[Add a new sub-section to the Water Quality Control Plan for the North Coast Region implementation chapter (Chapter 4) with the following Action Plan. This section will be added after the "ACTION PLAN FOR THE KLAMATH RIVER TOTAL MAXIMUM DAILY LOADS ADDRESSING TEMPERATURE, DISSOLVED OXYGEN, NUTRIENT, AND MICROCYSTIN IMPAIRMENTS IN THE KLAMATH RIVER IN CALIFORNIA AND LOST RIVER IMPLEMENTATION PLAN." In addition to adding the following language, several editorial revisions will be made, including appropriate changes to the Title Page, Table of Contents, Summary of Basin Plan Amendments (Appendix 1), page numbers, table and figure numbers, footnote numbers, and headers and footers to reflect the new language. The final locations of tables and figures in relation to the text may also be changed to accommodate the existing formatting of the Basin Plan.]

ACTION PLAN FOR THE UPPER ELK RIVER SEDIMENT TMDL

The Elk River Watershed is located in Humboldt County in northern California and drains into Humboldt Bay, south of the City of Eureka. Due to excessive sedimentation, the entire 58.3 square mile (37,310 acres) Elk River Watershed was placed on the Impaired Waters List for Section 303(d) of the Clean Water Act in 1998. This sediment TMDL addresses impairments in the 44.2 square mile (28,288 acres) Upper Elk River Watershed, which is predominantly timberland and includes impacted reaches wherein the most sediment has been stored and subsequent effects observed. The Program of Implementation described below includes nonregulatory actions that are designed to address sedimentation throughout the watershed. The Action Plan for the Upper Elk River Sediment TMDL (hereinafter known as the TMDL Action Plan) does not establish sediment load allocations for landuse in the Martin Slough or Lower Elk River West subwatersheds, nor for activities in the Lower Elk River subwatershed that are downstream of Berta Road.

The TMDL Action Plan includes a phased total maximum daily load (TMDL) for sediment and describes the implementation actions necessary to attain water quality standards in the Upper Elk River Watershed. The goal of the TMDL Action Plan is to achieve sediment related water quality standards, including the protection of the beneficial uses of water in the upper watershed and prevention of nuisance conditions. The TMDL Action Plan establishes the sediment load consistent with current conditions in the impacted reaches, identifies a process for assessing and implementing necessary and feasible remediation and restoration actions, and describes a program of implementation to be considered and incorporated into regulatory and non-regulatory actions of the Regional Water Board and other stewardship partners in the watershed.

