

Table 4-14 Shasta River Dissolved Oxygen and Temperature TMDL Implementation Actions		
Source or Land Use Activity	Responsible Parties	Actions to Address Dissolved Oxygen and Water Temperature Impairment
Range and Riparian Land Management	<ul style="list-style-type: none"> Parties Conducting Grazing Activities Landowners and managers owning and operating property adjacent to the Shasta River and its tributaries Shasta Valley Resource Conservation District (Shasta Valley RCD) Shasta Coordinated Resource Management and Planning Committee (Shasta CRMP) California Department of Fish and Game (CDFG) 	<p>Landowner/User Actions: Landowners should employ land stewardship practices and activities that minimize, control, and preferably prevent discharges of fine sediment, nutrients, and other oxygen consuming materials from affecting waters of the Shasta River and tributaries. Landowners should also employ land stewardship practices and activities that minimize, control, and preferably prevent elevated solar radiation loads from affecting waters of the Shasta River and its Class I and II tributaries.</p> <p>Those that oversee and manage grazing and range land activities in the Shasta River watershed should implement the applicable management measures for agriculture and grazing from the following sources:</p> <ul style="list-style-type: none"> <i>Policy for the Implementation and Enforcement of the Nonpoint Source Pollution Control Program (NPS Policy)</i> (SWRCB 2004 or as amended). <i>Shasta Watershed Restoration Plan</i> (November 1997). <i>Shasta Valley Resource Conservation District Master Incidental Take Permit (ITP) Application</i> (Shasta RCD 2005). <i>Recovery Strategy for California Coho Salmon</i> (Coho Recovery Strategy) (CDFG 2004). <p>See Appendix A of this Action Plan for examples of some of these applicable measures.</p> <p>Landowners may need to develop and implement management measures in addition to those specified above to address site-specific conditions. This may include determining appropriate riparian widths for tree planting activities such that the appropriate width buffer is created to ensure effective stream shading and oxygen consuming material discharge elimination.</p> <p>Landowners shall submit annually to the Regional Water Board a written summary of all range and riparian management actions taken to achieve compliance with water quality standards, the TMDLs, and the NPS Policy, either individually or through the Shasta Valley RCD and its CRMP or through the CDFG Coho ITP.</p> <p>RCD Actions: The Shasta Valley RCD and its CRMP should:</p> <ul style="list-style-type: none"> Assist landowners in developing and implementing management practices that minimize, control and preferably prevent discharges of fine sediment, nutrients and other oxygen consuming materials, as well as elevated solar radiation loads from affecting waters of the Shasta River and tributaries. Assist landowners in developing and implementing a monitoring program to evaluate and document implementation and effectiveness of the range and riparian management actions taken by the landowner. <p>State Actions: CDFG will:</p> <ul style="list-style-type: none"> Assist landowners in developing and implementing management practices that minimize, control, and preferably prevent discharges of fine sediment, nutrients and other oxygen consuming materials as well as elevated solar radiation loads from affecting waters of the

