment at the intake and increase turbidity locally from the discharged water. If not secured properly, the outlet discharge from the bypass pipe could cause erosion at the release site also mobilizing sediment. And, if pollutants from maintenance equipment were spilled into temporarily stored water or within the work site, water quality could degrade as a result. Implementation of BMP BR-4, which prescribes measures to ensure sediment is not transported unnecessarily during dewatering, flow bypass, and flow restoration, would ensure impacts on water quality would be less than significant.

Level of Significance: Less than significant with mitigation

Mitigation Measures:

BMP BR-4: Impact Avoidance and Minimization during Dewatering

1. All dewatering activities conducted in streams bearing state- or federally-listed salmonids shall comply with the terms and conditions of the Russian River Biological Opinion (summarized in BMP BR-18), and any other Biological Opinions issued by NOAA for the SMP.
2. Prior to dewatering, the best means to bypass flow through the work area will be determined to minimize disturbance to the channel and avoid direct mortality of fish and other aquatic vertebrates. The area to be dewatered will encompass the minimum area necessary to perform the maintenance activity. The period of dewatering will extend for the minimum amount of time needed to perform the maintenance activity. Where feasible and appropriate, dewatering will occur via gravity driven systems. Where feasible and appropriate, diversion structures shall be installed on concrete sections of the channels, such as concrete box culverts often used at road crossings.
3. A species relocation plan (BR-5) shall be implemented as a reasonable best effort to ensure that native fish and other native aquatic vertebrates and macroinvertebrates are not stranded.
4. Instream cofferdams shall only be built from materials such as sandbags, clean gravel, or rubber bladders which will cause little or no siltation or turbidity. Visqueen shall be placed over sandbags to minimize water seepage into the maintenance areas. The visqueen shall be firmly anchored to the streambed to minimize water seepage. If necessary, the footing of the dam shall be keyed into the channel bed at an appropriate depth to capture the majority of subsurface flow needed to dewater the streambed.
5. When use of gravity fed dewatering is not feasible and pumping is necessary to dewater a work site, a temporary siltation basin and/or use of silt bags may be required to prevent sediment from re-entering the wetted channel.

6. Downstream flows adequate to prevent fish or vertebrate stranding will be maintained at all times during dewatering activities. Bypass pipe diameter will be sized to accommodate, at a minimum, twice the summer baseflow.
7. Diverted and stored water will be protected from maintenance activity-related pollutants, such as soils or equipment lubricants or fuels.
8. If necessary, discharged water will pass over some form of energy dissipater to keep erosion of the downstream channel to a minimum. Silt bags will be equipped to the end of discharge hoses and pipes to remove sediment from discharged water.
9. For full channel dewatering, filtration devices or settling basins will be provided as necessary to ensure that the turbidity of discharged water is not visibly more turbid than in the channel upstream of the maintenance site. If increases in turbidity are observed, additional measures shall be implemented such as a larger settling basin or additional filtration. If increases in turbidity persist, turbidity measurements will be taken on a regular (i.e., at least daily) basis up- and downstream of the cofferdam enclosure. Data recorded will be compared against Regional Water Quality Control Board Basin Plan water quality standards. If Basin Plan standards are being exceeded, additional measures shall be installed and monitored to ensure Basin Plan standards are met.
10. When maintenance is completed, the flow diversion structure shall be removed as soon as possible. Impounded water will be released at a reduced velocity to minimize erosion, turbidity, or harm to fish or amphibians downstream. Cofferdams will be removed so surface elevations of water impounded above the cofferdam will not be reduced at a rate greater than one inch per hour.
11. The area disturbed by flow bypass mechanisms will be restored at the completion of the project. This may include, but is not limited to, recontouring the area and planting of riparian vegetation as appropriate.

Impact HYD-3: Water Quality Degradation Resulting in Violation of Water Quality Standards or Waste Discharge Requirements due to Accidental Release of Hazardous Materials (Less than Significant with Mitigation)

The majority of proposed vegetation removal activities would be conducted by hand or with small gas-powered tools such as chainsaws and weed whackers, however the majority of proposed sediment removal and bank stabilization activities would require the use of heavy machinery at the top of channel banks or within the stream channel. During sediment removal activities, equipment and worker vehicles would be stored and refueled in staging areas adjacent to the stream channel. If accidentally released directly or indirectly into the stream channel, the sediment and water in and around the worksite could be significantly degraded. Fine sediments contained within stream channels are particularly apt at absorbing pollutants such as petroleum products. Water in the channels can transport pollutants downstream and carry them through the soil into underlying ground waters, thus affecting a larger area. Fuel and lubricants such as oil and grease are used in excavation and transportation equipment and vehicles. Accidental release of maintenance-related hazardous materials would result in a significant impact on water quality. However, implementation of BMPs HAZ-1 through HAZ-5 would reduce this impact to a less-than-significant level.

Level of Significance: Less than significant with mitigation

Mitigation Measures:

BMP HAZ-1: Spill Prevention and Response Plan

The Agency will develop a Spill Prevention and Response Plan prior to commencement of maintenance activities. The plan will summarize the measures required under BMPs HAZ-2 through HAZ-6. It will also require that:

1. Equipment and materials for cleanup of spills be available on site and that spills and leaks will be cleaned up immediately and disposed of properly;
2. Prior to entering the work site, all field personnel shall be appropriately trained in spill prevention, hazardous material control, and clean-up of accidental spills.
3. Field personnel shall implement measures to ensure that hazardous materials are properly handled and the quality of water resources is protected by all reasonable means.
4. Spill prevention kits shall always be in close proximity when using hazardous materials (e.g., crew trucks and other logical locations). All field personnel shall be advised of these locations and trained in their appropriate use.

The Agency will routinely inspect the work site to verify that the Spill Prevention and Response Plan is properly implemented and maintained. The Agency will notify contractors immediately if there is a noncompliance issue and will require compliance.

Absorbent materials will be used on small spills located on impervious surface rather than hosing down the spill; wash waters shall not discharge to the storm drainage system or surface waters. For small spills on pervious surfaces such as soils, wet materials will be excavated and properly disposed rather than burying it. The absorbent materials will be collected and disposed of properly and promptly.

As defined in 40 CFR 110, a federal reportable spill of petroleum products is the spilled quantity that:

- violates applicable water quality standards;
- causes a film or sheen on, or discoloration of, the water surface or adjoining shoreline; or
- causes a sludge or emulsion to be deposited beneath the surface of the water or adjoining shorelines.

If a spill is reportable, the contractor's superintendent will notify the Agency, and the Agency will take action to contact the appropriate safety and cleanup crews to ensure that the Spill Prevention and Response Plan is followed. A written description of reportable releases must be submitted to the appropriate RWQCB and the California Department of Toxic Substances Control (DTSC). This submittal must contain a description of the release, including the type of material and an estimate of the amount spilled, the date of the release, an explanation of why the spill occurred, and a description of the steps taken to prevent and control future releases. The releases will be documented on a spill report form.

If an appreciable spill has occurred, and results determine that project activities have adversely affected surface water or groundwater quality, a detailed analysis will be performed to the specifications of DTSC to identify the likely cause of contamination. This analysis will include recommendations for reducing or eliminating the source or mechanisms of contamination. Based on this analysis, the Agency or contractors will select and implement measures to control contamination, with a performance standard that surface and groundwater quality must be returned to baseline conditions. These measures will be subject to approval by the Agency, DTSC, and the RWQCB.

BMP HAZ-2: Equipment and Vehicle Maintenance

1. All vehicles and equipment will be kept clean. Excessive build-up of oil or grease will be avoided.
2. All equipment used in the creek channel will be inspected for leaks each day prior to initiation of work. Action will be taken to prevent or repair leaks, if necessary.
3. Vehicle and equipment maintenance activities will be conducted off-site or in a designated, protected area away from the channel where vehicle fluids and spills can be handled with reduced risk to water quality.
4. If maintenance must occur on-site, designated areas will not directly connect to the ground, surface waters, or the storm drainage system to prevent the run-on of stormwater and runoff of spills. The service area will be clearly designated with berms, sandbags, or other barriers.
5. Secondary containment, such as a drain pan or drop cloth, to catch spills or leaks will be used when removing or changing fluids. Fluids will be stored in appropriate containers with covers, and properly recycled or disposed of off-site.
6. Cracked batteries will be stored in a non-leaking secondary container and removed from the site.
7. Spill clean-up materials will be stockpiled where they are readily accessible.
8. Incoming vehicles and equipment will be checked for leaking oil and fluids (including delivery trucks, and employee and subcontractor vehicles). Leaking vehicles or equipment will not be allowed on-site.

BMP HAZ-3: Equipment and Vehicle Cleaning

1. Equipment will be cleaned of any sediment or vegetation before transferring and using in a different watershed to avoid spreading pathogens or exotic/invasive species between watersheds.
2. Vehicles and equipment will not be washed on-site. Vehicle and equipment washing will occur on an appropriate wash rack at SCWA's maintenance center.

BMP HAZ-4: Refueling

1. No fueling shall be done in the channel (top-of-bank to top-of-bank) unless equipment stationed in these locations cannot be readily relocated (e.g., pumps and generators).
2. All off-site fueling sites (e.g., on access roads above the top-of-bank) shall be equipped with secondary containment and avoid a direct connection to underlying soil, surface water, or the storm drainage system.
3. For stationary equipment that must be fueled on-site, secondary containment, such as a drain pan or drop cloth, shall be provided in such a manner to prevent accidental spill of fuels to underlying soil, surface water, or the storm drainage system.

BMP HAZ-5: On-Site Hazardous Materials Management

1. The products used and/or expected to be used and the end products that are produced and/or expected to be produced after their use will be inventoried.
2. As appropriate, containers will be properly labeled with a "Hazardous Waste" label and hazardous waste will be properly recycled or disposed of off-site.
3. Contact of chemicals with precipitation will be minimized by storing chemicals in watertight containers or in a storage shed (completely enclosed), with appropriate secondary containment to prevent any spillage or leakage.

4. Quantities of equipment fuels and lubricants greater than 55 gallons shall be provided with secondary containment that is capable of containing 110% of the primary container(s).
5. Petroleum products, chemicals, cement, fuels, lubricants, and non-storm drainage water or water contaminated with the aforementioned materials shall not be allowed to enter receiving waters or the storm drainage system.
6. Sanitation facilities (e.g., portable toilets) will be surrounded by a berm, and a direct connection to the storm drainage system or receiving water will be avoided.
7. Sanitation facilities will be regularly cleaned and/or replaced, and inspected regularly for leaks and spills.
8. Waste disposal containers will be covered when they are not in use, and a direct connection to the storm drainage system or receiving water will be avoided.
9. All trash that is brought to a project site during maintenance activities (e.g., plastic water bottles, plastic lunch bags) will be removed from the site daily.

Impact HYD-4: Water Quality Degradation Resulting in Violation of Water Quality Standards or Waste Discharge Requirements due to Use of Herbicides (Less than Significant with Mitigation)

As part of SMP maintenance activities, herbicides would be applied in creek channels and along maintenance access roads to eradicate invasive plant species. The primary herbicide that would be used is AquaMaster® which contains glyphosate as the active ingredient. A drift-reduction agent called Stay-Put® is mixed with the herbicide. Drift-reduction agents commonly consist of poly-acrylamide or polyvinyl polymers. As part of the program, approximately 50 gallons per year of herbicide is hand-applied to prevent regrowth of willow stumps. To keep access roads clear of weeds, AquaMaster® is sprayed onto gravel portions of upland access roads (no roads in the channel low-flow area are sprayed) behind a truck. Figure 6-19, in Chapter 6 of the SMP Manual illustrates these application techniques. Herbicide application only occurs during the dry season. Herbicides would not be applied directly to waters, such as for ludwigia control. Due to the close proximity of herbicide application to sensitive aquatic habitats, accidental release of herbicides would result in a significant impact.

Regulatory requirements described in Chapter 2 of the SMP Manual and in the Biological Resources section of this EIR would apply under certain conditions (e.g., if listed pesticides are used in salmonid-bearing streams or sensitive California red-legged frog habitat, no-application buffers would apply). As discussed in Chapter 7 of the SMP Manual, and BMP VEG-2 *Use of Herbicides*, compliance with federal, state, and local regulatory requirements, including measures to comply with court-ordered protection of California red-legged frogs and salmonids, would be implemented. This measure would adequately protect against potential impacts on water quality due to the use of herbicides in the SMP Area. This impact is less than significant.

Level of Significance: Less than significant with mitigation

Mitigation Measures:

BMP VEG-2: Use of Herbicides

1. All herbicide use shall be consistent with all Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) label instructions and any use conditions issued by the Sonoma County Agricultural Commissioner.
2. Herbicide use will be restricted to the minimum amount needed to ensure adequate control of vegetation.
3. Application of herbicides to upland areas shall not be made within 72 hours of predicted rainfall.
4. Herbicides will not be directly applied to waters of the U.S., such as for ludwigia eradication.
5. Herbicides, including AquaMaster© and Renovate©, will not be used within 60 feet of areas identified in the Court-Ordered Stipulated Injunction for the protection of California red-legged frogs. This includes areas in Zones 1A and 3A, as well as Zones 8A and 9A (see SMP Manual Figure 3-29 for detail on where these areas are located.) The Agency will review the details and exceptions in the court order and comply with the herbicide use buffers as appropriate.
6. As required by the Court-Ordered Stipulated Injunction for pesticide use near Pacific salmon-supporting waters in Sonoma County, pesticides specified in the injunction including triclopyr (Renovate©) will not be used within 20 yards of salmon-supporting waters. The Agency will review the details and exceptions in the court order and comply with the herbicide use buffers as appropriate.

Impact HYD-5: Temporary Water Quality Degradation Resulting in Violation of Water Quality Standards or Waste Discharge Requirements due to Disturbance of Existing Contamination (Less than Significant with Mitigation)

The SMP channels receive and convey stormwater runoff from surrounding developed areas. Sediment removed as part of maintenance activities near a stormdrain outfall may contain high concentrations of urban contaminants, such as metals and petroleum residues. Active or historic sources of contamination, such as nearby leaking underground storage tanks, could also potentially lead to stream contamination. Urban contaminants have the tendency to adhere to fine sediments (silt and clay) which settle and accumulate in the channel bottom. Additionally, large quantities of organic matter mingled with fine sediments encourage sorption of urban contaminants.

As a result, sediment and vegetation removed as part of the proposed maintenance activities may contain hazardous levels of contaminants, which if released to the environment, could significantly degrade water quality and habitat. However, as discussed above, BMPs would be implemented to stabilize the worksite and prevent mobilization of sediment during and after maintenance activities. BMP HAZ-8 *Testing and Disposal of Spoils* would also identify existing contamination within the work area and prescribes measures for handling and remediation of contaminated areas. These measures would adequately protect against the release of existing hazardous materials sequestered in sediments. See also Chapter 3.6 *Hazards and Hazardous Materials* for further discussion of potential impacts due to existing hazardous materials.

Level of Significance: Less than significant with mitigation

Mitigation Measures:

BMP HAZ-8: Testing and Disposal of Spoils

As specified in the Sediment Sampling and Analysis Guidelines (Appendix B of the SMP Manual), after selecting potential sediment disposal locations and prior to disposing of excavated sediment, the Agency will test the sediment to determine the suitability for disposal based on presence of contaminants. Criteria for sediment disposal at the selected locations will dictate the concentrations of contaminants such as metals, pesticides, organic compounds, total organic carbon, asbestos, total sulfides, ammonia, and toxicity which are acceptable at the disposal locations. As specified in the Sediment Sampling and Analysis Guidelines, samples will be compared against federal and state environmental screening levels (ESLs) for protection of human health, groundwater quality, and terrestrial receptors.

If hazardous contaminant levels are in collected sediment such that disposal at the preferred locations is not feasible, the material will be taken to a permitted hazardous waste facility.

Impact HYD-6: Long-Term Water Quality Degradation Resulting in Violation of Water Quality Standards or Waste Discharge Requirements due to Disturbance of Existing Contamination (Beneficial)

As mentioned in Impact HYD-4, stream channels in the SMP Area receive trash and debris transported by stormwater runoff. Additionally, it is common for stream channels, particularly at road crossings, to accumulate trash, including toxic paint, computers, batteries, and motor oil, from public use of the creeks. As recognized by the RWQCBs, trash can contaminate the water and sediment resulting in degradation of beneficial uses of the creeks.

Chapter 6, Section 6.5.6 of the SMP Manual describes trash removal activities, including the removal of furniture, mattresses, shopping carts, paint cans, motor oil, solvents and other chemical products, and other debris that occurs as part of routine patrols and maintenance activities of creeks in the Program Area. Trash and any hazardous debris are properly removed and disposed of according to federal, state, and local regulations. Implementation of the Proposed Program would therefore benefit water quality and beneficial uses by removing potentially contaminating waste from the channels.

Level of Significance: Beneficial

Impact HYD-7: Temporary Water Quality Degradation Resulting in Violation of Water Quality Standards or Waste Discharge Requirements due to Sediment Handling and Disposal (Less than Significant with Mitigation)

As described in Chapters 5 and 6 of the SMP Manual, sediment excavated as part of maintenance activities would be deposited or reused at various locations. To ensure that excavation, handling, disposal or reuse activities would not harm people or water quality, BMP HAZ-8 *Testing and Disposal of Spoils* would be implemented. As described above, this BMP measure requires that the quality of soils to be excavated be tested for presence of hazardous levels of contaminants. The appropriate disposal location would then be

selected based on the characteristics of the soils excavated from the maintenance sites. Handling and disposal of spoils materials would be conducted in accordance with federal, state, and local regulations to protect water quality. Thus, this impact would be less than significant.

Level of Significance: Less than significant with mitigation

Mitigation Measures:

BMP HAZ-8: Testing and Disposal of Spoils

See Impact HYD-5.

Impact HYD-8: Temporary Erosion, Siltation, or Flooding due to Alternations to Drainage Patterns (Less than Significant with Mitigation)

SMP maintenance activities would not change the existing runoff sources, storm drainage pathways, or outlets (outfalls) from the storm drainage network to downstream areas. As such, this impact focuses on anticipated changes occurring within the stream channels to be maintained, and how such changes may influence other aspects of the geomorphic system.

Sediment Management Activities

The SMP proposes to conduct sediment removal and other related activities, such as culvert clearing and debris removal. As described in Chapter 6 *Maintenance Activities* of the SMP Manual, sediment removal activities will also often involve creation of a two-stage or low-flow inset channel (see Figure 6-5 in SMP Manual). The combination of sediment removal activities and creation of a low-flow channel (where appropriate) would alter channel conditions to better manage sediment transport and provide greater flow conveyance capacity.

Use of a two-stage channel would encourage the transport of fine sediments in the low-flow inset channel during small flow events (smaller than the annual sized event). As described in Chapter 6 *Maintenance Activities* in the SMP Manual, the locally increased flow depth and velocity within the narrower low-flow channel enables finer sediments to be transported through the system rather than deposit across the channel bed under smaller flow conditions. The ability to transport fine sediments under low-flow conditions is contrasted with non-maintained channels without a low-flow channel. Very often, in the channels of the Program Area without low-flow channels, a situation exists where slow moving, broadly diffuse, and shallow flow across the entire flood control channel bed creates a depositional environment where sediments collect. This difference can be observed in comparing Figure 6-2(e) of the SMP Manual showing a constructed low-flow channel with Figure 6-4 in SMP Manual showing the broad accumulation of sediments across the channel bed. Under higher flow conditions, sediments that are not conveyed through the low-flow channel may be deposited on the benches adjacent to low-flow channel (see Figure 6-5 from SMP Manual).

From the local reach perspective where maintenance occurs, changes to geomorphic form or process are summarized as (1) the lowering of bed elevation, (2) the excavation of a low-flow channel, (3) the transport fine sediments through the low-flow channel, and (4) the capture and deposition of sediments on benches adjacent to the low-flow channel. These

changes in geomorphic form and process do not result in an appreciable or adverse impact to the sediment delivery system. Note, the lowering of the bed elevation occurs within the as-built channel design and not any further below that level. These four changes do not represent adverse outcomes in themselves and the scale of such changes is relatively minor in comparison to the overall processes occurring within the channels of the Program Area. Additionally, because the reaches in the Program Area are typically bound upstream and downstream by hardened crossings; the potential for maintenance activities to somehow destabilize the channel system and cause an adverse geomorphic outcome such as excessive incision or channel downcutting is very low.

However, beyond the local reach perspective, where maintenance activities are not anticipated to cause adverse impacts to geomorphic processes; there is a question as to the overall Program effect of removing 10,000 to 25,000 cubic yards of sediment annually. To address this question, it is useful to acknowledge that, in general, the flood control channel network is not a system in geomorphic equilibrium where sediment gains are balanced more or less with sediment losses. The system is in disequilibrium in that most reaches are net depositional. Over time these reaches accumulate more and more sediment.

The cause for this net depositional condition is found in the disruption of the sediment delivery system associated with historic land development in the region and the construction of the flood control network. Historically, prior to development and channelization, the streams of the Program Area would overtop their banks on occasion and deposit sediment onto the adjacent floodplain. Additionally, over time the non-channelized streams would migrate across the floodplain seeking the most efficient pathway downstream. These pre-channelization geomorphic processes are described in Chapter 3 of the SMP Manual and can be reviewed in standard geomorphic texts such as Dunne & Leopold, 1978; Ritter 1986; or Mount 1995. While Program Area channels have lost their ability to spread and distribute sediments across adjacent floodplains, upstream sediment sources have not been reduced. To the contrary, sediment yields arriving from upstream sources have typically increased during the historic period. The net result of these processes is that more sediment is delivered to channels that are restricted from storing this sediment on their adjacent floodplains. The channels themselves become the reservoirs for sediment storage. The baseline channel system is depositional.

Removing abundant sediment volumes from a system that is in geomorphic equilibrium may cause adverse geomorphic impacts to the overall system, and in particular downstream channel processes. However, in the case of the Proposed Program, the existing baseline condition is net depositional whereby sedimentation far outpaces the ability for channels to transport their material downstream. As described in the approach and maintenance activities of the SMP (see Chapters 5 and 6 of the SMP Manual), the 10,000 to 25,000 cubic yards of annual sediment removed from the Program's channels occurs in balance with depositional rates and does not represent an adverse geomorphic impact to the sediment delivery system. Additionally, from an ecological viewpoint, excessive buildup of sediment in Program Area channels causes a succession of the instream habitat toward monocultural stands of cattail marsh. Removing the sediment has the beneficial effect of providing a varied habitat that supports a more diverse species mix until increasing aggradation triggers the need for sediment to be removed again. The Program's removal of sediment

from flood control channels also supports Beneficial Uses in protecting the Laguna de Santa Rosa, an important downstream resource that is impacted due to abundant sedimentation.

Vegetation Removal Activities

In-channel vegetation, such as cattails, currently captures sediment and creates a flooding risk. Proposed maintenance activities would remove vegetation that obstructs channel flows. When removed, the channel bed would be more exposed and it is conceivable that deposited sediment could migrate to downstream areas during subsequent flow events in the channel. This sediment has the potential to smother habitat and aggrade the channel bed downstream. However, BMPs VEG-3 *Planting and Revegetation after Soil Disturbance*, and WQ-1 *Apply Erosion Control Fabric to or Hydroseeding of Exposed Soils*, would be implemented. These measures would ensure that all disturbed areas, other than those located below the ordinary high water mark, would be stabilized. As such, it is unlikely that the adverse impacts identified would occur, and this impact is considered less than significant.

Bank Stabilization Activities

Bank stabilization activities would be implemented along stream banks where failure or severe erosion has occurred. As described in SMP Manual Chapter 5, biotechnical engineering is the preferred approach to stabilizing the bank. These designs use bioengineering techniques including use of engineered back-filled soils, erosion control fabric, and planting of native riparian trees at the top-of-bank and the toe-of-slope to provide additional bank stability and increased canopy in the channel. After bank stabilization is complete and as new plantings become established, the active source of eroding sediment would be eliminated, a beneficial impact.

Use of hardscape features, such as rip rap, would be used where other alternatives would not result in a sufficiently stabilized slope. A typical condition where a hardscape solution may be expected to be used is to stabilize an emerging culvert outlet to prevent reoccurring erosion. In such cases, rock will be used only beneath and below the culvert outfall, as well as on the sides to ensure stability of the culvert. When repairs are made, banks are recontoured to match the adjacent bank slope (i.e., returned to pre-failure condition). If site conditions allow, the bank slope may be stabilized at a less steep slope (reducing the likelihood of renewed failure), but only if the work is conducted within the confines of the original channel as-built condition. Stabilized banks will be flush with the existing bank slope, and only limited new material may protrude from the bank. As a result, stream flows would not be altered such that velocity is increased or erosion results near or downstream of the project site. It is unlikely that measureable changes to stream flow characteristics in the project reach would occur.

Given that hardscape would be minimally used in proposed bank stabilization projects, placement of hardscape would be localized to small areas, and bank stabilization sites would be contoured to match the existing bank, this impact would be less than significant.

Sediment Disposal Activities

Unused sediment from maintenance activities would be disposed offsite at different locations, which vary each year. As described in SMP Manual Chapters 5 and 6, the disposal

locations would all be located outside of any 100-year flood areas or surface waters and stabilized to prevent migration of sediment (erosion and siltation) to any nearby surface waters. Therefore, proposed disposal of excavated sediment from maintenance activities would have a less-than-significant impact on drainage patterns.

Level of Significance: Less than significant with mitigation

Mitigation Measures:

BMP VEG-3: Planting and Revegetation after Soil Disturbance

See Impact HYD-1

BMP WQ-1: Apply Erosion Control Fabric to or Hydroseeding of Exposed Soils

See Impact HYD-1

Impact HYD-9: Permanent Erosion, Siltation, or Flooding due to Alternations to Drainage Patterns (Beneficial)

Proposed sediment management, vegetation removal, bank stabilization, and revegetation activities would have long-term beneficial impacts on sediment transport and flood conveyance functioning. The improved maintenance of culverts, stream crossings, stream channels, stream banks, and the riparian corridor will stabilize sediment transport, the stream banks, flood conveyance, as well as improve wildlife habitat and water quality over time. Consistent watershed-wide maintenance of stream channels will reduce sediment and flooding impacts over time. Therefore, long-term permanent impacts on drainage patterns would be beneficial.

Level of Significance: Beneficial

Impact HYD-10: Permanent Water Quality Degradation Resulting in Violation of Water Quality Standards or Waste Discharge Requirements due to Sediment Handling and Disposal (Beneficial)

The BMPs described in Impact HYD-1 above would adequately protect against temporary water quality degradation due to proposed maintenance activities. In addition, on-site and off-site mitigation would be implemented as part of the SMP (see SMP Manual Chapter 8) to address short-term losses of Beneficial Uses. As the Tier 1, 2, and 3 projects are implemented, new in-channel and upland vegetation plantings would occur throughout the SMP Area.

Riparian and upland conditions would be improved over the long-term by the Tier 1, 2, and 3 mitigation efforts, therefore supporting water quality and associated Beneficial Uses. As such, the proposed maintenance activities would result in less than significant impacts on water quality. Over time, the maintenance activities would improve channel conditions and water quality functioning, a beneficial impact overall.

Level of Significance: Beneficial

Impact HYD-11: Reducing Nutrient Loading to 303(d)-listed Waterbodies (Beneficial)

Removal of sediment containing nutrients would reduce nutrient loads in waterbodies listed as impaired for nutrients under CWA Section 303(d). This would be particularly the case in the Laguna watershed, where the City of Santa Rosa is partnering with SCWA to provide sediment disposal locations under the North Coast RWQCB's Santa Rosa Nutrient Offset Policy (Resolution No. R1-2008-0061). This policy describes a process for recognizing the City's nutrient reduction efforts and determining credit toward compliance with a 2011 zero net nutrient load requirement for their wastewater discharges. SMP implementation jointly by SCWA and the City is intended to result in nutrient source control which qualifies for nutrient reduction credits under the Nutrient Offset Policy.

The disposal of SMP sediments at suitable City sites and other sites will provide important nutrient offset benefits through reducing the volume of organic nutrients reaching the Laguna de Santa Rosa and other nutrient-impaired water bodies.

