[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 Shasta River Watershed Temperature and Nutrient TMDL." 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.]

~~Klamath River TMDL~~ 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**[1]

The Klamath River basin in California, including all tributaries, comprises approximately 12,680 square miles (7,414,761 acres) and is located in Del Norte, Humboldt, Trinity, Siskiyou, and Modoc Counties.

This ~~*Klamath River Total Maximum Daily Load Action Plan and Lost River Implementation Plan* (Klamath River TMDL Action Plan)~~*Action Plan for the Klamath River* includes temperature, dissolved oxygen, nutrients, and organic matter ~~nutrient, and organic matter~~ total maximum daily loads (TMDLs) for the Middle and Lower Hydrologic Areas of the Klamath River, and references the Lower Lost River TMDLs established by the United States Environmental Protection Agency (USEPA).

The Action Plan also contains an implementation plan applicable to actions within the entire Klamath River basin (or watershed) in California, including the Lost River watershed. The ~~and describes the~~ implementation actions are necessary to achieve the TMDLs and attain ~~water quality standards in the Klamath River basin. The goal of the Klamath River TMDL implementation actions is to achieve the TMDLs, and thereby achieve~~ temperature, dissolved oxygen, biostimulatory substances, and toxicity water quality standards, including the protection and restoration of the beneficial uses of water in the Klamath River basin. The Klamath River TMDL Action Plan sets out the loads and conditions to be considered and incorporated into regulatory and non-regulatory actions in the Klamath River basin. The Lost River Implementation Plan sets out the conditions to be considered and incorporated into regulatory and non-regulatory actions in the Lost River basin.

I. Problem Statement

In 1996, the Klamath River mainstem was listed as impaired for organic enrichment/low dissolved oxygen (DO) from Iron Gate Reservoir to the Scott River, and for nutrient and temperature impairment in the remainder of the basin~~watershed (or basin)~~ pursuant to section 303(d) of the Clean Water Act. In 1998, the Klamath River watershed was listed for nutrient and temperature impairment from Iron Gate Reservoir to the Scott River, and the Klamath River mainstem was listed for organic enrichment/low dissolved oxygen in the reaches upstream of Iron Gate Reservoir and downstream of the Scott River. Iron Gate and Copco Reservoirs and the intervening reach of the Klamath River were listed for the blue-green algae toxin microcystin impairment in 2006. The 303(d) listings were confirmed in the Klamath River TMDL analysis.

Dissolved oxygen concentrations are regularly too low to comply with the Basin Plan dissolved oxygen objectives. Water temperature conditions regularly exceed temperature thresholds protective of salmonids. Low dissolved oxygen concentrations and elevated water temperatures in the Klamath River, its tributaries, Copco1 and Copco 2, ~~Reservoir,~~ and Iron Gate Reservoirs, and seasonal algae blooms have resulted in degraded water quality conditions that do not meet applicable water quality objectives and that impair designated beneficial uses. The designated beneficial uses that are not fully supported include: cold freshwater habitat (COLD); rare, threatened, and endangered species (RARE); migration of aquatic organisms (MIGR); ~~and~~ spawning, reproduction, and/or early development of fish (SPWN); commercial and sport fishing (COMM); Native American cultural use (CUL); subsistence fishing (FISH); and contact and non-contact water recreation (REC-1 and REC-2).

[1] Adopted by the North Coast Regional Water Quality Control Board on [insert date]. Adopted by the State Water Resources Control Board on [insert date]. Approved by the State Office of Administrative Law on [insert date]. Approved by the United States Environmental Protection Agency on [insert date].

The designated beneficial uses associated with the cold freshwater salmonid fishery (COMM, COLD, RARE, MIGR, and SPWN) and Native American cultural use and subsistence fishing~~resources~~ (CUL and~~,~~ FISH) are interrelated and are the designated beneficial uses most sensitive to the ~~dissolved oxygen and water temperature~~water quality impairments of the Klamath River. Important species in the Klamath River watershed include coho and Chinook salmon, trout, green sturgeon, eulachon, and Pacific lamprey.

II. Watershed Restoration Efforts

Throughout the Klamath River watershed in California, many individuals, groups, and agencies have been working to enhance and restore fish habitat and water quality. These groups include, but are not limited to the United States Forest Service (USFS), the United States Fish and Wildlife Service, NOAA-Fisheries, the United States Bureau of Reclamation (USBR), the Natural Resource Conservation Service, the Klamath River Basin Fisheries Task Force, the California Department of Fish and Game (CDFG), the California Department of Water Resources, the Klamath Tribe, Hoopa Valley Tribe, Karuk Tribe, and Yurok Tribe~~s~~, the Quartz Valley Indian Reservation, the Resighini Rancheria, the Five Counties Salmonid Conservation Program, local Resource Conservation Districts, ~~the Mid Klamath Watershed Council, Klamath Riverkeeper, Friends of the River, the Klamath Forest Alliance, the Nature Conservancy~~local and national environmental and conservation groups, local irrigation districts, local watershed groups, and private timber companies. Their past and present efforts have improved water quality conditions in the Klamath River and its tributaries.

On February 18, 2010, participants in the Klamath settlement process signed the Klamath Basin Restoration Agreement (KBRA) and Klamath Hydroelectric Settlement Agreement (KHSA). The KBRA is intended to result in effective and durable solutions which will: 1) restore and sustain natural fish production and provide for full participation in ocean and river harvest opportunities of fish species throughout the Klamath Basin; 2) establish reliable water and power supplies which sustain agricultural uses, communities, and National Wildlife Refuges; and 3) contribute to the public welfare and the sustainability of all Klamath Basin communities.
The KHSA lays out the process for additional studies, environmental review, and a decision by the Secretary of the Interior (Secretarial Determination) regarding whether removal of four dams owned by PacifiCorp: 1) will advance restoration of the salmonid fisheries of the Klamath Basin; and 2) is in the public interest, which includes but is not limited to consideration of potential impacts on affected local communities and tribes. The four dams are Iron Gate, J.C. Boyle, Copco 1 and Copco 2 dams on the Klamath River. The KHSA includes provisions for the interim operation of the dams and the process to transfer, decommission, and remove the dams. (Summary of Klamath Basin Settlement Agreements, 2010)

III. Temperature

A. Klamath River Temperature Source Analysis

The Klamath River watershed temperature TMDL addresses the heat loads that arise from seven sources:

1. Conditions of Klamath River water crossing the Oregon-California border (Stateline).
2. Thermal discharges from Copco 2 and Iron Gate Reservoirs.
3. The impoundment of water in the Copco 1, Copco 2, and Iron Gate Reservoirs.
4. Temperature effects of Iron Gate Hatchery;
5. Temperature effects of major tributaries on Klamath River temperatures;~~.~~
6. Effects of excess solar radiation;~~.~~
7. Effects of excess[2] (anthropogenic) sediment loads.