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Table 4-14 Shasta River Dissolved Oxygen and Temperature TMDL Implementation Actions (cont.)		
Source or Land Use Activity	Responsible Parties	Actions to Address Dissolved Oxygen and Water Temperature Impairment
Range and Riparian Land Management (cont.)	<ul style="list-style-type: none"> • CDFG (cont.) • Regional Water Board 	<p>Shasta River and tributaries.</p> <ul style="list-style-type: none"> • Administer the Coho Recovery Strategy and the ITP (when approved). <p>The Regional Water Board will:</p> <ul style="list-style-type: none"> • Work cooperatively with the Shasta Valley RCD and its CRMP to: <ol style="list-style-type: none"> 1. Provide technical support and information to individuals, landowners, and community members in the Shasta River watershed. 2. Coordinate monitoring, educational and outreach efforts. 3. Develop a monitoring program to evaluate and document implementation and effectiveness of the range and riparian management actions taken by the landowners. • Should efforts fail to be implemented or effective, the Regional Water Board's Executive Officer shall require, on a site specific as-needed basis, the appropriate responsible parties to develop, submit, and implement a ranch management plan designed to prevent discharges of fine sediment, nutrients and other oxygen consuming materials, as well as elevated solar radiation loads from affecting waters of the Shasta River and tributaries. <p>The ranch management plan shall describe in detail:</p> <ol style="list-style-type: none"> 1. Locations discharging and/or with the potential to discharge nutrients and other oxygen consuming materials, and elevated solar radiation loads to watercourses which are caused by livestock grazing or related activities. 2. How and when identified sites are to be controlled and monitored, and management practices that will be implemented to prevent and reduce future discharges of nutrient and other oxygen consuming materials, and elevated solar radiation loads to the Shasta River and its tributaries. <p>Group and/or individual ranch management plans shall be implemented upon review, comment, and approval by Regional Water Board staff and their Executive Officer for compliance with water quality standards, the TMDLs, and the NPS Policy.</p> <ul style="list-style-type: none"> • The Regional Water Board shall address the removal and suppression of vegetation that provides shade to a water body through development of a Stream and Wetland System Protection Policy. This will be a comprehensive, region-wide riparian policy that will address the importance of shade on instream water temperatures and will potentially propose riparian setbacks and buffer widths. The Policy will likely propose new rules and regulations, and will therefore take the form of an amendment to the Basin Plan. Other actions under this section may be modified for consistency with this policy, once adopted. With funding already available through a grant from the U.S. EPA, Regional Water Board staff are scheduled to develop this Policy for Regional Water Board consideration and adoption by the end of 2007. • Within two years of EPA approval of the TMDL Action Plan (by January 26, 2009), the Regional Water Board's Executive Officer shall report to the Regional Water Board on the status of the preparation and development of appropriate permitting actions.

Table 4-14 Shasta River Dissolved Oxygen and Temperature TMDL Implementation Actions (cont.)

Source or Land Use Activity	Responsible Parties	Actions to Address Dissolved Oxygen and Water Temperature Impairment
Range and Riparian Land Management (cont.)	<ul style="list-style-type: none"> Regional Water Board (cont.) 	<ul style="list-style-type: none"> The Regional Water Board shall take appropriate permitting actions as necessary to address the removal and suppression of vegetation that provides shade to a water body in the Shasta River watershed. Such actions may include, but are not limited to, prohibitions, waste discharge requirements (WDRs) or waivers of WDRs for grazing and rangeland activities, farming activities near water bodies, stream bank stabilization activities, and other land uses that may remove and/or suppress vegetation that provides shade to a water body. Should prohibitions, waivers or WDRs be developed, they may apply to the entire North Coast Region or just to the Shasta River watershed. Within ten years of EPA approval of the TMDL (by January 26, 2017), all identified discharges associated with riparian land use activities shall be in compliance with water quality standards, the TMDLs, and the NPS Policy.
Tailwater Return Flows	<ul style="list-style-type: none"> Irrigators Shasta Valley RCD Shasta CRMP 	<p>Landowner Actions: Those that oversee and manage tailwater discharges from irrigated lands in the Shasta River watershed, which may include landowners, lessees, and land managers (collectively referred to as irrigators), should employ land stewardship and irrigation management practices and activities that minimize, control, and preferably prevent discharges of fine sediment, nutrients and other oxygen consuming materials, and elevated water temperatures from affecting waters of the Shasta River and its tributaries.</p> <p>Irrigators should implement the applicable management measures for tailwater return flows from the following sources:</p> <ul style="list-style-type: none"> <i>Policy for the Implementation and Enforcement of the Nonpoint Source Pollution Control Program (NPS Policy) (SWRCB 2004 or as amended).</i> <i>Shasta Watershed Restoration Plan (November 1997).</i> <i>Shasta Valley Resource Conservation District Master Incidental Take Permit (ITP) Application (Shasta RCD 2005).</i> <i>Recovery Strategy for California Coho Salmon (Coho Recovery Strategy) (CDFG 2004).</i> <p>See Appendix B of this Action Plan for examples of some of these tailwater return flow measures.</p> <p>In addition, landowners may develop and implement management measures suitable for their site-specific conditions.</p> <p>Irrigators should submit annually to the Regional Water Board a written summary of all tailwater return flow management actions taken to help achieve compliance with water quality standards, the TMDLs, and the NPS Policy, either individually or through the Shasta Valley RCD and its CRMP or through the CDFG Coho ITP.</p> <p>RCD Actions: The Shasta Valley RCD and its CRMP should:</p> <ul style="list-style-type: none"> Assist irrigators in developing and implementing management practices that minimize, control and preferably prevent discharges of fine sediment, nutrients and other oxygen consuming materials, and elevated water temperatures from affecting waters of the Shasta River and its tributaries.