Level of Significance: Beneficial

Impact HYD-12: Create or Contribute Runoff Water That Would Provide Substantial Additional Sources of Polluted Runoff (Beneficial)

Implementation of the SMP would not require expansion of the existing channels within the Program Area. Proposed SMP maintenance activities would not alter the quantity or quality of stormwater generated from adjacent lands and received in the channels owned or maintained by SCWA. As buildout of the County and city general plans within the study area occurs, increased stormwater runoff may be generated and delivered to SMP channels. However, impacts on stormwater quantity or quality from new growth would be evaluated in other CEQA documents, such as general plan EIRs, and were also considered as part of the cumulative impacts analysis in Chapter 4 of this EIR. Additionally, federal, state, county, and city efforts to reduce the quantity and improve the quality of stormwater runoff are underway through support of low impact development (LID) and improved stormwater management.

In conclusion, the proposed SMP would have no impact on the quantity of stormwater runoff currently received within the SMP channels. However, the Proposed Program would influence the quality of stormwater runoff as it is conveyed downstream—maintenance and management activities would promote filtration of pollutants carried in stormwater runoff. Thus, the Proposed Program would have beneficial impacts on stormwater.

Level of Significance: Beneficial

Impact HYD-13: Harm to People, Structures, or Water Quality due to Flooding (Beneficial)

The proposed maintenance activities would occur within the designated 100-year flood zone of many channels within the Program Area. However, sediment removal and vegetation management activities would not result in any reduction of the flood holding or conveyance capacity within the channels. On the contrary, these maintenance activities would expand the conveyance capacity of the channels. Similarly, bank stabilization and other facility maintenance activities (repair or clearing of culverts and crossings) would return such features to their operational design. The proposed maintenance activities would therefore reduce the potential for flooding. The Proposed Program does not involve construction of any new structures within the 100-year flood zone which could result in harm to people or structures.

All proposed ground-disturbing maintenance activities would occur during the dry season, thus avoiding or minimizing the potential for flooding during construction. However, many maintenance sites occur at perennialized streams which carry water year-round. To conduct activities such as sediment removal and bank stabilization, the work site would sometimes require dewatering, which involves installation of a coffer dam or similar structure to prevent water from entering the work site. Chapter 6 of the SMP Manual provides additional details on dewatering activities. If the ponded water behind the temporary dewatering berm were accidentally released, localized flooding of the work site and downstream area could result. However, the stored water would behind the temporary coffer dams would be a relatively small amount. Anticipated berm heights for such coffer dams will be 18 inches (see Figure 6-6 in SMP Manual). The amount of stored water will be entirely held within the flood control channel and would not exceed a depth of 18 inches. If such pooled water were suddenly released there would be no potential to damage structures or harm people. Additionally BMP Measure BR-4 *Impact Avoidance and Minimization during Dewatering* would ensure dewatering activities are conducted and maintained properly (see Impact HYD-2).

Over the long-term, improved channel maintenance would reduce flooding risks which would indirectly reduce water quality impacts due to chemical or pathogenic contamination from flooding of agricultural or urbanized lands. For example, if a stream crossing was not cleared of sediment prior to a large storm event, runoff from surrounding development and from upstream areas could back up at that crossing and flood the areas adjacent to the clogged crossing. If an adjacent auto repair shop or dairy farm was flooded as a result, water quality contaminants such as motor oil and bacteria could be released to surrounding and downstream areas. Potable water supply and wildlife habitat could be threatened by these contaminants. Implementation SMP sediment removal and vegetation maintenance activities reduce the likelihood of flooding and therefore reduce the potential for water quality impacts as a result of flooding. This would be a beneficial impact of the Program.

Overall, the SMP seeks to improve conveyance conditions such that the potential for flooding and water quality impacts is minimized. Thus, implementation of the SMP would result in beneficial impacts on flooding.

Level of Significance: Beneficial

Impact HYD-14: Alterations to the Recharge, Quality, or Quantity of Groundwater (Beneficial)

Implementation of the Proposed Program would not utilize groundwater supplies, thus there would be no adverse impact on groundwater supply.

The majority of the creek channels maintained by SCWA retain earthen beds and banks, as opposed to concrete-lined beds. As such, water is allowed to percolate down to shallow and deeper groundwater storage units. These creek channels are major avenues for groundwater recharge. In some areas, such as the Rohnert Park/Cotati area, creek channels provide some of the most important locations for groundwater recharge to the underlying aquifer. For residents who rely on groundwater for their potable water supply, the benefits of earthen-lined creeks are immense.

The current sediment transport conditions in the Program Area encourage accumulation of fine materials in stream channels, particularly where vegetation is overgrown and where the longitudinal slope of the channel is gentle. Groundwater recharge capacity is reduced in these locations as fine sediment clog pores and interstices between bed sediments. Over time, this reduces the infiltration rates from surface water in the channels to the groundwater below. In periodically removing accumulated fine sediments from the channel beds, sediment removal activities of the Program would improve infiltration and percolation to groundwater.

On a Program scale, the proposed maintenance activities would also support and improve groundwater recharge functioning through more consistent and watershed-wide sediment management and riparian corridor development throughout the Program Area. Stabilization of failing stream banks, and supporting growth of riparian vegetation along channel banks would assist in reducing fine sediment inputs to the channels. Annual sediment removal activities and reshaping of the channel in some locations to keep sediment from depositing in the channel bed would improve groundwater percolation. The proposed sediment removal, bank stabilization, and in-channel and riparian vegetation management activities would beneficially impact groundwater.

Level of Significance: Beneficial

Impact HYD-15: Seiche, Tsunami or Mudflow (No Impact)

The SMP is located far from the ocean and would not be subject to tsunami hazard. Similarly, no large bodies of water are present in the SMP Area which would create hazards related to seiche. The SMP would involve bank stabilization activities which would reduce the potential for impacts of mudflow. There is no impact.

Level of Significance: No Impact

Table 3.7-1. Potential Impact of SMP Maintenance Activities on Beneficial Uses

SMP Maintenance Activity	GWR		REC-2		WARM		COLD	
	Adverse	Beneficial	Adverse	Beneficial	Adverse	Beneficial	Adverse	Beneficial
Sediment Removal	None	Improved infiltration after removal of fine sediments. (Permanent)	Sediment removal activities would temporarily suspend recreational access to channels, and would degrade the aesthetic quality of the channels in the short term. (Temporary)	Sediment management activities will improve riparian condition over time, with corresponding recreational benefits. (Permanent)	Dewatering and sediment removal would temporarily impact habitat in the dewatered area. (Temporary)	Removal of sediment and creation of low-flow channels will improve flow and water quality conditions, which will improve warm water habitat. (Permanent)	Dewatering and sediment removal would temporarily impact habitat in the dewatered area. (Temporary)	Removal of sediment and creation of low-flow channels will improve flow and water quality conditions, which will improve cold water habitat. (Permanent)
Bank Stabilization	None	Reduced release of fine sediments which could impair groundwater recharge. (Permanent)	Bank stabilization activities could temporarily suspend recreational access to channels, and newly stabilized areas would appear somewhat unnatural in the short term. (Temporary)	Bank stabilization will ultimately improve riparian condition, with corresponding recreational benefits. (Permanent)	Bank stabilization activities, and dewatering, where necessary, would temporarily impact habitat in the work area. (Temporary)	Bank stabilization will remove sediment inputs to the channel and enhance the riparian corridor, which will improve warm water habitat. (Permanent)	Bank stabilization activities, and dewatering, where necessary, would temporarily impact habitat in the work area. (Temporary)	Bank stabilization will remove sediment inputs to the channel and enhance the riparian corridor, which will improve cold water habitat. (Permanent)
Vegetation Management	None	Improved infiltration after removal of vegetation. (Permanent)	Vegetation removal activities could temporarily suspend recreational access to channels, and would degrade the aesthetic quality of the channels in the short term. (Temporary)	Vegetation management and riparian canopy development will improve riparian condition over time, with corresponding recreational benefits. (Permanent)	Vegetation removal would temporarily reduce canopy cover, impacting warm water habitat. (Temporary)	Vegetation management will improve flow and water quality conditions. In addition, revegetation activities will encourage riparian canopy development and improve habitat conditions over time through such mechanisms as water temperature moderation. (Permanent)	Vegetation removal would temporarily reduce canopy cover, impacting cold water habitat. (Temporary)	Vegetation management will improve flow and water quality conditions. In addition, revegetation activities will encourage riparian canopy development and improve habitat conditions over time through such mechanisms as water temperature moderation. (Permanent)
Other Activities Access Roads V-ditch Maintenance Culvert Replacement Debris Removal	None	None	Temporary closure of public trails during maintenance activities. (Temporary)	Maintenance would improve creek and trail aesthetics, public safety, and storm runoff. (Permanent)	If culvert replacement requires site dewatering, temporary impacts on warm water habitat would result. (Temporary)	Maintenance will ensure culverts are free of debris so flows and aquatic species can move freely through the system. (Permanent)	If culvert replacement requires site dewatering, temporary impacts on cold water habitat would result. (Temporary)	Maintenance will ensure culverts are free of debris so flows and aquatic species can move freely through the system. (Permanent)

Table 3.7-1. Potential Impact of SMP Maintenance Activities on Beneficial Uses

SMP Maintenance Activity	WILD		RARE		EST		MIGR	
	Adverse	Beneficial	Adverse	Beneficial	Adverse	Beneficial	Adverse	Beneficial
Sediment Removal	Dewatering and sediment removal would temporarily impact habitat in the dewatered area. (Temporary)	Removal of sediment and creation of low-flow channels will improve flow and water quality conditions, which will benefit a wide array of native fish and wildlife. (Permanent)	Dewatering and construction activities would temporarily impact habitat in and around the work site. (Temporary)	Sediment removal and creation of low-flow channels will improve flow and water quality conditions, which will benefit habitat for rare, threatened, and endangered species. (Permanent)	Dewatering and maintenance activities could temporarily impact habitat in and around tidal areas. (Temporary)	Sediment removal and channel reshaping will improve flow and water quality conditions, which will benefit estuarine habitat. (Permanent)	Reaches that support migratory habitat would be temporarily dewatered during the dry season. (Temporary)	Sediment removal and creation of low-flow channels will improve flow and water quality conditions, which will improve migratory habitat. (Permanent)
Bank Stabilization	Bank stabilization activities, and dewatering, where necessary, would temporarily impact habitat in the work area. (Temporary)	Bank stabilization will remove sediment inputs to the channel and enhance the riparian corridor, which will benefit a wide array of native fish and wildlife. (Permanent)	Bank stabilization activities, and dewatering, where necessary, would temporarily impact habitat in the work area. (Temporary)	Bank stabilization will remove sediment inputs to the channel and enhance the riparian corridor, which will benefit habitat for rare, threatened, and endangered species. (Permanent)	Bank stabilization activities, and dewatering, where necessary, would temporarily impact habitat in tidal areas. (Temporary)	Bank stabilization will remove sediment inputs to the channel and enhance the riparian corridor, which will benefit estuarine habitat. (Permanent)	Bank stabilization activities, and dewatering, where necessary, would temporarily impact habitat in the work area. (Temporary)	Bank stabilization will remove sediment inputs to the channel and enhance the riparian corridor, which will improve migratory habitat. (Permanent)
Vegetation Management	Vegetation removal would temporarily reduce canopy cover, impacting wildlife habitat. (Temporary)	Vegetation management and riparian corridor enhancement will benefit a wide array of native fish and wildlife. (Permanent)	Vegetation removal would temporarily reduce canopy cover, impacting habitat for rare, threatened, and endangered species. (Temporary)	Vegetation management and riparian corridor enhancement will benefit habitat for rare, threatened, and endangered species. (Permanent)	Vegetation removal would temporarily impact habitat in and around tidal areas. (Temporary)	Vegetation management and riparian corridor enhancement will improve flow and water quality conditions, which will benefit estuarine habitat. (Permanent)	Vegetation removal would temporarily reduce canopy cover, impacting migratory habitat. (Temporary)	Vegetation management and riparian corridor enhancement will improve migratory habitat over time. (Permanent)
Other Activities Access Roads V-ditch Maintenance Culvert Replacement Debris Removal	If culvert replacement requires site dewatering, temporary impacts on wildlife habitat would result. (Temporary)	Maintenance will ensure culverts are free of debris so flows and aquatic species can move freely through the system. (Permanent)	If culvert replacement requires site dewatering, temporary impacts on special status species habitat would result. (Temporary)	Maintenance will ensure culverts are free of debris so flows and aquatic species can move freely through the system. (Permanent)	If culvert replacement requires site dewatering, temporary impacts on estuarine habitat would result. (Temporary)	Maintenance will ensure culverts are free of debris so flows and aquatic species can move freely through the system. (Permanent)	If culvert replacement requires site dewatering, temporary impacts on migratory habitat would result. (Temporary)	Maintenance will ensure culverts are free of debris so flows and aquatic species can move freely through the system. (Permanent)

Table 3.7-1. Potential Impact of SMP Maintenance Activities on Beneficial Uses

SMP Maintenance Activity	SPWN		FLD		WET		WQE	
	Adverse	Beneficial	Adverse	Beneficial	Adverse	Beneficial	Adverse	Beneficial
Sediment Removal	Spawning does not currently occur in SCWA-maintained channels.	Improved flow and water quality conditions will benefit habitat for salmonids elsewhere in the watershed. (Permanent)	Activities would be conducted during the dry season, so there would be no impact on the flood peak or flood storage.	Sediment removal would improve flood conveyance. (Permanent)	Sediment removal activities would also remove wetland species. (Temporary)	Improved sediment management would support wetland habitat and functioning. (Permanent)	Dewatering and maintenance activities would temporarily impact water quality in and around the work site. (Temporary)	Sediment management and creation of low-flow channels would improve water quality functioning. (Permanent)
Bank Stabilization	Spawning does not currently occur in SCWA-maintained channels.	Improved water quality conditions will benefit habitat for salmonids elsewhere in the watershed. (Permanent)	Activities would be conducted during the dry season, so there would be no impact on the flood peak or flood storage.	Stabilized banks would reduce sources of sediment to downstream areas and would be replanted with riparian species to improve floodplain functioning. (Permanent)	Newly stabilized areas would be devoid of vegetation and temporarily covered with erosion controls. (Temporary)	Stabilized banks would reduce sources of sediment to downstream areas and would be replanted with riparian species to improve wetland functioning. (Permanent)	Newly stabilized areas would be devoid of vegetation and temporarily covered with erosion controls. (Temporary)	Stabilized banks would reduce sources of sediment to downstream areas and would be replanted with riparian species to improve water quality functioning. (Permanent)
Vegetation Management	Spawning does not currently occur in SCWA-maintained channels.	Improved riparian quality will benefit habitat for salmonids elsewhere in the watershed. (Permanent)	Activities would be conducted during the dry season, so there would be no impact on the flood peak or flood storage.	The site would be replanted with native riparian species to foster better floodplain functioning, including water quality filtration. (Permanent)	Non-native wetland species would be removed. (Temporary)	Planting of native wetland vegetation would support habitat for a variety of native species. (Permanent)	Removal of in-channel vegetation would reduce sediment trapping. (Temporary)	Improved vegetation management would support development of riparian corridors which enhance water quality functioning while improving channel stability. (Permanent)
Other Activities Access Roads V-ditch Maintenance Culvert Replacement Debris Removal	Spawning does not currently occur in SCWA-maintained channels.	Culvert and debris clearing activities will benefit habitat for salmonids elsewhere in the watershed. (Permanent)	Activities would be conducted during the dry season, so there would be no impact on the flood peak or flood storage.	Maintenance of v-ditches, culverts, and keeping channels free of debris will improve storm runoff and flood flows through channels.	If culvert replacement requires site dewatering, temporary impacts on wetland habitat would result. (Temporary)	Suppression of invasive plants along access roads and in v-ditches will support growth of native species, thus benefiting riparian habitat along the channels. (Permanent)	If culvert replacement requires site dewatering, temporary impacts on water quality would result. (Temporary)	Maintenance activities would improve water quality filtration functions, as well as prevent channel erosion due to culvert or debris blockages. (Permanent)

Table 3.7-1. Potential Impact of SMP Maintenance Activities on Beneficial Uses

Shaded Beneficial Uses listed below are not present at, or do not apply to, the sites potentially affected by SMP maintenance activities.

MUN	Municipal and Domestic Supply	NAV	Navigation	ASBS	Preservation of Areas of Special Biological Significance	SHELL	Shellfish Harvesting
AGR	Agricultural Supply	POW	Hydropower Generation	SAL	Inland Saline Water Habitat	EST	Estuarine Habitat
IND	Industrial Service Supply	REC-1	Water Contact Recreation	WILD	Wildlife Habitat	AQUA	Aquaculture
PRO	Industrial Process Supply	REC-2	Non-Contact Water Recreation	RARE	Rare, Threatened, or Endangered Species	CUL	Native American Culture
GWR	Groundwater Recharge	COMM	Commercial and Sport Fishing	MAR	Marine Habitat	FLD	Flood Peak Attenuation/ Flood Water Storage
FRSH	Freshwater Replenishment	WARM	Warm Freshwater Habitat	MIGR	Migration of Aquatic Organisms	WET	Wetland Habitat
		COLD	Cold Freshwater Habitat	SPWN	Spawning, Reproduction, and/or Early Development	WQE	Water Quality Enhancement

Chapter 3.8

LAND USE AND PLANNING

Chapter 3.8 LAND USE AND PLANNING

3.8.1 Introduction

This chapter presents potential environmental impacts of the proposed Stream Maintenance Program (SMP or Proposed Program) in Sonoma County related to land use and planning. The chapter includes a review of existing conditions based on available literature; a summary of local, state, and federal policies and regulations related to land use; and an analysis of direct and indirect environmental impacts of the Proposed Program.

3.8.2 Regulatory Setting

The following section discusses the policies and regulations that are relevant to the analysis of land use impacts of the Proposed Program. No specific federal or state land use regulations apply to the land use resources associated with this Program.

Local Regulations

General Plans are long-range comprehensive plans developed for cities and counties that govern growth and development. The Program Area is located in Sonoma County. Although Sonoma County includes many cities and towns, this analysis focuses on those municipalities directly affected by proposed SMP activities. The following section reviews key land use policies from Sonoma County, as well as policies for the cities of Cotati, Petaluma, Rohnert Park, Santa Rosa, Sebastopol, Sonoma, and the Town of Windsor, which are relevant to the SMP. Policies or regulations specifically associated with hydrology, biological resources, and other resources are analyzed in the corresponding chapters of this EIR.

Sonoma County General Plan (2020)

The following policies contained in the Sonoma County General Plan are applicable to the Proposed Program.

<i>Goal LU-4</i>	Maintain adequate public services in both rural and Urban Service Areas to accommodate projected growth. Authorize additional development only when it is clear that a funding plan or mechanism is in place to provide needed services in a timely manner.
<i>Objective LU-8.1</i>	Protect, restore, and enhance the quality of surface and groundwater resources to meet the needs of all beneficial uses.
<i>Objective LU-8.5</i>	Improve understanding and sound management of water resources on a watershed basis.

Policy LU-8h Support use of a watershed management approach for water quality programs and water supply assessments and for other plans and studies where appropriate.

Policy LU-10c Develop programs for preservation and enhancement of important biotic resource areas.

City of Cotati City Code

The following policies contained in the City of Cotati's Municipal Code are applicable to the Proposed Program.

Development standards (17.50.040) as set forth under Chapter 17.50, Watercourse and Riparian Resource Protection:

D. Alteration of Natural Features. No grading or filling, planting of exotic/nonnative or non-riparian plant species, or removal of native vegetation shall occur within a watercourse or watercourse setback area, except:

1. The review authority may grant an exception where the work is authorized for flood control purposes by permits issued by the California State Department of Fish and Game, and/or all other applicable local, state, and federal agencies having authority over the creek; and
2. As otherwise provided by this section.

City of Petaluma General Plan 2025

The following policies contained in the City of Petaluma's General Plan are applicable to the Proposed Program.

4-P-1D Create setbacks for all tributaries to the Petaluma River extending a minimum of 50 feet outward from the top of each bank, with extended buffers where significant habitat areas, vernal pools, or wetlands exist. Development shall not occur within this setback, except as part of greenway enhancement (for example, trails and bikeways). Where there is degradation within the zone, restoration of the natural creek channels and riparian vegetation is mandatory at time of adjacent development.

City of Rohnert Park General Plan

The following goals contained in the City of Rohnert Park's General Plan are applicable to the Proposed Program.

OS-7 Use creek protection zones (see Section 6.2) for permanent public open space and compatible purposes including habitat conservation, bike and walking paths, wildlife habitat, and native plant landscaping.

EC-13 Maintain creek protection zones extending a minimum of 50 feet (measured from the tops of the banks and a strip of land extending

laterally outward from the top of each bank) for creeks, with extended buffers where significant habitat areas or high potential wetlands exist (Figure 6.2-2). Where high potential wetland or other biological resources exist, require appropriately wide buffers to encompass and protect the resource. Development shall not occur within this zone, except as part of greenway enhancement (for example, trails and bikeways). Require City approval for the following activities within the creek protection zones:

- Construction, alteration, or removal of any structure;
- Excavation, filling, or grading;
- Removal or planting of vegetation (except for removal of invasive plant species); or
- Alteration of any embankment.

City of Santa Rosa 2020 General Plan

The following policies contained in the City of Santa Rosa's General Plan are applicable to the Proposed Program.

- | | |
|-----------------|--|
| <i>PSF-A-20</i> | Encourage multiple uses of waterways, including, where appropriate: <ul style="list-style-type: none">■ Flood control,■ Wildlife habitats,■ Passive open space uses,■ Nature study,■ Pedestrian and bicycle circulation, and■ Other compatible outdoor uses. |
| <i>OSC-B-3</i> | Require that new subdivisions, multifamily, and non-residential development abutting creek corridors are appropriately designed with respect to the creek. Development may orient toward the creek as an amenity, but adequate setbacks shall be used to ensure riparian habitat is protected. |
| <i>OSC-D-11</i> | New development along channelized waterways should allow for an ecological buffer zone between the waterway and development. This buffer zone should also provide opportunities for multi-use trails and recreation. |
| <i>OSC-D-12</i> | New development should maintain an adequate setback from channelized waterways to recognize the 100-year flood elevation, and allow for stream corridor restoration. Setbacks identified in the Zoning Code should serve as minimum setbacks. Larger setbacks are encouraged in accordance with Restoration Concept Plans to meet restoration and enhancement goals. |

Santa Rosa Citywide Creeks Master Plan

The City of Santa Rosa developed the Santa Rosa Citywide Creeks Master Plan in March 2007. The master plan presents a set of creek-related policies and recommendations for site-specific improvements on streams in the City of Santa Rosa. The following are applicable to the Proposed Program:

<i>Objective HA-2</i>	Enhance creek areas that require some remediation to reach a healthy condition.
<i>Policy HA-1-2</i>	Meet or exceed the required creek setback to provide ecological buffers, recognize the 100 year floodplain, and allow for stream corridor restoration. Development shall locate outside the creek setback, as defined within the Santa Rosa Zoning Code.
<i>Policy HA-2-3</i>	Allow streambank and waterway stability repairs as necessary and reasonable to protect the integrity of adjacent properties and public health and safety. Repairs should be sensitive to the natural environment. Use bioengineering techniques, where possible.
<i>Objective HA-3</i>	Restore creek areas that have become degraded due to channelization, erosion, or removal of creek-side vegetation.
<i>Objective SW-3</i>	Perform channel maintenance in an environmentally sensitive manner and only where needed.

City of Sebastopol Laguna Park Master Plan

The City of Sebastopol's Laguna Park Master Plan, adopted in 1992, addresses areas not proposed for active maintenance under the SMP. Therefore, the guiding land use policies are not applicable to the Proposed Program.

City of Sonoma General Plan 2020

The following policies contained in the City of Sonoma's General Plan are applicable to the Proposed Program.

<i>2.3.1</i>	Work with the County Water Agency, State Department of Fish and Game, the Sonoma Ecology Center and other interested parties to implement guidelines and regulations for preserving and enhancing riparian corridors and wildlife habitat.
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Town of Windsor General Plan - 2015

The following policies contained in the Town of Windsor's General Plan are applicable to the Proposed Program.

Chapter 4

- A.1.3 The Town should preserve valuable natural features, such as oaks and waterways, within urbanized areas and clearly define the Town's form to distinguish between urban areas and the surrounding rural and agricultural areas.
- A.1.4 The Town should protect Windsor's unique natural settings by conserving valuable habitats, establishing linear open spaces or "greenways", and recognizing scenic features, including hillsides, creeks, woodlands or other significant natural features.
- A.7.1 The Town should respect valuable natural features including hillsides, creeks, significant woodlands, and significant trees through sensitive site planning, building placement, and other measures.

3.8.3 Environmental Setting

Laguna de Santa Rosa Watershed

The Laguna de Santa Rosa watershed encompasses 253 square miles (sq. mi.) providing the largest southern tributary to the Russian River. As described in the SMP Manual, several steep, high-gradient creeks originate in the Mayacamas and Sonoma Mountains of the upper watershed. These smaller tributaries combine and collect into primary subbasin creeks that then flow west across the alluvial fans and Santa Rosa Plain, eventually meeting the Laguna main channel that flows north joining the Russian River. The primary subbasins of the Laguna de Santa Rosa watershed are shown in Figure 3-3 of the SMP Manual and include: Windsor Creek, Mark West Creek, Santa Rosa Creek (which includes Piner, Matanzas, Spring, Brush, and Oakmont creeks); Roseland Creek; Colgan Creek; Bellevue-Wilfred creeks; and the creeks of the upper Laguna subbasin including Gossage, Upper Laguna, Copeland, and Hinebaugh creeks. These subbasins and their engineered channels are described in greater detail in Chapter 4 of the SMP Manual.

Land uses in the Laguna de Santa Rosa watershed are mixed and include high density urban development, rural residential uses, public recreational areas, varying degrees of agricultural uses, and some rangeland. The distribution of these land uses is shown in Figure 3-4 of the SMP Manual. Areas of higher elevations on the east side of the watershed are encompassed by public lands, rural residential, agriculture (vineyards), and open ranchlands and woodlands. As the elevation levels towards the west, residential and commercial land uses intensifies, particularly at the urban areas of Santa Rosa and Rohnert Park. Land use shifts to rural residential and more intensive agriculture use moving further west across the watershed.

Petaluma River Watershed

The Petaluma River watershed (146 sq. mi.) lies in both Sonoma County (112 sq. mi. of the watershed) and Marin County (34 sq. mi. of the watershed). In the northeastern Petaluma River watershed, tributaries flow southwest out of the Sonoma Mountains to the Petaluma River and then flow southeast to San Pablo Bay. The Petaluma Valley in the central watershed forms a wide basin with characteristic rolling hills and grasslands that stretches from Cotati southeast to San Pablo Bay. Primary tributaries to the Petaluma River include

Willow Brook, Lichau, Lynch, Adobe, Ellis, Liberty, Marin, and San Antonio creeks. Those creeks that include engineered channels are described in greater detail in Chapter 4 of the SMP Manual.

The lower Petaluma River has been modified to enable commercial traffic and is dredged every four years to maintain navigability.

Predominant land uses in the Petaluma River watershed are comprised of agriculture, rural residential, and the urban center of Petaluma. As Figure 3-4 of the SMP Manual shows, the urban area of Petaluma sits squarely in the middle of the watershed surrounded by almost exclusive agricultural lands to the east and a buffer of rural residential to the west before agricultural lands begin again. As shown in Figure 3-1 of the SMP Manual, the town of Petaluma is also situated at the low point of the watershed.

Sonoma Creek Watershed

The Sonoma Creek watershed (170 sq. mi.) is located east of the Petaluma River watershed and west of the Napa River watershed of Napa County. As described in the SMP Manual, the Sonoma Creek valley is generally symmetrical with dendritic tributaries (small tributaries that feed a single, large tributary) descending from the Mayacamas Mountains to the east and the Sonoma Mountains to the west. This watershed contains few Sonoma County Water Agency (SCWA)-maintained engineered channels, with Fryer Creek containing most of SMP relevant channel segments. Maintained reaches are described in greater detail in Chapter 4 of the SMP Manual.