B. Klamath River Temperature TMDL

The Klamath River Temperature TMDL is set equal to the loading capacity. The loading capacity is the maximum amount of pollutant loading that can occur while still achieving water quality objectives and protecting beneficial

[2] Excess sediment is defined herein as soil, silt, sand, clay or other similar material rock, and/or sediments (e.g. sand silt, sand, or clay) discharged to waters of the state in an amount that could be deleterious to beneficial uses or cause a nuisance.

uses. For the temperature TMDL the water quality objective of concern is the temperature objective, which prohibits the alteration of the natural receiving water temperature unless such alteration does not adversely affect beneficial uses. The loading capacity provides a reference for calculating the amount of pollutant load reduction needed to bring a water body into compliance with standards. The starting point for the load allocation analysis is the equation that describes the total maximum daily load or loading capacity:

TMDL = Loading Capacity = ΣWLAs + ΣLAs + Natural Background + MOS

where Σ = the sum, WLAs = waste load allocations, ~~and~~ LAs = load allocations, and MOS = margin of safety. Waste load allocations are contributions of a pollutant from point sources, while load allocations are contributions from human-caused (anthropogenic) non-point sources.

This TMDL allocates no temperature increases year-round, thus the load and waste load allocations are zero, and the Temperature TMDL is:

Temperature TMDL
= Loading Capacity
= 0 increase over natural background
= 0 anthropogenic heat load at stateline
+ 0 heat load discharge~~d~~ from Copco 2 and Iron Gate Reservoirs
+ 0 heat load discharge from Iron Gate Hatchery
+ 0 heat load discharge from tributaries
+ 0 heat load from excess solar radiation
+ 0 heat load from anthropogenic sediment loads
+ natural background.
= natural background

C. Klamath River Temperature Load Allocations

In accordance with the Clean Water Act, the Klamath River Temperature TMDL is allocated to the sources of elevated temperature in the watershed. The Iron Gate Fish Hatchery is the one point-source heat load in the Klamath River watershed. The interstate water quality objective for temperature prohibits the discharge of thermal waste to the Klamath River, and therefore the waste load allocation is set to zero. The TMDL includes elevated temperatures from natural and non-point anthropogenic sources. The non-point sources include: (1) excess solar radiation, expressed as its inverse, shade; (2) heat loads associated with increased sediment loads; (3) heat loading from impoundments; and (4) heat loads from Oregon. The assigned load allocations for temperature are expressed in Table 4-15.

Table 4-15: Temperature Load Allocations

Source	Allocation
Excess Solar Radiation (expressed as effective shade)	The shade provided by topography and full potential vegetation conditions at a site, with an allowance for natural disturbances such as floods, wind throw, disease, landslides, and fire.
Increased Sediment Loads	Zero temperature increase caused by substantial human-caused sediment-related channel alteration.
Impoundment Discharges	Zero temperature increase above natural temperatures.
Reservoirs	See dual temperature - dissolved oxygen allocation, below in Section IV, C
Klamath River at Stateline	Zero increase above natural temperatures.

D. Klamath River Temperature Margin of Safety, Seasonal Variations, and Critical Conditions

The Klamath River Temperature TMDL for California relies on an implicit margin of safety. The intrastate water quality objective for temperature allows for temperature increases of up to 5°F if beneficial uses of water are not adversely affected. For much of the year the instream temperature of the Klamath River is too hot to accommodate more heat loading without beneficial uses of water being adversely affected. There are periods in

the winter and spring months, however, when temperature~~s~~ increases of up to 5°F may occur without beneficial uses of water being adversely affected. The timing of those periods changes from year to year and is difficult to predict. Therefore, this TMDL takes a conservative approach, allocating no temperature increases year-round. This conservative approach constitutes an implicit margin of safety.

To account for annual and seasonal variability, the Klamath River Temperature TMDL analysis evaluated temperatures and thermal processes throughout the calendar year. The seasonal variability is accounted for in the load allocations for temperature, described above, which do not allow for temperature increases during any part of the year.

IV. Dissolved Oxygen

A. Klamath River Dissolved Oxygen Source Analysis

The Klamath River dissolved oxygen (DO) source analysis quantified nutrient and organic matter pollutant loads from fourteen geographic areas or entities (called "source areas") within the Klamath River basin. Each source area has a different combination of source categories - processes at work which contribute to the load from that source area. The geographic source areas ~~can be more~~are generally grouped as follows:

- Stateline: Waters entering California from Oregon at ~~stateline~~Stateline, which includes the Williamson and Sprague River watersheds, Upper Klamath Lake, the Lost River watershed that drains the Klamath Project area and includes one municipal point source in California, municipal and industrial point sources to the Klamath River in Oregon, and Klamath River waters passing through Keno and JC Boyle Reservoirs. Oregon's Klamath River TMDL source analysis evaluates the contributions from these discrete sources on the water quality of the Klamath River in Oregon.

- Klamath Hydroelectric Project facilities in California: Copco 1 and 2 and Iron Gate Reservoirs – Copco 1 and 2 Reservoirs are treated as a single source for the purposes of this TMDL.

- Iron Gate Hatchery.

- Tributaries: Four individual rivers (Shasta, Scott, Salmon, and Trinity rivers) are included as discrete source areas, while groups of smaller creeks are combined into six additional source areas (Stateline to Iron Gate Dam reach tributaries, Iron Gate Dam to Shasta River, Shasta River to Scott River, Scott River to Salmon River, Salmon River to Trinity River, and Trinity River to Turwar Creek).

B. Klamath River Dissolved Oxygen TMDL

The TMDLs addressing dissolved oxygen and nutrient-related water quality impairments, including microcystin, are closely interrelated because of the strong relationship between biostimulatory conditions, decomposition of organic matter, and resulting dissolved oxygen conditions. The Klamath River TMDLs for California are calculated to attain and maintain Site Specific Objectives (SSOs) for DO in the Klamath River in California. The SSOs for DO and associated DO load allocations are the primary driver in establishing the nutrient and organic matter loading capacity for the river reaches of the Klamath River in California. Stateline and tributary allocations for the nutrients (total nitrogen (TN) and total phosphorus (TP)) and organic matter (CBOD)[3] were set to ensure that the site-specific DO objectives are met in the river reaches in California. Thus, achievement of the Klamath River Nutrient and Organic Matter TMDLs constitutes achievement of the Klamath River Dissolved Oxygen TMDLs, except in Copco 1 and 2 and Iron Gate Reservoirs, which were assigned additional nutrient load allocations, as described below.

C. Klamath River Dissolved Oxygen Load Allocations

Achievement of the nutrient and organic matter allocations at Stateline and the tributary nutrient and organic matter allocations will not result in compliance with the DO and temperature load allocations within Copco 1,

[3] The allocations for organic matter are expressed as CBOD, and refer to CBOD- ultimate. The water quality models represent CBOD as organic matter; it is converted to CBOD-ultimate for TMDL allocation calculations.

Copco ~~and~~ 2, and Iron Gate Reservoirs during periods of thermal stratification. Therefore, additional dissolved oxygen load allocations are assigned to the reservoirs for the period of May through October to ensure compliance with the SSOs for DO and temperature objectives within the reservoirs, and ensure support of the cold freshwater habitat (COLD) beneficial use.

