

**STATE WATER RESOURCES CONTROL BOARD
BOARD MEETING SESSION--DIVISION OF WATER QUALITY
NOVEMBER 15, 2006**

ITEM 18

SUBJECT

CONSIDERATION OF A RESOLUTION APPROVING AN AMENDMENT TO THE WATER QUALITY CONTROL PLAN FOR THE NORTH COAST REGION (BASIN PLAN) TO ESTABLISH TOTAL MAXIMUM DAILY LOADS (TMDLs) FOR DISSOLVED OXYGEN AND WATER TEMPERATURE IN THE SHASTA RIVER BASIN

DISCUSSION

The Shasta River Watershed was placed on the federal Clean Water Act (CWA) 303(d) list in 1992 as not meeting standards for organic enrichment/dissolved oxygen and in 1994 as not meeting standards for temperature. On June 29, 2006, the North Coast Regional Water Quality Control Board (North Coast Water Board) adopted Resolution No. R1-2006-0052 (attachment) amending the Basin Plan to establish TMDLs for temperature and dissolved oxygen (DO) in the Shasta River Watershed. The Shasta River Watershed includes all tributaries and Lake Shastina. The designated beneficial uses that are not fully supported are: cold freshwater habitat (COLD); rare, threatened, and endangered species (RARE); migration of aquatic organisms (MIGR); spawning, reproduction, and/or early development of fish (SPWN); commercial and sport fishing (COMM); and contact and non-contact water recreation (REC-1 and REC-2). The designated beneficial uses associated with the cold freshwater salmonid fishery (COMM, COLD, RARE, MIGR, SPWN) are the designated beneficial uses most sensitive to the DO and water temperature impairments.

Because the Shasta River Watershed is listed as not meeting water quality standards, section 303(d) of CWA requires that a TMDL be established for the Shasta River Watershed. A TMDL specifies load allocations for nonpoint sources and wasteload allocations for point sources that, when implemented, are expected to result in attainment of applicable water quality standards. Water Code § 13242 requires an implementation plan and schedule to ensure that water quality objectives are achieved. The TMDLs address DO and temperature in the Shasta River Watershed and assure that water quality standards will be achieved.

Temperature

There are no known point source heat loads to the Shasta River Watershed. The nonpoint source heat loads in the Shasta River Watershed include: (1) solar heat load (i.e., sunlight) at streamside (riparian) locations in the Shasta River Watershed, (2) heat load from tailwater return flows¹, and (3) reduced assimilative capacity from surface water flow reductions. Five primary factors have been identified as affecting stream temperatures in the Shasta River Watershed:

¹ **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.

- Reduced stream shade resulting from agricultural practices, including grazing and livestock activities;
- Tailwater return flows;
- Flow modification and diversion;
- Spring inflow; and
- Lake Shastina and minor channel impoundments.

The Basin Plan specifies narrative water quality objectives for temperature. The TMDL interprets these narrative objectives by establishing numeric targets for the Shasta River Watershed. The numeric targets for temperature are equal to the TMDL allocations, which are: the potential percent solar radiation transmittance² for the main stem Shasta River below Dwinnell Dam; adjusted potential effective riparian shade³ for the Shasta River above Dwinnell Dam and on tributaries, a zero net increase in receiving water temperature, and a flow regime that results in reductions in maximum daily temperatures of 1.5°C, 1.2°C, and 2.1°C from baseline at specific compliance locations.

DO

There are no known point sources of oxygen-demanding constituents to the Shasta River Watershed and tributaries. Each of the components that exert an oxygen demand on the Shasta River Watershed is attributed to nonpoint sources. The primary processes affecting DO concentrations in the Shasta River Watershed include photosynthesis and respiration of aquatic plants, nitrogenous deoxygenation (termed nitrogenous biochemical oxygen demand⁴ or NBOD), and sediment oxygen demand⁵ (SOD). The following five anthropogenic sources or factors adversely affect DO conditions in the Shasta River Watershed:

- Tailwater return flows;
- City of Yreka nonpoint and wastewater infiltration sources;
- Lake Shastina and minor impoundments;
- Agricultural practices including grazing and livestock activities that reduce riparian shade and deliver oxygen consuming materials to surface waters; and
- Flow modification and diversion.

The Basin Plan defines a numeric water quality objective for DO in the Shasta River Watershed. The TMDL's numeric target is equal to the minimum designated water quality objective for the Shasta River Watershed in the Basin Plan, which is 7.0 milligrams per liter. The load allocations for DO are expressed in terms of hourly oxygen demand in pounds, and the reductions

² **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.

³ **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.

⁴ **Nitrogenous Biochemical Oxygen Demand:** 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^-).

⁵ **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.

necessary to achieve water quality compliance in each given section of Shasta River Watershed.

The implementation actions are designed to encourage and build upon on-going, restoration and enhancement efforts in the watershed. The proposed amendment states that the North Coast Water Board will require implementation actions to achieve the TMDLs and the DO and temperature related-water quality standards in the Shasta River Watershed. Implementation actions are organized by source or land use activity and responsible parties considered appropriate to implement TMDL actions (See Table 4 of Attachment). Action items are fully independent of each other and require 100 percent implementation within each source or land use category. The North Coast Water Board, as part of the TMDL, adopted a Conditional Waiver of Waste Discharge requirement for implementation activities. If dischargers fail to implement the activities, the proposed amendment states that the North Coast Water Board will request a report of Waste Discharge and take the appropriate permitting or enforcement action.