Land uses in the Sonoma Creek watershed are mixed, but contain a high percentage of both agriculture and ranchland/woodland land uses. The town of Sonoma forms the main urban center and is located at the lower end of Flood Control Zone 3A.

Conservation Easements

Several areas located within the proposed activity area of the SMP are under contractual easement agreements made between the Agency and various jurisdictions. Table 3.8-1 summarizes the easements and their conditions; the full text of the easements is included in Appendix D. As shown, the majority of the agreements contain stipulations which permit SCWA to implement certain activities (maintain hydraulic capacity, vegetation management, restoration and enhancement, bank and soil stabilization, reduce soil erosion, enhancement of habitat, etc) on these properties so long as these activities would not adversely impact or be inconsistent with the purpose of the agreement. Only two of the agreements did not include conditions detailing approved/or inappropriate uses of the property. Because these were easements granted by SCWA to the Cities of Petaluma and Santa Rosa to construct and maintain pedestrian and/or bicycle pathways along the stream channel corridor; they do not restrict SCWA's other uses of the property.

Land Uses Surrounding SCWA-Maintained Channels

Most SMP channels are located in urban areas, and are surrounding by residential, commercial, industrial, or institutional developments (hospitals, schools). Some channels traverse through less developed areas, with land uses including rural residential,

Table 3.8-1. Conservation Easements in the Program Area

Date	Grantor	Grantee	Description of Area	Purpose	Conditions
June 1985	City of Santa Rosa	SCWA	A 58.72 acre portion of parcel no 60-060-52 along Laguna de Santa Rosa	To provide for wildlife habitat as a mitigation for the Delta Pond Project and the Spring Creek Project on the City's Wastewater Disposal property.	Improvements incompatible with the purpose of the easement are not allowed. Actions that would destroy the riparian or aquatic habitat established by the easement would be considered incompatible.
August 1996	SCWA	City of Santa Rosa	10,000 sq ft on APN 034-110-078, and 14,000 sq ft on APN 035-021-025	For the creation of a bike/pedestrian path easement. City may install, maintain, repair, and operate a public path on these parcels.	
August 1997	SCWA	City of Petaluma	3,673 sq meters on APN 136-100-028. This parcel is located along Lynch Creek	Rights for the City to create, maintain, repair, and operate a pedestrian pathway.	
July 2001	SCWA	City of Santa Rosa	Approx 1.31 acres in Santa Rosa, along Colgan Creek between Bellevue Ave and Victoria Drive.	Rights for the City to create, maintain, repair, and operate a pedestrian pathway provided that the use does not damage or restrict SCWA's full use of the property or the improvements existing on it in any way.	SCWA reserves the right to install, construct, operate, and maintain both existing and future improvements on the property. The grant of the easement is subject and subordinate to the rights of SCWA to use the property in the performance of its governmental and proprietary functions.
August 2001	SCWA	Sonoma County	15-ft wide easement along Colgan Creek between Stony Pt Rd and Bellevue Ave. Approximately 82,252 sq ft on APNs 134-090-069 and 134-070-007	Rights for the County to create, maintain, repair, and operate a pedestrian pathway provided that the use does not damage or restrict SCWA's full use of the property or the improvements existing on it in any way.	SCWA reserves the right to install, construct, operate, and maintain both existing and future improvements on the property. The grant of the easement is subject and subordinate to the rights of SCWA to use the property in the performance of its governmental and proprietary functions.

Table 3.8-1. Conservation Easements in the Program Area

Date	Grantor	Grantee	Description of Area	Purpose	Conditions
December 2002	City of Santa Rosa	Sonoma County Agricultural Preservation and Open Space District	Approx 23,485 sq ft along Santa Rosa Creek Channel between Santa Rosa Ave and Railroad Ave. The area is commonly known as the Prince Memorial Greenway, and SCWA owns the fee interest in a portion of the Property.	To preserve the open space, natural resource, habitat, public outdoor recreational, and scenic values of the Property and prevent any uses that would significantly impair or interfere with those values or with Santa Rosa Creek in its restored and natural state.	Appendix B of the agreement stipulates permitted uses and practices on the conservation easement land. This includes water agency activities necessary to maintain hydraulic capacity for flood control purposes, vegetation management and restoration and enhancement activities (bank and soil stabilization, practices to reduce soil erosion, enhancement of habitat) so long as these activities would not adversely impact or be inconsistent with the conservation purpose of the Agreement.
December 2004	SCWA	Sonoma County	The easement is a 14-ft wide area along Hunter Creek Channel between Santa Rosa Ave and Hunter Lane. The easement totals approximately 111,255 sq ft., consisting of a portion of APNs 134-192-014, 045-131-016, 045-132-078, 045-141-036, and 045-320-009	Rights for the County to create, maintain, repair, and operate a public pathway provided that the use does not damage or restrict SCWA's full use of the property or the improvements existing on it in any way.	SCWA reserves the right to install, construct, operate, and maintain both existing and future improvements on the property. The grant of the easement is subject and subordinate to the rights of SCWA to use the property in the performance of its governmental and proprietary functions.
November 2004	SCWA	City of Santa Rosa	The area totals approximately 1,319 sq ft along Ducker Creek and includes portions of APNs 182-230-002 and 182-160-047.	Rights for the City to create, maintain, repair, and operate a pedestrian bridge and sidewalk provided that the use does not damage or restrict SCWA's full use of the property or the improvements existing on it in any way.	SCWA reserves the right to install, construct, operate, and maintain both existing and future improvements on the property. The grant of the easement is subject and subordinate to the rights of SCWA to use the property in the performance of its governmental and proprietary functions.

Table 3.8-1. Conservation Easements in the Program Area

Date	Grantor	Grantee	Description of Area	Purpose	Conditions
March 2005	SCWA	Sonoma County	Along Santa Rosa Creek Channel between the Prince Memorial Greenway and downtown Santa Rosa. The easement area consists of a portion of APN 125-054-048, totaling 2,369 sq ft.	Rights for the County to create, maintain, repair, and operate a pedestrian bridge and trail provided that the use does not damage or restrict SCWA's full use of the property or the improvements existing on it in any way.	SCWA reserves the right to install, construct, operate, and maintain both existing and future improvements on the property. The grant of the easement is subject and subordinate to the rights of SCWA to use the property in the performance of its governmental and proprietary functions.
May 2006	SCWA	Sonoma County Agricultural Preservation and Open Space District	Located along Santa Rosa Creek from the corporate limits of the City of Santa Rosa to Willowside Road. The area includes portions of APNs 034-110-081, 130-020-025, and 130-030-026; totaling approx 50 acres.	To preserve the open space, natural resource, habitat, public outdoor recreational, and scenic values of the Property and prevent any uses that would significantly impair or interfere with those values or with Santa Rosa Creek in its restored and natural state.	Appendix B of the agreement stipulates permitted uses and practices on the conservation easement land. This includes water agency activities necessary to maintain hydraulic capacity for flood control purposes, vegetation management and restoration and enhancement activities (bank and soil stabilization, practices to reduce soil erosion, enhancement of habitat) so long as these activities would not adversely impact or be inconsistent with the conservation purpose of the Agreement.

agriculture and grazing, parks, and open space. Some of the less developed areas are located within the urban core (e.g., urban parks), but most of these areas are adjacent to channels that are either upstream or downstream of the core areas of urban development. A good example of the mosaic of land uses adjacent to SMP channels can be found in Rohnert Park. The channels which pass through Rohnert Park (e.g., Hinebaugh and Copeland Creeks) have upstream reaches located in less developed areas east of Snyder Lane and the Rohnert Park Expressway, then pass through the developed center of the city, and finally enter the less developed areas surrounding the Laguna at their western downstream extent.

Sediment disposal sites are typically surrounded by similar land uses, but are more frequently located in less-developed areas.

3.8.4 Impact Analysis

Methodology

This section describes the methods used to determine the Proposed Program's impacts and lists the thresholds used to conclude whether an impact would be significant. The analysis of land use and planning was generally qualitative, and included consideration of applicable land use policies, plans, and programs.

Criteria for Determining Significance

Criteria for determining the significance of impacts related to land use are based on Appendix G of the California Environmental Quality Act (CEQA) Guidelines and professional judgment. The Proposed Program would have a significant impact if it would:

- physically divide an established community;
- create substantial conflicts or incompatibility with existing and planned future land uses within or adjacent to the program study area;
- conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project; or
- conflict with any applicable habitat conservation plan, natural community conservation plan, or other land conservation plan.

Environmental Impacts

Impact LU-1: Disruption or Division of Existing Land Uses or Neighborhoods (Less than Significant)

The maintenance activities proposed under the Proposed Program would consist of sediment removal, bank stabilization, vegetation management, and other less intensive maintenance activities such as trash and debris clearing, fence repair, and access road maintenance, as well as sediment disposal. As described above in the Program Description (Chapter 2), the Proposed Program consists of work which is restricted to channel areas and easements to provide access to channel areas. The SMP would not permanently affect access to any of the surrounding land uses, nor create any new permanent, physical barriers

between developed areas. Sediment disposal would be conducted consistent with all local land use plans and zoning designations. Therefore, the project would not physically divide a community. This impact is considered to be less than significant. No mitigation is required.

Level of Significance: Less than significant

Mitigation Measures: None required

Impact LU-2: Incompatibility with Adjacent Land Uses and Inconsistencies with Applicable Land Use Designations and Zoning (Less than Significant)

The proposed SMP is generally consistent with applicable policies and programs in the Program Area. However, activities would take place within designated streamside conservation corridors, setbacks, and protection zones. These setbacks and protection zones have been established to limit development and encourage resource conservation in these areas. The sediment and vegetation removal, and bank stabilization activities proposed under the SMP for flood control purposes are allowable under the land use policies described above. And although temporary impacts are associated with the proposed activities (see the accompanying sections of Chapter 3 of this EIR for details), the longer-term implementation of the SMP will reduce the threat of flooding. The SMP will also enhance and restore habitat conditions along the flood control channels and maintain an extensive network of creek-side paths that provide recreational opportunities. The proposed program activities are not considered “new development,” as no new permanent habitable structures would be created nor would the land be altered from its present use.

Implementation of the SMP would facilitate the management of routine maintenance activities throughout the Program Area. The SMP would apply a more comprehensive approach than is currently used, which would ensure that streams and channels are managed with a more holistic watershed-based understanding of the governing physical and biological processes. Over time, this approach would reduce the need for invasive maintenance techniques and would improve the overall health of the channel corridors.

As such, the implementation of the Proposed Program would support the land use goals of several regional and municipal land use plans by providing adequate channel capacities, supporting flood management, and providing enhanced riparian habitat within the Program Area. Achieving these objectives would support existing land use plans and would not result in incompatibilities with existing and adjacent land uses. This impact is considered less than significant. No mitigation is required.

Level of Significance: Less than significant

Mitigation Measures: None required

Impact LU-3: Conflicts with Habitat Conservation Plans or other Land Conservation Plans (Less than Significant)

A full discussion of applicable habitat conservation plans is contained in Chapter 3.3 *Biological Resources*. Additionally, Chapter 2, Section 2.3.1 of the SMP Manual describes the

Santa Rosa Plain Conservation Strategy and its relation to the SMP. This impact review evaluates the potential for the SMP to affect or be inconsistent with land conservation plans and easements in the Program Area.

As discussed in the Environmental Setting portion of this chapter, and detailed in Table 3.8-1, there are several approved conservation or other easements which overlay on SCWA-maintained channels. The majority of easements have been deeded for trail or pathway use along channel corridors. While construction impacts could cause temporary closures to occur, SMP activities would not permanently alter the functionality or use of these facilities. As fully described in Chapter 3.11 *Recreation*, temporary impacts on recreational facilities would be considered less than significant with the implementation of various best management practices. Furthermore, these easements either are subordinate to SCWA's right to the full use of the property, or contain stipulations for permitted uses and practices on the conservation easement land which include SMP-type maintenance activities. Two of the easements do not contain conditions regarding uses other than those described in the agreement; however they also do not specifically prohibit the Program activities. These two easements were granted by SCWA to the Cities of Petaluma and Santa Rosa to construct and maintain pedestrian and/or bicycle pathways along the stream channel corridor. Since these easements are subordinate to SCWA's other rights of use of the parcel, they do not restrict SCWA's implementation of SMP activities in these locations.

As shown in Table 3.8-1, a portion of the Program Area along the Laguna de Santa Rosa has been identified as a conservation easement area on the City of Santa Rosa's Wastewater Disposal property in mitigation for the Delta Pond Project and the Spring Creek Project. The easement includes stipulations that require SCWA to set aside a total of 58.72 acres on-site for biological habitat mitigation and buffer areas. The easement does not allow any activity that would destroy the created riparian or aquatic habitat. While some of the maintenance activities have the potential to temporarily disturb habitat and vegetation at project sites, the SMP would support habitat values over the long term.

Although the Proposed Program would not directly conflict with conservation easements in the Program Area, SCWA would coordinate with the conservation easement signatories as outlined in Chapter 2 of the SMP Manual for any maintenance activities that may potentially affect easement areas. This impact is considered less than significant. No mitigation is required.

Level of Significance:	Less than significant
Mitigation Measures:	None required

Chapter 3.9

NOISE

3.9.1 Introduction

This section describes the setting and potential impacts to noise from the Proposed Program. Data sources used in the preparation of this section include the Sonoma County 2020 General Plan adopted in 2008, and general plans and city codes from the cities of Cotati, Petaluma, Rohnert Park, Santa Rosa, Sebastopol, Sonoma, and the Town of Windsor.

Maintenance activities are essentially construction activities and have a similar potential for noise generation, and are treated as such in this section.

3.9.2 Regulatory Setting

Federal Regulations

There are no commonly accepted federal thresholds for acceptable levels of noise from construction activities. The Federal Transit Administration (FTA) suggests the following guidelines in Table 3.9-1 as reasonable criteria for the assessment of construction noise impacts.

Table 3.9-1. FTA-Suggested Construction Noise Criteria

Land Use	One-Hour Leq (dBA)	
	Day	Night
Residential	90	80
Commercial	100	100
Industrial	100	100

Source: Federal Transit Administration 1995

State Regulations

California Vehicle Code

The California Vehicle Code sets noise limits for motor vehicles which must be met prior to sale or registration of the vehicle in the State of California. Certain off-highway vehicles including special construction equipment are excluded from the noise limits.

California Government Code

The California Government Code requires cities and counties to include a noise element in their general plans. The purpose of the noise element is to provide a guide for establishing a pattern of land uses that minimizes the exposure of community residents to excessive noise. The Office of Planning and Research has published general plan guidelines that include guidelines for noise land use compatibility, presented in Figure 3.9-1.

Local Regulations

Sonoma County General Plan 2020

There is currently no Sonoma County noise ordinance. The General Plan 2020 provides guidance for reviewing new permanent projects and new transportation projects, but does not address temporary construction noise.

The following goals, objectives, and policies are included in the Noise Element of the County General Plan for project review and apply to the Proposed Program.

- GOAL NE-1* Protect people from the adverse effects of exposure to excessive noise and to achieve an environment in which people and land uses may function without impairment from noise.
- Objective NE-1.1* Provide noise exposure information so that noise impacts may be effectively evaluated in land use planning and project review.
- Objective NE-1.3* Protect the present noise environment and prevent intrusion of new noise sources which would substantially alter the noise environment.

City of Santa Rosa 2020 General Plan

The following policies contained in the City of Santa Rosa’s General Plan are applicable to the Proposed Program.

- NS-B* Maintain an acceptable community noise level to protect the health and comfort of people living, working and/or visiting in Santa Rosa, while maintaining a visually appealing community.

City of Santa Rosa Noise Ordinance

The City of Santa Rosa Noise Ordinance is part of the City Code (Title 17 Environmental Protection, Chapter 16 Noise). Elements of the ordinance that apply to the Proposed Program include the following.

17-16.120 Machinery and equipment.

It is unlawful for any person to operate any machinery, equipment, pump, fan, air-conditioning apparatus or similar mechanical device in any manner so as to create any noise which would cause the noise level at the property line of any property to exceed the ambient base noise level by more than five decibels. (Prior code § 27.20)

The following criteria will be used as a base (ambient noise level) from which noise levels can be compared.

Zone	Time	Sound Level A (decibels) Community Environment Classification
R1 and R2	10 p.m. to 7 a.m.	45
R1 and R2	7 p.m. to 10 p.m.	50

Zone	Time	Sound Level A (decibels) Community Environment Classification
R1 and R2	7 a.m. to 7 p.m.	55
Multi-family	10 p.m. to 7 a.m.	50
Multi-family	7 a.m. to 10 p.m.	55
Office & Commercial	10 p.m. to 7 a.m.	55
Office & Commercial	7 a.m. to 10 p.m.	60
Intensive Commercial*	10 p.m. to 7 a.m.	55
Intensive Commercial	7 a.m. to 10 p.m.	65
Industrial	Anytime	70

* See Appendix B as set forth on a map on file in the office of the City clerk. (Prior code § 27.3)

City of Rohnert Park General Plan

The City of Rohnert Park 2000 General Plan noise element includes the following goals and policies that are applicable to the Proposed Program.

- Goal NS-A* Protect public health and welfare by eliminating or minimizing excessive noise levels.

- Goal NS-B* Minimize the exposure of noise-sensitive uses—including residences, schools, churches, hospitals, and other public uses—to excessive noise levels.

- Policy NS-4* Continue to require control of noise or mitigation measures for any noise emitting construction equipment or activity.

City of Rohnert Park Noise Ordinance

The City of Rohnert Park Noise Ordinance includes the following specification for operating hours of construction equipment.

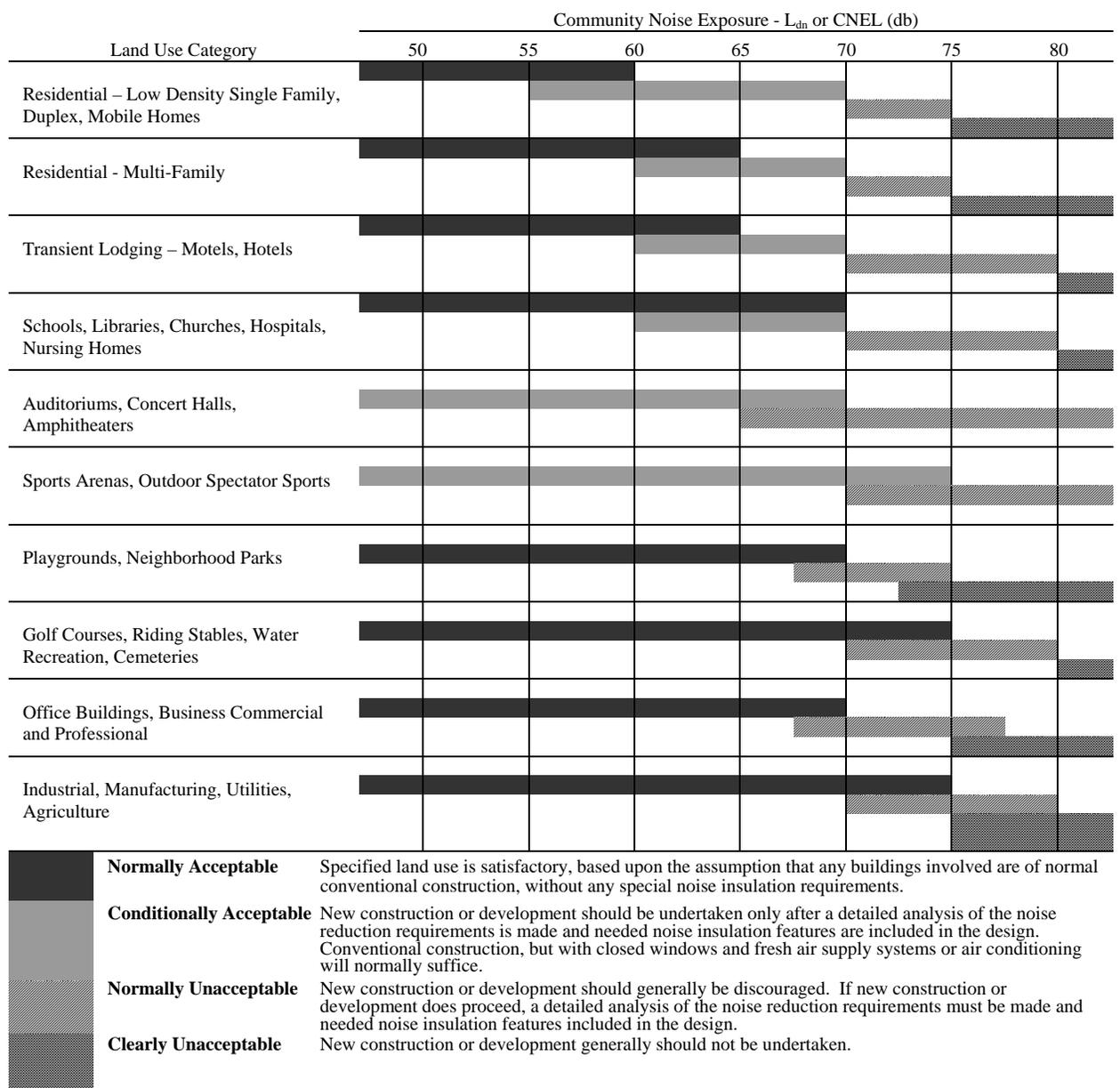
Article III. Construction

9.44.120 Construction of buildings and projects.

It is unlawful for any person within a residential zone, or within a radius of five hundred feet there from, to operate equipment or perform any outside construction or repair work on buildings, structures, or projects or to operate any pile driver, power shovel, pneumatic hammer, derrick, power hoist, or any other construction type device between the hours of six p.m. of one day and eight a.m. of the next day in such a manner that a reasonable person of normal sensitiveness residing in the area is caused discomfort or annoyance unless beforehand a permit therefore has been duly obtained from the superintendent of public works. No permit shall be required to perform emergency work as defined in Section 9.44.020 of this chapter. (Ord. 152 § 3.1, 1971)

(Title 9 Public Peace, Morals, and Welfare Ch 9.44 Noise)

Figure 3.9-1. State Land Use Compatibility Standards for Community Noise Environment



Source: California Governor’s Office of Planning and Research 2003.

City of Petaluma General Plan 2025

The City of Petaluma General Plan 2025 includes the following noise element policies that are applicable to the Proposed Program.

10-P-3

Protect public health and welfare by eliminating or minimizing the effects of existing noise problems, and by minimizing the increase of noise levels in the future.

D. Continue to require control of noise or mitigation measures for any noise-emitting construction equipment or activity.

City of Petaluma Noise Ordinance

The City of Petaluma Noise Ordinance limits construction-related noise to between 7:00 a.m. and 10:00 p.m. daily, except Saturday, Sunday and State, Federal or Local Holidays, when it is limited to between 9:00 a.m. and 10:00 p.m.

City of Sebastopol General Plan

The General Plan provides review guidelines for new development and transportation related noise increases, but does not address construction noise.

City of Sebastopol City Code

The City of Sebastopol City Code limits the allowable hours for operation of construction equipment, as follows:

Title 8 Health and Safety, Chapter 8.24 Prohibited Noise During Certain Hours

8.24.030 Limitations

It shall be unlawful for any person, within a residential zone or within 300 feet thereof, during the days and hours designated below, to perform any construction or repair work on buildings, structures or projects, or to operate any construction type equipment or device, in such a manner so as to generate noise causing a reasonable person of normal sensitiveness residing in the area discomfort of annoyance (except in the case of emergencies or upon advance written approval of the City Engineer when necessary for the convenience of the public).

The following days and hours are those in which the above activities shall be limited:

Sunday 5:00 p.m. to Monday 7:00 a.m.

Monday 8:00 p.m. to Tuesday 7:00 a.m.

Tuesday 8:00 p.m. to Wednesday 7:00 a.m.

Wednesday 8:00 p.m. to Thursday 7:00 a.m.

Thursday 8:00 p.m. to Friday 7:00 a.m.

Friday 8:00 p.m. to Saturday 8:00 a.m.

Saturday 5:00 p.m. to Sunday 8:00 a.m.

Upon any of the following designated holidays, the above activities shall be limited for the complete 24-hour period:

1. January 1st
2. The last Monday in May
3. July 4th
4. The first Monday in September

5. November 11th, Veterans Day

6. December 25th

7. The Thursday in November appointed as Thanksgiving Day.

“Emergencies” shall be defined as work made necessary to restore property to a safe condition following a public calamity, or work required to protect persons or property from an imminent exposure to danger, or work by private or public utilities when restoring utility service.

City of Sonoma General Plan 2020

The General Plan 2020 provides guidance for assessing planned new developments but does not address temporary construction noise.

City of Sonoma City Code

The City of Sonoma City Code places limits on noise levels in various zoning areas. The limits are excluded for construction which is regulated as follows.

9.56.050 Standard exceptions to general noise limits.

A. Construction. Except as otherwise provided in subsection (B) of this section, or by the planning commission or city council as part of the development review for the project, on any construction project on property within the city, construction, alteration, demolition, maintenance of construction equipment, deliveries of materials or equipment, or repair activities otherwise allowed under applicable law shall be allowed as follows: (1) between 8:00 a.m. and 6:00 p.m., Monday through Friday, (2) between 9:00 a.m. and 6:00 p.m. on Saturday, and (3) between 10:00 a.m. and 6:00 p.m. on Sundays and holidays; however, the noise level at any point outside of the property plane of the project shall not exceed 90 dBA.

Town of Windsor General Plan – 2015

The Town of Windsor does not currently have a noise ordinance but does address noise in its General Plan, as follows:

D.2 Control and abate those activities that exceed desirable sound levels.

D.2.1 The Town should regulate non-vehicular noise sources that are not preempted by state and federal regulations, to minimize disturbances to adjoining uses.

D.2.4 The Town should seek to restrict construction in a manner that allows for efficient construction mobilization and activities, while also protecting the noise environment of noise sensitive land uses.

3.9.3 Environmental Setting

This section provides a background on relevant noise concepts and discusses the existing noise conditions in the Program Area.

Overview of Noise Concepts and Terminology

Sound is mechanical energy transmitted by pressure waves in a compressible medium such as air. Noise can be defined as unwanted sound. Sound is characterized by various parameters that include the rate of oscillation of sound waves (frequency), the speed of propagation, and the pressure level or energy content (amplitude). In particular, the sound pressure level is the most common descriptor used to characterize the loudness of an ambient sound level. The decibel (dB) scale is used to quantify sound intensity. Because sound pressure can vary enormously within the range of human hearing, a logarithmic scale is used to keep sound intensity numbers at a convenient and manageable level. The human ear is not equally sensitive to all frequencies in the entire spectrum, so noise measurements are weighted more heavily for frequencies to which humans are sensitive in a process called "A-weighting," written "dBA."

Different types of measurements are used to characterize the time-varying nature of sound. Below are brief definitions of these measurements and other terminology used in this chapter.

- **Sound** is a vibratory disturbance created by a vibrating object, which, when transmitted by pressure waves through a medium such as air, can be detected by a receiving mechanism, such as the human ear or a microphone.
- **Noise** is sound that is loud, unpleasant, unexpected, or otherwise undesirable.
- **Decibel (dB)** is a unitless measure of sound on a logarithmic scale, which indicates the squared ratio of sound pressure amplitude to a reference sound pressure amplitude. The reference pressure is 20 micro-pascals.
- **A-weighted decibel (dBA)** is an overall frequency-weighted sound level in decibels that approximates the frequency response of the human ear.
- **Maximum sound level (L_{max})** is the maximum sound level measured during the measurement period.
- **Minimum sound level (L_{min})** is the minimum sound level measured during the measurement period.
- **Equivalent sound level (L_{eq})** is the equivalent steady-state sound level that, in a stated period of time, would contain the same acoustical energy as a time-varying sound level during that same period of time.
- **Percentile-exceeded sound level (L_{xx})** is the sound level exceeded $x\%$ of a specific time period. L_{10} is the sound level exceeded 10% of the time.
- **Day-night level (L_{dn})** is the energy average of the A-weighted sound levels occurring during a 24-hour period, with 10 dB added to the A-weighted sound levels during the period from 10:00 p.m. to 7:00 a.m.
- **Community noise equivalent level (CNEL)** is the energy average of the A-weighted sound levels during a 24-hour period, with 5 dB added to the A-weighted sound levels between 7:00 p.m. and 10:00 p.m. and 10 dB added to the A-weighted sound levels between 10:00 p.m. and 7:00 a.m.