The temperature and DO allocations for waters within Copco 1, Copco ~~and~~ 2, and Iron Gate Reservoirs are dual allocations, wherein achievement of the water quality objective for temperature must coincide with dissolved oxygen conditions compliant with the SSOs for DO ~~objective~~, and vice versa. Allocations for dissolved oxygen and temperature equate to a "compliance lens" where both DO and temperature conditions meet ~~Basin Plan~~ objectives for water temperature and DO and are therefore protective of the COLD and MIGR beneficial uses.

The allocation applies during the critical period of May 1st through October 31st and requires that DO concentrations be consistent with the SSOs for DO included in Table 3-1a[4] ~~-~~and overlap temperatures consistent with natural water temperatures at the point of entry to the reservoirs within a lens throughout the reservoir, or alternative in-reservoir temperature and DO conditions that provide equal or better protection of COLD and MIGR.

The volume of each reservoir's compliance lens is equal to the average hydraulic depth of the river in a free-flowing state for the width and length of the reservoir. The depth at which the compliance lens occurs within the reservoirs will vary, as will ~~an~~ the instantaneous mass of DO required to meet the DO objective.

C. Klamath River Dissolved Oxygen Margin of Safety, Seasonal Variations, and Critical Conditions

To account for annual and seasonal variability, the Klamath River Dissolved Oxygen TMDL analysis evaluated DO processes throughout the calendar year. The seasonal variability is accounted for in the load allocations for nutrients and organic matter, described below in Section V, which are set to ensure that the site-specific DO objectives are met in the river reaches in California, and by the DO load allocations, which define DO concentrations in each of the twelve months of the year. The margin of safety for the Dissolved Oxygen TMDL is addressed in Section V.D.

V. Nutrient and Organic Matter

A. Klamath River Nutrient and Organic Matter Source Analysis

The Klamath River Nutrient, Organic Matter, and Dissolved Oxygen TMDLs rely on a single source analysis. That source analysis is described in Section IV.A above.

B. Klamath River Nutrient and Organic Matter TMDLs

The nutrient TMDLs are expressed in terms of ~~for~~ total phosphorus (TP)~~,~~ and total nitrogen (TN). The organic matter TMDL is expressed in terms of ~~, and organic matter (~~carbonaceous biochemical oxygen demand or CBOD[5].~~)~~

The nutrient and organic matter TMDLs for the Klamath River in California are equal to the sum of waste load allocations, load allocations, and natural background loads for each parameter. The only waste load allocation~~s~~ assigned for these TMDLs is to the Iron Gate Hatchery. The contribution of natural background TP, TN, and CBOD loads ~~is~~ are incorporated into the load allocations for each source area. Accordingly, the TMDL equations for TP, TN, and CBOD take the form of the following equation:

~~Nutrient~~TP, TN, and CBOD TMDLs = Loading Capacity = ΣWLAs + ΣLAs

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[4] ~~Note to reader: Table 3-1a refers to a table that will be included in the Basin Plan Amendment for the Site Specific Dissolved Oxygen Objective for the Klamath River. (This footnote is not regulatory language, and will be removed from the final amendment.)~~

[5] ~~The allocations for organic matter are expressed as CBOD, and refer to CBOD-ultimate. The water quality models represent CBOD as organic matter; it~~CBOD is converted to CBOD-ultimate for TMDL allocation calculations. CBOD-ultimate is a measurement of oxygen consumed after sixty to ninety days of incubation.

where Σ = the sum, WLAs = waste load allocations, and LAs = load allocations.

The TP TMDL for the Klamath River in California equals 1,844 pounds per day. The TN TMDL for the Klamath River in California equals 14,986 pounds per day. The CBOD TMDL for the Klamath River in California equals 143,019 pounds per day.

~~Daily load and waste load TP, TN, and CBOD allocations for the Klamath River in California are presented in Table 4-16. These daily loads are those that achieve the TMDLs.~~

C. Klamath River Nutrient and Organic Matter Load Allocations

The loading capacity and associated load and waste load allocations for total phosphorus (TP), total nitrogen (TN), and organic matter (CBOD) for the Klamath River in California, including Copco 1, Copco ~~and~~ 2, and Iron Gate Reservoirs, are expressed in lbs/day, and are presented in Table 4-16. ~~For most Klamath River compliance locations, allocations have been set as monthly mean concentrations for nutrients (TP and TN) and organic matter (CBOD). Table 4.16 presents the same allocations expressed in lbs/day.~~

Table 4-16: Nutrient and Organic Matter Load Allocations (lbs/day)

Source Area	**Daily TP Load Allocations (lbs.)**	**Daily TN Load Allocations (lbs.)**	**Daily CBOD Load Allocations (lbs.)**
Stateline	245+	3,139+	19,067+
Upstream of Copco 1 Reservoir	(61)+	(330)+	(5,713)+
Stateline to Iron Gate Dam inputs	22+	339+	1,793+
Δ Iron Gate Hatchery	0+	0+	0+
~~Iron Gate to Shasta tributaries~~ Tributaries between Iron Gate Dam and the Shasta River	49+	317+	3,039+
Shasta River	75+	220+	2,406+
Tributaries between Shasta River and ~~to~~ Scott ~~tributaries~~River	17+	97+	871+
Scott River	87+	1,279+	13,608+
Tributaries between Scott River and~~to~~ Salmon ~~tributaries~~River	187+	1,050+	9,423+
Salmon River	193+	1,583+	18,428+
Tributaries between Salmon River and ~~to~~ Trinity ~~tributaries~~River	90+	504+	4,519+
Trinity River	762+	5,783+	66,571+
Tributaries between Trinity River and~~to~~ Turwar Creek ~~tributaries~~	179+	1,004+	9,007+
Total Maximum Daily Load	**1,844**	**14,986**	**143,019**

D. Klamath River Nutrient, ~~and~~ Organic Matter, and Microcystin Margin of Safety, Seasonal Variations, and Critical Conditions

The Klamath River Dissolved Oxygen, Nutrient~~,~~ and Organic Matter, and Microcystin TMDLs rely on an implicit margin of safety. An implicit margin of safety was deemed appropriate because uncertainty was reduced in the analysis by applying a comprehensive, dynamic numerical model. The model takes advantage of available data collected over multiple years, and through a series of mathematical computations represents the cause-effect relationship between discrete sources and water quality conditions throughout the Klamath's riverine, reservoir, and estuarine portions. By representing conditions in great detail spatially and temporally, the model effectively considers a spectrum of conditions that may be overlooked by a simpler analysis. It was determined that the largest source of uncertainty in this system is the highly variable and dominant loading from Upper Klamath Lake rather than the numeric water quality model. Conservative assumptions that make up the implicit margin of safety are as follows:

- The numeric model used to predict the impact of allocations assumes that sediment oxygen demand (SOD) does not improve in the riverine sections following upstream load reductions. The magnitude of SOD will likely decrease with the decrease of organic loading allocated by the TMDL, and result in increased DO concentrations over time.

- Predicted conditions in the Klamath River are strongly influenced by the predicted variable conditions of the Upper Klamath Lake TMDL. Conservative allocations were set by using a combination of the predicted conditions. The timing of the allocations within Oregon is based on the scenario which represents the greatest loading from Upper Klamath Lake (i.e. results in the longest period of water quality not meeting numeric criterion). The magnitudes of the allocations are based on median loading conditions from Upper Klamath Lake. This is conservative because allocations are based on the difference from a baseline condition. The closer the concentration or temperature is to the numeric criteria, the less loading is necessary to cause a measurable degradation.

