

State of California
North Coast Regional Water Quality Control Board

Public Review Draft
Staff Report
for the
2008 Integrated Report
for the Clean Water Act
Section 305(b) Surface Water Quality Assessment
and the 303(d) List of Impaired Waters

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List of Abbreviations

Basin Plan	Regional Water Quality Control Plan
CalWQA	California Water Quality Assessment Database
CCC	Criteria Continuous Concentration
CCR	California Code of Regulations
CDF	California Department of Forestry and Fire Protection
CFR	Code of Federal Regulations
CMC	Criteria Maximum Concentration
CTR	California Toxics Rule
CWA	Clean Water Act
C	degrees Celsius
F	degrees Fahrenheit
DDE	Dichlorodiphenyldichloroethylene
DDT	Dichlorodiphenyltrichloroethane
DFG	California Department of Fish and Game
DHS	California Department of Health Services
DO	Dissolved oxygen
HA	Hydrologic Area
HSA	Hydrologic Sub Area
HU	Hydrologic Unit
Listing Policy	Water Quality Control Policy for Developing California's Section 303(d) List
LOE	Line of Evidence
MCL	Maximum Contaminant Level
mg/kg	milligrams per kilogram (parts per million)
mg/L	milligrams per liter (parts per million)
µg/g	micrograms per gram (parts per million)
µg/L	micrograms per liter (parts per billion)
MPN	Most Probable Number
ng/g	nanograms per gram (parts per billion)
ng/L	nanograms per liter (parts per trillion)
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NPS	Nonpoint Source
OEHHA	Office of Environmental Health Hazard Assessment
PAH	Polynuclear aromatic hydrocarbon
PCB	Polychlorinated biphenyl
pg/L	picograms per liter
QA	Quality Assurance
QAPP	Quality Assurance Project Plan
QC	Quality Control
Regional Water Board	Regional Water Quality Control Board
RWQCB	Regional Water Quality Control Board
State Water Board	State Water Resources Control Board

SWAMP	Surface Water Ambient Monitoring Program
SWRCB	State Water Resources Control Board
TDS	Total Dissolved Solids
TMDL	Total Maximum Daily Load
USEPA	U.S. Environmental Protection Agency
USFS	U.S. Forest Service
WHO	World Health Organization

Chapter 1: Introduction

The Federal Clean Water Act (CWA) gives states the primary responsibility for protecting and restoring water quality. Under CWA Section 305(b), states are required to report biennially to the United States Environmental Protection Agency (USEPA) on the water quality conditions of their surface waters. The USEPA then compiles these assessments into their biennial “National Water Quality Inventory Report” to Congress. Under CWA Section 303(d), states are required to review, make changes as necessary, and submit to the USEPA a list identifying waterbodies not meeting water quality standards and identifying the water quality parameter (i.e., pollutant) not being met. Placement on this list generally triggers development of a pollution control plan called a total maximum daily load (TMDL) for each waterbody/pollutant pair on the list.

The USEPA issued guidance to states requiring that the 305(b) water quality assessment and the 303(d) list of impaired waters be integrated into a single report. For California, this report is called the 2008 Integrated Report, and it will satisfy both the CWA Section 305(b) and Section 303(d) requirements.

The North Coast Regional Water Quality Control Board is responsible for developing and adopting the 2008 Integrated Report for waters within the North Coast Region of California. Following adoption by the North Coast Regional Water Board, the 2008 Integrated Report will be transmitted to the State Water Resources Control Board (State Water Board), where it will be compiled with the other eight Regional Water Board reports and considered by the State Water Board as a state-wide report.

The purpose of this staff report is to describe the assessment process, the procedures utilized by North Coast Regional Water Board staff to analyze data and information, and the staff recommendations for additions, deletions, and changes to the 2006 California CWA Section 303(d) List.

The results of the staff analysis are presented as staff recommendations in the form of fact sheets that contain a decision and supporting lines of evidence for each waterbody/pollutant pair assessed. A summary of staff recommendations can be found in Chapter 4.

The fact sheets can be found online at:

http://www.waterboards.ca.gov/northcoast/water_issues/programs/tmdls/303d/

Fact sheets for selected the waterbody/pollutant pairs are also available in Appendix A. This includes fact sheets for all the waterbody/pollutant pairs that staff recommend be listed or delisted for the first time in 2008, plus those that are likely to be of particular public interest.

Chapter 2: Legal Requirements

This chapter provides a summary of the federal and state legal requirements for the 2008 Clean Water Act (CWA) Section 305(b) and Section 303(d) Integrated Report.

FEDERAL REQUIREMENTS

CWA Section 305(b) – Water Quality Assessment

Under CWA Section 305(b), states are required to report biennially to the United States Environmental Protection Agency (USEPA) on the water quality conditions of their surface waters. The USEPA then compiles these assessments into their biennial “National Water Quality Inventory Report” to Congress.

CWA Section 303(d) – Impaired Waters

The CWA Section 303(d) requires states to identify waters that do not meet applicable water quality standards after the application of certain technology-based controls¹. The Section 303(d) List must include a description of the pollutants causing the violation of water quality standards (40 CFR 130.7(b)(iii)(4)) and a priority ranking of the water quality limited segments, taking into account the severity of the pollution and the uses to be made of the waters. As defined in the CWA and federal regulations, water quality standards include the designated uses of a water segment, the adopted water quality criteria, and the State’s Antidegradation Policy (State Water Resources Control Board Resolution No. 68-16) (SWRCB 1968). Under state law (Porter-Cologne Water Quality Control Act, California Water Code Section 13300 et seq.), water quality standards are beneficial uses to be made of a water segment, the established water quality objectives (both narrative and numeric), and the State’s Antidegradation Policy. Federal regulation defines a “water quality limited segment” as “any segment [of a water segment] where it is known that water quality does not meet applicable water quality standards, and/or is not expected to meet applicable water quality standards, even after application of technology-based effluent limitations required by CWA Sections 301(b) or 306” (40 CFR 130.2(j)).

A total maximum daily load (TMDL) is generally developed for a water quality limited segment. A TMDL is the sum of the individual waste load allocations for point sources, load allocations for nonpoint sources, and natural background (40 CFR 130.2(j)). States are required to review the Section 303(d) List in even-numbered years, make changes as necessary, and submit the list to the USEPA for approval.

¹ Technology-based controls are defined in CWA Section 301. They include effluent limits (primarily and secondary treatment requirements) for industrial discharges and discharges from publically owned treatment works.

STATE REQUIREMENTS

On September 30, 2004, the State Water Board adopted the “Water Quality Control Policy for Developing California’s Clean Water Act Section 303(d) List,” also known as the Listing Policy (SWRCB 2004) in accordance with California Water Code Section 13191.3(a). The Listing Policy identifies the process by which the State Water Board and the Regional Water Quality Control Boards will comply with the listing requirements of CWA Section 303(d). The Listing Policy became effective in December 2004. Justification of each portion of the Listing Policy is presented in the Final Functional Equivalent Document (FED) (SWRCB, 2004) that was developed to support the provisions of the Listing Policy.

The objective of the Listing Policy is to establish a standardized approach for developing California’s Section 303(d) List with the overall goal of achieving water quality standards and maintaining beneficial uses in all of California’s surface waters. TMDLs will be developed as needed for the waters identified under the provisions of the Listing Policy.

The Listing Policy outlines a “weight of evidence” approach that provides the rules for making decisions based upon different kinds of data; an approach for analyzing data statistically; and requirements for data quality, data quantity, and the administration of the listing process. Decision rules for listing and delisting are provided for chemical-specific water quality standards; bacterial water quality standards; health advisories; bioaccumulation of chemicals in aquatic life tissues; nuisance such as trash, odor, and foam; nutrients; water and sediment toxicity; adverse biological response; and degradation of aquatic life populations and communities. The Listing Policy also requires that situation-specific weight of evidence listing or delisting factors be used if available information indicates water quality standards are attained or not attained and the other decision rules do not support listing or delisting.

The federal requirement for setting priorities on which TMDLs will be developed first is addressed in the Listing Policy by the establishment of schedules for TMDL development.

The Listing Policy also provides direction related to:

- The definition of readily available data and information.
- Administration of the listing process including data solicitation and fact sheet preparation.
- Interpretation of narrative water quality objectives using numeric evaluation guidelines.
- Data quality assessments.
- Data quantity assessments including water segment specific information, data spatial and temporal representation, aggregation of data by reach/area, quantitation of chemical concentrations, evaluation of data consistent with the expression of water quality objectives or criteria, binomial model statistical evaluation, evaluation of bioassessment data, and evaluation of temperature data.

The Listing Policy requires that all waters that do not meet water quality standards be placed on the Section 303(d) List. The Policy also states that the California 303(d) List includes (1) waters still requiring a TMDL, and (2) waters where the water quality limited segment is being

addressed. Water segments in the “Water Quality Limited Segments Being Addressed” category must meet either of the following conditions:

1. A TMDL has been developed and approved by USEPA and the approved implementation plan is expected to result in full attainment of the standard within a reasonable, specified time frame.
2. It has been determined that an existing regulatory program is reasonably expected to result in the attainment of the water quality standard within a reasonable, specified time frame.

This means that, for California, waters that fall into the Integrated Report Categories 4a, 4b, and 5 are also part of the California 303(d) List (for more information on the Integrated Report Categories, please see Table 1 of this report).

2006 303(d) LIST OF IMPAIRED WATERS

Until the 2008 303(d) List is adopted, the current list is the 2006 Section 303(d) List of Impaired Waters. The 2006 List was approved by the State Water Resources Control Board on October 25, 2006 in Resolution No. 2006-0079, and approved by the USEPA on June 28, 2007. At that time, the USEPA added the following seven waterbodies to the impaired list for indicator bacteria: Campbell Cove, Clam Beach, Doran Regional Park Beach, Luffenholtz Beach, Moonstone County Park, Salmon Creek Park Beach, and Trinidad State Beach. On May 29, 2008, the USEPA made a further addition to the 2006 List for Microcystin toxins for the mainstem Klamath River from the Copco 1 Reservoir to Iron Gate Dam.

Chapter 3: Assessment Process

The water quality assessment process for Sections 305(b) and 303(d) began with the evaluation of data collected from monitoring throughout the North Coast Region. The monitoring information is critical to understanding and protecting the beneficial uses of water, developing water quality standards, and determining the effect of pollution and pollution prevention programs. Determining the exceedances of water quality standards, objectives, criteria, and guidelines forms the basis of the water quality assessments for Sections 303(d) and 305(b). Whether or not water quality objectives are exceeded determines a water segment's ability to support its designated beneficial uses and also determines whether to list, or not list, the waterbody as impaired.

The basis for the 2008 Integrated Report Section 303(d) List is the 2006 Section 303(d) List, which was approved on June 28, 2007, and last modified on May 29, 2008. All listings on the 2006 Section 303(d) List will remain unless a change is recommended by North Coast Regional Water Board staff and approved by the North Coast Regional Water Board, the State Water Board, and the USEPA.

Throughout the assessment process, North Coast Regional Water Board staff complied with the requirements of the "Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) List," also known as the Listing Policy, which was adopted by the State Water Board on September 30, 2004.

FACT SHEETS

A fact sheet is composed of a decision and the supporting lines of evidence for each waterbody/pollutant pair assessed. The results of the staff analysis are presented as staff recommendations in the form of fact sheets. A summary of staff recommendations can be found in Chapter 4 and a selection of fact sheets that are most likely of interest to the public are found in Appendix A.

DATA & INFORMATION COLLECTION

The North Coast Regional Water Board and the State Water Board solicited, assembled, and considered all readily available data and information. This included data and information solicited from the public in general and data available from Regional Water Board files, documents, and programs.

The public solicitation of data and information began on December 4, 2006, and concluded on February 28, 2007. Regional Water Board staff received twenty-three requests for the review of the 2006 303(d) List for particular waterbodies and/or pollutants. Many of these requests included data and information used to develop and revise fact sheets for the 2008 Integrated

Report. Appendix B includes detailed responses by Regional Water Board staff to comments raised by the public in their submittal letters during the data solicitation period.

Available data and information from Regional Water Board files, documents, and programs were also used to develop and revise fact sheets for the 2008 Integrated Report. These sources included:

- Data and information supporting the 2006 Section 303(d) List.
- Data from the Surface Water Ambient Monitoring Program (SWAMP) collected as part of the regional monitoring effort from 2000 to 2006. Data for aluminum, chloride, other metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, and zinc), PCBs, pesticides, pentachlorophenol, specific conductivity, sulfates, and 2,3,4,6-tetrachlorophenol were included. Data from 2007 and 2008 were not included because these data have not gone through the full verification process to determine analytical quality and limitations.
- Data from ocean beach bacteria monitoring collected by coastal counties in accordance with AB411 (Chapter 765, Statutes of 1997) requirements.
- Data and information from documents and reports prepared and submitted to the Regional Water Board to satisfy toxic site cleanup requirements.
- Data and information collected by local, state, and federal agencies, tribes, facility operators, citizen monitoring groups, and academic institutions.

DATA ASSESSMENT

As stated above, North Coast Regional Water Board staff assessed data and information solicited from the public and from Regional Water Board files, documents, and programs. All readily available data and information were assessed using the rules described in the Listing Policy, as appropriate.

Regional Water Board staff developed lines of evidence that summarize the available data and information, and used these lines of evidence to make decisions on the overall beneficial use support ratings and water quality impairment. The decisions and lines of evidence constitute the fact sheets for a particular waterbody/pollutant pair. Lines of evidence and decisions were input into the State's California Water Quality Assessment (CalWQA) database.

When developing a line of evidence, staff's analysis began by looking at the sampling results and comparing them to the waterbody's beneficial uses and the pollutant's water quality standard(s). Results of this comparison, including the numbers of exceedances, are recorded in the line of evidence. Staff also reviewed the temporal, spatial, and quality characteristics of the data and information to ensure compliance with the Listing Policy.

Water Quality Standards Used in the Assessment

Water quality standards are composed of (1) designated beneficial uses, (2) water quality objectives, (3) the Federal and State antidegradation policies, and (4) general policies for implementation.

The beneficial uses for waters in the North Coast Region are identified in the “Water Quality Control Plan for the North Coast Region,” also known as the Basin Plan, which was last amended in January 2007. If beneficial uses were not identified for a water segment in the Basin Plan but the uses existed in the water segment, then waters were assessed using the existing beneficial uses of water.

The water quality objectives used in the assessments are from existing and available State Policy and Plans including some of the following:

- The Basin Plan
- State-wide Water Quality Control Plans (e.g., the California Ocean Plan)
- California Toxics Rule (40 CFR 131.38)
- Bacteria standards at bathing beaches (17 CCR 7958)
- Maximum Contaminant Levels to the extent applicable, such as Table 64431-A (Inorganic Chemicals) and 64431-B (Fluoride) of 22 CCR 64431, Table 64444-A (Organic Chemicals) of 22 CCR 64444, and Tables 64449-A (Secondary Maximum Contaminant Levels-Consumer Acceptance Limits) and 64449-B (Secondary Maximum Contaminant Levels-Ranges) of 22 CCR 64449.

Provisions of Basin Plans, statewide plans, and other documents containing water quality standards were used as they are written. Judgments were not made during the list development process regarding the suitability, quality, or applicability of beneficial uses or water quality objectives. Novel approaches for interpreting objectives were not used unless the approach was specifically allowed by the applicable water quality standards (e.g., analyzing wet and dry season data separately).

Comparison of data to narrative water quality objectives often required a numeric evaluation guideline to interpret the objective, as allowed by the Listing Policy. Regional Water Board staff used evaluation guidelines that potentially represented water quality objective attainment and/or protection of beneficial uses. Depending on the beneficial use and narrative standard, the following considerations were used in the selection of evaluation guidelines:

- Applicability to the beneficial use(s).
- Protective of the beneficial use(s).
- Linked to the pollutant under consideration.
- Scientifically-based and peer reviewed.
- Well described.

- Identified a range or limit above which impacts occur and below which no or few impacts are predicted.

The lines of evidences for each waterbody/pollutant pair describe the specific beneficial use(s), water quality objective, and evaluation guideline (if any) used to assess data.

DECISIONS

Following data assessment, North Coast Regional Water Board staff determined whether the data showed the waterbody was attaining water quality standards or not (i.e., if the waterbody was not impaired or impaired). This determination for each waterbody/pollutant pair, along with a presentation of the data assessment, is documented in a fact sheet. The decisions also include individual beneficial use support ratings.

Waterbody/pollutant pair listing decisions and beneficial use support ratings were determined and developed in the CalWQA database. These decisions summarize all relevant lines of evidence for a waterbody/pollutant combination and, based on the Listing Policy, determine if the number of exceedances constitute non-attainment that results in a listing.

For a waterbody/pollutant pair that is not listed on the 2006 303(d) List as impaired, staff made a decision to either list the waterbody/pollutant pair or not list it.

For a waterbody/pollutant pair that is already listed on the 2006 303(d) List as impaired, staff made a decision to either keep the waterbody/pollutant pair on the list or delist it.

Listing & Delisting Methodology

Staff recommended a waterbody/pollutant pair be listed as impaired for the first time or remain listed as impaired if any one of the following statements was found to be true. Staff recommended a waterbody/pollutant pair not be listed as impaired or be delisted if none of the following statements were found to be true, or if the original listing was based on faulty data and listing would not have occurred in the absence of the faulty data. These recommendations were made in compliance with the Listing Policy. Section 3 of the Listing Policy pertains to first time listing considerations and Section 4 pertains to waterbody/pollutant pairs that are already listed as impaired on the 2006 303(d) List. In summary,

“List” or “Keep Listed” if any one of the following statements is true.

“Delist” or “Do Not List” if none of the following statements are true.

1. Numeric data exceed the numeric objective or evaluation guideline more than a certain number of times. The number of times varies by the number of samples and is based a binomial distribution as described in the Listing Policy. See Sections 3.1, 3.2, 3.3, 3.5, 3.6, 4.1, 4.2, 4.3, 4.5, and 4.6 of the Listing Policy for more information. Tables 3.1, 3.2, 4.1, and 4.2 of the Listing Policy are especially useful.

2. A health advisory against the consumption of edible resident organisms or a shellfish harvest ban has been issued. See Section 3.4 of the Listing Policy for more information.
3. Nuisance conditions exist for odor, taste, excessive algae growth, foam, turbidity, oil, trash, litter, and color when compared to reference conditions. See Section 3.7 of the Listing Policy for more information.
4. Adverse biological response is measured in resident individuals as compared to referenced conditions and the impacts are associated with water or sediment concentrations of pollutants as described in Section 3.6 of the Listing Policy. See Section 3.8 of the Listing Policy for more information.
5. Significant degradation of biological populations and/or communities is exhibited as compared to reference sites. See Section 3.9 of the Listing Policy for more information.
6. A trend of declining water quality standards attainment is exhibited. See Section 3.10 of the Listing Policy for more information.
7. The weight of evidence demonstrates that a water quality standard is not attained. See Section 3.11 of the Listing Policy for more information.

Assessment Categories

As part of the decision, Regional Water Board staff determined whether beneficial uses are supported, and selected an appropriate beneficial use support rating category for each line of evidence. The rating categories are: fully supporting, not supporting, and insufficient information. These ratings are recommended by the USEPA.

Also as part of the decision, staff placed each waterbody/pollutant pair into one of five non-overlapping categories of water quality attainment, based on the overall beneficial use support of the water segment. The categories are taken from the USEPA guidance for states' integrated reports, with some modifications based on California's 303(d) Listing Policy. The categories are shown in Table 1.

Waterbody/pollutant pair fact sheets for all of the categories comprise the Section 305(b) surface water assessment. Categories 1, 2, and 3 however are informational, do not require state approval, and will be submitted as part of the state-wide 2008 Integrated Report to the USEPA for their biennial report to Congress. Categories 4A, 4B, and 5 comprise the Section 303(d) List of Impaired Waters and require public review and approval by the North Coast Regional Water Board, the State Water Board, and the USEPA. The status of a water segment's 303(d) listing (i.e., at what stage it is being addressed) determines whether it is a Category 4a, 4b, or 5 waterbody.

Table 1: Integrated Report Categories	
Category	Description
1	Evidence shows all core uses are supported.
2	Evidence shows some core uses are supported (at least one use is supported).
3	Evidence is insufficient to make use support determinations.
4A	Evidence shows at least one use is not supported, and a TMDL has been developed and approved by the USEPA which is reasonably expected to result in the attainment of the water quality standard within a reasonable, specified time frame.
4B	Evidence shows at least one use is not supported, but a TMDL is not needed as an existing regulatory program is reasonably expected to result in the attainment of the water quality standard within a reasonable, specified time frame.
4C	Evidence shows at least one use is not supported, but a TMDL is not needed as the impairment is caused by non-pollutant sources. No provision for this exists in California and this category is not used in the Integrated Report.
5	Evidence shows at least one use is not supported and a TMDL is needed.

The Decision Process

Regional Water Board staff first determined a beneficial use support rating for each *individual use* of a water segment. Staff's recommendation was done by looking at the lines of evidence in the CalWQA database for the waterbody/pollutant pair and applying the set of rules shown in Table 2. Then, staff determined the *overall* beneficial use support rating for the entire water segment. This was done by applying the same rules in Table 2 to the collection of final individual use support ratings. See Figure 1 for an example of this process.

In developing decisions and recommendations, North Coast Regional Water Board staff assumed that water segment or pollutant listings are independent of the TMDLs that have been approved and are being implemented for a water segment. If a pollutant listing is removed from the 303(d) List for any reason, that fact has no effect on the validity or requirements for implementing a TMDL that has been adopted and approved by USEPA. Implementation of Basin Plan provisions are not affected by the Section 303(d) List. Staff also assumed that exotic or invasive species are considered pollutants and are considered for inclusion on the Section 303(d) List.

**Table 2:
Rules for Determining Individual and Overall Beneficial Use Support Ratings**

Beneficial Use Rating for Line of Evidence A		Beneficial Use Rating for Line of Evidence B		Final Beneficial Use Rating
Fully Supporting	+	Fully Supporting	=	Fully Supporting
Fully Supporting	+	Not Supporting	=	Not Supporting
Fully Supporting	+	Insufficient Information	=	Fully Supporting
Not Supporting	+	Insufficient Information	=	Not Supporting
Not Supporting	+	Not Supporting	=	Not Supporting

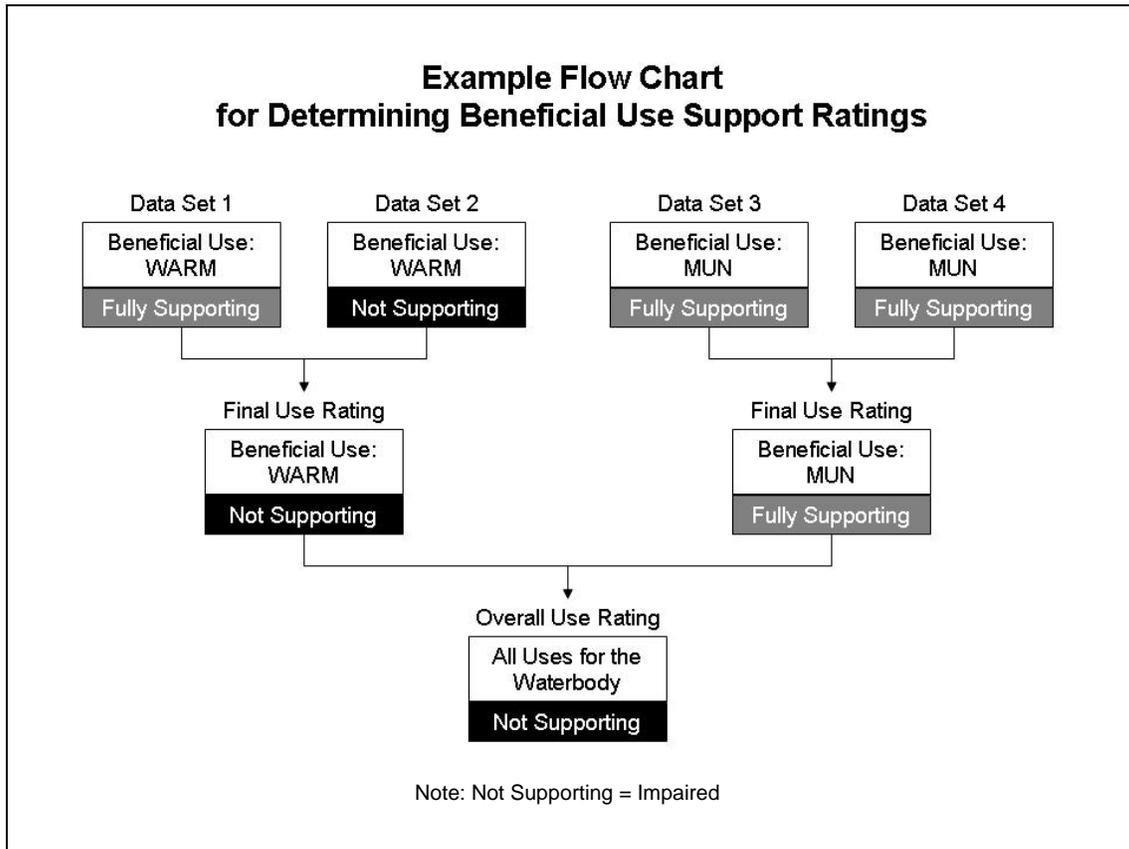


Figure 1: Example Flow Chart for Determining Beneficial Use Support Ratings

Original vs. Revised Decisions

All decisions in the CalWQA database are categorized as either “original” or “revised.” An original decision is one that was made prior to 2008 and does not include any new data assessments or changes (with the exception of grammatical or logistical changes) during the 2008 update cycle. A revised decision is one that is brand new for the 2008 Integrated Report, or one that is updated and changed from a previous listing cycle with new data or other information.

TMDL Scheduling

Regional Water Board staff developed a schedule for the completion of TMDLs for the waterbody/pollutant pairs listed as impaired under Section 303(d). The proposed TMDL completion dates are included in Table 8.

The recommended date for TMDL completion is the year that the USEPA will approve a TMDL following Regional Water Board (and often State Water Board) adoption. For those TMDLs that have been developed and approved by the USEPA and the implementation plans have been approved, the waterbody/pollutant pair was placed in the “Water Quality Limited Segments Being Addressed” category (Category 4A) of the Section 303(d) List. TMDLs with completion dates prior to the next list update (2010) already have resources dedicated to the effort. Schedules for non-consent decree TMDLs scheduled to be completed after 2011 should be considered tentative. Changes to the Section 303(d) List in the future could result in substantial changes to scheduled completion dates established for completion after 2011.

In developing the schedule, Regional Water Board staff reassessed the priorities established in the 2006 California CWA Section 303(d) List. The schedule was also developed in compliance with federal law and regulations based on the following Listing Policy provisions:

- Water segment significance (such as the importance and extent of beneficial uses, threatened and endangered species concerns, and size of water segment).
- Degree of impairment. Degree that water quality objectives are not met or beneficial uses are not attained or threatened (such as the severity of the pollution or the number of pollutants/stressors of concern) as per 40 CFR 130.7(b)(4).
- Potential threat to human health and the environment.
- Water quality benefits of activities ongoing in the watershed.
- Potential for beneficial use protection and recovery.
- Degree of public concern.
- Availability of funding.
- Availability of data and information to address the water quality problem.

Staff also relied upon guidance from the USEPA, which states that TMDLs for all waterbody/pollutant pairs should be completed within 13 years of time they were first listed as impaired. For waterbodies listed for the first time as part of the 2008 Integrated Report, the TMDL completion date is no later than 2021.

EXPLANATION OF SPECIFIC ANALYSES

Several of the analyzes conducted by North Coast Regional Water Board staff are explained in more detail in this section in order to allow for a better understanding of how data were assessed.

Klamath River Sediment Analysis

North Coast Regional Water Board staff performed an extensive analysis of available sediment data in the Middle Klamath River and Lower Klamath River hydrologic areas, particularly for those areas that drain into the Klamath River from Iron Gate to the confluence with the Trinity River. Staff recommended listing the following waterbodies and watersheds as sediment impaired. These waterbodies and watersheds are shown in Figures 2 and 3.

In the Iron Gate Dam to Scott River reach:

- Mainstem Klamath River from Beaver Creek to the Salmon River
- Beaver Creek Watershed
- Collins Creek Watershed
- Cove Gulch Watershed
- Doggett Creek Watershed
- Dona Creek Watershed
- Everill Creek Watershed
- Horse Creek Watershed
- Howard's Gulch Watershed
- Kinsman Creek Watershed
- Kohl Creek Watershed
- Lime Gulch Watershed
- Sambo Creek Watershed
- Smith Gulch Watershed

In the Scott River to Trinity River reach:

- Mainstem Klamath River from O'Neil Creek to Elk Creek
- Cade Creek Watershed
- Caroline Creek Watershed
- China Creek Watershed
- Elk Creek Watershed
- Fryingpan Creek Watershed
- Fort Goff Creek Watershed
- Grider Creek Watershed
- Horse Creek Watershed
- Indian Creek Watershed
- Joe Miles Creek Watershed
- O'Neil Creek Watershed
- Portuguese Creek Watershed
- Ranch Gulch Watershed
- Schutts Gulch Watershed
- Seiad Creek Watershed
- Thompson Creek Watershed
- Walker Creek Watershed
- Walker Gulch Watershed

Staff based these recommendations on available data, the majority of which were found in environmental and ecosystem analyses developed by the Klamath National Forest. Staff analyzed road density, landslide volume, surface erosion, percent fines, equivalent roaded area to threshold of concern (ERA/TOC) ratio, embeddedness, pool reduction, and cumulative impacts data. Tables 3 and 4 show which parameters were exceeded in each of the watersheds with available data. If a watershed exceeded the evaluation guideline for any one of these parameters, staff recommended that the watershed is sediment impaired. This was done in compliance with Section 3.11 of the Listing Policy as the weight of evidence demonstrates that instream and/or upslope sediment conditions in the above waterbodies and watersheds do not attain sediment objectives and/or evaluation guidelines.

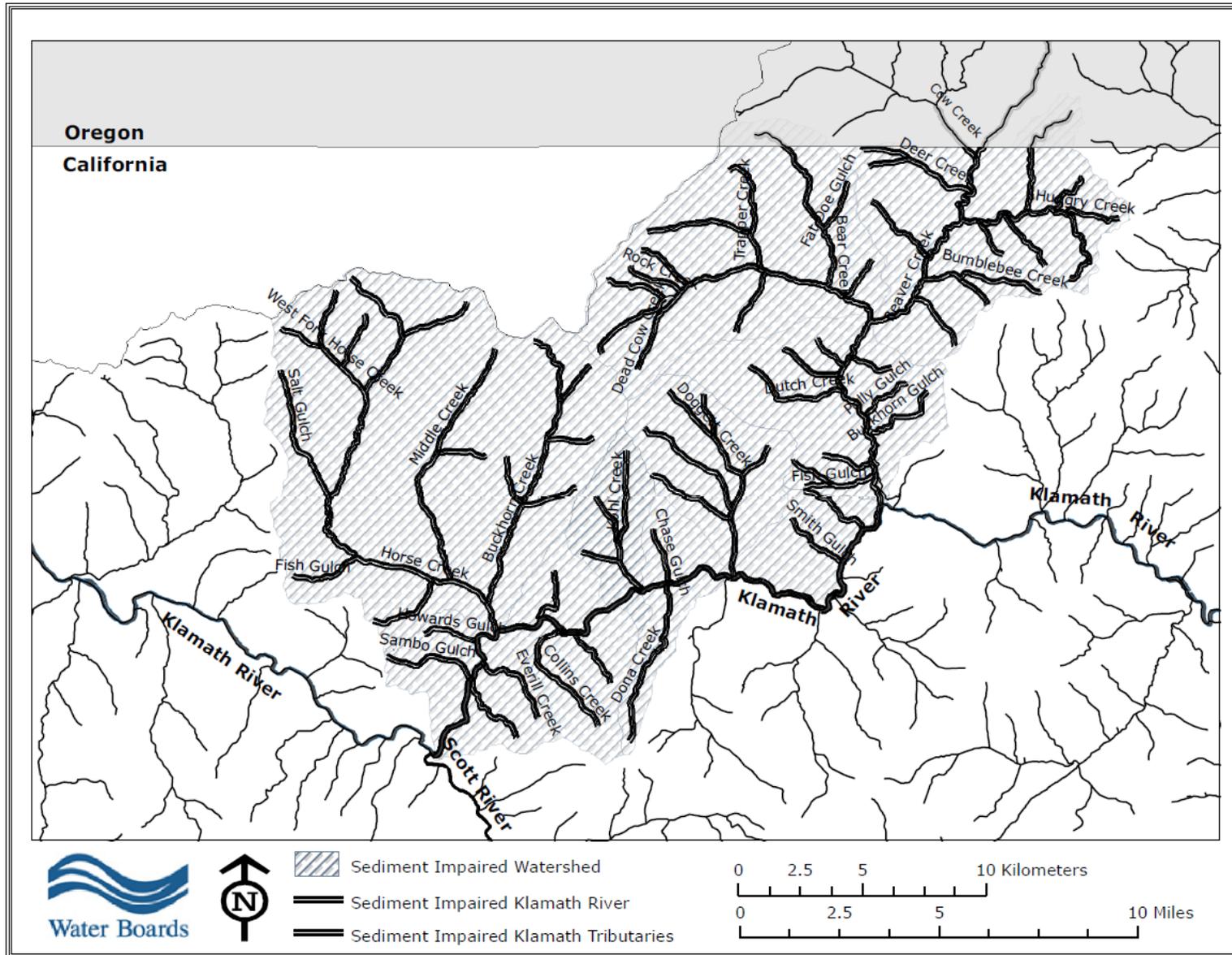


Figure 2. Sediment Impaired Waterbodies in the Iron Gate Dam to Scott River Reach of the Klamath River Watershed

**Table 3.
Exceedances of Sediment Parameters
in the Iron Gate Dam to Scott River Reach of the Klamath River Watershed**

	Watershed	Landslide Volume	Surface Erosion	% Fines	ERA/TOC	Embeddedness	Pool Reduction	Road Density	Cumulative Impacts
Impaired	Beaver Creek			Y		Y	Y		Y
	Beaver Creek, Buckhorn Creek				N			Y	
	Beaver Creek, Bumblebee Creek	Y			N			Y	
	Beaver Creek, Cow Creek (mostly in Oregon)			Y	N	Y		Y	
	Beaver Creek, Deer Creek			Y		Y			
	Beaver Creek, Hungry Creek	Y		Y	N	Y		Y	
	Beaver Creek, Jaynes Canyon Creek				N			Y	
	Beaver Creek, Grouse Creek	Y			N			Y	
	Beaver Creek, West Fork Beaver Creek			Y	N	Y		Y	
	Collins Creek	N	Y		N				
	Cove Gulch	N	Y		N				
	Doggett Creek	N	Y		N				
	Dona Creek	N	Y		N				
	Everill Creek	N	Y		N				
	Horse Creek, Buckhorn Creek	N	Y		N				
	Horse Creek, Lower Horse Creek	N	Y		N				
	Horse Creek, Middle Creek	N	Y		N				
	Horse Creek, Upper Horse Creek	N	Y		N				
	Howard's Gulch	N	Y		N				
	Kinsman Creek	N	Y		N				
	Kohl Creek	N	Y		N				
	Lime Gulch	N	Y		N				
Sambo Creek	N	Y		N					
Smith Gulch	N	Y		N					

Y = Exceedance of Objective or Evaluation Guideline

N = No Exceedance

Blank Cell = No Data

Table 4.
Exceedances of Sediment Parameters
in the Scott River to Trinity River Reach of the Klamath River Watershed

	Watershed	Landslide Volume	Surface Erosion	% Fines	ERA/TOC	Embeddedness	Pool Reduction	Road Density
Impaired	Cad Creek	N	Y	N	Y			
	Caroline Creek	Y	Y		N			
	China Creek	Y	Y	N	Y	Y		
	Elk Creek						Y	
	Fryingpan Creek	N	Y	N	Y			
	Fort Goff Creek	N	N	N	Y	Y		
	Grider Creek	N	N	Y		Y	Y	N
	Grider Creek, Lower and Upper Grider Creek	N	N		N			
	Grider Creek, W. Grider & Bittenbender Creeks	N	Y		N			
	Grider Creek, Rancheria Creek	N	N		Y			
	Grider Creek, Cliff Valley Creek	N	Y		N			
	Horse Creek	N	Y	N	Y			
	Indian Creek						Y	
	Joe Miles Creek	N	Y		N			
	O'Neil Creek	N	Y		N			
	Portuguese Creek	N	N	N	Y	Y		
	Ranch Gulch	N	Y	N	Y			
	Schutts Gulch	N	Y		N			
	Seiad Creek				N		N	
	Seiad Creek, Canyon Creek	N	N		Y			
	Seiad Creek, Lower Seiad Creek	N	N		N			
	Seiad Creek, Panther Creek	N	Y		N			
	Seiad Creek, Upper Seiad Creek	N	Y		Y			
Thompson Creek				Y		Y		N
Thompson Creek, Upper Thompson Creek	N	N		N				
Thompson Creek, Mill and Slide Creeks	N	Y		Y				
Walker Creek	Y	Y	Y	Y	Y	N	Y	
Walker Gulch	N	Y		N				
Not Impaired	Clear Creek	N	N					N
	Clear Creek, Cedar and Morgan Creeks	N	N		N			
	Ladds Creek and Tims Creek	N	N		N			
	Tom Martin Creek & Kuntz Creek	N	N		N			

Y = Exceedance of Objective or Evaluation Guideline

N = No Exceedance

Blank Cell = No Data

Use of Russian River First Flush Data

Multiple lines of evidence were prepared for the Russian River Watershed based on data collected by citizens under the Russian River First Flush program. Regional Water Board staff determined that only the 2002 monitoring data collected under First Flush is appropriate for inclusion in the 2008 Integrated Report. The 2002 data is supported by the “2002 Russian River First Flush Summary Report” (Katznelson et al. 2003), which includes quality control, spatial, and temporal information. Data collected in 2003 were not available in a final report. Data from 2004, 2005, and 2007 were collected, but are available in raw form only. A report on the 2007 data was expected to be completed following the data analysis period of the 2008 Integrated Report. Following the completion of the report on the 2007 data, Russian Riverkeeper intends to write a 5-year summary report which will include the 2003 to 2005 data. Data collected since 2002 will be considered when they are available in a finalized report with detailed information on collection and quality control procedures and site locations, which is expected for the 2010 Integrated Report.

Comparison of E. coli Data to the Fecal Coliform Objective

In several locations in the Russian River Watershed, samples were collected and analyzed for E. coli but not fecal coliform. In such instances, Regional Water Board staff compared the E. coli data to the fecal coliform water quality objective. This was in addition to comparing the E. coli data to the E. coli numeric evaluation guideline. Since E. coli is one of the group of bacteria that comprise the fecal coliform group, it is logical that if the median E. coli concentrations for any 30-day period are greater than 50 MPN / 100 ml, then the median fecal coliform concentrations for any 30-day period will also be greater than 50 MPN / 100 ml (which is the fecal coliform water quality objective). This comparison allowed staff to determine exceedances of the fecal coliform objective. It should be noted that this methodology does not allow staff to determine compliance with the objective, as there may be other types of fecal coliform present other than E. coli.

Chapter 4: Staff Recommendations

The 2008 Integrated Report, as recommended by North Coast Regional Water Board staff, is the results of staff's assessment of available data and information. The results of the staff analysis are presented in the form of fact sheets that consists of a decision and supporting lines of evidence for each waterbody/pollutant pair assessed.

The fact sheets for all the waterbody/pollutant pairs can be found online at:

http://www.waterboards.ca.gov/northcoast/water_issues/programs/tmdls/303d/

The fact sheets for just the waterbody/pollutant pairs that staff recommend be listed or delisted for the first time in 2008 are available in Appendix A. Also included in Appendix A are several fact sheets for waterbody/pollutant pairs of particular public interest.

SUMMARY OF STAFF RECOMMENDATIONS

The following tables summarize the 2008 Integrated Report as recommended by Regional Water Board staff.

Table 5: Presents the new delistings of waterbody/pollutant pairs for the 2008 Integrated Report and 303(d) List, as recommended by Regional Water Board staff.

Table 6: Presents the new listings of waterbody/pollutant pairs for the 2008 Integrated Report and 303(d) List, as recommended by Regional Water Board staff.

There are no waterbodies that support all core beneficial uses (Category 1).

Table 7: Presents all of the waterbodies that are supporting some, but not all, core beneficial uses (Category 2), as recommended by Regional Water board staff.

Table 8: Presents all of the waterbodies for which there is insufficient information available to make use support decisions (Category 3), as recommended by Regional Water board staff.

Table 9: Presents all of the impaired waterbodies (Categories 4A, 4B, and 5), including impaired waterbodies already listed from the 2006 List and those recommended for listing as part of the 2008 Integrated Report, as recommended by Regional Water Board staff.

Table 10: Presents a comprehensive summary of all of the results of staff's analysis for all waterbody/pollutant pairs, as recommended by Regional Water Board staff.

Waterbody Hydrologic Unit	Waterbody Name	Pollutant(s)
Bodega HU	Doran Regional Park	Indicator Bacteria
Bodega HU	Salmon Creek Park (South)	Indicator Bacteria
Eel River HU	Middle Fork Eel River, Wilderness HSA & Black Butte River HSA	Sediment/Siltation
Eel River HU	North Fork Eel River, Upper North Fork Eel River Watershed (area north of the Six Rivers National Forest boundary)	Sediment/Siltation
Klamath River HU	Salmon River HA, Wooley Creek	Temperature, water
Russian River HU	Guerneville HSA, Pocket Canyon Creek	pH

Waterbody Hydrologic Unit	Waterbody Name	Pollutant(s)
Eel River HU	Lower Eel River HA, Eel River Delta	Dissolved Oxygen
Klamath River HU	Middle & Lower Klamath River HAs, Scott River to Trinity River Reach, mainstem Klamath River	Microcystin
Klamath River HU	Middle Klamath River HA, Iron Gate Dam to Scott River Reach, mainstem Klamath River	Microcystin
Klamath River HU	Middle & Lower Klamath River HAs, Scott River to Trinity River Reach, mainstem Klamath River from the confluence of O'Neil Creek to the confluence of Elk Creek, and the watersheds of Cade Ck, Caroline Ck, China Ck, Elk Ck, Fryingpan Ck, Fort Goff Ck, Grider Ck, Horse Ck, Indian Ck, Joe Miles Ck, O'Neil Ck, Portuguese Ck, Ranch Gulch, Schutts Gulch, Seiad Ck, Thompson Ck, Walker Ck, and Walker Gulch	Sediment
Klamath River HU	Middle Klamath River HA, Iron Gate Dam to Scott River Reach, mainstem Klamath River from the confluence of Beaver Ck to the confluence of the Salmon River, and the watersheds of Beaver Ck, Collins Ck, Cove Gulch, Doggett Ck, Dona Ck, Everill Ck, Horse Ck, Howard's Gulch, Kinsman Ck, Kohl Ck, Lime Gulch, Sambo Ck, and Smith Gulch	Sediment
Klamath River HU	Shasta River HA, Lake Shastina	Mercury
Mad River HU	Mad River	DDE
Mendocino Coast HU	Hare Creek Beach	Indicator Bacteria
Mendocino Coast HU	Pudding Creek Beach	Indicator Bacteria
Russian River HU	Geyserville HSA, Unnamed Tributary (Stream 1) at Fitch Mountain	Indicator Bacteria
Russian River HU	Green Valley Creek Watershed	Indicator Bacteria
Russian River HU	Green Valley Creek Watershed	Dissolved Oxygen
Russian River HU	Guerneville HSA	DDT
Russian River HU	Laguna de Santa Rosa	Indicator Bacteria

Table 7.	
Waters Supporting Some Core Beneficial Uses (Category 2)	
Waterbody Hydrologic Unit	Waterbody Name
Bodega HU	Salmon Creek HA
Eureka Plain HU	Salmon Creek
Klamath River HU	Boles HSA
Klamath River HU	Wooley Creek HSA
Mendocino Coast HU	Berry Gulch
Mendocino Coast HU	Big River Beach at Mendocino Bay
Mendocino Coast HU	Big Salmon Creek
Mendocino Coast HU	Black Point
Mendocino Coast HU	Caspar Headlands State Beach
Mendocino Coast HU	Dehaven Creek
Mendocino Coast HU	Greenwood Creek HSA
Mendocino Coast HU	Gualala Regional Park Beach
Mendocino Coast HU	Little River
Mendocino Coast HU	MacKerricher State Park
Mendocino Coast HU	Stillwater Cove Regional Park Beach
Mendocino Coast HU	Ten Mile River HSA, Coastal Tributaries
Mendocino Coast HU	Usal Creek HSA
Mendocino Coast HU	Van Damme State Park Beach
Mendocino Coast HU	Wages Creek
Mad River HU	Ruth Lake
Russian River HU	Goat Rock State Park Beach
Smith River HU	Smith River Watershed
Trinidad HU	Little River HA

Table 8.	
Waters with Insufficient Information to Determine Use Rating (Category 3)	
Waterbody Hydrologic Unit	Waterbody Name
Mendocino Coast HU	Chadbourne Gulch Beach
Mendocino Coast HU	Wages Creek Beach
Winchuck River HU	Winchuck River

Table 9.			
Impaired Waterbodies (Categories 4A, 4B, and 5) – The 2008 303(d) List			
Waterbody HU	Waterbody Name	Pollutant	Category
Bodega HU	Bodega Harbor HA	Exotic Species	5
	Estero Americano	Sedimentation/Siltation	5
	Estero Americano & Americano Creek	Nutrients	5
	Stemple Creek & Estero de San Antonio	Nutrients	4A
		Sediment	4A
Cape Mendocino HU	Mattole River	Sedimentation/Siltation	4A
		Temperature	4A
Eel River HU	Lower Eel River HA, Eel River Delta	Dissolved Oxygen	5
		Sedimentation/Siltation	4A
		Temperature	4A
	Middle Fork Eel River HA, Eden Valley HSA & Round Valley HSA	Sedimentation/Siltation	4A
	Middle Fork Eel River HA, Eden Valley HSA & Round Valley HSA	Temperature	4A
	Middle Fork Eel River HA, Wilderness HSA & Black Butte River HSA	Temperature	4A
	Middle Main Eel River HA	Sedimentation/Siltation	4A
		Temperature	4A
	North Fork Eel River HA, Lower North Fork Eel River Watershed	Sedimentation/Siltation	4A
	North Fork Eel River HA, Lower North Fork Eel River Watershed	Temperature	4A
	North Fork Eel River HA, Upper North Fork Eel River Watershed	Temperature	4A
	South Fork Eel River HA	Sedimentation/Siltation	4A
		Temperature	4A
	Upper Main Eel River HA	Sedimentation/Siltation	4A
		Temperature	4A
	Upper Main Eel River HA, Lake Pillsbury	Mercury	5
Van Duzen River HA	Sedimentation/Siltation	4A	
Eureka Plain HU	Elk River	Sedimentation/Siltation	5
	Freshwater Creek	Sedimentation/Siltation	5
	Humboldt Bay	Dioxin Toxic Equivalents	5
		PCBs	5
Jacoby Creek Watershed	Sediment	5	
Klamath River HU	Butte Valley HA	Nutrients	5
		Temperature	5
	Copco Lake (Reservoir 1 and 2)	Microcystin	5
	Iron Gate Reservoir	Microcystin	5
	Klamath Glen HSA	Nutrients	5
		Organic Enrichment / Low Dissolved Oxygen	5
		Sedimentation/Siltation	5
Temperature		5	

Table 9. (cont.)				
Impaired Waterbodies (Categories 4A, 4B, and 5) – The 2008 303(d) List				
Waterbody HU	Waterbody Name	Pollutant	Category	
Klamath River HU	Middle Klamath River HA, Oregon to Iron Gate Reach	Nutrients	5	
		Organic Enrichment / Low Dissolved Oxygen	5	
		Temperature	5	
	Middle Klamath River HA, Oregon to Iron Gate Reach, mainstem Klamath River from the beginning of Copco 1 Reservoir to Iron Gate Dam	Microcystin	5	
		Middle Klamath River HA, Iron Gate Dam to Scott River Reach	Nutrients	5
			Organic Enrichment / Low Dissolved Oxygen	5
	Temperature		5	
	Middle Klamath River HA, Iron Gate Dam to Scott River Reach, mainstem Klamath River	Microcystin	5	
	Middle Klamath River HA, Iron Gate Dam to Scott River Reach, mainstem Klamath River from the confluence of Beaver Ck to the confluence of the Salmon River, and the watersheds of Beaver Ck, Collins Ck, Cove Gulch, Doggett Ck, Dona Ck, Everill Ck, Horse Ck, Howard's Gulch, Kinsman Ck, Kohl Ck, Lime Gulch, Sambo Ck, and Smith Gulch	Sediment	5	
	Middle & Lower Klamath River HAs, Scott River to Trinity River Reach	Nutrients	5	
		Organic Enrichment / Low Dissolved Oxygen	5	
		Temperature	5	
	Middle & Lower Klamath River HAs, Scott River to Trinity River Reach, mainstem Klamath River	Microcystin	5	
	Middle & Lower Klamath River HAs, Scott River to Trinity River Reach, mainstem Klamath River from the confluence of O'Neil Ck to the confluence of Elk Ck, and the watersheds of Cade Ck, Caroline Ck, China Ck, Elk Ck, Fryingpan Ck, Fort Goff Ck, Grider Ck, Horse Ck, Indian Ck, Joe Miles Ck, O'Neil Ck, Portuguese Ck, Ranch Gulch, Schutts Gulch, Seiad Ck, Thompson Ck, Walker Ck, and Walker Gulch	Sediment	5	
	Salmon River HA	Temperature	4A	
	Scott River HA	Sedimentation/Siltation	4A	
		Temperature	4A	
	Shasta River HA	Organic Enrichment / Low Dissolved Oxygen	4A	
		Temperature	4A	
	Shasta River HA, Lake Shastina	Mercury	5	
Tule Lake and Lower Klamath Lake National Wildlife Refuge	pH (high)	4A		

Table 9. (cont.) Impaired Waterbodies (Categories 4A, 4B, and 5) – The 2008 303(d) List			
Waterbody HU	Waterbody Name	Pollutant	Category
Klamath River HU	Tule Lake HSA and Mt Dome HSA	Nutrients	4A
Mad River HU	Mad River	DDE	5
		Sedimentation/Siltation	4A
		Temperature	4A
		Turbidity	4A
Mendocino Coast HU	Albion River	Sedimentation/Siltation	4A
		Temperature	5
	Big River	Sedimentation/Siltation	4A
		Temperature	5
	Campbell Cove	Indicator Bacteria	5
	Garcia River	Sediment	4A
		Temperature	5
	Gualala River	Sedimentation/Siltation	4A
	Gualala River, Entire Watershed except the Little N Fk Gualala R. Watershed	Temperature	4A
	Hare Creek Beach	Indicator Bacteria	5
	Navarro River	Sedimentation/Siltation	4A
		Temperature	4A
	Navarro River, Delta	Sedimentation/Siltation	4A
	Noyo River	Sedimentation/Siltation	4A
		Noyo River mainstem from confluence of Duffy Gulch downstream to confluence with Hayshed Gulch; South Fork Noyo River mainstem from confluence of Kass Creek downstream to confluence with Noyo River mainstem; and Little North Fork Noyo River, Duffy Gulch, and Kass Creek tributaries.	Temperature
Pudding Creek	Temperature	5	
Pudding Creek Beach	Indicator Bacteria	5	
Ten Mile River HSA	Sedimentation/Siltation	4A	
	Temperature	5	
Redwood Creek HU	Redwood Creek	Sedimentation/Siltation	4A
		Temperature	5
Russian River HU	Austin Creek HSA	Sedimentation/Siltation	5
		Temperature	5
	Big Sulphur Creek HSA	Sedimentation/Siltation	5
		Specific Conductivity	5
		Temperature	5
	Coyote Valley HSA	Sedimentation/Siltation	5
		Temperature	5
	Coyote Valley HSA, Lake Mendocino	Mercury	5
	Forsythe Creek HSA	Sedimentation/Siltation	5
		Temperature	5

Table 9. (cont.)			
Impaired Waterbodies (Categories 4A, 4B, and 5) – The 2008 303(d) List			
Waterbody HU	Waterbody Name	Pollutant	Category
Russian River HU	Geyserville HSA	Sedimentation/Siltation	5
		Temperature	5
	Geyserville HSA, Mainstem Russian River at Healdsburg Memorial Beach from the railroad bridge to the Hwy 101 bridge	Indicator Bacteria	5
	Geyserville HSA, Unnamed Tributary (Stream 1) at Fitch Mtn.	Indicator Bacteria	5
	Green Valley Creek Watershed	Dissolved Oxygen	5
		Indicator Bacteria	5
	Guerneville HSA	DDT	5
		Sedimentation/Siltation	5
		Temperature	5
	Guerneville HSA, Mainstem Russian River from Fife Creek to Dutch Bill Creek	Indicator Bacteria	5
	Laguna de Santa Rosa	Dissolved Oxygen	5
		Indicator Bacteria	5
		Mercury	5
		Nitrogen	4A
		Phosphorus	5
		Sedimentation/Siltation	4A
		Temperature	5
	Mark West Creek HSA	Sedimentation/Siltation	5
		Temperature	5
	Santa Rosa Creek	Indicator Bacteria	5
		Sedimentation/Siltation	5
		Temperature	5
	Ukiah HSA	Sedimentation/Siltation	5
Temperature		5	
Warm Springs HSA	Sedimentation/Siltation	5	
	Temperature	5	
Warm Springs HSA, Lake Sonoma	Mercury	5	
Trinidad HU	Clam Beach	Indicator Bacteria	5
	Luffenholtz Beach	Indicator Bacteria	5
	Moonstone County Park	Indicator Bacteria	5
	Trinidad State Beach	Indicator Bacteria	5
Trinity River HU	East Fork Trinity River	Mercury	5
		Sedimentation/Siltation	4A
	Lower Trinity River HA	Sedimentation/Siltation	4A
	Middle Trinity River HA	Sedimentation/Siltation	4A
	South Fork Trinity HA	Sedimentation/Siltation	4A
		Temperature	5
Trinity Lake (was Claire Engle Lake)	Mercury	5	
Upper Trinity River HA	Sedimentation/Siltation	4A	

Table 10.
Summary of All Assessed Waterbody/Pollutant Pairs

Waterbody Hydrologic Unit	Waterbody Name	Pollutant(s)	Staff Recommendation	Impaired	Based on New Data	TMDL Completion Date¹
Bodega HU	Bodega Harbor HA	Exotic Species	No Change - List	Y	N	2019
Bodega HU	Doran Regional Park	Indicator Bacteria	Delist	N	Y	-
Bodega HU	Estero Americano	Sedimentation/Siltation	No Change - List	Y	N	2019
Bodega HU	Estero Americano & Americano Creek	Nutrients	No Change - List	Y	N	2019
Bodega HU	Salmon Creek HA	Dissolved Oxygen	Do Not List	N	Y	-
Bodega HU	Salmon Creek HA	Nitrate	Do Not List	N	Y	-
Bodega HU	Salmon Creek HA	pH	Do Not List	N	Y	-
Bodega HU	Salmon Creek HA	Phosphorus	Do Not List	N	Y	-
Bodega HU	Salmon Creek HA	Specific Conductivity	No Change - Do Not List	N	N	-
Bodega HU	Salmon Creek HA	Turbidity	No Change - Do Not List	N	N	-
Bodega HU	Salmon Creek Park (South)	Indicator Bacteria	Delist	N	Y	-
Bodega HU	Stemple Creek & Estero de San Antonio	Nutrients	No Change - List	Y	N	1997
Bodega HU	Stemple Creek & Estero de San Antonio	Sediment	No Change - List	Y	N	1997
Cape Mendocino HU	Mattole River	Ammonia as Nitrogen	Do Not List	N	Y	-
Cape Mendocino HU	Mattole River	Chloride	Do Not List	N	Y	-
Cape Mendocino HU	Mattole River	Lead	Do Not List	N	Y	-
Cape Mendocino HU	Mattole River	Sedimentation/Siltation	No Change - List	Y	N	2003
Cape Mendocino HU	Mattole River	Specific Conductivity	Do Not List	N	Y	-
Cape Mendocino HU	Mattole River	Sulfates	Do Not List	N	Y	-
Cape Mendocino HU	Mattole River	Temperature, water	No Change - List	Y	N	2003
Eel River HU	Lower Eel River HA, Eel River Delta	Aluminum	Do Not List	N	Y	-
Eel River HU	Lower Eel River HA, Eel River Delta	Ammonia as Nitrogen	Do Not List	N	Y	-
Eel River HU	Lower Eel River HA, Eel River Delta	Chloride	Do Not List	N	Y	-
Eel River HU	Lower Eel River HA, Eel River Delta	Diesel Fuel	Do Not List	N	Y	-
Eel River HU	Lower Eel River HA, Eel River Delta	Dissolved Oxygen	List	Y	Y	2021
Eel River HU	Lower Eel River HA, Eel River Delta	Fecal Coliform	Do Not List	N	Y	-
Eel River HU	Lower Eel River HA, Eel River Delta	Gasoline	Do Not List	N	Y	-
Eel River HU	Lower Eel River HA, Eel River Delta	Metals	Do Not List	N	Y	-
Eel River HU	Lower Eel River HA, Eel River Delta	Oil	Do Not List	N	Y	-
Eel River HU	Lower Eel River HA, Eel River Delta	PCBs	Do Not List	N	Y	-
Eel River HU	Lower Eel River HA, Eel River Delta	Pentachlorophenol	Do Not List	N	Y	-
Eel River HU	Lower Eel River HA, Eel River Delta	Pesticides	Do Not List	N	Y	-
Eel River HU	Lower Eel River HA, Eel River Delta	pH	Do Not List	N	Y	-
Eel River HU	Lower Eel River HA, Eel River Delta	Sedimentation/Siltation	No Change - List	Y	N	2007

Table 10 (cont.) Summary of All Assessed Waterbody/Pollutant Pairs						
Waterbody Hydrologic Unit	Waterbody Name	Pollutant(s)	Staff Recommendation	Impaired	Based on New Data	TMDL Completion Date¹
Eel River HU	Lower Eel River HA, Eel River Delta	Specific Conductivity	Do Not List	N	Y	-
Eel River HU	Lower Eel River HA, Eel River Delta	Sulfates	Do Not List	N	Y	-
Eel River HU	Lower Eel River HA, Eel River Delta	Temperature, water	Do Not Delist	Y	Y	2007
Eel River HU	Lower Eel River HA, Eel River Delta	Total Coliform	Do Not List	N	Y	-
Eel River HU	Middle Fork Eel River HA, Eden Valley HSA & Round Valley HSA	Aluminum	Do Not List	N	Y	-
Eel River HU	Middle Fork Eel River HA, Eden Valley HSA & Round Valley HSA	Ammonia as Nitrogen	Do Not List	N	Y	-
Eel River HU	Middle Fork Eel River HA, Eden Valley HSA & Round Valley HSA	Chloride	Do Not List	N	Y	-
Eel River HU	Middle Fork Eel River HA, Eden Valley HSA & Round Valley HSA	Metals	Do Not List	N	Y	-
Eel River HU	Middle Fork Eel River HA, Eden Valley HSA & Round Valley HSA	Sedimentation/Siltation	No Change - List	Y	N	2003
Eel River HU	Middle Fork Eel River HA, Eden Valley HSA & Round Valley HSA	Specific Conductivity	Do Not List	N	Y	-
Eel River HU	Middle Fork Eel River HA, Eden Valley HSA & Round Valley HSA	Sulfates	Do Not List	N	Y	-
Eel River HU	Middle Fork Eel River HA, Eden Valley HSA & Round Valley HSA	Temperature, water	No Change - List	Y	N	2003
Eel River HU	Middle Fork Eel River HA, Wilderness & Black Butte River HSAs	Sediment	Delist	N	Y	2003
Eel River HU	Middle Fork Eel River HA, Wilderness & Black Butte River HSAs	Temperature, water	No Change - List	Y	N	2003
Eel River HU	Middle Main Eel River HA	Aluminum	Do Not List	N	Y	-
Eel River HU	Middle Main Eel River HA	Ammonia as Nitrogen	Do Not List	N	Y	-
Eel River HU	Middle Main Eel River HA	Chloride	Do Not List	N	Y	-
Eel River HU	Middle Main Eel River HA	Metals	Do Not List	N	Y	-
Eel River HU	Middle Main Eel River HA	PCBs	Do Not List	N	Y	-
Eel River HU	Middle Main Eel River HA	Pentachlorophenol	Do Not List	N	Y	-
Eel River HU	Middle Main Eel River HA	Pesticides	Do Not List	N	Y	-
Eel River HU	Middle Main Eel River HA	Phenol	Do Not List	N	Y	-
Eel River HU	Middle Main Eel River HA	Sedimentation/Siltation	No Change - List	Y	N	2005
Eel River HU	Middle Main Eel River HA	Specific Conductivity	Do Not List	N	Y	-
Eel River HU	Middle Main Eel River HA	Sulfates	Do Not List	N	Y	-

**Table 10 (cont.)
Summary of All Assessed Waterbody/Pollutant Pairs**

Waterbody Hydrologic Unit	Waterbody Name	Pollutant(s)	Staff Recommendation	Impaired	Based on New Data	TMDL Completion Date¹
Eel River HU	Middle Main Eel River HA	Temperature, water	No Change - List	Y	N	2005
Eel River HU	North Fork Eel River HA, Lower	Aluminum	Do Not List	N	Y	-
Eel River HU	North Fork Eel River HA, Lower	Ammonia as Nitrogen	Do Not List	N	Y	-
Eel River HU	North Fork Eel River HA, Lower	Chloride	Do Not List	N	Y	-
Eel River HU	North Fork Eel River HA, Lower	Metals	Do Not List	N	Y	-
Eel River HU	North Fork Eel River HA, Lower	Pesticides	Do Not List	N	Y	-
Eel River HU	North Fork Eel River HA, Lower	Sedimentation/Siltation	No Change - List	Y	N	2002
Eel River HU	North Fork Eel River HA, Lower	Specific Conductivity	Do Not List	N	Y	-
Eel River HU	North Fork Eel River HA, Lower	Sulfates	Do Not List	N	Y	-
Eel River HU	North Fork Eel River HA, Lower	Temperature, water	No Change - List	Y	N	2002
Eel River HU	North Fork Eel River HA, Upper	Sediment	Delist	N	Y	2002
Eel River HU	North Fork Eel River HA, Upper	Temperature, water	No Change - List	Y	N	2002
Eel River HU	South Fork Eel River HA	Aluminum	Do Not List	N	Y	-
Eel River HU	South Fork Eel River HA	Ammonia as Nitrogen	Do Not List	N	Y	-
Eel River HU	South Fork Eel River HA	Chloride	Do Not List	N	Y	-
Eel River HU	South Fork Eel River HA	Metals	Do Not List	N	Y	-
Eel River HU	South Fork Eel River HA	PCBs	Do Not List	N	Y	-
Eel River HU	South Fork Eel River HA	Pentachlorophenol	Do Not List	N	Y	-
Eel River HU	South Fork Eel River HA	Pesticides	Do Not List	N	Y	-
Eel River HU	South Fork Eel River HA	Phenol	Do Not List	N	Y	-
Eel River HU	South Fork Eel River HA	Sedimentation/Siltation	No Change - List	Y	N	1999
Eel River HU	South Fork Eel River HA	Specific Conductivity	Do Not List	N	Y	-
Eel River HU	South Fork Eel River HA	Sulfates	Do Not List	N	Y	-
Eel River HU	South Fork Eel River HA	Temperature, water	No Change - List	Y	N	1999
Eel River HU	Upper Main Eel River HA	Aluminum	Do Not List	N	Y	-
Eel River HU	Upper Main Eel River HA	Ammonia as Nitrogen	Do Not List	N	Y	-
Eel River HU	Upper Main Eel River HA	Chloride	Do Not List	N	Y	-
Eel River HU	Upper Main Eel River HA	Metals	Do Not List	N	Y	-
Eel River HU	Upper Main Eel River HA	PCBs	Do Not List	N	Y	-
Eel River HU	Upper Main Eel River HA	Pentachlorophenol	Do Not List	N	Y	-
Eel River HU	Upper Main Eel River HA	Pesticides	Do Not List	N	Y	-
Eel River HU	Upper Main Eel River HA	Phenol	Do Not List	N	Y	-
Eel River HU	Upper Main Eel River HA	Sedimentation/Siltation	No Change - List	Y	N	2004
Eel River HU	Upper Main Eel River HA	Specific Conductivity	Do Not List	N	Y	-

**Table 10 (cont.)
Summary of All Assessed Waterbody/Pollutant Pairs**

Waterbody Hydrologic Unit	Waterbody Name	Pollutant(s)	Staff Recommendation	Impaired	Based on New Data	TMDL Completion Date¹
Eel River HU	Upper Main Eel River HA	Sulfates	Do Not List	N	Y	-
Eel River HU	Upper Main Eel River HA	Temperature, water	No Change - List	Y	N	2004
Eel River HU	Upper Main Eel River HA, Lake Pillsbury	Mercury	No Change - Do Not Delist	Y	N	2012
Eel River HU	Van Duzen River HA	Aluminum	Do Not List	N	Y	-
Eel River HU	Van Duzen River HA	Ammonia as Nitrogen	Do Not List	N	Y	-
Eel River HU	Van Duzen River HA	Chloride	Do Not List	N	Y	-
Eel River HU	Van Duzen River HA	Metals	Do Not List	N	Y	-
Eel River HU	Van Duzen River HA	Sedimentation/Siltation	No Change - List	Y	N	1999
Eel River HU	Van Duzen River HA	Specific Conductivity	Do Not List	N	Y	-
Eel River HU	Van Duzen River HA	Sulfates	Do Not List	N	Y	-
Eureka Plain HU	Elk River	Aluminum	Do Not List	N	Y	-
Eureka Plain HU	Elk River	Ammonia as Nitrogen	Do Not List	N	Y	-
Eureka Plain HU	Elk River	Chloride	Do Not List	N	Y	-
Eureka Plain HU	Elk River	Metals	Do Not List	N	Y	-
Eureka Plain HU	Elk River	Sedimentation/Siltation	No Change - List	Y	N	2011
Eureka Plain HU	Elk River	Specific Conductivity	Do Not List	N	Y	-
Eureka Plain HU	Elk River	Sulfates	Do Not List	N	Y	-
Eureka Plain HU	Freshwater Creek	Aluminum	Do Not List	N	Y	-
Eureka Plain HU	Freshwater Creek	Ammonia as Nitrogen	Do Not List	N	Y	-
Eureka Plain HU	Freshwater Creek	Chloride	Do Not List	N	Y	-
Eureka Plain HU	Freshwater Creek	Metals	Do Not List	N	Y	-
Eureka Plain HU	Freshwater Creek	Sedimentation/Siltation	No Change - List	Y	N	2011
Eureka Plain HU	Freshwater Creek	Specific Conductivity	Do Not List	N	Y	-
Eureka Plain HU	Freshwater Creek	Sulfates	Do Not List	N	Y	-
Eureka Plain HU	Humboldt Bay	2,3,5,6-Tetrachlorophenol	Do Not List	N	Y	-
Eureka Plain HU	Humboldt Bay	Cadmium	Do Not List	N	Y	-
Eureka Plain HU	Humboldt Bay	Chromium	Do Not List	N	Y	-
Eureka Plain HU	Humboldt Bay	Dioxin Toxic Equivalents	Do Not Delist	Y	Y	2019
Eureka Plain HU	Humboldt Bay	Dissolved Oxygen	Do Not List	N	Y	-
Eureka Plain HU	Humboldt Bay	Fecal Coliform	Do Not List	N	Y	-
Eureka Plain HU	Humboldt Bay	Mercury	Do Not List	N	Y	-
Eureka Plain HU	Humboldt Bay	PCBs	Do Not Delist	Y	Y	2019
Eureka Plain HU	Humboldt Bay	Pentachlorophenol	Do Not List	N	Y	-