L_{dn} and CNEL values rarely differ by more than 1 dB. As a matter of practice, L_{dn} and CNEL values are considered to be equivalent and are treated as such in this assessment. In general, human sound perception is such that a change in sound level of 3 dB is just noticeable, a change of 5 dB is clearly noticeable, and a change of 10 dB is perceived as doubling or halving the sound level. Table 3.9-2 presents example noise levels for common noise sources, the levels are measured adjacent to the source.

Table 3.9-2. Examples of Common Noise Levels

Source	Noise Level (dBA)
Weakest sound heard by average ear	0
Whisper	30
Normal conversation	60
Ringling telephone	80
Power lawnmower	90
Tractor	96
Hand drill	98
Bulldozer	105
Chain saw	110
Ambulance siren	120
Jet engine at takeoff	140

Source: National Institute of Safety and Health 2008

Noise Sensitive Land Uses

Noise sensitive land uses identified by the California Government Code, also referred to in this chapter as “sensitive receptors,” include residences, schools, hospitals, nursing homes, churches, libraries, and long term medical or mental care facilities. Many of the reaches maintained under the Stream Maintenance Program (SMP) are located in the vicinity of noise sensitive land uses.

Existing Conditions

Noise conditions in the Program Area vary greatly based on local land uses. Noise monitoring was conducted in July 2002 at various locations near sensitive receptors around Sonoma County. The results are presented in the Sonoma County General Plan 2020 Environmental Impact Report. The community noise survey results indicate that typical noise levels in noise-sensitive areas range from 45 to 55 dB L_{dn} . These are relatively low noise levels, and are typical of small communities and rural areas. In more developed areas, increased local traffic resulted in higher noise levels, in the range of 55 to 65 dB L_{dn} .

3.9.4 Impact Analysis

Methodology

Impacts related to noise from the Proposed Program were analyzed quantitatively utilizing the Federal Highway Administration’s Roadway Construction Noise Model (RCNM) and noise attenuation approaches outlined the FTA’s Transit Noise and Vibration Impact Assessment (Harris, et al. 2006). The RCNM utilizes the sound levels shown in Table 3.9-3 for the various construction equipment and vehicles used in the Proposed Program.

Table 3.9-3. RCNM Equipment Noise Data Applicable to the Proposed Program

Equipment	L_{max} at 50 feet (dBA)
Backhoe	80
Chain saw	85
Dozer	85
Dump truck	84
Excavator	85
Grader	85

Source: USDOT 2006.

The RCNM was used to model typical construction equipment used in the SMP and predict the noise exposure to sensitive receptors at a distance of 50 feet from the construction site. The noise level at further distances from the site was then calculated using the exposure versus distance curve for a stationary source presented in Harris, et al. (2006). The conservative assumption was made that there would be no noise attenuation between the equipment and the receptors, such as attenuation due to fences, vegetation/trees, or topography (such as areas where work is conducted below grade in the channel). It was further assumed that the three loudest pieces of equipment would operate simultaneously and continuously over at least a 1-hour period for a combined source noise level.

The Proposed Program would not involve pile driving or other activities which produce ground-borne vibrations. Therefore, impacts related to vibration are not analyzed.

Any noise generated by maintenance activities is temporary. Typical maintenance projects are expected to last 1-2 days for localized sediment removal projects, 2-3 days for bank stabilization projects, 3 days to 6 weeks for reach-scale sediment removal projects, and up to 6 weeks for vegetation management activities. No permanent impacts to noise will result from the Proposed Program, and for this reason they were not considered further.

Criteria for Determining Significance

Based on Appendix G of the State CEQA Guidelines and professional expertise, it was determined that the Proposed Program would result in a significant impact if it would result in:

- Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?
- Exposure of persons to or generation of excessive ground-borne vibration or ground-borne noise levels?
- A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?
- A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?
- For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the

project expose people residing or working in the project area to excessive noise levels?

- For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?

Local general plan and noise ordinance standards are discussed in detail in the Regulatory Setting section above, and summarized below in Table 3.9-4. Noise levels associated with the Program were also compared against the suggested FTA standards identified in Table 3.9-1.

Table 3.9-4. General Plan and Noise Ordinance Standards

Jurisdiction	Noise Criteria
Sonoma County	Not applicable ¹
Santa Rosa	Operation of machinery and equipment must not result in a noise level greater than 5 dB above ambient at the property line (ambient is defined as 55 to 70 dB from 7:00 a.m. to 7:00 p.m., depending on land use)
Rohnert Park	Construction equipment may only be operated between the hours of 8:00 a.m. and 6:00 p.m. within a residential zone or within 500 feet thereof.
Petaluma	Construction equipment may only be operated between the hours of 7:00 a.m. and 10:00 p.m. Monday through Friday and 9:00 a.m. and 10:00 p.m. weekends and holidays.
Sebastopol	Construction equipment may only be operated between the hours of 7:00 a.m. and 8:00 p.m. Monday through Friday and 8:00 a.m. to 5:00 p.m. Saturday and Sunday, within a residential zone or within 300 feet thereof. Equipment may not be operated on holidays.
Sonoma	Construction equipment may only be operated between the hours of: 8:00 a.m. and 6:00 p.m. Monday through Friday, 9:00 a.m. and 6:00 p.m. Saturday, and 10:00 a.m. and 6:00 p.m. Sundays and holidays. The noise level at any point outside of the property plane of the project may not exceed 90 dBA.
Windsor	Not applicable ¹

1. See the regulatory discussion in Section 3.9.2 above for more information.

Environmental Impacts

Impact NZ-1: Exposure of the Public to Noise Levels in Excess of City or County Standards (Significant and Unavoidable)

The worse-case scenario of concurrent, continuous operation of the three loudest pieces of equipment utilized in the SMP was modeled using methodology described above. This scenario consists of concurrent use of a dozer, excavator, and grader. The resulting noise

level at 50 feet from the construction site is 89.8 dBA L_{eq} . The calculated results are presented in Table 3.9-5.

Table 3.9-5. Estimated Noise Levels in the Vicinity of Maintenance Activities

Sources:	dBA
Source 1: Dozer – Sound level (L_{max}) at 50 feet =	85
Source 2: Excavator – Sound level (L_{max}) at 50 feet =	85
Source 3: Grader– Sound level (L_{max}) at 50 feet =	85
All Sources Combined – Sound level (L_{eq}) at 50 feet =	89.8
Distance Between Source and Receiver (ft.)	Estimated Sound Level, L_{eq} (dBA)
50	89.8
100	88.1
200	84.7
300	81.4
400	78.0
500	74.6
600	71.3
700	67.9
800	64.5
900	61.2
1000	57.8

Note: This calculation does not include the effects, if any, of local shielding that may reduce sound levels further.

The modeled noise level for SMP activities is less than the City of Sonoma standard of 90 dbA for construction noise. The FTA suggested construction noise criteria for residential areas during the day is also 90 dBA. The Cities of Petaluma, Rohnert Park, Sebastopol, and Sonoma limit the hours construction equipment can be used to protect sensitive receptors from the temporary impacts of construction noise. The Proposed Program will comply with those City’s ordinances with implementation of BMP GN-3 *Noise Control*, which limits the equipment operating hours to 8:00 a.m. to 5:00 p.m. Monday through Friday, prohibits equipment operation on state and federal holidays, and prescribes noise control devices for all power equipment. Herbicide application on access roads is conducted during early morning hours (before 8:00 a.m) but application is conducted from a standard pickup truck and sound generated would be less than the levels shown in Table 3.9-3. Additionally, herbicide application on access roads is an activity that is currently conducted; there would be no change from baseline conditions. Therefore, the noise levels generated by the Proposed Program would comply with the noise standards identified above and commonly accepted construction noise criteria, and would result in less than significant impacts within all jurisdictions with the exception of the City of Santa Rosa.

However, use of construction equipment to perform maintenance activities under the Proposed Program will generate noise levels that exceed the City of Santa Rosa noise ordinance criteria. The City of Santa Rosa criteria specifies that it is unlawful to operate machinery and equipment which generates noise resulting in a noise level 5 dBA greater than ambient levels at the property line. Ambient is defined in the City Code as 55 dBA from 7:00 a.m. to 7:00 p.m. for residential areas. Note that each of the machinery uses 3.9-3 exceed the City of Santa Rosa criteria at 50 feet. The results presented in Table 3.9-5 show that the Proposed Program will generate noise greater than 60 dBA within approximately 1,000 feet of the maintenance site. Many of the SMP channels are within 1,000 feet of residences and other sensitive receptors.

The Program's maintenance activities will be temporary with no permanent noise sources resulting from the Proposed Program. While the Proposed Program meets the FTA criteria and the majority of city and county ordinances in the Program Area, it does exceed the City of Santa Rosa Noise Ordinance criteria, which is more stringent than the other criteria. Additional mitigation beyond that already identified, such as temporary sound barriers, is not considered feasible. For this reason, temporary noise impacts from SMP activities in Santa Rosa are considered significant and unavoidable.

Level of Significance: Significant and unavoidable

Mitigation Measures:

BMP GN-3: Noise Control

1. With the exception of emergencies, normal work will be limited to normal business hours (8:00 a.m.–5:00 p.m.). Routine activities in residential areas will not occur on Saturdays, Sundays, or SCWA observed state holidays except during emergencies, or with approval by the local jurisdiction and advance notification of surrounding residents.
2. SCWA will ensure that power equipment (vehicles, heavy equipment, and hand equipment such as chainsaws) is equipped with original manufacturer's sound-control devices, or alternate sound control that is no less effective than those provided as original equipment. Equipment will be operated and maintained to meet applicable standards for construction noise generation. No equipment will be operated with an unmuffled exhaust.

Impact NZ-2: Result in a Temporary Significant Increase in Noise above Ambient Levels (Less than Significant with Mitigation)

Use of construction equipment will result in noise levels substantially greater than ambient conditions. The modeled noise level would be perceived as two to three times the typical ambient level within approximately 800 feet of the maintenance or sediment disposal site. BMP GN-3 *Noise Control* will be implemented to reduce the noise impact to sensitive receptors. The measure requires all power equipment to be muffled at levels equal to or better than the original manufacturer's levels and specifies that work will be conducted during normal working hours, 8:00 a.m. to 5:00 p.m. Monday through Friday, excluding holidays.

Because noise-reducing measures will be implemented, and maintenance activities will be restricted to certain hours, this impact is considered less than significant with implementation of BMP GN-3.

Level of Significance: Less than significant with mitigation

Mitigation Measures:

BMP GN-3: Noise Control

1. With the exception of emergencies, normal work will be limited to normal business hours (8:00 a.m.-5:00 p.m.). Routine activities in residential areas will not occur on Saturdays, Sundays, or SCWA observed state holidays except during emergencies, or with approval by the local jurisdiction and advance notification of surrounding residents.
2. SCWA will ensure that power equipment (vehicles, heavy equipment, and hand equipment such as chainsaws) is equipped with original manufacturer's sound-control devices, or alternate sound control that is no less effective than those provided as original equipment. Equipment will be operated and maintained to meet applicable standards for construction noise generation. No equipment will be operated with an unmuffled exhaust.

Chapter 3.10

PUBLIC SERVICES AND UTILITIES

Chapter 3.10 PUBLIC SERVICES AND UTILITIES

3.10.1 Introduction

This section describes the setting and potential impacts on public services and utilities from the Proposed Program. The proposed program would not affect water or wastewater demands or capacity needs. As such, these public services are not discussed further in this section. Sources of data used in the preparation of this section include the Sonoma County General Plan adopted in 2008 and general plans from the cities of Cotati, Petaluma, Rohnert Park, Santa Rosa, Sebastopol, Sonoma, and the Town of Windsor.

3.10.2 Regulatory Setting

Local Regulations

Sonoma County 2020 General Plan

The following goals, objectives, and policies for the designation and review of new public facilities are included in the County's general plan and are applicable to the Proposed Program.

<i>Goal PF-2</i>	Assure that park and recreation, public education, fire suppression and emergency medical, and solid waste services, and public utility sites are available to the meet future needs of Sonoma County residents.
<i>Objective PF-2.8</i>	Continue to coordinate fire protection services and planning with all other related agencies.
<i>Objective PF-2.9</i>	Use the County Integrated Waste Management Plan (CoIWMP), and any subsequent amendments thereto, as the policy document for solid waste management in the County.
<i>Objective PF-2.10</i>	Locate and design public utility transmission, distribution, and maintenance facilities to minimize adverse effects on natural and scenic resources.

Countywide Integrated Waste Management Plan

The Sonoma County Waste Management Agency currently operates under their Countywide Integrated Waste Management Plan (CoIWMP), adopted in 2003, which established solid waste planning strategies through the Year 2050. The County's CoIWMP is a regional solid waste planning document for all of the nine Sonoma County cities and the unincorporated County area. This plan is currently being amended to update the Household Hazardous Waste Element to allow for development of additional household hazardous waste collection facilities. The Siting Element is also being updated to allow for additional waste

disposal strategies. The environmental impact analysis for these updates is currently underway and the updated CoIWMP is anticipated to be adopted in 2008 (Sonoma County Waste Management Agency 2008).

City of Rohnert Park General Plan

As stated in the City of Rohnert Park's General Plan (Chapters 5 Open Space, Parks and Public Facilities and 7 Health and Safety), the City is committed to providing ample public services, such as law enforcement and emergency response, to its residents. The Proposed Stream Maintenance Program (SMP) would not conflict with these policies.

City of Santa Rosa 2020 General Plan

The following policies contained in the City of Santa Rosa's General Plan, Public Facilities and Services Element are applicable to the Proposed Program.

- | | |
|-----------------|---|
| <i>PSF-A-19</i> | Provide recreational opportunities and establish bike and pedestrian paths along Santa Rosa Creek through implementation of the Santa Rosa Creek Master Plan. |
| <i>PSF-A-20</i> | Encourage multiple uses of waterways, including, where appropriate: <ul style="list-style-type: none">■ Flood control,■ Wildlife habitats,■ Passive open space uses,■ Nature study,■ Pedestrian and bicycle circulation, and■ Other compatible outdoor uses. |

City of Sebastopol General Plan

The City of Sebastopol General Plan, Safety Element contains policies to maintain and enhance their emergency response and law enforcement services. The Proposed SMP would not conflict with these policies.

City of Sonoma General Plan

As stated in the Public Safety Element of the City of Sonoma's General Plan, the City is committed to providing ample public services, such as law enforcement and emergency response, to its residents. The Proposed SMP would not conflict with these policies.

Town of Windsor General Plan - 2015

The Town of Windsor's General Plan, Community Development chapter contains policies aimed at coordinated emergency response and provisions for improving public facilities, such as schools and parks, as the town grows. The Proposed Program would not conflict with these policies.

3.10.3 Environmental Setting

This section discusses the current public services and utility systems in the Program Area.

Police and Fire

Law enforcement and public safety services in the SMP area are provided by a combination of county and city departments. The Sonoma County Sheriff's Department employs over 1,000 staff and is the primary law enforcement agency in unincorporated areas of the county and the Town of Windsor (Sonoma County Sheriff's Department 2004). Cities of Cotati, Petaluma, Rohnert Park, Santa Rosa, Sebastopol, and Sonoma operate independent police departments which enforce local, state, and federal laws within their city limits. The California Highway Patrol also lends law enforcement and emergency assistance in the SMP area.

Fire protection in Sonoma County is provided by multiple agencies. The Fire Services Division of the Sonoma County Department of Emergency Services manages fire protection within unincorporated areas of the county (also referred to as Community Service Area #40). Community Service Area #40 is comprised of 15 Volunteer Fire Companies, and is funded primarily through donations, with equipment and administrative support provided by the County. The cities of Cotati, Petaluma, Rohnert Park, Santa Rosa, Sebastopol, Sonoma, and the Town of Windsor operate independent fire departments. Fire protection for the City of Cotati and the community of Penngrove is provided by the Rancho Adobe Fire District. Fire protection for the City of Sonoma operates under a partnership with the Valley of the Moon Fire District, referred to as the "Sonoma Valley Fire and Rescue Authority" to provide service a larger area of Sonoma County and unincorporated communities in Sonoma Valley. The California Department of Forestry and Fire Protection (CDF) also provide additional fire protection services in the unincorporated parts of the county.

Emergency Services

The Sonoma County's Division of Emergency Management is the lead agency for coordination of response and recovery activities following an emergency or disaster within the Sonoma Operational Area, which includes the county's nine incorporated cities, Sonoma State University, and other special districts. The County provides emergency medical services through a combination of first responder agencies, ground and air ambulance providers, the Emergency Management System (EMS) - Fire Dispatch Center, and acute care receiving facilities. The County's EMS system also includes eight acute care hospitals, one of which is a Level II Trauma Center (Santa Rosa Memorial Hospital).

Schools

There are 40 school districts and 177 schools in Sonoma County (Sonoma County Office of Education 2003). All of these schools are in session during a traditional school calendar, starting in August and ending in May or June, as opposed to year-round. As such, children may be present during SMP activities implemented near schools.

Solid Waste

Sonoma County owns and operates the only permitted landfill in the county, the Central Landfill. There are four transfer stations and one compost facility operated by the Sonoma County Waste Management Agency in conjunction with the Central Landfill. Also located at the Central Landfill is a Household Toxic Waste Facility, where residents can properly dispose of hazardous substances such as paint, garden chemicals, old medications, and batteries. In October 2005, the Central Landfill was prohibited from accepting solid waste for disposal because contamination was detected in the landfill's drainage system. For a period of five years beginning in 2005, solid waste in Sonoma County is collected at the transfer stations then hauled and disposed at four out-of-county landfills; including the Potrero Hills Landfill in Suisun City, Vasco Road Landfill in Livermore, Keller Canyon Landfill in Pittsburg, and Redwood Sanitary Landfill in Novato. The agreements between the County and these sites include acceptance of a total daily average disposal of 1,650 tons of waste through the year 2010 (Caldwell 2008, pers. comm.).

The County is currently investigating alternate means of disposing waste within and outside of the county through preparation of a supplemental programmatic environmental impact report for an amendment to the Sonoma County CoIWMP. This analysis is anticipated to be complete in 2008 (Sonoma County Waste Management Agency 2008).

Underground and Overhead Utilities

Underground and overhead utilities in the Program area include natural gas and oil pipelines, and communication lines for telephone, cable, and Internet services. In addition, sewer, storm, and potable water pipelines are located underground. The location of these lines is documented and managed by the County and cities. Coordination between utility companies is required when construction is planned in close proximity to buried lines.

3.10.4 Impact Analysis

Methodology

Impacts of the Proposed Program were evaluated qualitatively, based on the potential for the Program to disrupt existing utilities and service systems. The proposed maintenance activities were identified and evaluated as temporary, short-term impacts; no long-term impacts of the Program on public services and utilities were identified.

Criteria for Determining Significance

Based on Appendix G of the State CEQA Guidelines and professional expertise, it was determined that the Proposed Program would result in a significant impact on utilities and public services if it would:

- Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities or the need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service

ratios, response times, or other performance objectives for fire protection, police protection, schools, parks, or other public facilities;

- Significantly impair or alter services provided by utilities such as electricity, phone, water, or wastewater systems;
- Be served by a landfill with insufficient permitted capacity to accommodate the project's solid waste disposal needs; or
- Fail to comply with federal, state, and local statutes and regulation related to solid waste.

Environmental Impacts

Impact PSU-1: Disruption to Utilities, Schools, Parks, or Other Public Facilities (Less than Significant)

Most of the proposed SMP maintenance activities would occur where no utilities, such as electric, communications, and water or sewer mains, are located. Most utilities are buried beneath or adjacent to roadways, as opposed to within creek channels. Stormwater pipelines and outfalls are, however, commonly located at or in close proximity to stream channels. Additionally, utility lines can cross over or under creek channels where roads intersect the creek channels. Damage to these lines which results in interruption to services would result in a significant impact.

The proposed SMP maintenance activities would not involve excavation of any existing utility lines. Sediment removal and vegetation management activities would occur within the confines of the channel. Sediment cleared at road crossings would not involve excavation deeper than the as-built conditions of the crossing or disturbance to any buried or suspended utility lines. Stormwater outfalls or pipes would be avoided, or in some instances cleared of debris or replaced where they have failed. This would be a less-than-significant impact. No mitigation is required.

The majority of the Agency's maintenance channels are inaccessible to the public. Potential impacts on proposed SMP maintenance sites which are available to public use are identified and discussed in Chapter 3.11 Recreation.

Level of Significance: Less than significant

Mitigation Measures: None required.

Impact PSU-2: Effects of Construction Activities on Police, Fire, and Emergency Services Response Times (Less than Significant with Mitigation)

If proposed maintenance activities would require road closures or detours which would significantly extend emergency response times, a significant impact would result.

However, to the extent feasible, two-way traffic flow on all roadways will be maintained at all times and no road closures are anticipated during stream maintenance activities. As

described in SMP Best Management Practice (BMP) GN-4 *Traffic Flow, Pedestrians, and Safety Measures*, if temporary lane closures are necessary, they would remain open to emergency response vehicles at all times. Additionally, the Agency would coordinate with emergency service providers as necessary to ensure that emergency vehicle response is not impeded. Further details of traffic control during construction can be found in Chapter 3.12 *Transportation and Traffic* and in Chapter 7 of the SMP Manual.

Impacts on police, fire, and emergency services response times and access would be minimal during construction and would be further minimized by implementation of a Traffic Management Plan (BMP GN-4). With implementation of this BMP, this impact is less than significant. No further mitigation is required.

Level of Significance: Less than significant with mitigation

Mitigation Measures:

BMP GN-4: Traffic Flow, Pedestrians, and Safety Measures

1. To the extent feasible, work will be staged and conducted in a manner that maintains two-way traffic flow on public roadways in the vicinity of the work site. If temporary lane closures are necessary, they will be scheduled outside of peak traffic hours (7:00-10:00 a.m. and 3:00-6:00 p.m.) to the maximum extent practicable, and advance warning signage, a detour route, and flaggers will be provided in both directions.
2. When work is conducted on public roads and may have the potential to affect traffic flow, work will be coordinated with local emergency service providers as necessary to ensure that emergency vehicle access and response is not impeded.
3. Public transit access and routes shall be maintained to the extent feasible. If public transit would be affected by temporary road closures and require detours, affected transit authorities will be consulted and kept informed of project activities.
4. Heavy equipment and haul traffic will be prohibited in residential areas, except when no other route to and from the site is available.
5. Roadway segments or intersections in the vicinity of project sites will be assessed to determine if they are at, or approaching an LOS that exceeds local standards. Maintenance traffic will avoid these locations to the extent feasible, either by traveling different routes or by traveling at non-peak times of day.
6. Adequate off-street parking will be provided or designated public parking areas will be used for maintenance workers' personal vehicles and maintenance-related vehicles not in use through the maintenance period.
7. Access for driveways and private roads will be maintained to the extent feasible. If brief periods of maintenance would temporarily block access, property owners will be notified prior to maintenance activities.

Impact PSU-3: Disposal of Excavated Sediment at Off-Site Locations, Including Landfills (Less than Significant with Mitigation)

As discussed in Chapter 6 of the SMP Manual, the proposed maintenance activities would generate 10,000 to 25,000 cubic yards of sediment (approximately 15,000 to 30,000 tons) per year. The majority of this sediment would require off-site disposal. Landfills spread

layers of soil over solid waste debris to contain gases and assist in the decomposition process. Due to the sensitive nature of landfills, soil accepted for use as cover must not be classified as hazardous waste. As discussed in Chapter 3.6 *Hazards and Hazardous Materials* (Impact HAZ-8) and in the Sediment Sampling and Analysis Guidelines (Appendix B of the SMP Manual), sediment removed from the project sites would be tested to determine whether hazardous levels of contaminants are present. If the sediment is considered hazardous, it would not be disposed of at Class II landfills; it would be disposed at sites designated to receive hazardous waste.

If the sediment is not considered hazardous, the Agency could dispose of it as landfill cover through the Sonoma County waste management system. As described in the setting section above, Sonoma County has an agreement for disposal of 1,650 tons of waste per day through 2010, or over 600,000 tons per year. As stated earlier, annual maintenance activities could generate up to 30,000 tons per year of waste; however, only a small portion of that material would be likely sent to a landfill, since this is a less preferential disposal option for the Agency. In addition, the materials generated under the SMP could be used at the landfill for beneficial purposes (i.e., cover material). As such, sediment disposed at landfills would not be anticipated to represent a significant portion of available landfill capacity.

As described in Chapter 5 of the SMP Manual and the Sediment Sampling and Analysis Guidelines (Appendix B of the SMP Manual), placement of the excavated sediment at other off-site locations, such as privately owned agricultural fields, would comply with all federal, state, and local regulations for land disposal.

There would be sufficient capacity to serve implementation of the proposed SMP and land disposal activities would comply with federal, state, and local regulations. Thus, this impact is less than significant with the implementation of BMP HAZ-8.

Level of Significance: Less than significant with mitigation

Mitigation Measures:

BMP HAZ-8: Testing and Disposal of Spoils

As specified in the Sediment Sampling and Analysis Guidelines (Appendix B of the SMP Manual), after selecting potential sediment disposal locations and prior to disposing of excavated sediment, the Agency will test the sediment to determine the appropriateness for disposal based on presence of contaminants. Criteria for sediment disposal at the selected locations will dictate the concentrations of contaminants such as metals, pesticides, organic compounds, total organic carbon, asbestos, total sulfides, ammonia, and toxicity which are acceptable at the disposal locations. As specified in the Sediment Sampling and Analysis Guidelines, samples will be compared against federal and state environmental screening levels (ESLs) for protection of human health, groundwater quality, and terrestrial receptors.

If hazardous levels of contaminants are present such that disposal at the preferred locations is not feasible, the material will be taken to a permitted hazardous waste facility.

Chapter 3.11

RECREATION

3.11.1 Introduction

This section describes the setting and potential impacts of the Proposed Program on recreation. Sources of data used in the preparation of this section include the Sonoma County General Plan adopted in 2008 and general plans from the cities of Santa Rosa, Rohnert Park, Cotati, Petaluma, Sebastopol, Sonoma, and the Town of Windsor.

3.11.2 Regulatory Setting

The following plans were reviewed for applicability: *Sonoma County 2003 Outdoor Recreation Plan*, *City of Cotati General Plan*, *City of Petaluma 2025 General Plan*, and the *City of Sonoma 2020 General Plan*. These plans contain policies related to provision of adequate parkland, and related parkland acquisition and development. However, because the SMP would not result in any new development or permanent changes to existing parklands, the policies in these plans are not relevant to the Stream Maintenance Program (SMP). The remainder of this section describes the plans which are applicable to the Proposed Program.

Local Regulations

Sonoma County General Plan 2020

The following goals, objectives, and policies for the designation and review of new public facilities are included in the County's general plan and are applicable to the Proposed Program.

<i>Goal PF-2</i>	Assure that park and recreation, public education, fire suppression and emergency medical, and solid waste services, and public utility sites are available to the meet future needs of Sonoma County residents.
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City of Rohnert Park General Plan

Chapter 5 of the 2000 General Plan contains the City's Open Space, Parks and Recreation element. This section contains an inventory of current facilities as well as policies, standards, and programs to ensure adequate parkland provision to match projected growth. While the majority of policies are aimed at development and acquisition of parklands, the following policy is applicable to the Proposed Program:

<i>OS-9</i>	As part of the specific plan process, institute mechanisms for maintenance of Open Space west of Petaluma Hill Road. Establish standards and schedules for the maintenance and management of any City-owned open space. Maintenance should include measures to cut back grass and brush to reduce the risk of fire, reduce flood hazards, and perform related maintenance activities.
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City of Santa Rosa 2020 General Plan

The following policies contained in the City of Santa Rosa's General Plan, Public Facilities and Services Element are applicable to the Proposed Program.

- PSF-A-19* Provide recreational opportunities and establish bike and pedestrian paths along Santa Rosa Creek through implementation of the Santa Rosa Creek Master Plan.
- PSF-A-20* Encourage multiple uses of waterways, including, where appropriate:
- Flood control,
 - Wildlife habitats,
 - Passive open space uses,
 - Nature study,
 - Pedestrian and bicycle circulation, and
 - Other compatible outdoor uses.