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Table 4-14 Shasta River Dissolved Oxygen and Temperature TMDL Implementation Actions (cont.)		
Source or Land Use Activity	Responsible Parties	Actions to Address Dissolved Oxygen and Water Temperature Impairment
Tailwater Return Flows (cont.)	<ul style="list-style-type: none"> • Shasta Valley RCD and Shasta CRMP (cont.) • CDFG • Regional Water Board 	<ul style="list-style-type: none"> • Implement the recommended actions specified in the Shasta Watershed Restoration Plan, Coho Recovery Strategy, and the ITP (when approved). • Assist irrigators in developing and implementing a monitoring program to evaluate and document implementation and effectiveness of the tailwater management actions taken by the irrigators. <p>State Actions: CDFG will:</p> <ul style="list-style-type: none"> • Assist irrigators in developing and implementing management practices that minimize, control, and preferably prevent discharges of fine sediment, nutrients and other oxygen consuming materials, and elevated water temperatures from affecting waters of the Shasta River and its tributaries. • Administer the Coho Recovery Strategy and the ITP (when approved). <p>Regional Water Board will:</p> <ul style="list-style-type: none"> • Work with the Shasta Valley RCD and its CRMP to develop a monitoring program to evaluate and document implementation and effectiveness of the tailwater management actions taken by the irrigators. • Evaluate the effectiveness of tailwater management actions and develop recommendations for the most effective regulatory vehicle to bring tailwater discharges into compliance with water quality standards, the TMDLs, and the NPS Policy. • Should efforts fail to be implemented or effective, the Regional Water Board's Executive Officer may require irrigators, on a site specific as-needed basis, to develop, submit, and implement, upon review, comment and approval by the Regional Water Board's Executive Officer, a tailwater management plan designed to prevent discharges of fine sediment, nutrients and other oxygen consuming materials, and elevated solar radiation loads from affecting waters of the Shasta River and its tributaries. • Within one year of EPA approval of the TMDL (by January 26, 2008), the Regional Water Board's Executive Officer shall report to the Regional Water Board on the status of the preparation and development of appropriate permitting actions to bring the discharge into compliance with water quality standards, the TMDLs, and the NPS Policy. • Within five years of EPA approval of the TMDL (by January 26, 2012) and based on Regional Water Board staff recommendation(s) derived from the evaluation phase for tailwater management, the Regional Water Board shall adopt prohibitions, WDRs, waivers of WDRs, or any combination thereof, as appropriate. • Within ten years of EPA approval of the TMDL (by January 26, 2017), the discharge of all tailwater return flow shall be in compliance with water quality standards, the TMDLs, and the NPS Policy.

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Table 4-14 Shasta River Dissolved Oxygen and Temperature TMDL Implementation Actions (cont.)		
Source or Land Use Activity	Responsible Parties	Actions to Address Dissolved Oxygen and Water Temperature Impairment
Water Use and Flow (cont.)	<ul style="list-style-type: none"> • CDFG (cont.) • Department of Water Resources (DWR) • Regional Water Board • State Water Resources Control Board (State Water Board) 	<p>Shasta River and tributaries.</p> <ul style="list-style-type: none"> • Administer the Coho Recovery Strategy and the ITP (when approved). • Assist in developing and implementing a monitoring program to evaluate and document implementation and effectiveness of the actions taken by the water diverters to increase dedicated cold water instream flows in the Shasta River. <p>DWR should:</p> <ul style="list-style-type: none"> • Coordinate and assist water diverters in developing and implementing a monitoring program through a watermaster service to evaluate and document implementation and effectiveness of the actions taken by the water diverters to increase dedicated cold water instream flows in the Shasta River. <p>The Regional Water Board will:</p> <ul style="list-style-type: none"> • Work cooperatively with water diverters, the Shasta Valley RCD and its CRMP, CDFG and DWR, wholly or in part, to establish monitoring and reporting programs to gauge implementation and effectiveness of the actions taken by responsible parties. • If the Executive Officer receives credible evidence that the Shasta River flows are diminishing, the Executive Officer shall promptly report this to the Regional and State Water Board. • If after five years, the Regional Water Board's Executive Officer finds that the above measures have failed to be implemented or are otherwise ineffective, the Regional Water Board may recommend that the State Water Board consider seeking modifications to the decree (<i>In re Waters of Shasta River and its Tributaries</i>, No. 7035 (Super. Ct. Siskiyou County Dec. 29, 1932)), conducting proceedings under the public trust doctrine and/or conducting proceedings under the waste and unreasonable use provisions of the California Constitution and the California Water Code.
<p>Irrigation Control Structures, Flashboard Dams, and other Minor Impoundments</p> <p>(Collectively referred to as minor impoundments)</p>	<ul style="list-style-type: none"> • Individual Irrigators • Irrigation Districts • DWR • Others owning, operating, managing, or anticipating construction of minor impoundments 	<p>Irrigator(s) Actions: Irrigation districts, individual irrigators, and others that own, operate, manage, or anticipate constructing instream minor impoundments or other structures capable of blocking, impounding, or otherwise impeding the free flow of water in the Shasta River system shall comply with one or more of the following measures:</p> <ul style="list-style-type: none"> • Permanently remove minor impoundments in the Shasta River mainstem. • Re-engineer existing impoundments to decrease surface area of impoundment. • Not construct new impoundments unless they can be shown to have positive effects to the beneficial uses of water relative to water quality compliance and the support of beneficial uses, including the salmonid fishery, in the Shasta Valley. <p>Within one year of EPA approval of the TMDL (by January 26, 2008), report in writing to the Regional Water Board methods and management practices they shall implement that will reduce sediment oxygen demand rates by 50% from baseline behind all minor impoundments.</p>