**Table 10 (cont.)
Summary of All Assessed Waterbody/Pollutant Pairs**

Waterbody Hydrologic Unit	Waterbody Name	Pollutant(s)	Staff Recommendation	Impaired	Based on New Data	TMDL Completion Date¹
Eureka Plain HU	Humboldt Bay	pH	Do Not List	N	Y	-
Eureka Plain HU	Humboldt Bay	Temperature, water	Do Not List	N	Y	-
Eureka Plain HU	Humboldt Bay	Total Coliform	Do Not List	N	Y	-
Eureka Plain HU	Jacoby Creek Watershed	Aluminum	Do Not List	N	Y	-
Eureka Plain HU	Jacoby Creek Watershed	Ammonia as Nitrogen	Do Not List	N	Y	-
Eureka Plain HU	Jacoby Creek Watershed	Chloride	Do Not List	N	Y	-
Eureka Plain HU	Jacoby Creek Watershed	Metals	Do Not List	N	Y	-
Eureka Plain HU	Jacoby Creek Watershed	Sediment	No Change - List	Y	N	2019
Eureka Plain HU	Jacoby Creek Watershed	Specific Conductivity	Do Not List	N	Y	-
Eureka Plain HU	Jacoby Creek Watershed	Sulfates	Do Not List	N	Y	-
Eureka Plain HU	Salmon Creek	Aluminum	Do Not List	N	Y	-
Eureka Plain HU	Salmon Creek	Ammonia as Nitrogen	Do Not List	N	Y	-
Eureka Plain HU	Salmon Creek	Chloride	Do Not List	N	Y	-
Eureka Plain HU	Salmon Creek	Metals	Do Not List	N	Y	-
Eureka Plain HU	Salmon Creek	Specific Conductivity	Do Not List	N	Y	-
Eureka Plain HU	Salmon Creek	Sulfates	Do Not List	N	Y	-
Klamath River HU	Butte Valley HA	Nutrients	No Change - List	Y	N	2019
Klamath River HU	Butte Valley HA	Temperature, water	No Change - List	Y	N	2019
Klamath River HU	Clear Lake HSA and Boles HSA	Nutrients	No Change - Delist	N	N	-
Klamath River HU	Clear Lake HSA and Boles HSA	Temperature	No Change - Delist	N	N	-
Klamath River HU	Copco Lake (Reservoir 1 and 2)	Mercury	Do Not List	N	Y	-
Klamath River HU	Copco Lake (Reservoir 1 and 2)	Microcystin	Do Not Delist	Y	Y	2019
Klamath River HU	Iron Gate Reservoir	Microcystin	Do Not Delist	Y	Y	2019
Klamath River HU	Klamath Glen HSA	Aluminum	Do Not List	N	Y	-
Klamath River HU	Klamath Glen HSA	Ammonia as Nitrogen	Do Not List	N	Y	-
Klamath River HU	Klamath Glen HSA	Chloride	Do Not List	N	Y	-
Klamath River HU	Klamath Glen HSA	Disulfoton	Do Not List	N	Y	-
Klamath River HU	Klamath Glen HSA	Metals	Do Not List	N	Y	-
Klamath River HU	Klamath Glen HSA	Microcystin	Do Not List	N	Y	-
Klamath River HU	Klamath Glen HSA	Nutrients	No Change - List	Y	N	2010
Klamath River HU	Klamath Glen HSA	Organic Enrichment / Low Dissolved Oxygen	No Change - List	Y	N	2010
Klamath River HU	Klamath Glen HSA	PCBs	Do Not List	N	Y	-
Klamath River HU	Klamath Glen HSA	Pesticides	Do Not List	N	Y	-

Table 10 (cont.) Summary of All Assessed Waterbody/Pollutant Pairs						
Waterbody Hydrologic Unit	Waterbody Name	Pollutant(s)	Staff Recommendation	Impaired	Based on New Data	TMDL Completion Date¹
Klamath River HU	Klamath Glen HSA	Sedimentation/Siltation	No Change - List	Y	N	2019
Klamath River HU	Klamath Glen HSA	Specific Conductivity	Do Not List	N	Y	-
Klamath River HU	Klamath Glen HSA	Sulfates	Do Not List	N	Y	-
Klamath River HU	Klamath Glen HSA	Temperature, water	No Change - List	Y	N	2010
Klamath River HU	Middle & Lower Klamath River HAS, Scott River to Trinity River Reach	Aluminum	Do Not List	N	Y	-
Klamath River HU	Middle & Lower Klamath River HAS, Scott River to Trinity River Reach	Ammonia as Nitrogen	Do Not List	N	Y	-
Klamath River HU	Middle & Lower Klamath River HAS, Scott River to Trinity River Reach	Chloride	Do Not List	N	Y	-
Klamath River HU	Middle & Lower Klamath River HAS, Scott River to Trinity River Reach	Metals	Do Not List	N	Y	-
Klamath River HU	Middle & Lower Klamath River HAS, Scott River to Trinity River Reach, mainstem Klamath River	Microcystin	List	Y	Y	2021
Klamath River HU	Middle & Lower Klamath River HAS, Scott River to Trinity River Reach	Nutrients	Do Not Delist	Y	Y	2010
Klamath River HU	Middle & Lower Klamath River HAS, Scott River to Trinity River Reach	Organic Enrichment / Low Dissolved Oxygen	No Change - List	Y	N	2010
Klamath River HU	Middle & Lower Klamath River HAS, Scott River to Trinity River Reach, mainstem Klamath River from the confluence of O'Neil Creek to the confluence of Elk Creek, and the watersheds of Cade Ck, Caroline Ck, China Ck, Elk Ck, Fryingpan Ck, Fort Goff Ck, Grider Ck, Horse Ck, Indian Ck, Joe Miles Ck, O'Neil Ck, Portuguese Ck, Ranch Gulch, Schutts Gulch, Seiad Ck, Thompson Ck, Walker Ck, and Walker Gulch	Sediment	List	Y	Y	2021
Klamath River HU	Middle & Lower Klamath River HAS, Scott River to Trinity River Reach	Sulfates	Do Not List	N	Y	-
Klamath River HU	Middle & Lower Klamath River HAS, Scott River to Trinity River Reach	Temperature, water	Do Not Delist	Y	Y	2010

Table 10 (cont.) Summary of All Assessed Waterbody/Pollutant Pairs						
Waterbody Hydrologic Unit	Waterbody Name	Pollutant(s)	Staff Recommendation	Impaired	Based on New Data	TMDL Completion Date¹
Klamath River HU	Middle Klamath River HA, Iron Gate Dam to Scott River Reach	Aluminum	Do Not List	N	Y	-
Klamath River HU	Middle Klamath River HA, Iron Gate Dam to Scott River Reach	Ammonia as Nitrogen	Do Not List	N	Y	-
Klamath River HU	Middle Klamath River HA, Iron Gate Dam to Scott River Reach	Chloride	Do Not List	N	Y	-
Klamath River HU	Middle Klamath River HA, Iron Gate Dam to Scott River Reach	Metals	Do Not List	N	Y	-
Klamath River HU	Middle Klamath River HA, Iron Gate Dam to Scott River Reach, mainstem Klamath River	Microcystin	List	Y	Y	2021
Klamath River HU	Middle Klamath River HA, Iron Gate Dam to Scott River Reach	Nutrients	No Change - List	Y	N	2010
Klamath River HU	Middle Klamath River HA, Iron Gate Dam to Scott River Reach	Organic Enrichment / Low Dissolved Oxygen	No Change - List	Y	N	2010
Klamath River HU	Middle Klamath River HA, Iron Gate Dam to Scott River Reach	PCBs	Do Not List	N	Y	-
Klamath River HU	Middle Klamath River HA, Iron Gate Dam to Scott River Reach	Pesticides	Do Not List	N	Y	-
Klamath River HU	Middle Klamath River HA, Iron Gate Dam to Scott River Reach, mainstem Klamath River from the confluence of Beaver Ck to the confluence of the Salmon River, and the watersheds of Beaver Ck, Collins Ck, Cove Gulch, Doggett Ck, Dona Ck, Everill Ck, Horse Ck, Howard's Gulch, Kinsman Ck, Kohl Ck, Lime Gulch, Sambo Ck, and Smith Gulch	Sediment	List	Y	Y	2021
Klamath River HU	Middle Klamath River HA, Iron Gate Dam to Scott River Reach	Specific Conductivity	Do Not List	N	Y	-
Klamath River HU	Middle Klamath River HA, Iron Gate Dam to Scott River Reach	Sulfates	Do Not List	N	Y	-
Klamath River HU	Middle Klamath River HA, Iron Gate Dam to Scott River Reach	Temperature, water	No Change - List	Y	N	2010

Table 10 (cont.) Summary of All Assessed Waterbody/Pollutant Pairs						
Waterbody Hydrologic Unit	Waterbody Name	Pollutant(s)	Staff Recommendation	Impaired	Based on New Data	TMDL Completion Date¹
Klamath River HU	Middle Klamath River HA, Oregon to Iron Gate Reach	Aluminum	Do Not List	N	Y	-
Klamath River HU	Middle Klamath River HA, Oregon to Iron Gate Reach	Ammonia as Nitrogen	Do Not List	N	Y	-
Klamath River HU	Middle Klamath River HA, Oregon to Iron Gate Reach	Chloride	Do Not List	N	Y	-
Klamath River HU	Middle Klamath River HA, Oregon to Iron Gate Reach	Metals	Do Not List	N	Y	-
Klamath River HU	Middle Klamath River HA, Oregon to Iron Gate Reach, mainstem Klamath River from the beginning of Copco 1 Reservoir to Iron Gate Dam	Microcystin	Do Not Delist	Y	Y	2019
Klamath River HU	Middle Klamath River HA, Oregon to Iron Gate Reach	Nutrients	No Change - List	Y	N	2010
Klamath River HU	Middle Klamath River HA, Oregon to Iron Gate Reach	Organic Enrichment / Low Dissolved Oxygen	No Change - List	Y	N	2010
Klamath River HU	Middle Klamath River HA, Oregon to Iron Gate Reach	PCBs	Do Not List	N	Y	-
Klamath River HU	Middle Klamath River HA, Oregon to Iron Gate Reach	Pesticides	Do Not List	N	Y	-
Klamath River HU	Middle Klamath River HA, Oregon to Iron Gate Reach	Specific Conductivity	Do Not List	N	Y	-
Klamath River HU	Middle Klamath River HA, Oregon to Iron Gate Reach	Sulfates	Do Not List	N	Y	-
Klamath River HU	Middle Klamath River HA, Oregon to Iron Gate Reach	Temperature, water	No Change - List	Y	N	2010
Klamath River HU	Salmon River HA	Nutrients	No Change - Delist	N	N	-
Klamath River HU	Salmon River HA	pH	No Change - Do Not List	N	N	-
Klamath River HU	Salmon River HA	Sediment	Do Not List	N	Y	-
Klamath River HU	Salmon River HA	Temperature, water	Do Not Delist	Y	Y	2005
Klamath River HU	Salmon River HA	Total Coliform	No Change - Do Not List	N	N	-
Klamath River HU	Salmon River HA	Total Dissolved Solids	No Change - Do Not List	N	N	-
Klamath River HU	Salmon River HA	Total Suspended Solids	No Change - Do Not List	N	N	-
Klamath River HU	Salmon River HA, Wooley Creek	Temperature, water	Delist	N	Y	-
Klamath River HU	Scott River HA	Aluminum	Do Not List	N	Y	-

Table 10 (cont.) Summary of All Assessed Waterbody/Pollutant Pairs						
Waterbody Hydrologic Unit	Waterbody Name	Pollutant(s)	Staff Recommendation	Impaired	Based on New Data	TMDL Completion Date¹
Klamath River HU	Scott River HA	Ammonia as Nitrogen	Do Not List	N	Y	-
Klamath River HU	Scott River HA	Chloride	Do Not List	N	Y	-
Klamath River HU	Scott River HA	Metals	Do Not List	N	Y	-
Klamath River HU	Scott River HA	PCBs	Do Not List	N	Y	-
Klamath River HU	Scott River HA	Pesticides	Do Not List	N	Y	-
Klamath River HU	Scott River HA	Sedimentation/Siltation	No Change - List	Y	N	2006
Klamath River HU	Scott River HA	Specific Conductivity	Do Not List	N	Y	-
Klamath River HU	Scott River HA	Sulfates	Do Not List	N	Y	-
Klamath River HU	Scott River HA	Temperature, water	No Change - List	Y	N	2006
Klamath River HU	Shasta River HA	Aluminum	Do Not List	N	Y	-
Klamath River HU	Shasta River HA	Ammonia as Nitrogen	Do Not List	N	Y	-
Klamath River HU	Shasta River HA	Chloride	Do Not List	N	Y	-
Klamath River HU	Shasta River HA	Metals	Do Not List	N	Y	-
Klamath River HU	Shasta River HA	Organic Enrichment / Low Dissolved Oxygen	No Change - List	Y	N	2007
Klamath River HU	Shasta River HA	PCBs	Do Not List	N	Y	-
Klamath River HU	Shasta River HA	Pesticides	Do Not List	N	Y	-
Klamath River HU	Shasta River HA	Specific Conductivity	Do Not List	N	Y	-
Klamath River HU	Shasta River HA	Sulfates	Do Not List	N	Y	-
Klamath River HU	Shasta River HA	Temperature, water	No Change - List	Y	N	2007
Klamath River HU	Shasta River HA, Lake Shastina	Mercury	List	Y	Y	2021
Klamath River HU	Tule Lake and Lower Klamath Lake National Wildlife Refuge	pH (high)	No Change - List	Y	N	2008
Klamath River HU	Tule Lake HSA and Mt Dome HSA	Nutrients	No Change - List	Y	N	2008
Klamath River HU	Tule Lake HSA and Mt Dome HSA	Temperature	No Change - Delist	N	N	-
Mad River HU	Mad River	Aluminum	Do Not List	N	Y	-
Mad River HU	Mad River	Ammonia as Nitrogen	Do Not List	N	Y	-
Mad River HU	Mad River	Chloride	Do Not List	N	Y	-
Mad River HU	Mad River	DDE	List	Y	Y	2021
Mad River HU	Mad River	Metals	Do Not List	N	Y	-
Mad River HU	Mad River	PCBs	Do Not List	N	Y	-
Mad River HU	Mad River	Pesticides	Do Not List	N	Y	-
Mad River HU	Mad River	Sedimentation/Siltation	No Change - List	Y	N	2007
Mad River HU	Mad River	Specific Conductivity	Do Not List	N	Y	-

**Table 10 (cont.)
Summary of All Assessed Waterbody/Pollutant Pairs**

Waterbody Hydrologic Unit	Waterbody Name	Pollutant(s)	Staff Recommendation	Impaired	Based on New Data	TMDL Completion Date¹
Mad River HU	Mad River	Sulfates	Do Not List	N	Y	-
Mad River HU	Mad River	Temperature, water	No Change - List	Y	N	2007
Mad River HU	Mad River	Turbidity	No Change - List	Y	N	2007
Mad River HU	Ruth Lake	Mercury	Do Not List	N	Y	-
Mendocino Coast HU	Albion River	Ammonia as Nitrogen	Do Not List	N	Y	-
Mendocino Coast HU	Albion River	Chloride	Do Not List	N	Y	-
Mendocino Coast HU	Albion River	Lead	Do Not List	N	Y	-
Mendocino Coast HU	Albion River	Sedimentation/Siltation	No Change - List	Y	N	2001
Mendocino Coast HU	Albion River	Specific Conductivity	Do Not List	N	Y	-
Mendocino Coast HU	Albion River	Sulfates	Do Not List	N	Y	-
Mendocino Coast HU	Albion River	Temperature, water	No Change - List	Y	N	2019
Mendocino Coast HU	Berry Gulch	Temperature, water	No Change - Do Not List	N	N	-
Mendocino Coast HU	Big River	Ammonia as Nitrogen	Do Not List	N	Y	-
Mendocino Coast HU	Big River	Chloride	Do Not List	N	Y	-
Mendocino Coast HU	Big River	Lead, Zinc	Do Not List	N	Y	-
Mendocino Coast HU	Big River	Sedimentation/Siltation	No Change - List	Y	N	2004
Mendocino Coast HU	Big River	Specific Conductivity	Do Not List	N	Y	-
Mendocino Coast HU	Big River	Sulfates	Do Not List	N	Y	-
Mendocino Coast HU	Big River	Temperature, water	No Change - Do Not Delist	Y	N	2019
Mendocino Coast HU	Big River Beach	Indicator Bacteria	Do Not List	N	Y	-
Mendocino Coast HU	Big Salmon Creek	Sediment	No Change - Do Not List	N	N	-
Mendocino Coast HU	Big Salmon Creek	Temperature, water	No Change - Do Not List	N	N	-
Mendocino Coast HU	Black Point Beach	Indicator Bacteria	Do Not List	N	Y	-
Mendocino Coast HU	Campbell Cove	Indicator Bacteria	Do Not Delist	Y	Y	2019
Mendocino Coast HU	Caspar Headlands State Beach	Indicator Bacteria	Do Not List	N	Y	-
Mendocino Coast HU	Chadbourne Gulch Beach	Indicator Bacteria	Do Not List	N	Y	-
Mendocino Coast HU	Dehaven Creek	Temperature, water	No Change - Do Not List	N	N	-
Mendocino Coast HU	Garcia River	Ammonia as Nitrogen	Do Not List	N	Y	-
Mendocino Coast HU	Garcia River	Chloride	Do Not List	N	Y	-
Mendocino Coast HU	Garcia River	Lead	Do Not List	N	Y	-
Mendocino Coast HU	Garcia River	Sediment	No Change - List	Y	N	2002
Mendocino Coast HU	Garcia River	Specific Conductivity	Do Not List	N	Y	-
Mendocino Coast HU	Garcia River	Sulfates	Do Not List	N	Y	-
Mendocino Coast HU	Garcia River	Temperature, water	No Change - List	Y	N	2019

**Table 10 (cont.)
Summary of All Assessed Waterbody/Pollutant Pairs**

Waterbody Hydrologic Unit	Waterbody Name	Pollutant(s)	Staff Recommendation	Impaired	Based on New Data	TMDL Completion Date¹
Mendocino Coast HU	Greenwood Creek HSA	Ammonia as Nitrogen	Do Not List	N	Y	-
Mendocino Coast HU	Greenwood Creek HSA	Chloride	Do Not List	N	Y	-
Mendocino Coast HU	Greenwood Creek HSA	Lead	Do Not List	N	Y	-
Mendocino Coast HU	Greenwood Creek HSA	Specific Conductivity	Do Not List	N	Y	-
Mendocino Coast HU	Greenwood Creek HSA	Sulfates	Do Not List	N	Y	-
Mendocino Coast HU	Gualala Regional Park Beach	Indicator Bacteria	Do Not List	N	Y	-
Mendocino Coast HU	Gualala River	Aluminum	Do Not List	N	Y	-
Mendocino Coast HU	Gualala River	Ammonia as Nitrogen	Do Not List	N	Y	-
Mendocino Coast HU	Gualala River	Chloride	Do Not List	N	Y	-
Mendocino Coast HU	Gualala River	Metals	Do Not List	N	Y	-
Mendocino Coast HU	Gualala River	PCBs	Do Not List	N	Y	-
Mendocino Coast HU	Gualala River	Pesticides	Do Not List	N	Y	-
Mendocino Coast HU	Gualala River	Sedimentation/Siltation	No Change - List	Y	N	2004
Mendocino Coast HU	Gualala River	Specific Conductivity	Do Not List	N	Y	-
Mendocino Coast HU	Gualala River	Sulfates	Do Not List	N	Y	-
Mendocino Coast HU	Gualala River, Entire Watershed except the Little N Fk Gualala R. Watershed	Temperature, water	No Change - List	Y	N	2019
Mendocino Coast HU	Hare Creek Beach	Indicator Bacteria	List	Y	Y	2021
Mendocino Coast HU	Little River	Ammonia as Nitrogen	Do Not List	N	Y	-
Mendocino Coast HU	Little River	Chloride	Do Not List	N	Y	-
Mendocino Coast HU	Little River	Lead, Zinc	Do Not List	N	Y	-
Mendocino Coast HU	Little River	Specific Conductivity	Do Not List	N	Y	-
Mendocino Coast HU	Little River	Sulfates	Do Not List	N	Y	-
Mendocino Coast HU	MacKerricher State Park Beach	Indicator Bacteria	Do Not List	N	Y	-
Mendocino Coast HU	Navarro River	Ammonia as Nitrogen	Do Not List	N	Y	-
Mendocino Coast HU	Navarro River	Chloride	Do Not List	N	Y	-
Mendocino Coast HU	Navarro River	Lead, Zinc	Do Not List	N	Y	-
Mendocino Coast HU	Navarro River	Sedimentation/Siltation	No Change - List	Y	N	2000
Mendocino Coast HU	Navarro River	Specific Conductivity	Do Not List	N	Y	-
Mendocino Coast HU	Navarro River	Sulfates	Do Not List	N	Y	-
Mendocino Coast HU	Navarro River	Temperature, water	No Change - List	Y	N	2000
Mendocino Coast HU	Navarro River, Delta	Sedimentation/Siltation	No Change - List	Y	N	2000
Mendocino Coast HU	Noyo River	Ammonia as Nitrogen	Do Not List	N	Y	-
Mendocino Coast HU	Noyo River	Chloride	Do Not List	N	Y	-

**Table 10 (cont.)
Summary of All Assessed Waterbody/Pollutant Pairs**

Waterbody Hydrologic Unit	Waterbody Name	Pollutant(s)	Staff Recommendation	Impaired	Based on New Data	TMDL Completion Date¹
Mendocino Coast HU	Noyo River	Lead	Do Not List	N	Y	-
Mendocino Coast HU	Noyo River	Sedimentation/Siltation	No Change - List	Y	N	1999
Mendocino Coast HU	Noyo River	Specific Conductivity	Do Not List	N	Y	-
Mendocino Coast HU	Noyo River	Sulfates	Do Not List	N	Y	-
Mendocino Coast HU	Noyo River mainstem from confluence of Duffy Gulch downstream to confluence with Hayshed Gulch; South Fork Noyo River mainstem from confluence of Kass Creek downstream to confluence with Noyo River mainstem; and Little North Fork Noyo River, Duffy Gulch, and Kass Creek tributaries.	Temperature, water	No Change - List	Y	N	2019
Mendocino Coast HU	Pudding Creek	Temperature, water	Do Not Delist	Y	Y	2019
Mendocino Coast HU	Pudding Creek Beach	Indicator Bacteria	List	Y	Y	2021
Mendocino Coast HU	Stillwater Cove Regional Park Beach	Indicator Bacteria	Do Not List	N	Y	-
Mendocino Coast HU	Ten Mile River HSA	Ammonia as Nitrogen	Do Not List	N	Y	-
Mendocino Coast HU	Ten Mile River HSA	Chloride	Do Not List	N	Y	-
Mendocino Coast HU	Ten Mile River HSA	Lead	Do Not List	N	Y	-
Mendocino Coast HU	Ten Mile River HSA	Sedimentation/Siltation	No Change - List	Y	N	2000
Mendocino Coast HU	Ten Mile River HSA	Specific Conductivity	Do Not List	N	Y	-
Mendocino Coast HU	Ten Mile River HSA	Sulfates	Do Not List	N	Y	-
Mendocino Coast HU	Ten Mile River HSA	Temperature, water	No Change - Do Not Delist	Y	N	2019
Mendocino Coast HU	Ten Mile River HSA, Coastal Tributaries	Temperature, water	No Change - Do Not List	N	N	-
Mendocino Coast HU	Usal Creek HSA	Temperature, water	No Change - Do Not List	N	N	-
Mendocino Coast HU	Van Damme State Park Beach	Indicator Bacteria	Do Not List	N	Y	-
Mendocino Coast HU	Wages Creek	Ammonia as Nitrogen	Do Not List	N	Y	-
Mendocino Coast HU	Wages Creek	Chloride	Do Not List	N	Y	-
Mendocino Coast HU	Wages Creek	Lead, Zinc	Do Not List	N	Y	-
Mendocino Coast HU	Wages Creek	Specific Conductivity	Do Not List	N	Y	-
Mendocino Coast HU	Wages Creek	Sulfates	Do Not List	N	Y	-
Mendocino Coast HU	Wages Creek	Temperature, water	No Change - Do Not List	N	N	-
Mendocino Coast HU	Wages Creek Beach	Indicator Bacteria	Do Not List	N	Y	-
Redwood Creek HU	Redwood Creek	Aluminum	Do Not List	N	Y	-
Redwood Creek HU	Redwood Creek	Ammonia as Nitrogen	Do Not List	N	Y	-
Redwood Creek HU	Redwood Creek	Chloride	Do Not List	N	Y	-

**Table 10 (cont.)
Summary of All Assessed Waterbody/Pollutant Pairs**

Waterbody Hydrologic Unit	Waterbody Name	Pollutant(s)	Staff Recommendation	Impaired	Based on New Data	TMDL Completion Date¹
Redwood Creek HU	Redwood Creek	Metals	Do Not List	N	Y	-
Redwood Creek HU	Redwood Creek	PCBs	Do Not List	N	Y	-
Redwood Creek HU	Redwood Creek	Pesticides	Do Not List	N	Y	-
Redwood Creek HU	Redwood Creek	Sedimentation/Siltation	No Change - List	Y	N	1998
Redwood Creek HU	Redwood Creek	Specific Conductivity	Do Not List	N	Y	-
Redwood Creek HU	Redwood Creek	Sulfates	Do Not List	N	Y	-
Redwood Creek HU	Redwood Creek	Temperature, water	Do Not Delist	Y	Y	2019
Russian River HU	Austin Creek HSA	Aluminum	Do Not List	N	Y	-
Russian River HU	Austin Creek HSA	Ammonia as Nitrogen	Do Not List	N	Y	-
Russian River HU	Austin Creek HSA	Chloride	Do Not List	N	Y	-
Russian River HU	Austin Creek HSA	Dissolved Oxygen	Do Not List	N	Y	-
Russian River HU	Austin Creek HSA	Indicator Bacteria	Do Not List	N	Y	-
Russian River HU	Austin Creek HSA	Metals	Do Not List	N	Y	-
Russian River HU	Austin Creek HSA	Nitrate	Do Not List	N	Y	-
Russian River HU	Austin Creek HSA	PCBs	Do Not List	N	Y	-
Russian River HU	Austin Creek HSA	Pesticides	Do Not List	N	Y	-
Russian River HU	Austin Creek HSA	pH	Do Not List	N	Y	-
Russian River HU	Austin Creek HSA	Phosphorus	Do Not List	N	Y	-
Russian River HU	Austin Creek HSA	Sedimentation/Siltation	No Change - List	Y	N	2019
Russian River HU	Austin Creek HSA	Specific Conductivity	Do Not List	N	Y	-
Russian River HU	Austin Creek HSA	Sulfates	Do Not List	N	Y	-
Russian River HU	Austin Creek HSA	Temperature, water	No Change - List	Y	N	2019
Russian River HU	Big Sulphur Creek HSA	Aluminum	Do Not List	N	Y	-
Russian River HU	Big Sulphur Creek HSA	Ammonia as Nitrogen	Do Not List	N	Y	-
Russian River HU	Big Sulphur Creek HSA	Chloride	Do Not List	N	Y	-
Russian River HU	Big Sulphur Creek HSA	Metals	Do Not List	N	Y	-
Russian River HU	Big Sulphur Creek HSA	PCBs	Do Not List	N	Y	-
Russian River HU	Big Sulphur Creek HSA	Pesticides	Do Not List	N	Y	-
Russian River HU	Big Sulphur Creek HSA	pH	No Change - Do Not List	N	N	-
Russian River HU	Big Sulphur Creek HSA	Phosphate	No Change - Do Not List	N	N	-
Russian River HU	Big Sulphur Creek HSA	Sedimentation/Siltation	No Change - List	Y	N	2019
Russian River HU	Big Sulphur Creek HSA	Specific Conductivity	Do Not Delist	Y	Y	2019
Russian River HU	Big Sulphur Creek HSA	Sulfates	Do Not List	N	Y	-
Russian River HU	Big Sulphur Creek HSA	Temperature, water	No Change - List	Y	N	2019

Table 10 (cont.) Summary of All Assessed Waterbody/Pollutant Pairs						
Waterbody Hydrologic Unit	Waterbody Name	Pollutant(s)	Staff Recommendation	Impaired	Based on New Data	TMDL Completion Date¹
Russian River HU	Coyote Valley HSA	Aluminum	Do Not List	N	Y	-
Russian River HU	Coyote Valley HSA	Ammonia as Nitrogen	Do Not List	N	Y	-
Russian River HU	Coyote Valley HSA	Chloride	Do Not List	N	Y	-
Russian River HU	Coyote Valley HSA	Indicator Bacteria	Do Not List	N	Y	-
Russian River HU	Coyote Valley HSA	Metals	Do Not List	N	Y	-
Russian River HU	Coyote Valley HSA	PCBs	Do Not List	N	Y	-
Russian River HU	Coyote Valley HSA	Pesticides	Do Not List	N	Y	-
Russian River HU	Coyote Valley HSA	pH	Do Not List	N	Y	-
Russian River HU	Coyote Valley HSA	Phosphorus	Do Not List	N	Y	-
Russian River HU	Coyote Valley HSA	Sedimentation/Siltation	No Change - List	Y	N	2019
Russian River HU	Coyote Valley HSA	Specific Conductivity	Do Not List	N	Y	-
Russian River HU	Coyote Valley HSA	Sulfates	Do Not List	N	Y	-
Russian River HU	Coyote Valley HSA	Temperature, water	No Change - List	Y	N	2019
Russian River HU	Coyote Valley HSA, Lake Mendocino (Reservoir)	Mercury	No Change - Do Not Delist	Y	N	2012
Russian River HU	Forsythe Creek HSA	Sedimentation/Siltation	No Change - List	Y	N	2019
Russian River HU	Forsythe Creek HSA	Temperature, water	No Change - List	Y	N	2019
Russian River HU	Geyserville HSA	Aluminum	Do Not List	N	Y	-
Russian River HU	Geyserville HSA	Ammonia as Nitrogen	Do Not List	N	Y	-
Russian River HU	Geyserville HSA	Chloride	Do Not List	N	Y	-
Russian River HU	Geyserville HSA	Diazinon	Do Not List	N	Y	-
Russian River HU	Geyserville HSA	Metals	Do Not List	N	Y	-
Russian River HU	Geyserville HSA	Nitrate	Do Not List	N	Y	-
Russian River HU	Geyserville HSA	PCBs	Do Not List	N	Y	-
Russian River HU	Geyserville HSA	Pesticides	Do Not List	N	Y	-
Russian River HU	Geyserville HSA	pH	Do Not List	N	Y	-
Russian River HU	Geyserville HSA	Phosphorus	Do Not List	N	Y	-
Russian River HU	Geyserville HSA	Sedimentation/Siltation	No Change – Do Not Delist	Y	N	2019
Russian River HU	Geyserville HSA	Specific Conductivity	Do Not List	N	Y	-
Russian River HU	Geyserville HSA	Sulfates	Do Not List	N	Y	-
Russian River HU	Geyserville HSA	Temperature, water	No Change - List	Y	N	2019
Russian River HU	Geyserville HSA, Mainstem Russian R. at Healdsburg Memorial Beach from the railroad bridge to the Hwy 101 bridge	Indicator Bacteria	Do Not Delist	Y	Y	2012

Table 10 (cont.) Summary of All Assessed Waterbody/Pollutant Pairs						
Waterbody Hydrologic Unit	Waterbody Name	Pollutant(s)	Staff Recommendation	Impaired	Based on New Data	TMDL Completion Date¹
Russian River HU	Geyserville HSA, Unnamed Tributary (Stream 1) at Fitch Mountain	Indicator Bacteria	List	Y	Y	2012
Russian River HU	Geyserville HSA, Remainder of the HSA	Indicator Bacteria	Do Not List	N	Y	-
Russian River HU	Goat Rock State Park Beach	Indicator Bacteria	Do Not List	N	Y	-
Russian River HU	Green Valley Creek Watershed	Ammonia as Nitrogen	Do Not List	N	Y	-
Russian River HU	Green Valley Creek Watershed	Diazinon	Do Not List	N	Y	-
Russian River HU	Green Valley Creek Watershed	Dissolved Oxygen	List	Y	Y	2021
Russian River HU	Green Valley Creek Watershed	Indicator Bacteria	List	Y	Y	2012
Russian River HU	Green Valley Creek Watershed	Nitrate	Do Not List	N	Y	-
Russian River HU	Green Valley Creek Watershed	pH	Do Not List	N	Y	-
Russian River HU	Green Valley Creek Watershed	Phosphorus	Do Not List	N	Y	-
Russian River HU	Green Valley Creek Watershed	Specific Conductivity	Do Not List	N	Y	-
Russian River HU	Guerneville HSA	Aluminum	Do Not List	N	Y	-
Russian River HU	Guerneville HSA	Ammonia as Nitrogen	Do Not List	N	Y	-
Russian River HU	Guerneville HSA	Chloride	Do Not List	N	Y	-
Russian River HU	Guerneville HSA	DDT	List	Y	Y	2021
Russian River HU	Guerneville HSA	Diazinon	Do Not List	N	Y	-
Russian River HU	Guerneville HSA	Dissolved Oxygen	Do Not List	N	Y	-
Russian River HU	Guerneville HSA	Metals	Do Not List	N	Y	-
Russian River HU	Guerneville HSA	Nitrate	Do Not List	N	Y	-
Russian River HU	Guerneville HSA	PCBs	Do Not List	N	Y	-
Russian River HU	Guerneville HSA	Pesticides	Do Not List	N	Y	-
Russian River HU	Guerneville HSA	Phosphorus	Do Not List	N	Y	-
Russian River HU	Guerneville HSA	Sedimentation/Siltation	No Change - Do Not Delist	Y	N	2019
Russian River HU	Guerneville HSA	Sodium	Do Not List	N	Y	-
Russian River HU	Guerneville HSA	Specific Conductivity	Do Not List	N	Y	-
Russian River HU	Guerneville HSA	Sulfates	Do Not List	N	Y	-
Russian River HU	Guerneville HSA	Temperature, water	Do Not Delist	Y	Y	2019
Russian River HU	Guerneville HSA	Total Dissolved Solids	Do Not List	N	Y	-
Russian River HU	Guerneville HSA, Mainstem Russian R. from Fife Creek to Dutch Bill Creek	Indicator Bacteria	Do Not Delist	Y	Y	2012
Russian River HU	Guerneville HSA, Rest of the HSA	Indicator Bacteria	Do Not List	N	Y	-
Russian River HU	Guerneville HSA, Pocket Canyon Creek	pH	Delist	N	Y	-
Russian River HU	Laguna de Santa Rosa	Aluminum	Do Not List	N	Y	-

**Table 10 (cont.)
Summary of All Assessed Waterbody/Pollutant Pairs**

Waterbody Hydrologic Unit	Waterbody Name	Pollutant(s)	Staff Recommendation	Impaired	Based on New Data	TMDL Completion Date¹
Russian River HU	Laguna de Santa Rosa	Chloride	Do Not List	N	Y	-
Russian River HU	Laguna de Santa Rosa	Diazinon	Do Not List	N	Y	-
Russian River HU	Laguna de Santa Rosa	Indicator Bacteria	List	Y	Y	2012
Russian River HU	Laguna de Santa Rosa	Dissolved Oxygen	Do Not Delist	Y	Y	2012
Russian River HU	Laguna de Santa Rosa	Mercury	Do Not Delist	Y	Y	2019
Russian River HU	Laguna de Santa Rosa	Metals	Do Not List	N	Y	-
Russian River HU	Laguna de Santa Rosa	Nitrogen	Do Not Delist	Y	Y	2012
Russian River HU	Laguna de Santa Rosa	PCBs	Do Not List	N	Y	-
Russian River HU	Laguna de Santa Rosa	Pesticides	Do Not List	N	Y	-
Russian River HU	Laguna de Santa Rosa	pH	Do Not List	N	Y	-
Russian River HU	Laguna de Santa Rosa	Phosphorus	Do Not Delist	Y	Y	2012
Russian River HU	Laguna de Santa Rosa	Sedimentation/Siltation	No Change - Do Not Delist	Y	N	2012
Russian River HU	Laguna de Santa Rosa	Specific Conductivity	Do Not List	N	Y	-
Russian River HU	Laguna de Santa Rosa	Sulfates	Do Not List	N	Y	-
Russian River HU	Laguna de Santa Rosa	Temperature, water	No Change - List	Y	N	2012
Russian River HU	Mark West Creek HSA	Dissolved Oxygen	Do Not List	N	Y	-
Russian River HU	Mark West Creek HSA	Indicator Bacteria	Do Not List	N	Y	-
Russian River HU	Mark West Creek HSA	Nitrate	Do Not List	N	Y	-
Russian River HU	Mark West Creek HSA	pH	Do Not List	N	Y	-
Russian River HU	Mark West Creek HSA	Phosphorus	Do Not List	N	Y	-
Russian River HU	Mark West Creek HSA	Sedimentation/Siltation	No Change - List	Y	N	2019
Russian River HU	Mark West Creek HSA	Temperature, water	No Change - List	Y	N	2019
Russian River HU	Santa Rosa Creek	Aluminum	Do Not List	N	Y	-
Russian River HU	Santa Rosa Creek	Ammonia as Nitrogen	Do Not List	N	Y	-
Russian River HU	Santa Rosa Creek	Chloride	Do Not List	N	Y	-
Russian River HU	Santa Rosa Creek	Diazinon	Do Not List	N	Y	-
Russian River HU	Santa Rosa Creek	Dissolved Oxygen	Do Not List	N	Y	-
Russian River HU	Santa Rosa Creek	Indicator Bacteria	Do Not Delist	Y	Y	2012
Russian River HU	Santa Rosa Creek	Metals	Do Not List	N	Y	-
Russian River HU	Santa Rosa Creek	Nitrate	Do Not List	N	Y	-
Russian River HU	Santa Rosa Creek	PCBs	Do Not List	N	Y	-
Russian River HU	Santa Rosa Creek	Pesticides	Do Not List	N	Y	-
Russian River HU	Santa Rosa Creek	pH	Do Not List	N	Y	-
Russian River HU	Santa Rosa Creek	Phosphorus	Do Not List	N	Y	-

**Table 10 (cont.)
Summary of All Assessed Waterbody/Pollutant Pairs**

Waterbody Hydrologic Unit	Waterbody Name	Pollutant(s)	Staff Recommendation	Impaired	Based on New Data	TMDL Completion Date¹
Russian River HU	Santa Rosa Creek	Sedimentation/Siltation	No Change - List	Y	N	2012
Russian River HU	Santa Rosa Creek	Specific Conductivity	Do Not List	N	Y	-
Russian River HU	Santa Rosa Creek	Sulfates	Do Not List	N	Y	-
Russian River HU	Santa Rosa Creek	Temperature, water	No Change - List	Y	N	2012
Russian River HU	Ukiah HSA	Aluminum	Do Not List	N	Y	-
Russian River HU	Ukiah HSA	Ammonia as Nitrogen	Do Not List	N	Y	-
Russian River HU	Ukiah HSA	Chloride	Do Not List	N	Y	-
Russian River HU	Ukiah HSA	Indicator Bacteria	Do Not List	N	Y	-
Russian River HU	Ukiah HSA	Metals	Do Not List	N	Y	-
Russian River HU	Ukiah HSA	Nitrate	Do Not List	N	Y	-
Russian River HU	Ukiah HSA	PCBs	Do Not List	N	Y	-
Russian River HU	Ukiah HSA	Pesticides	Do Not List	N	Y	-
Russian River HU	Ukiah HSA	pH	Do Not List	N	Y	-
Russian River HU	Ukiah HSA	Phosphorus	Do Not List	N	Y	-
Russian River HU	Ukiah HSA	Sedimentation/Siltation	No Change - List	Y	N	2019
Russian River HU	Ukiah HSA	Specific Conductivity	Do Not List	N	Y	-
Russian River HU	Ukiah HSA	Sulfates	Do Not List	N	Y	-
Russian River HU	Ukiah HSA	Temperature, water	No Change - List	Y	N	2019
Russian River HU	Ukiah HSA	Total Dissolved Solids	Do Not List	N	Y	-
Russian River HU	Warm Springs HSA	Aluminum	Do Not List	N	Y	-
Russian River HU	Warm Springs HSA	Ammonia as Nitrogen	Do Not List	N	Y	-
Russian River HU	Warm Springs HSA	Chloride	Do Not List	N	Y	-
Russian River HU	Warm Springs HSA	Metals	Do Not List	N	Y	-
Russian River HU	Warm Springs HSA	PCBs	Do Not List	N	Y	-
Russian River HU	Warm Springs HSA	Pesticides	Do Not List	N	Y	-
Russian River HU	Warm Springs HSA	Phosphorus	No Change - Do Not List	N	N	-
Russian River HU	Warm Springs HSA	Sedimentation/Siltation	No Change - Do Not Delist	Y	N	2019
Russian River HU	Warm Springs HSA	Specific Conductivity	Do Not List	N	Y	-
Russian River HU	Warm Springs HSA	Sulfates	Do Not List	N	Y	-
Russian River HU	Warm Springs HSA	Temperature, water	No Change - List	Y	N	2019
Russian River HU	Warm Springs HSA, Lake Sonoma (Reservoir)	Mercury	No Change - Do Not Delist	Y	N	2012
Smith River HU	Smith River Watershed	Aluminum	Do Not List	N	Y	-
Smith River HU	Smith River Watershed	Ammonia as Nitrogen	Do Not List	N	Y	-

**Table 10 (cont.)
Summary of All Assessed Waterbody/Pollutant Pairs**

Waterbody Hydrologic Unit	Waterbody Name	Pollutant(s)	Staff Recommendation	Impaired	Based on New Data	TMDL Completion Date¹
Smith River HU	Smith River Watershed	Chloride	Do Not List	N	Y	-
Smith River HU	Smith River Watershed	Metals	Do Not List	N	Y	-
Smith River HU	Smith River Watershed	PCBs	Do Not List	N	Y	-
Smith River HU	Smith River Watershed	Pesticides	Do Not List	N	Y	-
Smith River HU	Smith River Watershed	Specific Conductivity	Do Not List	N	Y	-
Smith River HU	Smith River Watershed	Sulfates	Do Not List	N	Y	-
Trinidad HU	Clam Beach	Indicator Bacteria	Do Not Delist	Y	Y	2019
Trinidad HU	Little River HA	Aluminum	Do Not List	N	Y	-
Trinidad HU	Little River HA	Ammonia as Nitrogen	Do Not List	N	Y	-
Trinidad HU	Little River HA	Chloride	Do Not List	N	Y	-
Trinidad HU	Little River HA	Metals	Do Not List	N	Y	-
Trinidad HU	Little River HA	Specific Conductivity	Do Not List	N	Y	-
Trinidad HU	Little River HA	Sulfates	Do Not List	N	Y	-
Trinidad HU	Luffenholtz Beach	Indicator Bacteria	Do Not Delist	Y	Y	2019
Trinidad HU	Moonstone County Park	Indicator Bacteria	Do Not Delist	Y	Y	2019
Trinidad HU	Trinidad State Beach	Indicator Bacteria	Do Not Delist	Y	Y	2019
Trinity River HU	East Fork Trinity River	Mercury	No Change - List	Y	N	2019
Trinity River HU	East Fork Trinity River	Sedimentation/Siltation	No Change - List	Y	N	2001
Trinity River HU	Lower Trinity River HA	Aluminum	Do Not List	N	Y	-
Trinity River HU	Lower Trinity River HA	Ammonia as Nitrogen	Do Not List	N	Y	-
Trinity River HU	Lower Trinity River HA	Chloride	Do Not List	N	Y	-
Trinity River HU	Lower Trinity River HA	Metals	Do Not List	N	Y	-
Trinity River HU	Lower Trinity River HA	Microcystin	Do Not List	N	Y	-
Trinity River HU	Lower Trinity River HA	Sedimentation/Siltation	No Change - List	Y	N	2001
Trinity River HU	Lower Trinity River HA	Specific Conductivity	Do Not List	N	Y	-
Trinity River HU	Lower Trinity River HA	Sulfates	Do Not List	N	Y	-
Trinity River HU	Middle Trinity River HA	Aluminum	Do Not List	N	Y	-
Trinity River HU	Middle Trinity River HA	Ammonia as Nitrogen	Do Not List	N	Y	-
Trinity River HU	Middle Trinity River HA	Chloride	Do Not List	N	Y	-
Trinity River HU	Middle Trinity River HA	Metals	Do Not List	N	Y	-
Trinity River HU	Middle Trinity River HA	PCBs	Do Not List	N	Y	-
Trinity River HU	Middle Trinity River HA	Pesticides	Do Not List	N	Y	-
Trinity River HU	Middle Trinity River HA	Sedimentation/Siltation	No Change - List	Y	N	2001
Trinity River HU	Middle Trinity River HA	Specific Conductivity	Do Not List	N	Y	-

Table 10 (cont.) Summary of All Assessed Waterbody/Pollutant Pairs						
Waterbody Hydrologic Unit	Waterbody Name	Pollutant(s)	Staff Recommendation	Impaired	Based on New Data	TMDL Completion Date¹
Trinity River HU	Middle Trinity River HA	Sulfates	Do Not List	N	Y	-
Trinity River HU	South Fork Trinity HA	Aluminum	Do Not List	N	Y	-
Trinity River HU	South Fork Trinity HA	Ammonia as Nitrogen	Do Not List	N	Y	-
Trinity River HU	South Fork Trinity HA	Chloride	Do Not List	N	Y	-
Trinity River HU	South Fork Trinity HA	Metals	Do Not List	N	Y	-
Trinity River HU	South Fork Trinity HA	PCBs	Do Not List	N	Y	-
Trinity River HU	South Fork Trinity HA	Pesticides	Do Not List	N	Y	-
Trinity River HU	South Fork Trinity HA	Sedimentation/Siltation	No Change - List	Y	N	2001
Trinity River HU	South Fork Trinity HA	Specific Conductivity	Do Not List	N	Y	-
Trinity River HU	South Fork Trinity HA	Sulfates	Do Not List	N	Y	-
Trinity River HU	South Fork Trinity HA	Temperature, water	No Change - List	Y	N	2019
Trinity River HU	Trinity Lake (was Claire Engle Lake)	Mercury	Do Not Delist	Y	Y	2019
Trinity River HU	Upper Trinity River HA	Aluminum	Do Not List	N	Y	-
Trinity River HU	Upper Trinity River HA	Ammonia as Nitrogen	Do Not List	N	Y	-
Trinity River HU	Upper Trinity River HA	Chloride	Do Not List	N	Y	-
Trinity River HU	Upper Trinity River HA	Metals	Do Not List	N	Y	-
Trinity River HU	Upper Trinity River HA	Sedimentation/Siltation	No Change - List	Y	N	2001
Trinity River HU	Upper Trinity River HA	Specific Conductivity	Do Not List	N	Y	-
Trinity River HU	Upper Trinity River HA	Sulfates	Do Not List	N	Y	-
Winchuck River HU	Winchuck River	Sediment	No Change - Do Not List	N	N	-

1. The TMDL completion date is the date the USEPA approved or is expected to approve the TMDL.

Chapter 5: Information Management

CALIFORNIA WATER QUALITY ASSESSMENT (CALWQA) DATABASE

All monitoring data lines of evidence, listing decisions, and beneficial use support ratings for assessed California water bodies are stored in the Regional and State Water Boards' California Water Quality Assessment (CalWQA) database. This database was developed in 2007 for the purpose of storing detailed water quality assessment information. The database is designed so that this information can be exported to the USEPA's Assessment Database at the end of each assessment cycle.

ADMINISTRATIVE RECORD

The administrative record contains all records used to develop the 2008 Integrated Report. Records are any documents produced, received, owned, or used by the State and Regional Boards regardless of media, physical form, or characteristics.

REFERENCES

Data and information used in lines of evidence come from a variety of sources. References are included to help track the sources where data and information summarized in the lines of evidence were derived from. Copies of referenced documents are included as part of the administrative record and are available at:

http://www.waterboards.ca.gov/northcoast/water_issues/programs/tmdls/303d/

Chapter 6: Public Participation

Integrated Report Category Lists 4A, 4B, and 5 require public review and approval by the Regional Water Board and then approval by the State Water Board. Category List 1, 2, and 3 are provided as information and will be submitted by the State Water Resources Control Board (State Water Board), as a statewide Integrated Report to the USEPA. A statewide Category 5 List will require final approval by the USEPA.

Regional Water Board staff intend to hold public workshops to receive comments on the Public Review Draft 2008 Integrated Report on February 17, 18, and 19, 2009. Staff will respond in writing to all written comments received by March 20, 2009. The staff responses will be included as a new appendix to the final Staff Report.

References

- Katznelson, R., R. Fadness, L. Hocker, and R. Klamt. 2003. 2002 Russian River First Flush Summary Report. Clean Water Team, Citizen Monitoring Program of the State Water Resources Control Board.
- State Water Resources Control Board. 2004. Water Quality Control Policy For Developing California's Clean Water Act Section 303(d) List, Adopted September 2004. Sacramento, CA: State Water Resources Control Board.
- State Water Resources Control Board. 2004. Final Functional Equivalent Document for the Water Quality Control Policy Developing California's Clean Water Act Section 303(d) List, September 2004. Sacramento, CA: State Water Resources Control Board.
- State Water Resources Control Board. 2006. California's 2006 Clean Water Act Section 303(d) List of Water Quality Limited Segments, Approved October 25, 2006. Board Resolution No. 2006-0079. Sacramento, CA: State Water Resources Control Board.
- State Water Resources Control Board. 2006. Notice of Public Solicitation of Water Quality Data and Information for 2008 Integrated Report – List of Impaired Waters and Surface Water Quality Assessment [303(d)/305(b)], dated December 4, 2006. Sacramento, CA: State Water Resources Control Board.
- State Water Resources Control Board. 1968. California Antidegradation Policy, Approved October 24, 1968. Board Resolution No. 68-16. Sacramento, CA: State Water Resources Control Board.

Appendix A: Selected Fact Sheets

This appendix includes the fact sheets for the waterbody/pollutant pairs that staff recommend be listed or delisted for the first time in 2008, plus those that are likely to be of particular public interest. The fact sheets included in this appendix are as follows:

Waterbody HU	Waterbody Name	Pollutant	Staff Recommendation
Bodega HU	Doran Regional Park	Indicator Bacteria	Delist
Bodega HU	Salmon Creek Park (South)	Indicator Bacteria	Delist
Eel River HU	Lower Eel River HA, Eel River Delta	Dissolved Oxygen	List
Eel River HU	Middle Fork Eel River, Wilderness HSA & Black Butte River HSA	Sediment/Siltation	Delist
Eel River HU	North Fork Eel River, Upper North Fork Eel River Watershed	Sediment/Siltation	Delist
Eureka Plain HU	Humboldt Bay	Dixon Toxic Equivalent	Do Not Delist
Klamath River HU	Copco Lake	Microcystin	Do Not Delist
Klamath River HU	Iron Gate Reservoir	Microcystin	Do Not Delist
Klamath River HU	Klamath Glen HSA	Microcystin	Do Not List
Klamath River HU	Middle Klamath River HAs, Oregon to Iron Gate Dam Reach, mainstem Klamath River from the beginning of Copco 1 Reservoir to Iron Gate Dam	Microcystin	Do Not Delist
Klamath River HU	Middle Klamath River HA, Iron Gate Dam to Scott River Reach, mainstem Klamath River	Microcystin	List
Klamath River HU	Middle & Lower Klamath River HAs, Scott River to Trinity River Reach, mainstem Klamath River	Microcystin	List
Klamath River HU	Middle Klamath River HA, Iron Gate Dam to Scott River Reach, mainstem Klamath River from the confluence of Beaver Ck to the confluence of the Salmon River, and the watersheds of Beaver Ck, Collins Ck, Cove Gulch, Doggett Ck, Dona Ck, Everill Ck, Horse Ck, Howard's Gulch, Kinsman Ck, Kohl Ck, Lime Gulch, Sambo Ck, and Smith Gulch	Sediment	List
Klamath River HU	Middle & Lower Klamath River HAs, Scott River to Trinity River Reach, mainstem Klamath River from the confluence of O'Neil Creek to the confluence of Elk Creek, and the watersheds of Cade Ck, Caroline Ck, China Ck, Elk Ck, Fryingpan Ck, Fort Goff Ck, Grider Ck, Horse Ck, Indian Ck, Joe Miles Ck, O'Neil Ck, Portuguese Ck, Ranch Gulch, Schutts Gulch, Seiad Ck, Thompson Ck, Walker Ck, and Walker Gulch	Sediment	List

Table A-1 (cont.) Fact Sheets Included in Appendix A			
Waterbody HU	Waterbody Name	Pollutant	Staff Recommendation
Klamath River HU	Salmon River HA	Sediment	Do Not List
Klamath River HU	Salmon River HA, Wooley Creek	Temperature, water	Delist
Klamath River HU	Shasta River HA, Lake Shastina	Mercury	List
Mad River HU	Mad River	DDE	List
Mendocino Coast HU	Hare Creek Beach	Indicator Bacteria	List
Mendocino Coast HU	Pudding Creek	Temperature	Do Not Delist
Mendocino Coast HU	Pudding Creek Beach	Indicator Bacteria	List
Redwood Creek HU	Redwood Creek	Temperature	Do Not Delist
Russian River HU	Geyserville HSA	Indicator Bacteria	List, Do Not Delist, and Do Not List
Russian River HU	Green Valley Creek Watershed	Indicator Bacteria	List
Russian River HU	Green Valley Creek Watershed	Dissolved Oxygen	List
Russian River HU	Guerneville HSA	Indicator Bacteria	Do Not Delist and Do Not List
Russian River HU	Guerneville HSA	DDT	List
Russian River HU	Guerneville HSA, Pocket Canyon Creek	pH	Delist
Russian River HU	Laguna de Santa Rosa	Indicator Bacteria	List

WATER BODY NAME: DORAN REGIONAL PARK

Water Body ID: CAC1152100020070319151205
Water Body Type: Coastal & Bay Shoreline

DECISION ID 6411

Pollutant: **INDICATOR BACTERIA**
Final Listing Decision: Delist from 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: List on 303(d) list (TMDL required list)(2006)
Revision Status: Revised
Reason for Delisting: State determines water quality standard is being met
Pollutant or Pollution: Pollutant

Weight of Evidence: Indicator bacteria (which includes enterococcus, fecal coliform, and total coliform) for Doran Regional Park Beach is being considered for removal from the Section 303(d) List under Section 4.3 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status. Four lines of evidence are available in the administrative record to assess indicator bacteria.

Data assessed for the 2008 Integrated Report include ocean beach bacteria data collected by the Sonoma County Division of Environmental Health in accordance with AB411 (Chapter 765, Statutes of 1997) requirements. In accordance with Section 4.3 of the Listing Policy, a 4% exceedance percentage shall be used to remove waters from the List. This equates to no more than 3 exceedance for each of the enterococcus, fecal coliform, and total coliform single sample parameters. Two of the 74 enterococcus values, 0 of the 16 fecal coliform values, and 0 of the total coliform values collected from Doran Regional Park Beach exceed the objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification for removing this water segment-pollutant combination from the Section 303(d) List (i.e., sufficient justification to de-list). This conclusion is based on the staff findings that: (1) The data used satisfies the data quality requirements of Section 6.1.4 of the Policy. (2) The data used satisfies the data quantity requirements of Section 6.1.5 of the Policy. (3) Enterococcus, fecal coliform, and total coliform samples do not exceed the objectives more than the 4% allowable frequency identified in Section 4.3 of the Listing Policy. (4) Pursuant to Section 4.11 of the Listing Policy, no additional data and information are available indicating that indicator bacteria standards are not met.

RWQCB Staff Recommendation: After review of the available data and information, North Coast RWQCB staff concludes that the water body-pollutant combination should be removed from the Section 303(d) List because applicable water quality standards for the pollutant are not being exceeded.

SWRCB Board Decision / Staff Recommendation:

USEPA Decision:

Lines of Evidence (LOEs) for Decision ID 6411

LOE ID:	8882
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Water Contact Recreation
Number of Samples:	74
Number of Exceedances:	0
Data and Information Type:	Pathogen Monitoring
Data Used to Assess Water Quality:	None of the 74 single samples of fecal coliform collected at Doran Regional Park Beach exceed the objective. Additionally, none of the 16 30-day geomean values exceed the objective. The single sample and geomean values are two different matrices used to analyzed the same data. Samples were collected by the Sonoma County Division of Environmental Health in accordance with AB411 (Chapter 765, Statutes of 1997) requirements. Data is maintained by the State Water Board's Beach Watch program. Data is summarized by the North Coast Regional Water Board (NCRWQCB 2007).
Data Reference:	<u>North Coast Beach Watch Data. Bacteria data collected by Del Norte County, Humboldt County, Mendocino County Environmental Health Division, Sonoma County Division of Environmental Health, and Marin County in accordance with AB411. Data managed by the State Water Resources Control Board's Beach Watch program at beachwatch.waterboards.ca.gov. Includes data from 2004 to 2006</u>
Water Quality Objective/Criterion:	Per the Ocean Plan (SWRCB 2005): The following bacterial objectives shall be maintained throughout the water column. The following standard is based on the 30-day geometric mean of the five most recent samples from each site: Fecal coliform density shall not exceed 200 MPN per 100 ml. The following standard is for the single sample maximum: Fecal coliform density shall not exceed 400 per 100ml. *Note: MPN is the most probable number of coliform units.
Objective/Criterion Reference:	<u>Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency</u>
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Doran Regional Park Beach.
Temporal Representation:	Samples were collected weekly from April through December 2005 and from April through October 2006.
Environmental Conditions:	Samples were collected during the dry season. Otherwise, there are no known environmental conditions (e.g., land use practices, fire events, storms, etc.) that are related to these data.
QAPP Information:	Samples were collected in accordance with the procedures described in "Environmental Health Policy and Procedure No. 00-1" (Krug 2000).
QAPP Information Reference(s):	<u>Environmental Health Policy and Procedure No. 00-1. Subject: Ocean Water Sampling Program Procedures. County of Sonoma Department of Health Services</u>

LOE ID:	8885
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Water Contact Recreation
Number of Samples:	74
Number of Exceedances:	2
Data and Information Type:	Pathogen Monitoring
Data Used to Assess Water Quality:	Two of the 74 single samples of enterococcus collected at Doran Regional Park Beach exceed the objective. Additionally, none of the 16 30-day geomean values exceed the objective. The single sample and geomean values are two different matrices used to analyze the same data. Samples were collected by the Sonoma County Division of Environmental Health in accordance with AB411 (Chapter 765, Statutes of 1997) requirements. Data is maintained by the State Water Board's Beach Watch program. Data is summarized by the North Coast Regional Water Board (NCRWQCB 2007).
Data Reference:	<u>North Coast Beach Watch Data. Bacteria data collected by Del Norte County, Humboldt County, Mendocino County Environmental Health Division, Sonoma County Division of Environmental Health, and Marin County in accordance with AB411. Data managed by the State Water Resources Control Board's Beach Watch program at beachwatch.waterboards.ca.gov. Includes data from 2004 to 2006</u>
Water Quality Objective/Criterion:	Per the Ocean Plan (SWRCB 2005): The following bacterial objectives shall be maintained throughout the water column. The following standard is based on the 30-day geometric mean of the five most recent samples from each site: Enterococcus density shall not exceed 35 MPN per 100ml. The following standard is for the single sample maximum: Enterococcus density shall not exceed 104 per 100 ml. *Note: MPN is the most probable number of coliform units.
Objective/Criterion Reference:	<u>Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency</u>
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Doran Regional Park Beach.
Temporal Representation:	Samples were collected weekly from April through December 2005 and from April through October 2006.
Environmental Conditions:	Samples were collected during the dry season. Otherwise, there are no known environmental conditions (e.g., land use practices, fire events, storms, etc.) that are related to these data.
QAPP Information:	Samples were collected in accordance with the procedures described in "Environmental Health Policy and Procedure No. 00-1" (Krug 2000).
QAPP Information Reference(s):	<u>Environmental Health Policy and Procedure No. 00-1. Subject: Ocean Water Sampling Program Procedures. County of Sonoma Department of Health Services</u>

LOE ID:	8879
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Water Contact Recreation
Number of Samples:	74
Number of Exceedances:	0
Data and Information Type:	Pathogen Monitoring
Data Used to Assess Water Quality:	None of the 74 single samples of total coliform collected at Doran Regional Park Beach exceed the objective. Additionally, none of the 16 30-day geomean values exceed the objective. The single sample and geomean values are two different matrices used to analyze the same data. Samples were collected by the Sonoma County Division of Environmental Health in accordance with AB411 (Chapter 765, Statutes of 1997) requirements. Data is maintained by the State Water Board's Beach Watch program. Data is summarized by the North Coast Regional Water Board (NCRWQCB 2007).
Data Reference:	<u>North Coast Beach Watch Data. Bacteria data collected by Del Norte County, Humboldt County, Mendocino County Environmental Health Division, Sonoma County Division of Environmental Health, and Marin County in accordance with AB411. Data managed by the State Water Resources Control Board's Beach Watch program at beachwatch.waterboards.ca.gov. Includes data from 2004 to 2006</u>
Water Quality Objective/Criterion:	Per the Ocean Plan (SWRCB 2005): The following bacterial objectives shall be maintained throughout the water column. The following standard is based on the 30-day geometric mean of the five most recent samples from each site: Total coliform density shall not exceed 1,000 MPN per 100 ml. The following standard is for the single sample maximum: (i) Total coliform density shall not exceed 10,000 per 100 ml; and (ii) Total coliform density shall not exceed 1,000 per 100 ml when the fecal coliform/total coliform ratio exceeds 0.1. *Note: MPN is the most probable number of coliform units.
Objective/Criterion Reference:	<u>Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency</u>
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Doran Regional Park Beach.
Temporal Representation:	Samples were collected weekly from April through December 2005 and from April through October 2006.
Environmental Conditions:	Samples were collected during the dry season. Otherwise, there are no known environmental conditions (e.g., land use practices, fire events, storms, etc.) that are related to these data.
QAPP Information:	Samples were collected in accordance with the procedures described in "Environmental Health Policy and Procedure No. 00-1" (Krug 2000).
QAPP Information Reference(s):	<u>Environmental Health Policy and Procedure No. 00-1. Subject: Ocean Water Sampling Program Procedures. County of Sonoma Department of Health Services</u>

LOE ID: 344

Pollutant: Indicator Bacteria

LOE Subgroup: Pollutant-Water

Matrix: Water

Fraction: Total

Beneficial Use: Water Contact Recreation

Number of Samples: 119

Number of Exceedances: 5

Data and Information Type: Pathogen Monitoring

Data Used to Assess Water Quality: Available data indicate sufficient exceedances of bacterial indicator objectives. There were 5 out of 119 samples that exceeded the geomean for enterococci(USEPA, 2007).
Data Reference: Placeholder reference 2006 303(d)

Water Quality Objective/Criterion: Title 17 CCR. Section 7958 states: Based on a single sample, the density of bacteria in water from each sampling station at a public beach or public water contact sports area shall not exceed:

(A) 1,000 total coliform bacteria per 100 milliliters, if the ratio of fecal/total coliform bacteria exceeds 0.1; or

(B) 10,000 total coliform bacteria per 100 milliliters; or

(C) 400 fecal coliform bacteria per 100 milliliters; or

(D) 104 enterococcus bacteria per 100 milliliters.

Based on the mean of the logarithms of the results of at least five weekly samples during any 30-day sampling period, the density of bacteria in water from any sampling station at a public beach or public water contact sports area, shall not exceed:

(A) 1,000 total coliform bacteria per 100 milliliters; or

(B) 200 fecal coliform bacteria per 100 milliliters; or

(C) 35 enterococcus bacteria per 100 milliliters. (DHS, 1999)

Objective/Criterion Reference: Placeholder reference 2006 303(d)

Evaluation Guideline:

Guideline Reference:

Spatial Representation: Station ID# SON70

Temporal Representation: 4/02/2001-10/24/2005

Environmental

Conditions:

QAPP Information: Data record: summers 2001-2005, Sonoma County Health Dept.

QAPP Information Reference(s):

WATER BODY NAME: SALMON CREEK PARK (SOUTH)

Water Body ID: CAC1152100020070319160630
Water Body Type: Coastal & Bay Shoreline

DECISION ID 6414

Pollutant: **INDICATOR BACTERIA**
Final Listing Decision: Delist from 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: List on 303(d) list (TMDL required list)(2006)
Revision Status: Revised
Reason for Delisting: State determines water quality standard is being met
Pollutant or Pollution: Pollutant

Weight of Evidence: Indicator bacteria (which includes enterococcus, fecal coliform, and total coliform) for South Salmon Creek State Park Beach is being considered for removal from the Section 303(d) List under Section 4.3 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status. Four lines of evidence are available in the administrative record to assess indicator bacteria.