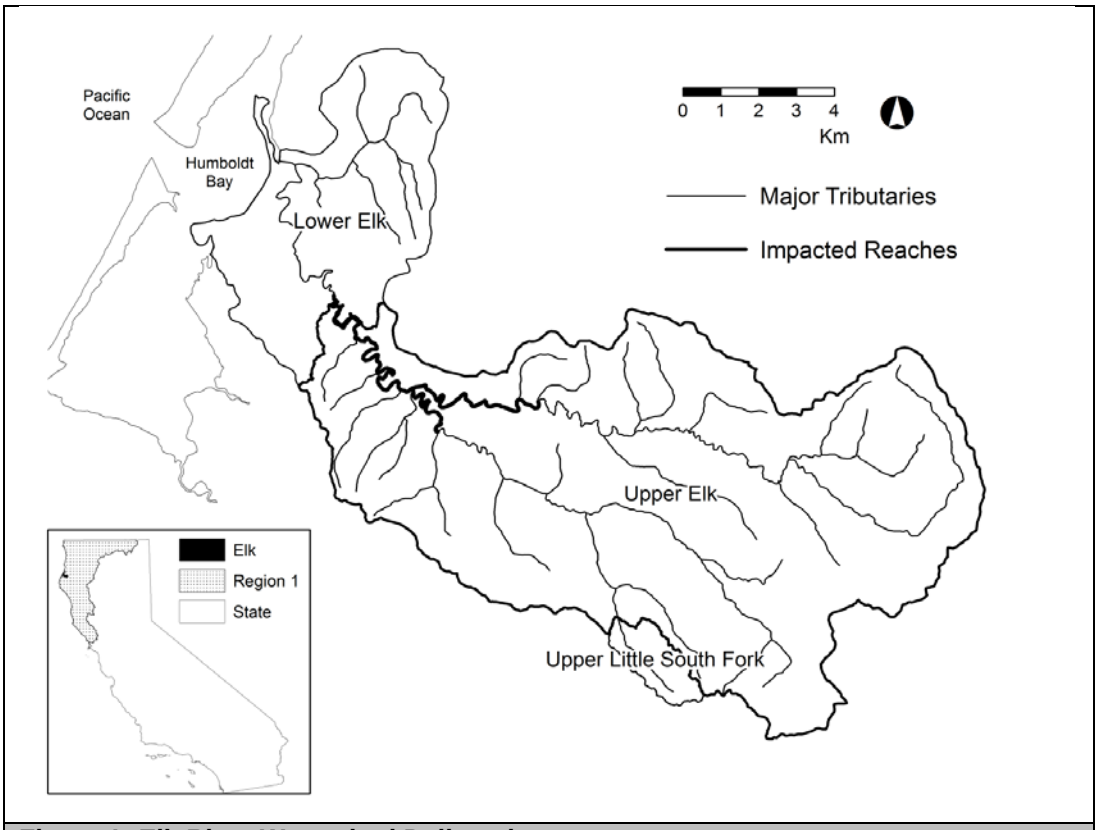

Figure 1: Elk River Watershed Delineation

I. Problem Statement

Site specific assessment of water quality conditions in the Upper Elk River Watershed confirm that sediment discharges from timberlands in the upper watershed and sedimentation in the impacted reaches, combining with other natural (e.g., tectonics, geology, soil characteristics, geomorphology, climate and vegetation) and anthropogenic (e.g., pre-Forest Practices Act logging, ranching, farming, roads, and residential development) factors exceed the water quality objectives for sediment, suspended material, settleable matter, and turbidity and result in adverse impact to several beneficial uses, including domestic water supplies (MUN), agricultural water supplies (AGR), cold water habitat (COLD); spawning, reproduction and early development (SPWN); rare, threatened, or endangered species (RARE), and recreation (REC-1 and REC-2). Sedimentation in the impacted reaches also has resulted in conditions of nuisance, including increased rates and depth of annual flooding and loss of property, use of property, access to property, and risk to human health and welfare. The impacted reach extends from the confluence of Brown's Gulch on the North Fork Elk and Tom Gulch on the South Fork Elk to the mainstem Elk River at Berta Road and is contained within the delineated boundaries of the Upper Elk River Watershed.

II. Source Analysis

Multiple natural and anthropogenic factors influence the behavior of sediment in the Elk River Watershed. Table 1 summarizes the estimated sediment loads, organized by source category and analysis time period. The presented estimates represent the data collection and assessment efforts of multiple federal, state, private and nonprofit entities over the course of more than 10 years. The estimates combine the

results of numerous Elk River specific studies, which constitute a rich and abundant dataset. Nonetheless, there is inherent uncertainty in the estimates, derived from necessary assumptions and conservative margins of safety. The estimates provide an adequate and reasonable basis for establishing a TMDL and load allocations. An adaptive management framework allows for adjustments to the program of implementation, as new data become available. Primary natural factors include: tectonics, geology, topography, geomorphology, climate and vegetation. Geological features are an especially important factor in sediment production in the Upper Elk River, which is dominated by young, fine-grained, erodible geology. Primary anthropogenic or land use-related factors include: timber harvest, yarding, road building and use, and legacy practices (e.g., pre-Forest Practice Rules). The interaction between inherent watershed characteristics, types of management practices, and timing of stochastic events such as earthquakes or large storm events, influence the magnitude and timing of sediment production. Increased sediment production results from greater incidence of landsliding, surface and gully erosion, and increases in channel erosion from increased peak flows and higher runoff.