North Coast Water Board staff plans to apply an adaptive management approach for the TMDL implementation. The proposed amendment specifies that the North Coast Water Board will review, reassess, and possibly revise the Shasta River Watershed TMDL Action Plan. Reassessment is likely to occur every three years during the Basin Planning Triennial Review process. The proposed amendment specifies that North Coast Water Board staff will report to their Board at least yearly on the status and progress of implementation activities, and on whether current efforts are reasonably calculated and on track to achieve water quality standards. In addition, the proposed amendment specifies that North Coast Water Board staff will conduct a comprehensive and formal assessment of effectiveness of collaborative efforts in the on-going programs and additional efforts recommended by the Action Plan within five years from the date of U.S. Environmental Protection Agency (USEPA) approval. The proposed amendment states that a more extensive reassessment will occur 10 years from the date the TMDL Action Plan is effective, or sooner, if the North Coast Water Board determines it is necessary.

This amendment underwent scientific peer review. All comments and questions received a response from North Coast Water Board staff. Responses included clarifications and revisions to the amendment.

POLICY ISSUE

Should the State Water Board approve the amendment to the Basin Plan to establish TMDLs for temperature and DO in the Shasta River Watershed as adopted under North Coast Water Board Resolution No. R1-2006-0052?

FISCAL IMPACT

North Coast Water Board and State Water Board staff work associated with or resulting from this action will be addressed with existing and future budgeted resources.

REGIONAL WATER BOARD IMPACT

Yes, approval of this Resolution will amend the North Coast Water Board's Basin Plan.

STAFF RECOMMENDATION

That the State Water Board:

1. Approves the amendment to the Basin Plan adopted under North Coast Water Board Resolution No. R1-2006-0052.
2. Authorizes the Executive Director or designee to submit the amendment adopted under North Coast Water Board Resolution No. R1-2006-0052, as approved, and the administrative record for this action to the Office of Administrative Law and the TMDLs to USEPA for approval.

DRAFT

October 6, 2006

STATE WATER RESOURCES CONTROL BOARD RESOLUTION NO. 2006 -

APPROVING AN AMENDMENT TO THE WATER QUALITY CONTROL PLAN
FOR THE NORTH COAST REGION (BASIN PLAN) TO ESTABLISH
TOTAL MAXIMUM DAILY LOADS (TMDLs) FOR DISSOLVED OXYGEN (DO)
AND WATER TEMPERATURE IN THE SHASTA RIVER BASIN

WHEREAS:

1. The North Coast Regional Water Quality Control Board (North Coast Water Board) adopted a revised Basin Plan on December 9, 1993, which was approved by the State Water Resources Control Board (State Water Board) on March 21, 1994 and by the Office of Administrative Law (OAL) on August 18, 1994.
2. On June 29, 2006, the North Coast Water Board adopted Resolution No. R1-2006-0052 ([Attachment](#)) amending the Basin Plan to establish TMDLs for temperature and DO in the Shasta River Watershed.
3. The North Coast Water Board found that Basin Planning documents and the environmental checklist comply with the requirements of the State Water Board's certified regulatory California Environmental Quality Act process. (California Code Regulations Title 23 §3777 et seq.)
4. North Coast Water Board staff found that adoption of this amendment would result in no adverse effect on wildlife, and the amendment would be consistent with the State Antidegradation Policy (State Water Board Resolution No. 68-16) and federal antidegradation requirements.
5. The State Water Board finds that the Basin Plan amendment is in conformance with Water Code section 13240, which specifies that Regional Water Quality Control Boards may revise Basin Plans, and section 13242, which requires a program of implementation of water quality objectives. The State Water Board also finds that the TMDLs as reflected in the Basin Plan amendment are consistent with the requirements of federal Clean Water Act section 303(d).
6. State Water Board staff is preparing for the Board's consideration, as authorized by subdivision (a)(2) of Water Code section 1259.4, an extension of the Assembly Bill 2121 enforcement policy to be adopted pursuant to subdivision (a)(1) of Water Code section 1959.4. The extension should include, but not necessarily be limited to, the Klamath River and its tributaries.
7. A Basin Plan amendment does not become effective until approved by the State Water Board and until the regulatory provisions are approved by OAL. TMDLs must also be approved by the U.S. Environmental Protection Agency (USEPA).

THEREFORE BE IT RESOLVED THAT:

The State Water Board:

1. Approves the amendment to the Basin Plan adopted under North Coast Water Board Resolution No. R1-2006-0052.
2. Authorizes the Executive Director or designee to submit the amendment adopted under North Coast Water Board Resolution No. R1-2006-0052, as approved, and the administrative record for this action to OAL and the TMDLs to USEPA for approval.

CERTIFICATION

The undersigned, Clerk to the Board, does hereby certify that the foregoing is a full, true, and correct copy of a resolution duly and regularly adopted at a meeting of the State Water Resources Control Board held on November 15, 2006.

Song Her
Clerk to the Board