Data assessed for the 2008 Integrated Report include ocean beach bacteria data collected by the Sonoma County Division of Environmental Health in accordance with AB411 (Chapter 765, Statutes of 1997) requirements. In accordance with Section 4.3 of the Listing Policy, a 4% exceedance percentage shall be used to remove waters from the List. This equates to no more than 3 exceedance for each of the enterococcus, fecal coliform, and total coliform single sample parameters. This also equates to no more than 1 exceedance for each of the enterococcus, fecal coliform, and total coliform geomean values. Three of 74 enterococcus, 2 of 74 fecal coliform, and 2 of 74 total coliform single samples exceed the objective. One of 16 enterococcus geomean values exceed the objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification for removing this water segment-pollutant combination from the Section 303(d) List (i.e., sufficient justification to de-list). This conclusion is based on the staff findings that: (1) The data used satisfies the data quality requirements of Section 6.1.4 of the Policy. (2) The data used satisfies the data quantity requirements of Section 6.1.5 of the Policy. (3) Enterococcus, fecal coliform, and total coliform samples do not exceed the objectives more than the 4% allowable frequency identified in Section 4.3 of the Listing Policy. (4) Pursuant to Section 4.11 of the Listing Policy, no additional data and information are available indicating that indicator bacteria standards are not met.

RWQCB Staff Recommendation: After review of the available data and information, North Coast Regional Water Board staff concludes that the water body-pollutant combination should be removed from the Section 303(d) List because applicable water quality standards for the pollutant are being attained.

SWRCB Board Decision / Staff Recommendation:

USEPA Decision:

Lines of Evidence (LOEs) for Decision ID 6414

LOE ID:	25303
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Water Contact Recreation
Number of Samples:	74
Number of Exceedances:	3
Data and Information Type:	Pathogen Monitoring
Data Used to Assess Water Quality:	Three of the 74 single samples of enterococcus collected at Salmon Creek State Park Beach exceed the objective. Additionally, one of the 16 30-day geomean values exceed the objective. The single sample and geomean values are two different matrices used Sonoma County Division of Environmental Health in accordance with AB411 (Chapter 765, Statutes of 1997) requirements. Data is maintained by the State Water Board's Beach Watch program. Data is summarized by the North Coast Regional Water Board (North Coast RWQCB 2007).
Data Reference:	<u>North Coast Beach Watch Data. Bacteria data collected by Del Norte County, Humboldt County, Mendocino County Environmental Health Division, Sonoma County Division of Environmental Health, and Marin County in accordance with AB411. Data managed by the State Water Resources Control Board's Beach Watch program at beachwatch.waterboards.ca.gov. Includes data from 2004 to 2006</u>
Water Quality Objective/Criterion:	Per the Ocean Plan (SWRCB 2005): The following bacterial objectives shall be maintained throughout the water column. The following standard is based on the 30-day geometric mean of the 5 most recent samples from each site: Enterococcus density shall not exceed 35 MPN per 100ml. The following standard is for the single sample maximum: Enterococcus density shall not exceed 104 per 100 ml. *Note: MPN is the most probable number of coliform units.
Objective/Criterion Reference:	<u>Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency</u>
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Salmon Creek State Park Beach.
Temporal Representation:	Samples were collected weekly from April to December 2005 and from April to October 2006.
Environmental Conditions:	Samples were collected during the dry season. Otherwise, there are no known environmental conditions (e.g., land use practices, fire events, storms, etc.) that are related to these data.
QAPP Information:	Samples were collected in accordance with the procedures described in "Environmental Health Policy and Procedure No. 00-1" (Krug 2000).
QAPP Information Reference(s):	<u>Environmental Health Policy and Procedure No. 00-1. Subject: Ocean Water Sampling Program Procedures. County of Sonoma Department of Health Services</u>

LOE ID:	25300
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Water Contact Recreation
Number of Samples:	74
Number of Exceedances:	2
Data and Information Type:	Pathogen Monitoring
Data Used to Assess Water Quality:	Two of the 74 single samples of fecal coliform collected at Salmon Creek State Park Beach exceed the objective. Additionally, none of the 16 30-day geomean values exceed the objective. The single sample and geomean values are two different matrices used Sonoma County Division of Environmental Health in accordance with AB411 (Chapter 765, Statutes of 1997) requirements. Data is maintained by the State Water Board's Beach Watch program. Data is summarized by the North Coast Regional Water Board (North Coast RWQCB 2007).
Data Reference:	<u>North Coast Beach Watch Data. Bacteria data collected by Del Norte County, Humboldt County, Mendocino County Environmental Health Division, Sonoma County Division of Environmental Health, and Marin County in accordance with AB411. Data managed by the State Water Resources Control Board's Beach Watch program at beachwatch.waterboards.ca.gov. Includes data from 2004 to 2006</u>
Water Quality Objective/Criterion:	Per the Ocean Plan (SWRCB 2005): The following bacterial objectives shall be maintained throughout the water column. The following standard is based on the 30-day geometric mean of the five most recent samples from each site: Fecal coliform density shall not exceed 200 MPN per 100 ml. The following standard is for the single sample maximum: Fecal coliform density shall not exceed 400 per 100ml. *Note: MPN is the most probable number of coliform units.
Objective/Criterion Reference:	<u>Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency</u>
Evaluation Guideline: Guideline Reference:	
Spatial Representation:	Samples were collected at Salmon Creek State Park Beach.
Temporal Representation:	Samples were collected weekly from April to December 2005 and from April to October 2006.
Environmental Conditions:	Samples were collected during the dry season. Otherwise, there are no known environmental conditions (e.g., land use practices, fire events, storms, etc.) that are related to these data.
QAPP Information:	Samples were collected in accordance with the procedures described in "Environmental Health Policy and Procedure No. 00-1" (Krug 2000).
QAPP Information Reference(s):	<u>Environmental Health Policy and Procedure No. 00-1. Subject: Ocean Water Sampling Program Procedures. County of Sonoma Department of Health Services</u>

LOE ID:	25304
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Water Contact Recreation
Number of Samples:	74
Number of Exceedances:	2
Data and Information Type:	Pathogen Monitoring
Data Used to Assess Water Quality:	Two of the 74 single samples of total coliform collected at Salmon Creek State Park Beach exceed the objective. Additionally, none of the 16 30-day geomean values exceed the objective. The single sample and geomean values are two different matrices used Sonoma County Division of Environmental Health in accordance with AB411 (Chapter 765, Statutes of 1997) requirements. Data is maintained by the State Water Board's Beach Watch program. Data is summarized by the North Coast Regional Water Board (North Coast RWQCB 2007).
Data Reference:	<u>North Coast Beach Watch Data. Bacteria data collected by Del Norte County, Humboldt County, Mendocino County Environmental Health Division, Sonoma County Division of Environmental Health, and Marin County in accordance with AB411. Data managed by the State Water Resources Control Board's Beach Watch program at beachwatch.waterboards.ca.gov. Includes data from 2004 to 2006</u>
Water Quality Objective/Criterion:	Per the Ocean Plan (SWRCB 2005): The following bacterial objectives shall be maintained throughout the water column. The following standard is based on the 30-day geometric mean of the five most recent samples from each site: Total coliform density shall not exceed 1,000 MPN per 100 ml. The following standard is for the single sample maximum: (i) Total coliform density shall not exceed 10,000 per 100 ml; and (ii) Total coliform density shall not exceed 1,000 per 100 ml when the fecal coliform/total coliform ratio exceeds 0.1. *Note: MPN is the most probable number of coliform units.
Objective/Criterion Reference:	<u>Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency</u>
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Salmon Creek State Park Beach.
Temporal Representation:	Samples were collected weekly from April to December 2005 and from April to October 2006.
Environmental Conditions:	Samples were collected during the dry season. Otherwise, there are no known environmental conditions (e.g., land use practices, fire events, storms, etc.) that are related to these data.
QAPP Information:	Samples were collected in accordance with the procedures described in "Environmental Health Policy and Procedure No. 00-1" (Krug 2000).
QAPP Information Reference(s):	<u>Environmental Health Policy and Procedure No. 00-1. Subject: Ocean Water Sampling Program Procedures. County of Sonoma Department of Health Services</u>

LOE ID: 345

Pollutant: Indicator Bacteria

LOE Subgroup: Pollutant-Water

Matrix: Water

Fraction: Total

Beneficial Use: Water Contact Recreation

Number of Samples: 123

Number of Exceedances: 10

Data and Information Type: Pathogen Monitoring

Type:

Data Used to Assess Water Quality: Available data indicate sufficient exceedances of bacterial indicator objectives. There were 10 out of 123 exceedances of the geometric mean for enterococci (USEPA, 2007).

Data Reference: Placeholder reference 2006 303(d)

Water Quality Objective/Criterion: Title 17 CCR. Section 7958 states: Based on a single sample, the density of bacteria in water from each sampling station at a public beach or public water contact sports area shall not exceed:

(A) 1,000 total coliform bacteria per 100 milliliters, if the ratio of fecal/total coliform bacteria exceeds 0.1; or

(B) 10,000 total coliform bacteria per 100 milliliters; or

(C) 400 fecal coliform bacteria per 100 milliliters; or

(D) 104 enterococcus bacteria per 100 milliliters.

Based on the mean of the logarithms of the results of at least five weekly samples during any 30-day sampling period, the density of bacteria in water from any sampling station at a public beach or public water contact sports area, shall not exceed:

(A) 1,000 total coliform bacteria per 100 milliliters; or

(B) 200 fecal coliform bacteria per 100 milliliters; or

(C) 35 enterococcus bacteria per 100 milliliters. (DHS, 1999)

Objective/Criterion Reference: Placeholder reference 2006 303(d)

Reference:

Evaluation Guideline:

Guideline Reference:

Spatial Representation: Station ID# SON50

Temporal Representation: 04/02/2001-10/24/2005

Environmental

Conditions:

QAPP Information: Data record: summers 2001-2005, Sonoma County Health Dept.

QAPP Information Reference(s):

WATER BODY NAME: EEL RIVER HU, LOWER EEL RIVER HA, EEL RIVER DELTA
Water Body ID: CAR1111103219980709182643
Water Body Type: River & Stream

DECISION ID 11850

Pollutant: OXYGEN, DISSOLVED
Final Listing Decision: List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status: Revised
Sources: Source Unknown
Expected TMDL: 2021
Completion Date:
Pollutant or Pollution: Pollutant

Weight of Evidence: Dissolved oxygen in the lower mainstem Eel River is being considered for placement on the Section 303(d) List under Section 3.2 of the Listing Policy. Under Section 3.2 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Thirty-seven out of 51 samples exceed the water quality objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the Section 303(d) List in the Water Quality Limited Segments category (i.e., sufficient justification to list).

This conclusion is based on the staff findings that: (1) The data used satisfies the data quality requirements of Section 6.1.4 of the Policy. (2) The data used satisfies the data quantity requirements of Section 6.1.5 of the Policy. (3) Thirty-seven of the 51 samples do not attain the dissolved oxygen objective, and this exceeds the allowable frequency listed in Table 3.2 of the Listing Policy. (4) Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

RWQCB Staff Recommendation: After review of the available data and information, North Coast RWQCB staff concludes that the water body-pollutant combination should be placed on the Section 303(d) List because applicable water quality standards are not attained and a pollutant contributes to or causes the problem.

SWRCB Board Decision / Staff Recommendation:

USEPA Decision:

Lines of Evidence (LOEs) for Decision ID 11850

LOE ID:	23454
Pollutant:	Oxygen, Dissolved
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Dissolved
Beneficial Use:	Cold Freshwater Habitat
Aquatic Life Use:	Estuarine Habitat Fish Migration Fish Spawning Preservation of Rare & Endangered Species Wildlife Habitat
Number of Samples:	51
Number of Exceedances:	37
Data and Information Type:	Physical/Chemical Monitoring
Data Used to Assess Water Quality:	Thirty-seven of the 52 minimum dissolved oxygen (DO) values calculated from samples collected in the Eel River Delta exceed the objectives. Data were divided into two categories, 1) no spawning and incubation occurring and 2) spawning and incubation occurring. Information on the timing of spawning and incubation for the Eel River was not readily available and thus information from the neighboring Russian River Watershed was used to determine periodicity (Steiner 1996). The minimum DO values when no spawning and incubation were occurring range from 2.71 mg/L to 11.85 mg/L (16 exceedances of the objective). Minimum DO values during times of spawning and incubation range from 4.77 mg/L to 10.39 mg/L (21 exceedances of the objective). Samples were collected by the Wiyot Tribe and data are summarized by the Tribe (Wiyot 2007).
Data Reference:	<u>A History of the Salmonid Decline in the Russian River Data for Dissolved Oxygen in McNulty Slough, December 2004 to December 2006, Table Bluff Reservation - Wiyot Tribe</u>
Water Quality Objective/Criterion:	Per the Basin Plan (NCRWQCB 2007): For waters not listed in Table 3-1 and where dissolved oxygen objectives are not prescribed the dissolved oxygen concentrations shall not be reduced below 7.0 mg/l for waters designated with the SPWN beneficial use, and shall not be reduced below 9.0 mg/l for waters designated with the SPWN beneficial use during critical spawning and egg incubation periods.
Objective/Criterion Reference:	<u>Water Quality Control Plan for the North Coast Region, North Coast Regional Water Quality Control Board</u>
Evaluation Guideline: Guideline Reference:	
Spatial Representation:	The samples were collected by the Wiyot Tribe at McNulty Slough. The site is on the seaward side of the tide gate located just south of McNulty Lane, adjacent to the old Wiyot Rancheria.
Temporal Representation:	The samples were collected every two weeks from December 2004 to December 2006. Samples were collected during mid and high tides. The sonde was deployed for approximately 15 minutes, with a 3-5 minute equilibration period and an 8-10 minute sample period with 4 second intervals. The minimum dissolved oxygen sample collected during the 8-10 minute sample period was used to determine exceedance of the objective.
Environmental Conditions:	There are no known environmental conditions (e.g., seasonality, land use practices, fire events, storms, etc.) that are related to these data.

QAPP Information: Samples were collected according to Wiyot Tribe's "Draft Quality Assurance Program Plan (QAPP) for Water Quality Assessment and Monitoring" (McKernan et al. 2004).

QAPP Information Reference(s): Draft Quality Assurance Program Plan (QAPP) for Water Quality Assessment and Monitoring, Table Bluff Reservation - Wiyot Tribe, Tribal Environmental Department, Prepared by Yurok Tribe Environmental Program, September 2004

WATER BODY NAME: EEL RIVER HU, MIDDLE FORK HA, WILDERNESS AND BLACK BUTTE HSAs

Water Body ID: CAR1117401120090128173104
Water Body Type: River & Stream

DECISION ID 16171

Pollutant: SEDIMENT

Final Listing Decision: Delist from 303(d) list (being addressed by USEPA approved TMDL)
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status: Revised
Reason for Delisting: State determines water quality standard is being met
TMDL Name: Middle Fork Eel River
TMDL Project Code: 82
Date TMDL Approved by USEPA: 12/31/2003
Pollutant or Pollution: Pollutant

Weight of Evidence: The entire Middle Fork Eel River Watershed was listed as sediment-impaired in 1994. The USEPA approved the "Middle Fork Eel River Total Maximum Daily Loads for Temperature and Sediment" in December 2003. For the 2008 303(d) List, the watershed was divided into an upper and lower section. The upper section includes the Wilderness HSA and the Black Butte River HSA. The lower section includes the Eden Valley HSA and the Round Valley HSA. This division was made in order to consider sediment data specific to individual HSAs.

Sediment in the Wilderness HSA and the Black Butte River HSA of the Middle Fork Eel River Watershed is being considered for removal from the Section 303(d) List under Section 4.11 of the Listing Policy. Two lines of evidence are available in the administrative record to assess this pollutant.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification for removing this water segment-pollutant combination from the Section 303(d) List (i.e., sufficient justification to de-list). This conclusion is based on the staff findings that:

- (1) The Middle Fork Eel River Total Maximum Daily Loads for Sediment and Temperature found that sediment TMDLs are equal to existing conditions in the Wilderness and Black Butte River HSAs, and load allocations are being achieved. The TMDLs are the estimate of the total amount of sediment that can be delivered to streams in the Middle Fork Eel River Watershed without exceeding applicable water quality standards. Therefore, the weight of evidence demonstrates that sediment-related water quality objectives are attained.
- (2) The data used satisfies the data quality requirements of Section 6.1.4 of the Policy.
- (3) The data used satisfies the data quantity requirements of Section 6.1.5 of the Policy.
- (4) Pursuant to Section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are not attained.

RWQCB Staff After review of the available data and information, North Coast RWQCB staff concludes

Recommendation: that the water body-pollutant combination should be removed from the Section 303(d) List because applicable water quality standards for the pollutant are being attained.

**SWRCB Board Decision
/ Staff Recommendation:**

USEPA Decision:

Lines of Evidence (LOEs) for Decision ID 16171

LOE ID: 26725

Pollutant: Sedimentation/Siltation

LOE Subgroup: Pollutant-Water

Matrix: Water

Fraction: None

Beneficial Use: Cold Freshwater Habitat

Number of Samples: 0

Number of Exceedances: 0

Data and Information Type: Not Specified

Data Used to Assess Water Quality: Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006..

Data Reference: Placeholder reference 2006 303(d)

Water Quality

Objective/Criterion:

Objective/Criterion Reference:

Evaluation Guideline:

Guideline Reference:

Spatial Representation:

Temporal Representation:

Environmental

Conditions:

QAPP Information: QA Info Missing

QAPP Information Reference(s):

LOE ID: 26729

Pollutant: Sediment

LOE Subgroup: Pollutant-Water

Matrix: -N/A

Fraction: None

Beneficial Use: Cold Freshwater Habitat

Aquatic Life Use: Fish Migration | Fish Spawning | Preservation of Rare & Endangered Species | Unknown | Warm Freshwater Habitat

Number of Samples: 1

Number of Exceedances: 0

Data and Information Type: Sediment analysis

Data Used to Assess Water Quality: Per the Middle Fork Eel River TMDLs for Sediment and Temperature (USEPA 2003), existing sediment loads within the Wilderness Hydrologic Subarea (HSA) and the Black Butte River HSA are equal to the TMDL, and load allocations are being achieved in these watersheds. Specifically, the existing sediment load of the Wilderness HSA is 420 tons/sq. mi/yr, which is the TMDL for the watershed. The existing sediment load of the Black Butte River HSA is 740 tons/sq. mi/yr, which is the TMDL for the watershed.

These estimates are based on the TMDL's sediment source analysis which combined information from (1) a landslide assessment based on aerial photograph analysis with some field-based quality control, and (2) a small sediment source survey primarily based on field assessments and rate estimates developed from other studies.

Data Reference: Middle Fork Eel River Total Maximum Daily Loads for Temperature and Sediment. U.S. Environmental Protection Agency Region IX

Water Quality Objective/Criterion: Per the Basin Plan (North Coast RWQCB 2007): The suspended sediment load and suspended sediment discharge rate of surface waters shall not be altered in such a manner as to cause nuisance or adversely affect beneficial uses.

Objective/Criterion Reference: Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board

Evaluation Guideline: Per the Middle Fork Eel River Total Maximum Daily Loads for Sediment and Temperature (USEPA 2003): The sediment TMDL is set equal to the loading capacity of the Middle Fork Eel River. It is the estimate of the total amount of sediment, from both natural and human-caused sources, that can be delivered to streams in the Middle Fork Eel River Watershed without exceeding applicable water quality standards. In the Upper Middle Fork Eel River Watershed (also known as the Wilderness Hydrologic Subarea), the TMDL is set at the existing load of 420 tons/sq. mi/yr. In the Black Butte River Watershed (also known as the Black Butte River Hydrologic Subarea), the TMDL is set at the existing load of 740 tons/sq. mi/yr.

Guideline Reference: Middle Fork Eel River Total Maximum Daily Loads for Temperature and Sediment. U.S. Environmental Protection Agency Region IX

Spatial Representation: The landslide assessment studied the entire Middle Fork Eel River Watershed. The small sediment source analysis was initially conducted on USFS lands only, then expanded to private lands in Round Valley, Elk Creek, and the Williams/Thatcher watersheds.

Temporal Representation: The landslide assessment utilized aerial photographs taken in 1952, 1969, 1979, 1981, 1993, and 1998. The small sediment source analysis was conducted in 2003.

Environmental Conditions: There are no known environmental conditions (e.g., seasonality, land use practices, fire events, storms, etc.) that are related to these data.

QAPP Information: The sediment source analysis used to estimate sediment delivery in the Middle Fork Eel River Watershed is found in the TMDL (USEPA 2003).

QAPP Information Reference(s): Middle Fork Eel River Total Maximum Daily Loads for Temperature and Sediment. U.S. Environmental Protection Agency Region IX

WATER BODY NAME: EEL RIVER HU, NORTH FORK HA,
UPPER NORTH FORK EEL RIVER WATERSHED

Water Body ID: CAR1115003020090129010733
Water Body Type: River & Stream

DECISION ID 16173

Pollutant: SEDIMENT

Final Listing Decision: Delist from 303(d) list (being addressed by USEPA approved TMDL)
Last Listing Cycle's Final Listing Decision: New Decision

Revision Status: Revised
Reason for Delisting: State determines water quality standard is being met
TMDL Name: Eel River, North Fork Sediment
TMDL Project Code: 662
Date TMDL Approved by USEPA: 12/30/2002
Pollutant or Pollution: Pollutant

Weight of Evidence: The entire North Fork Eel River Watershed was listed as sediment-impaired in 1994. The USEPA approved the "North Fork Eel River Total Maximum Daily Loads for Sediment and Temperature" on December 30, 2002. For the 2008 303(d) List, the watershed was divided into Upper and Lower sections. The Upper North Fork Eel River Watershed is the area of the North Fork Eel River Watershed that drains to the North Fork Eel River north of the Six Rivers National Forest boundary with the River. The Lower Watershed is the area that drains into the North Fork Eel River south of the Six Rivers National Forest boundary with the River. The division was made in order to consider sediment data specific to individual areas of the watershed.

Sediment in the Upper North Fork Eel River Watershed is being considered for removal from the Section 303(d) List under Section 4.11 of the Listing Policy. Two lines of evidence are available in the administrative record to assess this pollutant. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification for removing this water segment-pollutant combination from the Section 303(d) List (i.e., sufficient justification to de-list). This conclusion is based on the staff findings that:

- (1) The North Fork Eel River Total Maximum Daily Loads for Sediment and Temperature found that sediment load allocations are being achieved on USFS land. Total sediment loads are less than 125% of the natural sediment delivery (the total maximum daily load), which is the estimate of the total amount of sediment that can be delivered to streams in the North Fork Eel River Watershed without exceeding applicable water quality standards. Therefore, the weight of evidence demonstrates that sediment-related water quality objectives are attained.
- (2) The data used satisfies the data quality requirements of Section 6.1.4 of the Policy.
- (3) The data used satisfies the data quantity requirements of Section 6.1.5 of the Policy.
- (4) Pursuant to Section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are not attained.

RWQCB Staff Recommendation: After review of the available data and information, North Coast RWQCB staff concludes that the water body-pollutant combination should be removed from the

Section 303(d) List because applicable water quality standards for the pollutant are being attained.

**SWRCB Board Decision
/ Staff Recommendation:**

USEPA Decision:

Lines of Evidence (LOEs) for Decision ID 16173

LOE ID: 26734

Pollutant: Sediment
 LOE Subgroup: Adverse Biological Responses
 Matrix: Sediment
 Fraction: None

Beneficial Use: Cold Freshwater Habitat
 Aquatic Life Use: Fish Migration | Fish Spawning | Preservation of Rare & Endangered Species | Warm Freshwater Habitat | Wildlife Habitat

Number of Samples: 1
 Number of Exceedances: 0

Data and Information Type: Sediment analysis

Data Used to Assess Water Quality: For land managed by the U.S. Forest Service in the North Fork Eel River Watershed, the TMDL found that less than 125% of the natural sediment delivery is related to human activities, and load allocations are being achieved on USFS land. Specifically, the TMDL allows 20% of the total sediment delivery to be related to human activity, and only 10% of the sediment from landslides on USFS land is related to human activities and only 13% of sediment delivered to streams from USFS lands is related to human activities. These estimates are based on the TMDL's sediment source analysis which combined information from (1) the Northern Basin landslide analysis by Six Rivers National Forest (photo-based), (2) the Southern Basin landslide analysis by Pacific Watershed Associates (photo-based), and (3) the entire basin analysis of smaller sediment sources by Pacific Watershed Associates (field work-based).

Data Reference: [North Fork Eel River Total Maximum Daily Loads for Sediment and Temperature. U.S. Environmental Protection Agency Region IX](#)

Water Quality Objective/Criterion: Per the Basin Plan (North Coast RWQCB 2007): The suspended sediment load and suspended sediment discharge rate of surface waters shall not be altered in such a manner as to cause nuisance or adversely affect beneficial uses.

Objective/Criterion Reference: [Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board](#)

Evaluation Guideline: Per the North Fork Eel River Total Maximum Daily Loads for Sediment and Temperature (USEPA 2002): The TMDL is set equal to the loading capacity of the North Fork Eel River. It is the estimate of the total amount of sediment, from both natural and human-caused sources, that can be delivered to streams in the North Fork Eel River watershed without exceeding applicable water quality standards. The TMDL is set equal to 125% of natural sediment delivery. TMDL = Loading Capacity = 125% x 830 tons/sq. mi/yr = 1,038 tons/sq. mi/yr.

Guideline Reference: [North Fork Eel River Total Maximum Daily Loads for Sediment and Temperature. U.S. Environmental Protection Agency Region IX](#)

Spatial Representation: The landslide analysis by Six Rivers National Forest studied the area north of the Six Rivers National Forest boundary (at Wilburn Ranch). This includes USFS lands and nearby private lands. The landslide analysis by Pacific Watershed Associates studied the area south of the USFS boundary. This includes mainly private lands with some lands managed by the U.S. Bureau of Land Management. The small sediment source analysis by Pacific Watershed Associates studied the entire North Fork Eel River Watershed by measuring features on 43 randomly chosen locations and then extrapolating to the entire watershed.

Temporal Representation: The landslide analysis by Six Rivers National Forest mapped and quantified visible features from photos taken in 1944, 1960, 1975, 1990, and 1998. The small sources analysis by Pacific Watershed Associates estimated sediment yield for the period of 1960 to 2000.

Environmental Conditions: There are no known environmental conditions (e.g., seasonality, land use practices, fire events, storms, etc.) that are related to these data.

QAPP Information: The sediment source analysis used to estimate sediment delivery in the North Fork Eel River Watershed is found in the TMDL (USEPA 2002).

QAPP Information Reference(s): North Fork Eel River Total Maximum Daily Loads for Sediment and Temperature. U.S. Environmental Protection Agency Region IX

LOE ID: 26727

Pollutant: Sedimentation/Siltation

LOE Subgroup: Pollutant-Water

Matrix: Water

Fraction: None

Beneficial Use: Cold Freshwater Habitat

Number of Samples: 0

Number of Exceedances: 0

Data and Information Type: Not Specified

Type:

Data Used to Assess Water Quality: Unspecified—This LOE is a placeholder to support a 303(d) listing decision made prior to 2006.

Data Reference: Placeholder reference 2006 303(d)

Water Quality

Objective/Criterion:

Objective/Criterion Reference:

Evaluation Guideline:

Guideline Reference:

Spatial Representation:

Temporal Representation:

Environmental

Conditions:

QAPP Information: QA Info Missing

QAPP Information Reference(s):

WATER BODY NAME: EUREKA PLAIN HU, HUMBOLDT BAY
Water Body ID: CAB110000020020108173626
Water Body Type: Bay & Harbor

DECISION ID 6610

Pollutant: DIOXIN TOXIC EQUIVALENTS
Final Listing Decision: Do Not Delist from 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: List on 303(d) list (TMDL required list)(2006)
Revision Status Revised
Sources: Industrial Point Sources | Source Unknown | Waste Storage/Storage Tank Leaks (above ground)
Expected TMDL Completion Date: 2019
Pollutant or Pollution: Pollutant

Weight of Evidence: (A) Dioxin toxic equivalents in Humboldt Bay are being considered for removal from the Section 303(d) List under Sections 4.5 and 4.6 of the Listing Policy. Nine lines of evidence are available in the administrative record to access this pollutant. These lines of evidence are discussed in detail below:

(1) One of the lines of evidence (LOE 26439) is based on data compiled and assessed by the State Water Resources Control Board during the 2006 listing cycle and shows 14 out of 29 exceedances of the evaluation guideline used to interpret the water quality objective. Two lines of evidence (LOEs 21366 and 26044) are based on data assessed by the North Coast Regional Water Board during the current 2008 listing cycle and show 11 out of 41 exceedances of the evaluation guideline. Combined, there are 25 out of 70 exceedances of the evaluation guideline. The evaluation guideline is the dioxin toxic equivalent screening value for fish and shellfish tissue of 0.3 ng/kg by wet weight, which was developed by the Office of Environmental Health Hazard Assessment (Brodberg and Pollock 1999). The 0.3 ng/kg screening value is based on a low mean consumption value of fish of 21 g/day.

(2) Four lines of evidence (LOEs 21425, 21430, 21383, and 21427) analyze sediment data from Humboldt Bay in relation to the Marine Habitat Beneficial Use. These lines of evidence show that the Marine Habitat Beneficial Use is protected due to 9 out of 117 exceedances of the Canadian Sediment Quality Guideline used to interpret the toxicity water quality objective, which are within the number of exceedances acceptable for a waterbody to be delisted per Table 4.1 of the Listing Policy.

(3) The two remaining lines of evidence (LOEs 7810 and 21365) include data that are insufficient to make a decision regarding the dioxin impairment of Humboldt Bay. For LOE 7810, data could not be evaluated against the evaluation guideline as the data were presented in dry weight without a conversion factor, instead of wet weight. For LOE 21365, data quality was poor as information did not include sampling and analysis methods and quality assurance and control documents.

(B) Based on readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of continuing to place this water segment-pollutant combination on the Section 303(d) List in the Water Limited Segments category (i.e., sufficient justification to not de-list). This conclusion is based on the staff findings that:

(1) The data used satisfies the data quality requirements of Section 6.1.4 of the Policy in

all but one line of evidence (LOE 21365).

(2) The data used satisfies the data quantity requirements of Section 6.1.5 of the Policy.

(3) Combined, 25 out of 70 fish or shellfish tissue samples exceed the 0.3 ng/kg OEHHA screening value used to interpret the toxicity water quality objective for the protection of the Commercial and Sport Fishing Beneficial Use, and this exceeds the allowable frequency listed in Table 4.1 of the Listing Policy.

(4) Pursuant to Section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

RWQCB Staff Recommendation:

After review of the available data and information, North Coast RWQCB staff concludes that the water body-pollutant combination should not be removed from the Section 303(d) List because applicable water quality standards for the pollutant are being exceeded.

SWRCB Board Decision / Staff Recommendation:

USEPA Decision:

Lines of Evidence (LOEs) for Decision ID 6610

LOE ID:	26439
Pollutant:	Dioxin Toxic Equivalents
LOE Subgroup:	Pollutant-Tissue
Matrix:	Tissue
Fraction:	Dissolved
Beneficial Use:	Commercial or recreational collection of fish, shellfish, or organisms
Number of Samples:	29
Number of Exceedances:	14
Data and Information Type:	Not Specified
Data Used to Assess Water Quality:	This line of evidence (LOE) is a revision of LOE number 1 that was originally prepared by the State Water Resources Control Board for the 2006 303(d) List. The revision is necessary in order to state the proper evaluation guideline of 0.3 ng/kg instead of 3 ng/kg, and in order to provide references to the data used in the 2006 assessment.
Data Reference:	As analyzed by the State Water Board, 14 out of 29 samples exceed the evaluation guideline. Crab, mussel, oyster, and sculpin samples were taken in the North and South Bays from 3/24/02 to 10/25/02. Data was originally cited as coming from Smith (2006). Available data can be found in the spreadsheet prepared by the State Water Resources Control Board (SWRCB 2006). <u>Data for Dioxins and Furans in Humboldt Bay, March to October 2002. Compiled by the State Water Resources Control Board.</u>
Water Quality Objective/Criterion:	Per the Basin Plan (NCRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Objective/Criterion Reference:	<u>Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board</u>

Evaluation Guideline: Per the Office of Environmental Health Hazard Assessment (Brodberg and Pollack 1999): The dioxin toxic equivalent screening value for fish and shellfish tissue is 0.3 ng/kg by wet weight. It is appropriate for the 2,3,7,8-tetrachlorodibenzodioxin (TCDD) toxic equivalent concentration (TEQ) for mammals to be compared against this screening value. The TCDD equivalent is the sum of the concentrations of chlorinated dibenzodioxins (2,3,7,8-CDDs) and chlorinated dibenzofurans (2,3,7,8-CDFs) multiplied by their respective toxicity factors.

Guideline Reference: Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment

Spatial Representation: Two sample locations (Lappe S2) in the southern section of the Bay, south of the mouth, and 12 samples in the northern section of Humboldt Bay. Some samples taken in close proximity were averaged (pursuant to Section 6.1.5.2 of the Policy).

Temporal Representation: Samples were taken from 3/24/02 to 10/25/02.

Environmental Conditions:

QAPP Information: Sierra Pacific Industries Humboldt Bay.

QAPP Information Reference(s):

LOE ID: 7810

Pollutant: Dioxin Toxic Equivalents

LOE Subgroup: Pollutant-Tissue

Matrix: Tissue

Fraction: Not Recorded

Beneficial Use: Commercial or recreational collection of fish, shellfish, or organisms

Number of Samples: 4

Number of Exceedances: 0

Data and Information Type: Shellfish surveys

Data Used to Assess Water Quality: It is unknown if any of the 4 TCDD equivalent samples collected in Humboldt Bay exceed the evaluation guideline as data were presented as dry weight and the evaluation guideline is in wet weight. Since no conversion factor for calculating dry to wet weight was given in the data, the data could not be evaluated against the evaluation guideline. TCDD equivalent values range from 0.11 to 10.9 pg/g. TCDD equivalent values were analyzed from the tissue of the Bay Mussel (*Mytilus edulus*), a species endemic to Humboldt Bay. Samples were collected by Regional Water Board staff and data are summarized in a preliminary report (Rodriguez 1989).

Data Reference: Preliminary Report on Mussel Collections and Analyzes for Dioxins and Furans along the North Coast from the Mouth of San Francisco Bay to Crescent City. California Regional Water Quality Control Board, North Coast Region

Water Quality Objective/Criterion: Per the Basin Plan (NCRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.

Objective/Criterion Reference: Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board

Evaluation Guideline: Per the Office of Environmental Health Hazard Assessment (Brodberg and Pollack

Guideline Reference:	1999): The dioxin toxic equivalent screening value for fish and shellfish tissue is 0.3 ng/kg by wet weight. It is appropriate for the 2,3,7,8-tetracholorodibenzodioxin (TCDD) toxic equivalent concentration (TEQ) for mammals to be compared against this screening value. The TCDD equivalent is the sum of the concentrations of chlorinated dibenzodioxins (2,3,7,8-CDDs) and chlorinated dibenzofurans (2,3,7,8-CDFs) multiplied by their respective toxicity factors. <u>Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment</u>
Spatial Representation:	Samples were collected from 4 sites in Humboldt Bay as follows: (1) Mad River Slough Oyster Bed #1; (2) Bird Island West Side; (3) inside the North Jetty at the interface between the dolos and rock; and (4) in the Eureka Channel, Samoa Bridge pier, southeast side.
Temporal Representation:	One sample was collected from each site on June 5, 6, or 7, 1989.
Environmental Conditions:	There are no known environmental conditions (e.g., seasonality, land use practices, fire events, storm events, etc.) that may have impacted these data.
QAPP Information:	The procedures used to collect and analyze the data are summarized by Rodriguez (1989). No project specific quality control spikes or duplicates were collected due to funding constraints.
QAPP Information Reference(s):	<u>Preliminary Report on Mussel Collections and Analyzes for Dioxins and Furans along the North Coast from the Mouth of San Francisco Bay to Crescent City. California Regional Water Quality Control Board, North Coast Region</u>

LOE ID: 21365

Pollutant: Dioxin Toxic Equivalents

LOE Subgroup: Pollutant-Tissue

Matrix: Tissue

Fraction: Not Recorded

Beneficial Use: Commercial or recreational collection of fish, shellfish, or organisms

Number of Samples: 34

Number of Exceedances: 0

Data and Information Type: Shellfish surveys

Data Used to Assess Water Quality: None of the 34 shellfish tissue TCDD equivalent samples (wet weight) collected in Humboldt Bay exceed the evaluation guideline. The TCDD equivalent values range from 0 to 0.170 ng/kg. Samples were collected by the California Department of Health Services and data are summarized in their letter of March 3, 2006 (DHS 2006).

Data Reference: Letter from Michael F. Hernandez of the California Department of Health Services, Food and Drug Branch to Mary Middleton of Pacific Shellfish Institute dated March 3, 2006. State of California Health and Human Services Agency, Department of Health Services

Water Quality Objective/Criterion: Per the Basin Plan (NCRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.

Objective/Criterion Reference: Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board

Evaluation Guideline: Per the Office of Environmental Health Hazard Assessment (Brodberg and Pollack 1999): The dioxin toxic equivalent screening value for fish and shellfish tissue is 0.3

ng/kg by wet weight. It is appropriate for the 2,3,7,8-tetrachlorodibenzodioxin (TCDD) toxic equivalent concentration (TEQ) for mammals to be compared against this screening value. The TCDD equivalent is the sum of the concentrations of chlorinated dibenzodioxins (2,3,7,8-CDDs) and chlorinated dibenzofurans (2,3,7,8-CDFs) multiplied by their respective toxicity factors.

Guideline Reference: Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment

Spatial Representation: Samples were collected from 7 sites in the northern portion of Humboldt Bay, above Indian Island.

Temporal Representation: Data was collected April 15-18, 2002.

Environmental Conditions: There are no known environmental conditions (e.g., seasonality, land use practices, fire events, storm events, etc.) that may have impacted these data.

QAPP Information: The quality assurance and quality control measures used to collect the samples is unknown. Data were presented as TEQs for "dioxins in molluscan shellfish" and it is unknown which specific dioxin and/or furan congeners were present and used to calculate the TEQ.

QAPP Information Reference(s):

LOE ID: 21366

Pollutant: Dioxin Toxic Equivalents

LOE Subgroup: Pollutant-Tissue

Matrix: Tissue

Fraction: Not Recorded

Beneficial Use: Commercial or recreational collection of fish, shellfish, or organisms

Number of Samples: 25

Number of Exceedances: 11

Data and Information Type: Shellfish surveys

Data Used to Assess Water Quality: Eleven of the 25 shellfish tissue TCDD equivalent samples (wet weight) collected in Humboldt Bay exceed the evaluation guideline. The TCDD equivalent values range from 0.1 ng/kg to 4.3 ng/kg. Samples were collected by EnviroNet and ENVIRON on behalf of Sierra Pacific Industries, Arcata Division Sawmill in commercially grown oysters and mussels from Humboldt Bay. Data are summarized by EnviroNet and ENVIRON (2003).

Data Reference: Evaluation of the Results of Dioxin and Other Chemical Testing of Commercial Oyster Beds in Humboldt Bay, California From June and October 2002. Prepared by EnviroNet and ENVIRON for Sierra Pacific Industries

Water Quality Objective/Criterion: Per the Basin Plan (NCRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.

Objective/Criterion Reference: Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board

Evaluation Guideline: Per the Office of Environmental Health Hazard Assessment (Brodberg and Pollack 1999): The dioxin toxic equivalent screening value for fish and shellfish tissue is 0.3 ng/kg by wet weight. It is appropriate for the 2,3,7,8-tetrachlorodibenzodioxin (TCDD) toxic equivalent concentration (TEQ) for mammals to be compared against this screening value. The TCDD equivalent is the sum of the concentrations of

Guideline Reference:	chlorinated dibenzodioxins (2,3,7,8-CDDs) and chlorinated dibenzofurans (2,3,7,8-CDFs) multiplied by their respective toxicity factors. <u>Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment</u>
Spatial Representation:	Samples were collected from 10 sites in Humboldt Bay as follows: (1) at Coast Seafood, Inc., East Bay Bed 6-2; (2) at Coast Seafood, Inc., East Bay Bed 1-2; (3) at North Bay Shellfish Company Bed; (4) at North Bay Shellfish Company wet storage oyster; (5) at Coast Seafoods, Inc., Mad River Bed 7-1; (6) at Coast Seafoods, Inc., Mad River Bed 7-2; (7) at Coast Seafoods, Inc. Sand Island North Bed; (8) at Coast Seafoods, Inc., Sand Island North Bed 1-2; (9) at Coast Seafoods, Inc., Bird Island North Bed; and (10) at Coast Seafoods, Inc., Bird Island South Bed.
Temporal Representation:	Data was collected June 21 and October 21, 2002.
Environmental Conditions:	There are no known environmental conditions (e.g., seasonality, land use practices, fire events, storm events, etc.) that may have impacted these data.
QAPP Information:	Sampling and testing methods are described by EnvironNet and ENVIRON (2003). The TEQs were calculated using World Health Organization mammalian toxic equivalent factors from 1998. Non-detect data were represented using one half the congener-specific detection limit or estimated maximum possible concentrations reported by the laboratory.
QAPP Information Reference(s):	<u>Evaluation of the Results of Dioxin and Other Chemical Testing of Commercial Oyster Beds in Humboldt Bay, California From June and October 2002. Prepared by EnviroNet and ENVIRON for Sierra Pacific Industries</u>

LOE ID: 21425

Pollutant: Dioxin Toxic Equivalents

LOE Subgroup: Pollutant-Sediment

Matrix: Sediment

Fraction: Not Recorded

Beneficial Use: Marine Habitat

Number of Samples: 6

Number of Exceedances: 0

Data and Information Type: Chemical monitoring of sediments

Data Used to Assess Water Quality: None of the 6 sediment TCDD equivalent samples (dry weight) collected in Humboldt Bay exceeded the evaluation guideline. The TCDD equivalent values range from 0.01 ng/kg to 0.12 ng/kg. Samples were collected by Toxscan Inc. and Kinnetic Laboratories Inc. Data are summarized in the "Chemical Analysis, Toxicity Evaluation and Bioaccumulation Testing of Sediments from Humboldt Bay: Baseline Survey 1, Fiscal Year 1993" (Toxscan and Kinnetic 1994).

Data Reference: Chemical Analysis, Toxicity Evaluation and Bioaccumulation Testing of Sediment from Humboldt Bay: Baseline Survey I, Fiscal Year 1993. Final Report. Prepared for US. Army Engineering District San Francisco Corps of Engineers. Final Revision September 1994

Water Quality Objective/Criterion: Per the Basin Plan (NCRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.

Objective/Criterion Reference: Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board

Evaluation Guideline: Per the Canadian Sediment Quality Guidelines for the Protection of Aquatic Life (CCME 2001): The Interim Sediment Quality Guideline for polychlorinated dibenzo-p-dioxins and polychlorinated dibenzofurans is 0.85 ng/kg (dry weight) expressed on a toxic equivalent unit basis using toxic equivalent factors for fish.

Guideline Reference: Canadian Sediment Quality Guidelines for the Protection of Aquatic Life: Polychlorinated dioxins and furans (PCDD/Fs). In: Canadian Environmental Quality Guidelines, 1999, Canadian Council of Ministers of the Environment, Winnipeg. Excerpt from Publication No. 1299; ISBN1-896997-34-1

Spatial Representation: Composite samples were collected at 3 sites in Humboldt Bay, as follows: (1) at Eureka Upper Channel, (2) at Samoa Turning Basin, and (3) at Fields Landing Lower Channel and Turning Basin.

Temporal Representation: Samples were collected October 30 to November 1, 1992.

Environmental Conditions: There are no known environmental conditions (e.g., seasonality, land use practices, fire events, storms, etc.) that are related to these data.

QAPP Information: Quality control was conducted as specified in Toxscan Inc. and Kinnetic Laboratories Inc. (1994).

QAPP Information Reference(s): Chemical Analysis, Toxicity Evaluation and Bioaccumulation Testing of Sediment from Humboldt Bay: Baseline Survey I, Fiscal Year 1993. Final Report. Prepared for U.S. Army Engineering District San Francisco Corps of Engineers. Final Revision September 1994

LOE ID: 21427

Pollutant: Dioxin Toxic Equivalents

LOE Subgroup: Pollutant-Sediment

Matrix: Sediment

Fraction: Not Recorded

Beneficial Use: Marine Habitat

Number of Samples: 6

Number of Exceedances: 0

Data and Information Type: Chemical monitoring of sediments

Data Used to Assess Water Quality: None of the 6 sediment TCDD equivalent samples (dry weight) collected in Humboldt Bay exceeded the evaluation guideline. The TCDD equivalent values range from 0.01 ng/kg to 0.17 ng/kg. Samples were collected by Toxscan Inc. and Kinnetic Laboratories Inc. Data are summarized in the "Chemical Analysis, Toxicity Evaluation and Bioaccumulation Exposure of Sediments from Humboldt Bay: Baseline Survey II, Fiscal Year 1994" (Toxscan and Kinnetic 1994).

Data Reference: Chemical Analysis, Toxicity Evaluation and Bioaccumulation Exposure of Sediments from Humboldt Bay: Baseline Survey II, Fiscal Year 1994. Final Report. Prepared for U.S. Army Engineering District San Francisco Corps of Engineers. November 1994

Water Quality Objective/Criterion: Per the Basin Plan (NCRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.

Objective/Criterion Reference: Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board

Evaluation Guideline: Per the Canadian Sediment Quality Guidelines for the Protection of Aquatic Life (CCME 2001): The Interim Sediment Quality Guideline for polychlorinated dibenzo-p-

Guideline Reference: dioxins and polychlorinated dibenzofurans is 0.85 ng/kg (dry weight) expressed on a toxic equivalent unit basis using toxic equivalent factors for fish.
Canadian Sediment Quality Guidelines for the Protection of Aquatic Life: Polychlorinated dioxins and furans (PCDD/Fs). In: Canadian Environmental Quality Guidelines, 1999, Canadian Council of Ministers of the Environment, Winnipeg. Excerpt from Publication No. 1299: ISBN1-896997-34-1

Spatial Representation: Composite samples were collected at 3 sites in Humboldt Bay, as follows: (1) at Eureka Upper Channel, (2) at Samoa Turning Basin, and (3) at Fields Landing Lower Channel and Turning Basin.

Temporal Representation: Samples were collected April 1 and 2, 1994.

Environmental Conditions: There are no known environmental conditions (e.g., seasonality, land use practices, fire events, storms, etc.) that are related to these data.

QAPP Information: Quality control was conducted as specified in Toxscan Inc. and Kinnetic Laboratories Inc. (1994).

QAPP Information Reference(s): Chemical Analysis, Toxicity Evaluation and Bioaccumulation Exposure of Sediments from Humboldt Bay: Baseline Survey II, Fiscal Year 1994. Final Report. Prepared for U.S. Army Engineering District San Francisco Corps of Engineers. November 1994

LOE ID: 21382

Pollutant: Dioxin Toxic Equivalents

LOE Subgroup: Pollutant-Sediment

Matrix: Sediment

Fraction: Not Recorded

Beneficial Use: Marine Habitat

Number of Samples: 45

Number of Exceedances: 9

Data and Information Type: Physical/Chemical Monitoring

Data Used to Assess Water Quality: Nine of the 45 sediment TCDD equivalent samples (dry weight) collected in Humboldt Bay exceeded the evaluation guideline. The TCDD equivalent values range from <0.0002 ng/kg to 4.8 ng/kg. Samples were collected by the Soil/Water/Air Protection Enterprise (SWAPE), and data are summarized in the SWAPE attachment to Humboldt Baykeeper's letter of February 28, 2007 (Humboldt Baykeeper 2007).

Data Reference: Letter from Michelle D. Smith of Humboldt Baykeeper to Bruce Gwynne of the North Coast Regional Water Quality Control Board dated February 28, 2007, regarding Data Solicitation, 2008 Clean Water Act 303(d) List of Impaired Waters

Water Quality Objective/Criterion: Per the Basin Plan (NCRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.

Objective/Criterion Reference: Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board

Evaluation Guideline: Per the Canadian Sediment Quality Guidelines for the Protection of Aquatic Life (CCME 2001): The Interim Sediment Quality Guideline for polychlorinated dibenzo-p-dioxins and polychlorinated dibenzofurans is 0.85 ng/kg (dry weight) expressed on a toxic equivalent unit basis using toxic equivalent factors for fish.

Guideline Reference: Canadian Sediment Quality Guidelines for the Protection of Aquatic Life: Polychlorinated dioxins and furans (PCDD/Fs). In: Canadian Environmental Quality Guidelines, 1999, Canadian Council of Ministers of the Environment, Winnipeg.

Excerpt from Publication No. 1299; ISBN1-896997-34-1

Spatial Representation: Samples were collected at 3 sites in Humboldt Bay, as follows: 2 sites in the mud flats of Humboldt Bay (S-8 & S-9), and 1 site in Hookton Slough (S-10).

Temporal Representation: Samples collected April 18, 2006.

Environmental Conditions: There are no known environmental conditions (e.g., seasonality, land use practices, fire events, storms, etc.) that are related to these data.

QAPP Information: Quality control was conducted in accordance with the Soil/Water/Air Protection Enterprise's "Sampling and Analysis Plan" (Humboldt Baykeeper 2006).

QAPP Information Reference(s): Letter from Michelle D. Smith of Humboldt Baykeeper to Bruce Gwynne of the North Coast Regional Water Quality Control Board dated February 28, 2007, regarding Data Solicitation, 2008 Clean Water Act 303(d) List of Impaired Waters

LOE ID: 21430

Pollutant: Dioxin Toxic Equivalents

LOE Subgroup: Pollutant-Sediment

Matrix: Sediment

Fraction: Not Recorded

Beneficial Use: Marine Habitat

Number of Samples: 60

Number of Exceedances: 0

Data and Information Type: Chemical monitoring of sediments

Data Used to Assess Water Quality: None of the 60 sediment TCDD equivalent samples (dry weight) collected in Humboldt Bay exceeded the evaluation guideline. The TCDD equivalent values range from 0.001 ng/kg to 0.75 ng/kg. Samples were collected by Toxscan Inc. and Kinetic Laboratories Inc. Data are summarized in the "Chemical Analysis, Toxicity Evaluation and Bioaccumulation Exposure of Sediments from Humboldt Bay: Baseline Survey III, Fiscal Year 1995" (Toxscan and Kinetic 1996).

Data Reference: Chemical Analysis, Toxicity Evaluation and Bioaccumulation Exposure of Sediments from Humboldt Bay: Baseline Survey III, Fiscal Year 1995. Final Report. Prepared for: U.S. Army Engineering District San Francisco Corps of Engineers. February 1996

Water Quality Objective/Criterion: Per the Basin Plan (NCRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.

Objective/Criterion Reference: Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board

Evaluation Guideline: Per the Canadian Sediment Quality Guidelines for the Protection of Aquatic Life (CCME 2001): The Interim Sediment Quality Guideline for polychlorinated dibenzo-p-dioxins and polychlorinated dibenzofurans is 0.85 ng/kg (dry weight) expressed on a toxic equivalent unit basis using toxic equivalent factors for fish.

Guideline Reference: Canadian Sediment Quality Guidelines for the Protection of Aquatic Life: Polychlorinated dioxins and furans (PCDD/Fs). In: Canadian Environmental Quality Guidelines, 1999, Canadian Council of Ministers of the Environment, Winnipeg. Excerpt from Publication No. 1299; ISBN1-896997-34-1

Spatial Representation: Composite samples were collected at 4 sites in Humboldt Bay, as follows: (1) at Eureka Upper Channel, (2) at Samoa Turning Basin, (3) at Fields Landing Lower Channel and Turning Basin, and (4) at Eureka Upper Channel Extension.

Temporal Representation: Samples were collected April 1 to 4, 1995.
 Environmental Conditions: There are no known environmental conditions (e.g., seasonality, land use practices, fire events, storms, etc.) that are related to these data.
 QAPP Information: Quality control was conducted as specified in Toxscan Inc. and Kinnetic Laboratories Inc. (1996). Although it is not specified if dioxin data is reported in dry or wet weight, EPA Method 8290 dictates reporting as dry weight, and it is thus assumed that all dioxin data are in dry weight.
 QAPP Information Reference(s): Chemical Analysis, Toxicity Evaluation and Bioaccumulation Exposure of Sediments from Humboldt Bay: Baseline Survey III, Fiscal Year 1995. Final Report. Prepared for: U.S. Army Engineering District San Francisco Corps of Engineers. February 1996

LOE ID: 26044

Pollutant: Dioxin Toxic Equivalents
 LOE Subgroup: Pollutant-Tissue
 Matrix: Tissue
 Fraction: Fish fillet

Beneficial Use: Commercial or recreational collection of fish, shellfish, or organisms

Number of Samples: 16
 Number of Exceedances: 0

Data and Information Type: Fish tissue analysis

Data Used to Assess Water Quality: None of the 16 fish tissue TCDD equivalent samples (wet weight) collected in Mad River Slough exceed the evaluation guideline. The TCDD equivalent values range from 0.03 ng/kg to 0.29 ng/kg. Samples were collected by Geomatrix on behalf of Sierra Pacific Industries, Arcata Division Sawmill as fish fillets. Data are summarized by Geomatrix (2006).

Data Reference: Revised Supplement to Scoping Ecological and Off-site Human Health Risk Assessment. Sierra Pacific Industries. Arcata Division Sawmill. Arcata, CA. Project No. 9329.000, Task 20

Water Quality Objective/Criterion: Per the Basin Plan (NCRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.

Objective/Criterion Reference: Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board

Evaluation Guideline: Per the Office of Environmental Health Hazard Assessment (Brodberg and Pollack 1999): The dioxin toxic equivalent screening value for fish and shellfish tissue is 0.3 ng/kg by wet weight. It is appropriate for the 2,3,7,8-tetrachlorodibenzodioxin (TCDD) toxic equivalent concentration (TEQ) for mammals to be compared against this screening value. The TCDD equivalent is the sum of the concentrations of chlorinated dibenzodioxins (2,3,7,8-CDDs) and chlorinated dibenzofurans (2,3,7,8-CDFs) multiplied by their respective toxicity factors.

Guideline Reference: Prevalence of Selected Target Chemical Contaminants in Sport Fish From Two California Lakes: Public health designed screening study. Sacramento, CA: Office of Environmental Health Hazard Assessment

Spatial Representation: Samples were collected from 15 sites in the Mad River Slough, which drains to Humboldt Bay.

Temporal Representation: Data was collected between March 16, 2005 and May 10, 2005.

Environmental: There are no known environmental conditions (e.g., seasonality, land use practices, fire

Conditions: events, storm events, etc.) that may have impacted these data.

QAPP Information: Sampling and testing methods are described by Geomatrix (2006). The TEQs were calculated using World Health Organization mammalian toxic equivalent factors (2003), but were updated to the WHO 2005 values by Regional Water Board Staff.

QAPP Information Reference(s): Revised Supplement to Scoping Ecological and Off-site Human Health Risk Assessment. Sierra Pacific Industries. Arcata Division Sawmill. Arcata, CA. Project No. 9329.000, Task 20

WATER BODY NAME:	COPCO LAKE
Water Body ID:	CAL1053802120020720133912
Water Body Type:	Lake & Reservoir

DECISION ID	13972
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Pollutant:	CYANOBACTERIA HEPATOTOXIC MICROCYSTINS
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Final Listing Decision:	Do Not Delist from 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision:	New Decision

Revision Status	Revised
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Sources:	Agriculture Dam Construction Drainage/Filling Of Wetlands Flow Regulation/Modification Habitat Modification Hydromodification Internal Nutrient Cycling (primarily lakes) Source Unknown
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Expected TMDL Completion Date:	2019
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Pollutant or Pollution:	Pollutant
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Weight of Evidence: This pollutant was added to the Section 303(d) List on May 29, 2008, by the US EPA as part of the 2006 303(d) List Update process, which applies to the mainstem Klamath River in the Klamath River Hydrologic Unit, Middle Klamath River Hydrologic Area, Oregon to Iron Gate reach, excluding the riverine reach from the Oregon border downstream to the beginning of Copco 1 Reservoir (i.e., the mainstem Klamath River from the beginning of Copco 1 Reservoir to Iron Gate Dam). This listing applies to the Copco I and Copco II Reservoirs.

This pollutant is being considered for removal from the Section 303(d) List under Section 4.11 of the Listing Policy. Two lines of evidence are available in the administrative record to assess this pollutant.

Microcystins are a class of toxic chemicals produced by some strains of the cyanobacteria *Microcystis aeruginosa* that are released into waters when cyanobacterial cells die or cell membranes degrade. These chemicals are a human health risk, capable of inducing skin rashes, sore throat, oral blistering, nausea, gastroenteritis, fever, and liver toxicity. Routes of exposure for human health include dermal contact, ingestion of water, and ingestion of tissue (fish or shellfish). For animals, exposures of concern include ingestion of water and tissue.

Based on the readily available data and information, the situation-specific weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the Section 303(d) List in the Water Quality Limited Segments category (i.e., sufficient justification to not de-list). This conclusion is based on the staff findings that: (1) On May 29, 2008, the US EPA identified the portion of the "Klamath River Hydrologic Unit (HU), Middle HA Hydrologic Area (HA), from Oregon to Iron Gate [reservoir]" that is impaired due to microcystin toxins as the area including the Copco 1 and 2 reservoirs, Iron Gate Reservoir, and waters in between. (2) Twenty-one out of 22 tissue microcystin toxin samples and 4 out of 13 water column microcystin toxin samples exceed the evaluation guidelines used to interpret the water quality objective. (3) Any exceedance of the evaluation guidelines indicates non-attainment of standards. In compliance with Section 4.11 of the Listing Policy, a water segment shall not be removed from the Section 303(d) List if the weight of evidence indicates non-attainment. (4) The data used satisfies the data quality requirements of Section 6.1.4 of the Policy. (5) The data used satisfies the data quantity requirements of Section 6.1.5 of the Policy. (6) Pursuant to Section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are

met.

RWQCB Staff Recommendation: After review of the available data and information, North Coast RWQCB staff concludes that the water body-pollutant combination should not be removed from the Section 303(d) List because applicable water quality standards for the pollutant are being exceeded.

SWRCB Board Decision / Staff Recommendation:

USEPA Decision:

Lines of Evidence (LOEs) for Decision ID 13972

LOE ID: 25754

Pollutant: Cyanobacteria hepatotoxic microcystins

LOE Subgroup: Pollutant-Tissue

Matrix: Tissue

Fraction: Fish whole body

Beneficial Use: Commercial or recreational collection of fish, shellfish, or organisms

Number of Samples: 22

Number of Exceedances: 21

Data and Information Type: Fish tissue analysis

Data Used to Assess Water Quality: Twenty-one out of the 22 microcystin samples analyzed from the tissue of perch collected from Copco I Reservoir exceed the evaluation guideline. Sample concentrations range from 0.00 to 473.39 ng/g. Nineteen of the tissue samples were collected from perch fillet, and 3 were collected from perch liver. Fish samples were collected by the California Department of Fish and Game (CDFG) and analyzed for microcystin by the CDFG Fish and Wildlife Water Pollution Control Laboratory in Rancho Cordova, CA. Data are summarized by Kann (2008). The presence of the toxin microcystin in fish and mussels in the Klamath River has the potential to impair the Native American Culture (CUL) and Subsistence Fishing (FISH) beneficial uses, as well as the Commercial and Sport Fishing (COMM) beneficial use listed above.

Data Reference: Technical Memorandum. Microcystin Bioaccumulation in Klamath River Fish and Freshwater Mussel Tissue: Preliminary 2007 Results. Prepared by Jacob Kann, Ph.D. of Aquatic Ecosystem Sciences LLC. Prepared for Karuk Tribe of California.

Water Quality Objective/Criterion: Per the Basin Plan (North Coast RWQCB 2007): All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Water Board.

Objective/Criterion Reference: Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board

Evaluation Guideline: Per the California Office of Environmental Health Hazard Assessment (OEHHA) (Alexeeff 2008): The upper bound of the Advisory Tissue Level range for the one serving (8 oz. uncooked fish, 6 oz. cooked, equal to 32 g/day) per week category is 26 ng total microcystins per gram of fish (26 ng/g). This Advisory Tissue Level applies to

Guideline Reference: a composite of 3 or more individual samples of edible tissue.
Letter of August 6, 2008, to Randy Landolt, Managing Director, PacifiCorp Energy, from George V. Alexeeff, PhD, DABT, Deputy Director for Scientific Affairs, California Office of Environmental Health Hazard Assessment, regarding information related to the occurrence of microcystin in the tissues of Klamath River biota

Spatial Representation: Yellow perch samples were collected from Copco I Reservoir.
 Temporal Representation: Samples were collected September 6 to 7, 2007.
 Environmental Conditions: There are no known environmental conditions (e.g., seasonality, land use practices, fire events, storms, etc.) that are related to these data.
 QAPP Information: Samples were collected and analyzed in accordance with the quality assurance procedures described in the "Technical Memorandum. Microcystin Bioaccumulation in Klamath River Fish and Freshwater Mussel Tissue: Preliminary 2007 Results" (Kann 2008).
 QAPP Information Reference(s): Technical Memorandum. Microcystin Bioaccumulation in Klamath River Fish and Freshwater Mussel Tissue: Preliminary 2007 Results. Prepared by Jacob Kann, Ph.D. of Aquatic Ecosystem Sciences LLC. Prepared for Karuk Tribe of California.

LOE ID: 26004

Pollutant: Cyanobacteria hepatotoxic microcystins

LOE Subgroup: Pollutant-Water

Matrix: Water

Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 13

Number of Exceedances: 4

Data and Information Type: Physical/Chemical Monitoring

Data Used to Assess Water Quality: Four of the 13 microcystin samples collected in Copco I Reservoir in 2008 exceed the evaluation guideline. Microcystin concentrations ranged from non-detect to 14,000 ug/L. Samples were collected and summarized by the Karuk Tribe of California (Karuk 2008 - data).

Data Reference: Karuk Tribe 2008 BGA Data (KR TOX Table 2008). Data for Blue Green Algae in the Klamath River, July 2008 to September 2008

Water Quality Objective/Criterion: Per the Basin Plan (NCRWQCB 2007): All water shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Water Board.

Objective/Criterion Reference: Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board

Evaluation Guideline: Per the Blue Green Algae Work Group (2008): The guideline for microcystin toxin is 8 ug/l to protect the recreational exposure of a child.

Guideline Reference: Cyanobacteria in California Recreational Water Bodies. Providing Voluntary Guidance about Harmful Algal Blooms, Their Monitoring, and Public Notification. Draft. September 2008. Blue Green Algae Work Group of the State Water Resources Control Board, Department of Public Health, and Office of Environmental Health and Hazard Assessment

Spatial Representation: Samples were collected from 3 locations in Copco Reservoir as follows: (1) in the open water near the dam, (2) in Copco Cove, and (3) in Mallard Cove.

Temporal Representation: Grab samples were collected in Copco I Reservoir on 13 occasions between July 2, 2008 and September 3, 2008.

Environmental Conditions: There are no known environmental conditions (e.g., seasonality, land use practices, fire events, storms, etc.) that are related to these data.

QAPP Information: Samples were collected according to the procedures summarized in the "Draft Klamath River Nutrient, Periphyton, Phytoplankton and Algal Toxin Sampling Analysis Plan" (Karuk 2008-MonitoringPlan).

QAPP Information Reference(s): Draft Klamath River Nutrient, Periphyton, Phytoplankton and Algal Toxin Sampling Analysis Plan (SAP). Karuk Tribe of California Water Quality Program.

WATER BODY NAME: IRON GATE RESERVOIR
Water Body ID: CAL1053702320020720133707
Water Body Type: Lake & Reservoir

DECISION ID 13973

Pollutant: CYANOBACTERIA HEPATOTOXIC MICROCYSTINS

Final Listing Decision: Do Not Delist from 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: New Decision

Revision Status: Revised

Sources: Agriculture | Dam Construction | Drainage/Filling Of Wetlands | Flow Regulation/Modification | Habitat Modification | Hydromodification | Internal Nutrient Cycling (primarily lakes) | Source Unknown

Expected TMDL Completion Date: 2019

Pollutant or Pollution: Pollutant

Weight of Evidence: This pollutant was added to the Section 303(d) List on May 29, 2008, by the US EPA as part of the 2006 303(d) List Update process, which applies to the mainstem Klamath River in the Klamath River Hydrologic Unit, Middle Klamath River Hydrologic Area, Oregon to Iron Gate reach, excluding the riverine reach from the Oregon border downstream to the beginning of Copco 1 Reservoir (i.e., the mainstem Klamath River from the beginning of Copco 1 Reservoir to Iron Gate Dam). This listing applies to the Iron Gate Reservoir.

This pollutant is being considered for removal from the Section 303(d) List under Section 4.11 of the Listing Policy. Two lines of evidence are available in the administrative record to assess this pollutant.

Microcystins are a class of toxic chemicals produced by some strains of the cyanobacteria *Microcystis aeruginosa* that are released into waters when cyanobacterial cells die or cell membranes degrade. These chemicals are a human health risk, capable of inducing skin rashes, sore throat, oral blistering, nausea, gastroenteritis, fever, and liver toxicity. Routes of exposure for human health include dermal contact, ingestion of water, and ingestion of tissue (fish or shellfish). For animals, exposures of concern include ingestion of water and tissue.

Based on the readily available data and information, the situation-specific weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the Section 303(d) List in the Water Quality Limited Segments category (i.e., sufficient justification to not de-list). This conclusion is based on the staff findings that:

- (1) On May 29, 2008, the US EPA identified the portion of the "Klamath River Hydrologic Unit (HU), Middle HA Hydrologic Area (HA), from Oregon to Iron Gate [reservoir]" that is impaired due to microcystin toxins as the area including the Copco 1 and 2 reservoirs, Iron Gate Reservoirs, and waters in between.
- (2) Eight out of 25 tissue microcystin toxin samples and 10 out of 14 water column microcystin toxin samples exceed the evaluation guidelines used to interpret the water quality objective.
- (3) Any exceedance of the evaluation guidelines indicates non-attainment of standards. In compliance with Section 4.11 of the Listing Policy, a water segment shall not be

removed from the Section 303(d) List if the weight of evidence indicates non-attainment.

(4) The data used satisfies the data quality requirements of Section 6.1.4 of the Policy.

(5) The data used satisfies the data quantity requirements of Section 6.1.5 of the Policy.

(6) Pursuant to Section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

RWQCB Staff Recommendation:

After review of the available data and information, North Coast RWQCB staff concludes that the water body-pollutant combination should not be removed from the Section 303(d) List because applicable water quality standards for the pollutant are being exceeded.