Sediment transported from the upper sub-watersheds has deposited in low gradient channel and floodplain reaches, impacting residential and agricultural communities with increased incidence of overbank flooding, defined as nuisance conditions. Ongoing sediment loading continues to result in aggradation of fine sediment, encroachment of riparian vegetation, and impairment of beneficial uses, though the total volumes of delivered sediment have decreased since the 1988-1997 time period. The causes of reduced sediment loading have not been clearly established. But, improvements in management practices in the 2004-2011 period, as well as smaller magnitude peak flow events and a limited number of relatively wet years in this period, likely play a role. Cross sectional changes observed over the past three decades starting in 1988 indicate an estimated 640,000 cubic yards of sediment have accumulated in the impacted reaches. An estimated 25% of the annual sediment inflow to the impacted reaches causes aggradation and further worsens nuisance conditions.

The sediment source analysis identifies the key sediment source categories that produce sediment in the Upper Elk River Watershed. Sediment discharges resulting from timber harvest and other land-management activities in the most recent analysis time period (2004-2011) are (in order of significance): in-channel sources (headward channel incision, bank erosion, and streamside landslides), discharges from existing land use-related sediment discharge sites, other road-related discharges, and harvest-related discharges.

Table 1: Summary of Upper Elk River volumetric loading ($yd^3 \cdot mi^{-2} \cdot yr^{-1}$) by sediment source category and analysis time period

Sediment Source Category		1955 - 1966	1967 - 1974	1975 - 1987	1988 - 1997	1998 - 2000	2001 - 2003	2004 - 2011
Anthropogenic	In-Channel: Low Order Channel Incision	67	23	14	21	32	12	14
	In-Channel: Management-Related Bank Erosion & Streamside Landslides	186	141	54	219	240	240	160
	Road-Related Landslides	99	29	15	307	3	20	25
	Road Surface Erosion	52	78	87	137	55	56	22

Table 1: Summary of Upper Elk River volumetric loading ($yd^3 \cdot mi^{-2} \cdot yr^{-1}$) by sediment source category and analysis time period								
Sediment Source Category		**1955 - 1966**	**1967 - 1974**	**1975 - 1987**	**1988 - 1997**	**1998 - 2000**	**2001 - 2003**	**2004 - 2011**
	Land Use-related Sediment Discharge Sites	30	60	80	65	39	73	39
	Post-Treatment Sediment Discharge Sites	0	0	0	0	13	4	24
	Skid Trails	4	12	11	12	26	15	15
	Open Slope Landslides	189	82	6	201	118	51	5
	Harvest Surface Erosion	2	6	2	5	6	5	4
	Anthropogenic Loading	**629**	**431**	**268**	**966**	**531**	**476**	**308**
	Natural Loading	**152**	**132**	**93**	**167**	**176**	**176**	**144**
	Total Loading	**781**	**563**	**360**	**1,133**	**707**	**652**	**452**

III. Water Quality Indicators

Water quality indicators and associated numeric targets are not independently enforceable and are designed to measure progress towards attaining water quality objectives for suspended material, settleable material, turbidity and sediment. The water quality indicators are divided into hillslope and instream, as identified in Tables 2 and 3, respectively. The hillslope indicators and numeric targets in Table 2 are designed to inform Board actions and can be incorporated into orders, as appropriate and to the maximum extent feasible. The instream water quality indicators are designed to help assess the overall effectiveness of the program of implementation and confirm progress towards attainment of applicable water quality standards.

Attainment of water quality objectives is partly dependent on the control of sediment discharges from the Upper Elk River Watershed to minimize increased sediment production and other controllable water quality factors (e.g., altered hydrology and reduction in large woody debris recruitment trees).