Santa Rosa Citywide Creek Master Plan

Adopted in 2007, The Santa Rosa Citywide Creek Master Plan, implements General Plan policy OSC-D-13 and provides guidelines for the care, management, restoration and enhancement of nearly ninety miles of creeks in Santa Rosa. The Master Plan is intended for use by City and County staff when planning creek enhancement and restoration activities, coordination and expansion of creek side trail systems, making broader land-use planning decisions concerning creeks, and in the development project approvals process for projects proposed adjacent to a waterway. The Trail Management Guidelines of this document specifies that approved basic trail maintenance activities would include cleaning of drainage culverts inlets and ditches, vegetation management, and fence repair among other activities.

City of Sebastopol General Plan

The Sebastopol General Plan was originally adopted in 1994, but has been periodically updated to reflect changing conditions. Chapter 3 of the General Plan addresses parkland, open space and conservation issues. The following policies and goals apply specifically to the Proposed Program:

- Program 6.1* Establish standards for the management and maintenance of open space within and adjoining subdivisions. Regulations should include standards to ensure control of potential hazards and mechanisms for repair of damage.

Town of Windsor General Plan- 2015

The Town of Windsor General Plan was adopted in 1996, and last updated in 2005. Chapter 4 of the General Plan contains an inventory of current facilities as well as policies, standards, and programs to ensure adequate parkland provision to match projected growth. While the majority of recreation policies are aimed at development and acquisition of parklands, the following policy is applicable to the Proposed Program:

Preserve open space land for the continuation of commercial agriculture and productive uses, the protection of natural resources, the enjoyment of scenic beauty and recreation, and protection from natural hazards.

3.11.3 Environmental Setting

This section discusses the current recreational resources in the Program Area. It should be noted that SCWA has a policy to work with local jurisdictions and recreationalists to allow public access to SCWA-owned facilities, including creek easements and flood control reservoirs.

Reservoirs

As detailed in Chapter 6 of the SMP Manual, the Sonoma County Water Agency (SCWA) operates four reservoirs: the Brush Creek, Matanzas Creek, Piner Creek, and Spring Lake reservoirs. Brush Creek and Matanzas Creek reservoirs are flow-through reservoirs, designed to detain and store peak flood flows during storm events and provide controlled release of flows following the storm peak. These reservoirs are generally dry throughout the year, with some perennial flow occurring in the creeks on which the reservoir is located. Brush Creek Reservoir currently supports recreational uses of baseball and soccer and contains infrastructure to support such uses (e.g., fields, restrooms, and unpaved parking lots). Matanzas Creek Reservoir does not currently have any recreational facilities. Piner Creek and Spring Lake reservoirs maintain water throughout the year. Spring Lake Reservoir provides recreational water uses (swimming, camping, boating, etc.) and contains infrastructure to support such uses (e.g., restrooms and paved parking lots). Piner Creek Reservoir does not currently have recreational facilities.

Creek-Side Trails

The access roads that parallel most program maintenance channels also provide creek-side walking access. Some of these access roads are formalized as recreational trails, with signage and other amenities such as benches. These trails provide an important recreational resource, particularly in the urban environments of Santa Rosa, Rohnert Park, and Petaluma. Creek-side trails are typically composed of consolidated earth, gravel, or are fully paved. Most of the Program Area channels have some type of maintenance access road that can also serve as a creek-side trail or pathway. Many of the access roads/trails in the Program Area are not publically accessible; however, many miles are publically accessible. Where accessible, these trails are used for a variety of recreational activities, including walking, jogging, biking, dog-walking, bird watching, etc.

3.11.4 Impact Analysis

Methodology

This impact analysis describes the impacts on recreation associated with implementation of the Proposed Program. Impacts of the Proposed Program were evaluated qualitatively, based on the potential for the Program to disrupt existing recreational access and uses. Generally, construction activities may result in a short-term loss of recreational opportunities by disrupting use of or access to recreation areas or facilities. A long-term effect could occur if a recreational opportunity is eliminated as a result of operation or maintenance of the Proposed Program.

Criteria for Determining Significance

Based on Appendix G of the State California Environmental Quality Act (CEQA) Guidelines and professional expertise, it was determined that the Proposed Program would result in a significant impact on recreation if it would:

- substantially change the quality of recreational resources in the vicinity of the project site;
- alter the use of existing recreational facilities such that substantial physical deterioration of the resource would occur; or
- substantially change the availability of recreational resources in the vicinity of the project site.

Environmental Impacts

Impact REC-1: Temporary Disturbance of Recreational Quality (Less than Significant with Mitigation)

Temporary construction activities would involve the movement of heavy equipment, truck traffic, construction noise, and air emissions which could affect recreational quality in the immediate vicinity. Typical maintenance projects are expected to last 1-2 days for localized sediment removal projects, 2-3 days for bank stabilization projects, 3 days to 6 weeks for reach-scale sediment removal projects, and up to 6 weeks for vegetation management activities in a given reach. Construction impacts specifically related to nuisance effects (i.e., air quality, noise, traffic, and aesthetics) are addressed in other sections of this document. Although temporary, the proposed activities have the potential to impact recreational resources.

Best Management Practices (BMPs) provided in Table 2-1 identify measures to reduce significant impacts on these resource areas. More specifically related to recreational users, Good Neighbor BMPs GN 1 through 5 would ensure general site cleanliness, noise control, appropriate access and safety controls, and odor control. Impacts on recreational quality during construction would be less than significant with implementation of the BMP measures identified in Table 2-1.

Level of Significance: Less than significant with mitigation

Mitigation Measures:

BMP GN-1: Work Site Housekeeping

SCWA will maintain the work site in a neat and orderly condition, and will leave the site in a neat, clean, and orderly condition when work is complete. To the extent feasible, slash, sawdust, cuttings, etc. will be removed to clear the site of vegetation debris. Paved access roads will be swept and cleared of any residual vegetation or dirt resulting from the maintenance activity.

For activities that last more than one day, materials or equipment left on the site overnight will be stored as inconspicuously as possible, and will be neatly arranged.

BMP GN-2: Public Outreach

1. In efforts to keep the public informed about stream maintenance work, why it is necessary, when it occurs, and what a neighborhood can expect when crews arrive to conduct maintenance work, SCWA will post and update information about the SMP and maintenance activities on their website (http://www.scwa.ca.gov/about_your_water/).
2. Each spring, once maintenance sites have been selected for the annual work season, a newspaper notice will be published with information on the maintenance sites, approximate work dates, and contact information. This information will also be posted on SCWA's website.
3. For high profile projects, at SCWA's discretion, signs will be posted in the neighborhood to notify the public at least one week in advance of maintenance schedules, trail closures, and road/land closures as necessary and as possible. Signage used at work sites will provide contact information for lodging comments and/or complaints regarding the activities.

BMP GN-3: Noise Control

1. With the exception of emergencies, normal work will be limited to normal business hours (8:00 a.m.–5:00 p.m.). Routine activities in residential areas will not occur on Saturdays, Sundays, or SCWA observed state holidays except during emergencies, or with approval by the local jurisdiction and advance notification of surrounding residents.
2. SCWA will ensure that power equipment (vehicles, heavy equipment, and hand equipment such as chainsaws) is equipped with original manufacturer's sound-control devices, or alternate sound control that is no less effective than those provided as original equipment. Equipment will be operated and maintained to meet applicable standards for construction noise generation. No equipment will be operated with an unmuffled exhaust.

BMP GN-4: Traffic Flow, Pedestrians, and Safety Measures

1. To the extent feasible, work will be staged and conducted in a manner that maintains two-way traffic flow on public roadways in the vicinity of the work site. If temporary lane closures are necessary, they will be scheduled outside of peak traffic hours (7:00-10:00 a.m. and 3:00-6:00 p.m.) to the maximum extent practicable, and advance warning signage, a detour route, and flaggers will be provided in both directions.

2. When work is conducted on public roads and may have the potential to affect traffic flow, work will be coordinated with local emergency service providers as necessary to ensure that emergency vehicle access and response is not impeded.
3. Public transit access and routes shall be maintained to the extent feasible. If public transit would be affected by temporary road closures and require detours, affected transit authorities will be consulted and kept informed of project activities.
4. Heavy equipment and haul traffic will be prohibited in residential areas, except when no other route to and from the site is available.
5. Roadway segments or intersections in the vicinity of project sites will be assessed to determine if they are at, or approaching an LOS that exceeds local standards. Maintenance traffic will avoid these locations to the extent feasible, either by traveling different routes or by traveling at non-peak times of day.
6. Adequate off-street parking will be provided or designated public parking areas will be used for maintenance workers' personal vehicles and maintenance-related vehicles not in use through the maintenance period.
7. Access for driveways and private roads will be maintained to the extent feasible. If brief periods of maintenance would temporarily block access, property owners will be notified prior to maintenance activities.

BMP GN-5: Odors

Sediment that is rich in decaying organic matter that could generate assorted malodorous gases such as reduced sulfur compounds shall be handled to minimize impacts on sensitive receptors such as nearby residents. In general, such materials will be hauled off of the site at the time of excavation. Where it needs to be temporarily stockpiled, maintenance personnel shall stockpile potentially odorous sediments as far as possible from residential areas or other odor sensitive land uses.

Impact REC-2: Permanent Changes on Recreational Quality (Beneficial)

With the exception of aesthetic changes related to vegetation management activities, the Program would have no permanent changes on recreational quality. As previously discussed in Chapter 3.1 *Aesthetics*, the long-term effect of these maintenance activities would have an overall beneficial impact on visual quality in the Program Area. The vegetation thinning activities will keep vegetation from growing over or on to the access roads and trails. Without vegetation removal, the network of trails would become overgrown with vegetation. On-site revegetation activities conducted as part of the SMP will result in a more well-developed riparian corridor with fewer non-native and invasive species, and create the appearance of a more “natural” stream corridor. However, the access roads and trails will be preserved as open areas to provide access. By improving the visual quality of the Program Area, the SMP would also enhance the recreational quality of users. This impact is considered beneficial.

Level of Significance: Beneficial

Impact REC-3: Temporary Disruption of Use of, or Access to, Recreational Facilities (Less than Significant with Mitigation)

Reservoirs and channels supporting public recreation would undergo vegetation and sediment removal activities under the Proposed Program. Public trails associated with these facilities could experience temporary disruptions during the period of active maintenance. While maintenance is being conducted, portions of existing trails or trail parking areas may be used as an access corridor or staging for vehicles and equipment. Trails where maintenance activities are occurring would be closed during channel maintenance, temporarily impeding recreational traffic during the work hours from 8 a.m. to 5 p.m. Although temporary, the proposed activities have the potential to impact these recreational resources.

While trails closures would affect recreation, such closures would be localized to a specific maintenance site, and alternative recreational opportunities would continue to be available along other streamside trails and recreational facilities in the study area (e.g., City parks). Further, the duration of the closures would be relatively short (generally less than one week) and recreationalists can utilize the sites during the evenings (after 5 p.m.) when work has been completed for the day. In addition, Good Neighbor Policy BMPs GN-2 and GN-4 (see Table 2-1), which require advance notification of closures and the implementation of warning signs, barriers and detours, would ensure that these activities do not result in significant access disruption or safety hazards along public trails or other recreational facilities. Therefore, any potential effects on recreational uses or access during construction would be less-than-significant with implementation of this BMP measure.

Level of Significance: Less than significant with mitigation

Mitigation Measures:

BMP GN-2: Public Outreach

See Impact PSU-1 above.

BMP GN-4: Traffic Flow, Pedestrians, and Safety Measures

See Impact PSU-1 above.

Impact REC-4: Long-term Use or Access Disruption of Recreational Facilities (No Impact)

As described above, once construction is complete, any affected paths or parking areas would be reopened for public use. Additionally, the maintenance activities would be located within the channel or bank and would not result in any permanent disruption to use of the path or any other recreation facilities. There is no impact. No mitigation is required.

Level of Significance: No Impact

Impact REC-5: Changes in Recreational Facility Use (Less than Significant with Mitigation)

As described in Impact PSU-3 above, the proposed Program would result in the closure of limited portions of trails and/or parking areas for access and staging during maintenance activities. However, these temporary closures would be intermittent and would not cause entire trails or facilities to become unavailable. Over the long term, the improvement to the stream conditions would improve the quality of the trails as recreational amenities.

In addition, the Good Neighbor Policy BMPs discussed above (GN-2 and GN-4) would also ensure recreational access and detours around project sites and staging areas. Thus, the Program would not result a significant displacement of recreational users that could accelerate the deterioration of nearby facilities. Furthermore, the SMP would not induce population growth or create other factors that could create additional demand for recreational facilities and require new or expanded facilities. This impact is considered to be less-than-significant with the implementation of BMPs GN-2 and GN-4. No additional mitigation is required.

Level of Significance: Less than significant with mitigation

Mitigation Measures:

BMP GN-2: Public Outreach

See Impact PSU-1 above.

BMP GN-4: Traffic Flow, Pedestrians, and Safety Measures

See Impact PSU-1 above.

Chapter 3.12

TRANSPORTATION AND TRAFFIC

Chapter 3.12

TRANSPORTATION AND TRAFFIC

3.12.1 Introduction

This chapter describes the transportation infrastructure and traffic conditions in the program vicinity and addresses transportation impacts associated with the implementation of the Proposed Program.

Terminology

Following are definitions of key traffic and transportation terms used in this chapter, based on materials published by the Transportation Research Board (Transportation Research Board 2000).

Level of service (LOS) – A qualitative measure describing operational conditions within a traffic stream, based on service measures such as speed and travel time, freedom to maneuver, traffic interruptions, comfort, and convenience. Roadway LOS is defined according to methodologies presented in the Highway Capacity Manual (Transportation Research Board 2000). Using the Highway Capacity Manual procedures, the quality of traffic operation is graded as one of six LOS designations: A, B, C, D, E, or F. LOS A and B represent the best traffic operations, LOS C and D represent intermediate operations, and LOS E and F represent high levels of congestion and unstable traffic flow.

Delay – The additional travel time experienced by a vehicle or traveler that results from inability to travel at optimal speed, and stops due to congestion or traffic control.

Freeway – A multilane divided highway with a minimum of two lanes in each direction and full access control, with no interruption in traffic flow. Freeways are used exclusively by vehicular traffic.

Highway – A roadway with two or more lanes that is not completely access-controlled, and may have at-grade crossings and/or occasional traffic signals. Multilane highways may be divided. Two-lane highways are typically undivided. Highways may accommodate bicycle traffic.

Local access roadway, local roadway – A roadway designed with the primary function of providing access to an adjacent site or development; a roadway that connects local points but does not accommodate through traffic.

3.12.2 Regulatory Setting

Federal Regulations

The only road in Sonoma County within the Federal Highway System is US 101. Improvements on US 101 must meet federal highway standards and are subject to the National Environmental Policy Act. Funding for the improvements is programmed through the regional Metropolitan Transportation Commission (MTC) and the Sonoma County Transportation Authority (SCTA), comprised of representatives of the County and each of the nine cities.

State Regulations

The California Department of Transportation (Caltrans) is responsible for several highways under the State system in Sonoma County: Highways 1, 12, 37, 116, 121, and 128. Improvements to these roads must meet Caltrans standards and are subject to the California Environmental Quality Act (CEQA). Funding is also programmed through the MTC and SCTA.

Local Regulations

The Transportation chapters of the local area general plans generally describe the existing circulation system and travel characteristics, project future traffic, and identify the resulting roadway deficiencies. The policies and programs contained within these chapters provide a guide for decisions regarding transportation systems and are aimed mostly at development projects to ensure that traffic impacts are mitigated. Since the activities proposed under the Stream Maintenance Program (SMP) would not result in development or population increases that would permanently increase traffic; these policies generally do not apply. Of the documents reviewed, the City of Cotati's *General Plan* and *2005 draft Citywide Transportation Improvement Plan* did not contain policies relevant to the Program.

The following is a summary of policies and regulations which are applicable to the SMP maintenance projects.

Sonoma County General Plan 2020

The following goals, objectives, and policies for the designation and review of new public facilities are included in the County's general plan and are applicable to the Proposed Program.

Policy CT-2t

Encourage measures to modify the timing of peak commute and school trips to reduce congestion, including reduced work weeks, flexible, variable or staggered work hours. Consider adoption of standards requiring Traffic Demand Management programs and telecommuting for new businesses and employment centers.

Goal CT-3

Provide and maintain a highway system capacity that serves projected highway travel demand at acceptable levels of service in keeping with the character of rural and urban communities.

- Objective CT-3.1* Maintain LOS C or better on roadway segments unless a lower LOS has been adopted as shown on Figure CT-3.
- Objective CT-3.2* Maintain LOS D or better at roadway intersections.
- Objective CT-3.3* Allow the above levels of service to be exceeded if it is determined to be acceptable due to environmental or community values, or if the project(s) has an overriding public benefit that outweighs lower levels of service and increased congestion.
- Policy CT-3a* Use the levels of service established in Objectives CT-3.1 and 3.3 to determine whether or not roadway segment congestion would exceed the desired LOS on the countywide road system. In cases where a roadway segment is designated as LOS F on Figure CT-3, a PM peak volume to capacity ratio of 1.2 is the acceptable LOS, with the exception of road segments shown below, for which the acceptable LOS is determined by the volume to capacity ratio or LOS as indicated.
- Policy CT-3d* Designate road segments in Urban Service Areas and in unincorporated communities as shown on Figures CT-1a through 1i for traffic calming improvements designations do not preclude traffic calming in other areas. Consider traffic calming on local roads where needed to improve safety. Avoid traffic calming on collectors and arterials unless designated on Figures CT-1a through 1i. Traffic calming improvements are primarily intended to accommodate local circulation, reduce traffic volumes, and decrease speeds in order to promote the safety of pedestrians and bicycles. The latter include, but are not limited to, one way streets, turn restrictions, traffic signals, stop signs, narrow lanes, roundabouts, road closures, pavement undulations, and measures that discourage truck traffic.

City of Petaluma General Plan 2025

The following policies contained in the City of Petaluma's General Plan are applicable to the Proposed Program.

- Policy 5-P-9* Ensure safety improvements are undertaken in response to the changing travel environment.
- C. Designate official truck routes to ensure truck traffic minimizes its impact on residential neighborhoods and avoids mixed use and main streets, where possible, and enforce truck parking restrictions.
- Policy 5-P-10* Maintain an intersection level of service (LOS) standard for motor vehicle circulation that ensures efficient traffic flow and supports multi-modal mobility goals. LOS should be maintained at Level D or better for motor vehicles due to traffic from any development project.

City of Rohnert Park General Plan

The following goals contained in the City of Rohnert Park's General Plan are applicable to the Proposed Program.

<i>TR-A</i>	Promote safe and efficient vehicular circulation throughout Rohnert Park.
<i>TR-B</i>	Maintain high levels of mobility along all major street segments and at major intersections.
<i>TR-E</i>	Discourage high-speed traffic and trucks from using local streets.

City of Santa Rosa 2020 General Plan

The following policies contained in the City of Santa Rosa's General Plan are applicable to the Proposed Program.

<i>T-B</i>	Provide a safe, efficient, free-flowing circulation system.
<i>T-D</i>	Maintain acceptable traffic flows.
<i>T-D-1</i>	Maintain a Level of Service (LOS) D or better along all major corridors. Exceptions to meeting the standard include: Within downtown; <ul style="list-style-type: none">■ Where attainment would result in significant environmental degradation;■ Where topography or environmental impacts makes the improvement impossible; or■ Where attainment would ensure loss of an area's unique character.
<i>T-L-5</i>	Maintain all roadways and bicycle-related facilities so they provide safe and comfortable conditions for bicyclists.
<i>T-L-6</i>	Consider bicycle operating characteristics and safety needs in the design for roadways, intersections, and traffic control systems.

City of Sebastopol General Plan

The following transportation policies contained in the City of Sebastopol's General Plan are applicable to the Proposed Program.

<i>P.16</i>	Level of Service Standards: Establish LOS
<i>Program 16.1</i>	Adopt the following LOS standards: a. At intersections: Allow a minimum operation of LOS D for signalized intersections within the Downtown; an LOS C for all

signalized intersections outside of the Downtown; and LOS D for all side street movement at signalized intersections.

- b. On Road Segments: Allow a minimum LOS E for Highway 12, east of Main Street.; LOS D for Highway 116 and Bodega Avenue; and LOS C for all other road segments.
- c. On Local Residential Streets: Allow a maximum of 1,500 to 2,000 vehicles per day on all existing residential streets and a maximum of 1,000 to 1,500 vehicles per day on all new residential streets.

P.17 Reduce through traffic on local streets.

Program 17.1 Adopt and enforce a truck route plan for Sebastopol that limits trucks to arterial and collector streets, and specifies weight limitations and fines for non-compliance. Install route signs as appropriate.

Program 17.2 Develop measures to reduce traffic on local residential streets where traffic studies confirm that traffic volumes on such streets exceed the LOS established in this Chapter.

City of Sonoma General Plan 2020

The following policies contained in the City of Sonoma's General Plan are applicable to the Proposed Program.

3.9 Protect residential areas by keeping traffic speeds low and discouraging through truck traffic.

3.9.2 Establish and enforce truck routes and regulations that apply to all heavy vehicles, including delivery trucks and tour buses.

Town of Windsor General Plan - 2015

The following policies contained in the Town of Windsor's General Plan are applicable to the Proposed Program.

D.2.6 The Town should establish level of service standards to define the minimum acceptable operating characteristics for intersections and streets. A level of service D is defined as the minimum acceptable level of congestion for high volume facilities such as freeways, boulevards, and signalized intersections. This standard should apply at all these locations except at the intersection of Old Redwood Hwy/U.S. 101 Northbound offramps/ Lakewood Drive. A level of service E is tolerated at this intersection by the Town because it is a "critical" location into the Town's commercial and civic areas, in addition to being located at the main northbound off-ramp from U.S. 101. For local streets, a more appropriate performance standard is daily traffic volume.

D.4

Level of Service Standards. The Town shall adopt a level of service standard D for Crosstown Streets and signalized intersections. The Town shall recognize that reducing congestion must be balanced against improvement costs and community character concerns. The standard shall be used for planning new facilities and for monitoring proposed changes to the General Plan. The standard for local streets should be based on volume thresholds instead of level of service designations.

The Town of Windsor also requires a Transportation Permit authorizing the operation or movement upon Town streets of non-reducible vehicles and loads of a size and/or weight as allowed in the California Vehicle Code (CVC) Section 35780.

3.12.3 Environmental Setting

This section discusses the existing conditions related to transportation in the Program Area.

Regional Access

Although several freeways are located within Sonoma County, the most heavily used are US 101 and SR 12. US 101 is the county's principal freeway and the primary north-south highway linking the county to Marin County and San Francisco to the south, and Mendocino County to the north. The highway is currently four lanes for most of its length and frequently experiences congestion and delays during peak travel periods (Sonoma County 2006). Upgrades to add additional traffic lanes through the City of Santa Rosa are currently underway.

State Highway 12 (also known as the Sonoma Highway) links Sebastopol, Santa Rosa, the Sonoma Valley, and Napa County. It also provides an important connection to the Interstate 80 corridor. Highway 12 experiences recurring congestion mainly near US 101 and its two end points in Santa Rosa. The two lane sections in Sebastopol and in the Sonoma Valley are severely congested on both weekdays and weekends. Congestion is particularly bad during summer months, due to a variety of recreational attractions (e.g., wineries, special events, the Infineon Raceway, etc.) (Sonoma County 2006).

Highway 116 is a two-lane road that provides an east-west connection between Highway 1 and Sonoma. Congestion is most severe on weekends due to recreational traffic, particularly in Guerneville and Sebastopol. Other State highways with substantial weekend traffic are State Highway 121 (between Highway 37 and the Napa County line), Highway 37, and Highway 1. Note that because all SMP activities would occur on weekdays, weekend congestion would not affect the Program.

Local Roadway Networks

The following section briefly describes the local roadway network and existing conditions, as available.

City of Rohnert Park

Rohnert Park's street network includes two major north/south arterials, Petaluma Hill Road and Stony Point Road, which are partially used as bypass routes for trips between Santa Rosa and Petaluma. The Rohnert Park Expressway, East Cotati Avenue, and Southwest Boulevard provide the City's east/west connection. Areas that experience major congestion and delays include interchanges with Highway 101, Snyder Lane, Rohnert Park Expressway, and Commerce Boulevard (City of Rohnert Park 2000).

City of Santa Rosa

The City of Santa Rosa contains numerous arterials and collector streets that make up the City's road network. Principal among them include Dutton Avenue, Fulton Road, Santa Rosa Avenue, Stony Point Road, Sebastopol Road, Third Street, and Guerneville Road. These major routes are supported by a number of lesser arterials, collectors, and local streets. Inadequate roadway infrastructure and high commute volumes have resulted in approximately 19 failing intersections throughout the City (City of Santa Rosa 2001).

City of Sebastopol

Sebastopol's internal roadway network consists of major arterials such as Petaluma Avenue and Bodega Avenue, and numerous collector streets and local roadways. The most severe traffic congestion occurs during the afternoon weekday commute periods, with most non-signalized intersections in downtown operating at failing LOS (City of Sebastopol 1994).

City of Sonoma

Within the City of Sonoma, the major north/south carriers of traffic are Sonoma Highway, Fifth Street West, Broadway, and Eighth Street East. The major east/west roadways include Spain Street, Napa Street, Andrieux Street, MacArthur Street, and Napa/Leveroni Roads. These major routes are supported by a number of lesser arterials, collectors, and local streets. Three intersections and three roadway segments currently operate at unacceptable LOS (City of Sonoma 2004).

City of Petaluma

The major northwest/southeast arterials within the City of Petaluma are McDowell Boulevard, Sonoma Mountain Parkway, Payran Street, Ely Boulevard, and Petaluma Boulevard. The principal northeast/southwest streets include East Washington Boulevard, D Street, I Street, Caulfield Lane, and Western Avenue. Lakeville Highway traverses east-west through the city. A number of lesser collector and local streets comprise the road network for the City. The majority of intersections operate at LOS C or better during the AM and PM peak hours. Nine intersections operate at LOS D or worse during peak hour (approaching capacity) (City of Petaluma 2006).

Town of Windsor

The principal roadways that provide cross town access within Town of Windsor include Shiloh Road, Old Redwood Highway, Windsor Road, Starr Road, Arata Lane, and Hembree Lane. LOS information was not published as part of the General Plan.

Pedestrian, Bicycle, and Equestrian Access

As previously discussed in Chapter 3.11 *Recreation*, public access is provided along portions of Sonoma County Water Agency (SCWA) facility alignments.

Public Transit

Sonoma County is served by a variety of transit operators, including those which provide municipal services, countywide service, and regional transit. Sonoma County Transit and Golden Gate Transit are the two major transit systems serving the county.

The cities of Petaluma, Sonoma, Santa Rosa, Sebastopol, and Healdsburg provide municipal transit services. The City of Rohnert Park also contracts with Sonoma County transit for local bus service in its city (Sonoma County 2006).

Mendocino Transit Authority provides infrequent service between Highway 1 and Santa Rosa. Route 65 runs from Mendocino to Santa Rosa via US 101, while Route 95 travels from Point Arena to Santa Rosa via Highway 1.

Regional inter-county transit service is provided by Golden Gate Transit (GGT). GGT operated eight transit routes in 2000, some of which subsequently have been reduced due to budget cuts. Route 80 offers all-day service between Santa Rosa and San Francisco. The other routes are commuter routes which offer only peak hour and peak direction service during morning and evening commute periods (Sonoma County 2006).

Parking

Parking is available along roadways in designated areas, in parking lots, and occasionally provided as pull-out areas. The number and type of these parking areas vary by location due to city or County policies.

3.12.4 Impact Analysis

Methodology

Traffic impacts associated with implementation of the Proposed Program were identified by evaluating Program activities in the context of local and regional circulation patterns, impacts to existing roadway configurations, lane closures, local traffic operation requirements during maintenance activities, and relevance to standard traffic control plan requirements and strategies. The criteria for determining the significance of potential impacts are outlined below. The discussion below identifies key assumptions used in the impact analysis.