SWRCB Board Decision / Staff Recommendation:

USEPA Decision:

Lines of Evidence (LOEs) for Decision ID 13973

LOE ID:	26006
Pollutant:	Cyanobacteria hepatotoxic microcystins
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	14
Number of Exceedances:	10
Data and Information Type:	Physical/Chemical Monitoring
Data Used to Assess Water Quality:	Ten of the 14 microcystin samples collected in Iron Gate Reservoir exceed the evaluation guideline. Microcystin concentrations range from non-detect to 1,600 ug/L. Samples were collected and summarized by the Karuk Tribe of California (Karuk 2008 - data).
Data Reference:	<u>Karuk Tribe 2008 BGA Data (KR TOX Table 2008). Data for Blue Green Algae in the Klamath River, July 2008 to September 2008</u>
Water Quality Objective/Criterion:	Per the Basin Plan (NCRWQCB 2007, p. 3-4.00): All water shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Water Board.
Objective/Criterion Reference:	<u>Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board</u>
Evaluation Guideline:	Per the Blue Green Algae Work Group (2008): The guideline for microcystin toxin is 8 ug/l to protect the recreational exposure of a child.
Guideline Reference:	<u>Cyanobacteria in California Recreational Water Bodies. Providing Voluntary Guidance</u>

about Harmful Algal Blooms, Their Monitoring, and Public Notification. Draft, September 2008. Blue Green Algae Work Group of the State Water Resources Control Board, Department of Public Health, and Office of Environmental Health and Hazard Assessment

Spatial Representation: Samples were collected from 6 locations in Iron Gate Reservoir as follows: (1) in the open water near the dam, (2) at the Camp Creek Recreation Area, (3) at the Jay Williams Boat Dock, (4) at the Narrows, (5) in the open water scum, and (6) at the Spring Hill Boat Ramp.

Temporal Representation: Grab samples were collected in Iron Gate Reservoir on 14 occasions between July 8, 2008 and September 2, 2008.

Environmental Conditions: There are no known environmental conditions (e.g., seasonality, land use practices, fire events, storms, etc.) that are related to these data.

QAPP Information: Samples were collected according to the procedures summarized in the "Draft Klamath River Nutrient, Periphyton, Phytoplankton and Algal Toxin Sampling Analysis Plan" (Karuk 2008-MonitoringPlan).

QAPP Information Reference(s): Draft Klamath River Nutrient, Periphyton, Phytoplankton and Algal Toxin Sampling Analysis Plan (SAP). Karuk Tribe of California Water Quality Program.

LOE ID: 25755

Pollutant: Cyanobacteria hepatotoxic microcystins

LOE Subgroup: Pollutant-Tissue

Matrix: Tissue

Fraction: Fish whole body

Beneficial Use: Commercial or recreational collection of fish, shellfish, or organisms

Number of Samples: 25

Number of Exceedances: 8

Data and Information Type: Fish tissue analysis

Data Used to Assess Water Quality: Eight out of 25 microcystin samples collected from fish tissue from Iron Gate Reservoir and Iron Gate Hatchery exceed the evaluation guideline. Sample concentrations range from 0.00 to 229.37 ng/g. Tissue samples were collected from 22 yellow perch fillet samples from Iron Gate Reservoir and from 3 yearling fall Chinook liver, stomach, and fillet samples from Iron Gate Hatchery. It is appropriate to include the Iron Gate Hatchery samples as the Chinook raised at the Hatchery were raised in water directly from Iron Gate Reservoir. Fish samples were collected by the California Department of Fish and Game (CDFG) and analyzed for microcystin by the CDFG Fish and Wildlife Water Pollution Control Laboratory in Rancho Cordova, CA. Data are summarized by Kann (2008). The presence of the toxin microcystin in fish and mussels in the Klamath River has the potential to impair the Native American Culture (CUL) and Subsistence Fishing (FISH) beneficial uses, as well as the Commercial and Sport Fishing (COMM) beneficial use listed above.

Data Reference: Technical Memorandum. Microcystin Bioaccumulation in Klamath River Fish and Freshwater Mussel Tissue: Preliminary 2007 Results. Prepared by Jacob Kann, Ph.D. of Aquatic Ecosystem Sciences LLC. Prepared for Karuk Tribe of California.

Water Quality Objective/Criterion: Per the Basin Plan (North Coast RWQCB 2007): All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or

Objective/Criterion Reference:	other appropriate methods as specified by the Regional Water Board. <u>Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board</u>
Evaluation Guideline:	Per the California Office of Environmental Health Hazard Assessment (OEHHA) (Alexeeff 2008): The upper bound of the Advisory Tissue Level range for the one serving (8 oz. uncooked fish, 6 oz. cooked, equal to 32 g/day) per week category is 26 ng total microcystins per gram of fish (26 ng/g). This Advisory Tissue Level applies to a composite of 3 or more individual samples of edible tissue.
Guideline Reference:	<u>Letter of August 6, 2008, to Randy Landolt, Managing Director, PacifiCorp Energy, from George V. Alexeeff, PhD, DABT, Deputy Director for Scientific Affairs, California Office of Environmental Health Hazard Assessment, regarding information related to the occurrence of microcystin in the tissues of Klamath River biota</u>
Spatial Representation:	Yellow perch samples were collected from Iron Gate Reservoir. Chinook tissue samples were collected from Iron Gate Hatchery.
Temporal Representation:	Samples from Iron Gate Reservoir were collected September 6 to 7, 2007. Samples from the Hatchery were collected on July 13, 2007.
Environmental Conditions:	There are no known environmental conditions (e.g., seasonality, land use practices, fire events, storms, etc.) that are related to these data.
QAPP Information:	Samples were collected and analyzed in accordance with the quality assurance procedures described in the "Technical Memorandum. Microcystin Bioaccumulation in Klamath River Fish and Freshwater Mussel Tissue: Preliminary 2007 Results" (Kann 2008).
QAPP Information Reference(s):	<u>Technical Memorandum. Microcystin Bioaccumulation in Klamath River Fish and Freshwater Mussel Tissue: Preliminary 2007 Results. Prepared by Jacob Kann, Ph.D. of Aquatic Ecosystem Sciences LLC. Prepared for Karuk Tribe of California.</u>

WATER BODY NAME: **KLAMATH RIVER HU, LOWER HA, KLAMATH GLEN HSA**
Water Body ID: **CAR1051108619990608084033**
Water Body Type: **River & Stream**

DECISION ID **13976**

Pollutant: **CYANOBACTERIA HEPATOTOXIC MICROCYSTINS**
Final Listing Decision: **Do Not List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status: Revised
Pollutant or Pollution: Pollutant

Weight of Evidence: This decision applies to the mainstem Klamath River in the Klamath River Hydrologic Unit, Lower Klamath River Hydrologic Area, Klamath Glen Hydrologic Sub-Area.

This pollutant is being considered for placement on the Section 303(d) List under Section 3.11 of the Listing Policy. Two lines of evidence are available in the administrative record to assess this pollutant.

Microcystins are a class of toxic chemicals produced by some strains of the cyanobacteria *Microcystis aeruginosa* that are released into waters when cyanobacterial cells die or cell membranes degrade. These chemicals are a human health risk, capable of inducing skin rashes, sore throat, oral blistering, nausea, gastroenteritis, fever, and liver toxicity (WHO 1999). Routes of exposure for human health include dermal contact, ingestion of water, and ingestion of tissue (fish or shellfish). For animals, exposures of concern include ingestion of water and tissue.

Based on the readily available data and information, the situation-specific weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the Section 303(d) List in the Water Quality Limited Segments category (i.e., sufficient justification to not list). This conclusion is based on the staff findings that:

- (1) None of 15 water column microcystin toxin samples exceed the evaluation guidelines used to interpret the water quality objective. One of 36 water column *Microcystis* cell samples exceed the evaluation guideline used to interpret the water quality objective. While the cell counts are a strong indicator of potential toxicity associated with the toxin microcystin, one exceedance of the cell count evaluation guideline is not sufficient to demonstrate non-attainment of the water quality objective, especially as none of the 15 toxin samples exceed the evaluation guideline.
- (2) In compliance with Section 3.11 of the Listing Policy, a water segment shall not be placed on the Section 303(d) List if the weight of evidence indicates attainment of water quality objectives.
- (3) The data used satisfies the data quality requirements of Section 6.1.4 of the Policy.
- (4) The data used satisfies the data quantity requirements of Section 6.1.5 of the Policy.
- (5) Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

RWQCB Staff Recommendation: After review of the available data and information, North Coast RWQCB staff concludes that the water body-pollutant combination should be placed on the Section

303(d) List because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

**SWRCB Board Decision
/ Staff Recommendation:**

USEPA Decision:

Lines of Evidence (LOEs) for Decision ID 13976

LOE ID:	26043
Pollutant:	Cyanobacteria hepatotoxic microcystins
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	15
Number of Exceedances:	0
Data and Information Type:	Physical/Chemical Monitoring
Data Used to Assess Water Quality:	None of the 15 Microcystin samples collected in 2007 and 2008 exceeded the evaluation guideline. Sample concentrations range from less than the quantitation limit of 1.8 ug/l to 1.8 ug/l. Samples were collected by the Yurok Tribal Environmental Program. Data are summarized in the "Final 2007 Klamath River Blue-Green Algae Summary Report" (Fetcho 2008) and in a September 16, 2008 Memorandum (Fetcho 2008).
Data Reference:	<u>Final 2007 Klamath River Blue-Green Algae Summary Report. Yurok Tribe Environmental Program</u> <u>Memorandum to Klamath River Blue Green Algae Workgroup Regarding September 3, 2008 Phytoplankton Results. Yurok Tribe Environmental Program</u>
Water Quality Objective/Criterion:	Per the Basin Plan (NCRWQCB 2007): All water shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Water Board.
Objective/Criterion Reference:	<u>Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board</u>
Evaluation Guideline:	Per the Blue Green Algae Work Group (2008): The guideline for microcystin toxin is 8 ug/l to protect the recreational exposure of a child.
Guideline Reference:	<u>Cyanobacteria in California Recreational Water Bodies. Providing Voluntary Guidance about Harmful Algal Blooms, Their Monitoring, and Public Notification. Draft. September 2008. Blue Green Algae Work Group of the State Water Resources Control Board, Department of Public Health, and Office of Environmental Health and Hazard Assessment</u>
Spatial Representation:	Samples were collected in the mainstem Klamath River at 4 locations as follows: (1) below Weitchpec at river mile 42.5 (Site KBW), (2) above Tully Creek at river mile 38.5 (Site TC), (3) near the lower extent of the Yurok Indian Reservation at the USGS

gage at Terwer Creek at river mile 5.8 (Site TG), and (4) in the lower Klamath River Estuary just upstream of where the Klamath empties into the Pacific Ocean at river mile 0.5 (Site LES).

Temporal Representation: Grab samples were collected in the Klamath River on 11 occasions between May 30, 2007 and October 15, 2007 and on 3 occasions between August 7, 2008 and September 3, 2008.

Environmental Conditions: There are no known environmental conditions (e.g., seasonality, land use practices, fire events, storms, etc.) that are related to these data.

QAPP Information: Samples were collected and analyzed according to the procedures described in the "Lower Klamath River Nutrient, Periphyton, Phytoplankton and Algal Toxin Sampling Analysis Plan (SAP)" (Yurok 2008) and the "Final 2007 Klamath River Blue-Green Algae Summary Report" (Fetcho 2008).

QAPP Information Reference(s): Lower Klamath River Nutrient, Periphyton, Phytoplankton, and Algal Toxin Sampling Analysis Plan (SAP). June 2008. Prepared with assistance from Kier Associates
Final 2007 Klamath River Blue-Green Algae Summary Report. Yurok Tribe Environmental Program

LOE ID: 26026

Pollutant: Cyanobacteria hepatotoxic microcystins

LOE Subgroup: Pollutant-Water

Matrix: Water

Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 36

Number of Exceedances: 1

Data and Information Type: Physical/Chemical Monitoring

Data Used to Assess Water Quality: One of the 36 samples analyzed for Microcystis cells collected in the mainstem Klamath River exceed the evaluation guideline. Microcystis cell concentrations ranged from 0 to 90,764 cells/ml. Samples were collected by the Yurok Tribal Environmental Program. Data are summarized in the "Final 2007 Klamath River Blue-Green Algae Summary Report" (Fetcho 2008) and in a September 16, 2008 Memorandum (Fetcho 2008).

Data Reference: Final 2007 Klamath River Blue-Green Algae Summary Report. Yurok Tribe Environmental Program
Memorandum to Klamath River Blue Green Algae Workgroup Regarding September 3, 2008 Phytoplankton Results. Yurok Tribe Environmental Program

Water Quality Objective/Criterion: Per the Basin Plan (NCRWQCB 2007): All water shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Water Board.

Objective/Criterion Reference: Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board

Evaluation Guideline: Per the Blue Green Algae Work Group (2008): The guideline for Microcystis cells is 40,000 cells/ml if cell populations are dominated by Microcystis and Planktothrix to protect the recreational exposure of a child. This cell count evaluation guideline is a strong indicator of potential toxicity associated with the toxin microcystin.

Guideline Reference:	<u>Cyanobacteria in California Recreational Water Bodies. Providing Voluntary Guidance about Harmful Algal Blooms, Their Monitoring, and Public Notification. Draft. September 2008. Blue Green Algae Work Group of the State Water Resources Control Board, Department of Public Health, and Office of Environmental Health and Hazard Assessment</u>
Spatial Representation:	Samples were collected in the mainstem Klamath River at 4 locations as follows: (1) below Weitchpec at river mile 42.5 (Site KBW), (2) above Tully Creek at river mile 38.5 (Site TC), (3) near the lower extent of the Yurok Indian Reservation at the USGS gage at Terwer Creek at river mile 5.8 (Site TG), and (4) in the lower Klamath River Estuary just upstream of where the Klamath empties into the Pacific Ocean at river mile 0.5 (Site LES).
Temporal Representation:	Grab samples were collected in the Klamath River on 11 occasions between May 30, 2007 and October 15, 2007 and on 3 occasions between August 7, 2008 and September 3, 2008.
Environmental Conditions:	There are no known environmental conditions (e.g., seasonality, land use practices, fire events, storms, etc.) that are related to these data.
QAPP Information:	Samples were collected and analyzed according to the procedures described in the "Lower Klamath River Nutrient, Periphyton, Phytoplankton and Algal Toxin Sampling Analysis Plan (SAP)" (Yurok 2008) and the "Final 2007 Klamath River Blue-Green Algae Summary Report" (Fetcho 2008).
QAPP Information Reference(s):	<u>Lower Klamath River Nutrient, Periphyton, Phytoplankton, and Algal Toxin Sampling Analysis Plan (SAP). June 2008. Prepared with assistance from Kier Associates</u> <u>Final 2007 Klamath River Blue-Green Algae Summary Report. Yurok Tribe Environmental Program</u>

WATER BODY NAME: **KLAMATH RIVER HU, MIDDLE HA, OREGON TO IRON GATE**
Water Body ID: **CAR1053702220011219001110**
Water Body Type: **River & Stream**

DECISION ID **7168**

Pollutant: **CYANOBACTERIA HEPATOTOXIC MICROCYSTINS**

Final Listing Decision: **Do Not Delist from 303(d) list (TMDL required list)**

Last Listing Cycle's Final Listing Decision: List on 303(d) list (TMDL required list)(2006)

Revision Status Revised

Sources: Agriculture | Dam Construction | Drainage/Filling Of Wetlands | Flow

Regulation/Modification | Habitat Modification | Hydromodification | Internal Nutrient

Cycling (primarily lakes) | Source Unknown

Expected TMDL 2019

Completion Date:

Pollutant or Pollution: Pollutant

Weight of Evidence: This pollutant was added to the Section 303(d) List on May 29, 2008, by the US EPA as part of the 2006 303(d) List Update process, and applies to the mainstem Klamath River in the Klamath River Hydrologic Unit, Middle Klamath River Hydrologic Area, Oregon to Iron Gate reach, excluding the riverine reach from the Oregon border downstream to the beginning of Copco 1 Reservoir (i.e., the mainstem Klamath River from the beginning of Copco 1 Reservoir to Iron Gate Dam). Separate decision have been developed for 2008 that pertain to Copco 1 Reservoir and Iron Gate Reservoir.

This pollutant is being considered for removal from the Section 303(d) List under Section 4.11 of the Listing Policy. Two lines of evidence are available in the administrative record to assess this pollutant.

Microcystins are a class of toxic chemicals produced by some strains of the cyanobacteria *Microcystis aeruginosa* that are released into waters when cyanobacterial cells die or cell membranes degrade. These chemicals are a human health risk, capable of inducing skin rashes, sore throat, oral blistering, nausea, gastroenteritis, fever, and liver toxicity (WHO 1999). Routes of exposure for human health include dermal contact, ingestion of water, and ingestion of tissue (fish or shellfish). For animals, exposures of concern include ingestion of water and tissue.

Based on the readily available data and information, the situation-specific weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the Section 303(d) List in the Water Quality Limited Segments category (i.e., sufficient justification to not de-list). This conclusion is based on the staff findings that:

- (1) On May 29, 2008, the US EPA identified the portion of the "Klamath River Hydrologic Unit (HU), Middle HA Hydrologic Area (HA), from Oregon to Iron Gate [reservoir]" that is impaired due to microcystin toxins as the area including the Copco 1 and 2 reservoirs, Iron Gate Reservoir, and the waters in between.
- (2) In 2006, three years of data were assessed by State Water Board staff and 99 out of 259 samples exceeded the World Health Organization guideline of 20 ug/L (WHO 1999). See LOE 26467.
- (3) The evaluation guideline used in 2008 for microcystin toxin water column samples is 8 ug/l per the Blue Green Algae Working Group of the State Water Resources

Control Board. This evaluation guideline was developed in 2008, after the 2006 303(d) List Update process. The 99 exceedances identified in 2006 continue to be exceedances under the lower evaluation guideline.

(4) Combined, data evaluated in 2006 and 2008 indicate at least 99 out of 262 exceedances of the evaluation guideline used to interpret the water quality objective.

(5) Any exceedance of the evaluation guidelines indicates non-attainment of standards. In compliance with Section 4.11 of the Listing Policy, a water segment shall not be removed from the Section 303(d) List if the weight of evidence indicates non-attainment.

(6) The data used satisfies the data quality requirements of Section 6.1.4 of the Policy.

(7) The data used satisfies the data quantity requirements of Section 6.1.5 of the Policy.

(8) Pursuant to Section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

**RWQCB Staff
Recommendation:**

After review of the available data and information, North Coast RWQCB staff concludes that the water body-pollutant combination should not be removed from the Section 303(d) List because applicable water quality standards for the pollutant are being exceeded.

**SWRCB Board Decision
/ Staff Recommendation:**

USEPA Decision:

On May 29, 2008, the USEPA decision on the "Reconsideration of California's 2006 Section 303(d) List Omission of Microcystin Toxin Listings for three Klamath River Segments" added Cyanobacteria hepatotoxic microcystins to the 2006 303(d) list (TMDL required list) based on the information shown in the 2006 line of evidence.

Lines of Evidence (LOEs) for Decision ID 7168

LOE ID: 26467

Pollutant: Cyanobacteria hepatotoxic microcystins

LOE Subgroup: Pollutant-Water

Matrix: Water

Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 259

Number of Exceedances: 99

Data and Information Type: Physical/Chemical Monitoring

Data Used to Assess Water Quality: This line of evidence (LOE) is a revision of LOE 4787 that was originally prepared by the State Water Resources Control Board for the 2006 303(d) List. The revision is necessary in order to include the references cited by the State Water Board.

In 2005: 30 out of 77 aqueous samples for microcystins (MC) exceed the WHO moderate health risk guideline value of 20 ug/L.

	<p>In 2006: 35 out of 72 aqueous samples for MC exceeded the WHO guideline of 20 ug/L.</p> <p>In 2007: 34 out of 110 aqueous samples for MC exceeded the WHO guideline of 20 ug/L.</p>
Data Reference:	<p>Reference for this listing is a 2008 USEPA staff report "Reconsideration of California's 2006 Section 303(d) List Omission of Microcystin Toxin Listings for three Klamath River Segments and Determination to Add Microcystin Toxins Listing for Klamath River Hydrologic Unit (HU), Middle HA Hydrologic Area (HA), Oregon to Iron Gate." <u>Reconsideration of California's 2006 Section 303(d) List Omission of Microcystin Toxin Listings for three Klamath River Segments and Determination to Add microcystin Toxins Listing for Klamath River Hydrologic Unit (HU), Middle HA Hydrologic Area (HA), Oregon to Iron Gate</u></p>
Water Quality Objective/Criterion:	<p>The North Coast Regional Board Basin Plan contains a narrative toxicity objective of: "All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or plant life."</p>
Objective/Criterion Reference:	<p><u>Water Quality Control Plan For The North Coast Region</u></p>
Evaluation Guideline:	<p>World Health Organization (WHO) recommended guideline value of 20 ug/L for aqueous microcystins toxins in recreational waters.</p>
Guideline Reference:	<p><u>Toxic Cyanobacteria in Water: A Guide to their Public Health Consequences, Monitoring and Management. World Health Organization. Edited by I. Chorus and J. Bartram. Long, England. 400 pp</u></p>
Spatial Representation:	<p>Based on the North Coast Regional Water Board staff's comments, EPA has identified the portion of the "Klamath River Hydrologic Unit (HU), Middle HA Hydrologic Area (HA), from Oregon to Iron Gate [reservoir]" that is impaired due to microcystin toxins as the area including the Copco 1 and 2 reservoirs, Iron Gate Reservoir, and waters in between. This does not include California waters from the Oregon border downstream to the beginning of the Copco 1 Reservoir.</p>
Temporal Representation:	<p>Data were collected annually for three years: during 2005, 2006 and 2007.</p>
Environmental Conditions:	<p>The USEPA report summary indicates prolonged bluegreen algae blooms during summer months when samples are collected.</p>
QAPP Information:	<p>Data were used by the USEPA from the following 3 published reports: (1) Xie et al. 2005; (2) Kann 2006; and (3) Kann and Corum 2006. It is assumed that quality assurance procedures were used to review the data.</p>
QAPP Information Reference(s):	<p><u>Technical Memorandum. Microcystis aeruginosa Occurrence in the Klamath River System of Southern Oregon and Northern California. Prepared For: Yurok Tribe Environmental and Fisheries Program, Klamath, CA. Prepared By: Jacob Kann, Ph.D., Aquatic Ecosystem Sciences LLC, Ashland, OR</u> <u>Organ Distribution and Bioaccumulation of Microcystins in Freshwater Fish at Different Trophic Levels from the Eutrophic Lake Chaohu, China. Environ. Toxicol. 20, 293-300</u> <u>Partial Seasonal Summary of 2006 Toxic Microcystis aeruginosa Trends in Copco and Iron Gate Reservoirs and the Klamath River, CA; Aquatic Ecosystem Sciences; for Yurok Tribe Environmental and Fisheries Programs</u></p>

LOE ID:	25978
Pollutant:	Cyanobacteria hepatotoxic microcystins
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	3
Number of Exceedances:	0
Data and Information Type:	Physical/Chemical Monitoring
Data Used to Assess Water Quality:	None of the 3 microcystin samples collected in the mainstem Klamath River between the Oregon state line and Iron Gate exceed the evaluation guideline used to interpret the water quality objective. Microcystin concentrations range from non-detect to 1.4 ug/L. Samples were collected and summarized by the Karuk Tribe of California (Karuk 2008 - data).
Data Reference:	<u>Karuk Tribe 2008 BGA Data (KR TOX Table 2008). Data for Blue Green Algae in the Klamath River, July 2008 to September 2008</u>
Water Quality Objective/Criterion:	Per the Basin Plan (NCRWQCB 2007): All water shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Water Board.
Objective/Criterion Reference:	<u>Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board</u>
Evaluation Guideline:	Per the Blue Green Algae Work Group (2008): The guideline for microcystin toxin is 8 ug/l to protect the recreational exposure of a child.
Guideline Reference:	<u>Cyanobacteria in California Recreational Water Bodies. Providing Voluntary Guidance about Harmful Algal Blooms, Their Monitoring, and Public Notification. Draft. September 2008. Blue Green Algae Work Group of the State Water Resources Control Board, Department of Public Health, and Office of Environmental Health and Hazard Assessment</u>
Spatial Representation:	Samples were collected in the mainstem Klamath River above Copco Reservoir.
Temporal Representation:	Grab samples were collected on July 24, 2008, August 5, 2008, and September 3, 2008.
Environmental Conditions:	There are no known environmental conditions (e.g., seasonality, land use practices, fire events, storms, etc.) that are related to these data.
QAPP Information:	Samples were collected according to the procedures summarized in the "Draft Klamath River Nutrient, Periphyton, Phytoplankton and Algal Toxin Sampling Analysis Plan" (Karuk 2008-Monitoring Plan).
QAPP Information Reference(s):	Draft Klamath River Nutrient, Periphyton, Phytoplankton and Algal Toxin Sampling Analysis Plan (SAP). Karuk Tribe of California Water Quality Program.

WATER BODY NAME: **KLAMATH RIVER HU, MIDDLE HA, IRON GATE DAM TO SCOTT RIVER**
Water Body ID: **CAR1053505320011215015907**
Water Body Type: **River & Stream**

DECISION ID **13974**

Pollutant: **CYANOBACTERIA HEPATOTOXIC MICROCYSTINS**
Final Listing Decision: **List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status: Revised
Sources: Agriculture | Dam Construction | Drainage/Filling Of Wetlands | Flow Regulation/Modification | Habitat Modification | Hydromodification | Internal Nutrient Cycling (primarily lakes) | Source Unknown
Expected TMDL Completion Date: 2021
Pollutant or Pollution: Pollutant

Weight of Evidence: This decision applies to the mainstem Klamath River in the Klamath River Hydrologic Unit, Middle Klamath River Hydrologic Area, Iron Gate Dam to Scott River reach.

This pollutant is being considered for placement on the Section 303(d) List under Section 3.11 of the Listing Policy. Three lines of evidence are available in the administrative record to assess this pollutant.

Microcystins are a class of toxic chemicals produced by some strains of the cyanobacteria *Microcystis aeruginosa* that are released into waters when cyanobacterial cells die or cell membranes degrade. These chemicals are a human health risk, capable of inducing skin rashes, sore throat, oral blistering, nausea, gastroenteritis, fever, and liver toxicity (WHO 1999). Routes of exposure for human health include dermal contact, ingestion of water, and ingestion of tissue (fish or shellfish). For animals, exposures of concern include ingestion of water and tissue.

Based on the readily available data and information, the situation-specific weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the Section 303(d) List in the Water Quality Limited Segments category (i.e., sufficient justification to list). This conclusion is based on the staff findings that:

- (1) One of 4 tissue microcystin toxin samples (LOE 25846), 4 of 37 water column microcystin toxin samples (LOE 25995), and 4 of 14 water column *Microcystis* cell samples (LOE 26055) exceed the evaluation guidelines used to interpret the water quality objective.
- (2) Any exceedance of the evaluation guidelines indicates non-attainment of standards. In compliance with Section 3.11 of the Listing Policy, a water segment shall be placed on the Section 303(d) List if the weight of evidence indicates non-attainment.
- (3) The data used satisfies the data quality requirements of Section 6.1.4 of the Policy.
- (4) The data used satisfies the data quantity requirements of Section 6.1.5 of the Policy.
- (5) Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

RWQCB Staff Recommendation: After review of the available data and information, North Coast RWQCB staff concludes that the water body-pollutant combination should be placed on the Section 303(d) List because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

SWRCB Board Decision / Staff Recommendation:

USEPA Decision:

Lines of Evidence (LOEs) for Decision ID 13974

LOE ID: 25846

Pollutant: **Cyanobacteria hepatotoxic microcystins**

LOE Subgroup: Pollutant-Tissue
 Matrix: Tissue
 Fraction: Fish whole body

Beneficial Use: Commercial or recreational collection of fish, shellfish, or organisms

Number of Samples: 4
 Number of Exceedances: 1

Data and Information Type: Fish tissue analysis

Data Used to Assess Water Quality: One of the 4 microcystin samples collected from mussel tissue from the mainstem Klamath River in 2007 exceeds the evaluation guideline. Sample concentrations range from non-detect (with a reporting limit of 1.0 ng/g) to 2,803.10 ng/g. Samples were collected by the California Department of Fish and Game (CDFG) and analyzed for microcystin by the CDFG Fish and Wildlife Water Pollution Control Laboratory in Rancho Cordova, CA. Data are summarized by Kann (2008). The presence of the toxin microcystin in fish and mussels in the Klamath River has the potential to impair the Native American Culture (CUL) and Subsistence Fishing (FISH) beneficial uses, as well as the Commercial and Sport Fishing (COMM) beneficial use listed above.

Data Reference: Technical Memorandum. Microcystin Bioaccumulation in Klamath River Fish and Freshwater Mussel Tissue: Preliminary 2007 Results. Prepared by Jacob Kann, Ph.D. of Aquatic Ecosystem Sciences LLC. Prepared for Karuk Tribe of California.

Water Quality Objective/Criterion: Per the Basin Plan (North Coast RWQCB 2007): All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Water Board.

Objective/Criterion Reference: Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board

Evaluation Guideline: Per the California Office of Environmental Health Hazard Assessment (OEHHA) (Alexeeff 2008): The upper bound of the Advisory Tissue Level range for the one serving (8 oz. uncooked fish, 6 oz. cooked, equal to 32 g/day) per week category is 26 ng total microcystins per gram of fish (26 ng/g). This Advisory Tissue Level applies to a composite of 3 or more individual samples of edible tissue.

Guideline Reference: Letter of August 6, 2008, to Randy Landolt, Managing Director, PacifiCorp Energy, from George V. Alexeeff, PhD, DABT, Deputy Director for Scientific Affairs.

California Office of Environmental Health Hazard Assessment, regarding information related to the occurrence of microcystin in the tissues of Klamath River biota

Spatial Representation: Mussel samples were collected from the mainstem Klamath River near I-5 and below I-5.

Temporal Representation: Samples were collected at the near I-5 site on July 11, 2007. Samples were collected at the below I-5 site on November 5, 2007.

Environmental Conditions: There are no known environmental conditions (e.g., seasonality, land use practices, fire events, storms, etc.) that are related to these data.

QAPP Information: Samples were collected and analyzed in accordance with the quality assurance procedures described in the "Technical Memorandum. Microcystin Bioaccumulation in Klamath River Fish and Freshwater Mussel Tissue: Preliminary 2007 Results" (Kann 2008).

QAPP Information Reference(s): Technical Memorandum. Microcystin Bioaccumulation in Klamath River Fish and Freshwater Mussel Tissue: Preliminary 2007 Results. Prepared by Jacob Kann, Ph.D. of Aquatic Ecosystem Sciences LLC. Prepared for Karuk Tribe of California.

LOE ID: 26055

Pollutant: Cyanobacteria hepatotoxic microcystins

LOE Subgroup: Pollutant-Water

Matrix: Water

Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 14

Number of Exceedances: 4

Data and Information Type: Physical/Chemical Monitoring

Data Used to Assess Water Quality: Four of the 14 Microcystis cell samples collected in 2008 exceed the evaluation guideline. Microcystis cell values range from 55 cells/ml to 1,394,139 cells/ml. Samples were collected and summarized by the Karuk Tribe of California (Karuk 2008 - data).

Data Reference: Karuk Tribe 2008 BGA Data (KR TOX Table 2008). Data for Blue Green Algae in the Klamath River, July 2008 to September 2008

Water Quality Objective/Criterion: Per the Basin Plan (NCRWQCB 2007): All water shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Water Board.

Objective/Criterion Reference: Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board

Evaluation Guideline: Per the Blue Green Algae Work Group (2008): The guideline for Microcystis cells is 40,000 cells/ml if cell populations are dominated by Microcystis and Planktothrix to protect the recreational exposure of a child. This cell count evaluation guideline is a strong indicator of potential toxicity associated with the toxin microcystin.

Guideline Reference: Cyanobacteria in California Recreational Water Bodies. Providing Voluntary Guidance about Harmful Algal Blooms, Their Monitoring, and Public Notification. Draft. September 2008. Blue Green Algae Work Group of the State Water Resources Control Board, Department of Public Health, and Office of Environmental Health and Hazard

Assessment

Spatial Representation: Samples were collected in the mainstem Klamath River at 4 locations as follows: (1) at Brown Bear River Access, (2) at Beaver Creek Fish Disease Site, (3) below Iron Gate Dam, and (4) at Walker Bridge.

Temporal Representation: Grab samples were collected below Iron Gate Dam between July 10, 2008 and September 17, 2008. Grab samples were collected at Walker Bridge downstream of the town of Klamath River between July 23, 2008 and September 17, 2008.

Environmental Conditions: There are no known environmental conditions (e.g., seasonality, land use practices, fire events, storms, etc.) that are related to these data.

QAPP Information: Samples were collected according to the procedures summarized in the "Draft Klamath River Nutrient, Periphyton, Phytoplankton and Algal Toxin Sampling Analysis Plan" (Karuk 2008-MonitoringPlan).

QAPP Information Reference(s): Draft Klamath River Nutrient, Periphyton, Phytoplankton and Algal Toxin Sampling Analysis Plan (SAP). Karuk Tribe of California Water Quality Program.

LOE ID: 25995

Pollutant: Cyanobacteria hepatotoxic microcystins

LOE Subgroup: Pollutant-Water

Matrix: Water

Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 37

Number of Exceedances: 4

Data and Information Type: Physical/Chemical Monitoring

Data Used to Assess Water Quality: Four of the 37 microcystin samples collected in the mainstem Klamath River between the Iron Gate Dam and the Scott River in 2008 exceed the evaluation guideline. Microcystin concentrations range from non-detect to 840 ug/L. Samples were collected and summarized by the Karuk Tribe of California (Karuk 2008 - data).

Data Reference: Karuk Tribe 2008 BGA Data (KR TOX Table 2008). Data for Blue Green Algae in the Klamath River, July 2008 to September 2008

Water Quality Objective/Criterion: Per the Basin Plan (NCRWQCB 2007): All water shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Water Board.

Objective/Criterion Reference: Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board

Evaluation Guideline: Per the Blue Green Algae Work Group (2008): The guideline for microcystin toxin is 8 ug/l to protect the recreational exposure of a child.

Guideline Reference: Cyanobacteria in California Recreational Water Bodies. Providing Voluntary Guidance about Harmful Algal Blooms, Their Monitoring, and Public Notification. Draft, September 2008. Blue Green Algae Work Group of the State Water Resources Control Board, Department of Public Health, and Office of Environmental Health and Hazard Assessment

Spatial Representation: Samples were collected in the mainstem Klamath River at 5 locations as follows: (1) at

Brown Bear River Access, (2) at Beaver Creek Fish Disease Site, (3) below Iron Gate Dam, (4) at the mouth of the Shasta River, and (5) at Walker Bridge.

Temporal Representation: Grab samples were collected below Iron Gate Dam between July 10, 2008 and September 17, 2008. Grab samples were collected at Walker Bridge downstream of the town of Klamath River between July 23, 2008 and September 17, 2008.

Environmental Conditions: There are no known environmental conditions (e.g., seasonality, land use practices, fire events, storms, etc.) that are related to these data.

QAPP Information: Samples were collected according to the procedures summarized in the "Draft Klamath River Nutrient, Periphyton, Phytoplankton and Algal Toxin Sampling Analysis Plan" (Karuk 2008-Monitoring Plan).

QAPP Information Reference(s): Draft Klamath River Nutrient, Periphyton, Phytoplankton and Algal Toxin Sampling Analysis Plan (SAP). Karuk Tribe of California Water Quality Program.

WATER BODY NAME: **KLAMATH RIVER HU, MIDDLE HA AND LOWER HA, SCOTT RIVER TO TRINITY RIVER**
Water Body ID: **CAR1053107519990610152950**
Water Body Type: **River & Stream**

DECISION ID **13971**

Pollutant: **CYANOBACTERIA HEPATOTOXIC MICROCYSTINS**
Final Listing Decision: **List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status: Revised
Sources: Agricultural Water Diversion | Agriculture | Dam Construction | Drainage/Filling Of Wetlands | Flow Regulation/Modification | Habitat Modification | Hydromodification | Internal Nutrient Cycling (primarily lakes) | Source Unknown
Expected TMDL Completion Date: 2021
Pollutant or Pollution: Pollutant

Weight of Evidence: This listing applies to the mainstem Klamath River in the Klamath River Hydrologic Unit, Middle and Lower Klamath River Hydrologic Areas, Scott River to Trinity River reach.

This pollutant is being considered for placement on the Section 303(d) List under Section 3.11 of the Listing Policy. Five lines of evidence are available in the administrative record to assess this pollutant.

Microcystins are a class of toxic chemicals produced by some strains of the cyanobacteria *Microcystis aeruginosa* that are released into waters when cyanobacterial cells die or cell membranes degrade. These chemicals are a human health risk, capable of inducing skin rashes, sore throat, oral blistering, nausea, gastroenteritis, fever, and liver toxicity (WHO 1999). Routes of exposure for human health include dermal contact, ingestion of water, and ingestion of tissue (fish or shellfish). For animals, exposures of concern include ingestion of water and tissue.

Based on the readily available data and information, the situation-specific weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the Section 303(d) List in the Water Quality Limited Segments category (i.e., sufficient justification to list). This conclusion is based on the staff findings that:

- (1) Combined, there are 4 of 13 tissue microcystin toxin samples (LOE 25847), 2 of 28 water column microcystin toxin samples (LOEs 25997 and 26042), and 5 of 26 water column *Microcystis* cell samples (LOEs 26007 and 26056) that exceed the evaluation guidelines used to interpret the water quality objective.
- (2) Any exceedance of the evaluation guidelines indicate non-attainment of standards, in compliance with Section 3.11 of the Listing Policy.
- (3) The data used satisfies the data quality requirements of Section 6.1.4 of the Policy.
- (4) The data used satisfies the data quantity requirements of Section 6.1.5 of the Policy.
- (5) Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

RWQCB Staff Recommendation: After review of the available data and information, North Coast RWQCB staff concludes that the water body-pollutant combination should be placed on the Section 303(d) List because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

SWRCB Board Decision
/ Staff Recommendation:
USEPA Decision:

Lines of Evidence (LOEs) for Decision ID 13971

LOE ID:	26056
Pollutant:	Cyanobacteria hepatotoxic microcystins
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	12
Number of Exceedances:	4
Data & Information Type:	Physical/Chemical Monitoring
Data Used to Assess Water Quality:	Four of the 12 Microcystis cell samples collected from the mainstem Klamath River exceed the evaluation guideline. Microcystis cell concentrations range from 1,284 to 316,828 cells/ml. Samples were collected and summarized by the Karuk Tribe of California (Karuk 2008 - data).
Data Reference:	<u>Karuk Tribe 2008 BGA Data (KR TOX Table 2008). Data for Blue Green Algae in the Klamath River, July 2008 to September 2008</u>
Water Quality Objective/Criterion:	Per the Basin Plan (NCRWQCB 2007): All water shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Water Board.
Objective/Criterion Reference:	<u>Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board</u>
Evaluation Guideline:	Per the Blue Green Algae Work Group (2008): The guideline for Microcystis cells is 40,000 cells/ml if cell populations are dominated by Microcystis and Planktothrix to protect the recreational exposure of a child. This cell count evaluation guideline is a strong indicator of potential toxicity associated with the toxin microcystin.
Guideline Reference:	<u>Cyanobacteria in California Recreational Water Bodies. Providing Voluntary Guidance about Harmful Algal Blooms, Their Monitoring, and Public Notification. Draft. September 2008. Blue Green Algae Work Group of the State Water Resources Control Board, Department of Public Health, and Office of Environmental Health and Hazard Assessment</u>
Spatial Representation:	Samples were collected in the mainstem Klamath River between the Scott River and the Trinity River at 4 locations as follows: (1) at Orleans, (2) at the mouth of the Salmon River, (3) at Seiad Valley, and (4) at the mining claim river access.
Temporal Representation:	Samples were collected between July 23 and September 17, 2008.
Environmental Conditions:	There are no known environmental conditions (e.g., seasonality, land use practices, fire events, storms, etc.) that are related to these data.
QAPP Information:	Samples were collected according to the procedures summarized in the "Draft Klamath River Nutrient, Periphyton, Phytoplankton and Algal Toxin Sampling Analysis Plan" (Karuk 2008-MonitoringPlan).
QAPP Information Reference(s):	Draft Klamath River Nutrient, Periphyton, Phytoplankton and Algal Toxin Sampling Analysis Plan (SAP). Karuk Tribe of California Water Quality Program.

LOE ID:	26042
Pollutant:	Cyanobacteria hepatotoxic microcystins
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	6
Number of Exceedances:	0
Data and Information Type:	Physical/Chemical Monitoring
Data Used to Assess Water Quality:	None of the 6 Microcystin samples exceed the evaluation guideline. Sample concentrations range from less than the quantification limit of 1.8 ug/l to 2.0 ug/L. Samples were collected by the Yurok Tribal Environmental Program. Data are summarized in the "Final 2007 Klamath River Blue-Green Algae Summary Report" (Fetcho 2008) and in a September 16, 2008 Memorandum (Fetcho 2008).
Data Reference:	<u>Final 2007 Klamath River Blue-Green Algae Summary Report. Yurok Tribe Environmental Program</u> <u>Memorandum to Klamath River Blue Green Algae Workgroup Regarding September 3, 2008 Phytoplankton Results. Yurok Tribe Environmental Program</u>
Water Quality Objective/Criterion:	Per the Basin Plan (NCRWQCB 2007): All water shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Water Board.
Objective/Criterion Reference:	<u>Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board</u>
Evaluation Guideline:	Per the Blue Green Algae Work Group (2008): The guideline for microcystin toxin is 8 ug/l to protect the recreational exposure of a child.
Guideline Reference:	<u>Cyanobacteria in California Recreational Water Bodies. Providing Voluntary Guidance about Harmful Algal Blooms, Their Monitoring, and Public Notification. Draft. September 2008. Blue Green Algae Work Group of the State Water Resources Control Board, Department of Public Health, and Office of Environmental Health and Hazard Assessment</u>
Spatial Representation:	Samples were collected in the mainstem Klamath River at Weitchpec upstream of the Trinity River at river mile 43.5 (Site WE).
Temporal Representation:	Grab samples were collected in the Klamath River on 11 occasions between May 30, 2007 and October 15, 2007 and on 3 occasions between August 7, 2008 and September 3, 2008.
Environmental Conditions:	There are no known environmental conditions (e.g., seasonality, land use practices, fire events, storms, etc.) that are related to these data.
QAPP Information:	Samples were collected and analyzed according to the procedures described in the "Lower Klamath River Nutrient, Periphyton, Phytoplankton and Algal Toxin Sampling Analysis Plan (SAP)" (Yurok 2008) and the "Final 2007 Klamath River Blue-Green Algae Summary Report" (Fetcho 2008).
QAPP Information Reference(s):	<u>Lower Klamath River Nutrient, Periphyton, Phytoplankton, and Algal Toxin Sampling Analysis Plan (SAP). June 2008. Prepared with assistance from Kier Associates</u>

LOE ID:	26007
Pollutant:	Cyanobacteria hepatotoxic microcystins
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Water Contact Recreation
Number of Samples:	14
Number of Exceedances:	1
Data and Information Type:	Physical/Chemical Monitoring
Data Used to Assess Water Quality:	One of the 14 samples analyzed for Microcystis cells collected in the mainstem Klamath River exceeds the evaluation guideline. Microcystis cell concentrations ranged from 0 to 80,016 cells/ml. Samples were collected by the Yurok Tribal Environmental Program. Data are summarized in the "Final 2007 Klamath River Blue-Green Algae Summary Report" (Fetcho 2008) and in a September 16, 2008 Memorandum (Fetcho 2008).
Data Reference:	<u>Final 2007 Klamath River Blue-Green Algae Summary Report. Yurok Tribe Environmental Program</u> <u>Memorandum to Klamath River Blue Green Algae Workgroup Regarding September 3, 2008 Phytoplankton Results. Yurok Tribe Environmental Program</u>
Water Quality Objective/Criterion:	Per the Basin Plan (NCRWQCB 2007): All water shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Water Board.
Objective/Criterion Reference:	<u>Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board</u>
Evaluation Guideline:	Per the Blue Green Algae Work Group (2008): The guideline for Microcystis cells is 40,000 cells/ml if cell populations are dominated by Microcystis and Planktothrix to protect the recreational exposure of a child. This cell count evaluation guideline is a strong indicator of potential toxicity associated with the toxin microcystin.
Guideline Reference:	<u>Cyanobacteria in California Recreational Water Bodies. Providing Voluntary Guidance about Harmful Algal Blooms, Their Monitoring, and Public Notification. Draft. September 2008. Blue Green Algae Work Group of the State Water Resources Control Board, Department of Public Health, and Office of Environmental Health and Hazard Assessment</u>
Spatial Representation:	Samples were collected in the mainstem Klamath River at Weitchpec upstream of the Trinity River at river mile 43.5 (Site WE).
Temporal Representation:	Grab samples were collected in the Klamath River on 11 occasions between May 30, 2007 and October 15, 2007 and on 3 occasions between August 7, 2008 and September 3, 2008.
Environmental Conditions:	There are no known environmental conditions (e.g., seasonality, land use practices, fire events, storms, etc.) that are related to these data.
QAPP Information:	Samples were collected and analyzed according to the procedures described in the "Lower Klamath River Nutrient, Periphyton, Phytoplankton and Algal Toxin Sampling

QAPP Information Reference(s): Analysis Plan (SAP)" (Yurok 2008) and the "Final 2007 Klamath River Blue-Green Algae Summary Report" (Fetcho 2008).
Lower Klamath River Nutrient, Periphyton, Phytoplankton, and Algal Toxin Sampling Analysis Plan (SAP). June 2008. Prepared with assistance from Kier Associates

LOE ID: 25847

Pollutant: Cyanobacteria hepatotoxic microcystins

LOE Subgroup: Pollutant-Tissue

Matrix: Tissue

Fraction: Fish whole body

Beneficial Use: Commercial or recreational collection of fish, shellfish, or organisms

Number of Samples: 13

Number of Exceedances: 4

Data and Information Type: Fish tissue analysis

Data Used to Assess Water Quality: Four of the 13 microcystin samples collected from mussel tissue from the mainstem Klamath River exceeds the evaluation guideline. Sample concentrations range from non-detect (with a reporting limit of 1.0 ng/g) to 506.45 ng/g. Samples were collected by the California Department of Fish and Game (CDFG) and analyzed for microcystin by the CDFG Fish and Wildlife Water Pollution Control Laboratory in Rancho Cordova, CA. Data are summarized by Kann (2008). The presence of the toxin microcystin in fish and mussels in the Klamath River has the potential to impair the Native American Culture (CUL) and Subsistence Fishing (FISH) beneficial uses, as well as the Commercial and Sport Fishing (COMM) beneficial use listed above.

Data Reference: Technical Memorandum. Microcystin Bioaccumulation in Klamath River Fish and Freshwater Mussel Tissue: Preliminary 2007 Results. Prepared by Jacob Kann, Ph.D. of Aquatic Ecosystem Sciences LLC. Prepared for Karuk Tribe of California.

Water Quality Objective/Criterion: Per the Basin Plan (North Coast RWQCB 2007): All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Water Board.

Objective/Criterion Reference: Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board

Evaluation Guideline: Per the California Office of Environmental Health Hazard Assessment (OEHHA) (Alexeeff 2008): The upper bound of the Advisory Tissue Level range for the one serving (8 oz. uncooked fish, 6 oz. cooked, equal to 32 g/day) per week category is 26 ng total microcystins per gram of fish (26 ng/g). This Advisory Tissue Level applies to a composite of 3 or more individual samples of edible tissue.

Guideline Reference: Letter of August 6, 2008, to Randy Landolt, Managing Director, PacifiCorp Energy, from George V. Alexeeff, PhD, DABT, Deputy Director for Scientific Affairs, California Office of Environmental Health Hazard Assessment, regarding information related to the occurrence of microcystin in the tissues of Klamath River biota

Spatial Representation: Mussel samples were collected from the mainstem Klamath River at 6 sites as follows: (1) from the mainstem Klamath River, (2) near Seiad, (3) at Seiad Valley, (4) at Big Bar River Access, (5) at Brown Bear west of Happy Camp, and (6) at Orleans.

Temporal Representation: Samples were collected July 20, July 24, and November 5 to 6, 2007.

Environmental Conditions: There are no known environmental conditions (e.g., seasonality, land use practices, fire events, storms, etc.) that are related to these data.

QAPP Information: Samples were collected and analyzed in accordance with the quality assurance procedures described in the "Technical Memorandum. Microcystin Bioaccumulation in Klamath River Fish and Freshwater Mussel Tissue: Preliminary 2007 Results" (Kann 2008).

QAPP Information Reference(s): Technical Memorandum. Microcystin Bioaccumulation in Klamath River Fish and Freshwater Mussel Tissue: Preliminary 2007 Results. Prepared by Jacob Kann, Ph.D. of Aquatic Ecosystem Sciences LLC. Prepared for Karuk Tribe of California.

LOE ID: 25997

Pollutant: Cyanobacteria hepatotoxic microcystins

LOE Subgroup: Pollutant-Water

Matrix: Water

Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples: 22

Number of Exceedances: 2

Data and Information Type: Physical/Chemical Monitoring

Data Used to Assess Water Quality: Two of the 22 microcystin toxin samples collected from the mainstem Klamath River exceed the objective. Microcystin concentrations range from non-detect to 230 ug/L. Samples were collected and summarized by the Karuk Tribe of California (Karuk 2008 - data).

Data Reference: Karuk Tribe 2008 BGA Data (KR TOX Table 2008). Data for Blue Green Algae in the Klamath River, July 2008 to September 2008

Water Quality Objective/Criterion: Per the Basin Plan (NCRWQCB 2007): All water shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Water Board.

Objective/Criterion Reference: Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board

Evaluation Guideline: Per the Blue Green Algae Work Group (2008): The guideline for microcystin toxin is 8 ug/l to protect the recreational exposure of a child.

Guideline Reference: Cyanobacteria in California Recreational Water Bodies. Providing Voluntary Guidance about Harmful Algal Blooms, Their Monitoring, and Public Notification. Draft. September 2008. Blue Green Algae Work Group of the State Water Resources Control Board, Department of Public Health, and Office of Environmental Health and Hazard Assessment

Spatial Representation: Samples were collected in the mainstem Klamath River between the Scott River and the Trinity River at 4 locations as follows: (1) at Orleans, (2) at the mouth of the Salmon River, (3) at Seiad Valley, and (4) at the mining claim river access.

Temporal Representation: Samples were collected between July 23 and September 17, 2008.

Environmental Conditions: There are no known environmental conditions (e.g., seasonality, land use practices, fire events, storms, etc.) that are related to these data.

QAPP Information: Samples were collected according to the procedures summarized in the "Draft Klamath

QAPP Information
Reference(s):

River Nutrient, Periphyton, Phytoplankton and Algal Toxin Sampling Analysis Plan"
(Karuk 2008-MonitoringPlan).
Draft Klamath River Nutrient, Periphyton, Phytoplankton and Algal Toxin Sampling
Analysis Plan (SAP). Karuk Tribe of California Water Quality Program.

WATER BODY NAME: **KLAMATH RIVER HU, MIDDLE HA, IRON GATE DAM TO SCOTT RIVER**
Water Body ID: **CAR1053505320011215015907**
Water Body Type: **River & Stream**

DECISION ID **13197**

Pollutant: **SEDIMENT**
Final Listing Decision: **List on 303(d) list (TMDL required list)**
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status: Revised
Sources: Channel Erosion | Dredge Mining | Erosion/Siltation | Grazing-Related Sources | Highway Maintenance and Runoff | Logging Road Construction/Maintenance | Natural Sources | Other | Removal of Riparian Vegetation | Silviculture
Expected TMDL Completion Date: 2021
Pollutant or Pollution: Pollutant

Weight of Evidence: This pollutant is being considered for placement on the Section 303(d) List under Section 3.11 of the Listing Policy. The weight of evidence indicates there is sufficient justification in favor of placing the mainstem Klamath R from the confluence of Beaver Creek to the confluence of the Salmon River, and the watersheds of Beaver Creek, Collins Creek, Cove Gulch, Doggett Creek, Dona Creek, Everill Creek, Horse Creek, Howard's Gulch, Kinsman Creek, Kohl Creek, Lime Gulch, Sambo Creek, and Smith Gulch on the Section 303(d) List in the Water Quality Limited Segments category. This conclusion is based on the staff findings that:

- (A) The weight of evidence demonstrates that sediment conditions in the mainstem Klamath R from the confluence of Beaver Creek to the confluence of the Salmon River and 13 watersheds do not attain sediment objectives and/or evaluation guidelines, in compliance with Section 3.11 of the Listing Policy, as described below:
- (1) Beaver Creek Watershed (which includes Beaver, Buckhorn, Bumblebee, Cow, Deer, Hungry, Jaynes Canyon, Grouse, and West Fork Beaver creeks) exceeds the landslide volume (LOE 25688), percent fines (LOE 25689), embeddedness (LOE 25690), and road density (LOE 25709) evaluation guidelines. Beaver Creek Watershed also shows pool reduction as a result of the flood of 1997 (LOE 25700) and cumulative impacts (LOE 25691), which exceed the sediment water quality objective.
 - (2) Collins Creek Watershed exceeds the surface erosion (LOE 25717) evaluation guideline.
 - (3) Cove Gulch Watershed exceeds the surface erosion (LOE 25717) evaluation guideline.
 - (4) Doggett Creek Watershed exceeds the surface erosion (LOE 25717) evaluation guideline.
 - (5) Dona Creek Watershed exceeds the surface erosion (LOE 25717) evaluation guideline.
 - (6) Everill Creek Watershed exceeds the surface erosion (LOE 25717) evaluation guideline.
 - (7) Horse Creek Watershed (which includes Buckhorn, Lower Horse, Middle, and Upper Horse creeks) exceeds the surface erosion (LOE 25717) evaluation guideline.
 - (8) Howard's Gulch Watershed exceeds the surface erosion (LOE 25717) evaluation guideline.
 - (9) Kinsman Creek Watershed exceeds the surface erosion (LOE 25717) evaluation guideline.
 - (10) Kohn Creek Watershed exceeds the surface erosion (LOE 25717) evaluation guideline.

guideline.

(11) Lime Gulch Watershed exceeds the surface erosion (LOE 25717) evaluation guideline.

(12) Sambo Creek Watershed exceeds the surface erosion (LOE 25717) evaluation guideline.

(13) Smith Gulch Watershed exceeds the surface erosion (LOE 25717) evaluation guideline.

(B) The data used satisfies the data quality requirements of Section 6.1.4 of the Policy.

(C) The data used satisfies the data quantity requirements of Section 6.1.5 of the Policy.

(D) Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

RWQCB Staff Recommendation:

After review of the available data and information, North Coast RWQCB staff concludes that the mainstem Klamath River from the confluence of Beaver Creek to the confluence of the Salmon River, and the watersheds of Beaver Creek, Collins Creek, Cove Gulch, Doggett Creek, Dona Creek, Everill Creek, Horse Creek, Howard's Gulch, Kinsman Creek, Kohl Creek, Lime Gulch, Sambo Creek, and Smith Gulch should be placed on the Section 303(d) List because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

SWRCB Board Decision / Staff Recommendation:

USEPA Decision:

Lines of Evidence (LOEs) for Decision ID 13197

LOE ID: 25689

Pollutant: Sediment

LOE Subgroup: Adverse Biological Responses

Matrix: -N/A

Fraction: None

Beneficial Use: Cold Freshwater Habitat

Aquatic Life Use: Fish Migration | Fish Spawning | Preservation of Rare & Endangered Species | Wildlife Habitat

Number of Samples: 5

Number of Exceedances: 5

Data & Information Type: HABITAT ASSESSMENT

Data Used to Assess Water Quality: All 5 of the 5 subwatersheds within the Beaver Creek Watershed have percent fine compositions that exceed the evaluation guideline. Compositions range from 22% to 50% fines. Samples were collected by staff of the Klamath National Forest. Results are summarized in the Beaver Creek Environmental Analysis (USFS 1996).

Data Reference: Beaver Creek Environmental Analysis. United States Department of Agriculture, Forest Service, Klamath National Forest, Yreka, CA

Water Quality Objective/Criterion: Per the Basin Plan (North Coast RWQCB 2007): The suspended sediment load and suspended sediment discharge rate of surface waters shall not be altered in such a manner as to cause nuisance or adversely affect beneficial uses.

Objective/Criterion Reference:	<u>Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board</u>
Evaluation Guideline:	Per the "Klamath National Forest Land and Resource Management Plan" (USFS 2001), also known as the Forest Plan: Less than 15% fines of the substrate composition as the area weighted average in spawning habitat. Per the "Desired Salmonid Freshwater Habitat Conditions for Sediment-Related Indices" (North Coast RWQCB 2006), fine sediment particles in the substrate of a waterbody have the potential to fill the interstitial spaces of gravels used by salmonids to hold and incubate eggs, suffocating the eggs. Fines from 1.0 mm to 10.0 mm in diameter are also capable of blocking fry emergence. High amounts of fines can result in reduced embryo and fry survival and have deleterious effects on the cold water fishery beneficial uses.
Guideline Reference:	<u>Klamath National Forest Land and Resource Management Plan 1995 (including all amendments as of 11/21/01). Siskiyou County, CA and Jackson County, OR. Pacific Southwest Region, United States Department of Agriculture Forest Service Desired Salmonid Freshwater Habitat Conditions for Sediment-Related Indices. State of California North Coast Regional Water Quality Control Board</u>
Spatial Representation:	Samples were collected in 7 subwatersheds in the Beaver Creek Watershed. The 5 subwatersheds located in California are the Beaver Creek, West Fork Beaver Creek, Deer Creek, Hungry Creek, and Cow Creek subwatersheds. The 2 subwatersheds located in Oregon, and therefore not considered in this assessment, are Long John Creek and West Long John Creek.
Temporal Representation:	The temporal representation is unknown.
Environmental Conditions:	A major fire occurred in the Beaver Creek Watershed in 1987. Major storms occurred in 1964 and 1972.
QAPP Information:	Samples were collected and analyzed in accordance with procedures similar to those found in the "Stream Condition Inventory (SCI) Technical Guide" (Frazier et al. 2005).
QAPP Information Reference(s):	<u>Stream Condition Inventory Technical Guide. USDA Forest Service, Pacific Southwest Region - Ecosystem Conservation Staff. Vallejo, CA. 111 pp</u>

LOE ID: 25717

Pollutant: Sediment
 LOE Subgroup: Adverse Biological Responses
 Matrix: -N/A
 Fraction: None

Beneficial Use: Cold Freshwater Habitat
 Aquatic Life Use: Fish Migration | Fish Spawning | Preservation of Rare & Endangered Species | Wildlife Habitat

Number of Samples: 9
 Number of Exceedances: 9

Data and Information Type: MODELING
 Data Used to Assess Water Quality: All 9 of the 9 subwatersheds within the Horse Creek Watershed have modeled surface erosion volumes that exceed the evaluation guideline. Surface erosion volumes range from 462% over background to 1,061% over background. Volumes were modeled by staff of the Klamath National Forest. Results are summarized in the "Horse Creek Environmental Analysis " (USFS 2002).

Data Reference: Horse Creek Ecosystem Analysis. United States Department of Agriculture, Forest Service, Klamath National Forest

Water Quality Objective/Criterion:	Per the Basin Plan (North Coast RWQCB 2007): The suspended sediment load and suspended sediment discharge rate of surface waters shall not be altered in such a manner as to cause nuisance or adversely affect beneficial uses.
Objective/Criterion Reference:	<u>Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board</u>
Evaluation Guideline:	Per the "Quantitative Models for Surface Erosion, Mass-Wasting and ERA/TOC" (Elder & Reichert 2004): Surface erosion volumes of 400% over background conditions as computed by the USFS Universal Soil Loss Equation Model indicate the inference point where the risk of initiating or contributing to existing adverse cumulative watershed impacts (including impacts from excess sediment discharges) becomes a cause for concern.
Guideline Reference:	<u>Quantitative Models for Surface Erosion, Mass-wasting and ERA/TOC. CWE 2004. Cumulative Watershed Effects Analysis. Klamath National Forest</u>
Spatial Representation:	Modeling was conducted for 9 subwatersheds in the Horse Creek Watershed as follows: Upper Horse Creek, Lower Horse Creek, Middle Creek, Buckhorn Creek, Kohn/Dona Creek, Doggett Creek, Blue Heron Creek, Collins/Lime Creek, and Quigley Creek subwatersheds.
Temporal Representation:	The temporal representation of the model is unknown.
Environmental Conditions:	The environmental conditions (e.g., seasonality, land use practices, fire, floods, etc.) for the model are unknown.
QAPP Information:	Model results were calculated as part of the Universal Soil Loss Equation Model conducted by staff of the Klamath National Forest in accordance with the procedures described by Elder and Reichert (2004).
QAPP Information Reference(s):	<u>Quantitative Models for Surface Erosion, Mass-wasting and ERA/TOC. CWE 2004. Cumulative Watershed Effects Analysis. Klamath National Forest</u>

LOE ID: 25719

Pollutant: Sediment
 LOE Subgroup: Adverse Biological Responses
 Matrix: -N/A
 Fraction: None

Beneficial Use: Cold Freshwater Habitat
 Aquatic Life Use: Fish Migration | Fish Spawning | Preservation of Rare & Endangered Species | Wildlife Habitat

Number of Samples: 8
 Number of Exceedances: 0

Data and Information Type: MODELING
 Data Used to Assess Water Quality: None of the 8 subwatersheds within the Beaver Creek Watershed have modeled ERA/TOC ratios that exceed the evaluation guideline. ERA/TOC ratios range from 0.332 to 0.85. Ratios were modeled by staff of the Klamath National Forest. Results are summarized in the "Beaver Creek Environmental Analysis " (USFS 1996).
 Data Reference: Beaver Creek Environmental Analysis. United States Department of Agriculture, Forest Service, Klamath National Forest, Yreka, CA

Water Quality Objective/Criterion: Per the Basin Plan (North Coast RWQCB 2007): The suspended sediment load and suspended sediment discharge rate of surface waters shall not be altered in such a manner as to cause nuisance or adversely affect beneficial uses.
 Objective/Criterion Reference: Water Quality Control Plan for the North Coast Region. North Coast Regional Water

Reference:	<u>Quality Control Board</u>
Evaluation Guideline:	Per the "Quantitative Models for Surface Erosion, Mass-Wasting and ERA/TOC" (Elder & Reichert 2004): An Equivalent Roaded Area/Threshold of Concern (ERA/TOC) percent, or risk ratio, greater than 1.0 indicates the inference point where the risk of initiating or contributing to existing adverse cumulative watershed impacts (including impacts from excess sediment discharges) becomes a cause for concern.
Guideline Reference:	<u>Quantitative Models for Surface Erosion, Mass-wasting and ERA/TOC. CWE 2004. Cumulative Watershed Effects Analysis. Klamath National Forest</u>
Spatial Representation:	Samples were collected in 9 subwatersheds in the Beaver Creek Watershed. The 8 subwatersheds located in California are Cow Creek, Grouse Creek, Hungry Creek, Bumblebee Creek, Jaynes Canyon Creek, Upper West Fork Beaver Creek, Lower West Fork Beaver Creek, and Buckhorn Creek subwatersheds. The 1 subwatershed located in Oregon, and therefore not considered in this assessment, is Long John Creek.
Temporal Representation:	Model components included current (pre-1996) data layers.
Environmental Conditions:	A major fire occurred in 1987. Major storms occurred in 1964 and 1972.
QAPP Information:	Model components, data sources, and methodology are described in the "Beaver Creek Ecosystem Analysis" (USFS 1996).
QAPP Information Reference(s):	<u>Beaver Creek Environmental Analysis. United States Department of Agriculture. Forest Service, Klamath National Forest, Yreka, CA</u>

LOE ID:	25709
Pollutant:	Sediment
LOE Subgroup:	Adverse Biological Responses
Matrix:	-N/A
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Aquatic Life Use:	Fish Migration Fish Spawning Preservation of Rare & Endangered Species Wildlife Habitat
Number of Samples:	8
Number of Exceedances:	8
Data and Information Type:	Land use information and location of sources
Data Used to Assess Water Quality:	All 8 of 8 subwatersheds in the Beaver Creek Watershed have road densities that exceed the evaluation guideline. Road densities range from 3.0 to 4.9 miles per square mile. Data are summarized in the "Beaver Creek Environmental Analysis" (USFS 1996).
Data Reference:	<u>Beaver Creek Environmental Analysis. United States Department of Agriculture. Forest Service, Klamath National Forest, Yreka, CA</u>
Water Quality Objective/Criterion:	Per the Basin Plan (North Coast RWQCB 2007): The suspended sediment load and suspended sediment discharge rate of surface waters shall not be altered in such a manner as to cause nuisance or adversely affect beneficial uses.
Objective/Criterion Reference:	<u>Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board</u>
Evaluation Guideline:	Per NOAA Fisheries (1996): The guideline for the properly functioning condition for road density and location is less than 2 miles of road per square mile of watershed with no valley bottom roads.

Guideline Reference: Making Endangered Species Act Determinations of Effect for Individual or Group Actions at the Watershed Scale. Prepared by the National Oceanic and Atmospheric Administration National Marine Fisheries Service Environmental and Technical Services Division Habitat Conservation Branch

Spatial Representation: The data applies to 9 subwatersheds within the Beaver Creek Watershed. The 8 subwatersheds located in California are Cow Creek, Grouse Creek, Hungry Creek, Bumblebee Creek, Jaynes Canyon, Upper West Fork Creek, Lower West Fork Creek, and Buckhorn Creek subwatersheds. The 1 subwatershed located in Oregon, and therefore not considered in this assessment, is Long John Creek.

Temporal Representation: The temporal representation of the data is unknown.

Environmental Conditions: A major fire occurred in the Beaver Creek Watershed in 1987. Major storms occurred in 1964 and 1972.

QAPP Information: Model results were calculated as part of the Equivalent Roaded Area (ERA) Model conducted by staff of the Klamath National Forest in accordance with the procedures described by Elder and Reichert (2004).

QAPP Information Reference(s): Quantitative Models for Surface Erosion, Mass-wasting and ERA/TOC. CWE 2004. Cumulative Watershed Effects Analysis. Klamath National Forest

LOE ID: 25713

Pollutant: Sediment
 LOE Subgroup: Adverse Biological Responses
 Matrix: -N/A
 Fraction: None

Beneficial Use: Cold Freshwater Habitat
 Aquatic Life Use: Fish Migration | Fish Spawning | Preservation of Rare & Endangered Species | Wildlife Habitat

Number of Samples: 9
 Number of Exceedances: 0

Data and Information Type: MODELING
 Data Used to Assess Water Quality: None of the 9 subwatersheds within the Horse Creek Watershed have modeled landslide volumes that are 200% or more over undisturbed conditions and exceed the evaluation guideline. Landslide volumes range from 124.3% to 199%. Landslide volumes were modeled by staff of the Klamath National Forest. Results are summarized in the Horse Creek Environmental Analysis (USFS 2002).