Table 2: Hillslope Water Quality Indicators and Numeric Targets[†]		
Indicator	**Numeric Target**	**Associated Area**
Common Road Indicators		
Hydrologic connectivity of roads to watercourses	100% of road segments hydrologically disconnected from watercourses	All roads
Sediment delivery due to surface erosion from roads	Decreasing road surface erosion	
Sediment delivery due to road-	Decrease in sediment delivery from new	

Table 2: Hillslope Water Quality Indicators and Numeric Targets[†]		
Indicator	**Numeric Target**	**Associated Area**
related landslides	and reactivated road-related landslides	
Common Harvest-Related Indicators		
Sediment delivery due to surface erosion from harvest areas	100% of harvest areas have ground cover sufficient to prevent surface erosion	All harvest areas
Sediment delivery from open slope landslides due to harvest-related activities	Decrease in sediment delivery from new and reactivated open-slope landslides	All open slopes
Sediment delivery from deep seated landslides due to harvest-related activities	Zero increase in discharge from deep-seated landslides due to management-related activities	All deep-seated landslides
Common Management Discharge Site Indicators		
New management discharge sites	No new management discharge sites created	Class I, II, and III watercourses
Specific Upper Elk River Watershed Indicators		
Headward incision in low order channels	Zero increase in the existing drainage network	Class II/III catchments
Peak flows	Less than 10% increase in peak flows in 10 years related to timber harvest	Class II/III catchments
Channels with actively eroding banks	Decreasing length of channel with actively eroding banks	Class I, II, and III watercourses
Characteristics of riparian zones (i.e., 300 feet on either side of the channel) associated with Class I and II watercourses	Improvement in the quality/health of the riparian stand so as to promote 1) delivery of wood to channels, 2) slope stability, and 3) ground cover	Class I and II watercourses
Characteristics of riparian zones (i.e., 150 feet on either side of the channel) associated with Class III watercourses	Improvement in the quality/health of the riparian stand so as to promote 1) delivery of wood to channels, 2) slope stability, and 3) ground cover	Class III watercourses

[†] The hillslope indicators and numeric targets in Table 2 are designed to inform Board actions and can be incorporated into orders, as appropriate and to the maximum extent feasible.

Table 3: Instream Water Quality Indicators and Numeric Targets		
Instream Indicator	**Numeric Target**	**Associated Area**
Bankfull Channel Capacity	Channel cross-sectional area sufficient to contain the historic bankfull discharges: Upper Mainstem = 2,250 cfs (for drainage area of 43 mi^2) Lower North Fork, = 1,170 cfs (for drainage area of 22.5 mi^2) Lower South Fork = 1,015 cfs (for drainage area of 19.5 mi^2)	Impacted reaches near the confluence of North and South Forks Elk River, with target discharge scaled to drainage area at measurement location

Table 3: Instream Water Quality Indicators and Numeric Targets		
Instream Indicator	**Numeric Target**	**Associated Area**
Chronic turbidity	Clearing of turbidity between storms to a level sufficient for salmonid feeding and surface water pumping for domestic and agricultural water supplies	Salmonid feeding—watershed-wide historic range of salmonids Water supplies—Impacted reaches

IV. Sediment TMDL and Load Allocation, including Margin of Safety and Consideration of Seasonal Variation

TMDLs must be established at levels necessary to attain and maintain the applicable water quality standards with seasonal variations and a margin of safety (MOS) (40 CFR Part 130.7(c)(1).) The TMDL represents the maximum amount of a pollutant that can be discharged to a waterbody, taking into account critical conditions of stream flow, loading, and water quality parameters. The TMDL is equivalent to the loading capacity of the waterbody for the pollutant in question.

The Upper Elk River Sediment TMDL is set equal to the loading capacity of the waterbody. The loading capacity of the Upper Elk River Watershed is defined as the total sediment load (natural and management-related) that can be discharged into the Upper Elk River and its tributaries without impacting beneficial uses of water, causing an exceedance of water quality objectives, reducing the quality of high quality water, or creating nuisance conditions. Because capacity for sediment is limited by the ongoing aggradation in the impacted reaches, the loading capacity for additional sediment is defined as zero until the capacity of the impacted reaches can be expanded.