Criteria for Determining Significance

According to the State CEQA Guidelines and professional standards, a project is considered to have a significant effect on the environment if it would:

- cause an increase in traffic that is substantial in relation to the existing traffic volumes and capacity of the roadway system;
- exceed, either individually or cumulatively, a LOS standard established by local jurisdictions for designated roadways or highways;
- substantially increase safety hazards due to design features (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment);
- result in inadequate emergency access;
- result in inadequate parking capacity; or
- conflict with adopted policies supporting alternative transportation.

Environmental Impacts

Impact TR-1: Increase in Area Traffic Volumes and Degradation of LOS Due to SMP-Generated Traffic (Less than Significant with Mitigation)

The Program's effect on traffic in the Program Area would be limited to temporary impacts due to maintenance vehicle and haul trips associated with maintenance activities. Maintenance-related traffic would consist primarily of daily commutes by maintenance workers and periodic delivery and removal of materials to and from the site over the course of the maintenance period. The number of maintenance workers and vehicles would vary by project, phase, planned activity, and material needs.

The manner by which SMP maintenance activities are likely to affect traffic volumes and LOS in the Program Area are discussed below:

Temporary Lane Closures

SMP activities could include the physical encroachment into the traveled way. The availability of travel lanes may be affected when maintenance occurs within or adjacent to roadways and a portion of the pavement is required for maintenance purposes. Where insufficient widths for both maintenance vehicles and regular traffic occur, temporary closing or narrowing of lanes may be necessary to conduct maintenance activities.

Lane closures could lead to traffic delays, temporary reductions in roadway level of service, or create traffic hazards. However, Best Management Practice (BMP) GN-4 *Traffic Flow, Pedestrians, and Safety Measures* would be implemented, which states that two-way traffic on public roadways will be maintained to the extent feasible. If lane closures or traffic delays cannot be avoided, advance notice of road closures would be given to service providers and the general public, and adequate warning and detour signs will also be provided to safely guide travelers during maintenance activities, as described under BMP GN-2 *Public Outreach*. BMP GN-4 also stipulates that temporary lane closures are scheduled outside of peak traffic hours to the maximum extent feasible.

As such, the implementation of these measures would minimize the effects of temporary lane closures on traffic operations.

Maintenance Worker Trip Generation

Maintenance workers would need to access the work sites, which would add vehicle traffic to area roadways. Typically, maintenance workers meet at the SCWA maintenance yard and take one truck or van to the work site. Even if each worker drove his or her own vehicle and traveled alone, based on the anticipated number of workers (between 3 and 8, depending on the maintenance activity), the number of additional vehicle trips generated by maintenance at any given location would be quite small. Thus, even the maximum number of additional trips likely to result from maintenance (8 round trips per day) is considered unlikely to result in a noticeable change in traffic flow or intersection LOS on regional and local access routes.

Maintenance Activity Mobilization and Materials Deliveries

Heavy equipment would be needed for a variety of SMP activities, and would be delivered to the work site on trailers and/or flatbed trucks. Haul trucks (flatbeds and/or dump trucks) would be needed to deliver materials to the site. This type of traffic could result in short-term increases in traffic volumes traveling on roadways and waiting at intersections in the vicinity of the individual projects.

SMP-related traffic may also temporarily contribute trip volume to cumulative impacts, including at roadways and intersections that currently operate below local LOS standards or that are anticipated to operate below those standards in the future. Slower travel speeds, large size and turning radii typically associated with this kind of traffic could temporarily reduce roadway capacity and result in minor increases in congestion and delay for vehicles.

The specific impact of heavy equipment traffic on roadways would depend on the number and type of vehicles, the number of travel lanes on the roadways, existing traffic volumes on these roadways, the terrain, and other factors.

However, temporary traffic increases are common to all maintenance projects and generally are not considered a significant impact because of their limited duration and intermittent activity. Furthermore, as mentioned above, BMP GN-4 would minimize the effects of SMP traffic on the roadways adjacent to the project sites and minimize the effects on traffic operations by avoiding peak hours and roadway segments in the vicinity of project areas which are at or approaching an LOS that exceeds local standards. As such, SMP traffic will avoid impacting these locations either by traveling different routes or by traveling at non-peak times of day.

With the adherence to these standard measures, temporary impacts of maintenance activity mobilization and material delivery traffic would be less than significant.

Truck Trips Associated with Disposal of Excess Materials

The principal increase in traffic from SMP activities would be the number of truck trips required to haul excavated or mulched materials for reuse or disposal elsewhere. Under bank stabilization activities, minimal, if any, excess material is expected to be generated that would require off-site disposal. Sediment and vegetation management both entail the removal of excess materials, requiring the use of haul trucks. Sediment management activities would result in the greatest amount of disposal material, averaging approximately

10,000 - 25,000 CY per year. As discussed in the SMP Manual, this range of estimated annual sediment removal volume is based on past records. Sediment removal for a particular year represents a combination of factors including rainfall and erosion conditions during the previous winter season or two, and the extent of maintenance activities in the recent years. For individual maintenance projects, the range of sediment removal may range from 100 CY for localized sediment removal projects up to 7,500 CY for the larger reach-scale sediment removal projects. A variety of sites may be used for fill disposal.

Based on the 10,000 - 25,000 CY estimated range of annual excavated sediment requiring disposal, between 1,000 and 2,500 truck haul trips would be generated using standard 10-CY capacity trucks. Assuming that sediment maintenance activities would occur during the typical maintenance season, this represents 1,000 to 2,500 truck trips over a period of approximately 4 months or about 80 workdays, translating to approximately 10-32 truck trips per day, or 1.3 to 4 truck trips per hour over an 8-hour workday. With larger 20-cy trucks, this could be halved, to approximately 6-16 truck trips per day or one to two truck trips per hour.

Vegetation maintenance activities are often conducted by 2-3 vegetation crews during the summer, reducing to 1-2 crews working during the winter months for pruning along the upper creek banks. During the summer when vegetation maintenance activities are at their peak, 3-4 loads of mulch can be generated per day. The mulch would be driven to various places, such as local landscaping supply businesses or local landfills, in a standard 10-CY capacity truck. Considering that sediment removal and vegetation maintenance activities would occur at the same time, the total truck trips would be approximately 13-36 per day or 1.6 to 4.5 truck trips per hour over an 8-hour workday.

Because truck trips would be intermittent and dispatched to and from varying locations, the addition of approximately 10-36 truck trips per day over 80 work days would not cause substantial degradation of LOS or delay for motorists in the Program Area.

Furthermore, implementation of BMP GN-4 would minimize the effects of disposal traffic on haul routes by avoiding residential roads and congested areas, to the extent feasible. . Implementation of these standard measures would ensure that temporary impacts of haul traffic would be less than significant.

Summary

In summary, with implementation of BMP GN-4, impacts on traffic from temporary lane closures, maintenance worker trips, maintenance activity mobilization and materials deliveries, and truck trips associated with fill disposal would be less than significant.

Level of Significance: Less than significant with mitigation

Mitigation Measures:

BMP GN-2: Public Outreach

1. In efforts to keep the public informed about stream maintenance work, why it is necessary, when it occurs, and what a neighborhood can expect when crews arrive to conduct maintenance work, SCWA will post and update information about the SMP and maintenance activities on their website (http://www.scwa.ca.gov/about_your_water/).

2. Each spring, once maintenance sites have been selected for the annual work season, a newspaper notice will be published with information on the maintenance sites, approximate work dates, and contact information. This information will also be posted on SCWA's website.
3. For high profile projects, at SCWA's discretion, signs will be posted in the neighborhood to notify the public at least one week in advance of maintenance schedules, trail closures, and road/land closures as necessary and as possible. Signage used at work sites will provide contact information for lodging comments and/or complaints regarding the activities.

BMP GN-4: Traffic Flow, Pedestrians, and Safety Measures

1. To the extent feasible, work will be staged and conducted in a manner that maintains two-way traffic flow on public roadways in the vicinity of the work site. If temporary lane closures are necessary, they will be scheduled outside of peak traffic hours (7:00-10:00 a.m. and 3:00-6:00 p.m.) to the maximum extent practicable, and advance warning signage, a detour route, and flaggers will be provided in both directions.
2. When work is conducted on public roads and may have the potential to affect traffic flow, work will be coordinated with local emergency service providers as necessary to ensure that emergency vehicle access and response is not impeded.
3. Public transit access and routes shall be maintained to the extent feasible. If public transit would be affected by temporary road closures and require detours, affected transit authorities will be consulted and kept informed of project activities.
4. Heavy equipment and haul traffic will be prohibited in residential areas, except when no other route to and from the site is available.
5. Roadway segments or intersections in the vicinity of project sites will be assessed to determine if they are at, or approaching an LOS that exceeds local standards. Maintenance traffic will avoid these locations to the extent feasible, either by traveling different routes or by traveling at non-peak times of day.
6. Adequate off-street parking will be provided or designated public parking areas will be used for maintenance workers' personal vehicles and maintenance-related vehicles not in use through the maintenance period.
7. Access for driveways and private roads will be maintained to the extent feasible. If brief periods of maintenance would temporarily block access, property owners will be notified prior to maintenance activities.

Impact TR-2: Increase in Safety Hazards (Less than Significant with Mitigation)

SMP activities could result in the temporary closing or narrowing of lanes in the vicinity of the project sites. As previously noted in Impact TR-1, temporary reduction in the number or the available width of travel lanes and could subject vehicles using the affected roadways to increased hazards, congestion, and delays.

Any required road closures could also create traffic hazards affecting vehicle, transit, bicycle, and pedestrian traffic in the area. Because maintenance activities could temporarily

suspend the normal function of roadways, the potential exists for an increase in traffic safety hazards during this period. The increase in safety hazards results from the increased potential for conflicts between maintenance vehicles; conflicts between the movement of traffic and maintenance activities; and confusion of drivers, bicyclists, and pedestrians due to temporary alterations in otherwise familiar roadway conditions.

As part of SMP activities, BMP GN-4 *Traffic Flow, Pedestrians, and Safety Measures* would be implemented which ensures that work would be staged and conducted in a manner that would maintain 2-way directional flow and that temporary lane closures are scheduled outside of peak traffic hours. In addition, BMP GN-4 includes provisions for advance notification and adequate warning signage, and conducting pre-maintenance communications to notify affected agencies and parties. Adherence to these measures would ensure proper planning of traffic management during maintenance activities, and would provide adequate public awareness of temporarily altered road conditions and potential hazards.

The SMP does not propose any changes that would permanently reconfigure or alter roadways, and therefore the Program would not result in a permanent impact on roadway safety conditions. With the adherence to the BMPs described in Table 2-1, the Program's impact on traffic safety hazards would be less than significant.

Level of Significance: Less than significant with mitigation

Mitigation Measures:

BMP GN-4: Traffic Flow, Pedestrians, and Safety Measures

See Impact TR-1 above

Impact TR-3: Interference with Emergency Access and Circulation (Less than Significant with Mitigation)

Road closures, detours, and SMP-related traffic could delay or obstruct the movement of emergency vehicles in the Program Area. If maintenance activities interfere with emergency response efforts such that response times would be extended, a significant impact would result. However, the implementation of BMP GN-4, listed in Table 2-1, includes measures ensuring the timely notification of maintenance schedules and consultation with all affected agencies (including police and fire departments) for all activities which could affect emergency access.

The SMP does not propose any structures that would permanently block or constrain roadways, and therefore the Program would not result in a permanent impact on emergency access. With the adherence to the BMPs described in Table 2-1, the Program's impact on emergency access would be less than significant.

Level of Significance: Less than significant with mitigation

Mitigation Measures:

BMP GN-4: Traffic Flow, Pedestrians, and Safety Measures

See Impact TR-1 above

Impact TR-4: Increase in Parking Demand (Less than Significant with Mitigation)

The SMP would not generate permanent parking demand, and the activities proposed would not provide permanent parking. Maintenance activities would require temporary parking for maintenance workers. However, as detailed in BMP GN-4, temporary parking would be provided in selected areas and in numbers sufficient to serve the temporary needs for each site. With adherence to BMP GN-4, the Program would not result in significant parking impacts.

Level of Significance: Less than significant with mitigation

Mitigation Measures:

BMP GN-4: Traffic Flow, Pedestrians, and Safety Measures

See Impact TR-1 above

Impact TR-5: Conflicts with Alternative Transportation (Less than Significant with Mitigation)

The Program would not result in permanent effects on public transit, bicycle, or pedestrian traffic. Temporary SMP activities occurring within existing streets could disrupt public transit operations, as well as pedestrian and bicycle access to transit stops, general access along designated bike routes and trails, and sidewalk-based pedestrian access.

Where road or lane closures are required, bus routes would need to be temporarily detoured, and bus stops would need to be temporarily relocated. These effects would also extend to closures of trails and access roads, not normally used by through vehicular traffic. Although temporary closures of roads and trails are not considered significant impacts because of their limited duration, BMPs GN-2 and GN-4 include measures to minimize adverse effects related to these activities. Consultation with transit providers, as stated in BMP GN-4, will ensure that effects on transit systems would be accounted for and that service would not be significantly disrupted. Pre-maintenance public notifications, signage, and flaggers, as stated in BMP GN-4, will be adequate to alert transit passengers and bicycle and pedestrian traffic to revised routes and hazards during maintenance activities.

With adherence to these policies, the Program's temporary impacts on alternative transportation would be less than significant.

Level of Significance: Less than significant with mitigation

Mitigation Measures:

BMP GN-2: Public Outreach

See Impact TR-1 above

BMP GN-4: Traffic Flow, Pedestrians, and Safety Measures

See Impact TR-1 above

4.1 Introduction

This chapter presents discussions of irreversible impacts, significant and unavoidable impacts, growth-inducing impacts, and cumulative impacts as required by the California Environmental Quality Act (CEQA) Guidelines.

4.2 Irreversible Impacts

CEQA Guidelines Section 15126.2(c) requires that an environmental impact report (EIR) must identify any irreversible impacts, also referred to as irreversible environmental changes that may be caused by a proposed project including current or future commitments to using non-renewable resources, secondary, or growth-inducing impacts that commit future generations to similar uses. Section 15126 of the CEQA Guidelines states that significant irreversible environmental changes associated with a proposed project may include the following:

- uses of non-renewable resources during the initial and continued phases of the project which may be irreversible because a large commitment of such resources makes removal or nonuse thereafter unlikely;
- primary impacts and, particularly, secondary impacts (such as highway improvement that provides access to a previously inaccessible area) that commit future generations to similar uses; and
- irreversible damage, which may result from environmental accidents associated with the project.

The irretrievable commitment of nonrenewable resources would occur as a result of the Proposed Program. Implementation would involve ongoing maintenance activities, which would require the use of fossil fuels and other non-renewable resources. The Stream Maintenance Program (SMP) would not make future use of such resources compulsory, should alternative means of flood control be implemented that alleviate the need for maintenance. Indeed, the practices in the SMP should reduce the need for maintenance over time. In addition, the SMP is not anticipated to have secondary impacts that commit future generations to similar uses or result in irreversible damage.

4.3 Significant and Unavoidable Impacts

Section 15126.2(b) further requires an EIR to describe any significant impacts that cannot be mitigated to a level of insignificance. All of the impacts associated with the proposed project would be reduced to a less-than-significant level through the implementation of identified mitigation measures and Best Management Practices (BMPs), with the exception

of the impacts discussed below. The following impacts have been identified as significant and unavoidable.

Aesthetic Impacts of Maintenance Activities

Overall, the long-term effect of maintenance activities would result in a beneficial impact on the aesthetic conditions in the Program Area. However, temporary degradation of visual quality due to site disturbance from maintenance activities could affect sensitive viewer groups. Although BMPs and revegetation activities would be implemented, these short-term adverse impacts would still be considered to be significant. In order to achieve the longer-term goals of the Program, these temporary adverse visual impacts are unavoidable. As such, this is considered a significant and unavoidable impact. For a more complete discussion of this impact, please refer to the discussion under Impact AES-3 (Chapter 3.1 *Aesthetics*).

Aesthetic Impacts of Sediment Disposal

Sediment disposal in general would have less than significant impacts. However, in cases where the Sonoma County Water Agency (SCWA) gives the sediment to another entity, SCWA would not necessarily have control over what is done with the sediment. This could potentially result in adverse aesthetic impacts. For instance, sediment could be used by private land developers to build berms or building pads which could have adverse visual effects. Such adverse visual impacts would be unlikely and infrequent. However, because they are possible, and because SCWA does not necessarily have the authority to require mitigation in all cases, this impact was identified as significant and unavoidable. For a more complete discussion of this impact, please refer to the discussion under Impact AES-5 (Chapter 3.1, *Aesthetics*). The cumulative impact associated with sediment reuse by other non-SCWA entities is described below as Cumulative Impact 13 in Section 4.5.3.

Temporary Noise Impacts in the City of Santa Rosa

Maintenance activities would be temporary, short-term, and would only occur during business hours on weekdays. As such, it would conform to the noise ordinances associated with most jurisdictions, which restrict the hours of construction noise. Further, modeled noise levels from maintenance activities would be below the numeric standards of most jurisdictions which have such standards. However, the City of Santa Rosa has a stringent noise control standard, which requires that construction noise does not exceed ambient noise levels by more than 5 dBA. Ambient noise levels in the City range between 55 and 70 dBA, depending upon land use. Because maintenance activities would exceed 70 dBA in proximity to the work sites, the SMP has the potential to violate the City of Santa Rosa's noise control standard. Additional mitigation beyond that identified, such as temporary noise barriers, is not considered feasible. As such, this impact was identified as significant and unavoidable. For a more complete discussion of this impact, please refer to the discussion under Impact NZ-1 (Chapter 3.9, *Noise*).

Cumulative Emissions of PM10 and Ozone Precursors

Channel maintenance activities would involve ground disturbance and vehicle usage that would emit both particulates and ozone precursors. Given the non-attainment status for these pollutants, any project contribution to these significant cumulative impacts would be

considerable. While implementation of BMPs AQ-1 and AQ-2 would reduce PM₁₀ emissions, they would not address the emissions of ozone precursors, nor would they fully eliminate PM₁₀ emissions. No other feasible mitigation has been identified to further reduce emissions of these pollutants. As such, this cumulative impact is considered significant and unavoidable.

4.4 Growth Inducement

Section 15126.2(d) of the state's CEQA Guidelines requires an EIR to include a detailed statement of a proposed project's anticipated growth-inducing impacts. The analysis of growth-inducing impacts must discuss the ways in which a proposed project could foster economic or population growth or the construction of additional housing in the project area. The analysis must also address project-related actions that, either individually or cumulatively, would remove existing obstacles to population growth. A project would be considered growth inducing if it induces growth directly (through the construction of new housing or increasing population) or indirectly (increasing employment opportunities or eliminating existing constraints on development). Under CEQA, growth is not assumed to be either beneficial or detrimental.

The Program would not involve new development or infrastructure installation that could directly induce population growth in the Program Area. Additionally, the Program would not involve construction of new housing or create a demand for additional housing. No additional staff would be required to carry out the proposed activities under the SMP. Furthermore, the Proposed Program would not displace any existing housing units or persons. The Program Area is located on publicly owned lands, and no housing exists within the limits of proposed activity.

Therefore, the proposed SMP would have no impact on population growth or housing demand.

4.5 Cumulative Impacts

Cumulative impacts refer to two or more individual impacts that, when considered together, are considerable or that compound or increase other environmental impacts. Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time. Under CEQA, an EIR must discuss the cumulative impacts of a project when the project's incremental contribution to the group effect is "cumulatively considerable." An EIR does not need to discuss cumulative impacts that do not result in part from the project evaluated in the EIR.

A cumulative impact refers to the combined effect of "two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts" (CEQA Guidelines Sec. 15355). As defined by the state of California, cumulative impacts reflect "the change in the environment which results from the incremental impact of the project when added to other closely related past, present, and reasonably foreseeable probable future projects. Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time." (CEQA Guidelines Sec. 15355[b])

The state's CEQA Guidelines (Sec. 15130[a]) require that an EIR address the cumulative impacts of a proposed project when

- the cumulative impacts are expected to be significant; and
- the project's contribution to the cumulative impact is expected to be cumulatively considerable, or significant in the context of the overall (cumulative) level of effect.

In order to meet the adequacy standard established by Section 15130 of the CEQA Guidelines, an analysis of cumulative impacts must contain the following elements.

- An analysis of related future projects or planned development that would affect resources in the project area similar to those affected by the proposed project.
- A summary of the environmental effects expected to result from those projects with specific reference to additional information stating where that information is available.
- A reasonable analysis of the combined (cumulative) impacts of the relevant projects.

It must also evaluate a proposed project's potential to contribute to the significant cumulative impacts identified, and discuss feasible options for mitigating or avoiding any contributions assessed as cumulatively considerable.

The discussion of cumulative impacts is not required to provide as much detail as the discussion of the effects attributable to the project alone. Rather, the level of detail should be guided by what is practical and reasonable. In addition, Section 15130(e) of the CEQA Guidelines directs that if a cumulative impact was adequately addressed in a prior EIR for a general plan, and the proposed project is consistent with that general plan, the project EIR need not further analyze that cumulative impact.

Lead agencies may use a "list" approach to identify related projects, or may base the identification of cumulative impacts on a summary of projections in an adopted general plan or related planning document (CEQA Guidelines Sec. 15130[b]) (the "projection" approach).

4.5.1 Methods Used in this Analysis

As appropriate, this analysis considered short-term (construction-related) and long-term (operational) contributions separately. Analysis of the proposed program's contribution to cumulative regional impacts focused on the direct impacts of maintenance projects.

The cumulative impact analysis used the projection approach. Table 4-1 provides an overview of the planning documents used in the analysis; Sonoma County was the geographic area considered for the cumulative impact analysis. Additional information on each planning document can be obtained from the Regulatory Framework section of each individual impact discussion contained in Chapter 3. Table 4-2 illustrates population growth projections in the County.

Table 4-1. Planning Documents Considered for Cumulative Impact Analysis

Document	Summary
Sonoma County 2020 General Plan (2008)	<p>The broad purpose of the Sonoma County General Plan is to express policies which will guide decisions on future growth, development, and conservation of resources through 2005 in a manner consistent with the goals and quality of life desired by the county's residents. It specifically addresses the unincorporated areas of the County. The plan established nine major planning goals as the basic framework of its goals, objectives, and policies. They relate to the following subjects:</p> <ul style="list-style-type: none"> ▪ Growth projections and growth policy; ▪ City and community centered growth; ▪ Compact city and community boundaries; ▪ Phasing of rural and urban growth with availability of adequate services; ▪ Open space separation between cities/communities; ▪ Opportunities for diverse rural and urban residential environments; ▪ Use of environmental suitability criteria to locate urban and rural growth; ▪ Protection of agricultural lands; and ▪ Preservation of scenic features and biotic resource areas. <p>Within that framework, the 2020 General Plan addresses significant events that have occurred since the prior plan, and updates policies for selected issues. Key events include:</p> <ul style="list-style-type: none"> ▪ the emergence of wine grapes as the dominant agricultural commodity; ▪ growth which exceeded prior projections; ▪ the incorporation of the Town of Windsor; ▪ a sequence of major floods in the Russian and Petaluma River Basins; ▪ listing of salmonids as endangered or threatened species; ▪ litigation over the Housing Element; ▪ the creation of the Agricultural Preservation and Open Space District and accompanying funding measure; ▪ the temporary water supply impairment and longer term questions regarding the availability of water from the Eel River and Russian River Basin; ▪ regional and local wastewater system capacity problems; and ▪ major reorganization of County Government, particularly the consolidation of permitting services at Permit and Resource Management Department (PRMD). <p>The plan presents only limited land use map changes from the previous general plan; the majority of current land use designations and policies that concentrate future growth in the cities and county urban service areas remains unchanged. Only minor changes to land use maps are included, primarily to correct long-standing legal nonconforming uses and to implement changes necessitated by policy changes emanating from the selected issues.</p>
Healdsburg General Plan	The Healdsburg General Plan seeks to preserve Healdsburg's small-town character and quality of life while providing for

Table 4-1. Planning Documents Considered for Cumulative Impact Analysis

Document	Summary
(1987)	economic development that capitalizes on Healdsburg’s location and natural assets. The plan is in the process of being updated; the updated General Plan is based on a number of guiding principles intended to achieve the overall objective. These principles are organized around the topics of identity, balance, sustainability, mobility, vitality, livability, and safety.
Town of Windsor General Plan – 2015 (1996)	<p>Key challenges addressed in the Windsor General Plan include town identify, community life, economic viability, preservation of agricultural/natural resources, and growth management. The vision of the plan is to foster and promote an image of the Town as a place with a strong sense of community, a friendly, family-oriented community, a community with an active, involved citizenry, and a vital and growing community with small town character. Central to achieving this vision include the Town’s desires to:</p> <ul style="list-style-type: none"> ▪ create a strong Town identity; ▪ promote a unified, vital community; ▪ organize the community in a coherent fashion, marked by high quality buildings, streets, and open spaces; ▪ revitalize Old Town as the civic and cultural heart of the Town; ▪ preserve agricultural and natural resources; and ▪ manage growth and provide necessary community services and facilities concurrent with the needs of future development
Santa Rosa 2020 General Plan (2002)	<p>The Santa Rosa 2020 General Plan addresses issues related to physical development, growth, and conservation of resources in the City’s Planning Area. General Plan objectives include the following:</p> <ul style="list-style-type: none"> ▪ Outline a vision and provide implementing policies for long-range physical and economic development that reflects the aspirations of the community; ▪ Establish a basis for evaluating specific development proposals and public projects; ▪ Allow City departments, other public agencies, and private developers to design projects that will enhance the character of the community, preserve and enhance critical environmental resources, and minimize hazards; and ▪ Provide the basis for establishing and setting priorities for detailed plans and implementing programs, such as the Zoning Ordinance, specific and area plans, and the Capital Improvement Program. <p>The plan is based on a set of Guiding Principles which address the following topics: high quality development; provision of infrastructure; matching employment growth to housing availability; pedestrian, bicycle and transit alternatives; downtown mix of uses; conservation of natural assets; meeting local housing needs; youth facilities and programs; connectivity; neighborhood recreational opportunities; employment development; scenic streetscapes; and expanded art and culture.</p> <p>The plan focuses on reuse and intensification of the Downtown, and various arterial corridors radiating outward from Downtown, as well as development of small neighborhood-oriented centers within new residential neighborhoods. The plan</p>

Table 4-1. Planning Documents Considered for Cumulative Impact Analysis

Document	Summary
	includes a Growth Management Program which limits the number of new housing units and employment growth.
Sebastopol General Plan (1994)	<p>Sebastopol's General Plan establishes the City's environmental, social and economic goals, as well as the location and intensity of different land uses for a period of 20 years (through 2014). The main themes of the general plan are to:</p> <ul style="list-style-type: none"> ▪ Maintain the character of existing residential neighborhoods ▪ Emphasize infill versus annexations ▪ Matching future growth with available infrastructure ▪ Focus on downtown as a center ▪ Provide environmental protection ▪ Provide for housing opportunities ▪ Provide additional parks ▪ Employ an Urban Growth Boundary ▪ Reduce the Sphere of Influence
Rohnert Park General Plan (2000)	<p>At the time of General Plan preparation, the City of Rohnert Park was almost entirely built out. The General Plan responds to the need of having policies to guide Rohnert Park's growth before expiration of urban boundary provisions, ensure that the General Plan reflects Rohnert Park's current planning context and includes goals, policies, and desires of Rohnert Park citizens, and address the issue of land availability to meet the City's economic development objectives, the need for housing in the community, and State law requirements for Rohnert Park to accept its "fair share" of the regional housing needs. The themes of the plan, which form the basis for the goals and policies in the plan, are:</p> <ul style="list-style-type: none"> ▪ An urban growth boundary and growth management program. ▪ A "greenbelt" around the city, with targeted growth areas. ▪ City/university integration, and mixed-use centers. ▪ Balanced neighborhoods. ▪ Increased connectivity and accessibility. ▪ A network of open space. ▪ Pedestrian- and bicycle-friendly environments. ▪ Enhanced community character. <p>A General Plan update is currently underway. The update is intended to reflect changes that have occurred in the City since 2000, as well as to add a new Sustainability Element to the General Plan and to revise the Housing Element as required by State Law.</p>
Cotati General Plan	Cotati's General Plan is organized around four major areas which reflect the concern of the community's residents:

Table 4-1. Planning Documents Considered for Cumulative Impact Analysis

Document	Summary
(1998)	<p>Community Development, Quality of Life, Economic Vitality and Community Identity. The Community Development portion focuses on development of usable vacant lands within the city before considering annexation of new land. The Quality of Life section focuses on Cotati's desire for an identity which is unique yet unpretentious. Residents' views tend to center on conservation: conservation of the land, conservation of energy, conservation of rural vistas, and conservation of the small town atmosphere. The Economic Vitality section focuses on Cotati's opportunity to take advantage of residential and business growth which is moving steadily northward from the Bay Area. The Community Identity section focuses on the citizens' desire to retain the unassuming, relaxed atmosphere of a rural, small town. There is also a strong sensitivity to agricultural lands that have traditionally surrounded Cotati.</p>
Petaluma General Plan 2025 (2008)	<p>The goal of Petaluma's General Plan is to insure that the plan embodies the community's vision of a Petaluma that will endure for the following generations as a great place to be, live, and/or work, and that its natural surroundings and quality of life are sustained as a defining aspect of its community. Key issues addressed in the plan include economic health, infill/residential growth projection, water resources, mobility, and public facilities and parks. The General Plan contains 14 Guiding Principles that helped form the basis for the detailed goals, policies and programs of the General Plan:</p> <ul style="list-style-type: none"> ▪ Maintain a close-knit, neighborly, and family-friendly city. ▪ Preserve and enhance Petaluma's historic character. ▪ Preserve and enhance Petaluma's natural environment and distinct setting in the region—a community with a discrete edge surrounded by open space. ▪ Enhance the Petaluma River corridor while providing recreational and entertainment opportunities, including through active implementation of the Petaluma River Access and Enhancement Plan. ▪ Stimulate and increase public access and use of pathways as alternative transportation routes by providing a safe, efficient, and interconnected trail system. ▪ Provide for a range of attractive and viable transportation alternatives, such as bicycle, pedestrian, rail, and transit. ▪ Enhance Downtown by preserving its historic character, increasing accessibility, and ensuring a broad range of businesses and activities and increasing residential opportunities. ▪ Foster and promote economic diversity and opportunities. ▪ Expand retail opportunities to meet residents' needs and promote the city's fiscal health, while ensuring that new development is in keeping with Petaluma's character. ▪ Continue efforts to achieve a jobs/housing balance, emphasizing opportunities for residents to work locally. ▪ Foster a sustainable community in which today's needs do not compromise the ability of the community to meet its future needs. Promote green development. ▪ Ensure infrastructure is strengthened and maintained. ▪ Integrate and connect the east and west sides of town. ▪ Encourage cultural, ethnic, and social diversity.