Data Reference: Horse Creek Ecosystem Analysis. United States Department of Agriculture, Forest Service, Klamath National Forest

Water Quality Objective/Criterion: Per the Basin Plan (North Coast RWQCB 2007): The suspended sediment load and suspended sediment discharge rate of surface waters shall not be altered in such a manner as to cause nuisance or adversely affect beneficial uses.

Objective/Criterion Reference: Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board

Evaluation Guideline: Per the "Quantitative Models for Surface Erosion, Mass-Wasting and ERA/TOC" (Elder & Reichert 2004): Landslide/mass-wasting volumes of 200% over background conditions as computed by the USFS mass wasting model indicate the inference point where the risk of initiating or contributing to existing adverse cumulative watershed impacts (including impacts from excess sediment discharges) becomes a cause for concern.

Guideline Reference: Quantitative Models for Surface Erosion, Mass-wasting and ERA/TOC. CWE 2004. Cumulative Watershed Effects Analysis. Klamath National Forest

Spatial Representation: Modeling was conducted for 9 subwatersheds in the Horse Creek Watershed as follows: Upper Horse Creek, Lower Horse Creek, Middle Creek, Buckhorn Creek, Kohn/Dona Creek, Doggett Creek, Blue Heron Creek, Collins/Lime Creek, and Quigley Creek subwatersheds.

Temporal Representation: The temporal representation of the model is unknown.

Environmental Conditions: The environmental conditions (e.g., seasonality, land use practices, fire, floods, etc.) for the model are unknown.

QAPP Information: Model results were calculated as part of the GEO Mass Wasting Model conducted by staff of the Klamath National Forest in accordance with the procedures described by Elder and Reichert (2004).

QAPP Information Reference(s): Quantitative Models for Surface Erosion, Mass-wasting and ERA/TOC. CWE 2004. Cumulative Watershed Effects Analysis. Klamath National Forest

LOE ID: 25714

Pollutant: Sediment
 LOE Subgroup: Adverse Biological Responses
 Matrix: -N/A
 Fraction: None

Beneficial Use: Cold Freshwater Habitat
 Aquatic Life Use: Fish Migration | Fish Spawning | Preservation of Rare & Endangered Species | Wildlife Habitat

Number of Samples: 9
 Number of Exceedances: 0

Data and Information Type: MODELING
 Data Used to Assess Water Quality: None of the 9 subwatersheds within the Horse Creek Watershed have modeled ERA/TOC ratios that exceed the evaluation guideline. ERA/TOC ratios range from 0.28 to 0.94. Ratios were modeled by staff of the Klamath National Forest. Results are summarized in the "Horse Creek Ecosystem Analysis" (USFS 2002).
 Data Reference: Horse Creek Ecosystem Analysis. United States Department of Agriculture, Forest Service, Klamath National Forest

Water Quality Objective/Criterion: Per the Basin Plan (North Coast RWQCB 2007): The suspended sediment load and suspended sediment discharge rate of surface waters shall not be altered in such a manner as to cause nuisance or adversely affect beneficial uses.
 Objective/Criterion Reference: Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board

Evaluation Guideline: Per the "Quantitative Models for Surface Erosion, Mass-Wasting and ERA/TOC" (Elder & Reichert 2004): An Equivalent Roaded Area/Threshold of Concern (ERA/TOC) percent, or risk ratio, greater than 1.0 indicates the inference point where the risk of initiating or contributing to existing adverse cumulative watershed impacts (including impacts from excess sediment discharges) becomes a cause for concern.

Guideline Reference: Quantitative Models for Surface Erosion, Mass-wasting and ERA/TOC. CWE 2004. Cumulative Watershed Effects Analysis. Klamath National Forest

Spatial Representation: Modeling was conducted for 9 subwatersheds in the Horse Creek Watershed as follows: Upper Horse Creek, Lower Horse Creek, Middle Creek, Buckhorn Creek, Kohn/Dona

Creek, Doggett Creek, Blue Heron Creek, Collins/Lime Creek, and Quigley Creek subwatersheds.

Temporal Representation: The temporal representation of the model is unknown.

Environmental Conditions: The environmental conditions (e.g., seasonality, land use practices, fire, floods, etc.) for the model are unknown.

QAPP Information: Model results were calculated as part of the ERA Model conducted by staff of the Klamath National Forest in accordance with the procedures described by Elder and Reichert (2004).

QAPP Information Reference(s): Quantitative Models for Surface Erosion, Mass-wasting and ERA/TOC. CWE 2004. Cumulative Watershed Effects Analysis. Klamath National Forest

LOE ID: 25688

Pollutant: Sediment

LOE Subgroup: Adverse Biological Responses

Matrix: -N/A

Fraction: None

Beneficial Use: Cold Freshwater Habitat

Aquatic Life Use: Fish Migration | Fish Spawning | Preservation of Rare & Endangered Species | Wildlife Habitat

Number of Samples: 8

Number of Exceedances: 3

Data and Information Type: MODELING

Data Used to Assess Water Quality: Three of the 8 subwatersheds within the Beaver Creek Watershed have modeled landslide volumes that are 200% or more over undisturbed conditions and exceed the evaluation guideline. The 3 subwatersheds are Grouse Creek, Hungry Creek, and Bumblebee Creek subwatersheds. Landslide volumes were modeled by staff of the Klamath National Forest. Results are summarized in the Beaver Creek Environmental Analysis (USFS 1996).

Data Reference: Beaver Creek Environmental Analysis. United States Department of Agriculture, Forest Service, Klamath National Forest, Yreka, CA

Water Quality Objective/Criterion: Per the Basin Plan (North Coast RWQCB 2007): The suspended sediment load and suspended sediment discharge rate of surface waters shall not be altered in such a manner as to cause nuisance or adversely affect beneficial uses.

Objective/Criterion Reference: Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board

Evaluation Guideline: Per the "Quantitative Models for Surface Erosion, Mass-Wasting and ERA/TOC" (Elder & Reichert 2004): Landslide/mass-wasting volumes of 200% over background conditions as computed by the USFS mass wasting model indicate the inference point where the risk of initiating or contributing to existing adverse cumulative watershed impacts (including impacts from excess sediment discharges) becomes a cause for concern.

Guideline Reference: Quantitative Models for Surface Erosion, Mass-wasting and ERA/TOC. CWE 2004. Cumulative Watershed Effects Analysis. Klamath National Forest

Spatial Representation: Modeling was conducted for 9 subwatersheds in the Beaver Creek Watershed. The 8 subwatersheds located in California are Cow Creek, Grouse Creek, Hungry Creek, Bumblebee Creek, Jaynes Canyon Creek, Upper West Fork Beaver Creek, Lower West Fork Beaver Creek, and Buckhorn Creek subwatersheds. The 1 subwatershed located in

Oregon, and therefore not considered in this assessment, is Long John Creek.

Temporal Representation: The temporal representation of the model is unknown.

Environmental Conditions: A major fire occurred in the Beaver Creek Watershed in 1987. Major storms occurred in 1964 and 1972.

QAPP Information: Model results were calculated as part of the GEO Mass Wasting Model conducted by staff of the Klamath National Forest in accordance with the procedures described by Elder and Reichert (2004). These procedures were used to determine the data described in the Beaver Creek Environmental Analysis from 1996, although they were not published until 2004. Landslide rates were modeled using the landslide rates developed from the Salmon Sub-Basin Sediment Analysis (de la Fuente 1991). Air photo interpretation and field verification of observable failures and debris torrents that delivered sediment to streams were used to determine the landslide rates. It should be noted that the Salmon River watershed received more rainfall than the Beaver Creek watershed. Additionally, a large portion of the granitic terrains in the Salmon River are deeply dissected and prone to landsliding, whereas those in the Beaver Creek Watershed are not. Beaver Creek does have subwatersheds underlain by the Condrey Mountain Schist, which is highly erosive, although not quite as much as the deeply weathered granitic terrains in the Salmon River Watershed.

QAPP Information Reference(s): Beaver Creek Environmental Analysis. United States Department of Agriculture, Forest Service, Klamath National Forest, Yreka, CA
Quantitative Models for Surface Erosion, Mass-wasting and ERA/TOC. CWE 2004. Cumulative Watershed Effects Analysis. Klamath National Forest

LOE ID: 25690

Pollutant: Sediment
 LOE Subgroup: Adverse Biological Responses
 Matrix: -N/A
 Fraction: None

Beneficial Use: Cold Freshwater Habitat
 Aquatic Life Use: Fish Migration | Fish Spawning | Preservation of Rare & Endangered Species | Wildlife Habitat

Number of Samples: 5
 Number of Exceedances: 5

Data and Information Type: HABITAT ASSESSMENT
 Data Used to Assess Water Quality: All 5 of the 5 subwatersheds within the Beaver Creek Watershed have embeddedness values that exceed the evaluation guideline. Compositions range from 34% to 63% embedded. Samples were collected by staff of the Klamath National Forest. Results are summarized in the Beaver Creek Environmental Analysis (USFS 1996).
 Data Reference: Beaver Creek Environmental Analysis. United States Department of Agriculture, Forest Service, Klamath National Forest, Yreka, CA

Water Quality Objective/Criterion: Per the Basin Plan (North Coast RWQCB 2007): The suspended sediment load and suspended sediment discharge rate of surface waters shall not be altered in such a manner as to cause nuisance or adversely affect beneficial uses.
 Objective/Criterion Reference: Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board

Evaluation Guideline: Per the "Klamath National Forest Land and Resource Management Plan" (USFS 2001), also known as the Forest Plan: Less than 20% embeddedness values in the channel substrate. Per the "Desired Salmonid Freshwater Habitat Conditions for Sediment-

Guideline Reference:	Related Indices" (North Coast RWQCB 2006), embedded gravels can be cemented into the stream substrate, generally do not lift out easily, and can prevent spawning salmonids from building their redds to lay eggs. Embedded gravels also contain high levels of fine material, which reduces the permeability in the egg pocket and can slow growth and cause mortality. <u>Klamath National Forest Land and Resource Management Plan 1995 (including all amendments as of 11/21/01). Siskiyou County, CA and Jackson County, OR. Pacific Southwest Region, United States Department of Agriculture Forest Service Desired Salmonid Freshwater Habitat Conditions for Sediment-Related Indices. State of California North Coast Regional Water Quality Control Board</u>
Spatial Representation:	Samples were collected in 7 subwatersheds in the Beaver Creek Watershed. The 5 subwatersheds located within California are: Beaver Creek, West Fork Beaver Creek, Deer Creek, Hungry Creek, and Cow Creek subwatersheds. The 2 subwatersheds located in Oregon, and therefore not considered here, are: Long John Creek and West Long John Creek.
Temporal Representation:	The temporal representation of the samples is unknown.
Environmental Conditions:	A major fire occurred in the Beaver Creek Watershed in 1987. Major storms occurred in 1964 and 1972.
QAPP Information:	Samples were collected and analyzed in accordance with the procedures similar to those found in the "Stream Condition Inventory (SCI) Technical Guide" (Frazier et al. 2005).
QAPP Information Reference(s):	<u>Stream Condition Inventory Technical Guide. USDA Forest Service, Pacific Southwest Region - Ecosystem Conservation Staff. Vallejo, CA. 111 pp</u>

LOE ID: 25691

Pollutant: Sediment
 LOE Subgroup: Adverse Biological Responses
 Matrix: -N/A
 Fraction: None

Beneficial Use: Cold Freshwater Habitat
Aquatic Life Use: Fish Migration | Fish Spawning | Preservation of Rare & Endangered Species | Wildlife Habitat

Number of Samples: 1
 Number of Exceedances: 1

Data and Information Type: Surveys of fish and game biologists/other professionals
Data Used to Assess Water Quality: In their conclusions in the Beaver Creek Environmental Analysis (USFS 1996), the Klamath National Forest states that "[t]he riparian and aquatic habitat in Beaver Creek is currently affected by roads in the Riparian Reserves, upslope roads, and other disturbances that cause erosion and stream sedimentation. . . Cumulative watershed impacts have resulted in impaired fish and amphibian habitat quality, mostly excessive fine sediment in streambeds." The high amount of fines in spawning beds limits egg survival and is a major limiting factor of fish production in the Beaver Creek Watershed.

Data Reference: Beaver Creek Environmental Analysis. United States Department of Agriculture, Forest Service, Klamath National Forest, Yreka, CA

Water Quality Objective/Criterion: Per the Basin Plan (North Coast RWQCB 2007): The suspended sediment load and suspended sediment discharge rate of surface waters shall not be altered in such a manner as to cause nuisance or adversely affect beneficial uses.
Objective/Criterion: Water Quality Control Plan for the North Coast Region. North Coast Regional Water

Reference: Quality Control Board

Evaluation Guideline:
Guideline Reference:

Spatial Representation: The assessment applies to the Beaver Creek Watershed.
Temporal Representation: The assessment was made in July 1996.
Environmental Conditions: A major fire occurred in the Beaver Creek Watershed in 1987. Major storms occurred in 1964 and 1972.
QAPP Information: The assessment was made by professional staff of the Klamath National Forest.
QAPP Information Reference(s):

LOE ID: 25700

Pollutant: Sediment
LOE Subgroup: Adverse Biological Responses
Matrix: -N/A
Fraction: None

Beneficial Use: Cold Freshwater Habitat
Aquatic Life Use: Fish Migration | Fish Spawning | Preservation of Rare & Endangered Species | Wildlife Habitat

Number of Samples: 1
Number of Exceedances: 1

Data and Information Type: Surveys of fish and game biologists/other professionals
Data Used to Assess Water Quality: "The Flood of 1997 Klamath National Forest" report (de la Fuente and Elder 1998) states that "[b]ased on observations of fisheries personnel, there appeared to be considerable reduction in size, volume and depth of pools in Elk, Indian, Beaver, Grider, Tompkins, South Fork Salmon, and Walker Creeks, and there is a larger proportion of fine sediment in the substrate. Alluvial reaches were made shallower and wider due to sedimentation." Only Beaver Creek falls within the Iron Gate Dam to Scott River portion of the Middle Klamath River Hydrologic Area.
Data Reference: The flood of 1997-Klamath National Forest. Phase 1 Final Report. Yreka, CA: Klamath National Forest

Water Quality Objective/Criterion: Per the Basin Plan (North Coast RWQCB 2007): The suspended sediment load and suspended sediment discharge rate of surface waters shall not be altered in such a manner as to cause nuisance or adversely affect beneficial uses.
Objective/Criterion Reference: Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board

Evaluation Guideline:
Guideline Reference:

Spatial Representation: The assessment applies to the Beaver Creek Watershed.
Temporal Representation: The assessment was made after the flood of December 26, 1996 to January 3, 1997. Findings were made available in November 1998.
Environmental Conditions: Conditions were a result of the storm of December 26, 1996 to January 3, 1997.
QAPP Information: The assessment was made by professional staff of the Klamath National Forest.
QAPP Information Reference(s):

WATER BODY NAME: **KLAMATH RIVER HU, MIDDLE HA AND LOWER HA, SCOTT RIVER TO TRINITY RIVER**

Water Body ID: CAR1053107519990610152950
Water Body Type: River & Stream

DECISION ID 13198

Pollutant: **SEDIMENT**

Final Listing Decision: List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: New Decision

Revision Status: Revised

Sources: Channel Erosion | Dredge Mining | Erosion/Siltation | Grazing-Related Sources | Highway/Road/Bridge Runoff | Logging Road Construction/Maintenance | Natural Sources | Other | Removal of Riparian Vegetation | Silviculture | Streambank Modification/Destabilization | Unknown Nonpoint Source

Expected TMDL Completion Date: 2021

Pollutant or Pollution: Pollutant

Weight of Evidence: This pollutant is being considered for placement on the Section 303(d) List under Section 3.11 of the Listing Policy. The weight of evidence indicates there is sufficient justification in favor of placing the mainstem Klamath R from the confluence of O'Neil Ck to the confluence of Elk Ck, and the watersheds of Cade Ck, Caroline Ck, China Ck, Elk Ck, Fryingpan Ck, Fort Goff Ck, Grider Ck, Horse Ck, Indian Ck, Joe Miles Ck, O'Neil Ck, Portuguese Ck, Ranch Gulch, Schutts Gulch, Seiad Ck, Thompson Ck, Walker Ck, and Walker Gulch on the Section 303(d) List in the Water Quality Limited Segments category. This conclusion is based on the staff findings that:

- (A) The weight of evidence demonstrates that sediment conditions in the mainstem Klamath R from the confluence of O'Neil Ck to the confluence of Elk Ck and 18 watersheds do not attain sediment objectives and/or evaluation guidelines, in compliance with Section 3.11 of the Listing Policy, as described below:
- (1) Cade Ck Watershed exceeds surface erosion (LOE 25697) and equivalent roaded area to threshold of concern ratio (ERA/TOC) (LOE 25698) guidelines.
 - (2) Caroline Ck Watershed exceeds landslide volume (LOE 25696) and surface erosion (LOE 25697) guidelines.
 - (3) China Ck Watershed exceeds landslide volume (LOE 25696), surface erosion (LOE 25697), ERA/TOC (LOE 25698), and embeddedness (LOE 25692) guidelines.
 - (4) Elk Creek Watershed shows pool reduction as a result of the flood of 1997 (LOE 25701), which exceeds the sediment objective.
 - (5) Fryingpan Ck Watershed exceeds surface erosion (LOE 25697) and ERA/TOC (LOE 25698) guidelines.
 - (6) Fort Goff Ck Watershed exceeds ERA/TOC (LOE 25698) and embeddedness (LOE 25692) guidelines.
 - (7) Grider Ck Watershed (which includes Grider, Lower Grider, Upper Grider, West Grider, Rancheria, Cliff Valley, and Bittenbender creeks) exceeds surface erosion (LOE 25697), percent fines (LOE 25693), ERA/TOC (LOE 25698), and embeddedness (LOE 25692) guidelines and shows pool reduction as a result of the flood of 1997 (LOE 25701), which exceeds the sediment objective.
 - (8) Horse Ck Watershed exceeds surface erosion (LOE 25697) and ERA/TOC (LOE 25698) guidelines.
 - (9) Indian Ck Watershed shows pool reduction as a result of the flood of 1997 (LOE 25701), which exceeds the sediment objective.
 - (10) Joe Miles Ck Watershed exceeds the surface erosion (LOE 25697) guideline.

- (11) O'Neil Ck Watershed exceeds the surface erosion (LOE 25697) guideline.
- (12) Portuguese Ck Watershed exceeds ERA/TOC (LOE 25698) and embeddedness (LOE 25692) guidelines.
- (13) Ranch Gulch Watershed exceeds surface erosion (LOE 25697) and ERA/TOC (LOE 25698) guidelines.
- (14) Schutts Gulch Watershed exceeds the surface erosion (LOE 25697) guideline.
- (15) Seiad Ck Watershed (which includes Seiad, Lower Seiad, Upper Seiad, Canyon, and Panther creeks) exceeds surface erosion (LOE 25697) and ERA/TOC (LOE 25698) guidelines.
- (16) Thompson Ck Watershed (which includes Thompson, Upper Thompson, Mill, and Slide creeks) exceeds surface erosion (LOE 25697), percent fines (LOE 25693), ERA/TOC (LOE 25698), and embeddedness (LOE 25692) guidelines.
- (17) Walker Ck Watershed exceeds landslide volume (LOE 25696), surface erosion (LOE 25697), percent fines (LOE 25693), and ERA/TOC (LOE 25698) guidelines and shows pool reduction as a result of the flood of 1997 (LOE 25701), which exceeds sediment water quality objective.
- (18) Walker Gulch Watershed exceeds surface erosion (LOE 25697) and ERA/TOC (LOE 25698) guidelines.

(B) The data used satisfies the data quality requirements of Section 6.1.4 of the Policy.

(C) The data used satisfies the data quantity requirements of Section 6.1.5 of the Policy.

(D) Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

**RWQCB Staff
Recommendation:**

After review of the available data and information, North Coast RWQCB staff concludes that the mainstem Klamath River from the confluence of O'Neil Creek to the confluence of Elk Creek, and the watersheds of Cade Ck, Caroline Ck, China Ck, Elk Ck, Fryingpan Ck, Fort Goff Ck, Grider Ck, Horse Ck, Indian Ck, Joe Miles Ck, O'Neil Ck, Portuguese Ck, Ranch Gulch, Schutts Gulch, Seiad Ck, Thompson Ck, Walker Ck, and Walker Gulch should be placed on the Section 303(d) List because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

**SWRCB Board Decision
/ Staff Recommendation:**

USEPA Decision:

Lines of Evidence (LOEs) for Decision ID 13198

LOE ID: 25701

Pollutant: Sediment

LOE Subgroup: Adverse Biological Responses

Matrix: -N/A

Fraction: None

Beneficial Use: Cold Freshwater Habitat

Aquatic Life Use: Fish Migration | Fish Spawning | Preservation of Rare & Endangered Species | Wildlife Habitat

Number of Samples: 1

Number of Exceedances: 1

Data and Information Type: Surveys of fish and game biologists/other professionals

Data Used to Assess Water Quality: "The Flood of 1997 Klamath National Forest" report (de la Fuente and Elder 1998) states that "[b]ased on observations of fisheries personnel, there appeared to be considerable reduction in size, volume and depth of pools in Elk, Indian, Beaver, Grider, Tompkins, South Fork Salmon, and Walker Creeks, and there is a larger proportion of fine sediment in the substrate. Alluvial reaches were made shallower and wider due to sedimentation." All the waterbodies listed except for Beaver Creek, Tompkins Creek, and the South Fork Salmon River fall within the Scott River to Trinity River portion of the Middle and Lower Klamath River Hydrologic Areas.

Data Reference: [The flood of 1997-Klamath National Forest. Phase 1 Final Report. Yreka, CA: Klamath National Forest](#)

Water Quality Objective/Criterion: Per the Basin Plan (North Coast RWQCB 2007): The suspended sediment load and suspended sediment discharge rate of surface waters shall not be altered in such a manner as to cause nuisance or adversely affect beneficial uses.

Objective/Criterion Reference: [Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board](#)

Evaluation Guideline: Guideline Reference:

Spatial Representation: The assessment applies to the Beaver Creek Watershed.

Temporal Representation: The assessment was made after the flood over December 26, 1996 to January 3, 1997. Findings were made available in November 1998.

Environmental Conditions: Conditions were a result of the storm of December 26, 1996 to January 3, 1997.

QAPP Information: The assessment was made by professional staff of the Klamath National Forest.

QAPP Information Reference(s):

LOE ID: 25696

Pollutant: Sediment

LOE Subgroup: Adverse Biological Responses

Matrix: -N/A

Fraction: None

Beneficial Use: Cold Freshwater Habitat

Aquatic Life Use:	Fish Migration Fish Spawning Preservation of Rare & Endangered Species Warm Freshwater Habitat Wildlife Habitat
Number of Samples:	22
Number of Exceedances:	3
Data and Information Type:	MODELING
Data Used to Assess Water Quality:	Three of the 22 subwatersheds within the Thompson, Seiad, and Grider Creek watersheds of the Middle Klamath River Hydrologic Area have modeled landslide volumes that exceed the evaluation guideline. The 3 subwatersheds are Walker Creek, Caroline Creek, and China Creek subwatersheds. Landslide volumes were modeled by staff of the Klamath National Forest. Results are summarized in the "Thompson/Seiad/Grider Environmental Analysis " (USFS 1999).
Data Reference:	<u>Thompson/Seiad/Grider Ecosystem Analysis. United States Department of Agriculture, Forest Service, Pacific Southwest Region, Klamath National Forest, Happy Camp Ranger District</u>
Water Quality Objective/Criterion:	Per the Basin Plan (North Coast RWQCB 2007): The suspended sediment load and suspended sediment discharge rate of surface waters shall not be altered in such a manner as to cause nuisance or adversely affect beneficial uses.
Objective/Criterion Reference:	<u>Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board</u>
Evaluation Guideline:	Per the "Quantitative Models for Surface Erosion, Mass-Wasting and ERA/TOC" (Elder & Reichert 2004): Landslide/mass-wasting volumes of 200% over background conditions as computed by the USFS mass wasting model indicate the inference point where the risk of initiating or contributing to existing adverse cumulative watershed impacts (including impacts from excess sediment discharges) becomes a cause for concern.
Guideline Reference:	<u>Quantitative Models for Surface Erosion, Mass-wasting and ERA/TOC. CWE 2004. Cumulative Watershed Effects Analysis. Klamath National Forest</u>
Spatial Representation:	Samples were collected in 22 seventh field subwatersheds in the Middle Klamath River Hydrologic Area, as follows: Walker Creek, Caroline Creek, China Creek, Mill/Slide Creek, Canyon Creek, Horse/Cade Creek, Rancheria Creek, O'Neil/Schutts Creek, West Grider/Bittenbender Creek, Panther Creek, Lower Grider Creek, Upper Seiad Creek, Seattle/Joe Miles Creek, Fort Goff Creek, Cliff Valley Creek, Ladds/Tims Creek, Portuguese Creek, Lower Seiad Creek, Cedar/Morgan Creek, Tom Martin/Kuntz Creek, Upper Grider Creek, and Upper Thompson Creek subwatersheds.
Temporal Representation:	Model results were calculated based on pre-1999 data layers.
Environmental Conditions:	A major fire occurred in 1987. Major storms occurred in 1964 and 1972, 1997/1998.
QAPP Information:	Results were calculated using the USFS GEO Mass Wasting Model. Model components, data sources, and methodology are described in the "Thompson/Seiad/Grider Ecosystem Analysis" (USFS 1999).
QAPP Information Reference(s):	<u>Thompson/Seiad/Grider Ecosystem Analysis. United States Department of Agriculture, Forest Service, Pacific Southwest Region, Klamath National Forest, Happy Camp Ranger District</u>

LOE ID: 25698

Pollutant: Sediment
 LOE Subgroup: Adverse Biological Responses
 Matrix: -N/A

Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Aquatic Life Use:	Fish Migration Fish Spawning Preservation of Rare & Endangered Species Warm Freshwater Habitat Wildlife Habitat
Number of Samples:	22
Number of Exceedances:	10
Data and Information Type:	MODELING
Data Used to Assess Water Quality:	Ten of the 22 subwatersheds within the Thompson, Seiad, and Grider Creek watersheds of the Middle Klamath River Hydrologic Area have modeled ERA/TOC ratios that exceed the evaluation guideline. ERA/TOC ratios range from 0.14 to 1.75. The 10 subwatersheds that exceed the evaluation guideline are Upper Seiad Creek, Mill/Slide Creek, Rancheria Creek, Fort Goff Creek, China Creek, Portuguese Creek, Canyon Creek, Horse/Cade Creek, and Walker Creek subwatersheds. Ratios were modeled by staff of the Klamath National Forest. Results are summarized in the "Thompson/Seiad/Grider Environmental Analysis" (USFS 1999).
Data Reference:	<u>Thompson/Seiad/Grider Ecosystem Analysis. United States Department of Agriculture, Forest Service, Pacific Southwest Region, Klamath National Forest, Happy Camp Ranger District</u>
Water Quality Objective/Criterion:	Per the Basin Plan (North Coast RWQCB 2007): The suspended sediment load and suspended sediment discharge rate of surface waters shall not be altered in such a manner as to cause nuisance or adversely affect beneficial uses.
Objective/Criterion Reference:	<u>Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board</u>
Evaluation Guideline:	Per the "Quantitative Models for Surface Erosion, Mass-Wasting and ERA/TOC" (Elder & Reichert 2004): An Equivalent Roaded Area/Threshold of Concern (ERA/TOC) percent, or risk ratio, greater than 1.0 indicates the inference point where the risk of initiating or contributing to existing adverse cumulative watershed impacts (including impacts from excess sediment discharges) becomes a cause for concern.
Guideline Reference:	<u>Quantitative Models for Surface Erosion, Mass-wasting and ERA/TOC. CWE 2004. Cumulative Watershed Effects Analysis. Klamath National Forest</u>
Spatial Representation:	Samples were collected in 22 seventh field subwatersheds in the Middle Klamath River Hydrologic Area, as follows: Walker Creek, Caroline Creek, China Creek, Mill/Slide Creek, Canyon Creek, Horse/Cade Creek, Rancheria Creek, O'Neil/Schutts Creek, West Grider/Bittenbender Creek, Panther Creek, Lower Grider Creek, Upper Seiad Creek, Seattle/Joe Miles Creek, Fort Goff Creek, Cliff Valley Creek, Ladds/Tims Creek, Portuguese Creek, Lower Seiad Creek, Cedar/Morgan Creek, Tom Martin/Kuntz Creek, Upper Grider Creek, and Upper Thompson Creek subwatersheds.
Temporal Representation:	Model results were calculated based on pre-1999 data layers.
Environmental Conditions:	A major fire occurred in 1987. Major storms occurred in 1964 and 1972, 1997/1998.
QAPP Information:	Model components, data sources, and methodology are described in the "Thompson/Seiad/Grider Ecosystem Analysis" (USFS 1999).
QAPP Information Reference(s):	<u>Thompson/Seiad/Grider Ecosystem Analysis. United States Department of Agriculture, Forest Service, Pacific Southwest Region, Klamath National Forest, Happy Camp Ranger District</u>

LOE ID:	25697
Pollutant:	Sediment
LOE Subgroup:	Adverse Biological Responses
Matrix:	-N/A
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Aquatic Life Use:	Fish Migration Fish Spawning Preservation of Rare & Endangered Species Warm Freshwater Habitat Wildlife Habitat
Number of Samples:	22
Number of Exceedances:	11
Data and Information Type:	MODELING
Data Used to Assess Water Quality:	Eleven of the 22 subwatersheds within the Thompson, Seiad, and Grider Creek watersheds of the Middle Klamath River Hydrologic Area have modeled surface erosion volumes that exceed the evaluation guideline. Surface erosion volumes range from 1% over background to 1,202% over background. The 11 subwatersheds that exceed the evaluation guideline are China Creek, Horse/Cade Creek, West Grider/Bittenbender Creek, Walker Creek, Panther Creek, Mill/Slide Creek, Caroline Creek, Upper Seiad Creek, O'Neil/Schutts Creek, Seattle/Joe Miles Creek, and Cliff Valley Creek subwatersheds. Volumes were modeled by staff of the Klamath National Forest. Results are summarized in the "Thompson/Seiad/Grider Environmental Analysis " (USFS 1999).
Data Reference:	<u>Thompson/Seiad/Grider Ecosystem Analysis. United States Department of Agriculture, Forest Service, Pacific Southwest Region, Klamath National Forest, Happy Camp Ranger District</u>
Water Quality Objective/Criterion:	Per the Basin Plan (North Coast RWQCB 2007): The suspended sediment load and suspended sediment discharge rate of surface waters shall not be altered in such a manner as to cause nuisance or adversely affect beneficial uses.
Objective/Criterion Reference:	<u>Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board</u>
Evaluation Guideline:	Per the "Quantitative Models for Surface Erosion, Mass-Wasting and ERA/TOC" (Elder & Reichert 2004): Surface erosion volumes of 400% over background conditions as computed by the USFS Universal Soil Loss Equation Model indicate the inference point where the risk of initiating or contributing to existing adverse cumulative watershed impacts (including impacts from excess sediment discharges) becomes a cause for concern.
Guideline Reference:	<u>Quantitative Models for Surface Erosion, Mass-wasting and ERA/TOC. CWE 2004. Cumulative Watershed Effects Analysis. Klamath National Forest</u>
Spatial Representation:	Samples were collected in 22 seventh field subwatersheds in the Middle Klamath River Hydrologic Area, as follows: Walker Creek, Caroline Creek, China Creek, Mill/Slide Creek, Canyon Creek, Horse/Cade Creek, Rancheria Creek, O'Neil/Schutts Creek, West Grider/Bittenbender Creek, Panther Creek, Lower Grider Creek, Upper Seiad Creek, Seattle/Joe Miles Creek, Fort Goff Creek, Cliff Valley Creek, Ladds/Tims Creek, Portuguese Creek, Lower Seiad Creek, Cedar/Morgan Creek, Tom Martin/Kuntz Creek, Upper Grider Creek, and Upper Thompson Creek subwatersheds.
Temporal Representation:	Model results were calculated based on pre-1999 data layers.

Environmental Conditions: A major fire occurred in 1987. Major storms occurred in 1964 and 1972, 1997/1998.

QAPP Information: Surface erosion was predicted using the Universal Soil Loss Equation. Model components, data sources, and methodology are described in the "Thompson/Seiad/Grider Ecosystem Analysis" (USFS 1999).

QAPP Information Reference(s): Thompson/Seiad/Grider Ecosystem Analysis. United States Department of Agriculture, Forest Service, Pacific Southwest Region, Klamath National Forest, Happy Camp Ranger District

LOE ID: 25693

Pollutant: Sediment

LOE Subgroup: Adverse Biological Responses

Matrix: -N/A

Fraction: None

Beneficial Use: Cold Freshwater Habitat

Aquatic Life Use: Fish Migration | Fish Spawning | Preservation of Rare & Endangered Species | Warm Freshwater Habitat | Wildlife Habitat

Number of Samples: 8

Number of Exceedances: 3

Data and Information Type: HABITAT ASSESSMENT

Data Used to Assess Water Quality: Three of the 8 subwatersheds within the Middle Klamath River Hydrologic Area have percent fine compositions that exceed the evaluation guideline. Compositions range from 5% to 17% fines. The 3 subwatersheds that exceed the evaluation guideline are Thompson Creek, Walker Creek, and Grider Creek subwatersheds. Samples were collected by staff of the Klamath National Forest. Results are summarized in the "Thompson/Seiad/Grider Environmental Analysis" (USFS 1999).

Data Reference: Thompson/Seiad/Grider Ecosystem Analysis. United States Department of Agriculture, Forest Service, Pacific Southwest Region, Klamath National Forest, Happy Camp Ranger District

Water Quality Objective/Criterion: Per the Basin Plan (North Coast RWQCB 2007): The suspended sediment load and suspended sediment discharge rate of surface waters shall not be altered in such a manner as to cause nuisance or adversely affect beneficial uses.

Objective/Criterion Reference: Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board

Evaluation Guideline: Per the "Klamath National Forest Land and Resource Management Plan" (USFS 2001), also known as the Forest Plan: Less than 15% fines of the substrate composition as the area weighted average in spawning habitat. Per the "Desired Salmonid Freshwater Habitat Conditions for Sediment-Related Indices" (North Coast RWQCB 2006), fine sediment particles in the substrate of a waterbody have the potential to fill the interstitial spaces of gravels used by salmonids to hold and incubate eggs, suffocating the eggs. Fines from 1.0 mm to 10.0 mm in diameter are also capable of blocking fry emergence. High amounts of fines can result in reduced embryo and fry survival and have deleterious effects on the cold water fishery beneficial uses.

Guideline Reference: Klamath National Forest Land and Resource Management Plan 1995 (including all amendments as of 11/21/01). Siskiyou County, CA and Jackson County, OR. Pacific Southwest Region, United States Department of Agriculture Forest Service Desired Salmonid Freshwater Habitat Conditions for Sediment-Related Indices. State of California North Coast Regional Water Quality Control Board

Spatial Representation: Samples were collected in 8 subwatersheds in the Middle Klamath River Hydrologic Area, as follows: China Creek, Seiad Creek, Thompson Creek, Walker Creek, Grider Creek, Horse Creek, Portuguese Creek, and Fort Goff Creek subwatersheds.

Temporal Representation: The temporal representation is unknown.

Environmental Conditions: A major fire occurred in 1987. Major storms occurred in 1964 and 1972, 1997/1998.

QAPP Information: Samples were collected and analyzed in accordance with the procedures found in the "Stream Condition Inventory (SCI) Technical Guide" (Frazier et al. 2005).

QAPP Information Reference(s): Stream Condition Inventory Technical Guide. USDA Forest Service, Pacific Southwest Region - Ecosystem Conservation Staff. Vallejo, CA. 111 pp

LOE ID: 25692

Pollutant: Sediment
 LOE Subgroup: Adverse Biological Responses
 Matrix: -N/A
 Fraction: None

Beneficial Use: Cold Freshwater Habitat
 Aquatic Life Use: Fish Migration | Fish Spawning | Preservation of Rare & Endangered Species | Warm Freshwater Habitat | Wildlife Habitat

Number of Samples: 7
 Number of Exceedances: 5

Data and Information Type: HABITAT ASSESSMENT

Data Used to Assess Water Quality: Five of the 7 subwatersheds within the Middle Klamath River Hydrologic Area have embeddedness values that exceed the evaluation guideline. Embeddedness values range from 18% to 53% embedded. The 5 subwatersheds that exceed the evaluation guideline are the China Creek, Thompson Creek, Grider Creek, Portuguese Creek, and Fort Goff Creek subwatersheds. Samples were collected by staff of the Klamath National Forest. Results are summarized in the "Thompson/Seiad/Grider Environmental Analysis" (USFS 1999).

Data Reference: Thompson/Seiad/Grider Ecosystem Analysis. United States Department of Agriculture, Forest Service, Pacific Southwest Region, Klamath National Forest, Happy Camp Ranger District

Water Quality Objective/Criterion: Per the Basin Plan (North Coast RWQCB 2007): The suspended sediment load and suspended sediment discharge rate of surface waters shall not be altered in such a manner as to cause nuisance or adversely affect beneficial uses.

Objective/Criterion Reference: Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board

Evaluation Guideline: Per the "Klamath National Forest Land and Resource Management Plan" (USFS 2001), also known as the Forest Plan: Less than 20% embeddedness values in the channel substrate. Per the "Desired Salmonid Freshwater Habitat Conditions for Sediment-Related Indices" (North Coast RWQCB 2006), embedded gravels can be cemented into the stream substrate, generally do not lift out easily, and can prevent spawning salmonids from building their redds to lay eggs. Embedded gravels also contain high levels of fine material, which reduces the permeability in the egg pocket and can slow growth and cause mortality.

Guideline Reference: Klamath National Forest Land and Resource Management Plan 1995 (including all amendments as of 11/21/01). Siskiyou County, CA and Jackson County, OR. Pacific

Southwest Region, United States Department of Agriculture Forest Service
Desired Salmonid Freshwater Habitat Conditions for Sediment-Related Indices. State of
California North Coast Regional Water Quality Control Board

Spatial Representation: Samples were collected in 7 subwatersheds in the Middle Klamath River Hydrologic Area, as follows: China Creek, Seiad Creek, Thompson Creek, Walker Creek, Grider Creek, Portuguese Creek, and Fort Goff Creek subwatersheds.

Temporal Representation: The temporal representation is unknown.

Environmental Conditions: A major fire occurred in 1987. Major storms occurred in 1964 and 1972, 1997/1998.

QAPP Information: Samples were collected and analyzed in accordance with the procedures found in the "Stream Condition Inventory (SCI) Technical Guide" (Frazier et al. 2005).

QAPP Information Reference(s): Stream Condition Inventory Technical Guide. USDA Forest Service, Pacific Southwest Region - Ecosystem Conservation Staff. Vallejo, CA. 111 pp

WATER BODY NAME: KLAMATH RIVER HU, SALMON RIVER HA
Water Body ID: CAR1052103419990610171042
Water Body Type: River & Stream

DECISION ID 13255

Pollutant: SEDIMENT
Final Listing Decision: Do Not List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status: Revised
Pollutant or Pollution: Pollutant

Weight of Evidence: Sediment in the Upper South Fork Salmon River (the watershed upstream of the confluence with the East Fork South Fork Salmon River) and the North Fork Salmon River is being considered for placement on the Section 303(d) List under Sections 3.1 and 3.8 of the Listing Policy. Under Section 3.1, a single line of evidence is necessary to assess listing status. Five lines of evidence are available in the administrative record to assess this pollutant.

One line of evidence (LOE 25702), which is a conclusion statement, shows that a larger proportion of fine sediment in the substrate of the Upper South Fork Salmon River with alluvial reaches made shallower and wider due to sedimentation; therefore causing 1 out of 1 exceedance. However, four lines of evidence (LOEs 9121, 9128, 7460, and 9130) that pertain to road densities, landslide volumes, and surface erosion values show sediment loads are not exceeding evaluation guidelines in the Upper South Fork and North Fork Salmon River. Combined, the five lines of evidence show 1 out of 7 exceedances.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the Section 303(d) List in the Water Quality Limited Segments category (i.e., sufficient justification to not list). This conclusion is based on the staff findings that: (1) The data used satisfies the data quality requirements of Section 6.1.4 of the Policy. (2) The data used satisfies the data quantity requirements of Section 6.1.5 of the Policy. (3) Combined, 1 out of 7 samples/values exceed the sediment water quality objective or the evaluation guidelines used to interpret the objective, and this does not exceed the allowable frequency listed in Table 3.1 of the Listing Policy. (4) Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

RWQCB Staff Recommendation: After review of the available data and information, North Coast RWQCB staff concludes that the water body-pollutant combination should not be placed on the Section 303(d) List because applicable water quality standards are being attained.

SWRCB Board Decision / Staff Recommendation:

USEPA Decision:

Lines of Evidence (LOEs) for Decision ID 13255

LOE ID:	7460
Pollutant:	Sediment
LOE Subgroup:	Adverse Biological Responses
Matrix:	-N/A
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Aquatic Life Use:	Fish Migration Fish Spawning Freshwater Replenishment Preservation of Rare & Endangered Species Wildlife Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	MODELING
Data Used to Assess Water Quality:	None of the 2 model results (for landslide volumes and from surface erosion volumes) in the Upper South Fork Salmon River Watershed (the watershed upstream of the confluence with the East Fork South Fork Salmon River) exceed the evaluation guidelines. Estimated accelerated mass wasting from timber harvest, roads, and wildfire account for a 49% increase above background respectively in sediment production. Estimated accelerated soil erosion from timber harvest, roads, and wildfire account for a 217% increase above background respectively in sediment production. Models were interpreted by staff of the Klamath National Forest. Results are summarized by Boland (2001, Attachment F).
Data Reference:	<u>Attachment F: Supporting Narrative for Upslope, Channel and Habitat-associated Criteria (1-9) Rating Rationale. Klamath National Forest's Northern Province Category 1 Watersheds which meet "management-constrained" criteria</u>
Water Quality Objective/Criterion:	Per the Basin Plan (NCRWQCB 2007): The suspended sediment load and suspended sediment discharge rate of surface waters shall not be altered in such a manner as to cause nuisance or adversely affect beneficial uses.
Objective/Criterion Reference:	<u>Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board</u>
Evaluation Guideline:	Per the "Quantitative Models for Surface Erosion, Mass-Wasting and ERA/TOC" (Elder & Reichert 2004): Landslide/mass-wasting volumes of 200% over background conditions as computed by the USFS Mass Wasting Model, and surface erosion volumes of 400% over background conditions as computed by the USFS Universal Soil Loss Equation Model, indicate the inference point where the risk of initiating or contributing to existing adverse cumulative watershed impacts (including impacts from excess sediment discharges) becomes a cause for concern.
Guideline Reference:	<u>Quantitative Models for Surface Erosion, Mass-wasting and ERA/TOC. CWE 2004. Cumulative Watershed Effects Analysis. Klamath National Forest</u>
Spatial Representation:	The Klamath National Forest models are specific to the Upper South Fork Salmon River watershed.
Temporal Representation:	Data from the Klamath National Forest models were finalized in 1998.
Environmental Conditions:	There are no known environmental conditions (e.g., seasonality, land use practices, fire events, storms, etc.) that are related to these data.
QAPP Information:	Model results were calculated as part of the Universal Soil Loss Equation Model and GEO Mass Wasting Model conducted by staff of the Klamath National Forest in

QAPP Information Reference(s): accordance with the procedures described by Elder and Reichert (2004).
Quantitative Models for Surface Erosion, Mass-wasting and ERA/TOC. CWE 2004.
Cumulative Watershed Effects Analysis. Klamath National Forest

LOE ID: 26340

Pollutant: Sediment
 LOE Subgroup: Pollutant-Water
 Matrix: Water
 Fraction: None

Beneficial Use: Cold Freshwater Habitat
 Aquatic Life Use: Fish Migration | Fish Spawning | Freshwater Replenishment | Preservation of Rare & Endangered Species | Wildlife Habitat

Number of Samples: 1
 Number of Exceedances: 0

Data and Information Type: Land use information and location of sources

Data Used to Assess Water Quality: The road density in the Upper South Fork Salmon River Watershed (the watershed upstream of the confluence with the East Fork South Fork Salmon River) does not exceed the evaluation guideline as it applies to the sediment objective. Per the Klamath National Forest (KNF 2000), the road density in the Upper South Fork Salmon River Watershed is 1.24 mi / sq. mi. Of the 230 total miles of road in the 118,390 square mile watershed, 91.1 mi of road are located within 105 m of a stream (KNF 2000). While there are a significant number of road miles located near stream channels and in valley bottoms, the water quality impact from near stream roads applies more directly to the temperature objective than to the sediment objective.

Data Reference: Attachment E: Roads & Hydrologic Connectivity. Northern California Province Category 1 watersheds meeting "management-constrained" criteria. March 2000

Water Quality Objective/Criterion: Per the Basin Plan (NCRWQCB 2007): The suspended sediment load and suspended sediment discharge rate of surface waters shall not be altered in such a manner as to cause nuisance or adversely affect beneficial uses.

Objective/Criterion Reference: Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board

Evaluation Guideline: The density of roads within a watershed can impact water temperature and alter natural conditions. Near-stream roads that run parallel to a waterbody do not allow for vegetation to grow and produce shade. Roads are also a major source of erosion and sedimentation on most managed forest lands. Excess sediment in the stream channel can result in higher water temperatures as pools fill in with sediment and channels widen in response to the increased load. Per NOAA Fisheries (1996), the guideline for the properly functioning condition for road density and location is less than 2 miles of road per square mile of watershed with no valley bottom roads.

Guideline Reference: Making Endangered Species Act Determinations of Effect for Individual or Group Actions at the Watershed Scale. Prepared by the National Oceanic and Atmospheric Administration National Marine Fisheries Service Environmental and Technical Services Division Habitat Conservation Branch

Spatial Representation: Road density and location information were assessed for the entire Upper South Fork Salmon River Watershed.

Temporal Representation: The road density and location data from the Klamath National Forest is current as of early 2000.

Environmental Conditions: There are no known environmental conditions (e.g., seasonality, land use practices, fire events, storms, etc.) that are related to these data.

QAPP Information: Model results were calculated as part of the Equivalent Roaded Area (ERA) Model conducted by staff of the Klamath National Forest in accordance with the procedures described by Elder and Reichert (2004).

QAPP Information Reference(s): Quantitative Models for Surface Erosion, Mass-wasting and ERA/TOC. CWE 2004. Cumulative Watershed Effects Analysis. Klamath National Forest

LOE ID: 9130

Pollutant: Sediment

LOE Subgroup: Adverse Biological Responses

Matrix: -N/A

Fraction: None

Beneficial Use: Cold Freshwater Habitat

Aquatic Life Use: Fish Migration | Fish Spawning | Freshwater Replenishment | Preservation of Rare & Endangered Species | Wildlife Habitat

Number of Samples: 2

Number of Exceedances: 0

Data and Information Type: MODELING

Data Used to Assess Water Quality: None of the 2 model results (for landslide volumes and from surface erosion volumes) in the North Fork Salmon River Watershed exceed the evaluation guidelines. Estimated accelerated mass wasting and soil erosion from timber harvest, roads, and wildfire account for a 126% and 145% increase above background respectively in sediment production. Models were interpreted by staff of the Klamath National Forest. Results are summarized by Boland (2001, Attachment F).

Data Reference: Attachment F: Supporting Narrative for Upslope, Channel and Habitat-associated Criteria (1-9) Rating Rationale. Klamath National Forest's Northern Province Category 1 Watersheds which meet "management-constrained" criteria

Water Quality Objective/Criterion: Per the Basin Plan (NCRWQCB 2007): The suspended sediment load and suspended sediment discharge rate of surface waters shall not be altered in such a manner as to cause nuisance or adversely affect beneficial uses.

Objective/Criterion Reference: Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board

Evaluation Guideline: Per the "Quantitative Models for Surface Erosion, Mass-Wasting and ERA/TOC" (Elder & Reichert 2004): Landslide/mass-wasting volumes of 200% over background conditions as computed by the USFS Mass Wasting Model, and surface erosion volumes of 400% over background conditions as computed by the USFS Universal Soil Loss Equation Model, indicate the inference point where the risk of initiating or contributing to existing adverse cumulative watershed impacts (including impacts from excess sediment discharges) becomes a cause for concern.

Guideline Reference: Quantitative Models for Surface Erosion, Mass-wasting and ERA/TOC. CWE 2004. Cumulative Watershed Effects Analysis. Klamath National Forest

Spatial Representation: The Klamath National Forest models are specific to the North Fork Salmon River watershed.

Temporal Representation: Data from the Klamath National Forest models were finalized in 1998.

Environmental: Most of the modeled sediment increase from the Klamath National Forest models is

Conditions: associated with intense wildfires in 1977 and 1987 (Boland 2001, Attachment F). Otherwise, there are no known environmental conditions (e.g., seasonality, land use practices, storms, etc.) that are related to these data.

QAPP Information: Model results were calculated as part of the Universal Soil Loss Equation Model and GEO Mass Wasting Model conducted by staff of the Klamath National Forest in accordance with the procedures described by Elder and Reichert (2004).

QAPP Information Reference(s): Quantitative Models for Surface Erosion, Mass-wasting and ERA/TOC. CWE 2004. Cumulative Watershed Effects Analysis. Klamath National Forest

LOE ID: 26341

Pollutant: Sediment
 LOE Subgroup: Pollutant-Water
 Matrix: Water
 Fraction: None

Beneficial Use: Cold Freshwater Habitat
 Aquatic Life Use: Fish Migration | Fish Spawning | Freshwater Replenishment | Preservation of Rare & Endangered Species | Wildlife Habitat

Number of Samples: 1
 Number of Exceedances: 0

Data and Information Type: Land use information and location of sources

Data Used to Assess Water Quality: The road density in the North Fork Salmon River Watershed does not exceed the evaluation guideline as it applies to the sediment objective. Per the Klamath National Forest (KNF 2000), the road density in the North Fork Salmon River Watershed is 1.03 mi / sq. mi. Of the 210 total miles of road in the 130,394 acre watershed, 76.4 mi of road are located within 105 m of a stream (KNF 2000). While there are a significant number of road miles located near stream channels and in valley bottoms, the water quality impact from near stream roads applies more directly to the temperature objective than to the sediment objective.

Data Reference: Attachment E: Roads & Hydrologic Connectivity. Northern California Province Category 1 watersheds meeting "management-constrained" criteria. March 2000

Water Quality Objective/Criterion: Per the Basin Plan (NCRWQCB 2007): The suspended sediment load and suspended sediment discharge rate of surface waters shall not be altered in such a manner as to cause nuisance or adversely affect beneficial uses.

Objective/Criterion Reference: Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board

Evaluation Guideline: The density of roads within a watershed can impact water temperature and alter natural conditions. Near-stream roads that run parallel to a waterbody do not allow for vegetation to grow and produce shade. Roads are also a major source of erosion and sedimentation on most managed forest lands. Excess sediment in the stream channel can result in higher water temperatures as pools fill in with sediment and channels widen in response to the increased load. Per NOAA Fisheries (1996), the guideline for the properly functioning condition for road density and location is less than 2 miles of road per square mile of watershed with no valley bottom roads.

Guideline Reference: Making Endangered Species Act Determinations of Effect for Individual or Group Actions at the Watershed Scale. Prepared by the National Oceanic and Atmospheric Administration National Marine Fisheries Service Environmental and Technical Services Division Habitat Conservation Branch

Spatial Representation: Road density and location information were assessed for the entire North Fork Salmon River Watershed.

Temporal Representation: The road density and location data from the Klamath National Forest is current as of early 2000.

Environmental Conditions: There are no known environmental conditions (e.g., seasonality, land use practices, fire events, storms, etc.) that are related to these data.

QAPP Information: Model results were calculated as part of the Equivalent Roaded Area (ERA) Model conducted by staff of the Klamath National Forest in accordance with the procedures described by Elder and Reichert (2004).

QAPP Information Reference(s): Quantitative Models for Surface Erosion, Mass-wasting and ERA/TOC. CWE 2004. Cumulative Watershed Effects Analysis. Klamath National Forest

LOE ID: 25702

Pollutant: Sediment

LOE Subgroup: Adverse Biological Responses

Matrix: -N/A

Fraction: None

Beneficial Use: Cold Freshwater Habitat

Aquatic Life Use: Fish Migration | Fish Spawning | Preservation of Rare & Endangered Species | Wildlife Habitat

Number of Samples: 1

Number of Exceedances: 1

Data and Information Type: Surveys of fish and game biologists/other professionals

Data Used to Assess Water Quality: "The Flood of 1997 Klamath National Forest" report (de la Fuente and Elder 1998) states that "[b]ased on observations of fisheries personnel, there appeared to be considerable reduction in size, volume and depth of pools in Elk, Indian, Beaver, Grider, Tompkins, South Fork Salmon, and Walker Creeks, and there is a larger proportion of fine sediment in the substrate. Alluvial reaches were made shallower and wider due to sedimentation." Only the South Fork Salmon River falls within the Salmon River Hydrologic Area.

Data Reference: The flood of 1997-Klamath National Forest. Phase 1 Final Report. Yreka, CA: Klamath National Forest

Water Quality Objective/Criterion: Per the Basin Plan (North Coast RWQCB 2007): The suspended sediment load and suspended sediment discharge rate of surface waters shall not be altered in such a manner as to cause nuisance or adversely affect beneficial uses.

Objective/Criterion Reference: Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board

Evaluation Guideline: Guideline Reference:

Spatial Representation: The assessment applies to the South Fork Salmon River Watershed.

Temporal Representation: The assessment was made after the flood over December 26, 1996 to January 3, 1997.

Environmental Conditions: Findings were made available in November 1998.

QAPP Information: Conditions were a result of the storm of December 26, 1996 to January 3, 1997.

QAPP Information Reference(s): The assessment was made by professional staff of the Klamath National Forest.

WATER BODY NAME: **KLAMATH RIVER HU, SALMON RIVER HA, WOOLEY CREEK HSA**
Water Body ID: **CAR1052201020081010154452**
Water Body Type: **River & Stream**

DECISION ID **9540**

Pollutant: **TEMPERATURE, WATER**
Final Listing Decision: **Delist from 303(d) list (being addressed by USEPA approved TMDL)**
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status: Revised
Reason for Delisting: State determines water quality standard is being met
TMDL Name: Salmon River
TMDL Project Code: 109
Date TMDL Approved by USEPA: 08/03/2005
Pollutant or Pollution: Pollutant

Weight of Evidence: In 2008, the "Klamath River Hydrologic Unit, Wooley Creek Hydrologic Sub-Area" was removed from the "Klamath River Hydrologic Unit, Salmon River Hydrologic Area" in order to assess the Wooley Creek Watershed specifically as monitoring data indicated there are different conditions in the Wooley Creek Watershed than the rest of the Salmon River Watershed.

Water temperature in Wooley Creek is being considered for removal from the Section 303(d) List under Sections 4.2 and 6.1.5.9 of the Listing Policy. Under Section 4.2 of the Listing Policy, a minimum of one line of evidence is needed to assess listing status. Five lines of evidence are available in the administrative record to assess this pollutant.

Data show that the natural receiving water temperature of Wooley Creek has not been altered by human activities as demonstrated by the available information described in the lines of evidence. Per LOE 21156, none of the 2 model results (for landslide volumes and from surface erosion volumes) exceed the evaluation guidelines. Per LOE 21154, the road density in the Wooley Creek watershed does not exceed the evaluation guideline. Per LOE 21155, the amount of human disturbance does not exceed the evaluation guideline. Because natural receiving water temperatures have not been altered, the temperature water quality objective is being attained.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification for removing this water segment-pollutant combination from the Section 303(d) List (i.e., sufficient justification to de-list). This conclusion is based on the staff findings that: (1) The data used satisfies the data quality requirements of Section 6.1.4 of the Policy. (2) The data used satisfies the data quantity requirements of Section 6.1.5 of the Policy. (3) The natural receiving water temperature has not been altered by human activities and the temperature water quality objective is being attained. (4) Pursuant to Section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

RWQCB Staff Recommendation: After review of the available data and information, North Coast RWQCB staff concludes that the water body-pollutant combination should be removed from the Section 303(d) List because applicable water quality standards for the pollutant are not being exceeded.

SWRCB Board Decision / Staff Recommendation:

USEPA Decision:

Lines of Evidence (LOEs) for Decision ID 9540

LOE ID:	21156
Pollutant:	Sediment
LOE Subgroup:	Adverse Biological Responses
Matrix:	-N/A
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Aquatic Life Use:	Fish Migration Fish Spawning Freshwater Replenishment Preservation of Rare & Endangered Species Wildlife Habitat
Number of Samples:	2
Number of Exceedances:	0
Data and Information Type:	Physical/Chemical Monitoring
Data Used to Assess Water Quality:	None of the 2 model results (for landslide volumes and from surface erosion volumes) in the Wooley Creek Watershed exceed the evaluation guidelines. Estimated surface erosion from anthropogenic activities including harvest, fires, and roads account for a 7% increase above background in model-estimated sediment delivery. Estimated landslide erosion from the same anthropogenic activities account for a 24% increase over background in model-estimated sediment delivery. Estimates were calculated from models conducted by staff of the Klamath National Forest (USFS 2008).
Data Reference:	<u>Wooley Creek Model Data Following the 2006 Wildfires (2007 model year)</u>
Water Quality Objective/Criterion:	Per the Basin Plan (NCRWQCB 2007): The suspended sediment load and suspended sediment discharge rate of surface waters shall not be altered in such a manner as to cause nuisance or adversely affect beneficial uses.
Objective/Criterion Reference:	<u>Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board</u>
Evaluation Guideline:	Per the "Quantitative Models for Surface Erosion, Mass-Wasting and ERA/TOC" (Elder & Reichert 2004): Landslide/mass-wasting volumes of 200% over background conditions as computed by the USFS mass wasting model, and surface erosion volumes of 400% over background conditions as computed by the USFS USLE model, indicate the inference point where the risk of initiating or contributing to existing adverse cumulative watershed impacts (including impacts from excess sediment discharges) becomes a cause for concern.
Guideline Reference:	<u>Quantitative Models for Surface Erosion, Mass-wasting and ERA/TOC. CWE 2004. Cumulative Watershed Effects Analysis. Klamath National Forest</u>
Spatial Representation:	The Klamath National Forest models are specific to the Wooley Creek watershed.
Temporal Representation:	Model results are based on data collected following the 2006 wildfires for the 2007 model year.
Environmental Conditions:	There are no known environmental conditions (e.g., seasonality, land use practices, fire events, storms, etc.) that are related to these data.
QAPP Information:	Model results were calculated as part of the Universal Soil Loss Equation Model and GEO Mass Wasting Model conducted by staff of the Klamath National Forest in accordance with the procedures described by Elder and Reichert (2004).
QAPP Information Reference(s):	<u>Quantitative Models for Surface Erosion, Mass-wasting and ERA/TOC. CWE 2004. Cumulative Watershed Effects Analysis. Klamath National Forest</u>

LOE ID: 25802

Pollutant: Temperature, water
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Cold Freshwater Habitat

Number of Samples: 0
Number of Exceedances: 0

Data and Information Type: Not Specified
Data Used to Assess Water Quality: Unspecified--This LOE is a placeholder to support a 303(d) listing decision made prior to 2006.
Data Reference: Placeholder reference 2006 303(d)

Water Quality Objective/Criterion:
Objective/Criterion Reference:

Evaluation Guideline:
Guideline Reference:

Spatial Representation:
Temporal Representation:
Environmental Conditions:
QAPP Information: QA Info Missing
QAPP Information Reference(s):

LOE ID: 26643

Pollutant: Temperature, water
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Cold Freshwater Habitat
Aquatic Life Use: Fish Migration | Fish Spawning | Freshwater Replenishment | Preservation of Rare & Endangered Species | Wildlife Habitat

Number of Samples: 15
Number of Exceedances: 0

Data and Information Type: Physical/Chemical Monitoring
Data Used to Assess Water Quality: The natural receiving water temperature of Wooley Creek has not been altered by human activities, and therefore, 0 of the 15 MWMT values calculated from near-continuous summertime temperature samples collected in Wooley Creek exceed the evaluation guideline. MWMT values range from 16.1 to 25.6 C. Data are summarized by the Klamath National Forest (KNF 2008).

Data Reference:	<u>Stream Temperatures, Klamath River Basin. Includes data for Thompson Creek, Grider Creek, Clear Creek, Wooley Creek, North Fork Salmon River, and South Fork Salmon River</u> <u>Map of Temperature Monitoring Stations. Klamath National Forest</u>
Water Quality Objective/Criterion:	Per the Basin Plan (NCRWQCB 2007): The natural receiving water temperature of intrastate waters shall not be altered unless it can be demonstrated to the satisfaction of the Regional Water Board that such alteration in temperature does not adversely affect beneficial uses. At no time or place shall the temperature of any COLD water be increased by more than 5 F above natural receiving water temperature.
Objective/Criterion Reference:	<u>Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board</u>
Evaluation Guideline:	If the natural receiving water temperature has been altered, or if alternation is unknown, the evaluation guideline to determine adverse affect on the most sensitive beneficial use (in this case, salmonids) is as follows. Per "U.S. EPA Region 10 Guidance for Pacific Northwest State and Tribal Temperature Water Quality Standards" (USEPA 2003), the U.S. EPA recommends a criterion for the protection of moderate to high density summertime salmon and trout juvenile rearing (i.e., core juvenile rearing) of a maximum weekly maximum temperature (MWMT) of 16 degrees C. The MWMT is also known as the maximum 7-day average of daily maximums (7DADM). The 16 degrees C MWMT criterion is recommended to (1) safely protect juvenile salmon and trout from lethal temperatures; (2) provide upper optimal conditions for juvenile growth under limited food during the period of summer maximum temperatures and optimal temperatures for other times of the growth season; (3) avoid temperatures where juvenile salmon and trout are at a competitive disadvantage with other fish; (4) protect against temperature induced elevated disease rates; and (5) provide temperatures that studies show juvenile salmon and trout prefer and are found in high densities.
Guideline Reference:	<u>EPA Region 10 Guidance for Pacific Northwest State and Tribal Temperature Water Quality Standards. EPA 910-B-03-002. U.S. Environmental Protection Agency Region 10 Office of Water, Seattle, WA.</u>
Spatial Representation:	The Klamath National Forest models are specific to the Wooley Creek watershed. Temperature samples were collected from 4 locations in Wooley Creek as follows: (1) downstream from Big Meadows Creek, (2) downstream of North Fork Wooley Creek, (3) downstream of Bridge Creek, and (4) 300 m upstream from the mouth of Wooley Creek.
Temporal Representation:	Temperature samples were collected (1) downstream from Big Meadows Creek from October 1991 to August 1992; (2) downstream of North Fork Wooley Creek from October 1991 to September 1993; (3) downstream of Bridge Creek from October 1991 to April 1992, and July 1992 to September 1993; and (4) 300 m upstream from the mouth from October 1991 to September 1993, June to September 1998 to 2000, late April to September 2001, June to September 2003 to 2005, and July to October 2006.
Environmental Conditions:	There are no known environmental conditions (e.g., seasonality, land use practices, fire events, storms, etc.) that are related to these data.
QAPP Information:	Temperature data was collected in accordance with the quality assurance guidelines described by Schuyler (2008).
QAPP Information Reference(s):	<u>Memorandum from John Schuyler, Klamath Nation Forest, to Rebecca Fitzgerald, North Coast Regional Water Quality Control Board, Regarding the 303(d) De-Listing Request</u>

LOE ID:	21155
Pollutant:	Temperature, water
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Aquatic Life Use:	Fish Migration Fish Spawning Freshwater Replenishment Preservation of Rare & Endangered Species Wildlife Habitat
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Land use information and location of sources
Data Used to Assess Water Quality:	Much less than 15% of the Wooley Creek watershed has been or is currently disturbed by human activities. Per the Klamath National Forest (KNF 2001, Attachment F), 95% of the Wooley Creek watershed is a congressionally designated Wilderness Area. An additional 3% of the lands are managed as late-successional reserves, which limits management activities to those which promote old-growth habitat. Less than 1% of the watershed is privately owned.
Data Reference:	<u>Attachment F: Supporting Narrative for Upslope, Channel and Habitat-associated Criteria (1-9) Rating Rationale. Klamath National Forest's Northern Province Category 1 Watersheds which meet "management-constrained" criteria</u>
Water Quality Objective/Criterion:	Per the Basin Plan (NCRWQCB 2007): The natural receiving water temperature of intrastate waters shall not be altered unless it can be demonstrated to the satisfaction of the Regional Water Board that such alteration in temperature does not adversely affect beneficial uses. At no time or place shall the temperature of any COLD water be increased by more than 5 F above natural receiving water temperature.
Objective/Criterion Reference:	<u>Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board</u>
Evaluation Guideline:	Human disturbance within a watershed can impact water temperature and alter natural conditions. Activities that remove or reduce shade-producing vegetation, or that result in a discharge of sediment to a stream, can increase stream temperatures. Per NOAA Fisheries (1996), the guideline for the properly functioning condition for disturbance history is for the entire watershed to be less than 15% disturbed with no concentration of disturbance in (1) unstable areas, (2) potentially unstable areas, (3) refugia, and/or (4) riparian areas. For areas under the Northwest Forest Plan (which includes the Wooley Creek watershed), the guideline for the properly functioning condition for disturbance history is also for there to 15% retention of late succession and old growth forest in the watershed.
Guideline Reference:	<u>Making Endangered Species Act Determinations of Effect for Individual or Group Actions at the Watershed Scale. Prepared by the National Oceanic and Atmospheric Administration National Marine Fisheries Service Environmental and Technical Services Division Habitat Conservation Branch</u>
Spatial Representation:	The disturbance and land use information was assessed for the entire Wooley Creek Hydrologic Sub-Area.
Temporal Representation:	The disturbance and land use information from the Klamath National Forest is current as of 2001.

Environmental Conditions: There are no known environmental conditions (e.g., seasonality, land use practices, fire events, storms, etc.) that are related to these data.
 QAPP Information: Land use information was generated from GIS-based data sources of high quality and resolution.
 QAPP Information Reference(s):

LOE ID: 21154

Pollutant: Temperature, water
 LOE Subgroup: Pollutant-Water
 Matrix: Water
 Fraction: None

Beneficial Use: Cold Freshwater Habitat
 Aquatic Life Use: Fish Migration | Fish Spawning | Freshwater Replenishment | Preservation of Rare & Endangered Species | Wildlife Habitat

Number of Samples: 1
 Number of Exceedances: 0

Data and Information Type: MODELING

Data Used to Assess Water Quality: Per the Klamath National Forest (USFS 2008), the road density in the Wooley Creek Hydrologic Sub-Area is 0.47 mi / sq. mi. As identified on Figure 2.11 in the "Salmon River Watershed Total Maximum Daily Load for Temperature" (NCRWQCB 2005), the majority of the roads are on ridge tops, on mid-slope locations, or near by the upper reaches of high-gradient small streams and not in the valley bottoms.