- An empirical analysis suggests that the TMDL model may underestimate nutrient loss and retention within the Klamath River. The underestimate does not appear to be large. However, this potential underestimate results in more conservative allocations upstream.

- The year chosen for developing the water quality models and establishing the TMDL was selected because it included periods of critical low flow and poor water quality conditions, which results in more stringent load allocations.

- Allocations to nonpoint source are for all nutrients (TN, TP, and CBOD), not just the predicted limiting nutrient.

- Year 2000 flows are less than more recent flow requirements (i.e. USBR Klamath Project Operations and PacifiCorp Klamath Hydro Project Biological Opinion flows).

VI. Microcystin

A. Klamath River Microcystin Source Analysis

The sources of microcystin in the Klamath River were identified and quantified as part of one source analysis that addressed dissolved oxygen, nutrients and organic matter, and microcystin together, as described in Section IV.A above.

B. Load Allocations

The microcystin impairment is addressed by total phosphorus (TP) and total nitrogen (TN) load allocations, or alternative pollutant load reductions and/or alternative management measures or offsets, assigned to the owner(s) or operator(s) of Copco 1, Copco 2, and Iron Gate Reservoirs ~~Allocations for nutrients (TP and TN) are assigned to PacifiCorp, or any future owners or operators of Copco 1 and 2 and Iron Gate Reservoirsreservoirs,~~ in order to achieve the in-reservoir chlorophyll-a, *Microcystis aeruginosa*, and microcystin target conditions protective of beneficial uses. The~~se~~ TP and TN load allocations that apply to PacifiCorp ~~and are to be achieved~~ at a location upstream of Copco 1~~. These annual allocations~~ equal:

- 67,048 pounds TP/year (184 lbs/day);
- 1,025,314 pounds TN/year (2,809 lbs/day);

and equate to the following annual reductions below the nutrient allocations at S~~s~~tateline (to be achieved above Copco Reservoir):

- 22,367 pounds TP/year (61 lbs/day);
- 120,577 pounds TN/year (330 lbs/day).

C. Klamath River Microcystin Margin of Safety, Seasonal Variations, and Critical Conditions

The margin of safety, seasonal variations, and critical conditions for the Microcystin TMDL are addressed in Section V.D above.

VII. USEPA-Approved Lower Lost River TMDL

The source analysis, TMDL, load allocations, and discussion of the margin of safety, seasonal variations, and critical conditions for dissolved oxygen and pH impairments in the Lower Lost River are found in the *Lost River, California, Total Maximum Daily Loads for Nitrogen and Biochemical Oxygen Demand to Address Dissolved Oxygen and pH Impairments* that was established by the United State Environmental Protection Agency on December 30, 2008. The Lost River TMDL applies to the portion of the Lost River in the M~~m~~ount Dome Hydrologic Subarea and t~~T~~he Tule Lake Hydrologic Subarea, together known as the Lower Lost River.

VII~~I~~. Klamath River and Lost River Implementation Plan

Thi~~s~~se implementation plan describes the specific actions that the Regional Water Board and other responsible parties shall implement to achieve the Klamath River and Lower Lost River TMDLs and meet temperature, dissolved oxygen, biostimulatory, and toxicity water quality standards in the Klamath River basin. The implementation plan addresses sources of impairment throughout the Klamath River ~~B~~basin, ~~including~~ which includes the Lost River, the Shasta River, the Scott River, the Salmon River, the Trinity River, and all other tributary basins. The implementation plan gives ~~, with~~ consideration ~~for~~ to the existing TMDL implementation plans in the Salmon, Scott, and Shasta basins.

The implementation plan includes a prohibition on unauthorized discharges that violate water quality objectives, guidance on the control of sediment waste discharges, a Thermal Refugia Protection Policy, and ~~The TMDL~~ implementation actions that are assigned to specific responsible parties as~~are~~ presented in Table 4-1~~7~~8. ~~The implementation plan also includes a prohibition on unauthorized discharges that violate water quality objectives and a Thermal Refugia Protection Policy.~~

Coordination with Oregon

Achieving compliance with the Klamath River TMDLs in both California and Oregon requires a coordinated approach that involves state and federal agencies as well as responsible parties in both states. The Regional Water Board, Oregon Department of Environmental Quality (ODEQ), and USEPA Regions 9 and 10 have signed a Memorandum of Agreement (MOA) for implementing the Klamath River basin TMDLs. The process will accommodate short-term measures working in concert with longer-term programs to achieve full compliance. This plan encourages implementation of large scale, engineered projects designed to reduce nutrient loads to the Klamath River in Oregon and California. Critical participants in this effort include the U.S. Bureau of Reclamation (USBR) and U.S. Fish and Wildlife Service; both federal agencies that have control over discharges from the Lost River basin that impact water quality in the mainstem Klamath River. Regional Water Board, ODEQ, and USEPA are working to develop a Klamath basin water quality improvement tracking and accounting program. The cooperation and participation of PacifiCorp has been instrumental in supporting this endeavor. As planned, this program would provide a mechanism to allow for collaboration among basin stakeholders on common projects and calculates credit towards meeting regulatory requirements through offsite mitigation.

Nonpoint Source implementation

The implementation actions described in Table ~~4-17~~4-18 are necessary to implement the 2004 Statewide Nonpoint Source Pollution Control Program (NPS Policy). The NPS Policy requires the Regional Water Board to regulate all nonpoint source discharges of waste through some combination of regulatory tools that include WDRs, conditional waivers of WDRs, and Basin Plan prohibitions.[6] For all currently unregulated nonpoint source discharges, the implementation plan directs the Regional Water Board to develop one or more regulatory tools as

[6] The 2004 *Policy for the Implementation and Enforcement of the Nonpoint Source Pollution Control Program* (NPS Policy).

needed to control nonpoint source discharges of waste and implement the TMDLs. ~~This~~ The implementation plan encourages and builds upon on-going, proactive restoration and enhancement efforts in the watershed to the extent possible. Responsible parties that manage large land areas in the Klamath River basin, such as the United States Forest Service, California Department of Transportation~~Caltrans~~, and the Klamath ~~Basin~~ River counties, are currently implementing land management programs that overlap several watersheds. For these parties, the Regional Water Board intends to implement a consistent regionwide approach that streamlines compliance with all existing and future TMDLs and makes efficient use of staff resources. With these goals in mind, the ~~Klamath~~ implementation plan seeks to coordinate actions with the existing land management programs with the requirements of the Klamath TMDLs and regionwide nonpoint source program objectives whenever possible.

A. Prohibition of Discharges in Violation of Water Quality Objectives in the Klamath River Basin

Discharges of waste that violate any narrative or numerical water quality objective~~s~~ that are not authorized by waste discharge requirements or other order or action by the R~~r~~egional or S~~s~~tate W~~w~~ater B~~b~~oard, are prohibited.

