

The following text is to be inserted into Chapter 7: Water Quality Attainment Strategies Including Total Maximum Daily Loads.

7.4.2 Pescadero-Butano Watershed Sediment TMDL and Habitat Enhancement Plan

This sediment TMDL and habitat enhancement plan address the impairments to beneficial uses in Pescadero and Butano creeks. The following sections establish:

- The sediment TMDL, which identifies the allowable annual sediment load that can be discharged into the Pescadero-Butano watershed, expressed as a percentage of the natural background sediment delivery rate to channels; and
- An implementation plan to achieve the TMDL and habitat enhancement goals.

The goals of the Pescadero-Butano Watershed Sediment TMDL and Habitat Enhancement Plan are as follows:

- To restore water quality and attain beneficial uses.
- To conserve the steelhead trout population.
- To restore a self-sustaining coho salmon population.
- To improve water quality and habitat for native fish and aquatic wildlife species communities.

The TMDL and the implementation plan address the significant increases in sediment supply to channels, as well as simplification, loss, and/or reduction in the quality and quantity of instream habitat for listed populations of salmonids in the Pescadero-Butano watershed. To attain water quality objectives and restore properly functioning channels and habitat, the TMDL calls for actions throughout the watershed to substantially reduce sediment supply to channels and, where safe and feasible, reconnect the channels to their floodplains and enhance channel complexity by adding and retaining large woody debris in channels.

This TMDL focuses on the implementation actions within the channel network upstream of the Pescadero lagoon and marsh complex, located at the watershed-ocean interface, and does not address other water quality issues specific to the Pescadero lagoon and marsh complex. However, achievement of this TMDL is a necessary step to help restore water quality and beneficial uses throughout the watershed, including the lagoon and marsh.

7.4.2.1 Problem Statement

Populations of steelhead and salmon in the Pescadero-Butano watershed have declined substantially over the last century due to progressive changes in land use resulting in excess sediment in the channels and degradation of channel habitat. Land clearing, timber harvesting, legacy grazing and agricultural practices, channel modifications, and roads have: i) increased hillslope erosion; ii) doubled annual sediment supply to channels; iii) resulted in deep incision of Pescadero and Butano creeks and their tributaries; and iv) eliminated sediment storage along the channel and on the floodplains.

Pescadero and Butano creeks are impaired by excess erosion and sedimentation such that the narrative water quality objectives for sediment and settleable material are not being met, and cold freshwater

habitat, wildlife habitat, fish spawning and migration, contact and non-contact recreation, and preservation of rare and endangered species beneficial uses are impaired. In addition, the narrative water quality objective for population and community ecology is not being met due to channel incision, which is a significant sediment source and results in habitat simplification and floodplain disconnection. Channel incision and associated simplification of habitat are primary causes of the decline of coho salmon and steelhead trout populations and are controllable water quality factors.

Habitat conditions are degraded by elevated concentrations of fine sediment in the streambed (primarily sand) – caused by pervasive alteration of sediment supply, transport, and storage, which further reduces juvenile salmonid growth and survival in all freshwater life stages. Excess amounts of fine sediment have been deposited on the streambed at potential steelhead spawning and rearing sites. Excess fine sediment in the streambed can cause poor incubation for fish eggs, resulting in high mortality prior to emergence. Fine sediment has also compromised the quality of pools as rearing habitat and reduced winter rearing habitat by filling the spaces between cobbles and boulders.

Channel incision has severely impacted the basic physical habitat structure of the channel and has caused habitat simplification expressed by a substantial reduction in the frequency and area of gravel bars, riffles, and side channels. Channel incision has isolated channels from their floodplains: floodplains no longer function as sediment storage sites and are lost as excellent rearing and refuge habitats for juvenile salmon and steelhead. In addition, a substantial reduction in the amount of large woody debris in channels has greatly diminished the capacity for the creeks to store, sort, and meter sediment, as well as the quality and diversity of freshwater channel habitats. Lastly, significant and persistent increases in sediment supply and loss of floodplains have contributed to an order-of-magnitude increase in the sedimentation rate in the Pescadero lagoon and marsh, adversely impacting water quality.

7.4.2.2 Numeric Targets

The numeric targets for the TMDL to achieve the Basin Plan’s water quality objectives for sediment, settleable material, and population and community ecology are listed in Table 7.4.2-1.