Data Reference: [Salmon River, Siskiyou County, California Total Maximum Daily Load for Temperature and Implementation Plan. Adopted June 22, 2005. NCRWQCB Resolution No. R1-2005-0058. Prepared by California North Coast Regional Water Quality Control Board Total Maximum Daily Load Development Unit Staff. Figures Only](#)
[Wooley Creek Model Data Following the 2006 Wildfires \(2007 model year\)](#)

Water Quality Objective/Criterion: Per the Basin Plan (NCRWQCB 2007): The natural receiving water temperature of intrastate waters shall not be altered unless it can be demonstrated to the satisfaction of the Regional Water Board that such alteration in temperature does not adversely affect beneficial uses. At no time or place shall the temperature of any COLD water be increased by more than 5 F above natural receiving water temperature.

Objective/Criterion Reference: [Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board](#)

Evaluation Guideline: The density of roads within a watershed can impact water temperature and alter natural conditions. Near-stream roads that run parallel to a waterbody do not allow for vegetation to grow and produce shade. Roads are also a major source of erosion and sedimentation on most managed forest lands. Excess sediment in the stream channel can result in higher water temperatures as pools fill in with sediment and channels widen in response to the increased load. Per NOAA Fisheries (1996), the guideline for the properly functioning condition for road density and location is less than 2 miles of road per square mile of watershed with no valley bottom roads.

Guideline Reference: [Making Endangered Species Act Determinations of Effect for Individual or Group Actions at the Watershed Scale. Prepared by the National Oceanic and Atmospheric Administration National Marine Fisheries Service Environmental and Technical Services Division Habitat Conservation Branch](#)

Spatial Representation: Road density and location information were assessed for the entire Wooley Creek

Temporal Representation:	Hydrologic Sub-Area. The road density data from the Klamath National Forest are based on data collected following the 2006 wildfires for the 2007 model year. The road location data used for the Salmon River TMDL was collected in 1993.
Environmental Conditions:	There are no known environmental conditions (e.g., seasonality, land use practices, fire events, storms, etc.) that are related to these data.
QAPP Information:	Road density data from the Klamath National Forest were developed as part of the Equivalent Roaded Area (ERA) model conducted by staff of the Klamath National Forest in accordance with the procedures described by Elder and Reichert (2004). The Salmon River TMDL is of sufficient quality per Section 6.1.4 of the 303(d) Listing Policy. It describes temperature conditions and their impacts on water quality, provides linkages between the TMDL and the temperature water quality standard, is scientifically defensible, was developed by qualified professionals, was scientifically peer reviewed, and was adopted by the Regional Water Board.
QAPP Information Reference(s):	<u>Quantitative Models for Surface Erosion, Mass-wasting and ERA/TOC. CWE 2004. Cumulative Watershed Effects Analysis. Klamath National Forest</u>

WATER BODY NAME: SHASTINA, LAKE
Water Body ID: CAL1055007720020720134715
Water Body Type: Lake & Reservoir

DECISION ID 9638

Pollutant: MERCURY
Final Listing Decision: List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status: Revised
Sources: Atmospheric Deposition | Natural Sources | Resource Extraction | Source Unknown
Expected TMDL: 2021
Completion Date:
Pollutant or Pollution: Pollutant

Weight of Evidence: Mercury in Lake Shastina is being considered for placement on the Section 303(d) list under Section 3.5 of the Listing Policy. One line of evidence is available in the administrative record to assess this pollutant. Two of the 3 total mercury composite samples of fish tissue taken from Lake Shastina exceed the evaluation guideline used to interpret the toxicity water quality objective. The evaluation guideline is the tissue residue criterion of 0.3 mg methylmercury per kg of fish tissue from the "Water Quality Criterion for the Protection of Human Health: Methylmercury" (USEPA 2001). Total mercury is usually analyzed for most fish tissue studies and assumed to be 100% methylmercury for the purposes of risk assessment (Klasing & Brodberg 2008). Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the Section 303(d) list in the Water Quality Limited Segments category (i.e., sufficient justification to list).

This conclusion is based on the staff findings that: (1) The data used satisfies the data quality requirements of section 6.1.4 of the Policy. (2) The data used satisfies the data quantity requirements of section 6.1.5 of the Policy. (3) Two of 3 samples exceeded the evaluation guideline, and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy. (4) Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

RWQCB Staff Recommendation: After review of the available data and information, North Coast Regional Water Board staff concludes that the water body-pollutant combination should be placed on the Section 303(d) List because applicable water quality standards are not attained and a pollutant contributes to or causes the problem.

SWRCB Board Decision / Staff Recommendation:

USEPA Decision:

Lines of Evidence (LOEs) for Decision ID 9638

LOE ID: 21168
Pollutant: Mercury
LOE Subgroup: Pollutant-Tissue
Matrix: Tissue

Fraction:	Fish fillet
Beneficial Use:	Commercial or recreational collection of fish, shellfish, or organisms
Number of Samples:	3
Number of Exceedances:	2
Data and Information Type:	Fish tissue analysis
Data Used to Assess Water Quality:	Two of 3 total mercury composite samples of fish fillet tissue from Lake Shastina exceed the evaluation guideline. Sample composite concentrations range from 0.14 mg/kg to 0.47 mg/kg. Sample composites were made from fish of each species of approximately the same size. For Lake Shastina, 3 sample composites were made as follows: 4 large mouth bass that range in fork length size from 263 mm to 283 mm, 3 large mouth bass from 330 mm to 353 mm; and 3 large mouth bass from 375 mm to 402 mm. Sample composites were analyzed for total mercury with the assumption that 100% of the total mercury value represents the methylmercury content of the tissue. Data is summarized by the California Department of Water Resources (DWR 2001; DWR 2007). It is also important to note that Lake Shastina is not currently designated with the Commercial and Sport Fishing Beneficial Use in the Basin Plan. However, evidence exists that people are fishing in Lake Shastina (CA Lake Maps 2002, Lake Shastina Property Owners Association 2006), and it is reasonable and responsible for North Coast Regional Water Board staff to assume caught fish are consumed by people.
Data Reference:	<u>Mercury Contamination in Fish from Northern California Lakes and Reservoirs. State of California. The Resources Agency. Department of Water Resources. Northern District. July 2007</u> <u>Data for Mercury Tissue in Northern California Lakes, 2000-2001</u> <u>California Lake Maps. Downloaded from http://www.fishersnet.com/fishmap.html#A145 on 10/13/2008</u> <u>Lake Shastina & Siskiyou County Facts & Figures. As of December 31, 2006</u>
Water Quality Objective/Criterion:	Per the Basin Plan (NCRWQCB 2007): All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyzes of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Water Board.
Objective/Criterion Reference:	<u>Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board</u>
Evaluation Guideline:	Per the Water Quality Criterion for the Protection of Human Health: Methylmercury (USEPA 2001): the Ambient Water Quality Criterion for methylmercury is the tissue residue criterion of 0.3 mg methylmercury per kg of fish (0.3 mg/kg). This is the concentration in fish tissue that should not be exceeded to protect human health based on a total fish and shellfish consumption-weighted rate of 0.0175 kg fish/day. Note: Total Mercury is usually analyzed for most fish studies and assumed to be 100% methylmercury for the purposes of risk assessment (Klasing & Brodberg 2008).
Guideline Reference:	<u>Development of Fish Contaminant Goals and Advisory Tissue Levels for Common Contaminants in California Sport Fish: Chlordane, DDTs, Dieldrin, Methylmercury, PCBs, Selenium, and Toxaphene</u> <u>Water Quality Criterion for the Protection of Human Health: Methylmercury. Final. United States Environmental Protection Agency Office of Science and Technology Office of Water. EPA-823-R-01-001. January 2001</u>
Spatial Representation:	Samples were collected in Lake Shastina near Dwinnell Dam.
Temporal Representation:	Samples were collected on the 11th, 12th, and 23rd of July 2001.

Environmental Conditions: There are no known environmental conditions (e.g., seasonality, land use practices, fire events, storms, etc.) that are related to these data.

QAPP Information: Samples were collected, processed, and analyzed in accordance with the methods described in "Mercury Contamination in fish from Northern California Lakes and Reservoirs" (DWR 2007), which closely follows the Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program (Puckett 2002).

QAPP Information Reference(s): Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)
Mercury Contamination in Fish from Northern California Lakes and Reservoirs. State of California. The Resources Agency. Department of Water Resources. Northern District. July 2007

WATER BODY NAME:	MAD RIVER HU, MAD RIVER
Water Body ID:	CAR1091001119980706155140
Water Body Type:	River & Stream

DECISION ID	12851
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Pollutant:	DDE
Final Listing Decision:	List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Agriculture Source Unknown
Expected TMDL	2021
Completion Date:	
Pollutant or Pollution:	Pollutant

Weight of Evidence: DDE in the Mad River is being considered for placement on the Section 303(d) List under Section 3.1 of the Listing Policy. Under Section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Two of the 12 DDE samples exceed the evaluation guideline used to interpret the water quality objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the Section 303(d) List in the Water Quality Limited Segments category (i.e., sufficient justification to list). This conclusion is based on the staff findings that: (1) The data used satisfies the data quality requirements of Section 6.1.4 of the Policy. (2) The data used satisfies the data quantity requirements of Section 6.1.5 of the Policy. (3) Two of the 12 DDE samples exceed the evaluation guideline and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy. (4) Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

RWQCB Staff Recommendation: After review of the available data and information, North Coast RWQCB staff concludes that the water body-pollutant combination should be placed on the Section 303(d) List because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

SWRCB Board Decision / Staff Recommendation:

USEPA Decision:

Lines of Evidence (LOEs) for Decision ID 12851

LOE ID:	25604
Pollutant:	DDE
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Municipal & Domestic Supply
Number of Samples:	12
Number of Exceedances:	2

Data and Information Type:	Physical/Chemical Monitoring
Data Used to Assess Water Quality:	Two of 12 DDE samples collected in the Mad River exceed the evaluation guideline. Sample concentrations range from non-detect (with a reporting limit of 0.002 ug/l) to 0.004 ug/l. The samples were collected as part of the Surface Water Ambient Water Monitoring Program (SWAMP). The data are found in the 5-Year Monitoring Report (NCRWQCB 2008).
Data Reference:	<u>Surface Water Ambient Monitoring Program (SWAMP) Summary Report for the North Coast Region (RWQCB-1) for Years 2000-2006. North Coast Regional Water Quality Control Board</u>
Water Quality Objective/Criterion:	Per the Basin Plan (NCRWQCB 2007): No individual pesticide or combination of pesticides shall be present in concentrations that adversely affect beneficial uses. There shall be no bioaccumulation of pesticide concentrations found in bottom sediments or aquatic life. Waters designated for use as domestic or municipal supply shall not contain concentrations of pesticides in excess of the limiting concentrations set forth in California Code of Regulations, Title 22, Division 4, Chapter 15, Article 4, Section 64444, and listed in Table 3.2 of the Basin Plan.
Objective/Criterion Reference:	<u>Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board</u>
Evaluation Guideline:	Per the National Recommended Water Quality Criteria (USEPA 2006): The recommended criterion for DDE for the protection of source waters for human health consumption of water and organisms is 0.00022 ug/l.
Guideline Reference:	<u>National Recommended Water Quality Criteria. United States Environmental Protection Agency. Office of Water. Office of Science and Technology. 4304T</u>
Spatial Representation:	Samples were collected from the mainstem Mad River at Blue Lake below the hatchery (SWAMP Station ID 109MADBLU). Samples were collected from well-mixed flows in glides or riffles.
Temporal Representation:	Samples were collected from March 2001 to June 2006. The site visits corresponded to fall, winter, spring and early summer seasonal conditions.
Environmental Conditions:	There are no known environmental conditions (e.g., seasonality, land use practices, fire events, storms, etc.) that are related to these data.
QAPP Information:	Quality control was conducted in accordance with the SWAMP Quality Assurance Management Plan (SWAMP 2002).
QAPP Information Reference(s):	<u>Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)</u>

WATER BODY NAME: HARE CREEK BEACH
Water Body ID: CAC1132004120081013222913
Water Body Type: Coastal & Bay Shoreline

DECISION ID 12173

Pollutant: INDICATOR BACTERIA
Final Listing Decision: List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status: Revised
Sources: Source Unknown
Expected TMDL Completion Date: 2021
Pollutant or Pollution: Pollutant

Weight of Evidence: Indicator bacteria (which includes enterococcus, fecal coliform, and total coliform) is being considered for placement on the Section 303(d) list under Section 3.3 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status. Three lines of evidence are available in the administrative record to assess indicator bacteria.

Data assessed for the 2008 Integrated Report include ocean beach bacteria data collected by the Mendocino County Environmental Health Division in accordance with AB411 (Chapter 765, Statutes of 1997) requirements. In accordance with Section 3.3 of the Listing Policy, a 4% exceedance percentage shall be used to add waters to the List. This equates to no more than 1 exceedance each for enterococcus, fecal coliform, and total coliform single sample values. This also equates to no exceedances each for enterococcus, fecal coliform, and total coliform 30-day geomean values. Two of the 11 total coliform geomean values exceed the objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification for adding this water segment-pollutant combination to the Section 303(d) list (i.e., sufficient justification to list). This conclusion is based on the staff findings that: (1) The data used satisfies the data quality requirements of Section 6.1.4 of the Policy. (2) The data used satisfies the data quantity requirements of Section 6.1.5 of the Policy. (3) Total coliform geomean values exceed the objective more than the 4% allowable frequency identified in Section 3.3 of the Listing Policy. (4) Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

RWQCB Staff Recommendation: After review of the available data and information, North Coast RWQCB staff concludes that the water body-pollutant combination should be placed on the Section 303(d) List because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

SWRCB Board Decision / Staff Recommendation:

USEPA Decision:

Lines of Evidence (LOEs) for Decision ID 12173

LOE ID:	25315
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Water Contact Recreation
Number of Samples:	36
Number of Exceedances:	1
Data and Information Type:	Pathogen Monitoring
Data Used to Assess Water Quality:	One of the 36 single samples of enterococcus collected at Hare Creek Beach exceed the objective. Additionally, none of the 11 30-day geomean values exceed the objective. The single sample and geomean values are two different matrices used Mendocino County Division of Environmental Health in accordance with AB411 (Chapter 765, Statutes of 1997) requirements. Data is maintained by the State Water Board's Beach Watch program. Data is summarized by the North Coast Regional Water Board (North Coast RWQCB 2007).
Data Reference:	<u>North Coast Beach Watch Data. Bacteria data collected by Del Norte County, Humboldt County, Mendocino County Environmental Health Division, Sonoma County Division of Environmental Health, and Marin County in accordance with AB411. Data managed by the State Water Resources Control Board's Beach Watch program at beachwatch.waterboards.ca.gov. Includes data from 2004 to 2006</u>
Water Quality Objective/Criterion:	Per the Ocean Plan (SWRCB 2005): The following bacterial objectives shall be maintained throughout the water column. The following standard is based on the 30-day geometric mean of the 5 most recent samples from each site: Enterococcus density shall not exceed 35 MPN per 100ml. The following standard is for the single sample maximum: Enterococcus density shall not exceed 104 per 100 ml. *Note: MPN is the most probable number of coliform units.
Objective/Criterion Reference:	<u>Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency</u>
Evaluation Guideline: Guideline Reference:	
Spatial Representation:	Samples were collected at Hare Creek Beach.
Temporal Representation:	Samples were collected weekly from July to October 2005 and April to October 2006.
Environmental Conditions:	Samples were collected during the dry season. Otherwise, there are no known environmental conditions (e.g., land use practices, fire events, storms, etc.) that are related to these data.
QAPP Information:	Samples were collected and analyzed in accordance with the Sampling and Analysis Plan and the Laboratories and Laboratory Analyses procedures described in the "Draft Guidance for Salt Water Beaches" (DHS 2006).
QAPP Information Reference(s):	<u>Draft Guidance for Salt Water Beaches. Last Update: April 10, 2006. Initial Draft: November 1997. Division of Drinking Water and Environmental Management, California Department of Health Services</u>

LOE ID:	25316
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Water Contact Recreation
Number of Samples:	36
Number of Exceedances:	0
Data and Information Type:	Pathogen Monitoring
Data Used to Assess Water Quality:	None of the 36 single samples of fecal coliform collected at Hare Creek Beach exceed the objective. Additionally, none of the 11 30-day geomean values exceed the objective. The single sample and geomean values are two different matrices used Mendocino County Division of Environmental Health in accordance with AB411 (Chapter 765, Statutes of 1997) requirements. Data is maintained by the State Water Board's Beach Watch program. Data is summarized by the North Coast Regional Water Board (North Coast RWQCB 2007).
Data Reference:	<u>North Coast Beach Watch Data. Bacteria data collected by Del Norte County, Humboldt County, Mendocino County Environmental Health Division, Sonoma County Division of Environmental Health, and Marin County in accordance with AB411. Data managed by the State Water Resources Control Board's Beach Watch program at beachwatch.waterboards.ca.gov. Includes data from 2004 to 2006</u>
Water Quality Objective/Criterion:	Per the Ocean Plan (SWRCB 2005): The following bacterial objectives shall be maintained throughout the water column. The following standard is based on the 30-day geometric mean of the five most recent samples from each site: Fecal coliform density shall not exceed 200 MPN per 100 ml. The following standard is for the single sample maximum: Fecal coliform density shall not exceed 400 per 100ml. *Note: MPN is the most probable number of coliform units.
Objective/Criterion Reference:	<u>Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency</u>
Evaluation Guideline: Guideline Reference:	
Spatial Representation:	Samples were collected at Hare Creek Beach.
Temporal Representation:	Samples were collected weekly from July to October 2005 and April to October 2006.
Environmental Conditions:	Samples were collected during the dry season. Otherwise, there are no known environmental conditions (e.g., land use practices, fire events, storms, etc.) that are related to these data.
QAPP Information:	Samples were collected and analyzed in accordance with the Sampling and Analysis Plan and the Laboratories and Laboratory Analyses procedures described in the "Draft Guidance for Salt Water Beaches" (DHS 2006).
QAPP Information Reference(s):	<u>Draft Guidance for Salt Water Beaches. Last Update: April 10, 2006. Initial Draft: November 1997. Division of Drinking Water and Environmental Management, California Department of Health Services</u>

LOE ID:	25317
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Water Contact Recreation
Number of Samples:	11
Number of Exceedances:	2
Data and Information Type:	Pathogen Monitoring
Data Used to Assess Water Quality:	None of the 36 single samples of total coliform collected at Hare Creek Beach exceed the objective. Additionally, 2 of the 11 30-day geomean values exceed the objective. The single sample and geomean values are two different matrices used Mendocino County Division of Environmental Health in accordance with AB411 (Chapter 765, Statutes of 1997) requirements. Data is maintained by the State Water Board's Beach Watch program. Data is summarized by the North Coast Regional Water Board (North Coast RWQCB 2007).
Data Reference:	<u>North Coast Beach Watch Data. Bacteria data collected by Del Norte County, Humboldt County, Mendocino County Environmental Health Division, Sonoma County Division of Environmental Health, and Marin County in accordance with AB411. Data managed by the State Water Resources Control Board's Beach Watch program at beachwatch.waterboards.ca.gov. Includes data from 2004 to 2006</u>
Water Quality Objective/Criterion:	Per the Ocean Plan (SWRCB 2005): The following bacterial objectives shall be maintained throughout the water column. The following standard is based on the 30-day geometric mean of the five most recent samples from each site: Total coliform density shall not exceed 1,000 MPN per 100 ml. The following standard is for the single sample maximum: (i) Total coliform density shall not exceed 10,000 per 100 ml; and (ii) Total coliform density shall not exceed 1,000 per 100 ml when the fecal coliform/total coliform ratio exceeds 0.1. *Note: MPN is the most probable number of coliform units.
Objective/Criterion Reference:	<u>Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency</u>
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Samples were collected at Hare Creek Beach.
Temporal Representation:	Samples were collected weekly from July to October 2005 and April to October 2006.
Environmental Conditions:	Samples were collected during the dry season. Otherwise, there are no known environmental conditions (e.g., land use practices, fire events, storms, etc.) that are related to these data.
QAPP Information:	Samples were collected and analyzed in accordance with the Sampling and Analysis Plan and the Laboratories and Laboratory Analyses procedures described in the "Draft Guidance for Salt Water Beaches" (DHS 2006).
QAPP Information Reference(s):	<u>Draft Guidance for Salt Water Beaches. Last Update: April 10, 2006. Initial Draft: November 1997. Division of Drinking Water and Environmental Management, California Department of Health Services</u>

WATER BODY NAME: MENDOCINO COAST HU, NOYO RIVER HA, PUDDING CREEK
Water Body ID: CAR1132005020020227182345
Water Body Type: River & Stream

DECISION ID 4551

Pollutant: TEMPERATURE, WATER
Final Listing Decision: Do Not Delist from 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: List on 303(d) list (TMDL required list)(2006)
Revision Status: Revised
Sources: Logging Road Construction/Maintenance | Removal of Riparian Vegetation | Silviculture
Expected TMDL Completion Date: 2019
Pollutant or Pollution: Pollutant

Weight of Evidence: This pollutant is being considered for removal from the Section 303(d) List under Sections 4.11 and 6.1.5.9 of the Listing Policy. Under the Listing Policy, a minimum of one line of evidence is needed to assess listing status. Four lines of evidence are available in the administrative record to assess this pollutant.

Data from LOE 1692 was assessed for the 2006 303(d) List using an evaluation guideline of 14.8 C. These same data were re-assessed for the 2008 303(d) List as described in LOEs 7496, 7502, and 7505. In 2008, the data were evaluated using the maximum weekly maximum temperature (MWMT) metric and compared to an evaluation guideline of 16 C, as described below.

Data show that the natural receiving water temperature of Pudding Creek has been altered by human activities, including the removal of riparian vegetation and the subsequent loss of shade. Riparian vegetation has been removed through timber harvest activities and near-stream roads. In order to determine if water temperatures adversely affect salmonids, the most sensitive beneficial use in Pudding Creek, temperature data were analyzed. Ten of the 14 MWMT values calculated from near-continuous summertime temperature samples exceed the water temperature evaluation guideline. The guideline is a MWMT of 16 C for the protection of moderate to high density summertime salmon and trout juvenile rearing, per the "U.S. EPA Regional 10 Guidance for Pacific Northwest State and Tribal Temperature Water Quality Standards" (USEPA 2003). MWMT values range from 14.6 to 17.6 C.

Based on the readily available data and information, the weight of the evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the Section 303(d) List (i.e., the waterbody remains impaired). This conclusion is based on the staff findings that:

- (1) The binomial distribution of Section 4.2 of the Listing Policy cannot be used to support a delisting with a sample size of less than 26. Therefore, Section 4.11 is relied upon.
- (2) The natural receiving water temperature has been altered by human activities. At a minimum, 10 of 14 MWMT values exceed the U.S. EPA 16 C evaluation guideline used to determine an adverse affect on beneficial uses. Therefore the water quality standard is not attained and it is warranted to maintain the listing per Section 4.11 of the Listing Policy.
- (3) The data used satisfies the data quality requirements of Section 6.1.4 of the Listing Policy.
- (4) The data used satisfies the data quantity requirements of Section 6.1.5 of the Listing Policy.

(5) Pursuant to Section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

RWQCB Staff Recommendation:

After review of the available data and information, North Coast RWQCB staff concludes that the water body-pollutant combination should not be removed from the Section 303(d) List because applicable water quality standards for the pollutant are being exceeded.

SWRCB Board Decision / Staff Recommendation:

USEPA Decision:

Lines of Evidence (LOEs) for Decision ID 4551

LOE ID: 7505

Pollutant: Temperature, water

LOE Subgroup: Pollutant-Water

Matrix: Water

Fraction: None

Beneficial Use: Cold Freshwater Habitat

Aquatic Life Use: Fish Migration | Fish Spawning | Preservation of Rare & Endangered Species | Wildlife Habitat

Number of Samples: 2

Number of Exceedances: 1

Data and Information Type: Physical/Chemical Monitoring

Type:

Data Used to Assess Water Quality:

The natural receiving water temperature of the Pudding Creek Watershed has been altered due to the removal of riparian vegetation and the subsequent loss of shade. Riparian vegetation has been removed through timber harvest activities and near-stream roads. In order to determine if temperatures adversely affect salmonids, the most sensitive beneficial uses in Pudding Creek, temperature data was analyzed. One of the 2 MWMT values calculated from temperature samples collected from Upper Pudding Creek (PUD 5) exceeds the evaluation guideline. MWMT values range from 15.5 to 16.2 C. Data are summarized by Hawthorne Timber Co. (2003).

Data Reference:

Instream temperature monitoring information: Usal Creek, Ten Mile River (north and south forks), Big River, Salmon Creek. Arcata, CA: Campbell Timberland Management Map of the present and Historic Stream Temperature Monitoring Stations. Pudding Creek. 1994-2008

Water Quality Objective/Criterion:

Per the Basin Plan (NCRWQCB 2007): The natural receiving water temperature of intrastate waters shall not be altered unless it can be demonstrated to the satisfaction of the Regional Water Board that such alteration in temperature does not adversely affect beneficial uses. At no time or place shall the temperature of any COLD water be increased by more than 5 F above natural receiving water temperature.

Objective/Criterion Reference:

Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board

Evaluation Guideline:

If the natural receiving water temperature has been altered, or if alternation is unknown, the evaluation guideline to determine adverse affect on the most sensitive beneficial use (in this case, salmonids) is as follows. Per "U.S. EPA Region 10 Guidance for Pacific

Guideline Reference:	Northwest State and Tribal Temperature Water Quality Standards" (USEPA 2003), the U.S. EPA recommends a criterion for the protection of moderate to high density summertime salmon and trout juvenile rearing (i.e., core juvenile rearing) of a maximum weekly maximum temperature (MWMT) of 16 degrees C. The MWMT is also known as the maximum 7-day average of daily maximums (7DADM). The 16 degrees C MWMT criterion is recommended to (1) safely protect juvenile salmon and trout from lethal temperatures; (2) provide upper optimal conditions for juvenile growth under limited food during the period of summer maximum temperatures and optimal temperatures for other times of the growth season; (3) avoid temperatures where juvenile salmon and trout are at a competitive disadvantage with other fish; (4) protect against temperature induced elevated disease rates; and (5) provide temperatures that studies show juvenile salmon and trout prefer and are found in high densities. <u>EPA Region 10 Guidance for Pacific Northwest State and Tribal Temperature Water Quality Standards. EPA 910-B-03-002. U.S. Environmental Protection Agency Region 10 Office of Water, Seattle, WA.</u>
Spatial Representation:	PUD 5 is located on the mainstem of Upper Pudding Creek above the confluence with LeValley Gulch. The exact location of the site is found on the map provided by Campbell Timberland Management (2008). Hobo-Temps were placed in well-mixed pools near the bottom and towards the deepest portion to record the in-stream temperatures.
Temporal Representation:	At PUD 5, a total of 97 water temperature samples were collected at 90-minute intervals. The 2 MWMT values were calculated from these 97 individual measurements. Samples were collected during the summer months (generally June to mid-October) in 1995 and 1996.
Environmental Conditions:	Data were collected during the hottest time of the year. There are no other known environmental conditions (e.g., land use practices, fire events, storms, etc.) that are related to these data.
QAPP Information:	Quality control was conducted in accordance with Campbell Timberland Management's QA/QC Information Summary (Hawthorne Timber Co., 2003). Installation of the temperature data logger (Onset Computer Corp. model HOBO-Temp and OST temperature loggers) in Class 1 streams occurred one day before the first day logged on the continuous temperature monitoring figures. This was done to allow the data loggers to reach equilibrium with the instream temperature regimes and to capture complete daily cycles. No information on equipment calibration, standard operating procedures or data protocols were included with the submittal.
QAPP Information Reference(s):	<u>Instream temperature monitoring information: Usal Creek, Ten Mile River (north and south forks), Big River, Salmon Creek. Arcata, CA: Campbell Timberland Management</u>

LOE ID:	7502
Pollutant:	Temperature, water
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Aquatic Life Use:	Fish Migration Fish Spawning Preservation of Rare & Endangered Species Wildlife Habitat
Number of Samples:	9
Number of Exceedances:	8
Data and Information Type:	Physical/Chemical Monitoring

Data Used to Assess Water Quality:	The natural receiving water temperature of the Pudding Creek Watershed has been altered due to the removal of riparian vegetation and the subsequent loss of shade. Riparian vegetation has been removed through timber harvest activities and near-stream roads. In order to determine if temperatures adversely affect salmonids, the most sensitive beneficial uses in Pudding Creek, temperature data was analyzed. Eight of the 9 MWMT values calculated from temperature samples collected from Pudding Creek at Slaughter House Gulch (PUD 2) exceed the evaluation guideline. MWMT values range from 15.2 to 17.6 C. Data are summarized by Hawthorne Timber Co. (2003).
Data Reference:	<u>Instream temperature monitoring information: Usal Creek, Ten Mile River (north and south forks), Big River, Salmon Creek, Arcata, CA: Campbell Timberland Management Map of the present and Historic Stream Temperature Monitoring Stations, Pudding Creek, 1994-2008</u>
Water Quality Objective/Criterion:	Per the Basin Plan (NCRWQCB 2007): The natural receiving water temperature of intrastate waters shall not be altered unless it can be demonstrated to the satisfaction of the Regional Water Board that such alteration in temperature does not adversely affect beneficial uses. At no time or place shall the temperature of any COLD water be increased by more than 5 F above natural receiving water temperature.
Objective/Criterion Reference:	<u>Water Quality Control Plan for the North Coast Region, North Coast Regional Water Quality Control Board</u>
Evaluation Guideline:	If the natural receiving water temperature has been altered, or if alternation is unknown, the evaluation guideline to determine adverse affect on the most sensitive beneficial use (in this case, salmonids) is as follows. Per "U.S. EPA Region 10 Guidance for Pacific Northwest State and Tribal Temperature Water Quality Standards" (USEPA 2003), the U.S. EPA recommends a criterion for the protection of moderate to high density summertime salmon and trout juvenile rearing (i.e., core juvenile rearing) of a maximum weekly maximum temperature (MWMT) of 16 degrees C. The MWMT is also known as the maximum 7-day average of daily maximums (7DADM). The 16 degrees C MWMT criterion is recommended to (1) safely protect juvenile salmon and trout from lethal temperatures; (2) provide upper optimal conditions for juvenile growth under limited food during the period of summer maximum temperatures and optimal temperatures for other times of the growth season; (3) avoid temperatures where juvenile salmon and trout are at a competitive disadvantage with other fish; (4) protect against temperature induced elevated disease rates; and (5) provide temperatures that studies show juvenile salmon and trout prefer and are found in high densities.
Guideline Reference:	<u>EPA Region 10 Guidance for Pacific Northwest State and Tribal Temperature Water Quality Standards. EPA 910-B-03-002. U.S. Environmental Protection Agency Region 10 Office of Water, Seattle, WA.</u>
Spatial Representation:	PUD 2 is located on the mainstem of Pudding Creek at the confluence with Slaughter House Gulch. The exact location of the site is found on the map provided by Campbell Timberland Management (2008). Hobo-Temps were placed in well-mixed pools near the bottom and towards the deepest portion to record the in-stream temperatures.
Temporal Representation:	At PUD 2, a total of 907 water temperature samples were collected at 90-minute intervals. The 9 MWMT values were calculated from these 907 individual measurements. Samples were collected during the summer months (generally June to mid-October) in 1994 - 2000, 2001, and 2003.
Environmental Conditions:	Data were collected during the hottest time of the year. There are no other known environmental conditions (e.g., land use practices, fire events, storms, etc.) that are related to these data.
QAPP Information:	Quality control was conducted in accordance with Campbell Timberland Management's QA/QC Information Summary (Hawthorne Timber Co., 2003). Installation of the temperature data logger (Onset Computer Corp. model HOBO-Temp and OST temperature loggers) in Class 1 streams occurred one day before the first day logged on the continuous temperature monitoring figures. This was done to allow the data loggers

to reach equilibrium with the instream temperature regimes and to capture complete daily cycles. No information on equipment calibration, standard operating procedures or data protocols were included with the submittal.

QAPP Information Reference(s): Instream temperature monitoring information: Usal Creek, Ten Mile River (north and south forks), Big River, Salmon Creek. Arcata, CA: Campbell Timberland Management

LOE ID: 7496

Pollutant: Temperature, water
 LOE Subgroup: Pollutant-Water
 Matrix: Water
 Fraction: None

Beneficial Use: Cold Freshwater Habitat
 Aquatic Life Use: Fish Migration | Fish Spawning | Preservation of Rare & Endangered Species | Wildlife Habitat

Number of Samples: 3
 Number of Exceedances: 1

Data and Information Type: Physical/Chemical Monitoring

Data Used to Assess Water Quality: The natural receiving water temperature of the Pudding Creek Watershed has been altered due to the removal of riparian vegetation and the subsequent loss of shade. Riparian vegetation has been removed through timber harvest activities and near-stream roads. In order to determine if temperatures adversely affect salmonids, the most sensitive beneficial uses in Pudding Creek, temperature data was analyzed. One of the 3 MWMT values calculated from temperature samples collected from site PUD 1 exceeds the evaluation guideline. MWMT values range from 14.6 to 16.5 C. Data are summarized by Hawthorne Timber Co. (2003).

Data Reference: Instream temperature monitoring information: Usal Creek, Ten Mile River (north and south forks), Big River, Salmon Creek. Arcata, CA: Campbell Timberland Management Map of the present and Historic Stream Temperature Monitoring Stations. Pudding Creek. 1994-2008

Water Quality Objective/Criterion: Per the Basin Plan (NCRWQCB 2007): The natural receiving water temperature of intrastate waters shall not be altered unless it can be demonstrated to the satisfaction of the Regional Water Board that such alteration in temperature does not adversely affect beneficial uses. At no time or place shall the temperature of any COLD water be increased by more than 5 F above natural receiving water temperature.

Objective/Criterion Reference: Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board

Evaluation Guideline: If the natural receiving water temperature has been altered, or if alternation is unknown, the evaluation guideline to determine adverse affect on the most sensitive beneficial use (in this case, salmonids) is as follows. Per "U.S. EPA Region 10 Guidance for Pacific Northwest State and Tribal Temperature Water Quality Standards" (USEPA 2003), the U.S. EPA recommends a criterion for the protection of moderate to high density summertime salmon and trout juvenile rearing (i.e., core juvenile rearing) of a maximum weekly maximum temperature (MWMT) of 16 degrees C. The MWMT is also known as the maximum 7-day average of daily maximums (7DADM). The 16 degrees C MWMT criterion is recommended to (1) safely protect juvenile salmon and trout from lethal temperatures; (2) provide upper optimal conditions for juvenile growth under limited food during the period of summer maximum temperatures and optimal temperatures for other times of the growth season; (3) avoid temperatures where juvenile salmon and trout

Guideline Reference:	are at a competitive disadvantage with other fish; (4) protect against temperature induced elevated disease rates; and (5) provide temperatures that studies show juvenile salmon and trout prefer and are found in high densities. <u>EPA Region 10 Guidance for Pacific Northwest State and Tribal Temperature Water Quality Standards. EPA 910-B-03-002. U.S. Environmental Protection Agency Region 10 Office of Water, Seattle, WA.</u>
Spatial Representation:	PUD 1 is located on the mainstem of Pudding Creek in the lower portion of the watershed. The exact location of the site is found on the map provided by Campbell Timberland Management (2008). Hobo-Temps were placed in well-mixed pools near the bottom and towards the deepest portion to record the in-stream temperatures.
Temporal Representation:	At PUD 1, a total of 352 water temperature samples were collected at 90-minute intervals. The 3 MWMT values were calculated from these 352 individual measurements. Samples were collected during the summer months (generally June to mid-October) in 1994, 1996, and 1997.
Environmental Conditions:	Data were collected during the hottest time of the year. There are no other known environmental conditions (e.g., land use practices, fire events, storms, etc.) that are related to these data.
QAPP Information:	Quality control was conducted in accordance with Campbell Timberland Management's QA/QC Information Summary (Hawthorne Timber Co., 2003). Installation of the temperature data logger (Onset Computer Corp. model HOBO-Temp and OST temperature loggers) in Class 1 streams occurred one day before the first day logged on the continuous temperature monitoring figures. This was done to allow the data loggers to reach equilibrium with the instream temperature regimes and to capture complete daily cycles. No information on equipment calibration, standard operating procedures or data protocols were included with the submittal.
QAPP Information Reference(s):	<u>Instream temperature monitoring information: Usal Creek, Ten Mile River (north and south forks), Big River, Salmon Creek. Arcata, CA: Campbell Timberland Management</u>

LOE ID: 1692

Pollutant: Temperature, water

LOE Subgroup: Pollutant-Water

Matrix: Water

Fraction: Total

Beneficial Use: Cold Freshwater Habitat

Number of Samples: 1391

Number of Exceedances: 289

Data and Information Type: Physical/Chemical Monitoring

Data Used to Assess Water Quality: When compared to the 14.8 °C coho threshold, there were 289 exceedances out of 1391 total samples taken over all of the years at this location. When compared to the 17.5 °C threshold there were no exceedances found for any of the data (Hawthorne Timber Co., 2003).

Data Reference: Placeholder reference 2006 303(d)

Water Quality Objective/Criterion: Basin Plan: Temperature objectives for COLD interstate waters, WARM interstate waters, and Enclosed Bays and Estuaries are as specified in the "Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays of California" including any revisions thereto. A copy of this plan is included verbatim in the Appendix Section of this Plan. In addition, the following temperature objectives apply to surface waters: The natural receiving water temperature of intrastate waters shall

	<p>not be altered unless it can be demonstrated to the satisfaction of the Regional Water Board that such alteration in temperature does not adversely affect beneficial uses. At no time or place shall the temperature of any COLD water be increased by more than 5°F above natural receiving water temperature. At no time or place shall the temperature of WARM intrastate waters be increased more than 5°F above natural receiving water temperature.</p>
Objective/Criterion Reference:	<p><u>Placeholder reference 2006 303(d)</u></p>
Evaluation Guideline:	<p>The guideline used was from Sullivan et al. (2000) Published Temperature Thresholds-Peer Reviewed Literature which includes reviewed sub-lethal and acute temperature thresholds from a wide range of studies, incorporating information from laboratory-based research, field observations, and risk assessment approaches. This report calculated the 7-day mean (maximum value of the 7-day moving average of the daily mean temperature) upper threshold criterion for coho salmon as 14.8°C and for steelhead trout as 17.0°C. The risk assessment approach used by Sullivan et al. (2000) suggests that an upper threshold for the 7-day average of 14.8°C for coho and 17.0°C for steelhead will reduce average growth 10% from optimum.</p>
Guideline Reference:	<p><u>Placeholder reference 2006 303(d)</u></p>
Spatial Representation:	<p>There were 1,391 total samples taken at the middle to upper watershed of Pudding Creek. Hobo-Temps were placed in the pools near the bottom and towards the deepest portion to record the in-stream temperatures. In stream and riparian measurements were taken at all monitoring locations on Pudding Creek.</p>
Temporal Representation:	<p>Samples were recorded for 9 years between 1994 and 2001 and again in 2003. Water temperature data were recorded at 90-minute intervals, generally from June until Mid-October upstream temperatures were measured continuously with temperature data loggers (Onset Computer Corp. model HOBO-Temp and OST temperature loggers) in Class 1 streams throughout the property from 1994 to 2004. Hobo-temps allowed uninterrupted data collection to occur throughout the critical summer period.</p>
Environmental Conditions:	
QAPP Information:	<p>QA/QC Information Summary was submitted. Installation of the temperature data logger (Onset Computer Corp. model HOBO-Temp and OST temperature loggers in Class 1 streams throughout the property devices occurred one day before the first day logged on the continuous temperature monitoring figures. This was done to allow the data loggers to reach equilibrium with the instream temperature regimes and to capture complete daily cycles. No information on equipment calibration, standard operating procedures or data protocols were included with the submittal.</p>
QAPP Information Reference(s):	

WATER BODY NAME:	PUDDING CREEK BEACH
Water Body ID:	CAC1132005020081013224604
Water Body Type:	Coastal & Bay Shoreline

DECISION ID	12178
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Pollutant:	INDICATOR BACTERIA
Final Listing Decision:	List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL	2021
Completion Date:	
Pollutant or Pollution:	Pollutant

Weight of Evidence: Indicator bacteria (which includes enterococcus, fecal coliform, and total coliform) is being considered for placement on the Section 303(d) list under Section 3.3 of the Listing Policy. Under this section a single line of evidence is necessary to assess listing status. Three lines of evidence are available in the administrative record to assess indicator bacteria.

Data assessed for the 2008 Integrated Report include ocean beach bacteria data collected by the Mendocino County Environmental Health Division in accordance with AB411 (Chapter 765, Statutes of 1997) requirements. In accordance with Section 3.3 of the Listing Policy, a 4% exceedance percentage shall be used to add waters to the List. This equates to no more than 3 exceedance each for enterococcus, fecal coliform, and total coliform single sample values. This also equates to no more than 1 exceedance each for enterococcus, fecal coliform, and total coliform 30-day geomean values. Two of the 21 enterococcus geomean values exceed the objective. Six of the 21 total coliform geomean values exceed the objective.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification for adding this water segment-pollutant combination to the Section 303(d) list (i.e., sufficient justification to list). This conclusion is based on the staff findings that: (1) The data used satisfies the data quality requirements of Section 6.1.4 of the Policy. (2) The data used satisfies the data quantity requirements of Section 6.1.5 of the Policy. (3) Enterococcus and total coliform geomean values exceed the objective more than the 4% allowable frequency identified in Section 3.3 of the Listing Policy. (4) Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

RWQCB Staff Recommendation: After review of the available data and information, North Coast RWQCB staff concludes that the water body-pollutant combination should be placed on the Section 303(d) List because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

SWRCB Board Decision / Staff Recommendation:

USEPA Decision:

Lines of Evidence (LOEs) for Decision ID 12178

LOE ID:	25322
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Water Contact Recreation
Number of Samples:	85
Number of Exceedances:	3
Data and Information Type:	Pathogen Monitoring
Data Used to Assess Water Quality:	Three of the 85 single samples of fecal coliform collected at Pudding Creek Beach exceed the objective. Additionally, none of the 21 30-day geomean values exceed the objective. The single sample and geomean values are two different matrices used Mendocino County Division of Environmental Health in accordance with AB411 (Chapter 765, Statutes of 1997) requirements. Data is maintained by the State Water Board's Beach Watch program. Data is summarized by the North Coast Regional Water Board (North Coast RWQCB 2007).
Data Reference:	<u>North Coast Beach Watch Data. Bacteria data collected by Del Norte County, Humboldt County, Mendocino County Environmental Health Division, Sonoma County Division of Environmental Health, and Marin County in accordance with AB411. Data managed by the State Water Resources Control Board's Beach Watch program at beachwatch.waterboards.ca.gov. Includes data from 2004 to 2006</u>
Water Quality Objective/Criterion:	Per the Ocean Plan (SWRCB 2005): The following bacterial objectives shall be maintained throughout the water column. The following standard is based on the 30-day geometric mean of the five most recent samples from each site: Fecal coliform density shall not exceed 200 MPN per 100 ml. The following standard is for the single sample maximum: Fecal coliform density shall not exceed 400 per 100ml. *Note: MPN is the most probable number of coliform units.
Objective/Criterion Reference:	<u>Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency</u>
Evaluation Guideline: Guideline Reference:	
Spatial Representation:	Samples were collected at Pudding Creek Beach.
Temporal Representation:	Samples were collected weekly from April to October 2005 and April to October 2006.
Environmental Conditions:	Samples were collected during the dry season. Otherwise, there are no known environmental conditions (e.g., land use practices, fire events, storms, etc.) that are related to these data.
QAPP Information:	Samples were collected and analyzed in accordance with the Sampling and Analysis Plan and the Laboratories and Laboratory Analyses procedures described in the "Draft Guidance for Salt Water Beaches" (DHS 2006).
QAPP Information Reference(s):	<u>Draft Guidance for Salt Water Beaches. Last Update: April 10, 2006. Initial Draft: November 1997. Division of Drinking Water and Environmental Management, California Department of Health Services</u>

LOE ID:	25323
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Water Contact Recreation
Number of Samples:	21
Number of Exceedances:	6
Data and Information Type:	Pathogen Monitoring
Data Used to Assess Water Quality:	Three of the 85 single samples of total coliform collected at Pudding Creek Beach exceed the objective. Additionally, six of the 21 30-day geomean values exceed the objective. The single sample and geomean values are two different matrices used Mendocino County Division of Environmental Health in accordance with AB411 (Chapter 765, Statutes of 1997) requirements. Data is maintained by the State Water Board's Beach Watch program. Data is summarized by the North Coast Regional Water Board (North Coast RWQCB 2007).
Data Reference:	<u>North Coast Beach Watch Data. Bacteria data collected by Del Norte County, Humboldt County, Mendocino County Environmental Health Division, Sonoma County Division of Environmental Health, and Marin County in accordance with AB411. Data managed by the State Water Resources Control Board's Beach Watch program at beachwatch.waterboards.ca.gov. Includes data from 2004 to 2006</u>
Water Quality Objective/Criterion:	Per the Ocean Plan (SWRCB 2005): The following bacterial objectives shall be maintained throughout the water column. The following standard is based on the 30-day geometric mean of the five most recent samples from each site: Total coliform density shall not exceed 1,000 MPN per 100 ml. The following standard is for the single sample maximum: (i) Total coliform density shall not exceed 10,000 per 100 ml; and (ii) Total coliform density shall not exceed 1,000 per 100 ml when the fecal coliform/total coliform ratio exceeds 0.1. *Note: MPN is the most probable number of coliform units.
Objective/Criterion Reference:	<u>Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency</u>
Evaluation Guideline: Guideline Reference:	
Spatial Representation:	Samples were collected at Pudding Creek Beach.
Temporal Representation:	Samples were collected weekly from April to October 2005 and April to October 2006.
Environmental Conditions:	Samples were collected during the dry season. Otherwise, there are no known environmental conditions (e.g., land use practices, fire events, storms, etc.) that are related to these data.
QAPP Information:	Samples were collected and analyzed in accordance with the Sampling and Analysis Plan and the Laboratories and Laboratory Analyses procedures described in the "Draft Guidance for Salt Water Beaches" (DHS 2006).
QAPP Information Reference(s):	<u>Draft Guidance for Salt Water Beaches. Last Update: April 10, 2006. Initial Draft: November 1997. Division of Drinking Water and Environmental Management, California Department of Health Services</u>

LOE ID: 25321

Pollutant: Enterococcus
 LOE Subgroup: Pollutant-Water
 Matrix: Water
 Fraction: Total

Beneficial Use: Water Contact Recreation

Number of Samples: 21
 Number of Exceedances: 2

Data and Information Type: Pathogen Monitoring

Data Used to Assess Water Quality: Three of the 85 single samples of enterococcus collected at Pudding Creek Beach exceed the objective. Additionally, 2 of the 21 30-day geomean values exceed the objective. The single sample and geomean values are two different matrices used Mendocino County Division of Environmental Health in accordance with AB411 (Chapter 765, Statutes of 1997) requirements. Data is maintained by the State Water Board's Beach Watch program. Data is summarized by the North Coast Regional Water Board (North Coast RWQCB 2007).

Data Reference: [North Coast Beach Watch Data. Bacteria data collected by Del Norte County, Humboldt County, Mendocino County Environmental Health Division, Sonoma County Division of Environmental Health, and Marin County in accordance with AB411. Data managed by the State Water Resources Control Board's Beach Watch program at \[beachwatch.waterboards.ca.gov\]\(http://beachwatch.waterboards.ca.gov\). Includes data from 2004 to 2006](#)

Water Quality Objective/Criterion: Per the Ocean Plan (SWRCB 2005): The following bacterial objectives shall be maintained throughout the water column. The following standard is based on the 30-day geometric mean of the 5 most recent samples from each site: Enterococcus density shall not exceed 35 MPN per 100ml. The following standard is for the single sample maximum: Enterococcus density shall not exceed 104 per 100 ml. *Note: MPN is the most probable number of coliform units.

Objective/Criterion Reference: [Water Quality Control Plan Ocean Waters of California. California Ocean Plan 2005. Sacramento, CA: State Water Resources Control Board, California Environmental Protection Agency](#)

Evaluation Guideline: Guideline Reference:

Spatial Representation: Samples were collected at Pudding Creek Beach.
 Temporal Representation: Samples were collected weekly from April to October 2005 and April to October 2006.
 Environmental Conditions: Samples were collected during the dry season. Otherwise, there are no known environmental conditions (e.g., land use practices, fire events, storms, etc.) that are related to these data.

QAPP Information: Samples were collected and analyzed in accordance with the Sampling and Analysis Plan and the Laboratories and Laboratory Analyses procedures described in the "Draft Guidance for Salt Water Beaches" (DHS 2006).

QAPP Information Reference(s): [Draft Guidance for Salt Water Beaches. Last Update: April 10, 2006. Initial Draft: November 1997. Division of Drinking Water and Environmental Management, California Department of Health Services](#)

WATER BODY NAME: REDWOOD CREEK HU, REDWOOD CREEK
Water Body ID: CAR1071002019990528100152
Water Body Type: River & Stream

DECISION ID 6086

Pollutant: TEMPERATURE, WATER

Final Listing Decision: Do Not Delist from 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: List on 303(d) list (TMDL required list)(2006)

Revision Status Revised

Sources: Erosion/Siltation | Logging Road Construction/Maintenance | Natural Sources | Nonpoint Source | Range Grazing-Riparian | Removal of Riparian Vegetation | Silviculture | Streambank Modification/Destabilization

Expected TMDL Completion Date: 2019

Pollutant or Pollution: Pollutant

Weight of Evidence: This pollutant is being considered for removal from the Section 303(d) List under Section 4.11 of the Listing Policy (SWRCB 2004).

Under the Policy a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess water temperature in Redwood Creek. The evidence demonstrates that the temperature water quality objective is not attained in Redwood Creek. Water temperatures do not reflect natural conditions as the environmental factors that influence water temperature have been altered by human activities. For example, there is a loss of shade provided by large conifers as a result of timber harvest and stream bank erosion. Additionally, water temperatures in Redwood Creek adversely affect beneficial uses. When compared to the 18Â°C MWMT evaluation guideline for non-core juvenile salmon and trout rearing (USEPA 2003), all 5 of the 5 MWMT values calculated for Redwood Creek from 2001 to 2005 exceed the evaluation guideline. The MWMT values range from 25.7Â°C to 28.3Â°C.

Based on the readily available data and information, the weight of the evidence indicates that there is sufficient justification to not remove this water segment-pollutant combination from the Section 303(d) List. In other words, there is sufficient justification for Redwood Creek to remain listed as temperature impaired.

This conclusion is based on staff findings that:
 (1) The data used satisfies the data quality requirements of Section 6.1.4 of the Policy.
 (2) The data used satisfies the data quantity requirements of Section 6.1.5 of the Policy.
 (3) The evaluation of the data satisfies the temperature data evaluation requirements of Section 6.1.5.9 of the Policy.
 (4) The weight of the evidence indicates the temperature water quality objective is not attained, which requires the listing be maintained per Section 4.11 of the Policy.
 (5) Pursuant to Section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are met.

RWQCB Staff Recommendation: After review of the available data and information, Regional Water Board staff conclude that the water body-pollutant combination should not be removed from the Section 303(d) List because the water quality objective for temperature is not attained.

SWRCB Board Decision / Staff Recommendation:

USEPA Decision:

Lines of Evidence (LOEs) for Decision ID 6086

LOE ID: 5374

Pollutant: Temperature, water

LOE Subgroup: Pollutant-Water

Matrix: Water

Fraction: None

Beneficial Use: Cold Freshwater Habitat

Aquatic Life Use: Fish Migration | Fish Spawning | Preservation of Rare & Endangered Species | Wildlife Habitat

Number of Samples: 5

Number of Exceedances: 5

Data and Information Type: Physical/Chemical Monitoring

Data Used to Assess Water Quality: The water temperatures of Redwood Creek do not reflect natural conditions as the environmental factors that influence water temperature have been altered by human activities. For example, as stated in the Redwood Creek Watershed Assessment Report (Cannata et al. 2006), there is a loss of shade provided by large conifers as a result of timber harvest and stream bank erosion, and the present habitat problems observed in most streams in the basin are often related to excessive sediment in stream channels and/or the lack of a large conifer contribution in riparian and nearstream forests. In order to determine if temperatures adversely affect beneficial uses, staff compared temperature data to the 18 C MWMT criterion/evaluation guideline from US EPA (2003). All 5 of the 5 MWMT values calculated for Redwood Creek exceed the evaluation guideline, indicating that water temperatures adversely affect beneficial uses. The MWMTs range from 25.7 to 28.3 C. The data are found in the "2005 Annual Report Upper Redwood Creek Juvenile Salmonid (Smolt) Downstream Migration Study 2000-2005 Seasons Project 2a5" (Sparkman 2005).

Data Reference: [2005 Annual Report. Upper Redwood Creek Juvenile Salmonid \(Smolt\) Downstream Migration Study. 2000-2005 Seasons. Project 2a5. Anadromous Fisheries Resource Assessment and Monitoring Program. California Resources Agency, Department of Fish and Game.](#)
[Redwood Creek Watershed Assessment Report. Coastal Watershed Planning and Assessment Program and North Coast Watershed Assessment Program. California Resources Agency and California Environmental Protection Agency, Sacramento, California](#)

Water Quality Objective/Criterion: Per the Basin Plan (NCRWQCB 2007, p. 3-4.00): The natural receiving water temperature of intrastate waters shall not be altered unless it can be demonstrated to the satisfaction of the Regional Water Board that such alteration in temperature does not adversely affect beneficial uses. At no time or place shall the temperature of any COLD water be increased by more than 5 F above natural receiving water temperature.

Objective/Criterion Reference: [Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board](#)

Evaluation Guideline: Per "U.S. EPA Region 10 Guidance for Pacific Northwest State and Tribal Temperature Water Quality Standards" (USEPA 2003), the recommended criterion for the protection of moderate to low density summertime salmon and trout juvenile rearing (i.e., non-core juvenile rearing) of a maximum weekly maximum temperature (MWMT) of 18 C. The

MWMT is also known as the maximum 7-day average of daily maximums (7DADM). The 18 C MWMT criterion is recommended to (1) safely protect juvenile salmon and trout from lethal temperatures; (2) provide upper optimal conditions for juvenile growth under limited food during the period of summer maximum temperatures and optimal temperatures for other times of the growth season; (3) avoid temperatures where juvenile salmon and trout are at a competitive disadvantage with other fish; (4) protect against temperature induced elevated disease rates; and (5) provide temperatures that studies show juvenile salmon and trout prefer and are found in high densities.

Guideline Reference: [EPA Region 10 Guidance for Pacific Northwest State and Tribal Temperature Water Quality Standards. EPA 910-B-03-002. U.S. Environmental Protection Agency Region 10 Office of Water, Seattle, WA.](#)

Spatial Representation: Water temperature data were collected in the mainstem Redwood Creek in the Beaver Creek Hydrologic Area. The data logger was placed behind a rotary screw trap used for collected outmigrating smolts. The shallowest stream depths during which measurements were taken were about 2-3 feet.

Temporal Representation: Water temperature data were collected from the end of March to the end of August each year from 2001 to 2005. Measurements were taken every hour. Approximately 3,700 measurements were taken over the course of the study.

Environmental Conditions: There are no known environmental conditions (e.g., seasonality, land use practices, fire events, storms, etc.) that are related to these data.

QAPP Information: Water temperatures were recorded with an Optic StowAway Temp data logger by Onset Computer Corporation. Two data loggers were used. Both gave the similar results and only data from one probe was included by Sparkman (2005). The data loggers were placed in a PVC cylinder with holes to ensure adequate ventilation and to prevent influences from direct sunlight. The MWMT values were determined following methods described by the 2005 draft of Madej et al. (2006).

QAPP Information Reference(s): [Assessing Possible Thermal Rearing Restrictions for Juvenile Coho Salmon \(*Oncorhynchus kisutch*\) through Thermal Infrared Imaging and In-Stream Monitoring. Redwood Creek, California. Canadian Journal of Fisheries and Aquatic Sciences 63:1384-1396](#)

LOE ID: 4755

Pollutant: Temperature, water

LOE Subgroup: Pollutant-Water

Matrix: Water

Fraction: None

Beneficial Use: Cold Freshwater Habitat

Number of Samples: 0

Number of Exceedances: 0

Data and Information Type: Not Specified

Data Used to Assess Water Quality: This LOE is a placeholder to support a 303(d) listing decision made prior to 2006.

Data Reference: [Placeholder reference pre-2006 303\(d\)](#)

Water Quality

Objective/Criterion:

Objective/Criterion Reference:

Evaluation Guideline:

Guideline Reference:

Spatial Representation:

Temporal Representation:

Environmental

Conditions:

QAPP Information: Unspecified

QAPP Information Reference(s):

WATER BODY NAME:	RUSSIAN RIVER HU, MIDDLE RUSSIAN RIVER HA, GEYSERVILLE HSA
Water Body ID:	CAR1142503219990615082353
Water Body Type:	River & Stream

DECISION ID	13300
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Pollutant:	INDICATOR BACTERIA
Final Listing Decision:	Do Not Delist from 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision:	New Decision
Revision Status	Revised
Sources:	Source Unknown
Expected TMDL	2012
Completion Date:	
Pollutant or Pollution:	Pollutant

Weight of Evidence: Indicator bacteria (which includes enterococcus, E. Coli, fecal coliform, and total coliform) in the Geyserville Hydrologic Sub-Area (HSA) is being considered for placement and removal from the Section 303(d) List in 3 parts: for the mainstem Russian River from the railroad bridge to the Highway 101 bridge, for unnamed Stream 1 on Fitch Mountain, and for the remainder of the Geyserville HSA.

(A) For the mainstem Russian River from the railroad bridge to the Highway 101 bridge, this pollutant is being considered for removal from the Section 303(d) List under Section 4.2 of the Listing Policy. Ten lines of evidence (LOEs 6120, 5943, 5941, 6119, 7110, 5936, 6118, 6117, 7111, and 5935) are available in the administrative record to assess this pollutant. The weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the Section 303(d) List in the Water Quality Limited Segments category (i.e., sufficient justification to not delist). This conclusion is based on the staff findings that: (1) Combined, 1 of 52 enterococcus, 0 of 106 E. Coli, 56 of 116 fecal coliform, and 0 of 189 total coliform samples exceed the evaluation guidelines. The 56 of 116 fecal coliform samples exceed the evaluation guideline used to interpret the water quality objective, and this exceeds the allowable frequency listed in Table 4.2 of the Listing Policy. (2) The data used satisfies the data quality requirements of Section 6.1.4. (3) The data used satisfies the data quantity requirements of Section 6.1.5. (4) Pursuant to Section 4.11, no additional data and information are available indicating that standards are not met.

(B) For Stream 1 on Fitch Mountain, this pollutant is being considered for placement on the Section 303(d) List under Section 3.2. Four lines of evidence (LOEs 6107, 6106, 6105, and 6103) are available in the administrative record to assess this pollutant. The weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the Section 303(d) List in the Water Quality Limited Segments category (i.e., sufficient justification to list). This conclusion is based on the staff findings that: (1) Five of 7 enterococcus, 3 of 9 E. Coli, 7 of 7 fecal coliform, and 0 of 12 total coliform samples exceed the evaluation guidelines. The 5 out of 7 enterococcus and 7 out of 7 fecal coliform samples exceed the evaluation guidelines, and this exceeds the allowable frequency listed in Table 3.2 of the Listing Policy. (2) The data used satisfies the data quality requirements of Section 6.1.4. (3) The data used satisfies the data quantity requirements of Section 6.1.5. (4) Pursuant to Section 3.11, no additional data and information are available indicating that standards are not met.

(C) For the remainder of the Geyserville HSA, this pollutant is being considered for placement on the Section 303(d) List under Section 3.2. Twenty lines of evidence are available in the administrative record to assess this pollutant. The weight of evidence

indicates that there is sufficient justification against placing this water segment-pollutant combination on the Section 303(d) List in the Water Quality Limited Segments category (i.e., sufficient justification to not list). This conclusion is based on the staff findings that: (1) Combined, 9 of 628 samples exceed the evaluation guidelines, and this does not exceed the allowable frequency of 105 per the binomial distribution described in Section 3.2. (2) The data used satisfies the data quality requirements of Section 6.1.4. (3) The data used satisfies the data quantity requirements of Section 6.1.5. (4) Pursuant to Section 3.11, no additional data and information are available indicating that standards are not met.

RWQCB Staff Recommendation:

After review of the available data and information, North Coast Regional Water Board staff concludes that:

(A) For the mainstem Russian River from the railroad bridge to the Highway 101 bridge, the water body-pollutant combination should not be removed from the Section 303(d) List because applicable water quality standards for the pollutant are not being attained.

(B) For Stream 1 on Fitch Mountain, the water body-pollutant combination should be placed on the Section 303(d) List because applicable water quality standards are not being attained and a pollutant contributes to or causes the problem

(C) For the remainder of the Geyserville HSA, the water body-pollutant combination should not be placed on the Section 303(d) List because applicable water quality standards are being attained.

SWRCB Board Decision / Staff Recommendation:

USEPA Decision:

Lines of Evidence (LOEs) for Decision ID 13300

LOE ID:	6112
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Water Contact Recreation
Number of Samples:	5
Number of Exceedances:	0
Data and Information Type:	Physical/Chemical Monitoring
Data Used to Assess Water Quality:	None of the 5 total coliform samples from the Russian River at Stream 2 in the Fitch Mountain area exceed the evaluation guideline. Sample concentrations range from 110 to 350 MPN / 100 ml. Samples were collected by Regional Water Board staff as part of a targeted sampling event on the Russian River around Fitch Mountain. Data are summarized by Goodwin (1997).
Data Reference:	<u>Staff Report Regarding Russian River Bacterial Water Quality Monitoring in the Vicinity of Fitch Mountain Sonoma County, California. April through September, 1995. North Coast Regional Water Quality Control Board</u>

Water Quality Objective/Criterion: Objective/Criterion Reference:	Per the Basin Plan (NCRWQCB 2007): The bacteriological quality of waters of the North Coast Region shall not be degraded beyond natural background levels. <u>Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board</u>
Evaluation Guideline:	Per the "Draft Guidance for Fresh Water Beaches" (DHS 2006): Beach posting is recommended when single sample total coliform levels exceed 10,000 MPN / 100 ml. *Note: MPN is the most probable number of coliform units.
Guideline Reference:	<u>Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Health Services Division of Drinking Water and Environmental Management.</u>
Spatial Representation:	The samples were collected from a unnamed tributary to the mainstem Russian River, designated as Stream 2. Stream 2 enters the Russian River about 1 mile downstream of Redwood Drive in the Fitch Mountain area. Stream 2 was sampled at Hilltop Drive.
Temporal Representation:	Samples were collected weekly from April 25 to May 22, 1995.
Environmental Conditions:	There are no known environmental conditions (e.g., seasonality, land use practices, fire events, storms, etc.) that are related to these data.
QAPP Information:	The samples were collected in accordance with the study design methods described by Goodwin (1997).
QAPP Information Reference(s):	<u>Staff Report Regarding Russian River Bacterial Water Quality Monitoring in the Vicinity of Fitch Mountain Sonoma County, California. April through September, 1995. North Coast Regional Water Quality Control Board</u>

LOE ID: 6117

Pollutant: Total Coliform
 LOE Subgroup: Pollutant-Water
 Matrix: Water
 Fraction: Total

Beneficial Use: Water Contact Recreation

Number of Samples: 20
 Number of Exceedances: 0

Data and Information Type: Physical/Chemical Monitoring

Data Used to Assess Water Quality: None of the 20 total coliform samples from the Russian River at Healdsburg Memorial Beach exceed the evaluation guideline. Sample concentrations range from 90 to 2,401 MPN / 100 ml. Samples were collected by Regional Water Board staff as part of a targeted sampling event on the Russian River around Fitch Mountain. Data are summarized by Goodwin (1997).

Data Reference: Staff Report Regarding Russian River Bacterial Water Quality Monitoring in the Vicinity of Fitch Mountain Sonoma County, California. April through September, 1995. North Coast Regional Water Quality Control Board

Water Quality Objective/Criterion: Objective/Criterion Reference: Per the Basin Plan (NCRWQCB 2007): The bacteriological quality of waters of the North Coast Region shall not be degraded beyond natural background levels.
Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board

Evaluation Guideline: Per the "Draft Guidance for Fresh Water Beaches" (DHS 2006): Beach posting is recommended when single sample total coliform levels exceed 10,000 MPN / 100 ml.
*Note: MPN is the most probable number of coliform units.

Guideline Reference: Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Health Services Division of Drinking Water and Environmental Management.

Spatial Representation: The samples were collected from the mainstem Russian River at 4 sites along Healdsburg Memorial Beach: at the upstream end of the beach immediately downstream of the automobile bridge, in the area designated for young children to swim, at the downstream end of the swim area, and from the gravel bar at the fisherman's beach which is immediately downstream of the dam. Samples were collected in well mixed flowing water, either in midstream or near the shore. Data from samples collected on the same day at more than one of these sites were averaged.

Temporal Representation: Samples were collected weekly from April 25 to September 6, 1995.

Environmental Conditions: There are no known environmental conditions (e.g., seasonality, land use practices, fire events, storms, etc.) that are related to these data.

QAPP Information: The samples were collected in accordance with the study design methods described by Goodwin (1997).

QAPP Information Reference(s): Staff Report Regarding Russian River Bacterial Water Quality Monitoring in the Vicinity of Fitch Mountain Sonoma County, California. April through September, 1995. North Coast Regional Water Quality Control Board

LOE ID: 6118

Pollutant: Fecal Coliform
 LOE Subgroup: Pollutant-Water
 Matrix: Water
 Fraction: Total

Beneficial Use: Water Contact Recreation

Number of Samples: 12
 Number of Exceedances: 7

Data and Information Type: Physical/Chemical Monitoring

Data Used to Assess Water Quality: Of the 20 fecal coliform samples collected from the Russian River at Healdsburg Memorial Beach, 12 median fecal coliform concentration values were calculated based on a minimum of not less than 5 samples for any 30-day period. Of these 12 median values, 7 exceed the objective. Median value concentrations range from 30 to 130 MPN / 100 ml. Samples were collected by Regional Water Board staff as part of a targeted sampling event on the Russian River around Fitch Mountain. Data are summarized by Goodwin (1997).