B. Guidance to Control Excess Sediment Discharges

Parties conducting land use activities in the Klamath Basin that have the potential to discharge excess sediment are encouraged to implement the following sequential measures:

1. Prevent: Plan, design, and implement the project or activity in such a way that no excess sediment discharge occurs or could occur to waters of the state.

2. Minimize: If the discharge or threatened discharge of excess sediment cannot be fully prevented, then plan, design, and implement the project in such a way that discharges to waters of the state are minimized to the maximum extent possible.

Parties responsible for existing sediment sources must implement the following measures:

1. Inventory: Identify sources of excess sediment discharge or threatened discharge and quantify the discharge or threatened discharge from the source(s).

2. Prioritize: Prioritize efforts to control the inventoried sediment sources based on, but not limited to, severity of threat to water quality and beneficial uses, the feasibility of source control, and source site accessibility.

3. Schedule: Develop a schedule to implement the cleanup of ~~controllable~~ excess sediment discharge sites.

4. Implement: Develop and implement feasible sediment control practices to prevent, minimize, and control the discharge.

5. Monitor and Adapt: Use monitoring results to direct adaptive management in order to refine excess sediment control practices and implementation schedules~~ until discharges are reduced to a level that meets the TMDL load allocations and water quality standards.~~.

This Guidance is suggestive only and in no way limits the enforcement authority of the Regional Water Board under applicable law.

C. Thermal Refugia Protection Policy

The Thermal Refugia Protection Policy provides enhanced protection of thermal refugia along the mainstem Klamath River and in the lower Scott River. Thermal refugia are typically identified as areas of cool water created by inflowing tributaries, springs, seeps, ~~or through~~ upwelling hyporheic flow, ~~and~~ and/or groundwater in an otherwise warm stream channel offering refuge habitat to cold-water fish and other cold water aquatic species. The refugia created by tributaries in the Klamath River basin are typically in the plumes and pools of cold water that form in the mainstem at the tributary confluence. Refugia can also exist in tributary streams themselves. Thermal refugia are essential to the support of the cold water fishery because they moderate naturally elevated temperatures in the mainstem Klamath River.

1. Discharge Restriction In and Around Thermal Refugia

Parties conducting ~~instream activities~~activities associated with suction dredging in the Klamath Basin are restricted from discharging waste in and around known thermal refugia within a specified instream buffer unless that activity is regulated by a separate regulatory mechanism such as WDRs, waiver(s) of WDRs, and/or a 401 water quality certification. The restriction applies ~~June~~ April 15 to September 15 to protect ~~when~~ thermal ~~refugia~~ refugia when they are typically functioning in the mainstem Klamath River. The known thermal refugia locations ~~and site-specific buffers~~ are designated in ~~the~~ Table 4-17 below.

The default instream buffer for all thermal refugia in the Klamath Basin is 500 ft from the tributary confluence with the mainstem river in both the upstream and downstream direction and also upstream into the tributary.

Some thermal refugia require larger instream buffers than the default 500 ft and these site specific buffer lengths are given below ~~Table 4-17~~. The larger buffers are needed in tributaries where fish have been found over 500 feet upstream of the tributary confluence or where the cold-water plume that creates the refugia extends for a distance greater than 500 ft downstream of the ~~tributaries~~ tributary confluence with the Klamath River.

Table 4-17: Tributaries to the Klamath River
Known to Provide Thermal Refugia In and Around Their Confluence.

Tributaries		
Aikens Creek	Halverson Creek	Pine Creek
Aubrey Creek	Hopkins Creek	Portuguese Creek
Barkhouse Creek	Horse Creek	Red Cap Creek
Beaver Creek	Humbug Creek	Reynolds Creek
Blue Creek	Hunter Creek	Roach Creek
Bluff Creek	Ikes Creek	Rock Creek
Bogus Creek	Independence Creek	Rogers Creek
Boise Creek	Indian Creek	Rosaleno Creek
Boulder Creek[1]	Irving Creek	Sandy Bar Creek
Cade Creek	Kelsey Creek[1]	Salt Creek
Camp Creek	King Creek	Seiad Creek
Canyon Creek[1]	Kohl Creek	Slate Creek
Cappell Creek	Kuntz Creek	Stanshaw Creek
Cheenitch Creek	Ladds Creek	Swillup Creek
China Creek	Little Horse Creek	Ten Eyck Creek
Clear Creek	Little Humbug Creek	Thompson Creek
Coon Creek	Little Grider Creek	Thomas Creek
Crawford Creek (Humboldt Co.)	Lumgrey Creek	Ti Creek
Crawford Creek (Siskiyou Co.)	McGarvey Creek	Titus Creek
Dillon Creek	Mill Creek	Tom Martin Creek
Doggett Creek	Miners Creek	Trinity River
Dona Creek	McKinney Creek	Tully Creek
Donahue Flat Creek	Nantucket Creek	Ukonom Creek
Elk Creek	Negro Creek	Ullathorne Creek
Elliot Creek	Oak Flat Creek	Walker Creek
Empire Creek	O'Neil Creek	West Grider Creek
Fort Goff Creek	Pecwan Creek	Whitmore Creek
Grider Creek	Pearch Creek	Wilson Creek

[1] Scott River tributary

A 3000 ft buffer length is required in the following tributary creeks upstream of their confluence with the mainstem Klamath River:

Aubrey, Beaver, Clear, Dillon, Elk, Empire, Fort Goff, Grider, Horse, Indian, King, Little Horse, Little Humbug, Mill, Nantucket, O'Neil, Portuguese, Reynolds, Rock, Sandy Bar, Seiad, Stanshaw, Swillup, Thompson, Ti, and Titus.

A 1500 ft buffer length is required in the mainstem Klamath River downstream of the confluence with the following tributary creeks:

Aubrey, Beaver, Clear, Dillon, Elk, Grider, Horse, Indian, Rock, Swillup, Thompson, and Ukonom.

Revising the Thermal Refugia List and Buffer Designations
The list of thermal refugia locations and/or buffer length designations may be revised through a public process ~~to add or remove thermal refugia and/or buffer length designations~~. Persons proposing modification ~~to the list~~ should submit supporting evidence to the Executive Officer. The Executive Officer may add or remove thermal refugia and/or buffer length designations after public notice and opportunity for public comment. The current list and maps showing locations of thermal refugia and designated buffer lengths will be maintained on the Regional Water Board website at: www.waterboards.ca.gov/northcoast/water_issues/programs/tmdls/klamath_river/.

2. Policy Directives and Recommendations

   a. Regional Water Board staff shall place heightened scrutiny on permits and 401 water quality certifications for activities that have the potential to impact the function of thermal refugia.

   b. The State Water Resources Control Board and the California Department of Fish and Game ~~shall~~ should ~~exclude~~ restrict discharges associated with suction dredging activities ~~from the instream buffer areas~~ as specified by this policy. This directive in no way limits the permitting agency from implementing more stringent requirements.

   c. State Water Resources Control Board staff shall consider the impact of increased diversions in tributaries that provide thermal refugia when issuing water rights permits to divert surface water in the Klamath River basin in California.

   d. It is recommended that large landowners and land managers in the Klamath River basin prioritize restoration and water quality control efforts in tributary watersheds that provide or otherwise create thermal refugia.

   e. In the event that suction dredging is determined to be a point source discharge, the prohibition on point source discharges to the Klamath River shall not apply to suction dredging activities except within the instream buffer lengths designated by this policy.