Table 4-14 Shasta River Dissolved Oxygen and Temperature TMDL Implementation Actions (cont.)

Source or Land Use Activity	Responsible Parties	Actions to Address Dissolved Oxygen and Water Temperature Impairment
Minor impoundments (cont.)	<ul style="list-style-type: none"> • Shasta Valley RCD • Shasta CRMP • CDFG • Regional Water Board 	<p>RCD Actions: The Shasta Valley RCD and its CRMP should:</p> <ul style="list-style-type: none"> • Assist in developing and implementing minor impoundment removal, re-engineering or initial design work for compliance with water quality standards, the TMDLs, and the NPS Policy. • Implement the recommended actions specified in the Shasta Watershed Restoration Plan and the ITP (when approved). • Assist in developing and implementing a monitoring program to evaluate and document implementation and effectiveness of the actions taken to remove, re-engineer or limit construction of minor impoundments on the mainstem Shasta River. <p>State Actions: CDFG will:</p> <ul style="list-style-type: none"> • Assist in developing and implementing the removal, re-engineering, or limitation on the construction of minor impoundments in the Shasta River mainstem. • Administer the Coho Recovery Strategy and the ITP (when approved). • Assist in the development and implementation of a monitoring program to evaluate and document the implementation and effectiveness of the actions taken to remove, re-engineer, or limit construction of minor impoundments on the mainstem Shasta River. <p>The Regional Water Board will:</p> <ul style="list-style-type: none"> • Work with CDFG to establish monitoring and reporting elements of their programs in order to gage their effectiveness. • Work with the Shasta Valley RCD and its CRMP to establish monitoring and reporting programs to gage the implementation and effectiveness of the Shasta Watershed Restoration Plan. • Include appropriate conditions in Clean Water Act water quality certification permits for minor impoundment removal or re-engineering activities that comply with water quality standards, the TMDL, and the NPS Policy.
Lake Shastina	<ul style="list-style-type: none"> • MWCD • City of Weed • County of Siskiyou • Caltrans • Communities of Lake Shastina • U.S. Forest Service (USFS) • U.S. Bureau of Land Management (BLM) • Private timberland owners 	<p>Within 2 years of EPA approval of the TMDL (by January 26, 2009), the responsible parties shall complete a study of water quality conditions and factors affecting water quality conditions in Lake Shastina, and develop a plan for addressing factors affecting water quality conditions to bring Lake Shastina into compliance with water quality standards, the TMDLs, and the NPS Policy.</p> <p>The study and plan shall be submitted to the Regional Water Board Executive Officer for review, comment and approval. Within 5 years of EPA approval of the TMDL (by January 26, 2012), the responsible parties shall begin implementing the plan.</p>