Data Reference: Staff Report Regarding Russian River Bacterial Water Quality Monitoring in the Vicinity of Fitch Mountain Sonoma County, California. April through September, 1995. North Coast Regional Water Quality Control Board

Water Quality Objective/Criterion: Per the Basin Plan (NCRWQCB 2007): The bacteriological quality of waters of the North Coast Region shall not be degraded beyond natural background levels. In no case shall coliform concentrations in waters of the North Coast Region exceed the following: In waters designated for contact recreation (REC-1), the median fecal coliform concentration based on a minimum of not less than 5 samples for any 30-day period shall not exceed 50 MPN* / 100 ml, nor shall more than 10% of total samples during any 30-day period exceed 400 MPN / 100 ml. *Note: MPN is the most probable number of coliform units.

Objective/Criterion Reference: Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board

Evaluation Guideline:
Guideline Reference:

Spatial Representation: The samples were collected from the mainstem Russian River at 4 sites along Healdsburg Memorial Beach: at the upstream end of the beach immediately downstream of the automobile bridge, in the area designated for young children to swim, at the downstream end of the swim area, and from the gravel bar at the fisherman's beach which is immediately downstream of the dam. Samples were collected in well mixed flowing water, either in midstream or near the shore. Data from samples collected on the same day at more than one of these sites were averaged.

Temporal Representation: Samples were collected weekly from April 25 to September 6, 1995.
Environmental Conditions: There are no known environmental conditions (e.g., seasonality, land use practices, fire events, storms, etc.) that are related to these data.

QAPP Information: Samples were collected in accordance with the study design methods described by Goodwin (1997).

QAPP Information Reference(s): Staff Report Regarding Russian River Bacterial Water Quality Monitoring in the Vicinity of Fitch Mountain Sonoma County, California. April through September, 1995. North Coast Regional Water Quality Control Board

LOE ID: 6095

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Total

Beneficial Use: Water Contact Recreation

Number of Samples: 19
Number of Exceedances: 0

Data and Information Type: Physical/Chemical Monitoring

Data Used to Assess Water Quality: None of the 19 total coliform samples from the Russian River at Geyserville exceed the evaluation guideline. Sample concentrations ranged from 50 to 1,601 MPN / 100 ml. Samples were collected by Regional Water Board staff as part of a targeted sampling event on the Russian River around Fitch Mountain. Data are summarized by Goodwin (1997).

Data Reference: Staff Report Regarding Russian River Bacterial Water Quality Monitoring in the Vicinity of Fitch Mountain Sonoma County, California. April through September, 1995. North Coast Regional Water Quality Control Board

Water Quality Objective/Criterion: Per the Basin Plan (NCRWQCB 2007): The bacteriological quality of waters of the North Coast Region shall not be degraded beyond natural background levels.
Objective/Criterion Reference: Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board

Evaluation Guideline: Per the "Draft Guidance for Fresh Water Beaches" (DHS 2006): Beach posting is recommended when single sample total coliform levels exceed 10,000 MPN / 100 ml.
*Note: MPN is the most probable number of coliform units.

Guideline Reference: Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Health Services Division of Drinking Water and Environmental Management.

Spatial Representation: The samples were collected from the mainstem Russian River at Geyserville upstream of the Highway 128 bridge. Samples were collected in well mixed flowing water, either in midstream or near the shore.

Temporal Representation: Samples were collected weekly from April 25 to September 6, 1995.

Environmental Conditions: There are no known environmental conditions (e.g., seasonality, land use practices, fire events, storms, etc.) that are related to these data.

QAPP Information: The samples were collected in accordance with the study design methods described by Goodwin (1997).

QAPP Information Reference(s): [Staff Report Regarding Russian River Bacterial Water Quality Monitoring in the Vicinity of Fitch Mountain Sonoma County, California. April through September, 1995. North Coast Regional Water Quality Control Board](#)

LOE ID: 6098

Pollutant: Enterococcus
 LOE Subgroup: Pollutant-Water
 Matrix: Water
 Fraction: Total

Beneficial Use: Water Contact Recreation

Number of Samples: 14
 Number of Exceedances: 0

Data and Information Type: Physical/Chemical Monitoring

Data Used to Assess Water Quality: None of the 14 Enterococcus samples from the Russian River at Geyserville exceeds the evaluation guideline. Sample concentrations ranged from less than 0 to 22 MPN / 100 ml. Samples were collected by Regional Water Board staff as part of a targeted sampling event on the Russian River around Fitch Mountain. Data are summarized by Goodwin (1997).

Data Reference: [Staff Report Regarding Russian River Bacterial Water Quality Monitoring in the Vicinity of Fitch Mountain Sonoma County, California. April through September, 1995. North Coast Regional Water Quality Control Board](#)

Water Quality Objective/Criterion: Per the Basin Plan (NCRWQCB 2007): The bacteriological quality of waters of the North Coast Region shall not be degraded beyond natural background levels.
 Objective/Criterion Reference: [Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board](#)

Evaluation Guideline: Per the "Draft Guidance for Fresh Water Beaches" (DHS 2006): Beach posting is recommended when single sample Enterococcus levels exceed 61 MPN / 100 ml. *Note: MPN is the most probable number of coliform units.

Guideline Reference: [Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Health Services Division of Drinking Water and Environmental Management.](#)

Spatial Representation: The samples were collected from the mainstem Russian River at Geyserville upstream of the Highway 128 bridge. Samples were collected in well mixed flowing water, either in midstream or near the shore.

Temporal Representation: Samples were collected weekly from May 30 to September 6, 1995.

Environmental Conditions: There are no known environmental conditions (e.g., seasonality, land use practices, fire events, storms, etc.) that are related to these data.

QAPP Information: Samples were collected in accordance with the study design methods described by Goodwin (1997).

QAPP Information Reference(s): Staff Report Regarding Russian River Bacterial Water Quality Monitoring in the Vicinity of Fitch Mountain Sonoma County, California. April through September, 1995. North Coast Regional Water Quality Control Board

LOE ID: 6119

Pollutant: **Escherichia coli (E. Coli)**

LOE Subgroup: Pollutant-Water

Matrix: Water

Fraction: Total

Beneficial Use: Water Contact Recreation

Number of Samples: 10

Number of Exceedances: 0

Data and Information Type: Physical/Chemical Monitoring

Data Used to Assess Water Quality: None of the 10 E. coli samples from the Russian River at Healdsburg Memorial Beach exceed the evaluation guideline. Sample concentrations range from 8 to 62 MPN / 100 ml. Samples were collected by Regional Water Board staff as part of a targeted sampling event on the Russian River around Fitch Mountain. Data are summarized by Goodwin (1997).

Data Reference: Staff Report Regarding Russian River Bacterial Water Quality Monitoring in the Vicinity of Fitch Mountain Sonoma County, California. April through September, 1995. North Coast Regional Water Quality Control Board

Water Quality Objective/Criterion: Per the Basin Plan (NCRWQCB 2007): The bacteriological quality of waters of the North Coast Region shall not be degraded beyond natural background levels.
Objective/Criterion Reference: Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board

Evaluation Guideline: Per the "Draft Guidance for Fresh Water Beaches" (DHS 2006): Beach posting is recommended when single sample E. coli levels exceed 235 MPN / 100 ml. *Note: MPN is the most probable number of coliform units.

Guideline Reference: Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Health Services Division of Drinking Water and Environmental Management.

Spatial Representation: The samples were collected from the mainstem Russian River at 4 sites along Healdsburg Memorial Beach: at the upstream end of the beach immediately downstream of the automobile bridge, in the area designated for young children to swim, at the downstream end of the swim area, and from the gravel bar at the fisherman's beach which is immediately downstream of the dam. Samples were collected in well mixed flowing water, either in midstream or near the shore. Data from samples collected on the same day at more than one of these sites were averaged.

Temporal Representation: Samples were collected weekly on May 9 and July 5, 1995.

Environmental Conditions: There are no known environmental conditions (e.g., seasonality, land use practices, fire events, storms, etc.) that are related to these data.

QAPP Information: Samples were collected in accordance with the study design methods described by Goodwin (1997).

QAPP Information Reference(s): Staff Report Regarding Russian River Bacterial Water Quality Monitoring in the Vicinity of Fitch Mountain Sonoma County, California. April through September, 1995. North Coast Regional Water Quality Control Board

LOE ID:	6120
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Water Contact Recreation
Number of Samples:	14
Number of Exceedances:	0
Data and Information Type:	Physical/Chemical Monitoring
Data Used to Assess Water Quality:	None of the 14 Enterococcus samples from the Russian River at Healdsburg Memorial Beach exceed the evaluation guideline. Sample concentrations range from 7 to 21 MPN / 100 ml. Samples were collected by Regional Water Board staff as part of a targeted sampling event on the Russian River around Fitch Mountain. Data are summarized by Goodwin (1997).
Data Reference:	<u>Staff Report Regarding Russian River Bacterial Water Quality Monitoring in the Vicinity of Fitch Mountain Sonoma County, California. April through September, 1995. North Coast Regional Water Quality Control Board</u>
Water Quality Objective/Criterion: Objective/Criterion Reference:	Per the Basin Plan (NCRWQCB 2007): The bacteriological quality of waters of the North Coast Region shall not be degraded beyond natural background levels. <u>Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board</u>
Evaluation Guideline:	Per the "Draft Guidance for Fresh Water Beaches" (DHS 2006): Beach posting is recommended when single sample Enterococcus levels exceed 61 MPN / 100 ml. *Note: MPN is the most probable number of coliform units.
Guideline Reference:	<u>Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Health Services Division of Drinking Water and Environmental Management.</u>
Spatial Representation:	The samples were collected from the mainstem Russian River at 4 sites along Healdsburg Memorial Beach: at the upstream end of the beach immediately downstream of the automobile bridge, in the area designated for young children to swim, at the downstream end of the swim area, and from the gravel bar at the fisherman's beach which is immediately downstream of the dam. Samples were collected in well mixed flowing water, either in midstream or near the shore. Data from samples collected on the same day at more than one of these sites were averaged.
Temporal Representation: Environmental Conditions:	Samples were collected weekly from May 30 to September 6, 1995. There are no known environmental conditions (e.g., seasonality, land use practices, fire events, storms, etc.) that are related to these data.
QAPP Information:	Samples were collected in accordance with the study design methods described by Goodwin (1997).
QAPP Information Reference(s):	<u>Staff Report Regarding Russian River Bacterial Water Quality Monitoring in the Vicinity of Fitch Mountain Sonoma County, California. April through September, 1995. North Coast Regional Water Quality Control Board</u>

LOE ID:	6106
Pollutant:	Escherichia coli (E. Coli)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Water Contact Recreation
Number of Samples:	9
Number of Exceedances:	3
Data and Information Type:	Physical/Chemical Monitoring
Data Used to Assess Water Quality:	Three of the 9 E. coli samples from the Russian River at Stream 1 in the Fitch Mountain area exceed the evaluation guideline. Sample concentrations range from 9 to 1,652 MPN / 100 ml. Samples were collected by Regional Water Board staff as part of a targeted sampling event on the Russian River around Fitch Mountain. Data are summarized by Goodwin (1997).
Data Reference:	<u>Staff Report Regarding Russian River Bacterial Water Quality Monitoring in the Vicinity of Fitch Mountain Sonoma County, California. April through September, 1995. North Coast Regional Water Quality Control Board</u>
Water Quality Objective/Criterion Reference:	Per the Basin Plan (NCRWQCB 2007): The bacteriological quality of waters of the North Coast Region shall not be degraded beyond natural background levels. <u>Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board</u>
Evaluation Guideline:	Per the "Draft Guidance for Fresh Water Beaches" (DHS 2006): Beach posting is recommended when single sample E. coli levels exceed 235 MPN / 100 ml. *Note: MPN is the most probable number of coliform units.
Guideline Reference:	<u>Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Health Services Division of Drinking Water and Environmental Management.</u>
Spatial Representation:	The samples were collected from a unnamed tributary to the mainstem Russian River, designated as Stream 1. Stream 1 enters the Russian River at Redwood Drive in the Fitch Mountain area. Stream 1 was sampled at 2 locations. Data from the 2 locations were averaged.
Temporal Representation:	Samples were collected weekly from May 9 to July 5, 1995.
Environmental Conditions:	There are no known environmental conditions (e.g., seasonality, land use practices, fire events, storms, etc.) that are related to these data.
QAPP Information:	Samples were collected in accordance with the study design methods described by Goodwin (1997).
QAPP Information Reference(s):	<u>Staff Report Regarding Russian River Bacterial Water Quality Monitoring in the Vicinity of Fitch Mountain Sonoma County, California. April through September, 1995. North Coast Regional Water Quality Control Board</u>

LOE ID:	6102
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Water Contact Recreation
Number of Samples:	37
Number of Exceedances:	0
Data and Information Type:	Physical/Chemical Monitoring
Data Used to Assess Water Quality:	None of the 37 Enterococcus samples from the Russian River at Fitch Mountain at Redwood Drive, Camp Rose, and Almond Way exceed the evaluation guideline. At Fitch Mountain at Redwood Drive, 10 samples were collected with concentrations ranging from 1 to 7 MPN / 100 ml. At Camp Rose, 13 samples were collected with concentrations ranging from 11 to 50 MPN / 100 ml. At Almond Drive, 14 samples were collected with concentrations ranging from 0 to 36 MPN / 100 ml. Samples were collected by Regional Water Board staff as part of a targeted sampling event on the Russian River around Fitch Mountain. Data are summarized by Goodwin (1997).
Data Reference:	<u>Staff Report Regarding Russian River Bacterial Water Quality Monitoring in the Vicinity of Fitch Mountain Sonoma County, California. April through September, 1995. North Coast Regional Water Quality Control Board</u>
Water Quality Objective/Criterion:	Per the Basin Plan (NCRWQCB 2007): The bacteriological quality of waters of the North Coast Region shall not be degraded beyond natural background levels.
Objective/Criterion Reference:	<u>Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board</u>
Evaluation Guideline:	Per the "Draft Guidance for Fresh Water Beaches" (DHS 2006): Beach posting is recommended when single sample Enterococcus levels exceed 61 MPN / 100 ml. *Note: MPN is the most probable number of coliform units.
Guideline Reference:	<u>Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Health Services Division of Drinking Water and Environmental Management.</u>
Spatial Representation:	The samples were collected from the mainstem Russian River at 3 sites in the Fitch Mountain reach: Fitch Mountain at Redwood Drive, Camp Rose Beach, and Almond Way. Fitch Mountain at Redwood Drive is located upstream of a small stream that enters the Russian River at Redwood Drive. Samples were collected in well mixed flowing water, either in midstream or near the shore.
Temporal Representation:	Samples were collected weekly from May 30 to September 6, 1995.
Environmental Conditions:	There are no known environmental conditions (e.g., seasonality, land use practices, fire events, storms, etc.) that are related to these data.
QAPP Information:	Samples were collected in accordance with the study design methods described by Goodwin (1997).
QAPP Information Reference(s):	<u>Staff Report Regarding Russian River Bacterial Water Quality Monitoring in the Vicinity of Fitch Mountain Sonoma County, California. April through September, 1995. North Coast Regional Water Quality Control Board</u>

LOE ID:	6097
Pollutant:	Escherichia coli (E. Coli)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Water Contact Recreation
Number of Samples:	9
Number of Exceedances:	1
Data and Information Type:	Physical/Chemical Monitoring
Data Used to Assess Water Quality:	One of the 9 E. coli samples from the Russian River at Geyserville exceeds the evaluation guideline. Sample concentrations ranged from 1 to 324 MPN / 100 ml. Samples were collected by Regional Water Board staff as part of a targeted sampling event on the Russian River around Fitch Mountain. Data are summarized by Goodwin (1997).
Data Reference:	<u>Staff Report Regarding Russian River Bacterial Water Quality Monitoring in the Vicinity of Fitch Mountain Sonoma County, California. April through September, 1995. North Coast Regional Water Quality Control Board</u>
Water Quality Objective/Criterion Reference:	Per the Basin Plan (NCRWQCB 2007): The bacteriological quality of waters of the North Coast Region shall not be degraded beyond natural background levels. <u>Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board</u>
Evaluation Guideline:	Per the "Draft Guidance for Fresh Water Beaches" (DHS 2006): Beach posting is recommended when single sample E. coli levels exceed 235 MPN / 100 ml. *Note: MPN is the most probable number of coliform units.
Guideline Reference:	<u>Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Health Services Division of Drinking Water and Environmental Management.</u>
Spatial Representation:	The samples were collected from the mainstem Russian River at Geyserville upstream of the Highway 128 bridge. Samples were collected in well mixed flowing water, either in midstream or near the shore.
Temporal Representation:	Samples were collected weekly from May 9 to July 5, 1995.
Environmental Conditions:	There are no known environmental conditions (e.g., seasonality, land use practices, fire events, storms, etc.) that are related to these data.
QAPP Information:	Samples were collected in accordance with the study design methods described by Goodwin (1997).
QAPP Information Reference(s):	<u>Staff Report Regarding Russian River Bacterial Water Quality Monitoring in the Vicinity of Fitch Mountain Sonoma County, California. April through September, 1995. North Coast Regional Water Quality Control Board</u>

LOE ID:	6103
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Water Contact Recreation
Number of Samples:	12
Number of Exceedances:	0
Data and Information Type:	Physical/Chemical Monitoring
Data Used to Assess Water Quality:	None of the 12 total coliform samples from the Russian River at Stream 1 in the Fitch Mountain area exceed the evaluation guideline. Sample concentrations range from 130 to 2,401 MPN / 100 ml. Samples were collected by Regional Water Board staff as part of a targeted sampling event on the Russian River around Fitch Mountain. Data are summarized by Goodwin (1997).
Data Reference:	<u>Staff Report Regarding Russian River Bacterial Water Quality Monitoring in the Vicinity of Fitch Mountain Sonoma County, California. April through September, 1995. North Coast Regional Water Quality Control Board</u>
Water Quality Objective/Criterion Reference:	Per the Basin Plan (NCRWQCB 2007): The bacteriological quality of waters of the North Coast Region shall not be degraded beyond natural background levels. <u>Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board</u>
Evaluation Guideline:	Per the "Draft Guidance for Fresh Water Beaches" (DHS 2006): Beach posting is recommended when single sample total coliform levels exceed 10,000 MPN / 100 ml. *Note: MPN is the most probable number of coliform units.
Guideline Reference:	<u>Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Health Services Division of Drinking Water and Environmental Management.</u>
Spatial Representation:	The samples were collected from a unnamed tributary to the mainstem Russian River, designated as Stream 1. Stream 1 enters the Russian River at Redwood Drive in the Fitch Mountain area. Stream 1 was sampled at 2 locations on the same day on 5 occasions. These data were averaged.
Temporal Representation:	Samples were collected weekly from May 9 to July 11, 1995.
Environmental Conditions:	There are no known environmental conditions (e.g., seasonality, land use practices, fire events, storms, etc.) that are related to these data.
QAPP Information:	The samples were collected in accordance with the study design methods described by Goodwin (1997).
QAPP Information Reference(s):	<u>Staff Report Regarding Russian River Bacterial Water Quality Monitoring in the Vicinity of Fitch Mountain Sonoma County, California. April through September, 1995. North Coast Regional Water Quality Control Board</u>

LOE ID:	6099
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Water Contact Recreation
Number of Samples:	54
Number of Exceedances:	0
Data and Information Type:	Physical/Chemical Monitoring
Data Used to Assess Water Quality:	None of the 54 total coliform samples from the Russian River at Fitch Mountain at Redwood Drive, Camp Rose, and Almond Way exceed the evaluation guideline. At Fitch Mountain at Redwood Drive, 15 samples were collected with concentrations ranging from 50 to 2,401 MPN / 100 ml. At Camp Rose, 19 samples were collected with concentrations ranging from 30 to 1,601 MPN / 100 ml. At Almond Drive, 20 samples were collected with concentrations ranging from 30 to 2,401 MPN / 100 ml. Samples were collected by Regional Water Board staff as part of a targeted sampling event on the Russian River around Fitch Mountain. Data are summarized by Goodwin (1997).
Data Reference:	<u>Staff Report Regarding Russian River Bacterial Water Quality Monitoring in the Vicinity of Fitch Mountain Sonoma County, California. April through September, 1995. North Coast Regional Water Quality Control Board</u>
Water Quality Objective/Criterion:	Per the Basin Plan (NCRWQCB 2007): The bacteriological quality of waters of the North Coast Region shall not be degraded beyond natural background levels.
Objective/Criterion Reference:	<u>Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board</u>
Evaluation Guideline:	Per the "Draft Guidance for Fresh Water Beaches" (DHS 2006): Beach posting is recommended when single sample total coliform levels exceed 10,000 MPN / 100 ml. *Note: MPN is the most probable number of coliform units.
Guideline Reference:	<u>Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Health Services Division of Drinking Water and Environmental Management.</u>
Spatial Representation:	The samples were collected from the mainstem Russian River at 3 sites in the Fitch Mountain reach: Fitch Mountain at Redwood Drive, Camp Rose Beach, and Almond Way. Fitch Mountain at Redwood Drive is located upstream of a small stream that enters the Russian River at Redwood Drive. Samples were collected in well mixed flowing water, either in midstream or near the shore.
Temporal Representation:	Samples were collected weekly from April 25 to September 6, 1995.
Environmental Conditions:	There are no known environmental conditions (e.g., seasonality, land use practices, fire events, storms, etc.) that are related to these data.
QAPP Information:	The samples were collected in accordance with the study design methods described by Goodwin (1997).
QAPP Information Reference(s):	<u>Staff Report Regarding Russian River Bacterial Water Quality Monitoring in the Vicinity of Fitch Mountain Sonoma County, California. April through September, 1995. North Coast Regional Water Quality Control Board</u>

LOE ID:	6101
Pollutant:	Escherichia coli (E. Coli)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Water Contact Recreation
Number of Samples:	27
Number of Exceedances:	0
Data and Information Type:	Physical/Chemical Monitoring
Data Used to Assess Water Quality:	None of the 27 E. coli samples from the Russian River at Fitch Mountain at Redwood Drive, Camp Rose, and Almond Way exceed the evaluation guideline. At Fitch Mountain at Redwood Drive, 9 samples were collected with concentrations ranging from 4.2 to 23.8 MPN / 100 ml. At Camp Rose, 9 samples were collected with concentrations ranging from 7.5 to 59.1 MPN / 100 ml. At Almond Drive, 9 samples were collected with concentrations ranging from 2 to 73.8 MPN / 100 ml. Samples were collected by Regional Water Board staff as part of a targeted sampling event on the Russian River around Fitch Mountain. Data are summarized by Goodwin (1997).
Data Reference:	<u>Staff Report Regarding Russian River Bacterial Water Quality Monitoring in the Vicinity of Fitch Mountain Sonoma County, California. April through September, 1995. North Coast Regional Water Quality Control Board</u>
Water Quality Objective/Criterion:	Per the Basin Plan (NCRWQCB 2007): The bacteriological quality of waters of the North Coast Region shall not be degraded beyond natural background levels.
Objective/Criterion Reference:	<u>Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board</u>
Evaluation Guideline:	Per the "Draft Guidance for Fresh Water Beaches" (DHS 2006): Beach posting is recommended when single sample E. coli levels exceed 235 MPN / 100 ml. *Note: MPN is the most probable number of coliform units.
Guideline Reference:	<u>Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Health Services Division of Drinking Water and Environmental Management.</u>
Spatial Representation:	The samples were collected from the mainstem Russian River at 3 sites in the Fitch Mountain reach: Fitch Mountain at Redwood Drive, Camp Rose Beach, and Almond Way. Fitch Mountain at Redwood Drive is located upstream of a small stream that enters the Russian River at Redwood Drive. Samples were collected in well mixed flowing water, either in midstream or near the shore.
Temporal Representation:	Samples were collected weekly from May 9 to July 5, 1995.
Environmental Conditions:	There are no known environmental conditions (e.g., seasonality, land use practices, fire events, storms, etc.) that are related to these data.
QAPP Information:	Samples were collected in accordance with the study design methods described by Goodwin (1997).
QAPP Information Reference(s):	<u>Staff Report Regarding Russian River Bacterial Water Quality Monitoring in the Vicinity of Fitch Mountain Sonoma County, California. April through September, 1995. North Coast Regional Water Quality Control Board</u>

LOE ID:	6105
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Water Contact Recreation
Number of Samples:	7
Number of Exceedances:	7
Data and Information Type:	Physical/Chemical Monitoring
Data Used to Assess Water Quality:	Of the 12 fecal coliform samples collected from the Russian River at Stream 1 in the Fitch Mountain area, 7 median fecal coliform concentration values were calculated based on a minimum of not less than 5 samples for any 30-day period. Of these 7 median values, all 7 exceed the objective. Median values range from 240 to 1,600 MPN / 100 ml. Samples were collected by Regional Water Board staff as part of a targeted sampling event on the Russian River around Fitch Mountain. Data are summarized by Goodwin (1997).
Data Reference:	<u>Staff Report Regarding Russian River Bacterial Water Quality Monitoring in the Vicinity of Fitch Mountain Sonoma County, California. April through September, 1995. North Coast Regional Water Quality Control Board</u>
Water Quality Objective/Criterion:	Per the Basin Plan (NCRWQCB 2007): The bacteriological quality of waters of the North Coast Region shall not be degraded beyond natural background levels. In no case shall coliform concentrations in waters of the North Coast Region exceed the following: In waters designated for contact recreation (REC-1), the median fecal coliform concentration based on a minimum of not less than 5 samples for any 30-day period shall not exceed 50 MPN* / 100 ml, nor shall more than 10% of total samples during any 30-day period exceed 400 MPN / 100 ml. *Note: MPN is the most probable number of coliform units.
Objective/Criterion Reference:	<u>Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board</u>
Evaluation Guideline: Guideline Reference:	
Spatial Representation:	The samples were collected from a unnamed tributary to the mainstem Russian River, designated as Stream 1. Stream 1 enters the Russian River at Redwood Drive in the Fitch Mountain area. Stream 1 was sampled at 2 locations on the same day on 5 occasions. These data were averaged.
Temporal Representation:	Samples were collected weekly from May 9 to July 11, 1995.
Environmental Conditions:	There are no known environmental conditions (e.g., seasonality, land use practices, fire events, storms, etc.) that are related to these data.
QAPP Information:	Samples were collected in accordance with the study design methods described by Goodwin (1997).
QAPP Information Reference(s):	<u>Staff Report Regarding Russian River Bacterial Water Quality Monitoring in the Vicinity of Fitch Mountain Sonoma County, California. April through September, 1995. North Coast Regional Water Quality Control Board</u>

LOE ID:	6096
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Water Contact Recreation
Number of Samples:	15
Number of Exceedances:	1
Data and Information Type:	Physical/Chemical Monitoring
Data Used to Assess Water Quality:	Of the 19 fecal coliform samples collected from the Russian River at Geyserville, 15 median fecal coliform concentration values were calculated based on a minimum of not less than 5 samples for any 30-day period. Of these 15 median values, 1 exceeded the objective by exceeding 400 MPN / 100 ml during 20% of a 30-day period with a value of 540 MPN / 100 ml. In other words, there was one instance where the objective was exceeded more than 10% of the time; it was exceeded 20% of the time. Samples were collected by Regional Water Board staff as part of a targeted sampling event on the Russian River around Fitch Mountain. Data are summarized by Goodwin (1997).
Data Reference:	<u>Staff Report Regarding Russian River Bacterial Water Quality Monitoring in the Vicinity of Fitch Mountain Sonoma County, California. April through September, 1995. North Coast Regional Water Quality Control Board</u>
Water Quality Objective/Criterion:	Per the Basin Plan (NCRWQCB 2007): The bacteriological quality of waters of the North Coast Region shall not be degraded beyond natural background levels. In no case shall coliform concentrations in waters of the North Coast Region exceed the following: In waters designated for contact recreation (REC-1), the median fecal coliform concentration based on a minimum of not less than 5 samples for any 30-day period shall not exceed 50 MPN* / 100 ml, nor shall more than 10% of total samples during any 30-day period exceed 400 MPN / 100 ml. *Note: MPN is the most probable number of coliform units.
Objective/Criterion Reference:	<u>Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board</u>
Evaluation Guideline: Guideline Reference:	
Spatial Representation:	The samples were collected from the mainstem Russian River at Geyserville upstream of the Highway 128 bridge. Samples were collected in well mixed flowing water, either in midstream or near the shore.
Temporal Representation:	Samples were collected weekly from April 25 to September 6, 1995.
Environmental Conditions:	There are no known environmental conditions (e.g., seasonality, land use practices, fire events, storms, etc.) that are related to these data.
QAPP Information:	Samples were collected in accordance with the study design methods described by Goodwin (1997).
QAPP Information Reference(s):	<u>Staff Report Regarding Russian River Bacterial Water Quality Monitoring in the Vicinity of Fitch Mountain Sonoma County, California. April through September, 1995. North Coast Regional Water Quality Control Board</u>

LOE ID:	6100
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Water Contact Recreation
Number of Samples:	43
Number of Exceedances:	3
Data and Information Type:	Physical/Chemical Monitoring
Data Used to Assess Water Quality:	Of the 54 fecal coliform samples collected from the Russian River at Fitch Mountain at Redwood Drive, Camp Rose Beach, and Almond Way, there are 43 median fecal coliform concentration values calculated based on a minimum of not less than 5 samples for any 30-day period. Of these 43 median values, 3 exceed the objective. Two of the exceedances occurred at the Fitch Mountain at Redwood Drive site with median values of 140 and 80 MPN / 100 ml. The third exceedance occurred at the Almond Way site with a median value of 80 MPN / 100 ml. Samples were collected by Regional Water Board staff as part of a targeted sampling event on the Russian River around Fitch Mountain. Data are summarized by Goodwin (1997).
Data Reference:	<u>Staff Report Regarding Russian River Bacterial Water Quality Monitoring in the Vicinity of Fitch Mountain Sonoma County, California. April through September, 1995. North Coast Regional Water Quality Control Board</u>
Water Quality Objective/Criterion:	Per the Basin Plan (NCRWQCB 2007): The bacteriological quality of waters of the North Coast Region shall not be degraded beyond natural background levels. In no case shall coliform concentrations in waters of the North Coast Region exceed the following: In waters designated for contact recreation (REC-1), the median fecal coliform concentration based on a minimum of not less than 5 samples for any 30-day period shall not exceed 50 MPN* / 100 ml, nor shall more than 10% of total samples during any 30-day period exceed 400 MPN / 100 ml. *Note: MPN is the most probable number of coliform units.
Objective/Criterion Reference:	<u>Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board</u>
Evaluation Guideline: Guideline Reference:	
Spatial Representation:	The samples were collected from the mainstem Russian River at 3 sites in the Fitch Mountain reach: Fitch Mountain at Redwood Drive, Camp Rose Beach, and Almond Way. Fitch Mountain at Redwood Drive is located upstream of a small stream that enters the Russian River at Redwood Drive. Samples were collected in well mixed flowing water, either in midstream or near the shore.
Temporal Representation: Environmental Conditions:	Samples were collected weekly from April 25 to September 6, 1995. There are no known environmental conditions (e.g., seasonality, land use practices, fire events, storms, etc.) that are related to these data.
QAPP Information:	Samples were collected in accordance with the study design methods described by Goodwin (1997).
QAPP Information Reference(s):	<u>Staff Report Regarding Russian River Bacterial Water Quality Monitoring in the Vicinity of Fitch Mountain Sonoma County, California. April through September, 1995. North Coast Regional Water Quality Control Board</u>

LOE ID:	5907
Pollutant:	Escherichia coli (E. Coli)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Water Contact Recreation
Number of Samples:	81
Number of Exceedances:	0
Data and Information Type:	Physical/Chemical Monitoring
Data Used to Assess Water Quality:	None of the 81 E. coli samples from the Russian River at Camp Rose Beach exceed the evaluation guideline. Sample concentrations ranged from 0 to 98 MPN / 100 ml. The samples were collected by staff of the North Coast Regional Water Quality Control Board. The data for 1997 - 2007 are presented in the Russian River Pathogen Data Report of the Russian River Pathogen Project Database (ICE 2008). The data for 2008 are presented by the Regional Water Board (NCRWQCB 2008).
Data Reference:	<u>Russian River Pathogen Data Report of the Russian River Pathogen Project Database. Information Center for the Environment. Version 1. Beta. 2008.</u> <u>http://rrpp.ice.ucdavis.edu/</u> <u>Summer 2008 Russian River Bacteria Data. Downloaded July 23, 2008 from http://www.waterboards.ca.gov/northcoast/water_issues/programs/water_quality_sampling/russian_river.shtml.</u> North Coast Regional Water Quality Control Board
Water Quality Objective/Criterion:	Per the Basin Plan (NCRWQCB 2007): The bacteriological quality of waters of the North Coast Region shall not be degraded beyond natural background levels.
Objective/Criterion Reference:	<u>Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board</u>
Evaluation Guideline:	Per the "Draft Guidance for Fresh Water Beaches" (DHS 2006): Beach posting is recommended when single sample E. coli levels exceed 235 MPN / 100 ml. *Note: MPN is the most probable number of coliform units.
Guideline Reference:	<u>Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Health Services Division of Drinking Water and Environmental Management.</u>
Spatial Representation:	The samples were collected from the mainstem Russian River at Camp Rose Beach near Healdsburg, upstream of the river bend near the well head. Samples were collected from the center of the main river flow.
Temporal Representation:	The samples were generally collected once a week during the summer months. Samples for 2002-2003 and 2005-2007 were collected from Memorial Day to Labor Day. Samples for 2008 were collected from May to July. The samples were often collected on the same day of the week and at the same time of day.
Environmental Conditions:	There are no known environmental conditions (e.g., seasonality, land use practices, fire events, storms, etc.) that are related to these data.
QAPP Information:	The samples were collected in accordance with the "Protocol for Conducting Russian River Bacteriological Sampling at Summer Recreational Beaches" (Goodwin 2007).
QAPP Information Reference(s):	

LOE ID:	5935
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Water Contact Recreation
Number of Samples:	151
Number of Exceedances:	0
Data and Information Type:	Physical/Chemical Monitoring
Data Used to Assess Water Quality:	None of the 151 total coliform samples from the Russian River at Healdsburg Memorial Beach exceed the evaluation guideline. Sample concentrations ranged from 23 to 8,164 MPN / 100 ml. The samples were collected by staff of the North Coast Regional Water Quality Control Board. The data for 1997 - 2007 are presented in the Russian River Pathogen Data Report of the Russian River Pathogen Project Database (ICE 2008). The data for 2008 are presented by the Regional Water Board (NCRWQCB 2008).
Data Reference:	<u>Russian River Pathogen Data Report of the Russian River Pathogen Project Database. Information Center for the Environment. Version 1. Beta. 2008.</u> <u>http://rrpp.ice.ucdavis.edu/</u> <u>Summer 2008 Russian River Bacteria Data. Downloaded July 23, 2008 from http://www.waterboards.ca.gov/northcoast/water_issues/programs/water_quality_sampling/russian_river.shtml.</u> North Coast Regional Water Quality Control Board
Water Quality Objective/Criterion:	Per the Basin Plan (NCRWQCB 2007): The bacteriological quality of waters of the North Coast Region shall not be degraded beyond natural background levels. In no case shall coliform concentrations in waters of the North Coast Region exceed the following: In waters designated for contact recreation (REC-1), the median fecal coliform concentration based on a minimum of not less than 5 samples for any 30-day period shall not exceed 50 MPN* / 100 ml, nor shall more than 10% of total samples during any 30-day period exceed 400 MPN / 100 ml. At all areas where shellfish may be harvested for human consumption (SHELL), the fecal coliform concentration throughout the water column shall not exceed 43 MPN / 100 ml for a 5-tube decimal dilution test or 49 MPN / 100 ml when a three-tube decimal dilution is used. *Note: MPN is the most probable number of coliform units.
Objective/Criterion Reference:	<u>Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board</u>
Evaluation Guideline:	Per the "Draft Guidance for Fresh Water Beaches" (DHS 2006): Beach posting is recommended when single sample total coliform levels exceed 10,000 MPN / 100 ml.
Guideline Reference:	<u>Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Health Services Division of Drinking Water and Environmental Management.</u>
Spatial Representation:	The samples were collected from the mainstem Russian River at Healdsburg Memorial Beach near Healdsburg, in front of lifeguard stand 3 at the downstream end of the swim area. Samples were collected as far into the main river flow as possible while wading.
Temporal Representation:	The samples were generally collected once a week during the summer months between Memorial Day and Labor Day in 1997 to 2003, and 2005 to 2007. Samples for 2008 were collected from May 27, 2008 to July 15, 2008. The samples were often collected on

Environmental Conditions: the same day of the week and at the same time of day.
 There are no known environmental conditions (e.g., seasonality, land use practices, fire events, storms, etc.) that are related to these data.

QAPP Information: The samples were collected in accordance with the "Protocol for Conducting Russian River Bacteriological Sampling at Summer Recreational Beaches" (Goodwin 2007).

QAPP Information Reference(s): Protocol for Conducting Russian River Bacteriological Sampling at Summer Recreational Beaches. Prepared by Cathy Goodwin, NCRWQCB - July 21, 1999, July 29, 1999, May 2005, and May 22, 2007. North Coast Regional Water Quality Control Board

LOE ID: 5943

Pollutant: Enterococcus
 LOE Subgroup: Pollutant-Water
 Matrix: Water
 Fraction: Total

Beneficial Use: Water Contact Recreation

Number of Samples: 38
 Number of Exceedances: 1

Data and Information Type: Physical/Chemical Monitoring

Data Used to Assess Water Quality: One of the 38 Enterococcus samples from the Russian River at Healdsburg Memorial Beach exceeds the evaluation guideline. Sample concentrations ranged from less than 10 to 109 MPN / 100 ml. The samples were collected by staff of the North Coast Regional Water Quality Control Board. The data for 2006-2007 are presented in the Russian River Pathogen Data Report of the Russian River Pathogen Project Database (ICE 2008). The data for 2008 are presented by the Regional Water Board (NCRWQCB 2008).

Data Reference: Russian River Pathogen Data Report of the Russian River Pathogen Project Database. Information Center for the Environment. Version 1. Beta. 2008.
<http://rrpp.ice.ucdavis.edu/>
Summer 2008 Russian River Bacteria Data. Downloaded July 23, 2008 from
http://www.waterboards.ca.gov/northcoast/water_issues/programs/water_quality_sampling/russian_river.shtml. North Coast Regional Water Quality Control Board

Water Quality Objective/Criterion: Per the Basin Plan (NCRWQCB 2007): The bacteriological quality of waters of the North Coast Region shall not be degraded beyond natural background levels. In no case shall coliform concentrations in waters of the North Coast Region exceed the following: In waters designated for contact recreation (REC-1), the median fecal coliform concentration based on a minimum of not less than 5 samples for any 30-day period shall not exceed 50 MPN* / 100 ml, nor shall more than 10% of total samples during any 30-day period exceed 400 MPN / 100 ml. At all areas where shellfish may be harvested for human consumption (SHELL), the fecal coliform concentration throughout the water column shall not exceed 43 MPN / 100 ml for a 5-tube decimal dilution test or 49 MPN / 100 ml when a three-tube decimal dilution is used. *Note: MPN is the most probable number of coliform units.

Objective/Criterion Reference: Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board

Evaluation Guideline: Per the "Draft Guidance for Fresh Water Beaches" (DHS 2006): Beach posting is recommended when single sample Enterococcus levels exceed 61 MPN / 100 ml.

Guideline Reference: Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Health Services Division of Drinking Water

and Environmental Management.

Spatial Representation: The samples were collected from the mainstem Russian River at Healdsburg Memorial Beach near Healdsburg, in front of lifeguard stand 3 at the downstream end of the swim area. Samples were collected as far into the main river flow as possible while wading.

Temporal Representation: The samples were generally collected once a week during the summer months between Memorial Day and Labor Day in 2006 to 2007. Samples for 2008 were collected from May to July. The samples were often collected on the same day of the week and at the same time of day.

Environmental Conditions: There are no known environmental conditions (e.g., seasonality, land use practices, fire events, storms, etc.) that are related to these data.

QAPP Information: The samples were collected in accordance with the "Protocol for Conducting Russian River Bacteriological Sampling at Summer Recreational Beaches" (Goodwin 2007).

QAPP Information Reference(s): Protocol for Conducting Russian River Bacteriological Sampling at Summer Recreational Beaches. Prepared by Cathy Goodwin, NCRWQCB - July 21, 1999, July 29, 1999, May 2005, and May 22, 2007. North Coast Regional Water Quality Control Board

LOE ID: 5882

Pollutant: Total Coliform
 LOE Subgroup: Pollutant-Water
 Matrix: Water
 Fraction: Total

Beneficial Use: Water Contact Recreation

Number of Samples: 153
 Number of Exceedances: 0

Data and Information Type: Physical/Chemical Monitoring

Data Used to Assess Water Quality: None of the 153 total coliform samples from the Russian River at Camp Rose Beach exceed the evaluation guideline. Sample concentrations ranged from 20 to 4,352 MPN / 100 ml. The samples were collected by staff of the North Coast Regional Water Quality Control Board. The data for 1997 - 2007 are presented in the Russian River Pathogen Data Report of the Russian River Pathogen Project Database (ICE 2008). The data for 2008 are presented by the Regional Water Board (NCRWQCB 2008).

Data Reference: Russian River Pathogen Data Report of the Russian River Pathogen Project Database. Information Center for the Environment. Version 1. Beta. 2008. <http://rrpp.ice.ucdavis.edu/> Summer 2008 Russian River Bacteria Data. Downloaded July 23, 2008 from http://www.waterboards.ca.gov/northcoast/water_issues/programs/water_quality_sampling/russian_river.shtml. North Coast Regional Water Quality Control Board

Water Quality Objective/Criterion: Per the Basin Plan (NCRWQCB 2007): The bacteriological quality of waters of the North Coast Region shall not be degraded beyond natural background levels. In no case shall coliform concentrations in waters of the North Coast Region exceed the following: In waters designated for contact recreation (REC-1), the median fecal coliform concentration based on a minimum of not less than 5 samples for any 30-day period shall not exceed 50 MPN* / 100 ml, nor shall more than 10% of total samples during any 30-day period exceed 400 MPN / 100 ml. At all areas where shellfish may be harvested for human consumption (SHELL), the fecal coliform concentration throughout the water column shall not exceed 43 MPN / 100 ml for a 5-tube decimal dilution test or 49 MPN / 100 ml when a three-tube decimal dilution is used. *Note: MPN is the most probable

Objective/Criterion Reference:	number of coliform units. <u>Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board</u>
Evaluation Guideline:	Per the "Draft Guidance for Fresh Water Beaches" (DHS 2006): Beach posting is recommended when single sample total coliform levels exceed 10,000 MPN / 100 ml.
Guideline Reference:	<u>Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Health Services Division of Drinking Water and Environmental Management.</u>
Spatial Representation:	The samples were collected from the mainstem Russian River at Camp Rose Beach near Healdsburg, upstream of the river bend near the well head. Samples were collected from the center of the main river flow.
Temporal Representation:	The samples were generally collected once a week during the summer months between Memorial Day and Labor Day in 1997-2003, and 2005-2007. Samples for 2008 were collected from May 27, 2008 to July 15, 2008. The samples were often collected on the same day of the week and at the same time of day.
Environmental Conditions:	There are no known environmental conditions (e.g., seasonality, land use practices, fire events, storms, etc.) that are related to these data.
QAPP Information:	The samples were collected in accordance with the "Protocol for Conducting Russian River Bacteriological Sampling at Summer Recreational Beaches" (Goodwin 2007).
QAPP Information Reference(s):	<u>Protocol for Conducting Russian River Bacteriological Sampling at Summer Recreational Beaches. Prepared by Cathy Goodwin, NCRWOCB - July 21, 1999, July 29, 1999, May 2005, and May 22, 2007. North Coast Regional Water Quality Control Board</u>

LOE ID: 7108

Pollutant: Total Coliform
 LOE Subgroup: Pollutant-Water
 Matrix: Water
 Fraction: Total

Beneficial Use: Water Contact Recreation

Number of Samples: 14
 Number of Exceedances: 0

Data and Information Type: Physical/Chemical Monitoring

Data Used to Assess Water Quality: None of the 14 total coliform samples from the Russian River at Camp Rose Beach exceed the evaluation guideline. Samples concentrations range from 866.4 to 2,419.2 MPN / 100 ml. Samples were collected by the Sonoma County Water Agency. Data are summarized in the "Russian River Pathogen Data Report" of the Russian River Pathogen Project Database (ICE 2008).

Data Reference: Russian River Pathogen Data Report of the Russian River Pathogen Project Database. Information Center for the Environment. Version 1. Beta. 2008. <http://rrpp.ice.ucdavis.edu/>

Water Quality Objective/Criterion: Per the Basin Plan (NCRWOCB 2007): The bacteriological quality of waters of the North Coast Region shall not be degraded beyond natural background levels.
 Objective/Criterion Reference: Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board

Evaluation Guideline: Per the "Draft Guidance for Fresh Water Beaches" (DHS 2006): Beach posting is

recommended when single sample total coliform levels exceed 10,000 MPN / 100 ml.
 *Note: MPN is the most probable number of coliform units.

Guideline Reference: Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Health Services Division of Drinking Water and Environmental Management.

Spatial Representation: The samples were collected from the mainstem Russian River at Camp Rose Beach.
 Temporal Representation: Samples were collected once every several days from May 17 to June 28, 2007. One sample was also collected on August 9, 2004.

Environmental Conditions: There are no known environmental conditions (e.g., seasonality, land use practices, fire events, storms, etc.) that are related to these data.
 QAPP Information: The quality assurance information for these data is unknown.
 QAPP Information Reference(s):

LOE ID: 7109

Pollutant: **Escherichia coli (E. Coli)**

LOE Subgroup: Pollutant-Water

Matrix: Water

Fraction: Total

Beneficial Use: Water Contact Recreation

Number of Samples: 13

Number of Exceedances: 0

Data and Information Type: Physical/Chemical Monitoring

Data Used to Assess Water Quality: None of the 13 E. coli samples from the Russian River at Camp Rose Beach exceed the evaluation guideline. Samples concentrations range from 0 to 10.9 MPN / 100 ml. Samples were collected by the Sonoma County Water Agency. Data are summarized in the "Russian River Pathogen Data Report" of the Russian River Pathogen Project Database (ICE 2008).

Data Reference: Russian River Pathogen Data Report of the Russian River Pathogen Project Database. Information Center for the Environment. Version 1. Beta. 2008. <http://rppp.ice.ucdavis.edu/>

Water Quality Objective/Criterion: Per the Basin Plan (NCRWQCB 2007): The bacteriological quality of waters of the North Coast Region shall not be degraded beyond natural background levels.
 Objective/Criterion Reference: Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board

Evaluation Guideline: Per the "Draft Guidance for Fresh Water Beaches" (DHS 2006): Beach posting is recommended when single sample E. coli levels exceed 235 MPN / 100 ml. *Note: MPN is the most probable number of coliform units.

Guideline Reference: Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Health Services Division of Drinking Water and Environmental Management.

Spatial Representation: The samples were collected from the mainstem Russian River at Camp Rose Beach.
 Temporal Representation: Samples were collected once every several days from May 17 to June 28, 2007.
 Environmental Conditions: There are no known environmental conditions (e.g., seasonality, land use practices, fire events, storms, etc.) that are related to these data.
 QAPP Information: The quality assurance information for these data is unknown.
 QAPP Information Reference(s):

LOE ID: 7110

Pollutant: **Escherichia coli (E. Coli)**
 LOE Subgroup: Pollutant-Water
 Matrix: Water
 Fraction: Total

Beneficial Use: Water Contact Recreation

Number of Samples: 13
 Number of Exceedances: 0

Data and Information Type: Physical/Chemical Monitoring
 Data Used to Assess Water Quality: None of the 13 E. coli samples from the Russian River at Healdsburg Memorial Beach exceed the evaluation guideline. Samples concentrations range from 8.6 to 31.3 MPN / 100 ml. Samples were collected by the Sonoma County Water Agency. Data are summarized in the "Russian River Pathogen Data Report" of the Russian River Pathogen Project Database (ICE 2008).
 Data Reference: [Russian River Pathogen Data Report of the Russian River Pathogen Project Database. Information Center for the Environment. Version 1. Beta. 2008. http://rrpp.ice.ucdavis.edu/](http://rrpp.ice.ucdavis.edu/)

Water Quality Objective/Criterion: Per the Basin Plan (NCRWQCB 2007): The bacteriological quality of waters of the North Coast Region shall not be degraded beyond natural background levels.
 Objective/Criterion Reference: [Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board](#)

Evaluation Guideline: Per the "Draft Guidance for Fresh Water Beaches" (DHS 2006): Beach posting is recommended when single sample E. coli levels exceed 235 MPN / 100 ml. *Note: MPN is the most probable number of coliform units.
 Guideline Reference: [Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Health Services Division of Drinking Water and Environmental Management.](#)

Spatial Representation: The samples were collected from the mainstem Russian River at Healdsburg Memorial Beach.
 Temporal Representation: Samples were collected once every several days from May 17 to June 28, 2007.
 Environmental Conditions: There are no known environmental conditions (e.g., seasonality, land use practices, fire events, storms, etc.) that are related to these data.
 QAPP Information: The quality assurance information for these data is unknown.
 QAPP Information Reference(s):

LOE ID: 6113

Pollutant: **Fecal Coliform**
 LOE Subgroup: Pollutant-Water
 Matrix: Water
 Fraction: Total

Beneficial Use: Water Contact Recreation

Number of Samples: 1

Number of Exceedances: 0

Data and Information Type: Physical/Chemical Monitoring

Data Used to Assess Water Quality: Of the 5 fecal coliform samples collected from the Russian River at Stream 2 in the Fitch Mountain area, 1 median fecal coliform concentration value was calculated based on a minimum of not less than 5 samples for any 30-day period. Of these 1 median value, none exceed the objective. The median value is 8 MPN / 100 ml. Samples were collected by Regional Water Board staff as part of a targeted sampling event on the Russian River around Fitch Mountain. Data are summarized by Goodwin (1997).

Data Reference: [Staff Report Regarding Russian River Bacterial Water Quality Monitoring in the Vicinity of Fitch Mountain Sonoma County, California. April through September, 1995. North Coast Regional Water Quality Control Board](#)

Water Quality Objective/Criterion: Per the Basin Plan (NCRWQCB 2007): The bacteriological quality of waters of the North Coast Region shall not be degraded beyond natural background levels. In no case shall coliform concentrations in waters of the North Coast Region exceed the following: In waters designated for contact recreation (REC-1), the median fecal coliform concentration based on a minimum of not less than 5 samples for any 30-day period shall not exceed 50 MPN* / 100 ml, nor shall more than 10% of total samples during any 30-day period exceed 400 MPN / 100 ml. *Note: MPN is the most probable number of coliform units.

Objective/Criterion Reference: [Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board](#)

Evaluation Guideline: Guideline Reference:

Spatial Representation: The samples were collected from a unnamed tributary to the mainstem Russian River, designated as Stream 2. Stream 2 enters the Russian River about 1 mile downstream of Redwood Drive in the Fitch Mountain area. Stream 2 was sampled at Hilltop Drive.

Temporal Representation: Samples were collected weekly from April 25 to May 22, 1995.

Environmental Conditions: There are no known environmental conditions (e.g., seasonality, land use practices, fire events, storms, etc.) that are related to these data.

QAPP Information: Samples were collected in accordance with the study design methods described by Goodwin (1997).

QAPP Information Reference(s): [Staff Report Regarding Russian River Bacterial Water Quality Monitoring in the Vicinity of Fitch Mountain Sonoma County, California. April through September, 1995. North Coast Regional Water Quality Control Board](#)

LOE ID: 6215

Pollutant: Total Coliform
 LOE Subgroup: Pollutant-Water
 Matrix: Water
 Fraction: Total

Beneficial Use: Water Contact Recreation

Number of Samples: 2
 Number of Exceedances: 2

Data and Information Type: Physical/Chemical Monitoring

Data Used to Assess: All 2 of the 2 total coliform samples collected in Foss Creek exceed the evaluation

Water Quality:	guideline. Sample concentrations are greater than 240,000 MPN / 100 ml. The samples were collected as part of the Russian River First Flush sampling event. Data are summarized by Katznelson et al. (2003).
Data Reference:	<u>2002 Russian River First Flush Summary Report. Clean Water Team, Citizen Monitoring Program of the State Water Resources Control Board</u>
Water Quality Objective/Criterion:	Per the Basin Plan (NCRWQCB 2007): The bacteriological quality of waters of the North Coast Region shall not be degraded beyond natural background levels.
Objective/Criterion Reference:	<u>Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board</u>
Evaluation Guideline:	Per the "Draft Guidance for Fresh Water Beaches" (DHS 2006): Beach posting is recommended when single sample total coliform levels exceed 10,000 MPN / 100 ml. *Note: MPN is the most probable number of coliform units.
Guideline Reference:	<u>Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Health Services Division of Drinking Water and Environmental Management.</u>
Spatial Representation:	The samples were collected from 2 sites in Foss Creek as follows: (1) in Foss Creek in downtown Healdsburg, and (2) in Upper Foss Creek.
Temporal Representation:	The samples were collected on November 7, 2002. At each site, 3 instantaneous grab samples were collected over half hour increments. The data are averaged for each site.
Environmental Conditions:	Samples were collected during the first runoff event of the rainy season.
QAPP Information:	Samples were collected in accordance with the study plan and quality control procedures described by Katznelson et al. (2003).
QAPP Information Reference(s):	<u>2002 Russian River First Flush Summary Report. Clean Water Team, Citizen Monitoring Program of the State Water Resources Control Board</u>

LOE ID: 6107

Pollutant: Enterococcus
 LOE Subgroup: Pollutant-Water
 Matrix: Water
 Fraction: Total

Beneficial Use: Water Contact Recreation

Number of Samples: 7
 Number of Exceedances: 5

Data and Information Type: Physical/Chemical Monitoring

Data Used to Assess Water Quality: Five of the 7 Enterococcus samples from the Russian River at Stream 1 in the Fitch Mountain area exceed the evaluation guideline. Sample concentrations range from 9 to 201 MPN / 100 ml. Samples were collected by Regional Water Board staff as part of a targeted sampling event on the Russian River around Fitch Mountain. Data are summarized by Goodwin (1997).

Data Reference: Staff Report Regarding Russian River Bacterial Water Quality Monitoring in the Vicinity of Fitch Mountain Sonoma County, California. April through September, 1995. North Coast Regional Water Quality Control Board

Water Quality Objective/Criterion: Per the Basin Plan (NCRWQCB 2007): The bacteriological quality of waters of the North Coast Region shall not be degraded beyond natural background levels.
 Objective/Criterion Reference: Water Quality Control Plan for the North Coast Region. North Coast Regional Water

Reference: Quality Control Board

Evaluation Guideline: Per the "Draft Guidance for Fresh Water Beaches" (DHS 2006): Beach posting is recommended when single sample Enterococcus levels exceed 61 MPN / 100 ml. *Note: MPN is the most probable number of coliform units.

Guideline Reference: Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Health Services Division of Drinking Water and Environmental Management.

Spatial Representation: The samples were collected from a unnamed tributary to the mainstem Russian River, designated as Stream 1. Stream 1 enters the Russian River at Redwood Drive in the Fitch Mountain area. Stream 1 was sampled at 2 locations on the same day on 2 occasions. These data were averaged.

Temporal Representation: Samples were collected weekly from May 30 to July 11, 1995.

Environmental Conditions: There are no known environmental conditions (e.g., seasonality, land use practices, fire events, storms, etc.) that are related to these data.

QAPP Information: Samples were collected in accordance with the study design methods described by Goodwin (1997).

QAPP Information Reference(s): Staff Report Regarding Russian River Bacterial Water Quality Monitoring in the Vicinity of Fitch Mountain Sonoma County, California. April through September, 1995. North Coast Regional Water Quality Control Board

LOE ID: 6214

Pollutant: **Escherichia coli (E. Coli)**

LOE Subgroup: Pollutant-Water

Matrix: Water

Fraction: Total

Beneficial Use: Water Contact Recreation

Number of Samples: 2

Number of Exceedances: 2

Data and Information Type: Physical/Chemical Monitoring

Data Used to Assess Water Quality: All 2 of the 2 E. coli samples from Foss Creek exceed the evaluation guideline. Sample concentrations range from 121,700 to 30,700 MPN / 100 ml. The samples were collected as part of the Russian River First Flush sampling event. Data are summarized by Katznelson et al. (2003)

Data Reference: 2002 Russian River First Flush Summary Report. Clean Water Team, Citizen Monitoring Program of the State Water Resources Control Board

Water Quality Objective/Criterion: Per the Basin Plan (NCRWQCB 2007): The bacteriological quality of waters of the North Coast Region shall not be degraded beyond natural background levels.

Objective/Criterion Reference: Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board

Evaluation Guideline: Per the "Draft Guidance for Fresh Water Beaches" (DHS 2006): Beach posting is recommended when single sample E. coli levels exceed 235 MPN / 100 ml. *Note: MPN is the most probable number of coliform units.

Guideline Reference: Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Health Services Division of Drinking Water and Environmental Management.

Spatial Representation: The samples were collected from 2 sites in Foss Creek as follows: (1) in Foss Creek in downtown Healdsburg, and (2) in Upper Foss Creek.

Temporal Representation: The samples were collected on November 7, 2002. At each site, 3 instantaneous grab samples were collected over half hour increments. The data are averaged for each site.

Environmental Conditions: Samples were collected during the first runoff event of the rainy season.

QAPP Information: Samples were collected in accordance with the study plan and quality control procedures described by Katznelson et al. (2003).

QAPP Information Reference(s): 2002 Russian River First Flush Summary Report. Clean Water Team. Citizen Monitoring Program of the State Water Resources Control Board

LOE ID: 6115

Pollutant: **Escherichia coli (E. Coli)**
 LOE Subgroup: Pollutant-Water
 Matrix: Water
 Fraction: Total

Beneficial Use: Water Contact Recreation

Number of Samples: 2
 Number of Exceedances: 0

Data and Information Type: Physical/Chemical Monitoring

Data Used to Assess Water Quality: None of the 2 E. coli samples from the Russian River at Stream 2 in the Fitch Mountain area exceed the evaluation guideline. Sample concentrations range from 1 to 2 MPN / 100 ml. Samples were collected by Regional Water Board staff as part of a targeted sampling event on the Russian River around Fitch Mountain. Data are summarized by Goodwin (1997).

Data Reference: Staff Report Regarding Russian River Bacterial Water Quality Monitoring in the Vicinity of Fitch Mountain Sonoma County, California. April through September, 1995. North Coast Regional Water Quality Control Board

Water Quality Objective/Criterion: Per the Basin Plan (NCRWQCB 2007): The bacteriological quality of waters of the North Coast Region shall not be degraded beyond natural background levels.
 Objective/Criterion Reference: Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board

Evaluation Guideline: Per the "Draft Guidance for Fresh Water Beaches" (DHS 2006): Beach posting is recommended when single sample E. coli levels exceed 235 MPN / 100 ml. *Note: MPN is the most probable number of coliform units.

Guideline Reference: Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Health Services Division of Drinking Water and Environmental Management.

Spatial Representation: The samples were collected from a unnamed tributary to the mainstem Russian River, designated as Stream 2. Stream 2 enters the Russian River about 1 mile downstream of Redwood Drive in the Fitch Mountain area. Stream 2 was sampled at Hilltop Drive.

Temporal Representation: Samples were collected weekly on May 15 and May 22, 1995.

Environmental Conditions: There are no known environmental conditions (e.g., seasonality, land use practices, fire events, storms, etc.) that are related to these data.

QAPP Information: Samples were collected in accordance with the study design methods described by Goodwin (1997).

QAPP Information Reference(s): Staff Report Regarding Russian River Bacterial Water Quality Monitoring in the Vicinity

Reference(s): of Fitch Mountain Sonoma County, California. April through September, 1995. North Coast Regional Water Quality Control Board

LOE ID: 5941

Pollutant: **Escherichia coli (E. Coli)**

LOE Subgroup: Pollutant-Water

Matrix: Water

Fraction: Total

Beneficial Use: Water Contact Recreation

Number of Samples: 83

Number of Exceedances: 0

Data and Information Type: Physical/Chemical Monitoring

Data Used to Assess Water Quality: None of the 83 E. coli samples from the Russian River at Healdsburg Memorial Beach exceed the evaluation guideline. Sample concentrations ranged from 0 to 111 MPN / 100 ml. The samples were collected by staff of the North Coast Regional Water Quality Control Board. The data for 2002 - 2007 are presented in the Russian River Pathogen Data Report of the Russian River Pathogen Project Database (ICE 2008). The data for 2008 are presented by the Regional Water Board (NCRWQCB 2008).

Data Reference: Russian River Pathogen Data Report of the Russian River Pathogen Project Database. Information Center for the Environment. Version 1. Beta. 2008.
<http://rrpp.ice.ucdavis.edu/>
Summer 2008 Russian River Bacteria Data. Downloaded July 23, 2008 from
http://www.waterboards.ca.gov/northcoast/water_issues/programs/water_quality_sampling/russian_river.shtml. North Coast Regional Water Quality Control Board

Water Quality Objective/Criterion: Per the Basin Plan (NCRWQCB 2007): The bacteriological quality of waters of the North Coast Region shall not be degraded beyond natural background levels.
Objective/Criterion Reference: Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board

Evaluation Guideline: Per the "Draft Guidance for Fresh Water Beaches" (DHS 2006): Beach posting is recommended when single sample E. coli levels exceed 235 MPN / 100 ml. *Note: MPN is the most probable number of coliform units.

Guideline Reference: Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Health Services Division of Drinking Water and Environmental Management.

Spatial Representation: The samples were collected from the mainstem Russian River at Healdsburg Memorial Beach near Healdsburg, in front of lifeguard stand 3 at the downstream end of the swim area. Samples were collected as far into the main river flow as possible while wading.

Temporal Representation: The samples were generally collected once a week during the summer months from Memorial Day to Labor Day in 2002-2003 and 2005-2007. Samples for 2008 were collected from May to July. The samples were often collected on the same day of the week and at the same time of day.

Environmental Conditions: There are no known environmental conditions (e.g., seasonality, land use practices, fire events, storms, etc.) that are related to these data.

QAPP Information: The samples were collected in accordance with the "Protocol for Conducting Russian River Bacteriological Sampling at Summer Recreational Beaches" (Goodwin 2007).

QAPP Information Reference(s): Protocol for Conducting Russian River Bacteriological Sampling at Summer Recreational Beaches. Prepared by Cathy Goodwin, NCRWQCB - July 21, 1999, July

29, 1999, May 2005, and May 22, 2007. North Coast Regional Water Quality Control Board

LOE ID:	5934
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Water Contact Recreation
Number of Samples:	37
Number of Exceedances:	0
Data and Information Type:	Physical/Chemical Monitoring
Data Used to Assess Water Quality:	None of the 37 Enterococcus samples from the Russian River at Camp Rose Beach exceed the evaluation guideline. Sample concentrations ranged from 10 to 41 MPN / 100 ml. The samples were collected by staff of the North Coast Regional Water Quality Control Board. The data for 2006-2007 are presented in the Russian River Pathogen Data Report of the Russian River Pathogen Project Database (ICE 2008). The data for 2008 are presented by the Regional Water Board (NCRWQCB 2008).
Data Reference:	<u>Russian River Pathogen Data Report of the Russian River Pathogen Project Database. Information Center for the Environment. Version 1. Beta. 2008.</u> <u>http://rrpp.ice.ucdavis.edu/</u> <u>Summer 2008 Russian River Bacteria Data. Downloaded July 23, 2008 from</u> <u>http://www.waterboards.ca.gov/northcoast/water_issues/programs/water_quality_sampling/russian_river.shtml</u> . North Coast Regional Water Quality Control Board
Water Quality Objective/Criterion:	Per the Basin Plan (NCRWQCB 2007): The bacteriological quality of waters of the North Coast Region shall not be degraded beyond natural background levels. In no case shall coliform concentrations in waters of the North Coast Region exceed the following: In waters designated for contact recreation (REC-1), the median fecal coliform concentration based on a minimum of not less than 5 samples for any 30-day period shall not exceed 50 MPN* / 100 ml, nor shall more than 10% of total samples during any 30-day period exceed 400 MPN / 100 ml. At all areas where shellfish may be harvested for human consumption (SHELL), the fecal coliform concentration throughout the water column shall not exceed 43 MPN / 100 ml for a 5-tube decimal dilution test or 49 MPN / 100 ml when a three-tube decimal dilution is used. *Note: MPN is the most probable number of coliform units.
Objective/Criterion Reference:	<u>Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board</u>
Evaluation Guideline:	Per the "Draft Guidance for Fresh Water Beaches" (DHS 2006): Beach posting is recommended when single sample Enterococcus levels exceed 61 MPN / 100 ml.
Guideline Reference:	<u>Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Health Services Division of Drinking Water and Environmental Management.</u>
Spatial Representation:	The samples were collected from the mainstem Russian River at Camp Rose Beach near Healdsburg, upstream of the river bend near the well head. Samples were collected from the center of the main river flow.
Temporal Representation:	The samples were generally collected once a week during the summer months between Memorial Day and Labor Day in 2006 to 2008. The samples were often collected on the

Environmental Conditions: same day of the week and at the same time of day.
 There are no known environmental conditions (e.g., seasonality, land use practices, fire events, storms, etc.) that are related to these data.

QAPP Information: The samples were collected in accordance with the "Protocol for Conducting Russian River Bacteriological Sampling at Summer Recreational Beaches" (Goodwin 2007).

QAPP Information Reference(s): Protocol for Conducting Russian River Bacteriological Sampling at Summer Recreational Beaches. Prepared by Cathy Goodwin, NCRWQCB - July 21, 1999, July 29, 1999, May 2005, and May 22, 2007. North Coast Regional Water Quality Control Board

LOE ID: 5936

Pollutant: Fecal Coliform
 LOE Subgroup: Pollutant-Water
 Matrix: Water
 Fraction: Total

Beneficial Use: Water Contact Recreation

Number of Samples: 104
 Number of Exceedances: 49

Data and Information Type: Physical/Chemical Monitoring

Data Used to Assess Water Quality: In total between 1992 and 2008, of the 104 median fecal coliform or median E. coli samples collected from the Russian River at Healdsburg Memorial Beach, 49 exceed the objective.

Fecal coliform samples were collected from 1980 to 2001. Of the 117 fecal coliform samples collected, 57 median fecal coliform concentration values were calculated based on a minimum of not less than 5 samples for any 30-day period. Of these 57 median values, 44 exceed the objective. The median values ranged from 49 to 240 MPN / 100 ml.

From 2002 to 2008, E. coli samples were collected while fecal coliform samples were not collected. Since E. coli is one of the group of bacteria that comprise the fecal coliform group, it is logical that if median E. coli concentrations for any 30-day period are greater than 50 MPN / 100 ml, then the median fecal coliform concentrations for any 30-day period will also be greater than 50 MPN / 100 ml. Of the 71 E. coli samples collected, 47 median E. coli concentration values were calculated based on a minimum of not less than 5 samples for any 30-day period. Of these 47 median values, 5 exceed the objective. E. coli median values range from 10 to 53 MPN / 100 ml.