All the sediment delivered to the stream channels in the Upper Elk River Watershed is attributed to management-related nonpoint source pollution and natural background. Due to the lack of sediment loading capacity in the impacted reaches, the nonpoint source load allocation is defined as zero. This approach incorporates a conservative, implicit MOS[1] and includes seasonal variation of sediment production through estimating sediment loads on an annual time step. The zero load allocation is necessarily conceptual since, using current technology and techniques, no amount of land use restriction can physically result in zero loading of non-point source sediment (i.e., the control of all natural and anthropogenic sediment delivery from the tributary system). This regulatory loading capacity will guide the program of implementation and will be maintained until the sediment loading capacity of the impacted reaches has been expanded. The zero load allocation does not constitute an effluent limitation or a waste load allocation, and the Board has discretion on how to implement it in WDRs, waivers or other actions to reduce and eliminate waste discharges. Once the loading capacity has been expanded, the Regional Water Board can reevaluate the load allocation and establish a second phase of the TMDL, as appropriate.

[1] Estimating the sediment loading capacity of a natural system as zero is inherently conservative since no amount of source control, remediation, and restoration can completely eliminate sediment transport downstream. In addition, the TMDL is derived from the sediment source analysis, which likewise incorporated multiple conservative assumptions when applying measurements of surface erosion, landslide, and stream bank erosion across all the subwatersheds.

V. Watershed Efforts

Throughout the Elk River Watershed, many individuals, groups, and agencies have been working to assess, enhance, and restore beneficial uses and assess, abate, and prevent nuisance conditions related to sedimentation and flooding. These groups include, but are not limited to the Regional Water Quality Control Board, State Water Resources Control Board , Bureau of Land Management, National Oceanographic and Atmospheric Administration, U.S. Fish and Wildlife Service, U.S.D.A. Forest Service Redwood Sciences Laboratory and National Resources Conservation Service, U.C. Cooperative Extension, California Department of Fish and Wildlife, California Department of Forestry and Fire Protection, Board of Forestry, California Coastal Conservancy, Humboldt County Board of Supervisors and Planning Department, Redwood Community Action Agency, Salmon Forever, Friends of Elk River, CalTrout, Elk River Residents Association, Humboldt Redwood Company, Green Diamond Resource Company, individual residents and landowners, and other watershed stakeholders.

In February 2012, the Regional Water Board, in coordination with Redwood Community Action Agency, held a Restoration Summit to explore strategies for restoration of the low gradient reaches of Elk River impacted by stored sediment deposits. The primary purpose of this summit was to convene affected landowners, resource agency staff, technical experts, potential funders, and diverse stakeholders to discuss approaches to addressing long-standing channel restoration, excess sediment loads, nuisance flooding, and related issues in the impacted reaches of the Elk River Watershed. A conclusion of the Restoration Summit was to pursue funding for full-scale data collection and sediment and hydrodynamic modeling from the top of the impacted reaches to Humboldt Bay, so as to characterize existing conditions and inform sediment remediation and channel restoration activities necessary to prevent nuisance and recover beneficial uses.

In 2014, the State Water Resources Control Board executed a contract with CalTrout, relying primarily on funds from the State's Cleanup and Abatement Account, but including contributions from the California Coastal Conservancy and Humboldt Redwood Company, to conduct the Elk River Recovery Assessment. The Elk River Recovery Assessment is designed to assess the fate and transport of fine sediment from the top of the impacted reaches downstream to Humboldt Bay. The Elk River Recovery Assessment requires the collection of sediment and hydraulic data, which is used to populate full scale hydrodynamic and sediment transport models within which several different remediation and restoration scenarios can be tested. The Elk River Recovery Assessment will provide the feasibility assessment from which a remediation action plan can be developed in coordination with the Elk River Watershed Stewardship Program.

In 2015, Humboldt County was awarded 319(h) grant funds to develop and initiate an Elk River Watershed Stewardship Program through which to develop consensus-based recommendations with respect to health and safety, sediment remediation and habitat restoration, and science and coordinated monitoring needs in the Elk River Watershed. The Elk River Watershed Stewardship Program developed under this contract will provide the framework within which to implement non-regulatory components of phase 1 of the TMDL.