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Source or Land Use Activity	Responsible Parties	Actions to Address Dissolved Oxygen and Water Temperature Impairment
Dwinnell Dam	<ul style="list-style-type: none"> Montague Water Conservation District (MWCD) 	<p>Within 2 years of EPA approval of the TMDL (by January 26, 2009), the MWCD shall report in writing to the Regional Water Board on a plan to bring the discharge from Dwinnell Dam into compliance with water quality standards, the TMDLs, and the NPS Policy.</p>
City of Yreka Wastewater Treatment Facility (Yreka WWTF)	<ul style="list-style-type: none"> City of Yreka Regional Water Board 	<p>Yreka Wastewater Treatment Facility Actions: The Yreka WWTF shall comply with existing Regional Water Board Orders and Monitoring and Reporting Programs.</p> <p>Regional Water Board Actions: The Regional Water Board will:</p> <ul style="list-style-type: none"> Pursue aggressive compliance with Order No 96-69 and CAO No. R1-2004-0037. Continue vigorous oversight and enforcement of Monitoring and Reporting Program No. R1-2003-0047 to ensure timely submittal of sampling and analytical results from the operators of the Yreka WWTF.
Urban and Suburban Runoff	<ul style="list-style-type: none"> City of Yreka City of Weed City of Montague Community of Edgewood Communities of Lake Shastina Other landowners with suburban runoff Regional Water Board 	<p>Actions: The cities of Yreka, Weed, Montague, the communities of Lake Shastina, and other landowners with suburban runoff should identify possible pollutants, their sources, and volumes of polluted runoff from urban and suburban sources within their spheres of influence that may discharge, directly or indirectly, to waters of the Shasta River watershed.</p> <p>Cities and other landowners with suburban runoff should implement the applicable measures from the NPS Policy. See Appendix D of this Action Plan for examples of some of these applicable measures.</p> <p>Within two years of EPA approval of the TMDL (by Jan. 2009), cities and landowners with suburban runoff shall develop a plan to minimize, control, and preferably prevent discharges of fine sediment, nutrients and other oxygen consuming materials and elevated temperature waste discharge from affecting waters of the Shasta River and its tributaries. The plan shall be submitted to the Regional Water Board's Executive Officer for review, comment and approval. Within 5 years of EPA approval of the TMDL (by Jan. 2012), cities and landowners with suburban runoff shall begin implementing the plan.</p> <p>State Actions: The Regional Water Board will:</p> <ul style="list-style-type: none"> Work cooperatively with responsible parties to implement their plan, including appropriate management measures and reasonable time schedules which minimize, control, and preferably prevent discharges of fine sediment, nutrients and other oxygen consuming materials and elevated temperature waste discharge from affecting waters of the Shasta River and its tributaries.
Activities on Federal Lands	<ul style="list-style-type: none"> USFS 	<p>USFS Actions: The USFS should consistently implement the best management practices for timber harvest activities, grazing, and other activities included in the:</p> <ul style="list-style-type: none"> Klamath <i>National Forest Land and Resource Management Plan</i> (USFS 1995) or as amended as long as equivalent or better water quality protections are required. Shasta-Trinity National Forest Land and Resource Management Plan (USFS 1995) or as amended as long as equivalent or better water quality protections are required. <i>Water Quality Management for Forest System Lands in California, Best Management Practices</i> (USFS 2000) or as amended as long as

Table 4-14 Shasta River Dissolved Oxygen and Temperature TMDL Implementation Actions (cont.)