D. Individual Implementation Plan Actions

The implementation plan actions are organized into Table 4-18 by source or land use activity and by the responsible party(ies) considered appropriate to implement TMDL actions. Responsible parties may find that more than one implementation action is applicable to their circumstances. For each action in Table 4-18, there is a corresponding timeframe, within which the responsible party is expected to implement the action. Action items are fully independent of each other and require 100% implementation within each Source or Land Use category identified in Table 4-18.

Table 4-18 . ~~Klamath River TMDL I~~Implementation Actions

Source or Land Use Activity and Responsible Party	Implementation Actions
Stateline Allocations Regional Water Board Oregon (ODEQ) USEPA 9 and 10	Action Work together to implement and monitor measures that will achieve compliance with the Klamath and Lost River TMDLs in Oregon and California as specified in the Klamath River/Lost River TMDL Implementation Memorandum of Agreement (MOA). ~~developed to implement and monitor measures that will achieve compliance with the Klamath and Lost River TMDLs in Oregon and California~~. The MOA includes commitments such as: ▪ Work to develop and implement a joint adaptive management program, including joint time frames for reviewing progress and considering adjustments to TMDLs; ▪ Work with the Klamath Basin Monitoring Program (KBMP) and other appropriate entities to develop and implement basinwide monitoring programs designed to track progress, fill in data gaps, and provide a feedback loop for management actions on both sides of the common state border. ▪ Work jointly with common implementation parties (e.g., USBR, U.S. Forest Service, USFWS, BLM, PacifiCorp, and the Klamath Water Users Association (KWUA) to develop effective implementation plans and achieve water quality standards. ▪ Explore engineered treatment options such as treatment wetlands, algae harvesting, and package wastewater treatment systems to reduce nutrient loads to the Klamath River and encourage implementation of these options where feasible; and ▪ Work to develop and implement a basinwide water quality tracking and accounting program that would establish a framework to track water quality improvements, facilitate planning and coordinated TMDL implementation, and enable appropriate water quality offsets or trades. Timeline Ongoing

Table 4-18 . ~~Klamath River TMDL I~~Implementation Actions

Source or Land Use Activity and Responsible Party	Implementation Actions
U.S. Bureau of Reclamation's Klamath Project ~~Klamath Irrigation Project (KIP)~~ Regional Water Board US Bureau of Reclamation (USBR) US Fish and Wildlife Service (USFWS) Tulelake Irrigation District (TID)	Action Develop and implement a Management Agency Agreement (MAA) between USBR, USFWS, TID, and the Regional Water Board that addresses the water quality impacts of the ~~U.S. Bureau of Reclamation~~USBR's Klamath Project. ~~the Klamath Irrigation Project (KIP).~~ The MAA should include the following action items: ▪ Complete a water quality study based on best available science to characterize the seasonal and annual nutrient and organic matter loading through ~~Reclamation~~USBR's Klamath Project ~~the KIP~~ and refuges. The study should be completed in time to inform the development of a water quality management plan described in the following bullet. ~~to be submitted to the Regional Water Board within 18 months of Regional Water Board approval of the Klamath River TMDL Action Plan;~~ ▪ Based on the results of the water quality study, develop a water quality management plan to meet and/or offset the Lower Lost River and Klamath River TMDL allocations. The plan should be submitted to the Regional Water Board for approval by [insert date that is 18 months after this Amendment takes effect]~~within 18 months of OAL approval of the Klamath River TMDL Action Plan~~. ▪ Include a schedule with interim milestones for meeting the TMDL allocations and targets; ▪ Coordinate implementation actions with other responsible parties discharging pollutants within ~~Reclamation~~USBR's Klamath Project ~~the KIP~~ and refuges; ▪ Develop a monitoring and reporting program with the Regional Water Board to evaluate the effectiveness of management measures and track progress towards meeting the Lower Lost River and Klamath River TMDL allocations and targets; ▪ Coordinate with the Klamath River water quality improvement tracking and accounting program in implementing offset projects; and ▪ Periodically report to the Regional Water Board on actions taken to implement the TMDL and progress towards meeting the TMDL allocations and targets. Timeline Complete the MAA ~~within six months of Regional Water Board adoption~~~~OAL approval of the Klamath River TMDL Action Plan~~ by [insert date that is 6 months after this Amendment takes effect].

Table 4-18 . ~~Klamath River TMDL I~~Implementation Actions

Source or Land Use Activity and Responsible Party	Implementation Actions
Klamath Hydroelectric Project PacifiCorp~~, or any future owner(s) or operator(s) of Copco 1, Copco 2, and Iron Gate Reservoirs~~	Action Submit a proposed implementation plan that incorporates timelines and contingencies pursuant to the KHSA. In the event that the KHSA does not move forward, the implementation plan should specify that the Federal Energy Regulatory Commission (FERC) 401 water quality certification process shall resume. Section 6.3.2 of the KHSA describes TMDL implementation to include a timeline for implementing management strategies, water quality-related measures in Appendix D, and Facilities Removal as the final measure. PacifiCorp may propose the use of offsite pollutant reduction measures (i.e. offsets or "trades") to meet the allocations and targets in the context of Interim measures 10 and 11. The implementation plan should identify appropriate intervals whereby PacifiCorp will provide the Regional Water Board updates on the status and progress of the plan, and provide adequate time for review so that select project(s) are ready for construction by the date of the Secretarial Determination. The implementation plan must provide for Regional Water Board review of site specific environmental assessments of dam removal before the Regional Water Board's approval of that approach as a final TMDL compliance measure. ~~Submit a proposed implementation plan for coming into compliance with the TMDL load allocations and targetsin consideration of the guidance provided in Chapter 6 of the Klamath TMDL Staff Report. At a minimum, tThe plan shall include a timeline for implementing management strategies and water quality-related measures, and at a minimum shall include a reassessment by the Regional Water Board in 2012 in light of the Department of the Interior Secretarial Determination.~~ Timeline ~~Within 60 days of Regional Water BoardOAL approval of adoption of the Klamath River TMDL Action Plan~~By [insert date that is 60 days after this Amendment takes effect]. Action Implement measures to meet and/or offset TMDL allocations and targets as prescribed in the approved implementation plan. Timeline As required by the approved implementation plan.
Klamath Hydroelectric Project State Water Resources Control Board	Action If applicable, process the 401 water quality certification for the ~~Federal Energy Regulatory Commission (~~FERC~~)~~ relicensing of the Klamath Hydroelectric Project to meet Basin Plan requirements, including Klamath River TMDL allocations and targets. This Action Plan is not intended to constrain the discretion of the State Water Board to determine, as appropriate, time periods required for various studies, options for interim requirements, and methods for final compliance. Timeline Pursuant to the FERC licensing process timeline.