VI. Program of Implementation

The Program of Implementation identifies a combination of regulatory and non-regulatory actions that will lead to the attainment of water quality objectives, recovery of beneficial uses, protection of high quality waters, and prevention of nuisance conditions in the Upper Elk River Watershed. Implementation of phase 1 requires control of all existing and potential future sediment sources in the upper watershed while the Elk River Recovery Assessment is completed and the Elk River Watershed Stewardship Program is

developed, initiated, and successfully results in the activities necessary to expand the sediment loading capacity of the impacted reaches and abate nuisance conditions. The Regional Water Board can recalculate, as appropriate, the sediment TMDL following remediation and restoration of the impacted reaches, by assessing the expanded capacity of the watershed to transport sediment and water more normally. Normal sediment and water transport occurs when 1.5 to 2-year flood events are contained within the bankfull stream channel. As appropriate, the Regional Water Board may modify the program of implementation for a second phase of the TMDL Action Plan if the sediment TMDL is recalculated.

There are three main components of the program of implementation associated with phase 1 of the TMDL Action Plan, including:

a. Waste Discharge Requirements (WDR) or waiver of WDRs: Applicable regulatory programs to reduce sediment loads from new and existing sediment sources on lands in the Upper Elk River Watershed, so as to reduce sediment loading toward the load allocation;
b. Elk River Recovery Assessment: A non-regulatory feasibility assessment of the sediment remediation and channel restoration activities, which in combination with sediment load reductions, are necessary to improve hydraulic and sediment transport in the Elk River Watershed; and
c. Watershed Stewardship Program: A non-regulatory program under which implementation of health and safety projects, remediation and restoration activities, and science and coordinated monitoring serves to support beneficial use enhancement and a trajectory of watershed recovery, including abatement of nuisance flooding and an expansion of sediment loading capacity.

Implementation actions associated with each of the three components of the program of implementation are identified in Table 4.

WDRs: WDRs are the primary regulatory mechanism utilized by the Regional Water Board to control the nonpoint source pollution resulting from past and ongoing timber harvesting activities, the dominant land use in Upper Elk River Watershed. Existing adverse cumulative impacts from current and past land management practices combined with watershed characteristics (such as sensitive geology and altered hydrologic conditions) require that additional actions be taken beyond those currently being implemented in the Upper Elk River Watershed. Updated management actions are necessary to prevent continued impact to beneficial uses and contributions to downstream nuisance conditions that result from ongoing timberland management. The WDRs will consider the unique watershed factors that influence the discharge of sediment so as to properly update management practices and better manage watershed effects.

The Regional Water Board has discretion in developing WDRs that can allow individual dischargers to tailor a compliance strategy. Humboldt Redwood Company (HRC) is the largest landowner, with 79 percent ownership of the Upper Elk River Watershed. In 2016, the Regional Water Board will consider adoption of WDRs to address waste discharges and other controllable water quality factors on lands within the Upper Elk River Watershed owned by HRC. The WDRs shall provide for implementation of rigorous best management practices (BMPs) with variation according to the sediment loading risk of individual sub-watersheds.

Other landowners include Green Diamond Resource Company (GDRC), Bureau of Land Management (BLM), and individual non-industrial timberland owners. As part of its ownership WDRs for timber harvesting and roads, GDRC has a South Fork Elk Management Plan. (Order No. R1-2012-0087 Waste Discharge Requirements for Discharges Related to Green Diamond Resource Company's Forest Management Activities Conducted within the Area Covered by Its Aquatic Habitat Conservation Plan in the North Coast Region, Humboldt and Del Norte Counties). The South Fork Elk Management Plan shall

be modified to be consistent with the TMDL Action Plan and available for Regional Water Board consideration in 2016. The BLM manages the Headwaters Forest Reserve comprising about 7,472 acres of old growth coast redwood as part of the National Landscape Conservation System. The 2004 Management Plan for the Headwaters Forest Reserve focuses on restoration, research, and recreation/education and is being updated. BLM management of the Headwaters Forest generally provides benefits to water quality in the Elk River Watershed. Any BLM projects expected to discharge sediment can be enrolled and regulated as a Category B project under the USFS Waiver. (Order No. R1-2015-0021 Waiver of Waste Discharge Requirements for Nonpoint Source Discharges Related to Certain Federal Land Management Activities on National Forest System Lands.) Non-industrial timber management Plan (NTMP) owners must enroll under the General NTMP WDRs in Tier B (Order No. R1-2013-0005 General Waste Discharge Requirements for Discharges for Timber Operations on NTMPs). Tier B requires that a landowner submit an erosion control plan (ECP) for their entire NTMP area. Other timberland owners may enroll individual THPs under the General Timber WDRs (Order No. 2004-0030) with any additional conditions identified during THP review to make consistent with the TMDL Action Plan.