Table 7.4.2-1 Sediment TMDL and Habitat Targets for Pescadero and Butano Creeks and Their Tributaries

Sediment Condition Target	
Residual Pool Volume (V*) A unitless measure of the fraction of a pool's volume that is filled by fine sediment	Mean value ≤ 0.21 Maximum value ≤ 0.45
Substrate Composition	$\leq 14\%$ fines < 0.85 millimeter (mm), i.e., percent fines less than 0.85 mm in diameter is less than or equal to 14% of the total bulk core sample $\leq 30\%$ fines < 6.40 mm
Habitat Condition Target	
Large Woody Debris (LWD) loading in Redwood Channels	≥ 300 cubic meters per hectare of bankfull channel area (m ³ /ha)
LWD loading in Hardwood Channels	≥ 100 m ³ /ha
Redwood channels are defined as those where the adjacent valley floor and/or hillslopes are vegetated primarily by coast redwood forest. Hardwood channels are defined as those where the adjacent valley flat is vegetated by a hardwood forest (typically some combination of willow species, white alder, California bay laurel, bigleaf maple, tan oak, and/or Oregon ash). The large woody debris loading targets apply to channel reaches that provide actual or potential spawning habitat for anadromous salmonids as defined above.	

7.4.2.3 Sediment Sources

Field inventories and sediment modeling conducted throughout the Pescadero-Butano watershed provide credible estimates of the average rate of sediment delivery to channels between 1970 and 2010. Based on this work (Table 7.4.2-2), the Water Board concludes:

1. Sediment delivery to fish-bearing channels has doubled in the last 150 years as compared to the natural background rate. More than half of the fine sediment delivered to Pescadero and Butano creeks and their tributaries is associated with land use activities, including roads, human-caused channel incision, and legacy effects of intensive historical livestock grazing and timber harvesting.
2. The average annual rate of sediment supply to channels in the watershed is 1,200 tons per km² per year.
3. More than 40,000 tons of sediment that historically deposited annually on floodplains and alluvial valley (one third of the total sediment delivered from the watershed) is now transported downstream to the Pescadero lagoon and marsh complex due to channel incision. Therefore, not only has this significant storage function along the floodplains and alluvial valley been lost, but the valley itself is now a significant sediment source.

4. Contributions of sediment from municipal and construction stormwater runoff are small in comparison to other sources and are estimated to be about 500 tons per year.

Table 7.4.2-2 Mean Annual Sediment Delivery to the Pescadero-Butano Watershed (tons/year)

Sediment Source Category	Natural Background Annual Delivery Rate (tons/year)	Current Mean Annual Delivery Rate (tons/year)
Sediment Sources		
▪ Natural Processes:	120,000	120,000
▪ Human Actions:		
• Roads		51,000
• Channel incision		30,000
• Gullyng on grasslands		24,000
• Landslides and debris flows		23,000
• Surface erosion on grasslands		4,500
Total from Human Actions		132,500
TOTAL		252,500

7.4.2.4 Total Maximum Daily Load and Allocations

The Pescadero-Butano watershed sediment TMDL is 150,000 tons per year, or 125 percent of the estimated natural background load and applies to Pescadero and Butano creeks and their tributaries. In order to achieve the TMDL, controllable sediment delivery resulting from human actions needs to be reduced by approximately 78 percent (Table 7.4.2-3).

Attainment of the TMDL will be evaluated immediately downstream of the confluence of Pescadero and Butano creeks at the upstream boundary of the Pescadero marsh and lagoon complex. Attainment of the TMDL will be evaluated using a 10-year averaging period.