Table 4-1. Planning Documents Considered for Cumulative Impact Analysis

Document	Summary
City of Sonoma 2020 General Plan (2006)	<p>The vision of the City of Sonoma’s General Plan is to be a beautiful, environmentally friendly, and safe place, widely recognized as one of the most desirable cities in Northern California to live, visit, and do business. The General Plan vision includes:</p> <ul style="list-style-type: none"> ▪ Innovative, creative and sustainably-designed development that respects the availability of natural resources and enhances the scale, character, and natural setting of the community. ▪ The community’s history and its role as a cultural center are enhanced through public art, special events, and careful preservation of historic features. ▪ A vibrant, entrepreneurial economy is fueled largely by retention and incubation of locally-owned businesses that complement the small-town atmosphere and provide high paying jobs. ▪ Housing is available and affordable to the residents and the local workforce to support an economically diverse population. ▪ Creeks, trees, other natural features are valued and preserved, and open space and agricultural lands are protected—both in and around the city. ▪ Residents have access to a variety of high-quality recreational opportunities. ▪ Walking and bicycling are safe and the use of clean-fuel transit is popular. Traffic congestion is mitigated. ▪ Residents enjoy peace, quiet, and security, as well as efficient, high-quality public services. ▪ The City enjoys productive relationships with neighboring communities to effectively address regional issues, including planning, service provision and capital improvements

In addition to the planning documents considered, the analysis also considers as cumulative impacts the potential effects of reuse of sediment generated under the SMP by entities other than SCWA. This is described in the setting section below, and in the impact analysis.

Table 4-2. Population Growth 2000-2008

Jurisdiction	Population	
	2000	2020
Cloverdale	7,052	11,200
Healdsburg	11,253	13,160
Windsor	22,744	30,300
Santa Rosa	165,849	195,300
Sebastopol	8,108	9,620
Rohnert Park	42,236	50,400
Cotati	7,279	9,600
Petaluma	55,743	64,200
City of Sonoma	9,754	14,590
City Subtotal	330,018	398,370
Unincorporated Sonoma County	128,596	147,660
Total	458,614	546,030

Source: Sonoma County General Plan 2020 Draft EIR

4.5.2 Cumulative Impact Analysis

Cumulative Setting

The following key impacts are considered cumulatively significant in the context of existing and future projects:

Air Quality. The San Francisco Bay Area Air Basin has been designated by the BAAQMD as in nonattainment under both federal and state standards for ozone. PM₁₀ and PM_{2.5} are also designated as in nonattainment under state standards. Several pollutants are undesignated at either the federal or state level: 24-hour PM₁₀ and PM_{2.5} concentrations under federal standards, and hydrogen sulfide and visibility reducing particles under state standards. As growth occurs in the County, increased emissions of these and other pollutants could result in continued nonattainment status or new nonattainment designations.

In addition, anthropogenic emissions of greenhouse gases are widely accepted in the scientific community as contributing to global warming. According to *Climate Change 2007: The Physical Science Basis: Summary for Policymakers* (IPCC 2007), there is no doubt that the climate system is warming. Global average air and ocean temperatures, as well as global average sea level, are rising. Of the last 12 years, 11 years have ranked as among the warmest on record since 1850. While some of the increase is explained by natural occurrences, the 2007 report asserts that the increase in temperature is very likely (> 90%) due to human activity, most notably the burning of fossil fuels.

For California, similar effects are described in *Our Changing Climate: Assessing the Risks to California* (California Climate Change Center 2006). Based on projections using state of the art climate modeling, the temperatures in California are expected to rise between 3 degrees Fahrenheit (°F) and 10.5°F (1.7 degrees Celsius [°C] and 5.8°C) by the end of the century, dependent on how much California is able to reduce its GHG emissions. The report states that these temperature increases will negatively impact public health, water supply, agriculture, plant and animal species, and the coastline.

Climate change is a global problem, and GHGs are global pollutants, unlike criteria air pollutants (such as ozone precursors) and Toxic Air Contaminants, which are pollutants of regional and local concern. Worldwide, California is the 12th to 16th largest emitter of CO₂ (California Energy Commission 2006), and is responsible for approximately 2% of the world's CO₂ emissions (California Energy Commission 2006).

The Intergovernmental Panel on Climate Change (IPCC) has been established by the World Meteorological Organization and United Nations Environment Program to assess scientific, technical, and socio-economic information relevant to the understanding of climate change, its potential impacts and options for adaptation and mitigation. The IPCC predicts substantial increases in temperatures globally may affect the natural environment in California in the following ways, among others:

- rising sea levels along the California coastline, particularly in San Francisco and the San Joaquin Delta due to ocean expansion;
- extreme-heat conditions, such as heat waves and very high temperatures, which could last longer and become more frequent;
- an increase in heat-related human deaths, infection diseases, and a higher risk of respiratory problems caused by deteriorating air quality;
- reduced snow pack and stream flow in the Sierra Nevada, affecting winter recreation and water supplies;
- potential increase in the severity of winter storms, affecting peak stream flows and flooding;
- changes in growing season conditions that could affect California agriculture, causing variations in crop quality and yield; and/or
- changes in distribution of plant and wildlife species due to changes in temperature, competition from colonizing species, changes in hydrologic cycles, changes in sea levels, and other climate-related effects.

These changes in California's climate and ecosystems are occurring at a time when California's population is expected to increase from 34 million to 59 million by the year 2040 (California Energy Commission 2006). As such, the number of people potentially affected by climate change, as well as the amount of anthropogenic GHG emissions expected under a "business as usual" scenario, are expected to increase. Similar changes as those noted above for California would also occur in other parts of the world, with regional variations in resources affected and vulnerability to adverse effects.

GHG emissions in California are attributable to human activities associated with industrial/manufacturing, utilities, transportation, residential, and agricultural sectors (California Energy Commission 2006) as well as natural processes. Transportation is responsible for 41% of the state's GHG emissions, followed by the industrial sector (23%), electricity generation (20%), agriculture and forestry (8%) and other sources (8%) (California Energy Commission 2006). Emissions of CO₂ and N₂O are byproducts of fossil fuel combustion, among other sources. Methane, a highly potent GHG, results from off-gassing associated with agricultural practices and landfills, among other sources. Sinks of CO₂ include uptake by vegetation and dissolution into the ocean.

The BAAQMD has not yet established significance thresholds or guidance for evaluating impacts associated with greenhouse gas emissions and their contribution to climate change.

Biological Resources. The various general plans contain policies addressing conservation and preservation of open space, ongoing development in the County are anticipated to result in the loss of riparian habitat, wetlands, and other sensitive natural communities. These outcomes will likely lead to direct take or loss of habitat for both common and special-status species.

Cultural Resources. Similar to biological resources, the various general plans contain policies regarding preservation of important cultural resources. Regardless, ongoing development could lead to the cumulative loss of significant historic, archeological, or paleontological resources.

Energy. Despite efficiency and conservation programs, land uses and development in the County is likely to substantially increase the demand for and consumption of energy resources.

Geology and Soils. As growth continues in the County, new development would be exposed to seismic and geotechnical hazards such as seismic ground shaking, landslides, expansive soils, etc. In addition, increased risk could be present related to tsunamis and seiches, and soil erosion could increase.

Land Use, Population and Housing. As the County develops, land use conflicts or incompatibilities, such as between agriculture and urban development at the urban/rural interface, could intensify.

Noise. As the County grows, the number of noise sources will multiply, and ambient noise levels are likely to increase in a variety of locations, particularly in urban areas and along transit corridors.

Traffic. Automobile traffic congestion is already a severe problem in the County, particularly along the Highway 101 corridor. Provision of an adequate automotive transportation network, and reducing automobile traffic by providing alternative means of transportation, is identified as a key issue to be addressed in various general plans. Traffic conditions may worsen as development in the County continues.

Utilities and Service Systems. Similar to transportation infrastructure, provision of adequate water, wastewater, stormwater, and solid waste infrastructure will be a key issue as the County continues to grow.

Water Resources. Increased development in the County could lead a variety of impacts on water resources, including increased demand for groundwater supplies, new sources of point source and non-point source pollution, increased area of impervious surface and volume of stormwater runoff, and potential flooding impacts.

In addition, various surface waters in the County and downstream receiving waters are listed for water quality impairments under the CWA Section 303(d). Listed waterbodies include the Laguna de Santa Rosa, the Russian River, Santa Rosa Creek, the Petaluma River, and Sonoma Creek. Impairments span a range of contaminants; those most relevant to the SMP include nutrients, sedimentation/siltation, temperature, and low dissolved oxygen.

Sediment Disposal. Sediment that is not reused by SCWA or disposed at a landfill would be transferred to other entities for reuse. Activities which may reuse the sediment could include ecological restoration projects, agricultural, commercial, and industrial operations, and residential developments. Reuse could have direct effects, but also may have indirect effects where the reuse is part of a larger project. A portion of sediment generated may be given to the City of Santa Rosa, who would dispose of it at one of several sites described in Chapter 2. At this time, SCWA has not identified other recipients of such sediment, and hence the types of activities that may be undertaken are speculative at this time.

The Proposed Program has been evaluated to determine whether it would make a considerable contribution to any of these cumulative impacts. Because no cumulative impacts have been identified related to aesthetics, minerals, hazards and hazardous materials, public services, or recreation, these topical areas are not considered further.

4.5.3 Cumulative Impacts

Impact CUM-1. Emissions of PM₁₀ and Ozone Precursors (Significant and Unavoidable)

Channel maintenance activities would involve ground disturbance and vehicle usage that would emit both particulates and ozone precursors. Given the non-attainment status for these pollutants, any project contribution to these significant cumulative impacts would be considerable. While implementation of BMPs AQ-1 and AQ-2 would reduce PM₁₀ emissions, they would not address the emissions of ozone precursors, nor would they fully eliminate PM₁₀ emissions. No other feasible mitigation has been identified to further reduce emissions of these pollutants. As such, this cumulative impact is considered significant and unavoidable.

Impact CUM-2. Emissions of Greenhouse Gases (Less than Significant)

Vehicles and heavy equipment associated with SMP activities emit greenhouse gases. In addition, vegetation management has the secondary effect of altering the uptake and sequestration of greenhouse gases, and the decomposition of removed vegetation would release stored carbon to the atmosphere. These activities would represent a contribution to global climate change. However, as part of the SMP, SCWA engages in extensive

revegetation and tree planting, which serves as a carbon sink. The SMP revegetation and other mitigation activities at least partially, if not fully, offset any contributions that the SMP may have to global climate change. For this reason, the contribution of the SMP is not considered considerable. This cumulative impact is considered less than significant.

Impact CUM-3. Effects on Biological Resources (Less than Significant with Mitigation)

The project has potential for impacts to a variety of biological resources, including the following:

- Temporary Loss or Disturbance to Aquatic and Upland Natural Communities;
- Temporary Disturbance to Potential Habitat and Loss of Individual Populations of Special Status Plants;
- Temporary Disturbance to Potential Habitat and Loss of Individuals of the following wildlife species:
 - California freshwater shrimp
 - Special status fish
 - California tiger salamander
 - California red-legged frog
 - Foothill yellow-legged frog
 - Western pond turtle
- Temporary Disturbance to Potential Nesting Habitat for Migratory Birds and Raptors

The specific impacts on each of these resources would be dependent upon the timing and location of activities. BMPs BR-1 through BR-19 prescribe a variety of measures to reduce, avoid, or compensate for impacts, including timing of construction, biological surveys, relocation of species, compensation for lost habitat, etc. In addition, the mitigation program described in Chapter 8 of the SMP Manual describes both on-site and off-site mitigation that would preserve, restore or improve habitat for a variety of species. With implementation of these measures, the Program is not anticipated to make a considerable contribution to cumulative impacts related to biological resources.

Impact CUM-4. Effects on Cultural Resources (Less than Significant with Mitigation)

While unlikely, it is possible that maintenance activities could result in demolition or modification of significant historic, archeological, or paleontological resources. BMPs CR-1 through CR-3 prescribe measures to address potential effects on historic, archeological, and paleontological resources. With implementation of these BMPs, the Program is not anticipated to make a considerable contribution to cumulative impacts related to cultural resources.

Impact CUM-5. Project-Related Energy Use (Less than Significant)

Maintenance equipment would consume fossil fuels. In addition, support facilities for the SMP (such as the maintenance yard) would use energy resources. As such, the SMP will contribute to increased energy demand in the County. However, the amount of energy consumption associated with the SMP is very small in comparison to overall energy demand in the County, and the SMP would not cause the need for new energy sources or generation facilities. As such, the SMP is not anticipated to make a considerable contribution to cumulative impacts related to energy use.

Impact CUM-6. Geologic Hazards (Less than Significant)

As a maintenance program, the SMP would not involve construction of any new facilities that could be subject to geologic hazards. Facility replacement (e.g., culverts) would require compliance with current California Building Standards Code and City and County codes, as well as geotechnical studies and related protective measures where appropriate. With implementation of this BMP, the Program is not anticipated to make a considerable contribution to cumulative impacts related to geologic hazards.

Impact CUM-7. Land Use Conflicts (No Impact)

The Program would not involve any activities that could cause land use incompatibilities or conflicts with adopted plans or policies. The Program would not induce substantial population growth, directly or indirectly. As such, the Program would not make any contribution to cumulative impacts related to land use or population and housing.

Impact CUM-8. Program-Related Noise Emissions (Less than Significant with Mitigation)

Equipment used as part of the Proposed Program, such as excavators, dump trucks, and worker vehicles, would generate noise. However, construction noise in any given location would be short-term. In addition, BMP GN-3 *Noise Control* would limit the hours of noise-generating maintenance activities and require that SCWA employ noise-reducing maintenance practices. As a result, the Program is not anticipated to make a considerable contribution to cumulative impacts from noise generation.

Impact CUM-9. Disruption to Automobile Traffic Patterns (Less than Significant with Mitigation)

The SMP would generate traffic in the form of maintenance equipment, deliveries of materials, fill hauling, and worker trips. In addition, maintenance activities may result in temporary lane or road closures. However, BMP GN-4 would prescribe multiple measures to minimize traffic impacts, such as scheduling vehicle trips and lane closures outside of peak traffic periods, and avoidance of roadways that fail to meet LOS standards. In addition, traffic effects in any given location would be short-term. Therefore, the Program is not anticipated to make a considerable contribution to cumulative impacts related to traffic.

Impact CUM-10. Effects on Utilities and Service Systems (Beneficial)

During maintenance activities, measures would be implemented to avoid any interruptions to utilities and service systems. The Program would not generate the need for additional water, stormwater, or wastewater infrastructure, or result in solid waste disposal needs which exceed the capacity of landfills or other receiver sites. Further, Program activities are focused to maintaining adequate conveyance capacity in the flood control channels of the Program Area. These activities provide flood management benefits and can reduce the likely threat of flooding. As such, the Program is anticipated to be beneficial from the standpoint of cumulative impacts related to utilities and service systems.

Impact CUM-11. Effects on Water Quality (Less than Significant with Mitigation)

Maintenance activities could result in discharges of sediment or other contaminants, which could reach impaired water bodies. However, multiple BMPs have been prescribed which would limit the potential for such impacts, including erosion and sediment control measures, and implementation of spill prevention and control. These measures will ensure that any residual releases of contaminants will not contribute to listed impairments. In addition, Program activities, such as bank stabilization and sediment removal, would directly address listed impairments for sediment. Similarly, vegetation management activities to restore riparian canopy will have water quality benefits including temperature moderation, and pollutant filtrations. Therefore, the project is not anticipated to make a considerable contribution to cumulative impacts related to water quality.

Impact CUM-12. Sediment Reuse by the City of Santa Rosa (Beneficial)

As described previously, the City of Santa Rosa may utilize some portion of the sediment generated by SCWA as part of its participation in the NCRWQCB's Nutrient Offset Program. This would have cumulatively beneficial impacts related to the 303(d)-listed impairment for nutrients in the Laguna, as described in Impact HYD-10. In addition, this reuse would have other beneficial aspects, including support of recreation (Place-to-Play site) and agriculture (use as a soil amendment at City agricultural sites), as well as potentially other beneficial impacts. Thus, sediment reuse by the City of Santa Rosa is considered cumulatively beneficial.

Impact CUM-13. Sediment Reuse by Other Entities besides SCWA (No Impact)

As stated in the setting section above, sediment could be reused for a variety of purposes, and may be part of a larger project. The direct effects of sediment reuse have been addressed in the SMP Manual and EIR, which prescribes chemical testing prior to disposal, as well as cultural and biological evaluations to identify, and prescribe mitigation for, any sensitive resources at the disposal site that could be adversely affected by sediment disposal. The EIR makes conclusions regarding the direct impacts of sediment disposal, and these conclusions are not repeated here.

The indirect effects of sediment disposal, where it is a constituent part of a larger project, are more difficult to predict, as the recipients of the sediment have not been identified at this time. It is possible that reuse could have beneficial effects, for instance where it is used for gravel augmentation in a sediment-starved stream, with corollary benefits to anadromous fisheries. Similarly, reuse for soil augmentation at agricultural sites could

benefit agricultural productivity. On the other hand, a residential development which uses the sediment to construct building pads could have impacts on air quality, noise, traffic, and generate population growth. It is anticipated that any major projects involving reuse of sediment would be the subject of their own environmental analysis. However, because the potential uses have not been identified at this time, their impacts remain speculative. As such, no impact conclusions are made in this EIR.

5.1 Introduction

5.1.1 Regulatory Requirements

This chapter describes alternatives to the Stream Maintenance Program (SMP) and evaluates their environmental impacts compared to the Proposed Program. This alternatives analysis was developed to serve three regulatory purposes: (1) California Environmental Quality Act (CEQA) compliance; (2) National Environmental Policy Act (NEPA) compliance; and (3) Clean Water Act Section 404(b)(1) permitting requirements. While this environmental impact report (EIR) document addresses CEQA requirements, NEPA and 404(b)(1) environmental review activities for the Program are occurring in parallel. This chapter provides a consistent evaluation for each of these regulatory purposes.

A more detailed description of the regulatory requirements for consideration of alternatives is provided in the sections immediately below. The chapter continues with a description of the alternatives development process, alternatives that were considered, and alternatives that were considered but dismissed. The chapter concludes with a summary statement regarding the environmentally superior alternative.

CEQA/NEPA Requirements

CEQA requires that an EIR, and NEPA requires that an environmental assessment (EA) or environmental impact statement (EIS), evaluate a reasonable range of alternatives to the proposed action, including the No Action Alternative. While there is no clear rule for determining a reasonable range, CEQA and NEPA provide guidance that can be used to define the range of alternatives for consideration in the environmental document.

According to NEPA, the range of alternatives required is governed by the rule of reason, which requires an EA or EIS to set forth only those alternatives necessary to allow for a reasoned decision regarding the proposed action. An EA or EIS must consider a reasonable range of options as defined by the specific facts and circumstances of the proposed action. First, alternatives must fulfill the basic purpose and need for the action. Second, alternatives to be analyzed should not have more significant impacts on the environment than the proposed action, or result in impacts that are indistinguishable from those of the proposed action. Finally, alternatives must be able to be feasibly carried out in the context of technical, economic, environmental, and other factors. If alternatives have been eliminated from detailed study, the EA or EIS must briefly discuss the reason for their elimination (40 CFR 1502.14[a]; Forty Questions No.1[a]).

The range of alternatives under CEQA is similarly governed by the rule of reason. Alternatives under CEQA must meet the basic project objectives, should reduce or eliminate

one or more of the significant impacts of the proposed project (although the alternative could have greater impacts overall), and must be feasible. In determining whether alternatives are feasible, Lead Agencies are guided by the general definition of feasibility found in CEQA Guidelines Section 15364: “capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social, and technological factors.” In accordance with CEQA Guidelines Section 15126.6[f], the Lead Agency should consider site suitability, economic viability, availability of infrastructure, general plan consistency, other regulatory limitations, jurisdictional boundaries, and the proponent’s control over alternative sites in determining the range of alternatives to be evaluated in an EIR. An EIR must briefly describe the rationale for selection and rejection of alternatives and the information that the Lead Agency relied upon in making the selection. It should also identify any alternatives that were considered by the Lead Agency but were rejected as infeasible during the scoping process and briefly explain the reason for their exclusion (CEQA Guidelines Section 15126[d][2]). These guidelines were used in developing the alternatives and their evaluation as described below.

A No Action (NEPA)/No Project (CEQA) Alternative is also required to be considered. The No Action/No Project alternative allows decision makers to compare the impacts of approving the action against the impacts of not approving the action.

Clean Water Act Section 401(b)(1)

Under 40 CFR Part 230 Section 401(b)(1), discharge of dredged or fill material would not be permitted if there is a practicable alternative to the proposed discharge which would have a lesser adverse impact on the aquatic ecosystem. However, the alternative should not have other significant adverse environmental consequences that are greater than that of the proposed discharge.

For the purpose of this requirement, practicable alternatives include, but are not limited to:

- Activities which do not involve a discharge of dredged or fill material into the waters of the United States or ocean waters; and
- Discharges of dredged or fill material at other locations in waters of the United States or ocean waters.

Because the Proposed Program activities are necessarily water-dependent, alternatives which do not involve a discharge of dredged or fill material into waters of the United States were not considered. Additionally, the Program Area is specifically defined based on maintenance needs for the region’s flood control channels. Because the Program Area was determined by fundamental Program needs, this precluded consideration of alternative locations for discharges outside of the Program Area. An alternative is practicable if it is available and capable of being undertaken after taking into consideration cost, existing technology, and logistics in light of overall Program purposes. If it is otherwise a practicable alternative, an area not presently owned by the applicant which could reasonably be obtained, utilized, expanded or managed in order to fulfill the basic purpose of the proposed activity may be considered.

For actions subject to NEPA, where the U.S. Army Corps of Engineers (USACE) is the permitting agency, the analysis of alternatives required for NEPA environmental documents, including supplemental USACE NEPA documents, will in most cases provide the information for the evaluation of alternatives under the Section 401(b)(1) guidelines. On occasion, these NEPA documents may not have considered the alternatives in sufficient detail to respond to the requirements of the 401(b)(1) guidelines, and it may be necessary to supplement the NEPA documents with this additional information.

5.2 Alternatives Development Process

Alternatives to the SMP were developed at two scales: (1) programmatic alternatives to the SMP as a whole; and (2) alternative methods to implement the Program. Programmatic alternatives seek to achieve similar goals as the proposed program, though they may be more or less extensive in their results. Methodological alternatives operate within the proposed SMP program, but provide alternative techniques and standards to conducting maintenance. Using this dual scale approach provided an effective means to develop suitable alternatives for a program as wide ranging as the SMP, with its several maintenance activities and broad Program Area. A reasonable range of alternatives is presented below that capture a range of potential impacts, as well as benefits. The alternatives considered provide varying levels of flood protection, representing an impact continuum from more invasive and more impacting, to less invasive and less impacting. Alternatives were developed with consideration to the Program's goals and objectives (i.e., purpose and need), and the significant environmental impacts of the Program.

5.2.1 Program Goals and Objectives

The Stream Maintenance Program was developed to achieve the following objectives:

- Provide adequate flood protection and channel conveyance capacity for channels under Sonoma County Water Agency (SCWA) authority;
- Use an informed, consistent, systemic, and scientific understanding of the watershed and individual stream reaches to guide maintenance activities and avoid and minimize environmental impacts;
- Improve communication, coordination, and permitting efficiency between regulatory agencies and SCWA through an open and collaborative process;
- Develop an adaptable and sustainable program that can respond to changing environmental, maintenance, and regulatory conditions;
- Provide an administratively stable program that provides consistency in oversight and implementation of annual program activities;
- Obtain and maintain 10-year programmatic permits that regulate program activities;
- Adhere and comply with CEQA requirements.