Source or Land Use Activity	Responsible Parties	Actions to Address Dissolved Oxygen and Water Temperature Impairment
Activities on Federal Lands (cont.)	<ul style="list-style-type: none"> • USFS (cont.) • Regional Water Board • BLM • Regional Water Board 	<p style="text-align: center;">equivalent or better water quality protections are required.</p> <p>See Appendix E of this Action Plan for some examples of these measures.</p> <p>Regional Water Board Actions: The Regional Water Board will:</p> <ul style="list-style-type: none"> • Continue its involvement with the USFS to periodically reassess the mutually agreed upon goals of the 1981 Management Agency Agreement between the SWRCB and the USFS. • Work with the USFS to draft and finalize a Memorandum of Understanding (MOU). The MOU shall be drafted and ready for consideration by the appropriate decision-making body of the USFS within two years of EPA approval of the TMDL (by January 26, 2009). The MOU shall include, in part, buffer width requirements and other management practices as detailed in Appendix E. <p>BLM Actions: BLM shall implement best management grazing strategies that are detailed in a joint management agency document titled:</p> <ul style="list-style-type: none"> • <i>Riparian Management, TR 1737-14, Grazing Management for Riparian-Wetland Areas, USDI-BLM, USDA-FS (1997).</i> <p>See Appendix F of this Action Plan for some examples of these measures.</p> <p>Regional Water Board Actions: The Regional Water Board will work with the BLM to draft and finalize a Memorandum of Understanding (MOU). The MOU shall be drafted and ready for consideration by the appropriate decision-making body of the BLM within two years of EPA approval of the TMDL (by January 26, 2009). The MOU shall include buffer width requirements and other management practices as detailed in Appendix F of this Action Plan.</p>
Timber Harvest Activities on Non-Federal Lands	<ul style="list-style-type: none"> • Private Parties Conducting Timber Harvest Activities • California Department of Forestry (CDF) • Regional Water Board 	<p>Timber Harvest Related Actions: Parties conducting timber harvest activities should employ land stewardship practices that minimize, control, and preferably prevent discharges of fine sediment, nutrients and other oxygen consuming materials from affecting waters of the Shasta River and tributaries. Landowners should also employ land stewardship practices and activities that minimize, control, and preferably prevent elevated solar radiation loads from affecting waters of the Shasta River and its Class I and II tributaries.</p> <p>State Actions: CDF will:</p> <ul style="list-style-type: none"> • Ensure timber operations in the Shasta River watershed are in compliance with the water quality standards, the TMDLs, and NPS Policy. <p>Regional Water Board Actions: The Regional Water Board shall use appropriate permitting and enforcement tools to regulate discharges from timber harvest activities in the Shasta River watershed, including, but not limited to:</p> <ul style="list-style-type: none"> • Participation in the CDF timber harvest review and approval process. • Use of general or specific WDRs and waivers of WDRs, if applicable, to regulate timber harvest activities on private lands in the Shasta River watershed.

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Table 4-14 Shasta River Dissolved Oxygen and Temperature TMDL Implementation Actions (cont.)		
Source or Land Use Activity	Responsible Parties	Actions to Address Dissolved Oxygen and Water Temperature Impairment
Timber Harvest Activities on Non-Federal Lands (cont.)	<ul style="list-style-type: none"> Regional Water Board (cont.) 	<ul style="list-style-type: none"> Timber harvest activities on private lands in the Shasta River watershed are not eligible for Categorical Waiver C included in the Categorical Waiver of <i>Waste Discharge Requirements for Discharges Related to Timber Harvest Activities on Non-Federal Lands in the North Coast Region</i> (Order No. R1-2004-0016) simply through the adoption of this TMDL Action Plan. However, timber harvest activities on private lands in the Shasta River watershed may be eligible for Categorical Waivers A, B, D, E, and F, as appropriate. If the California Forest Practice Rules (Title 14 CCR Chapters 4, 4.5 and 10) are changed in a manner that reduces water quality protections, the Regional Water Board shall require plan submitters to maintain the level of water quality protection provided by the 2006 Forest Practice Rules. <p>See Appendix G of this Action Plan for select examples of 2006 Forest Practice Rules.</p>
California Department of Transportation Activities (Caltrans)	<ul style="list-style-type: none"> Caltrans Regional Water Board 	<p>Caltrans Actions: Caltrans shall implement the requirements of its stormwater program.</p> <p>Regional Water Board Actions: Regional Water Board shall:</p> <ul style="list-style-type: none"> Within two years of EPA approval of the TMDL (by January 26, 2009), complete an initial evaluation of the Caltrans Stormwater Program. After the initial two-year evaluation is completed, the Regional Water Board shall continue periodic reviews of the program to assure ongoing compliance.

IX. Glossary

Adjusted Potential Effective Shade:

The percentage of direct beam solar radiation attenuated and scattered before reaching the ground or stream surface from the potential vegetation conditions, reduced by 10% to account for natural disturbance such as fire, windthrow, disease, and earth movements that reduce actual riparian vegetation below the site potential.

Biochemical Oxygen Demand (CBOD):

An analytical method used as an indicator for the concentration of biodegradable organic matter present in a sample of water. It measures the rate of uptake of oxygen by micro-organisms in the sample of water over a given period of time, and can be used to infer the general quality of the water and its degree of pollution.

Carbonaceous Deoxygenation:

Refers to the consumption of oxygen by bacteria during the breakdown of (decomposition) of organic (carbon-containing) material.