Table 7.4.2-3 Load Allocations

Source Category	Current Load	Estimated Percentage Reductions Needed	Load Allocations	
	tons/year	Percent	tons/year	Percent of Natural Background
▪ Natural processes	120,000	0	120,000	100
▪ Human actions:				
- Roads*	51,000	78	11,500	9.5
- Channel incision	30,000	78	6,600	5.5
- Gullies	24,000	78	5,300	4.4
- Landslides	23,000	78	5,100	4.2
- Surface erosion grasslands	4,500	78	1,000	0.8
TOTAL	252,500		149,500	124.4

*Approximately 15% of the allowable load for roads is allocated to San Mateo County

Table 7.4.2-4 Wasteload Allocations for Stormwater Runoff

Source Category	Current Load	Percent Reductions Needed	Wasteload Allocations	
	tons/year		tons/year	Percent of Natural Background
▪ San Mateo County Municipal Stormwater NPDES Permit No. CAS612008	300	0	300	0.3
▪ Construction Stormwater NPDES Permit No. CAS000002	150	0	150	0.3
▪ CalTrans Stormwater NPDES Permit No. CAS000003	<50	0	50	0
TOTAL	500	0	500	0.6

7.4.2.5 Implementation Plan

The actions described below are necessary to achieve TMDL targets, allocations, performance standards, and habitat enhancement goals within twenty years of the effective date of the Basin Plan amendment.

Stormwater Runoff

Stormwater runoff from State highways and municipal and construction stormwater runoff are the only known point sources of sediment to the Pescadero-Butano watershed and have small wasteload allocations (Table 7.4.2-4) relative to nonpoint sources of sediment. These sources are regulated under existing NPDES permits that include requirements to control erosion, sedimentation, and hydromodification from new development and requirements to maintain rural roads. Table 7.4.2-5 shows implementation measures required for these sources. Implementation to address reductions in loading for sediment discharges associated with roads under the jurisdiction of San Mateo County are included here.

Table 7.4.2-5 TMDL Implementation Measures for Sediment Discharges Associated with Stormwater Runoff and Roads

Source Category	Actions	Implementing Parties
<i>Stormwater Runoff</i> CalTrans, Construction	Comply with applicable NPDES permits	CalTrans Owners or operators of construction projects > 1 acre
<i>Stormwater Runoff and Roads</i> Municipal	Comply with applicable NPDES permits	San Mateo County

Nonpoint Sources

The State’s 2004 Policy for Implementation and Enforcement of the Nonpoint Source Pollution Control Program provides for regulation of nonpoint source discharges using the Water Board’s administrative permitting authorities, including WDRs, waiver of WDRs, Basin Plan Discharge Prohibitions, or some combination of these. Consistent with this policy, Tables 7.4.2-6 through 7.4.2-11 specify actions and performance standards by nonpoint source category, as needed to achieve TMDL targets and allocations in the Pescadero-Butano watershed. The Water Board will consider adopting permits that apply to the nonpoint sources from roads, grazing lands, non-grazing agricultural lands, and/or timberlands listed in Tables 7.4.2-6 through 7.4.2-10. Individual landowners or coalitions may work with “third parties,” such as the San Mateo Resource Conservation District, to develop and implement sediment pollutant control programs.

Habitat Enhancement

Channel incision, loss of sediment storage function, and loss of essential habitat features are the result of multiple historical and ongoing disturbances. This implementation plan calls for habitat enhancement actions. A channel and habitat restoration program that increases woody debris and re-establishes width-to-depth ratios and a modest flood plain will be the most effective means of controlling channel

incision and reducing related sediment delivery to the creeks. Floodplains and large woody debris jams would provide essential high-quality rearing habitats and enhance food production for coho salmon and steelhead. These features also help create pools, reduce scouring, store sediment, and diversify habitat types within the stream. The habitat enhancement program, presented in Table 7.4.2-11, will therefore focus on actions to: (1) to the extent safe and feasible, substantially increase the amount of large woody debris in channels that run through public lands and timber harvest lands; and (2) study safe and feasible opportunities for floodplain restoration in channel reaches on private lands. The effectiveness of implementation of actions specified in Table 7.4.2-11 to enhance habitat will be evaluated as part of the adaptive implementation program.

7.4.2.6 Agricultural Water Quality Program Costs

The implementation measures in Tables 7.4.2-6 and 7.4.2-7 for grazing and agricultural land constitute an agricultural water quality control program and therefore, consistent with Water Code section 13141, the cost of this program is estimated herein. This cost estimate includes the cost of implementing all road-related and surface erosion-related sediment control measures specified in the implementation plan and is based on costs associated with technical assistance, project design, and implementation of actions needed to achieve the TMDL.