Table 4-18 . ~~Klamath River TMDL I~~Implementation Actions

Source or Land Use Activity and Responsible Party	Implementation Actions
Iron Gate Hatchery Regional Water Board	Action Revise NPDES Permit No. CA0006688 and WDR No. R1-2000-17 to incorporate revised effluent limits to implement the TMDL wasteload allocations, and the recalculated site-specific objectives for dissolved oxygen, and to require that the responsible parties implement measures to improve the water quality of discharges from the Iron Gate Hatchery to meet TMDL allocations and targets on a compliance schedule. ~~Revise NPDES Permit No. CA0006688 and WDR No. R1-2000-0017 to include a compliance schedule and ensure that the discharge requirements are consistent with the Basin Plan requirements and the Klamath TMDL wasteload allocations necessary to comply with the Klamath River TMDL wasteload allocations.~~ Timeline ~~Adoption of~~ Bring revised permits ~~by~~ to the Regional Water Board for consideration by December ~~2010~~2011.
Iron Gate Hatchery ~~Pacificorp~~PacifiCorp~~, or any future owner(s) or operator(s) of Copco 1, Copco 2, and Iron Gate Reservoirs~~ CDFG	Action Implement measures to improve the water quality of discharges from the Iron Gate Hatchery to meet and/or offset the Klamath River TMDL wasteload allocations and targets. Timeline As specified in the revised NPDES permit.
Tulelake Wastewater Treatment Plant Regional Water Board	Action Revise NPDES Permit No. CA0023272 and WDR No. R1-2004-0075 to include a compliance schedule and ensure that the discharge requirements are consistent with the Basin Plan requirements and the Lower Lost River TMDL wasteload allocations. Timeline ~~Adoption of~~ Bring revised permit ~~by~~ to the Regional Water Board for consideration by ~~December 2010~~June 2012.
Tulelake Wastewater Treatment Plant City of Tulelake	Action Implement measures to improve the water quality of discharges from Tulelake Wastewater Treatment Plant to meet ~~the~~ the Lower Lost River TMDL wasteload allocations. Timeline As specified in the revised NPDES permit.
Trinity River Restoration Plan (TRRP) Regional Water Board	Action Develop general Waste Discharge Requirements/401 water quality certification for TRRP mechanical restoration. Timeline 2010
Trinity River Restoration Plan US Bureau of Reclamation	Action Implement Trinity River Restoration Plan Record of Decision. Timeline Ongoing~~.~~

Table 4-18 . ~~Klamath River TMDL I~~Implementation Actions

Source or Land Use Activity and Responsible Party	Implementation Actions
Road Construction and Maintenance on County Lands Regional Water Board	Action The Regional Water Board shall consider adopting a resolution and accompanying waiver for maintenance of county roads certifying the Five Counties Salmonid Conservation Program (5C Program) if it complies with the TMDL and attains standards in accordance with California Impaired Waters Guidance.[7] Timeline December 2010 Action In the event that a county does not show intent to implement the 5C Program, develop WDRs or a conditional waiver of WDRs for that county. Timeline June 2011
Road Construction and Maintenance on County Lands Del Norte, Humboldt, Siskiyou, and Trinity Counties	Action Implement measures through the 5C Program. Timeline Pursuant to the 5C Program timelines.

[7] In any resolution certifying that another entity's program will comply with the TMDL and attain standards, the Regional Water Board must demonstrate in the resolution that the implementing program is consistent with the assumptions and requirements of the TMDL, that sufficient mechanisms exist to provide reasonable assurances that the program will address the impairment in a reasonable period of time, and that sufficient mechanisms exist to ensure that the program will be enforced, or that the Regional Water Board has sufficient confidence that the program will be implemented such that further regulatory action would be unnecessary and redundant. (A Process for Addressing Impaired Waters in California, SWRCB Resolution No. 2005-0050 (June, 2005) found on page 6-10.)

Table 4-18 . ~~Klamath River TMDL I~~Implementation Actions

Source or Land Use Activity and Responsible Party	Implementation Actions
Road Construction and Maintenance of State Highway Facilities State Water Resources Control Board Regional Water Board	Action Incorporate the following measures into the NPDES Statewide Storm Water Permit and Waste Discharge Requirements for the State of California, Department of Transportation (Caltrans permit) to address sediment sources from road and highway facilities under Caltrans control: 1. Inventory: Identify sources of excess sediment discharge or threatened discharge and quantify the discharge or threatened discharge from the source(s). 2. Prioritize: Prioritize efforts to control the inventoried sediment sources based on, but not limited to, severity of threat to water quality and beneficial uses, the feasibility of source control, and source site accessibility. 3. Schedule: Develop a schedule to implement the cleanup of ~~controllable~~ excess sediment discharge sites. 4. Implement: Develop and implement feasible sediment control practices to prevent, minimize, and control the discharge. 5. Monitor and Adapt: Use monitoring results to direct adaptive management in order to refine excess sediment control practices and implementation schedules ~~until discharges are reduced to a level that meets the TMDL load allocations and water quality standards~~. Action Incorporate measures to meet the riparian shade allocation in~~to~~ the statewide Caltrans permit and 401 water quality certifications. Timeline The revised permit is anticipated to be adopted by the State Water Resources Control Board by ~~April~~ August 2010, with USEPA adoption anticipated by ~~August~~ December 2010.
Road Construction and Maintenance of State Highway Facilities Caltrans	Action Implement the measures outlined above to control the discharge of excess sediment from their facilities and comply with the Klamath TMDL allocations and targets, even if measures are not incorporated into the statewide Caltrans permit. Action Implement measures to meet the riparian shade allocation, even if measures are not incorporated into the statewide Caltrans permit. Action Fully assess all barriers and potential barriers to migration caused by Caltrans road and highway facilities along the mainstem Klamath River~~mainstem~~ and in the tributary watersheds identified in the Thermal Refugia Protection Policy. Develop a priority ranking and time schedule for modifying the identified fish passage barriers to accommodate free passage of fish upstream and downstream. Timeline Caltrans shall submit annual reports to the Regional Water Board documenting progress in implementing the above measures.