5.2.2 Significant Environmental Impacts of the Proposed Program

The following impacts have been identified as significant, but would be mitigated to a level of less-than-significant through implementation of mitigation in the form of Best Management Practices (BMPs):

- *Impact AES-2*: Alteration to Scenic Resources within a State Scenic Highway
- *Impact AIR-1*: Temporary Increase in Emissions During Maintenance
- *Impact AIR-3*: Creation of Objectionable Odors
- *Impact BIO-1*: Temporary Loss or Disturbance of Aquatic Natural Communities
- *Impact BIO-2*: Temporal Disturbance to Upland Natural Communities
- *Impact BIO-3*: Temporary Disturbance to Potential Habitat and Loss of Individual Populations of Special-Status Plants
- *Impact BIO-4*: Temporary Disturbance to Potential Habitat and Loss of Individual California Freshwater Shrimp
- *Impact BIO-5*: Temporary Disturbance to Potential Habitat and Loss of Individual Special-Status Fish
- *Impact BIO-6*: Temporary Disturbance to Potential Upland Habitat and Loss of Individual California Tiger Salamander
- *Impact BIO-7*: Temporary Disturbance to Potential Aquatic and Upland Habitat and Loss of Individual California Red-legged Frog
- *Impact BIO-8*: Temporary Disturbance to Potential Aquatic Habitat and Loss of Individual Foothill Yellow-legged Frog
- *Impact BIO-9*: Temporary Disturbance to Potential Habitat and Loss of Individual Western Pond Turtle
- *Impact BIO-10*: Temporary Disturbance to Potential Nesting Habitat for Migratory Birds and Raptors
- *Impact BIO-11*: Disturbance to Potential Roosting and Foraging Habitat for Special Status Bat Species
- *Impact CR-1*: Disturbance to a Known Archeological or Historic Site
- *Impact CR-2*: Disturbance to Unknown Archeological or Historic Sites, or Human Remains
- *Impact CR-3*: Impacts to Sensitive Paleontological Resources as a Result of Maintenance Activities
- *Impact GEO-2*: Substantial Adverse Effects Resulting from Unstable Geologic Units
- *Impact HAZ-1*: Use, Transport, or Accidental Release of Hazardous Materials such that a Significant Hazard to the Public or Environment Would Result
- *Impact HAZ-2*: Potential to Interfere with Emergency Response

- *Impact HAZ-3:* Be Located on a Known Existing Contaminated Site
- *Impact HAZ-4:* Be Located on a Previously Undiscovered Contaminated Site
- *Impact HAZ-5:* Create Safety Hazards from Public Access to Maintenance Sites
- *Impact HAZ-6:* Create Safety Hazards or Releases of Hazardous Materials in Proximity to a School or Airport
- *Impact HAZ-7:* Exacerbation of Wildland Fires
- *Impact HAZ-8:* Disposal of Contaminated Sediments
- *Impact HYD-1:* Water Quality Degradation Resulting in Violation of Water Quality Standards or Waste Discharge Requirements due to Ground Disturbance
- *Impact HYD-2:* Water Quality Degradation Resulting in Violation of Water Quality Standards or Waste Discharge Requirements due to Dewatering
- *Impact HYD-3:* Water Quality Degradation Resulting in Violation of Water Quality Standards or Waste Discharge Requirements due to Accidental Release of Hazardous Materials
- *Impact HYD-4:* Water Quality Degradation Resulting in Violation of Water Quality Standards or Waste Discharge Requirements due to Use of Herbicides
- *Impact HYD-5:* Temporary Water Quality Degradation Resulting in Violation of Water Quality Standards or Waste Discharge Requirements due to Disturbance of Existing Contamination
- *Impact HYD-7:* Temporary Water Quality Degradation Resulting in Violation of Water Quality Standards or Waste Discharge Requirements due to Sediment Handling and Disposal
- *Impact HYD-8:* Temporary Erosion, Siltation, or Flooding due to Alternations to Drainage Patterns
- *Impact NZ-2:* Result in a Temporary Significant Increase in Noise Above Ambient
- *Impact PSU-2:* Effects of Construction Activities on Police, Fire, and Emergency Services Response Times
- *Impact PSU-3:* Disposal of Excavated Sediment at Off-Site Locations, Including Landfills
- *Impact REC-1:* Temporary Disturbance of Recreational Quality
- *Impact REC-3:* Temporary Disruption of Use of, or Access to, Recreational Facilities
- *Impact REC-5:* Changes in Recreational Facility Use
- *Impact TR-1:* Increase in Area Traffic Volumes and Degradation of LOS Due to SMP-Generated Traffic
- *Impact TR-2:* Increase in Safety Hazards
- *Impact TR-3:* Interference with Emergency Access and Circulation

- *Impact TR-4: Increase in Parking Demand*
- *Impact TR-5: Conflicts with Alternative Transportation*

5.2.3 Significant and Unavoidable Environmental Impacts of the Proposed Program

The following impacts have been identified as significant and unavoidable:

- *Impact AES-3: Temporary Alteration of Visual Character or Quality from Maintenance Activities*
- *Impact AES-5: Alteration to Visual Character or Quality from Sediment Disposal*
- *Impact NZ-1: Exposure of the Public to Noise Levels in Excess of City or County Standards*
- *Impact CUM-1: Emissions of PM10 and Ozone Precursors*

5.3 Alternatives Considered

The following alternatives were considered because they meet most of the Program objectives, are feasible, and avoid or substantially reduce one or more significant impacts of the Proposed Program:

- No Program Alternative
- Programmatic Alternatives
 - Reduced Maintenance Alternative
 - Increased Maintenance Alternative
 - Expanded Maintenance in Modified and Natural Channels Alternative
- Alternative Stream Maintenance Methods
 - Alternative Bank Stabilization Approach
 - Alternative Vegetation Management Approach
 - Alternative Sediment Removal Approach

5.3.1 No Program Alternative

Characteristics of this Alternative

Under the No Program Alternative, SCWA would not implement an integrated, comprehensive, and consistent Stream Maintenance Program to guide and direct stream maintenance activities for the channels under their maintenance authority. Rather, under the reasonably foreseeable No Program scenario, current maintenance practices would continue to be developed, permitted, and implemented on a project-by-project basis.

Currently, routine maintenance needs are assessed annually. Individual projects are prioritized based on the reduction in channel capacity and the apparent flood risk. Sediment removal, bank stabilization, and vegetation management activities are undertaken to maintain channels nearer to their designed capacity. Under current operations individual maintenance projects are reviewed for their permitting needs including compliance with federal laws and regulations such as the Endangered Species Act and Clean Water Act, as well as state laws and regulations administered by the California Department of Fish and Game and Regional Water Quality Control Boards. The time requirement for annual permitting typically requires a 10 to 18 month planning and application process, and a typical work period would last 1 to 3 months.

Impact Analysis

Because the activities are similar under the No Program Alternative compared to the Proposed Program, the impacts under this alternative would be somewhat comparable. However, stream maintenance activities would not necessarily benefit from the use of a consistent and comprehensive set of BMPs or programmatic on-site and off-site mitigation approaches. As such, the impacts of stream maintenance could be greater under this alternative, if appropriate mitigation or BMPs were not implemented.

In addition, obtaining necessary regulatory permits on a project-by-project basis can be a lengthy process, and it is likely that certain projects would not obtain permits in a timely manner (i.e., to allow work to be completed during the first dry season following the identification of the need for the project). As such, the impacts caused by the failure to conduct maintenance may persist for one or more additional storm seasons. In the case of sediment and vegetation management projects, the primary impact is flooding, with corresponding potential for loss of life and property. SCWA has documented cases (Washington Creek 2006) where flooding has occurred when work was delayed by time requirements of the permitting process. In the case of bank stabilization, impacts include damage to infrastructure should the bank failure worsen, as well as continued sediment inputs and corollary impacts to water quality and instream habitat.

5.3.2 Programmatic Alternatives

Reduced Maintenance Alternative

Characteristics of this Alternative

The Reduced Maintenance Alternative is similar to the Proposed Program, but would set a reduced limit to the annual volume of sediment to be removed from the Program's channels. The Proposed Program has an annual sediment removal range allowing from 10,000 to 25,000 cubic yards of sediment to be removed. As described in the SMP Manual, a range of annual sediment volumes is necessary, as maintenance requirements vary greatly year to year based on climatic conditions and past maintenance activities. The Reduced Maintenance Alternative would establish a maximum annual sediment removal volume at 10,000 cubic yards.

The reduced sediment removal volume would require SCWA to prioritize sediment removal at the most threatened and impacted channels, where conveyance capacity is most greatly reduced. Based on sediment removal records from recent years (2006-2008), establishing

an annual sediment removal limit at 10,000 cubic yards could reduce sediment removal activities by more than 50%. For reference, in 2008 over 22,000 cubic yards of sediment was removed from channels in the Program Area.

Activities conducted would consist of those requiring minimal work effort and the least invasive methods to restore the flood recurrence interval. Depending on channel requirements and conditions, preference for vegetation management would generally be given over sediment removal. Equipment, methods, and work schedules used under this alternative would be similar to those described in the Proposed Program. Sediment disposal needs under this alternative would be less than that under the SMP due to the limit on volume of sediment removed and the preference given to vegetation management over sediment removal. Bank stabilization and other maintenance activities (fence repair, graffiti removal, etc) would likely be similar to those described in the Proposed Program.

This alternative would meet program objectives, albeit to a lesser extent than that of the Proposed Program. It would reduce impacts of the Proposed Program by reducing the extent of activities conducted.

Impact Analysis

Under this alternative, stream maintenance activities, to the extent that they are conducted, would have similar impacts to those of the Proposed Program, although to a reduced extent due to the reduced extent of stream maintenance. This alternative may result in reduced impacts related to dewatering, truck hauling and sediment disposal, all of which would lessen in intensity with reduced sediment removal. This would include impacts to traffic on local roadways, air emissions and noise from maintenance vehicles, and potential impacts to biological resources, cultural resources, and water resources at the dewatering and sediment disposal sites. Similar to the Proposed Program, BMPs would be implemented as part of this alternative which would mitigate all of these impacts to a less than significant level.

However, this alternative, in limiting the extent of sediment removal activities, would also considerably increase the risk of flooding in the Program Area. An increased flood risk could occur following particularly wet years when more sediment has been deposited in area channels and maintenance needs are greater. When a series of wet years occurs in progression, this impact is magnified. Under such conditions, having such a limit on sediment removal activities, compared to the flexibility of the Proposed Program, would increase the flood risk

Increased Maintenance Alternative

Characteristics of this Alternative

Under this alternative, the channels with the most severe and chronic flooding and sediment/vegetation buildup would be maintained to original as-built conditions, while other channels less affected by sediment and vegetation would be maintained according to the more environmentally sensitive approaches of the SMP. Channels requiring the most intensive management would likely encompass approximately 30% of the SCWA-maintained channels, and include creeks such as Hinebaugh, Santa Rosa, Adobe, East Washington, and Washington. Streams with chronic problems but significant resource

concerns, such as Copeland Creek or the Laguna, would not be returned to as-built conditions. Selection of areas with an increased maintenance regimen would be based on a specific and rigorous approach that considers channel capacity, sediment input, adjacent land uses, flooding history, and ecological concerns (e.g., habitat value, endangered species, etc.).

Returning channels to as-built conditions would entail the complete removal all vegetation and excess sediment that is currently present in those channels. Initial vegetation clearing and sediment removal tasks would likely require 3-4 dedicated maintenance seasons (June 15th – October 31st) to address the target channels. Equipment used under this alternative would be similar to those described in the Proposed Program. However, sediment and other disposal material would likely exceed the amounts projected for the Proposed Program given the areas to be more intensely cleared, and thus would require additional trucks, and truck trips, to haul. Bank stabilization and other maintenance activities (fence repair, graffiti removal, etc) would likely be similar to those described in the Proposed Program.

Once the initial sediment and vegetation removal phase is complete, routine maintenance activities would proceed on an annual or bi-annual basis to preserve the as-built condition of selected channels. The remaining channels would be managed on an as-needed basis, identical to that described for the SMP. To ensure that vegetation re-growth is minimized within the fully cleared channels, additional applications of herbicides may be used and would be applied during the routine inspections.

This alternative would meet Program objectives, and reduce flood risk compared to the Proposed Program by proactively improving flood conveyance in natural and modified channels.

Impact Analysis

As described above, by proactively maintaining certain channels to as-built condition, this alternative would reduce flood risk compared to the Proposed Program. This would reduce the risks to life and property associated with flooding.

However, during initial stages of activity under this alternative, the additional amount of sediment and vegetation removal work would increase and intensify several impacts, including air emissions from maintenance vehicles, dust from construction sites, potential water quality impacts, impacts to aquatic resources from dewatering, and impacts to traffic, noise, and recreation along SMP channels. Similarly, the increased volume of excavated sediment would result in increased impacts at sediment disposal sites.

In addition, over the long term, maintenance of the channels in a denuded state would result in reduced instream habitats, reduced channel complexity, reduced aesthetic quality (and associated effects on recreation activities), and the loss of water quality benefits compared to the condition under the proposed SMP-style maintenance.

While BMPs would be implemented similar to those the Proposed Program, they would be unlikely to reduce all of these impacts below significance thresholds. Additional off-site

mitigation would likely be required to offset the increased impacts to biological and water resources from returning and maintaining channels to their as-built design conditions.

Expanded Maintenance in Modified and Natural Channels Alternative

Characteristics of this Alternative

The Expanded Maintenance in Modified and Natural Channels Alternative (Expanded Maintenance Alternative) would be the same as the Proposed Program, except that natural and modified channels would be maintained using the same methods and extent of activities as engineered channels. As a point of reference, under the Proposed Program, maintenance activities in modified and natural channels are more restrictive than in the engineered flood control channels. In the Proposed Program, reach-scale or extensive sediment removal would be infrequent in modified channels, and would not be conducted in natural channels at all. Under the Proposed Program, vegetation removal activities are allowed in modified and natural channels, but such activities are focused to vegetation that is directly causing backwatering or flow diversion and is increasing the flood hazard or erosion potential. In contrast, under the Expanded Maintenance Alternative, the methods and techniques available for channel maintenance in the engineered flood control channels would be available for use in the modified and natural channels. The inclusion of natural channels would further promote a watershed-wide approach to flood management, with less regard to habitat concerns associated with modified and natural channels.

Natural and modified channels comprise approximately 129 miles out of the total SMP channel length of 205 miles (which includes 76 miles of engineered flood control channels). In other words, natural and modified channels represent about 63% of the total Program Area channels. Since these areas would be treated in a similar fashion as the engineered and owned-in-fee channels, this alternative would entail similar work schedule, methods, and equipment. However, it is likely to result in a greater volume of disposal material than the Proposed Program, due to the expanded area which would receive active maintenance. In addition, although no additional staff would be hired to implement this alternative, costs would likely exceed that of the SMP due to additional equipment use and personnel time required to maintain the increased area.

This alternative would meet Program objectives, and reduce flood risk compared to the Proposed Program by proactively improving flood conveyance in natural and modified channels. This alternative would address and remove several upstream sediment sources prior to their arrival to downstream engineered channels.

Impact Analysis

As described above, by proactively conducting sediment and vegetation management in modified and natural channels, this alternative would reduce flood risk compared to the Proposed Program. This would reduce the risks to life and property associated with flooding.

However, the additional amount of work conducted would mean that air emissions from maintenance vehicles, dust from construction sites, potential water quality impacts, and impacts to traffic, noise, and recreation along SMP channels, would be more intense, and in

new and different locations. Similarly, the need for additional sediment disposal would result in increased impacts at sediment disposal sites.

In addition, the modified and natural streams represent the locations in the SMP with the greatest ecological value. Many of these streams possess a developed riparian corridor and complex instream structure, providing amenities such as maintenance/treatment of water quality and habitat for both common and special-status species. While maintenance activities would be as non-invasive as possible, some of the ecological value of these channels would inevitably be compromised. SMP approaches, such as creation of sinuous low-flow channels and revegetation to support a riparian overstory and ecological lift, would partially but not fully mitigate these impacts. Overall, these streams would have reduced habitat quality, reduced aesthetic quality (and associated effects on recreation activities), and the loss of water quality benefits compared to their condition under the Proposed Program.

While BMPs would be implemented similar to those the Proposed Program, they would be unlikely to reduce all of these impacts below significance thresholds. Additional off-site mitigation would be required to offset the impacts to biological and water resources from maintenance in modified and natural streams.

5.3.3 Alternative Stream Maintenance Methods

Alternative Bank Stabilization Approach

Characteristics of this Alternative

This alternative method proposes an expanded use of rip-rap and other bank hardening techniques to repair and stabilize bank slopes. This approach differs from the Proposed Program's approach which minimizes the use of rip-rap and bank hardening (solely to toe-of-slope and culvert outfall applications where necessary) and emphasizes the use of soil, vegetation, and biotechnical treatments. Installation of additional rip-rap would reduce many future bank slope failures and instabilities due to soil erosion and wildlife activity that can occur over time with the use of biotechnical methods. Because this alternative method for bank stabilization would reduce the need for future maintenance at these sites, it is likely to reduce the costs and resources required to implement these activities within the Program Area. In addition, the use of rocks for bank stabilization would impede unwanted vegetation growth, thereby reducing the need for vegetation management at these sites.

As discussed in the SMP, riprap would consist of rock typically between 1-2 feet in diameter and would be placed using heavy machinery (excavators, bulldozers, front-end loaders, and dump trucks). While replanting along the repaired slopes would not be included under this alternative, the remaining SMP avoidance and minimization techniques would be implemented.

Impact Analysis

As described above, this alternative would reduce the potential for recurring bank failures and related damage to infrastructure. A recurring bank failure would result in increased sediment inputs to the stream system, with corollary impacts to water quality and instream habitat.

However, under this alternative, the ecological and aesthetic benefits associated with biotechnical bank stabilization techniques would not be realized. These include establishment of native soil and vegetative cover which can shade the channel and provide habitat for birds and other species. Installation of boulders and rootwads or other structures can provide bank protection and additional habitat complexity while the vegetation establishes. Overall, the locations of bank stabilization under this alternative would exhibit reduced aesthetic quality (and associated effects on recreation activities), reduced habitat quality, and the loss of water quality benefits compared to biotechnical approaches.

Additional off-site mitigation would likely be required to offset the impacts to biological and water resources from use of conventional bank stabilization approaches.

Alternative Vegetation Management Approach

Characteristics of this Alternative

Two options are proposed under the Alternative Vegetation Management Approach Alternative. Under the first option, Option A, no revegetation activities would be implemented. This would mean that once vegetation was removed as part of management activities, Tier 1 revegetation or canopy development would not be implemented. This option would reduce the amount of time and resources required for project implementation and post-maintenance monitoring. Under this alternative, BMPs would still be implemented stabilize soils and minimize the potential for migration of sediment to the channel.

A second option for vegetation management, Option B, would implement vegetation management without herbicide use. Accidental spills, chemicals, and other risks associated with herbicide use would be eliminated under this option. On balance, this option would require additional vegetation removal using hand tools and/or heavy equipment.

Impact Analysis

Option A – No Revegetation

This alternative would reduce the amount of effort needed to implement the overall SMP. Air emissions and traffic associated with transport of materials for revegetation, as well as the site-specific effects of revegetation activities (such as noise impacts), would be reduced.

However, this alternative would greatly increase the recovery time of channels following maintenance. While natural recruitment would occur over time, it is likely that vegetation would be dominated by undesirable species—invasive, non-native and ruderal—including annual grasses and forbs, cattails, ludwigia, blackberries, and non-native tree species such as *Ailanthus* spp. In some cases, channel or bank stability may be compromised by the lack of vegetation, and features such as low-flow channels may not persist. The channels would be less likely to experience ecological lift over time, and overall, these streams would experience reduced habitat quality, reduced aesthetic quality (and associated effects on recreation activities), and the loss of water quality benefits compared to their condition under the Proposed Program.

While BMPs would still be implemented, due to the absence of on-site mitigation, additional off-site mitigation would be required to offset impacts to biological and water resources.

Option B – No Herbicide Use

This alternative would eliminate adverse impacts associated with use of herbicides, including effects on human health, non-target species, and water quality. Note that under the SMP, BMPs for handling and use of herbicides would minimize such risks.

However, without use of herbicides, additional effort would be needed by maintenance crews using hand tools and mechanized equipment in support of vegetation management. Certain types of vegetation would be difficult, if not impossible, to control, resulting in persistent degraded habitat conditions. Air emissions and traffic associated with maintenance worker trips and mowing equipment, as well as the site-specific effects of vegetation management such as noise impacts, would be increased.

Alternative Sediment Removal Approach

Characteristics of this Alternative

Under this alternative, sediment removal would be entirely conducted from top-of-bank, without use of heavy equipment placed in the channel. Sediment removal activities would avoid direct in-channel impacts resulting from the presence of heavy equipment in the channel.

This alternative would implement BMP and avoidance/minimization techniques similar to those described in the SMP; however damage to riparian vegetation might result where few clear access points exist. In such cases, equipment and staging sites for sediment removal would be selected to maximize efficiency and minimize environmental impacts given the specific constraints at the site. In many locations, due to the presence of vegetation, sediment removal from top-of-bank locations may be difficult or impossible, and would result in expanded effort for maintenance, or an absence of maintenance in those locations.

Impact Analysis

This alternative would reduce the impacts associated with in-channel sediment removal, such as impacts to biological resources, water quality, and (although already unlikely) disturbance to buried cultural resources. On balance, use of equipment on the top of bank may cause additional damage to riparian vegetation, with corresponding reductions in habitat value.

Of most importance, certain areas cannot be accessed from top-of-bank, and would not receive necessary maintenance. In these cases, increased flood risk would result compared to the Proposed Program, with corresponding risks to life and property.

5.4 Alternatives Considered and Dismissed

The following alternatives were considered but ultimately were dismissed from further analysis because they did not meet most of the Program objectives, were determined to be

infeasible, or did not avoid or substantially reduce one or more significant impacts of the Proposed Program:

- Programmatic Alternatives
 - Return to As-Built Conditions
 - Watershed-Level Controls
 - Infrastructure and Regional Flood Control Improvements
 - Large-Scale Channel and Floodplain Restoration and Management
 - Emergency Actions Only
 - Reduced Program Scope and Activities
- Alternative Implementation Methods
 - Hand Tool Alternative

5.4.1 Programmatic Alternatives Considered and Dismissed

Return to As-Built Conditions

This alternative would entail the complete removal of all vegetation and excess sediment in all channels in the Program Area. Under present maintenance agreements, SCWA would be within its authority to return Program channels to this condition. Maintaining the channels in this manner would return the full flow capacity of the facilities and reduce the likelihood of reoccurring flood events. Initial clearing and other tasks would likely require a minimum of 5-8 years of work during the dry season to complete. Once the initial work is complete, routine clearing activities would proceed on an annual or bi-annual basis to maintain the condition of the channels. This alternative was not considered feasible due to the level of effort involved, and the likelihood that such an approach would not be acceptable and/or permitted by regulatory agencies.

Watershed-Level Controls

This alternative would attempt to control sediment and/or runoff at its sources in the watershed lands above the Program Area channels. This alternative was dismissed because it is beyond the scope and SCWA authority over the maintenance program and would require an integrated multi-agency and landowner program to implement. Such a program would be difficult to feasibly implement. Furthermore, because SCWA is not a land-use planning agency, this alternative is arguably beyond the authority of the Agency. While this alternative was not considered a feasible alternative to the SMP, it bears noting that the Agency is currently updating the County's Flood Control Design Criteria (FCDC), which will in part address watershed runoff management issues.

Infrastructure and Regional Flood Control Improvements

Installation of new infrastructure and regional flood control projects to control flooding, such as the excavation of sediment basins, enlarging channels and expanding channel capacity (i.e., excavation of existing channels beyond as-built design), creation of additional

engineered channels, construction of dams, raising of levees, etc., were not considered further. Such approaches would meet the Program objective of reducing flood risk. However, they would involve capital improvements and would therefore be beyond of the purpose of the SMP, which is to create a maintenance program for existing facilities in the Program Area. While this alternative was considered but dismissed for the purposes of the SMP EIR, SCWA may still consider capital improvements where necessary and appropriate. Additionally, such infrastructure and regional capital projects would be likely to result in site-specific environmental impacts that would need to be reviewed and disclosed in project-level CEQA documents.

Large-Scale Channel and Floodplain Restoration and Management

Under this approach, the Agency would implement a plan to effectively reduce the Program Area's flood threat through a combination of stream setbacks and riparian/floodplain restoration efforts. Ecological restoration in the floodplains would have the dual benefit of improved flood control by providing additional storage and retention of flood flows. This alternative would meet the Program objective of reducing flood risk and would reduce environmental impacts over the long term. However, this type of land conservation and capital improvement project is outside the scope of the SMP, which is a maintenance program. This approach would be cost-prohibitive and time-consuming to implement this over a meaningful number of SCWA-maintained channels. Additionally, finding adequate and available floodplain areas to provide the needed flood storage and obtaining the necessary rights-of-way may not be possible. Despite the fact that this alternative was considered but dismissed for the purposes of the SMP, SCWA may still consider floodplain restoration and conservation where feasible and appropriate. This may be a particularly appropriate approach in the areas near the Laguna de Santa Rosa, where wider easements and the lack of urban development may provide the right opportunities. Projects of this nature are possible as part of the Tier 3 off-site mitigation program under the SMP.

Emergency Actions Only

Under this alternative, SCWA would only conduct channel maintenance activities in the Program Area under emergency necessity due to an imminent flood threat or an occurring flood event. 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 (Public Resource Code Section 21060.3). While this alternative may temporarily increase channel capacities immediately after flood events, it would not prevent future flooding events from reoccurring, nor would it proactively address flood risk. A central objective of the SMP is to provide comprehensive management across the Program Area and to provide adequate maintenance planning such that channels with reduced conveyance capacities are identified and prioritized for work during the following summer season. This alternative was dismissed from further consideration because it would not meet SMP flood control objectives, since actions taken during emergencies would generally not provide significant protection against loss of life and property.

Reduced Program Scope and Activities

This alternative includes component approaches of the SMP but does not include the full extent of Program activities as currently defined. A reduced scope might involve only conducting vegetation management activities without sediment management or bank stabilization activities. Conversely, another approach would be to include sediment removal activities but not vegetation management actions. Such attempts to reduce the Program's scope of activities were dismissed because sediment removal, bank stabilization, and vegetation management activities are integrated and all necessary in meeting the Agency's Program objectives of providing adequate flood control.

5.4.2 Alternative Methods Considered and Dismissed

Hand Tool Alternative

Under this alternative Program activities would remain the same, however the methods to conduct the maintenance work would be modified. Instead of using heavy mechanized equipment (e.g., bulldozers, excavators), maintenance would be completed using hand tools only (e.g., shovels, weed-whackers). This would potentially minimize adverse effects associated with heavy machinery (transport, accidental spills, and impacts to habitat in channels); however the time and costs for personnel to perform these activities using hand tools would far exceed that of the original SMP and is considered infeasible.

5.5 Environmentally Superior Alternative

Weighing all issues, the Proposed Program is considered to be environmentally superior. Compared to any of the alternatives, it strikes the most appropriate balance between managing flood risk, protecting the ecological integrity of the SMP channels, and addressing other short- and long-term impacts associated with stream channel maintenance.

This fact notwithstanding, CEQA requires that an environmentally superior alternative be selected from among the alternatives to the Proposed Program. The Reduced Maintenance Alternative is considered the environmentally superior alternative, since by limited the amount of work it would limit the impacts associated with such work. However, while the Reduced Maintenance Alternative would lessen potential Program impacts, it does not provide the same level of flood management as the Proposed Program. Providing up to 10,000 cubic yards of sediment removal annually would provide a certain level of maintenance, and in many years this may be adequate to address flood risk. However, observations and sediment removal records from recent years indicate that maintenance requirements for the Program's channels may require up to 25,000 cubic yards of sediment removal annually. It is useful to note that the 25,000 cubic yard annual sediment removal limit of the Proposed Program is already a much reduced volume compared to what the *Return to As-Built Alternative* as described above would require.

The other programmatic alternatives were not selected as the environmentally superior alternative for the following reasons:

- **No Program Alternative.** While this alternative would ultimately achieve flood protection goals, maintenance would not necessarily be conducted in a timely manner to avoid flood hazards. Further, maintenance activities would not benefit from the use of a comprehensive mitigation approach and consistent set of BMPs. As such, flood risk would be greater, while at the same time, more residual impacts would remain.
- **Increased Maintenance and Expanded Maintenance in Modified and Natural Channel Alternatives.** These alternatives would reduce flood risk. However, this factor was overwhelmed by the substantially greater short-term impacts from the increased amount of maintenance, as well as greater long-term impacts from maintaining channels in their as-built condition (Increased Maintenance Alternative) or conducting extensive maintenance activities in natural and modified streams (Expanded Geographic Scope Alternative).

The alternative maintenance methods were not selected as the environmentally superior alternative for the following reasons:

- **Alternative Bank Stabilization Approach.** Compared to biotechnical techniques, the increased durability of rip-rap and bank hardening approaches were not considered advantageous enough to outweigh their reduced ecological benefits.
- **Alternative Vegetation Management Approach, Option A – No Revegetation.** While this alternative would reduce the amount of maintenance work necessary, reducing associated short-term impacts, this was outweighed by the long-term impacts to channel ecology.
- **Alternative Vegetation Management Approach, Option B – No Herbicides.** The ecological and human health impacts associated with proper use of herbicides would be minimal. Additionally, the difficulty or inability to control certain types of vegetation without herbicide use would increase the level of effort and short-term impacts associated with maintenance work, as well as reduce the long-term integrity of channel ecology.
- **Alternative Sediment Removal Approach.** While use of equipment exclusively from top-of-bank would eliminate the impacts from use of in-channel equipment, this would be outweighed by the riparian impacts associated with use of such equipment, and the inability to provide adequate flood protection in certain locations.

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