Class I Tributary:

This watercourse must have one of the following properties in order to be considered a Class I tributary, according to California Forest Practice Rules: (1) domestic supplies, including springs, on site and/or within 100 feet downstream of the operations area, and/or (2) fish are always or seasonally present onsite, includes habitat to sustain fish migration and spawning.

Class II Tributary:

This watercourse must have one of the following properties in order to be considered a Class II tributary, according to California Forest Practice Rules: (1) fish always or seasonally present offsite within 1000 feet downstream, (2) is an aquatic habitat for nonfish aquatic species, and/or (3) excludes Class III waters that are tributary to Class I waters.

Compliance and Trend Monitoring:

Monitoring intended to determine, on a watershed scale, if water quality standards are being met, and to track progress towards meeting water quality standards.

Dedicated Cold Water Instream Flow:

Water remaining in the stream in a manner that that the diverter, either individually or as a group, can ensure will result in water quality benefits. Temperature, length, and timing are factors to consider when determining the water quality benefits of an instream flow.

Implementation Monitoring:

Monitoring used to assess whether activities and control practices were carried out as planned. This type of monitoring can be as simple as photographic documentation, provided that the photographs are adequate to represent and substantiate the implementation of control practices.

Instream Effectiveness Monitoring:

Monitoring of instream conditions to assess whether pollution control practices are effective at keeping waste from being discharged to a water body. Instream effectiveness monitoring may be conducted upstream and downstream of the discharge point or before, during, and after the implementation of pollution control practices.

Irrigation Return Flows:

See Tailwater Return Flow.

Natural Potential Vegetation Conditions:

The most advanced seral stage that nature is capable of developing and making actual at a site in the absence of human interference. Seral stages are the series of plant communities that develop during ecological succession from bare ground to the climax community (e.g., fully mature, old-growth).

Nitrification:

The oxidation of an ammonium (NH_4^+) compound to nitrite (NO_2^-) and nitrate (NO_3^-), a process that consumes oxygen.

Nitrogenous Deoxygenation:

The conversion of organic nitrogen to ammonium (NH_4^+) and the subsequent oxidation of ammonium to nitrite (NO_2^-) and then to nitrate (NO_3^-), a process that consumes oxygen

Nitrogenous Biochemical Oxygen Demand (NBOD):

A measure of the amount of oxygen consumed from the conversion of organic nitrogen to ammonium (NH_4^+) and the oxidation of ammonium to nitrite (NO_2^-) and subsequently (NO_3^-).

Nitrogenous Oxygen Demand:

The conversion of organic nitrogen to ammonium by bacteria, a process that consumes oxygen.

Potential Effective Riparian Shade:

That shade resulting from topography and natural potential vegetation that reduces the heat load reaching the stream. The difference between existing (baseline) and adjusted potential effective shade reflects the amount of effective riparian shade increase (i.e. reduced solar transmittance) that is necessary to achieve natural receiving water temperatures.

Potential Solar Radiation Transmittance:

Potential solar radiation transmittance is the amount of solar radiation that passes through the vegetation canopy and reaches the water surface, when natural potential vegetation conditions are achieved.

Reaeration:

The process whereby atmospheric oxygen is transferred to a waterbody.

Salmonids:

Fish species in the family Salmonidae, including but not limited to: salmon, trout, and char.

Sediment:

Any inorganic or organic earthen material, including, but not limited to: soil, silt, sand, clay, peat, and rock.

Sediment Oxygen Demand (SOD):

The consumption of oxygen by sediment and associated organisms (such as bacteria and invertebrates) through both the decomposition of organic matter and respiration by plants, bacteria, and invertebrates.

Solar Radiation Transmittance:

Solar radiation transmittance is defined as the amount of solar radiation that passes through the vegetation canopy and reaches the water surface. A value of 1.0 represents no shade; a value of 0.0 represents complete shade.

Tailwater Return Flow:

Water applied to a field for irrigation at rates that exceed soil infiltration and evaporation rates, resulting in runoff of irrigation water to a surface water body. Same as Irrigation Return Flows.

Water Quality Compliance Model Scenario:

A computer water quality model scenario developed by Regional Water Board staff that characterizes Shasta River watershed conditions under which the Basin Plan narrative temperature objective and numeric dissolved oxygen are met in the Shasta River.