Elk River Recovery Assessment: The State Water Resources Control Board executed a contract with CalTrout in 2014 to conduct full scale sediment and hydrodynamic modeling from the top of the impacted reach to the river's outlet at Humboldt Bay, with a final deliverable due in 2017. This is a non-regulatory assessment of the feasibility of improving conditions in the impacted reaches of the Upper Elk River Watershed. The final assessment report is expected to result in the technical foundation for a remediation action plan by which to initiate recovery of ecosystem functions and beneficial uses in the Elk River and abate nuisance conditions. Potential recovery actions may include dredging, new channel construction, off-channel sediment detention basins, levee construction or modification, vegetation management, infrastructure improvements, creation of inset floodplains, high flow channels, and placement of instream large woody debris. Pilot remediation permitting and implementation projects are planned for 2016-2018. Full scale remediation and restoration permitting will proceed with larger-scale actions to be initiated in approximately 2020. Monitoring and maintenance is anticipated for an extended period (e.g., ten to twenty years) following completion of remediation efforts.

Watershed Stewardship Program: This is a non-regulatory, participatory program that engages residents, community members, scientists, land owners, land managers, and regulatory agencies in developing a collaborative planning process that seeks to enhance conditions in the Elk River Watershed. The Elk River Watershed Stewardship Program will work to accomplish the following goals:

a. Seek common ground among diverse participants.
b. Identify strategies and solutions to:
    i. Improve the hydrologic, water quality, and habitat conditions of Elk River;
    ii. Reduce nuisance flooding and improve public transportation routes during high water conditions; and
    iii. Improve residential and agricultural water supplies.
c. Promote coordinated science and monitoring.

In 2016, a steering committee comprised of Humboldt County, University of California Cooperative Extension, Natural Resources Conservations Services, CalTrout, and the Regional Water Board will initiate the Elk River Watershed Stewardship Program. Initial program funding is provided by 319(h) grant funds from the US EPA and will support the stewardship efforts through 2018.

Table 4: Upper Elk River Sediment TMDL Implementation Actions‡		
Topic	Responsible Parties	Actions
Sediment Source Control	Humboldt Redwood Company	Humboldt Redwood Company shall implement its revised WDRs adopted by the Regional Water Board to implement phase 1 of the Upper Elk River Sediment TMDL and a zero load allocation.
Sediment Source Control	Green Diamond Resource Company	Green Diamond Resource Company shall implement its South Fork Elk management plan including any revisions approved by the Regional Water Board to implement phase 1 of the Upper Elk River Sediment TMDL and a zero sediment load allocation.
Sediment Source Control	Non-Industrial Timberland Owners	Prior to any timberland management activities, non-industrial timberland owners shall enroll under the General NTMP WDR in Tier B (Order No. R1-2013-0005 General Waste Discharge Requirements for Discharges for Timber Operations on NTMPs) or a future Order that replaces Order No. R1-2013-0005.
Sediment Source Control	Other Timberland Owners	For other timber harvest plans, landowners shall enroll individual THPs under the General Timber WDRs (Order No. 2004-0030) or a future Order that replaces Order No. R1-2004-0030 and incorporate any additional conditions identified during the timber review process as necessary to be consistent with the TMDL Action Plan.
Sediment Source Control	Bureau of Land Management	The Bureau of Land Management shall request enrollment of any projects with potential sediment discharges under the U.S. Forest Service Waiver (Order No. R1-2015-0021) or a future Order that replaces Order No. R1-2015-0021.
Sediment Remediation	CalTrout	By 2017, CalTrout will produce a final report detailing the results of full-scale sediment and hydrodynamic modeling, including feasible remediation and restoration activities sufficient to achieve water quality standards and return the watershed to a trajectory of recovery.
Watershed Stewardship	Humboldt County, the Steering Committee, and the Watershed Stewardship Program	By 2016, in coordination with a steering committee, Humboldt County will initiate a watershed stewardship program for the Elk River Watershed in conformance with the 319(h) grant contract, including establishment of: a Health and Safety workgroup responsible for developing recommendations appropriate for resolving water supply, flooding, and road access issues; a Science and Coordinated Monitoring workgroup responsible for developing recommendations appropriate for improving the effectiveness of water quality, sediment and flow monitoring efforts throughout the watershed; a Sediment Remediation workgroup responsible for developing recommendations appropriate for remediating instream stored sediment and improving floodwater conveyance, sediment transport, and ecosystem function. Final reports documenting the workgroup's recommendations, including plans and schedules are due in 2018.
TMDL and Watershed Stewardship Effectiveness	Regional Water Board	By 2021, the Regional Water Board shall evaluate the available information to assess the degree to which the efforts of the Watershed Stewardship Program are making sufficient progress towards achievement of health and safety, coordinated monitoring, and sediment remediation improvements. By 2026, the Regional Water Board shall evaluate the available information to assess the degree to which recommended health and safety, coordinated monitoring, and sediment remediation improvements have been achieved. By 2031, the Regional Water Board shall evaluate the available information to assess the degree to which water quality