There are no other costs to farmers or ranchers associated with actions to enhance channel habitat complexity and floodplain connection, because participation by private landowners is voluntary, and almost all of the costs of these projects are expected to be paid for from grants by public agencies and/or non-profits. In estimating costs, the Water Board estimated that owners of grazing and non-grazing agricultural businesses own up to 20 percent of the total land area. The Water Board estimates that the total cost to agricultural businesses associated with efforts to reduce sediment supply to Pescadero and Butano creeks watershed is \$200,000 to \$300,000 per year.

7.4.2.7 Evaluation and Monitoring

Water Board staff, working in partnership with other entities, e.g., San Mateo County and the San Mateo County Resource Conservation District, will conduct baseline monitoring to document existing residual pool volumes (V^*), substrate composition, and woody debris loadings along representative reaches. In addition to baseline conditions monitoring, the following monitoring is necessary:

- 1) Implementation monitoring to document actions taken on individual properties to reduce fine sediment discharge and enhance habitat complexity and connectivity;
- 2) Upslope effectiveness monitoring to evaluate effectiveness of sediment control actions in reducing rates of sediment delivery to channels on a subwatershed basis; and
- 3) In-channel effectiveness monitoring (e.g., pool filling and substrate composition) to evaluate channel response to management actions and natural processes.

Implementation monitoring will be conducted by landowners or designated agents to document that sediment control actions, i.e., best management practices as specified herein, occur.

The Water Board anticipates working in partnership with the implementing parties to conduct upslope effectiveness monitoring to reevaluate rates of sediment delivered to channels from land use activities and natural processes.

In-channel effectiveness monitoring should be conducted by the Water Board and local partners with scientific expertise and demonstrated capability in working effectively with private property owners (to gain permissions for access), as needed to develop a representative sample of stream habitat conditions, in relation to sediment supply and transport within the watershed. In-channel effectiveness monitoring is needed to evaluate: a) progress toward achieving water quality targets, and b) channel response to management measures and natural processes. The main parameters that will be monitored to assess progress toward achieving water quality targets are residual pool volume and substrate composition.

The Water Board, working in partnership with other entities, such as the San Mateo County Resource Conservation District and other organizations with scientific expertise, will assess large woody debris loading in channels to evaluate attainment of the numeric targets for large woody debris loading and to guide development of reach-specific prescriptions for installation of engineered log jams and riparian management actions to attain the target values in future years through natural recruitment.

Desired measurement frequency for pool filling, substrate composition, and large woody debris is once every five years.

7.4.2.8 Adaptive Implementation

Adaptive implementation entails taking actions commensurate with existing, available information, reviewing new information as it becomes available, and modifying actions as necessary based on the new information. Water Board staff will evaluate and report to the Water Board on the progress of implementation of the TMDL and habitat enhancement actions periodically and will evaluate the need for amending the TMDL within 10 years of the effective date of the TMDL.

Key questions to be considered in the course of adaptive implementation:

- What is the population status of steelhead and coho salmon in the watershed? Do numbers of steelhead and coho salmon increase as sediment reduction and habitat enhancement measures are implemented? An improved understanding of the status of steelhead and salmon populations in the Pescadero-Butano watershed is essential for guiding adaptive updates to the management actions recognized in this plan.
- Are Pescadero and Butano creeks and their tributaries progressing toward TMDL targets and performance standards as expected? If there is a lack of adequate progress, how might the implementation actions, targets, performance standards, or allocations be modified?
- Are the specified sediment reduction measures and recommended habitat enhancement measures resulting in an improving trend in channel habitat quantity and quality?
- Are there new data or information available that warrant revision of water quality targets, allocations, or implementation measures?

Table 7.4.2-6 Required TMDL Implementation Measures for Sediment Discharges Associated with Non-Grazing Agricultural Lands of 5 Acres or Greater