Table 4-18 . ~~Klamath River TMDL I~~Implementation Actions

Source or Land Use Activity and Responsible Party	Implementation Actions
Agricultural Activities on Non-Federal Lands Regional Water Board	Action Develop a conditional waiver of WDRs for discharges associated with agricultural activities, including grazing and irrigated agriculture, in the Klamath River basin. The conditional waiver~~/WDRs~~ shall require compliance with the Klamath River TMDL ~~watershed-wide~~load allocations where they apply and will serve as the means of compliance with the Lower Lost River TMDL load allocations associated with agricultural sources ~~in the Klamath River basin.~~. Timeline Regional Water Board staff shall propose the conditional waiver for Regional Water Board consideration by December 2012.
Agricultural Activities on Non-Federal Lands Responsible Parties (Any party conducting grazing activities or activities associated with irrigated agriculture that discharge waste or have the potential to discharge waste on non-federal land in the Klamath River basin)	Action The Regional Water Board ~~encourages~~ recommends the following actions: 1. Document past projects and current practices that address sources of pollution from their operations. 2. Organize into watershed groups to report to the Regional Water Board as a group as part of the future waiver program. 3. Participate in the development of the conditional waiver through a Technical Advisory Group that will convene to develop the draft waiver by December 2011. 4. Attend water quality training on implementing management practices and/or water quality management plan development. Timeline From Regional Water Board adoption of the Klamath River TMDL Action Plan until adoption of the conditional waiver addressing agricultural discharges.
Timber Harvest Activities on Non-Federal Lands Regional Water Board	Action The Regional Water Board shall adopt individual watershed-wide and ownership WDRs, in lieu of the general WDR or conditional waiver of WDRs, to achieve the TMDL load allocations and water quality standards as appropriate~~needed and/or at the request of the discharger~~. Action Regional Water Board staff shall make recommendations for additional measures to ensure the water quality objective for temperature is achieved during the timber harvest review process, if necessary. Timeline Ongoing~~.~~
Timber Harvest Activities on Non-Federal Lands Responsible Parties (Any party conducting timber harvest activities that discharge waste or have the potential to discharge waste in the Klamath River basin.)	Action Implement riparian management measures that meet the riparian shade allocations and water quality standards.~~by implementing the *Anadromous Salmonid Protection Rules* (CDF, 2010).~~ Where the ~~ASP~~ Forest Practice Rules~~rules~~, including the Anadromous Salmonid Protection Rules, are not sufficient to meet the TMDL allocations or water quality standards, implement additional measures as directed by Regional Water Board staff during the ~~waiver/WDR enrollment~~timber harvest review process. Timeline Ongoing~~.~~

Table 4-18 . ~~Klamath River TMDL I~~Implementation Actions

Source or Land Use Activity and Responsible Party	Implementation Actions
All Activities on USFS Lands Regional Water Board	Action Develop a conditional waiver of WDRs for nonpoint source activities on USFS lands that includes conditions that implement the Klamath TMDL. Timeline Develop for consideration by the Regional Water Board by April 2010.
All Activities on Lands Managed by the USFS USFS	Action Conduct land management activities in compliance with the waiver of WDRs when adopted. Timeline As required in the waiver of WDRs.

VI. Enforcement

The Regional Water Board shall take enforcement actions for violations of this implementation plan where elements of the plan are enforceable restrictions, such as application of the waste discharge prohibitions, or as required under a specific permit or order, as appropriate. Enforcement implementation is ongoing. Nothing in this plan precludes actions to enforce any directly applicable prohibition or provisions found elsewhere in the Basin Plan or to require clean up and abatement of existing sources of pollution where appropriate.

VII. Monitoring

A. Compliance Monitoring

Monitoring is an important component in determining the effectiveness of the TMDL implementation measures taken by the responsible parties. It is also important in determining the responsible parties' progress towards meeting the TMDL allocations. Monitoring by responsible parties shall be conducted upon the request of the Regional Water Board Executive Officer in conjunction with existing and/or proposed activities that have the potential to contribute to the TMDL impairments in the Klamath River basin. Monitoring may involve implementation, upslope effectiveness, photo documentation, instream and near-stream effectiveness, and/or instream water quality monitoring. The Regional Water Board Executive Officer will base the decision to require monitoring on site-specific conditions, the size and location of the ~~discharger's~~ responsible parties' ownership, and/or the type and intensity of land uses being conducted or proposed ~~by the discharger~~. If monitoring is required, the Regional Water Board's Executive Officer will direct the ~~discharger~~ responsible party to develop a monitoring plan and may describe specific monitoring requirements to include in the plan.

B. Basin-wide Monitoring

Basin-wide TMDL monitoring will be coordinated with other monitoring efforts in the Klamath River ~~basin~~watershed. The overall goal of ~~the~~ TMDL monitoring is to track progress towards meeting the water quality standards and the TMDL allocations ~~established by the Klamath River TMDL Action Plan~~. Monitoring results will also be used to reassess the effectiveness and appropriateness of the ~~Klamath TMDL~~ Action Plan and to make revisions as necessary.

The objectives of the monitoring plan include:

- Assessment of water quality standards attainment.
- Verification of pollution source allocations.
- Calibration or modification of the model used in the TMDL analysis.
- Evaluation of progress towards meeting TMDL allocations.

- Evaluation of point and nonpoint source control implementation and effectiveness.
- Evaluation of instream water quality.
- Evaluation of temporal and spatial trends in water quality.
- Evaluation of the risk to public health related to cyanobacteria and cyanotoxin exposure.
- Evaluation of the functionality of thermal refugia in the ~~mainstem~~ Klamath River basin.
- Provide data for the development of the Klamath River basin water quality improvement tracking and accounting ~~and tracking~~ program.

The Klamath River TMDL monitoring plan is complimentary to other basinwide monitoring programs in the Klamath River ~~Basin~~ basin including the Klamath ~~River~~ Basin ~~Water Quality~~ Monitoring ~~Coordination Group a~~Program and the Klamath Hydroelectric ~~Project~~ Settlement Agreement ~~in Principle~~ Interim Measure 12 Water Quality Monitoring Plan.

VIII. Reassessment and Adaptive Management

The Regional Water Board will review, reassess, and make any necessary revisions to this implementation plan. Regional Water Board staff will report to the Regional Water Board at least yearly on the status and progress of implementation activities, and the attainment of the Klamath TMDLs. Every five years, Regional Water Board staff will conduct a comprehensive and formal assessment of the effectiveness of the implementation plan. During reassessment, the Regional Water Board will consider how effective the requirements of the TMDL implementation plan are at meeting the TMDLs, achieving water quality objectives, and protecting the beneficial uses of water in the Klamath River basin.

The success of the TMDL will be assessed based on water quality trends in the Klamath River basin and the degree to which responsible parties are meeting the TMDL load allocations. The monitoring program is designed to track water quality trends and timelines for meeting target water quality conditions~~, as provided in Chapter 7 of the Klamath TMDL Staff Report.~~. Progress towards meeting TMDL allocations and targets will be reported by the responsible parties pursuant to monitoring requirements in WDRs, waivers, and other mechanisms. The assessment of responsible party compliance with the TMDL will be based on compliance with applicable WDRs and waivers and management agency agreements.

A. Responsible Party Compliance

The items that will be evaluated in the annual and five-year reassessments are shown below in relation to the responsible parties named in the ~~Klamath~~ implementation plan.

USBR, USFWS and TID

- Timely completion of the MAA and implementation of the MAA measures.
- Water quality monitoring of nutrient and organic matter reductions to meet the load allocations in the Lower Lost River ~~basin and in the~~and Klamath River ~~basin~~ TMDLs in California and Oregon.

PacifiCorp

- Reductions in nutrients and organic matter entering the reservoirs.
- Reductions in chlorophyll a concentrations in the reservoirs.
- Effectiveness of temperature and nutrient offset projects as calculated through tracking and accounting program ratios.

USFS

- Reporting through waiver monitoring and reporting program on progress to meet TMDL allocations and targets.

Timber Harvest

- Reporting through waivers and WDRs for timber harvest projects.

Agriculture

- Development of agricultural waiver.
- Implementation and reporting per the waiver program.

County Roads

- Compliance with 5 C Program.

State Roads

- ~~Compliance with~~ Follow Guidance for Control of Excess Sediment Discharges.
- Incorporat~~eion of~~ TMDL implementation measures into Statewide permit.
- Assess ~~M~~migration barriers ~~assessment~~.