Table 4: Upper Elk River Sediment TMDL Implementation Actions‡		
Topic	Responsible Parties	Actions
		objectives are attained and beneficial uses are restored throughout the watershed, and nuisance flooding conditions are abated.
TMDL and Watershed Stewardship Effectiveness	Regional Water Board	By 2031 or upon attainment of water quality objectives, the Regional Water Board shall re-evaluate the sediment loading capacity and load allocation for the Upper Elk River Watershed and revise accordingly.

‡ The zero load allocation does not constitute an effluent limitation or a waste load allocation, and the Board has discretion on how to implement it in WDRs, waivers or other actions to reduce and eliminate waste discharges.

VII. Monitoring and Adaptive Management

The Program of Implementation relies on coordinated monitoring and adaptive management as the basis for tracking trends, updating scientific understanding, and modifying implementation actions over time. The Regional Water Board has identified four primary goals for near and long-term monitoring in the Elk River: (1) evaluate compliance with WDR/waiver requirements and verify that the provisions of the WDRs are being implemented as designed and permitted; (2) evaluate the effectiveness of management measures, management modifications, and remediation efforts aimed at reducing sediment loads and improving conditions in the impacted reaches; (3) track whether conditions are trending toward numeric targets, water quality objectives, and beneficial use support via the Watershed Stewardship Program; and (4) inform when and how to reevaluate the loading capacity.

A combination of monitoring resources is anticipated to achieve these goals. The WDRs will require monitoring and reporting from the landowners in the Upper Elk River Watershed. The Elk River Recovery Assessment will provide reach-scale targets defining channel and habitat conditions. In addition, pilot remediation projects will be implemented as part of the Elk River Recovery Assessment, including effectiveness monitoring to assess which techniques should be brought full-scale. Finally, the Science and Coordinated Monitoring workgroup of the Watershed Stewardship Program will recommend monitoring and special studies as necessary to address the resource protection goals of the group and answer specific questions.

Regional Water Board staff will report to the Regional Water Board annually on the status and progress of implementation activities. Approximately five years after adoption, Regional Water Board staff will conduct a formal assessment of the effectiveness of the implementation plan and make any necessary revisions to this TMDL Action Plan. This includes a review of the sediment source analysis for the Upper Elk River, sediment deposition in the impacted reach and Lower Elk River, and the need for a Lower Elk River sediment TMDL, using Recovery Assessment tools and other available data, as appropriate. During reassessment, the Regional Water Board will consider how effective the requirements of the TMDL program of implementation are at meeting the TMDL, achieving water quality objectives, and protecting the beneficial uses of water in the Upper Elk River Watershed. The success of the TMDL will be assessed based on water quality trends in the Upper Elk River Watershed, particularly the attainment of water quality standards in the impacted reach. Ultimately success is achieved when nuisance conditions are abated, and beneficial uses are supported.