Land Use	Performance Standards	Actions	Implementing Parties	Completion Dates
NON-GRAZING AGRICULTURAL LANDS	<p>Roads: Design, construct, and maintain roads to reduce road-related sediment delivery to channels to ≤ 500 cubic yards per mile per 20-year period; or i) limit the length of roads that are hydrologically connected to 25 percent of total road length; and ii) ensure culvert inlets have low plug potential; and iii) install critical dips at culverted crossings that have a diversion potential; and</p> <p>Stream corridors: Protect streambanks, wetlands, and riparian areas from degradation through vegetated buffers; and</p> <p>Gullies and/or shallow landslides: Manage non-grazing agricultural practices to allow for natural recovery of gullies and/or landslides, prevent human-caused increases in sediment delivery from unstable areas, and decrease connectivity of gullies to stream channels; and</p> <p>Effectively attenuate significant increases in storm runoff, so that the runoff from non-grazing agricultural lands shall not cause or contribute to downstream increases in rates of bank or bed erosion.</p>	<p style="text-align: center;">PLANNING AND PRIORITIZING</p> <p>Inventory and assess natural resources, agricultural lands, and management practices that may deliver sediment to streams. Evaluate stream and riparian corridors for opportunities for improving habitat. Develop and submit a report acceptable to the Executive Officer that includes a prioritized list and schedule of actions.</p> <p style="text-align: center;">EITHER</p> <p>Submit a Report of Waste Discharge (ROWD) to the Water Board that provides, at a minimum, the following: a description of the land; identification of site-specific erosion control measures needed to achieve performance standard(s) specified in this table; and a schedule for implementation of identified erosion control measures.</p> <p style="text-align: center;">OR</p> <p>Comply with applicable Waste Discharge Requirements (WDRs) or waiver of WDRs. Develop and begin implementing an erosion control plan that would be approved as part of WDRs or waiver of WDRs.</p>	<p style="text-align: center;">Non-grazing agricultural land owner and/or operator of properties ≥5 acres</p>	<p style="text-align: center;">3 years from effective date of this Basin Plan amendment</p> <p style="text-align: center;">5 years from effective date of this Basin Plan amendment</p> <p style="text-align: center;">As specified in applicable WDRs or waiver of WDRs</p>

Table 7.4.2-7 Required TMDL Implementation Measures for Sediment Discharges Associated with Grazing Lands of 50 Acres or Greater

Land Use	Performance Standards	Actions	Implementing Parties	Completion Dates
GRAZING LANDS	<p>Surface erosion associated with livestock grazing: Attain or exceed minimal residual dry matter (RDM) values consistent with University of California Division of Agriculture and Natural Resources Guidelines¹; and</p> <p>Stream corridors: Protect streambanks, wetlands, and riparian areas from degradation through grazing management, livestock access controls, and vegetated buffers; and</p> <p>Roads: Design, construct, and maintain roads to reduce road-related sediment delivery to channels to ≤ 500 cubic yards per mile per 20-year period; or i) limit the length of roads that are hydrologically connected to 25 percent of total road length; and ii) ensure culvert inlets have low plug potential; and iii) install critical dips at culverted crossings that have a diversion potential; and</p> <p>Gullies and/or shallow landslides: Manage grazing practices to allow for natural recovery of gullies and/or landslides, prevent human-caused increases in sediment delivery from unstable areas, and decrease connectivity of gullies to stream channels.</p>	<p style="text-align: center;">PLANNING AND PRIORITIZING</p> <p>Inventory and assess natural resources, agricultural practices, and management practices that may deliver sediment to streams. Evaluate stream and riparian corridors and water bodies for opportunities for improving habitat. Develop and submit a report acceptable to the Executive Officer that includes a prioritized list and schedule of actions for landowner(s).</p> <p style="text-align: center;">EITHER</p> <p>Submit a ROWD to the Water Board that provides, at a minimum, the following: description of the property/ranch and road network; identification of site-specific erosion control measures to achieve performance standard(s) specified in this table; and a schedule for implementation of identified erosion control measures.</p> <p style="text-align: center;">OR</p> <p>Comply with applicable Waste Discharge Requirements (WDRs) or waiver of WDRs. Develop and begin implementing Grazing Management plan that would be approved as part of WDRs or waiver of WDRs.</p>	<p>Landowner and/or ranch operator of properties ≥50 acres</p>	<p>3 years from effective date of this Basin Plan amendment</p> <p>5 years from effective date of this Basin Plan amendment</p> <p>As specified in applicable WDRs or waiver of WDRs</p>
<p>¹ University of California 2002, California guidelines for residual dry matter (RDM) management on coastal and foothill annual rangelands. Rangeland Monitoring Series Publication 8092.</p>				

Table 7.4.2-8 Required TMDL Implementation Measures for Sediment Discharges associated with San Mateo County

Landowner Type	Performance Standards	Actions	Implementing Parties	Completion Dates
<p>SAN MATEO COUNTY</p>	<p>Roads: Design, construct, and maintain roads to reduce road-related sediment delivery to channels to ≤ 500 cubic yards per mile per 20-year period; or i) limit the length of roads that are hydrologically connected to 25 percent of total road length; and ii) ensure culvert inlets have low plug potential; and iii) install critical dips at culverted crossings that have a diversion potential; and</p> <p>Gullies and/or shallow landslides: Promote natural recovery and minimize human-caused increases in sediment delivery from unstable areas. Manage existing roads and other infrastructure to prevent additional erosion of legacy sediment delivery sites and/or delivery from potentially unstable areas.</p>	<p style="text-align: center;">PLANNING AND PRIORITIZING</p> <p>Comply with NPDES Permit No. CAS612008 (also referred to as the Municipal Regional Stormwater Permit).</p> <p style="text-align: center;">AND</p> <p>Create an inventory of roads that may contribute to sediment delivery to streams and develop a prioritized list and schedule of actions.</p> <p>Where performance standards are not achieved or where road-related sediment sources are not covered by NPDES Permit No. CAS612008, do one of the following:</p> <p style="text-align: center;">EITHER</p> <p>Submit a Report of Waste Discharge to the Water Board that provides, at a minimum, the following: description of the road network and/or segments; identification of erosion and sediment control measures to achieve performance standard(s) specified in this table; and a schedule for implementation of identified control measures. For paved roads, erosion and sediment control actions could primarily focus on road crossings to meet the performance standard.</p> <p style="text-align: center;">OR</p> <p>Comply with applicable Waste Discharge Requirements (WDRs) or waiver of WDRs.</p>	<p>San Mateo County</p>	<p style="text-align: center;">3 years from effective date of this Basin Plan amendment</p> <p style="text-align: center;">5 years from effective date of this Basin Plan amendment</p> <p style="text-align: center;">As specified in applicable WDRs or waiver of WDRs</p>

Table 7.4.2-9 Required TMDL Implementation Measures for Sediment Discharges associated with Parks and Open Space Lands

Landowner Type	Performance Standards	Actions	Implementing Parties	Completion Dates
PARKS/OPEN SPACE LANDS	<p>Roads: Design, construct, and maintain roads to reduce road-related sediment delivery to channels to ≤ 500 cubic yards per mile per 20-year period; or i) limit the length of roads that are hydrologically connected to 25 percent of total road length; and ii) ensure culvert inlets have low plug potential; and iii) install critical dips at culverted crossings that have a diversion potential; and</p> <p>Gullies and/or shallow landslides: Promote natural recovery and minimize human-caused increases in sediment delivery from unstable areas. Manage existing roads and other infrastructure to prevent additional erosion of legacy sediment delivery sites and/or delivery from potentially unstable areas.</p>	<p style="text-align: center;">PLANNING AND PRIORITIZING</p> <p>Adopt and implement best management practices for maintenance of unpaved (dirt/gravel) roads, conduct a survey of stream-crossings associated with unpaved public roadways, and develop a prioritized implementation plan and schedule for repair and/or replacement of high priority crossings/culverts to reduce road-related erosion and protect stream-riparian habitat conditions.</p> <p style="text-align: center;">EITHER</p> <p>Submit a Report of Waste Discharge to the Water Board that provides, at a minimum, the following: description of the road network and/or segments; identification of erosion and sediment control measures to achieve performance standard(s) specified in this table; and a schedule for implementation of identified control measures. For paved roads, erosion and sediment control actions could primarily focus on road crossings to meet the performance standard.</p> <p style="text-align: center;">OR</p> <p>Comply with applicable Waste Discharge Requirements (WDRs) or waiver of WDRs.</p>	<p style="text-align: center;">State of California, Department of Parks and Recreation</p> <p style="text-align: center;">MidPeninsula Open Space District</p> <p style="text-align: center;">Peninsula Open Space Trust</p>	<p style="text-align: center;">3 years from effective date of this Basin Plan amendment</p> <p style="text-align: center;">5 years from effective date of this Basin Plan amendment</p> <p style="text-align: center;">As specified in in applicable WDRs or waiver of WDRs</p>

Table 7.4.2-10 Required TMDL Implementation Measures for Sediment Discharges Associated with Timber Lands of 100 acres or Greater

Land Use	Performance Standards	Actions	Implementing Parties	Completion Dates
TIMBER LANDS	<p>Roads: Design, construct, and maintain roads to reduce road-related sediment delivery to channels to ≤ 500 cubic yards per mile per 20-year period; or i) limit the length of roads that are hydrologically connected to 25 percent of total road length; and ii) ensure culvert inlets have low plug potential; and iii) install critical dips at culverted crossings that have a diversion potential; and</p> <p>Gullies, shallow landslides, and/or unstable areas: Manage operations (e.g., tree removal (felling), hauling of trees, road construction, heavy equipment use) to prevent additional erosion of legacy sediment delivery sites, and/or delivery from other potentially unstable areas, and to decrease connectivity of gullies to stream channels.</p>	<p>Comply with California Forest Practice Rules, Anadromous Salmonid Protection Rules, and Road Rules or other requirements to control sediment sources from timber harvest operations that are provided by the Water Board.</p> <p style="text-align: center;">PLANNING AND PRIORITIZING</p> <p>Inventory and assess natural resources and management practices that may contribute to sediment delivery to streams. Evaluate stream and riparian corridors and water bodies for opportunities to improve habitat. Develop and submit a report acceptable to the Executive Officer that includes a prioritized list and schedule of actions for timberland owner(s).</p> <p style="text-align: center;">EITHER</p> <p>Submit a Report of Waste Discharge to the Water Board that provides, at a minimum, the following: description of the property road network; identification of site-specific erosion control measures to achieve performance standard(s) specified in this table; and a schedule for implementation of identified erosion control measures.</p> <p style="text-align: center;">OR</p> <p>Comply with other applicable Waste Discharge Requirements (WDRs) or waiver of WDRs.</p>	<p>Landowner and/or timber lands operator of properties ≥100 acres</p>	<p style="text-align: center;">Ongoing</p> <p style="text-align: center;">3 years from effective date of this Basin Plan amendment</p> <p style="text-align: center;">5 years from effective date of this Basin Plan amendment</p> <p style="text-align: center;">As specified in applicable WDRs or waiver of WDRs</p>

Table 7.4.2-11 Recommended Actions to Reduce Sediment Load and Enhance Habitat Complexity in Pescadero and Butano Creeks and Their Tributaries

Stressor	Management Objective(s)	Actions	Implementing Parties	Completion Dates
<p>Habitat degradation as a result of incision along Pescadero and Butano creeks and their tributaries.</p>	<p>Reduce rates of sediment delivery (associated with incision) to channels, by 78 percent.</p> <p>Increase sediment storage in the channels and on the floodplains.</p> <p>Enhance channel habitat complexity and connectivity as needed to support self-sustaining run of steelhead and coho salmon and enhance the overall health of the native fish community.</p>	<p>Develop detailed technical studies to characterize reach-specific opportunities and priorities for floodplain restoration.</p> <p>Develop and implement plans to enhance stream-riparian habitat conditions and channel complexity.</p> <p>Comply with conditions of Clean Water Act section 401 certifications in the implementation of projects to increase channel-floodplain connectivity</p>	<p>State and local government agencies, landowners and/or designated agents, and reach-based stewardships</p>	<p>Technical studies to characterize reach specific opportunities and priorities for floodplain restoration will be completed within 5 years of Basin Plan amendment.</p>
<p>Habitat degradation as a result of reduction in large woody debris in stream channels.</p>	<p>Enhance quality of rearing habitat for juvenile salmonids.</p>	<p>Develop and implement plans to enhance large woody debris loading and restore natural rates of recruitment to channels, as needed to achieve numeric targets for large woody debris loading. This plan will include a survey to quantify baseline values for large woody debris loading. Comply with conditions of Clean Water Act section 401 certifications in the implementation of projects for large woody debris loading and recruitment.</p>	<p>State and local government agencies, landowners and/or designated agents, and reach-based stewardships</p>	<p>Targets for large woody debris loading will be achieved within 10 years of Basin Plan amendment adoption.</p>