The samples were collected by staff of the North Coast Regional Water Quality Control Board. The data for 1980 to 2007 are presented in the Russian River Pathogen Data Report of the Russian River Pathogen Project Database (ICE 2008). The data for 2008 are presented by the Regional Water Board (NCRWQCB 2008).

Data Reference: Russian River Pathogen Data Report of the Russian River Pathogen Project Database. Information Center for the Environment. Version 1. Beta. 2008.
<http://rrpp.ice.ucdavis.edu/>
Summer 2008 Russian River Bacteria Data. Downloaded July 23, 2008 from
http://www.waterboards.ca.gov/northcoast/water_issues/programs/water_quality_sampling/russian_river.shtml. North Coast Regional Water Quality Control Board

Water Quality Objective/Criterion:	Per the Basin Plan (NCRWQCB 2007): The bacteriological quality of waters of the North Coast Region shall not be degraded beyond natural background levels. In no case shall coliform concentrations in waters of the North Coast Region exceed the following: In waters designated for contact recreation (REC-1), the median fecal coliform concentration based on a minimum of not less than 5 samples for any 30-day period shall not exceed 50 MPN* / 100 ml, nor shall more than 10% of total samples during any 30-day period exceed 400 MPN / 100 ml. *Note: MPN is the most probable number of coliform units.
Objective/Criterion Reference:	<u>Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board</u>
Evaluation Guideline: Guideline Reference:	
Spatial Representation:	Samples were collected from the mainstem Russian River at Healdsburg Memorial Beach near Healdsburg. Samples collected in 2001, from May to June 11, 2002, and from May to June 26, 2007, were collected from the west bank. All the rest of the samples were collected from the east bank in front of lifeguard stand 3 at the downstream end of the swim area. Samples were collected as far into the main river flow as possible while wading.
Temporal Representation:	The samples were collected once in June 1980, October 1986, June 1988, and once a month from June to August 1989. In 1987-1994, 1997-2003, and 2005-2006, samples were generally collected once a week during the summer months between Memorial Day and Labor Day. In 2007, samples were collected from July 3 to August 7. In 2008, samples were collected from Memorial Day to July 15. The samples were often collected on the same day of the week and at the same time of day.
Environmental Conditions:	There are no known environmental conditions (e.g., seasonality, land use practices, fire events, storms, etc.) that are related to these data.
QAPP Information:	The samples were collected in accordance with the "Protocol for Conducting Russian River Bacteriological Sampling at Summer Recreational Beaches" (Goodwin 2007).
QAPP Information Reference(s):	<u>Protocol for Conducting Russian River Bacteriological Sampling at Summer Recreational Beaches. Prepared by Cathy Goodwin, NCRWQCB - July 21, 1999, July 29, 1999, May 2005, and May 22, 2007. North Coast Regional Water Quality Control Board</u>

LOE ID:	7111
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Water Contact Recreation
Number of Samples:	18
Number of Exceedances:	0
Data and Information Type:	Physical/Chemical Monitoring
Data Used to Assess Water Quality:	None of the 18 total coliform samples from the Russian River at Healdsburg Memorial Beach exceed the evaluation guideline. Samples concentrations range from 152.3 to 2,419.2 MPN / 100 ml. Samples were collected by the Sonoma County Water Agency. Data are summarized in the "Russian River Pathogen Data Report" of the Russian River Pathogen Project Database (ICE 2008).
Data Reference:	<u>Russian River Pathogen Data Report of the Russian River Pathogen Project Database.</u>

Information Center for the Environment. Version 1. Beta. 2008.
<http://rrpp.ice.ucdavis.edu/>

Water Quality Objective/Criterion: Per the Basin Plan (NCRWQCB 2007): The bacteriological quality of waters of the North Coast Region shall not be degraded beyond natural background levels.

Objective/Criterion Reference: Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board

Evaluation Guideline: Per the "Draft Guidance for Fresh Water Beaches" (DHS 2006): Beach posting is recommended when single sample total coliform levels exceed 10,000 MPN / 100 ml.
*Note: MPN is the most probable number of coliform units.

Guideline Reference: Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Health Services Division of Drinking Water and Environmental Management.

Spatial Representation: The samples were collected from the mainstem Russian River at Healdsburg Memorial Beach.

Temporal Representation: Samples were collected once every several days from July 30 to August 9, 2004, and from May 17 to June 28, 2007.

Environmental Conditions: There are no known environmental conditions (e.g., seasonality, land use practices, fire events, storms, etc.) that are related to these data.

QAPP Information: The quality assurance information for these data is unknown.

QAPP Information Reference(s):

LOE ID: 5906

Pollutant: Fecal Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Total

Beneficial Use: Water Contact Recreation

Number of Samples: 100
Number of Exceedances: 0

Data and Information Type: Physical/Chemical Monitoring

Data Used to Assess Water Quality: In total between 1992 and 2008, of the 100 median fecal coliform or median E. coli samples collected from the Russian River at Camp Rose Beach, none exceed the objective.

Fecal coliform samples were collected from 1997 to 2001. Of the 69 fecal coliform samples collected, 47 median fecal coliform concentration values were calculated based on a minimum of not less than 5 samples for any 30-day period. Of these 47 median values, none exceed the objective. The median values ranged from 10 to 46 MPN / 100 ml.

From 2002 to 2008, E. coli samples were collected while fecal coliform samples were not collected. Since E. coli is one of the group of bacteria that comprise the fecal coliform group, it is logical that if median E. coli concentrations for any 30-day period are greater than 50 MPN / 100 ml, then the median fecal coliform concentrations for any 30-day period will also be greater than 50 MPN / 100 ml. Of the 77 E. coli samples collected, 53 median E. coli concentration values were calculated based on a minimum of not less

	<p>than 5 samples for any 30-day period. Of these 53 median values, none exceed the objective. E. coli median values range from 10 to 41 MPN / 100 ml.</p>
Data Reference:	<p>The samples were collected by staff of the North Coast Regional Water Quality Control Board. The data for 1980 to 2007 are presented in the Russian River Pathogen Data Report of the Russian River Pathogen Project Database (ICE 2008). The data for 2008 are presented by the Regional Water Board (NCRWQCB 2008).</p> <p><u>Russian River Pathogen Data Report of the Russian River Pathogen Project Database. Information Center for the Environment. Version 1. Beta. 2008.</u> <u>http://rrpp.ice.ucdavis.edu/</u> <u>Summer 2008 Russian River Bacteria Data. Downloaded July 23, 2008 from</u> <u>http://www.waterboards.ca.gov/northcoast/water_issues/programs/water_quality_sampling/russian_river.shtml</u>. North Coast Regional Water Quality Control Board</p>
Water Quality Objective/Criterion:	<p>Per the Basin Plan (NCRWQCB 2007): The bacteriological quality of waters of the North Coast Region shall not be degraded beyond natural background levels. In no case shall coliform concentrations in waters of the North Coast Region exceed the following: In waters designated for contact recreation (REC-1), the median fecal coliform concentration based on a minimum of not less than 5 samples for any 30-day period shall not exceed 50 MPN* / 100 ml, nor shall more than 10% of total samples during any 30-day period exceed 400 MPN / 100 ml. *Note: MPN is the most probable number of coliform units.</p>
Objective/Criterion Reference:	<p><u>Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board</u></p>
Evaluation Guideline: Guideline Reference:	<p><u>Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Health Services Division of Drinking Water and Environmental Management.</u></p>
Spatial Representation:	<p>The samples were collected from the mainstem Russian River at Camp Rose Beach near Healdsburg, upstream of the river bend near the well head. Samples were collected from the center of the main river flow.</p>
Temporal Representation:	<p>The samples were generally collected once a week during the summer months between Memorial Day and Labor Day from 1997 to 2003 and from 2005 - 2007. In 2008, samples were collected once a week during the summer months between Memorial Day and July 15. The samples were often collected on the same day of the week and at the same time of day.</p>
Environmental Conditions:	<p>There are no known environmental conditions (e.g., seasonality, land use practices, fire events, storms, etc.) that are related to these data.</p>
QAPP Information:	<p>The samples were collected in accordance with the "Protocol for Conducting Russian River Bacteriological Sampling at Summer Recreational Beaches" (Goodwin 2007).</p>
QAPP Information Reference(s):	<p><u>Protocol for Conducting Russian River Bacteriological Sampling at Summer Recreational Beaches. Prepared by Cathy Goodwin, NCRWQCB - July 21, 1999, July 29, 1999, May 2005, and May 22, 2007. North Coast Regional Water Quality Control Board</u></p>

WATER BODY NAME: RUSSIAN RIVER HU, LOWER RUSSIAN RIVER HA, GUERNEVILLE HSA, GREEN VALLEY CREEK WATERSHED

Water Body ID: CAR1141101320081204231407
Water Body Type: River & Stream

DECISION ID 14381

Pollutant: INDICATOR BACTERIA

Final Listing Decision: List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status: Revised
Sources: Source Unknown
Expected TMDL Completion Date: 2012
Pollutant or Pollution: Pollutant

Weight of Evidence: For Green Valley Creek, this pollutant is being considered for placement on the Section 303(d) List under Section 3.2 of the Listing Policy. Under Section 3.2 a single line of evidence is necessary to assess listing status. Two lines of evidence are available in the administrative record to assess this pollutant. Five out of 5 E. coli and 4 out of 5 total coliform samples exceed the evaluation guidelines used to interpret the water quality objective. The weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the Section 303(d) List in the Water Quality Limited Segments category (i.e., sufficient justification to list). This conclusion is based on the staff findings that: (1) Five out of 5 E. coli samples exceed the evaluation guideline, and this exceeds the allowable frequency listed in Table 3.2 of the Listing Policy.
 (2) The data used satisfies the data quality requirements of Section 6.1.4 of the Policy.
 (3) The data used satisfies the data quantity requirements of Section 6.1.5 of the Policy.
 (4) Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

RWQCB Staff Recommendation: After review of the available data and information, North Coast RWQCB staff concludes that the water body-pollutant combination should be placed on the Section 303(d) List because applicable water quality standards are exceeded and a pollutant contributes to or causes the problem.

SWRCB Board Decision / Staff Recommendation:

USEPA Decision:

Lines of Evidence (LOEs) for Decision ID 14381

LOE ID: 26089
Pollutant: Escherichia coli (E. Coli)
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Total
Beneficial Use: Water Contact Recreation

Number of Samples:	5
Number of Exceedances:	5
Data and Information Type:	Physical/Chemical Monitoring
Data Used to Assess Water Quality:	Five of the 5 E. coli samples from the Green Valley Creek Watershed exceed the evaluation guideline. Concentrations range from 410 to 2,800 MPN / 100 ml. The samples were collected as part of the Russian River First Flush sampling event. Data are summarized by Katznelson et al. (2003).
Data Reference:	<u>2002 Russian River First Flush Summary Report. Clean Water Team, Citizen Monitoring Program of the State Water Resources Control Board</u>
Water Quality Objective/Criterion Reference:	Per the Basin Plan (NCRWQCB 2007): The bacteriological quality of waters of the North Coast Region shall not be degraded beyond natural background levels. <u>Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board</u>
Evaluation Guideline:	Per the "Draft Guidance for Fresh Water Beaches" (DHS 2006): Beach posting is recommended when single sample E. coli levels exceed 235 MPN / 100 ml. *Note: MPN is the most probable number of coliform units.
Guideline Reference:	<u>Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Health Services Division of Drinking Water and Environmental Management.</u>
Spatial Representation:	The samples were collected from 5 sites in the Green Valley Creek Watershed as follows: (1) in Green Valley Creek at Martinelli Road; (2) in Atascadero Creek at the Green Valley Road bridge; (3) in Graton Gulch at Railroad Avenue; (4) in Atascadero Creek at Mill Station Road; and (5) in Atascadero Creek at Bodega Highway.
Temporal Representation:	The samples were collected on November 7, 2002. At each site, 1 to 3 instantaneous grab samples were collected over half hour increments. The data are averaged for each site when multiple samples were collected.
Environmental Conditions:	Samples were collected during the first runoff event of the rainy season.
QAPP Information:	Samples were collected in accordance with the study plan and quality control procedures described by Katznelson et al. (2003).
QAPP Information Reference(s):	<u>2002 Russian River First Flush Summary Report. Clean Water Team, Citizen Monitoring Program of the State Water Resources Control Board</u>

LOE ID: 26090

Pollutant: Total Coliform
 LOE Subgroup: Pollutant-Water
 Matrix: Water
 Fraction: Total

Beneficial Use: Water Contact Recreation

Number of Samples: 5
 Number of Exceedances: 4

Data and Information Type: Physical/Chemical Monitoring
 Data Used to Assess Water Quality: Four of the 5 total coliform samples from the Green Valley Creek Watershed exceed the evaluation guideline. The sample concentrations range from 2,600 to more than 240,000 MPN / 100 ml. The samples were collected as part of the Russian River First Flush

Data Reference:	sampling event. Data are summarized by Katznelson et al. (2003). <u>2002 Russian River First Flush Summary Report. Clean Water Team, Citizen Monitoring Program of the State Water Resources Control Board</u>
Water Quality Objective/Criterion: Objective/Criterion Reference:	Per the Basin Plan (NCRWQCB 2007): The bacteriological quality of waters of the North Coast Region shall not be degraded beyond natural background levels. <u>Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board</u>
Evaluation Guideline:	Per the "Draft Guidance for Fresh Water Beaches" (DHS 2006): Beach posting is recommended when single sample total coliform levels exceed 10,000 MPN / 100 ml. *Note: MPN is the most probable number of coliform units.
Guideline Reference:	<u>Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Health Services Division of Drinking Water and Environmental Management.</u>
Spatial Representation:	The samples were collected from 5 sites in the Green Valley Creek Watershed as follows: (1) in Green Valley Creek at Martinelli Road; (2) in Atascadero Creek at the Green Valley Road bridge; (3) in Graton Gulch at Railroad Avenue; (4) in Atascadero Creek at Mill Station Road; and (5) in Atascadero Creek at Bodega Highway.
Temporal Representation:	The samples were collected on November 7, 2002. At each site, 1 to 3 instantaneous grab samples were collected over half hour increments. The data are averaged for each site when multiple samples were collected..
Environmental Conditions:	Samples were collected during the first runoff event of the rainy season.
QAPP Information:	Samples were collected in accordance with the study plan and quality control procedures described by Katznelson et al. (2003).
QAPP Information Reference(s):	<u>2002 Russian River First Flush Summary Report. Clean Water Team, Citizen Monitoring Program of the State Water Resources Control Board</u>

WATER BODY NAME: RUSSIAN RIVER HU, LOWER RUSSIAN RIVER HA, GUERNEVILLE HSA, GREEN VALLEY CREEK WATERSHED

Water Body ID: CAR1141101320081204231407
Water Body Type: River & Stream

DECISION ID 14380

Pollutant: OXYGEN, DISSOLVED

Final Listing Decision: List on 303(d) list (TMDL required list)

Last Listing Cycle's Final Listing Decision: New Decision

Revision Status: Revised

Sources: Agriculture | Erosion/Siltation | Habitat Modification | Internal Nutrient Cycling (primarily lakes) | Other | Removal of Riparian Vegetation | Source Unknown

Expected TMDL Completion Date: 2021

Pollutant or Pollution: Pollutant

Weight of Evidence: This pollutant is being considered for placement on the Section 303(d) List under Section 3.2 of the Listing Policy. Under Section 3.2 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant.

Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the Section 303(d) List in the Water Quality Limited Segments category (i.e., sufficient justification to list).

This conclusion is based on the staff findings that: (1) Seventeen out of 71 dissolved oxygen samples exceed the water quality objective, and this exceeds the allowable frequency of 12 listed in Table 3.2 of the Listing Policy. (2) The data used satisfies the data quality requirements of Section 6.1.4 of the Policy. (3) The data used satisfies the data quantity requirements of Section 6.1.5 of the Policy. (4) Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

RWQCB Staff Recommendation: After review of the available data and information, North Coast Regional Water Board staff concludes that the water body-pollutant combination should be placed on the Section 303(d) List because applicable water quality standards are not attained and a pollutant contributes to or causes the problem.

SWRCB Board Decision / Staff Recommendation:

USEPA Decision:

Lines of Evidence (LOEs) for Decision ID 14380

LOE ID: 26094

Pollutant: Oxygen, Dissolved

LOE Subgroup: Pollutant-Water

Matrix: Water

Fraction: Total Dissolved

Beneficial Use:	Cold Freshwater Habitat
Aquatic Life Use:	Fish Migration Fish Spawning Freshwater Replenishment Preservation of Rare & Endangered Species Warm Freshwater Habitat Wildlife Habitat
Number of Samples:	71
Number of Exceedances:	17
Data and Information Type:	Physical/Chemical Monitoring
Data Used to Assess Water Quality:	<p>Seventeen of the 71 samples collected in Green Valley Creek exceeded the minimum DO water quality objective. Data were divided into two categories, 1) no spawning, incubation, and emergence occurring and 2) spawning, incubation, and emergence occurring. Presence and absence of salmonid species was determined by utilizing CDFG map (Brooks 2002). Timing of spawning, incubation, and emergence was determined utilizing Steiner Environmental Consulting (1996).</p> <p>The DO values when no spawning, incubation, and emergence were occurring ranged from 2.3 mg/L to 11.3 mg/L (11 exceedances of the objective). DO values during times of spawning, incubation, and emergence ranged from 7.1 mg/L to 13.1 mg/L (6 exceedances of the objective).</p> <p>These samples were collected by the Community Clean Water Institute's Volunteer Water Quality Monitoring Program (CCWI 2006, and CCWI 2007).</p>
Data Reference:	<p><u>http://ccwi.org/issues/data.htm</u> on August 25, 2008</p> <p><u>http://ccwi.org/issues/data.htm</u> on August 25, 2008</p> <p><u>Map of Historical Salmonid Streams and Calwater 2.2a Hydrologic Sub-Areas, California Department of Fish and Game, Central Coast Region. IHRMP North Coast GIS Lab. Hopland, CA</u></p> <p><u>A History of the Salmonid Decline in the Russian River</u></p>
Water Quality Objective/Criterion:	<p>Per the Basin Plan (NCRWQCB 2007): (1) Dissolved oxygen concentrations for waters not listed in Table 3-1, and where dissolved oxygen objectives are not prescribed, shall not be reduced below 6.0 mg/L for waters designated as COLD.</p> <p>(2) Dissolved oxygen concentrations for waters not listed in Table 3-1, and where dissolved oxygen objectives are not prescribed, shall not be reduced below 9.0 mg/L for waters designated as SPWN during critical spawning and egg incubation periods.</p>
Objective/Criterion Reference:	<p><u>Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board</u></p>
Evaluation Guideline: Guideline Reference:	
Spatial Representation:	<p>The samples were collected at 7 sites along the entire mainstem of Green Valley Creek: from Harrison Grade and Green Valley Road to the Russian River confluence.</p>
Temporal Representation:	<p>The DO samples were collected from July 2005 to December 2006. The DO samples were collected as instantaneous values and do not represent diurnal conditions.</p>
Environmental Conditions:	<p>There are no known environmental conditions (e.g., seasonality, land use practices, fire events, storms, etc.) that are related to these data.</p>
QAPP Information:	<p>Samples were collected in accordance with the "Community Clean Water Institute Volunteer Water Quality Monitoring Program Sampling and Analysis Methods" (CCWI 2007).</p>
QAPP Information Reference(s):	<p><u>Community Clean Water Institute Volunteer Water Quality Monitoring Program Sampling and Analysis Methods. Updated April 12, 2007</u></p>

WATER BODY NAME: RUSSIAN RIVER HU, LOWER RUSSIAN RIVER HA, GUERNEVILLE HSA
Water Body ID: CAR1141104119990614110247
Water Body Type: River & Stream

DECISION ID 5914

Pollutant: INDICATOR BACTERIA
Final Listing Decision: Do Not Delist from 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: List on 303(d) list (TMDL required list)(2006)
Revision Status: Revised
Sources: Source Unknown
Expected TMDL Completion Date: 2012
Pollutant or Pollution: Pollutant

Weight of Evidence: Indicator bacteria (which includes enterococcus, E. Coli, fecal coliform, and total coliform) in the Guerneville Hydrologic Sub-Area (HSA) is being considered for placement on the Section 303(d) List in 2 parts: for the mainstem Russian River from Dutch Bill Creek to Fife Creek and for the remainder of the Guerneville HSA.

(A) For the mainstem Russian River from Dutch Bill Creek to Fife Creek, this pollutant is being considered for removal from the Section 303(d) List under Section 4.2 of the Listing Policy. Seven lines of evidence (LOEs 4758, 6074, 6075, 6076, 6077, 7114, and 7115) are available in the administrative record to assess this pollutant. Four of 38 enterococcus, 5 of 96 E. Coli, 29 of 103 fecal coliform, and 2 of 175 total coliform samples exceed the evaluation guidelines. The weight of evidence indicates that there is sufficient justification against removing this water segment-pollutant combination from the Section 303(d) List in the Water Quality Limited Segments category (i.e., sufficient justification to not de-list). This conclusion is based on the staff findings that: (1) The data used satisfies the data quality requirements of Section 6.1.4 of the Policy. (2) The data used satisfies the data quantity requirements of Section 6.1.5 of the Policy. (3) Twenty-nine of the 103 fecal coliform samples exceed the evaluation guideline used to interpret the water quality objective, and this exceeds the allowable frequency listed in Table 4.2 of the Listing Policy. (4) Pursuant to Section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

(B) For the remainder of the Guerneville HSA, this pollutant is being considered for placement on the Section 303(d) List under Section 3.2. Thirty-one lines of evidence are available in the administrative record to assess this pollutant. Thirty-five of the 1,175 indicator bacteria samples exceed the evaluation guidelines. The weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the Section 303(d) List in the Water Quality Limited Segments category (i.e., sufficient justification to not list). This conclusion is based on the staff findings that: (1) The data used satisfies the data quality requirements of Section 6.1.4 of the Policy. (2) The data used satisfies the data quantity requirements of Section 6.1.5 of the Policy. (3) Thirty-five of the 1,175 samples exceed the evaluation guidelines, and this does not exceed the allowable frequency of 195 per the binomial distribution described in Section 3.2 of the Listing Policy. (4) Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

RWQCB Staff Recommendation: For the mainstem Russian River from Dutch Bill Creek to Fife Creek, after review of the available data and information, North Coast Regional Water Board staff concludes that the water body-pollutant combination should not be removed from the Section 303(d) List because applicable water quality standards for the pollutant are not being attained. For the remainder of the Guerneville HSA, after review of the available data and

information, North Coast Regional Water Board staff concludes that the water body-pollutant combination should not be placed on the Section 303(d) List because applicable water quality standards are being attained.

**SWRCB Board Decision
/ Staff Recommendation:**

USEPA Decision:

Lines of Evidence (LOEs) for Decision ID 5914

LOE ID:	7078
Pollutant:	Escherichia coli (E. Coli)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Water Contact Recreation
Number of Samples:	20
Number of Exceedances:	4
Data and Information Type:	Physical/Chemical Monitoring
Data Used to Assess Water Quality:	Four of the 20 E. coli samples from the Russian River at Johnson's Beach exceed the evaluation guideline. Concentrations range from less than 10 to 4,569 MPN / 100 ml. The samples were collected by the Community Clean Water Institute (CCWI 2006; CCWI 2007).
Data Reference:	<u>Community Clean Water Institute Master Data for 2005. Downloaded from http://ccwi.org/issues/data.htm on August 25, 2008</u> <u>Community Clean Water Institute Master Data for 2006. Downloaded from http://ccwi.org/issues/data.htm on August 25, 2008</u>
Water Quality Objective/Criterion:	Per the Basin Plan (NCRWQCB 2007): The bacteriological quality of waters of the North Coast Region shall not be degraded beyond natural background levels.
Objective/Criterion Reference:	<u>Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board</u>
Evaluation Guideline:	Per the "Draft Guidance for Fresh Water Beaches" (DHS 2006): Beach posting is recommended when single sample E. coli levels exceed 235 MPN / 100 ml. *Note: MPN is the most probable number of coliform units.
Guideline Reference:	<u>Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Health Services Division of Drinking Water and Environmental Management.</u>
Spatial Representation:	The samples were collected from the mainstem Russian River at Johnson's Beach in Guerneville.
Temporal Representation:	The samples were generally collected monthly in 2005 and 2006.
Environmental Conditions:	There are no known environmental conditions (e.g., seasonality, land use practices, fire events, storms, etc.) that are related to these data.
QAPP Information:	The samples were collected in accordance the "Community Clean Water Institute Volunteer Water Quality Monitoring Program Sampling and Analysis Methods" (CCWI 2007).
QAPP Information Reference(s):	<u>Community Clean Water Institute Volunteer Water Quality Monitoring Program Sampling and Analysis Methods. Updated April 12, 2007</u>

LOE ID: 7083

Pollutant: Enterococcus
 LOE Subgroup: Pollutant-Water
 Matrix: Water
 Fraction: Total

Beneficial Use: Water Contact Recreation

Number of Samples: 1
 Number of Exceedances: 0

Data and Information Type: Physical/Chemical Monitoring
 Data Used to Assess Water Quality: None of the 1 Enterococcus samples collected from the Russian River at Odd Fellows Bridge exceeds the evaluation guideline. The sample concentration is 41 MPN / 100 ml. The sample was collected by the Community Clean Water Institute (CCWI 2006).
 Data Reference: [Community Clean Water Institute Master Data for 2005. Downloaded from http://ccwi.org/issues/data.htm on August 25, 2008](http://ccwi.org/issues/data.htm)

Water Quality Objective/Criterion: Per the Basin Plan (NCRWQCB 2007): The bacteriological quality of waters of the North Coast Region shall not be degraded beyond natural background levels.
 Objective/Criterion Reference: [Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board](#)

Evaluation Guideline: Per the "Draft Guidance for Fresh Water Beaches" (DHS 2006): Beach posting is recommended when single sample Enterococcus levels exceed 61 MPN / 100 ml. *Note: MPN is the most probable number of coliform units.
 Guideline Reference: [Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Health Services Division of Drinking Water and Environmental Management.](#)

Spatial Representation: The sample was collected from the mainstem Russian River, just downstream of the Odd Fellows Bridge.
 Temporal Representation: The sample was collected on November 21, 2005.
 Environmental Conditions: There are no known environmental conditions (e.g., seasonality, land use practices, fire events, storms, etc.) that are related to these data.
 QAPP Information: The sample was collected in accordance with the "Community Clean Water Institute Volunteer Water Quality Monitoring Program Sampling and Analysis Methods" (CCWI 2007).
 QAPP Information Reference(s): [Community Clean Water Institute Volunteer Water Quality Monitoring Program Sampling and Analysis Methods. Updated April 12, 2007](#)

LOE ID: 6075

Pollutant: Fecal Coliform
 LOE Subgroup: Pollutant-Water
 Matrix: Water
 Fraction: Total

Beneficial Use: Water Contact Recreation

Number of Samples: 103

Number of Exceedances: 29

Data and Information Type: Physical/Chemical Monitoring

Data Used to Assess Water Quality: In total between 1997 and 2008, of the 103 median fecal coliform or median E. coli samples collected from the Russian River at Monte Rio Beach, 29 exceed the objective.

Fecal coliform samples were collected from 1997 to 2001. Of the 70 fecal coliform samples collected, 49 median fecal coliform concentration values were calculated based on a minimum of not less than 5 samples for any 30-day period. Of these 49 median values, 16 exceed the 50 MPN / 100 ml objective and 4 exceed the 400 MPN / 100 ml objective. Fecal coliform median values range from 2 to 9200 MPN / 100 ml.

From 2002 to 2008, E. coli samples were collected while fecal coliform samples were not collected. Since E. coli is one of the group of bacteria that comprise the fecal coliform group, it is logical that if median E. coli concentrations for any 30-day period are greater than 50 MPN / 100 ml, then the median fecal coliform concentrations for any 30-day period will also be greater than 50 MPN / 100 ml. Of the 78 E. coli samples collected, 54 median E. coli concentration values were calculated based on a minimum of not less than 5 samples for any 30-day period. Of these 54 median values, 9 exceed the objective. E. coli median values range from 10 to 178 MPN / 100 ml.

Data Reference: The samples were collected by staff of the North Coast Regional Water Quality Control Board. The data for 1997 to 2007 are presented in the Russian River Pathogen Data Report of the Russian River Pathogen Project Database (ICE 2008). The data for 2008 are presented by the Regional Water Board (NCRWQCB 2008).
Russian River Pathogen Data Report of the Russian River Pathogen Project Database. Information Center for the Environment. Version 1. Beta. 2008.
<http://rppp.ice.ucdavis.edu/>
Summer 2008 Russian River Bacteria Data. Downloaded July 23, 2008 from http://www.waterboards.ca.gov/northcoast/water_issues/programs/water_quality_sampling/russian_river.shtml. North Coast Regional Water Quality Control Board

Water Quality Objective/Criterion: Per the Basin Plan (NCRWQCB 2007): The bacteriological quality of waters of the North Coast Region shall not be degraded beyond natural background levels. In no case shall coliform concentrations in waters of the North Coast Region exceed the following: In waters designated for contact recreation (REC-1), the median fecal coliform concentration based on a minimum of not less than 5 samples for any 30-day period shall not exceed 50 MPN* / 100 ml, nor shall more than 10% of total samples during any 30-day period exceed 400 MPN / 100 ml. *Note: MPN is the most probable number of coliform units.

Objective/Criterion Reference: Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board

Evaluation Guideline: Guideline Reference:

Spatial Representation: The samples were collected from the mainstem Russian River at Monte Rio Beach in Monte Rio. The sampling site is located downstream of the children's swim area. Samples were collected as far into the main river flow as possible while wading.

Temporal Representation: The samples were generally collected once a week during the summer months between Memorial Day and Labor Day from 1997 to 2003 and from 2005 - 2007. In 2008, samples were collected once a week during the summer months between Memorial Day and July 15. The samples were often collected on the same day of the week and at the same time of day.

Environmental Conditions: There are no known environmental conditions (e.g., seasonality, land use practices, fire events, storms, etc.) that are related to these data.

QAPP Information: The samples were collected in accordance with the "Protocol for Conducting Russian River Bacteriological Sampling at Summer Recreational Beaches" (Goodwin 2007).

QAPP Information Reference(s): Protocol for Conducting Russian River Bacteriological Sampling at Summer Recreational Beaches. Prepared by Cathy Goodwin, NCRWQCB - July 21, 1999, July 29, 1999, May 2005, and May 22, 2007. North Coast Regional Water Quality Control Board

LOE ID: 6132

Pollutant: Total Coliform
 LOE Subgroup: Pollutant-Water
 Matrix: Water
 Fraction: Total

Beneficial Use: Water Contact Recreation

Number of Samples: 3
 Number of Exceedances: 3

Data and Information Type: Physical/Chemical Monitoring

Data Used to Assess Water Quality: Three of the 3 total coliform samples from Dutch Bill Creek exceed the evaluation guideline. Sample concentrations range from 180,000 to more than 240,000 MPN / 100 ml. The samples were collected as part of the Russian River First Flush sampling event. Data are summarized by Katznelson et al. (2003).

Data Reference: 2002 Russian River First Flush Summary Report. Clean Water Team, Citizen Monitoring Program of the State Water Resources Control Board

Water Quality Objective/Criterion: Per the Basin Plan (NCRWQCB 2007): The bacteriological quality of waters of the North Coast Region shall not be degraded beyond natural background levels.
 Objective/Criterion Reference: Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board

Evaluation Guideline: Per the "Draft Guidance for Fresh Water Beaches" (DHS 2006): Beach posting is recommended when single sample total coliform levels exceed 10,000 MPN / 100 ml.
 *Note: MPN is the most probable number of coliform units.

Guideline Reference: Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Health Services Division of Drinking Water and Environmental Management.

Spatial Representation: Samples were collected from 3 sites in Dutch Bill Creek as follows: (1) at Camp Meeker / Alliance Redwoods Camp; (2) at Graton Road at Bohemian Highway; and (3) in Dutch Bill Creek's headwaters at Graton Road.

Temporal Representation: The samples were collected on November 7, 2002. At each site, 3 instantaneous grab samples were collected over half hour increments. The data are averaged for each site. Samples were collected during the first runoff event of the rainy season.

Environmental Conditions: QAPP Information: Samples were collected in accordance with the study plan and quality control procedures described by Katznelson et al. (2003).

QAPP Information Reference(s): 2002 Russian River First Flush Summary Report. Clean Water Team, Citizen Monitoring Program of the State Water Resources Control Board

LOE ID:	6148
Pollutant:	Escherichia coli (E. Coli)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Water Contact Recreation
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	Physical/Chemical Monitoring
Data Used to Assess Water Quality:	One of the 1 E. coli sample from the Hobson Creek exceed the evaluation guideline. The sample concentration is 2,500 MPN / 100 ml. The sample was collected as part of the Russian River First Flush sampling event. Data are summarized by Katznelson et al. (2003).
Data Reference:	<u>2002 Russian River First Flush Summary Report. Clean Water Team, Citizen Monitoring Program of the State Water Resources Control Board</u>
Water Quality Objective/Criterion Reference:	Per the Basin Plan (NCRWQCB 2007): The bacteriological quality of waters of the North Coast Region shall not be degraded beyond natural background levels. <u>Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board</u>
Evaluation Guideline:	Per the "Draft Guidance for Fresh Water Beaches" (DHS 2006): Beach posting is recommended when single sample E. coli levels exceed 235 MPN / 100 ml. *Note: MPN is the most probable number of coliform units.
Guideline Reference:	<u>Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Health Services Division of Drinking Water and Environmental Management.</u>
Spatial Representation:	The samples were collected from 1 site in Hobson Creek where it intersects with Skyline Road near McPeak Road. Hobson Creek empties into the Russian River near Hacienda.
Temporal Representation:	The samples were collected on November 7, 2002. At each site, 3 instantaneous grab samples were collected over half hour increments. The data are averaged for each site.
Environmental Conditions:	Samples were collected during the first runoff event of the rainy season.
QAPP Information:	Samples were collected in accordance with the study plan and quality control procedures described by Katznelson et al. (2003).
QAPP Information Reference(s):	<u>2002 Russian River First Flush Summary Report. Clean Water Team, Citizen Monitoring Program of the State Water Resources Control Board</u>

LOE ID:	7072
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Water Contact Recreation
Number of Samples:	23
Number of Exceedances:	3
Data and Information Type:	Physical/Chemical Monitoring
Data Used to Assess Water Quality:	Three of the 23 total coliform samples collected from the Russian River at Odd Fellows Bridge exceed the evaluation guideline. Sample concentrations range from 404 to 24,196 MPN / 100 ml. The samples were collected by the Community Clean Water Institute (CCWI 2006; CCWI 2007).
Data Reference:	<u>Community Clean Water Institute Master Data for 2005. Downloaded from http://ccwi.org/issues/data.htm on August 25, 2008</u> <u>Community Clean Water Institute Master Data for 2006. Downloaded from http://ccwi.org/issues/data.htm on August 25, 2008</u>
Water Quality Objective/Criterion Reference:	Per the Basin Plan (NCRWQCB 2007): The bacteriological quality of waters of the North Coast Region shall not be degraded beyond natural background levels. <u>Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board</u>
Evaluation Guideline:	Per the "Draft Guidance for Fresh Water Beaches" (DHS 2006): Beach posting is recommended when single sample total coliform levels exceed 10,000 MPN / 100 ml. *Note: MPN is the most probable number of coliform units.
Guideline Reference:	<u>Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Health Services Division of Drinking Water and Environmental Management.</u>
Spatial Representation:	Samples were collected from the mainstem Russian River, just downstream of the Odd Fellows Bridge.
Temporal Representation:	The samples were generally collected monthly in 2005 and 2006.
Environmental Conditions:	There are no known environmental conditions (e.g., seasonality, land use practices, fire events, storms, etc.) that are related to these data.
QAPP Information:	Samples were collected in accordance with the "Community Clean Water Institute Volunteer Water Quality Monitoring Program Sampling and Analysis Methods" (CCWI 2007).
QAPP Information Reference(s):	<u>Community Clean Water Institute Volunteer Water Quality Monitoring Program Sampling and Analysis Methods. Updated April 12, 2007</u>

LOE ID:	6149
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Water Contact Recreation
Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	Physical/Chemical Monitoring
Data Used to Assess Water Quality:	One of the 1 total coliform sample from Hobson Creek exceeds the evaluation guideline. The sample concentration is 22,000 MPN / 100 ml. The sample was collected as part of the Russian River First Flush sampling event. Data are summarized by Katznelson et al. (2003).
Data Reference:	<u>2002 Russian River First Flush Summary Report. Clean Water Team, Citizen Monitoring Program of the State Water Resources Control Board</u>
Water Quality Objective/Criterion Reference:	Per the Basin Plan (NCRWQCB 2007): The bacteriological quality of waters of the North Coast Region shall not be degraded beyond natural background levels. <u>Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board</u>
Evaluation Guideline:	Per the "Draft Guidance for Fresh Water Beaches" (DHS 2006): Beach posting is recommended when single sample total coliform levels exceed 10,000 MPN / 100 ml. *Note: MPN is the most probable number of coliform units.
Guideline Reference:	<u>Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Health Services Division of Drinking Water and Environmental Management.</u>
Spatial Representation:	The samples were collected from 1 site in Hobson Creek where it intersects with Skyline Road near McPeak Road. Hobson Creek empties into the Russian River near Hacienda.
Temporal Representation:	The samples were collected on November 7, 2002. At each site, 3 instantaneous grab samples were collected over half hour increments. The data are averaged for each site.
Environmental Conditions:	Samples were collected during the first runoff event of the rainy season.
QAPP Information:	Samples were collected in accordance with the study plan and quality control procedures described by Katznelson et al. (2003).
QAPP Information Reference(s):	<u>2002 Russian River First Flush Summary Report. Clean Water Team, Citizen Monitoring Program of the State Water Resources Control Board</u>

LOE ID:	7118
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Water Contact Recreation
Number of Samples:	18
Number of Exceedances:	0
Data and Information Type:	Physical/Chemical Monitoring
Data Used to Assess Water Quality:	None of the 18 total coliform samples from the Russian River at Vacation Beach exceed the evaluation guideline. Sample concentrations range from 980.4 to 2,419.2 MPN / 100 ml. Samples were collected by the Sonoma County Water Agency. Data are summarized in the "Russian River Pathogen Data Report" of the Russian River Pathogen Project Database (ICE 2008).
Data Reference:	<u>Russian River Pathogen Data Report of the Russian River Pathogen Project Database. Information Center for the Environment. Version 1. Beta. 2008.</u>
Water Quality Objective/Criterion Reference:	Per the Basin Plan (NCRWQCB 2007): The bacteriological quality of waters of the North Coast Region shall not be degraded beyond natural background levels. <u>Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board</u>
Evaluation Guideline:	Per the "Draft Guidance for Fresh Water Beaches" (DHS 2006): Beach posting is recommended when single sample total coliform levels exceed 10,000 MPN / 100 ml. *Note: MPN is the most probable number of coliform units.
Guideline Reference:	<u>Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Health Services Division of Drinking Water and Environmental Management.</u>
Spatial Representation:	The samples were collected from the mainstem Russian River at Vacation Beach.
Temporal Representation:	Samples were collected once every several days from July 30 to August 9, 2004, and from May 17 to June 28, 2007.
Environmental Conditions:	There are no known environmental conditions (e.g., seasonality, land use practices, fire events, storms, etc.) that are related to these data.
QAPP Information:	The quality assurance information for these data is unknown.
QAPP Information Reference(s):	

LOE ID:	7119
Pollutant:	Escherichia coli (E. Coli)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Water Contact Recreation
Number of Samples:	13
Number of Exceedances:	0
Data and Information Type:	Physical/Chemical Monitoring
Data Used to Assess Water Quality:	None of the 13 E. coli samples from the Russian River at Vacation Beach exceed the evaluation guideline. Sample concentrations range from 5.2 to 85.5 MPN / 100 ml. Samples were collected by the Sonoma County Water Agency. Data are summarized in the "Russian River Pathogen Data Report" of the Russian River Pathogen Project Database (ICE 2008).
Data Reference:	<u>Russian River Pathogen Data Report of the Russian River Pathogen Project Database. Information Center for the Environment. Version 1. Beta. 2008.</u>
Water Quality Objective/Criterion Reference:	Per the Basin Plan (NCRWQCB 2007): The bacteriological quality of waters of the North Coast Region shall not be degraded beyond natural background levels. <u>Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board</u>
Evaluation Guideline:	Per the "Draft Guidance for Fresh Water Beaches" (DHS 2006): Beach posting is recommended when single sample E. coli levels exceed 235 MPN / 100 ml. *Note: MPN is the most probable number of coliform units.
Guideline Reference:	<u>Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Health Services Division of Drinking Water and Environmental Management.</u>
Spatial Representation:	The samples were collected from the mainstem Russian River at Vacation Beach.
Temporal Representation:	Samples were collected once every several days from May 17 to June 28, 2007.
Environmental Conditions:	There are no known environmental conditions (e.g., seasonality, land use practices, fire events, storms, etc.) that are related to these data.
QAPP Information:	The quality assurance information for these data is unknown.
QAPP Information Reference(s):	

LOE ID:	7069
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Water Contact Recreation
Number of Samples:	1
Number of Exceedances:	0
Data and Information Type:	Physical/Chemical Monitoring
Data Used to Assess Water Quality:	None of the 1 total coliform samples collected from the Russian River at Laurel Dell Road exceeds the evaluation guideline. The sample concentration is 1,274 MPN / 100 ml. The sample was collected by the Community Clean Water Institute (CCWI 2006).
Data Reference:	<u>Community Clean Water Institute Master Data for 2005</u> . Downloaded from <u>http://ccwi.org/issues/data.htm</u> on August 25, 2008
Water Quality Objective/Criterion Reference:	Per the Basin Plan (NCRWQCB 2007): The bacteriological quality of waters of the North Coast Region shall not be degraded beyond natural background levels. <u>Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board</u>
Evaluation Guideline:	Per the "Draft Guidance for Fresh Water Beaches" (DHS 2006): Beach posting is recommended when single sample total coliform levels exceed 10,000 MPN / 100 ml. *Note: MPN is the most probable number of coliform units.
Guideline Reference:	<u>Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Health Services Division of Drinking Water and Environmental Management.</u>
Spatial Representation:	The sample was collected from the mainstem Russian River from a private beach in a trailer park on Laurel Dell Road, which is located off Highway 116 between Monte Rio and Cazadero.
Temporal Representation:	The samples was collected on July 20, 2005.
Environmental Conditions:	There are no known environmental conditions (e.g., seasonality, land use practices, fire events, storms, etc.) that are related to these data.
QAPP Information:	The sample was collected in accordance with the "Community Clean Water Institute Volunteer Water Quality Monitoring Program Sampling and Analysis Methods" (CCWI 2007).
QAPP Information Reference(s):	<u>Community Clean Water Institute Volunteer Water Quality Monitoring Program Sampling and Analysis Methods. Updated April 12, 2007</u>

LOE ID:	7073
Pollutant:	Escherichia coli (E. Coli)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Water Contact Recreation
Number of Samples:	2
Number of Exceedances:	2
Data and Information Type:	Physical/Chemical Monitoring
Data Used to Assess Water Quality:	Two of the 2 E. coli samples from the Dutch Bill Creek exceed the evaluation guideline. Concentrations range from 602 to 870 MPN / 100 ml. The samples were collected by the Community Clean Water Institute (CCWI 2006).
Data Reference:	<u>Community Clean Water Institute Master Data for 2005. Downloaded from http://ccwi.org/issues/data.htm on August 25, 2008</u>
Water Quality Objective/Criterion Reference:	Per the Basin Plan (NCRWQCB 2007): The bacteriological quality of waters of the North Coast Region shall not be degraded beyond natural background levels. <u>Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board</u>
Evaluation Guideline:	Per the "Draft Guidance for Fresh Water Beaches" (DHS 2006): Beach posting is recommended when single sample E. coli levels exceed 235 MPN / 100 ml. *Note: MPN is the most probable number of coliform units.
Guideline Reference:	<u>Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Health Services Division of Drinking Water and Environmental Management.</u>
Spatial Representation:	The samples were collected from 2 locations in Dutch Bill Creek as follows: (1) from Dutch Bill Creek at the fish ladder; and (2) from Dutch Bill Creek at the Graton Road and Main Street bridge in Occidental.
Temporal Representation:	The samples were collected on December 19, 2005.
Environmental Conditions:	There are no known environmental conditions (e.g., seasonality, land use practices, fire events, storms, etc.) that are related to these data.
QAPP Information:	The samples were collected in accordance the "Community Clean Water Institute Volunteer Water Quality Monitoring Program Sampling and Analysis Methods" (CCWI 2007).
QAPP Information Reference(s):	<u>Community Clean Water Institute Volunteer Water Quality Monitoring Program Sampling and Analysis Methods. Updated April 12, 2007</u>

LOE ID:	7079
Pollutant:	Escherichia coli (E. Coli)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Water Contact Recreation
Number of Samples:	19
Number of Exceedances:	4
Data and Information Type:	Physical/Chemical Monitoring
Data Used to Assess Water Quality:	Four of the 19 E. coli samples from the Russian River at Odd Fellows Bridge exceed the evaluation guideline. Concentrations range from 10 to 4,160 MPN / 100 ml. The samples were collected by the Community Clean Water Institute (CCWI 2006; CCWI 2007).
Data Reference:	<u>Community Clean Water Institute Master Data for 2005. Downloaded from http://ccwi.org/issues/data.htm on August 25, 2008</u> <u>Community Clean Water Institute Master Data for 2006. Downloaded from http://ccwi.org/issues/data.htm on August 25, 2008</u>
Water Quality Objective/Criterion Reference:	Per the Basin Plan (NCRWQCB 2007): The bacteriological quality of waters of the North Coast Region shall not be degraded beyond natural background levels. <u>Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board</u>
Evaluation Guideline:	Per the "Draft Guidance for Fresh Water Beaches" (DHS 2006): Beach posting is recommended when single sample E. coli levels exceed 235 MPN / 100 ml. *Note: MPN is the most probable number of coliform units.
Guideline Reference:	<u>Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Health Services Division of Drinking Water and Environmental Management.</u>
Spatial Representation:	The samples were collected from the mainstem Russian River, just downstream of the Odd Fellows Bridge.
Temporal Representation:	The samples were generally collected monthly in 2005 and 2006.
Environmental Conditions:	There are no known environmental conditions (e.g., seasonality, land use practices, fire events, storms, etc.) that are related to these data.
QAPP Information:	The samples were collected in accordance the "Community Clean Water Institute Volunteer Water Quality Monitoring Program Sampling and Analysis Methods" (CCWI 2007).
QAPP Information Reference(s):	<u>Community Clean Water Institute Volunteer Water Quality Monitoring Program Sampling and Analysis Methods. Updated April 12, 2007</u>

LOE ID:	6985
Pollutant:	Fecal Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Water Contact Recreation
Number of Samples:	72
Number of Exceedances:	0
Data and Information Type:	Physical/Chemical Monitoring
Data Used to Assess Water Quality:	In the Russian River at Steelhead Beach, E. coli samples were collected while fecal coliform samples were not collected. Since E. coli is one of the group of bacteria that comprise the fecal coliform group, it is logical that if median E. coli concentrations for any 30-day period are greater than 50 MPN / 100 ml, then the median fecal coliform concentrations for any 30-day period will also be greater than 50 MPN / 100 ml. Of the 72 E. coli samples collected, 48 median E. coli concentration values were calculated based on a minimum of not less than 5 samples for any 30-day period. Of these 48 median values, none exceed the objective. E. coli median values range from 10 to 30 MPN / 100 ml.
Data Reference:	The samples were collected by staff of the North Coast Regional Water Quality Control Board. The data for 2002 to 2007 are presented in the Russian River Pathogen Data Report of the Russian River Pathogen Project Database (ICE 2008). The data for 2008 are presented by the Regional Water Board (NCRWQCB 2008). <u>Russian River Pathogen Data Report of the Russian River Pathogen Project Database. Information Center for the Environment. Version 1. Beta. 2008.</u> <u>http://rppp.ice.ucdavis.edu/</u> <u>Summer 2008 Russian River Bacteria Data. Downloaded July 23, 2008 from http://www.waterboards.ca.gov/northcoast/water_issues/programs/water_quality_sampling/russian_river.shtml.</u> North Coast Regional Water Quality Control Board
Water Quality Objective/Criterion:	Per the Basin Plan (NCRWQCB 2007): The bacteriological quality of waters of the North Coast Region shall not be degraded beyond natural background levels. In no case shall coliform concentrations in waters of the North Coast Region exceed the following: In waters designated for contact recreation (REC-1), the median fecal coliform concentration based on a minimum of not less than 5 samples for any 30-day period shall not exceed 50 MPN* / 100 ml, nor shall more than 10% of total samples during any 30-day period exceed 400 MPN / 100 ml. *Note: MPN is the most probable number of coliform units.
Objective/Criterion Reference:	<u>Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board</u>
Evaluation Guideline: Guideline Reference:	
Spatial Representation:	Samples were collected from the mainstem Russian River at Steelhead Beach near Forestville. Samples were collected as far into the main river flow as possible while wading.
Temporal Representation:	The samples were generally collected once a week during the summer months between

Memorial Day and Labor Day from 2002 to 2003 and from 2005 - 2007. In 2008, samples were collected once a week during the summer months between Memorial Day and July 15. The samples were often collected on the same day of the week and at the same time of day.

Environmental Conditions: There are no known environmental conditions (e.g., seasonality, land use practices, fire events, storms, etc.) that are related to these data.

QAPP Information: The samples were collected in accordance with the "Protocol for Conducting Russian River Bacteriological Sampling at Summer Recreational Beaches" (Goodwin 2007).

QAPP Information Reference(s): Protocol for Conducting Russian River Bacteriological Sampling at Summer Recreational Beaches. Prepared by Cathy Goodwin, NCRWQCB - July 21, 1999, July 29, 1999, May 2005, and May 22, 2007. North Coast Regional Water Quality Control Board

LOE ID: 4758

Pollutant: Pathogens
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Water Contact Recreation

Number of Samples:
Number of Exceedances:

Data and Information Type: Not Specified

Data Used to Assess Water Quality: This LOE is a placeholder to support a 303(d) listing decision made prior to 2006.
Data Reference: Placeholder reference pre-2006 303(d)

Water Quality Objective/Criterion:
Objective/Criterion Reference:

Evaluation Guideline:
Guideline Reference:

Spatial Representation:
Temporal Representation:
Environmental Conditions:
QAPP Information: Unspecified
QAPP Information Reference(s):

LOE ID: 7112

Pollutant: Escherichia coli (E. Coli)
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Total

Beneficial Use: Water Contact Recreation

Number of Samples: 13
 Number of Exceedances: 0

Data and Information Type: Physical/Chemical Monitoring

Data Used to Assess Water Quality: None of the 13 E. coli samples from the Russian River at Johnson's Beach exceed the evaluation guideline. Samples concentrations range from 9.8 to 122.3 MPN / 100 ml. Samples were collected by the Sonoma County Water Agency. Data are summarized in the "Russian River Pathogen Data Report" of the Russian River Pathogen Project Database (ICE 2008).

Data Reference: [Russian River Pathogen Data Report of the Russian River Pathogen Project Database. Information Center for the Environment. Version 1. Beta. 2008. http://rrpp.ice.ucdavis.edu/](http://rrpp.ice.ucdavis.edu/)

Water Quality Objective/Criterion: Per the Basin Plan (NCRWQCB 2007): The bacteriological quality of waters of the North Coast Region shall not be degraded beyond natural background levels.

Objective/Criterion Reference: [Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board](#)

Evaluation Guideline: Per the "Draft Guidance for Fresh Water Beaches" (DHS 2006): Beach posting is recommended when single sample E. coli levels exceed 235 MPN / 100 ml. *Note: MPN is the most probable number of coliform units.

Guideline Reference: [Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Health Services Division of Drinking Water and Environmental Management.](#)

Spatial Representation: The samples were collected from the mainstem Russian River at Johnson's Beach.

Temporal Representation: Samples were collected once every several days from May 17 to June 28, 2007.

Environmental Conditions: There are no known environmental conditions (e.g., seasonality, land use practices, fire events, storms, etc.) that are related to these data.

QAPP Information: The quality assurance information for these data is unknown.

QAPP Information Reference(s):

LOE ID: 7070

Pollutant: Total Coliform
 LOE Subgroup: Pollutant-Water
 Matrix: Water
 Fraction: Total

Beneficial Use: Water Contact Recreation

Number of Samples: 24
 Number of Exceedances: 3

Data and Information Type: Physical/Chemical Monitoring

Data Used to Assess Water Quality: Three of the 24 total coliform samples collected from the Russian River at Johnson's Beach exceed the evaluation guideline. Sample concentrations range from 369 to 19,864 MPN / 100 ml. The samples were collected by the Community Clean Water Institute (CCWI 2006; CCWI 2007).

Data Reference: [Community Clean Water Institute Master Data for 2005. Downloaded from http://ccwi.org/issues/data.htm on August 25, 2008](http://ccwi.org/issues/data.htm)
[Community Clean Water Institute Master Data for 2006. Downloaded from http://ccwi.org/issues/data.htm on August 25, 2008](http://ccwi.org/issues/data.htm)

Water Quality Objective/Criterion: Per the Basin Plan (NCRWQCB 2007): The bacteriological quality of waters of the North Coast Region shall not be degraded beyond natural background levels.
 Objective/Criterion Reference: Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board

Evaluation Guideline: Per the "Draft Guidance for Fresh Water Beaches" (DHS 2006): Beach posting is recommended when single sample total coliform levels exceed 10,000 MPN / 100 ml.
 *Note: MPN is the most probable number of coliform units.

Guideline Reference: Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Health Services Division of Drinking Water and Environmental Management.

Spatial Representation: Samples were collected from the mainstem Russian River at Johnson's Beach in Guerneville.

Temporal Representation: The samples were generally collected monthly in 2005 and 2006.

Environmental Conditions: There are no known environmental conditions (e.g., seasonality, land use practices, fire events, storms, etc.) that are related to these data.

QAPP Information: Samples were collected in accordance with the "Community Clean Water Institute Volunteer Water Quality Monitoring Program Sampling and Analysis Methods" (CCWI 2007).

QAPP Information Reference(s): Community Clean Water Institute Volunteer Water Quality Monitoring Program Sampling and Analysis Methods. Updated April 12, 2007

LOE ID: 7113

Pollutant: Total Coliform
 LOE Subgroup: Pollutant-Water
 Matrix: Water
 Fraction: Total

Beneficial Use: Water Contact Recreation

Number of Samples: 18
 Number of Exceedances: 0

Data and Information Type: Physical/Chemical Monitoring

Data Used to Assess Water Quality: None of the 18 total coliform samples from the Russian River at Johnson's Beach exceed the evaluation guideline. Samples concentrations range from 1,203.3 to 2,419.2 MPN / 100 ml. Samples were collected by the Sonoma County Water Agency. Data are summarized in the "Russian River Pathogen Data Report" of the Russian River Pathogen Project Database (ICE 2008).

Data Reference: Russian River Pathogen Data Report of the Russian River Pathogen Project Database. Information Center for the Environment. Version 1. Beta. 2008. <http://rrpp.ice.ucdavis.edu/>

Water Quality Objective/Criterion: Per the Basin Plan (NCRWQCB 2007): The bacteriological quality of waters of the North Coast Region shall not be degraded beyond natural background levels.
 Objective/Criterion Reference: Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board

Evaluation Guideline: Per the "Draft Guidance for Fresh Water Beaches" (DHS 2006): Beach posting is recommended when single sample total coliform levels exceed 10,000 MPN / 100 ml.
 *Note: MPN is the most probable number of coliform units.

Guideline Reference: Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Health Services Division of Drinking Water and Environmental Management.

Spatial Representation: The samples were collected from the mainstem Russian River at Johnson's Beach.
Temporal Representation: Samples were collected once every several days from July 30 to August 8, 2004, and from May 17 to June 28, 2007.

Environmental Conditions: There are no known environmental conditions (e.g., seasonality, land use practices, fire events, storms, etc.) that are related to these data.
QAPP Information: The quality assurance information for these data is unknown.
QAPP Information Reference(s):

LOE ID: 7114

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Total

Beneficial Use: Water Contact Recreation

Number of Samples: 18
Number of Exceedances: 0

Data and Information Type: Physical/Chemical Monitoring

Data Used to Assess Water Quality: None of the 18 total coliform samples from the Russian River at Monte Rio Beach exceed the evaluation guideline. Samples concentrations range from 866.4 to 2,419.2 MPN / 100 ml. Samples were collected by the Sonoma County Water Agency. Data are summarized in the "Russian River Pathogen Data Report" of the Russian River Pathogen Project Database (ICE 2008).

Data Reference: Russian River Pathogen Data Report of the Russian River Pathogen Project Database. Information Center for the Environment. Version 1. Beta. 2008.
<http://rrpp.ice.ucdavis.edu/>

Water Quality Objective/Criterion: Per the Basin Plan (NCRWQCB 2007): The bacteriological quality of waters of the North Coast Region shall not be degraded beyond natural background levels.
Objective/Criterion Reference: Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board

Evaluation Guideline: Per the "Draft Guidance for Fresh Water Beaches" (DHS 2006): Beach posting is recommended when single sample total coliform levels exceed 10,000 MPN / 100 ml.
*Note: MPN is the most probable number of coliform units.

Guideline Reference: Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Health Services Division of Drinking Water and Environmental Management.

Spatial Representation: The samples were collected from the mainstem Russian River at Monte Rio Beach.
Temporal Representation: Samples were collected once every several days from July 30 to August 8, 2004, and from May 17 to June 28, 2007.

Environmental Conditions: There are no known environmental conditions (e.g., seasonality, land use practices, fire events, storms, etc.) that are related to these data.
QAPP Information: The quality assurance information for these data is unknown.
QAPP Information Reference(s):

LOE ID: 7115

Pollutant: **Escherichia coli (E. Coli)**
 LOE Subgroup: Pollutant-Water
 Matrix: Water
 Fraction: Total

Beneficial Use: Water Contact Recreation

Number of Samples: 13
 Number of Exceedances: 0

Data and Information Type: Physical/Chemical Monitoring
 Data Used to Assess Water Quality: None of the 13 E. coli samples from the Russian River at Monte Rio Beach exceed the evaluation guideline. Samples concentrations range from 7.4 to 133.3 MPN / 100 ml. Samples were collected by the Sonoma County Water Agency. Data are summarized in the "Russian River Pathogen Data Report" of the Russian River Pathogen Project Database (ICE 2008).

Data Reference: [Russian River Pathogen Data Report of the Russian River Pathogen Project Database. Information Center for the Environment. Version 1. Beta. 2008.](http://rrpp.ice.ucdavis.edu/)

Water Quality Objective/Criterion: Per the Basin Plan (NCRWQCB 2007): The bacteriological quality of waters of the North Coast Region shall not be degraded beyond natural background levels.
 Objective/Criterion Reference: [Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board](#)

Evaluation Guideline: Per the "Draft Guidance for Fresh Water Beaches" (DHS 2006): Beach posting is recommended when single sample E. coli levels exceed 235 MPN / 100 ml. *Note: MPN is the most probable number of coliform units.

Guideline Reference: [Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Health Services Division of Drinking Water and Environmental Management.](#)

Spatial Representation: The samples were collected from the mainstem Russian River at Monte Rio Beach.
 Temporal Representation: Samples were collected once every several days from May 17 to June 28, 2007.
 Environmental Conditions: There are no known environmental conditions (e.g., seasonality, land use practices, fire events, storms, etc.) that are related to these data.
 QAPP Information: The quality assurance information for these data is unknown.
 QAPP Information Reference(s):

LOE ID: 7116

Pollutant: **Escherichia coli (E. Coli)**
 LOE Subgroup: Pollutant-Water
 Matrix: Water
 Fraction: Total

Beneficial Use: Water Contact Recreation

Number of Samples: 26
 Number of Exceedances: 0

Data and Information Type: Physical/Chemical Monitoring

Data Used to Assess Water Quality: None of the 26 E. coli samples from the Russian River at Odd Fellows Beach and Steelhead Beach exceed the evaluation guideline. At Odd Fellows Beach, samples concentrations range from 6.3 to 51.2 MPN / 100 ml. At Steelhead Beach, sample concentrations range from 8.4 to 41 MPN / 100 ml. Samples were collected by the Sonoma County Water Agency. Data are summarized in the "Russian River Pathogen Data Report" of the Russian River Pathogen Project Database (ICE 2008).

Data Reference: [Russian River Pathogen Data Report of the Russian River Pathogen Project Database. Information Center for the Environment. Version 1. Beta. 2008. http://rrpp.ice.ucdavis.edu/](http://rrpp.ice.ucdavis.edu/)

Water Quality Objective/Criterion: Per the Basin Plan (NCRWQCB 2007): The bacteriological quality of waters of the North Coast Region shall not be degraded beyond natural background levels.

Objective/Criterion Reference: [Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board](#)

Evaluation Guideline: Per the "Draft Guidance for Fresh Water Beaches" (DHS 2006): Beach posting is recommended when single sample E. coli levels exceed 235 MPN / 100 ml. *Note: MPN is the most probable number of coliform units.

Guideline Reference: [Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Health Services Division of Drinking Water and Environmental Management.](#)

Spatial Representation: The samples were collected from 2 sites on the mainstem Russian River as follows: (1) at Odd Fellows Beach, and (2) at Steelhead Beach.

Temporal Representation: Samples were collected at each site once every several days from May 17 to June 28, 2007.

Environmental Conditions: There are no known environmental conditions (e.g., seasonality, land use practices, fire events, storms, etc.) that are related to these data.

QAPP Information: The quality assurance information for these data is unknown.

QAPP Information Reference(s):

LOE ID: 7117

Pollutant: Total Coliform

LOE Subgroup: Pollutant-Water

Matrix: Water

Fraction: Total

Beneficial Use: Water Contact Recreation

Number of Samples: 28

Number of Exceedances: 0

Data and Information Type: Physical/Chemical Monitoring

Data Used to Assess Water Quality: None of the 28 total coliform samples from the Russian River at Odd Fellows Beach and Steelhead Beach exceed the evaluation guideline. At Odd Fellows Beach, samples concentrations range from 1,046.2 to 2,419.2 MPN / 100 ml. At Steelhead Beach, sample concentrations range from 980.4 to 2,419.2 MPN / 100 ml. Samples were collected by the Sonoma County Water Agency. Data are summarized in the "Russian River Pathogen Data Report" of the Russian River Pathogen Project Database (ICE 2008).

Data Reference: [Russian River Pathogen Data Report of the Russian River Pathogen Project Database.](#)

Information Center for the Environment. Version 1. Beta. 2008.
<http://rrpp.ice.ucdavis.edu/>

Water Quality Objective/Criterion: Per the Basin Plan (NCRWQCB 2007): The bacteriological quality of waters of the North Coast Region shall not be degraded beyond natural background levels.

Objective/Criterion Reference: Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board

Evaluation Guideline: Per the "Draft Guidance for Fresh Water Beaches" (DHS 2006): Beach posting is recommended when single sample total coliform levels exceed 10,000 MPN / 100 ml. *Note: MPN is the most probable number of coliform units.

Guideline Reference: Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Health Services Division of Drinking Water and Environmental Management.

Spatial Representation: The samples were collected from 2 sites on the mainstem Russian River as follows: (1) at Odd Fellows Beach, and (2) at Steelhead Beach.

Temporal Representation: Samples were collected at each site once every several days from May 17 to June 28, 2007. One sample at each site was also collected on August 9, 2004.

Environmental Conditions: There are no known environmental conditions (e.g., seasonality, land use practices, fire events, storms, etc.) that are related to these data.

QAPP Information: The quality assurance information for these data is unknown.

QAPP Information Reference(s):

LOE ID: 7081

Pollutant: Enterococcus
 LOE Subgroup: Pollutant-Water
 Matrix: Water
 Fraction: Total

Beneficial Use: Water Contact Recreation

Number of Samples: 1
 Number of Exceedances: 0

Data and Information Type: Physical/Chemical Monitoring

Data Used to Assess Water Quality: None of the 1 Enterococcus samples collected from the Russian River at Johnson's Beach exceeds the evaluation guideline. The sample concentration is 10 MPN / 100 ml. The sample was collected by the Community Clean Water Institute (CCWI 2006).

Data Reference: Community Clean Water Institute Master Data for 2005. Downloaded from <http://ccwi.org/issues/data.htm> on August 25, 2008

Water Quality Objective/Criterion: Per the Basin Plan (NCRWQCB 2007): The bacteriological quality of waters of the North Coast Region shall not be degraded beyond natural background levels.

Objective/Criterion Reference: Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board

Evaluation Guideline: Per the "Draft Guidance for Fresh Water Beaches" (DHS 2006): Beach posting is recommended when single sample Enterococcus levels exceed 61 MPN / 100 ml. *Note: MPN is the most probable number of coliform units.

Guideline Reference: Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Health Services Division of Drinking Water and Environmental Management.

Spatial Representation: The sample was collected from the mainstem Russian River at Johnson's Beach in Guerneville.

Temporal Representation: The sample was collected on November 21, 2005.

Environmental Conditions: There are no known environmental conditions (e.g., seasonality, land use practices, fire events, storms, etc.) that are related to these data.

QAPP Information: The sample was collected in accordance with the "Community Clean Water Institute Volunteer Water Quality Monitoring Program Sampling and Analysis Methods" (CCWI 2007).

QAPP Information Reference(s): Community Clean Water Institute Volunteer Water Quality Monitoring Program Sampling and Analysis Methods. Updated April 12, 2007

LOE ID: 6981

Pollutant: Fecal Coliform

LOE Subgroup: Pollutant-Water

Matrix: Water

Fraction: Total

Beneficial Use: Water Contact Recreation

Number of Samples: 6

Number of Exceedances: 0

Data and Information Type: Physical/Chemical Monitoring

Data Used to Assess Water Quality: In the Russian River at Forestville Access Beach, E. coli samples were collected while fecal coliform samples were not collected. Since E. coli is one of the group of bacteria that comprise the fecal coliform group, it is logical that if median E. coli concentrations for any 30-day period are greater than 50 MPN / 100 ml, then the median fecal coliform concentrations for any 30-day period will also be greater than 50 MPN / 100 ml. Of the 14 E. coli samples collected, 6 median E. coli concentration values were calculated based on a minimum of not less than 5 samples for any 30-day period. Of these 6 median values, none exceed the objective. E. coli median values range from 10 to 20 MPN / 100 ml.

The samples were collected by staff of the North Coast Regional Water Quality Control Board. The data for 2007 are presented in the Russian River Pathogen Data Report of the Russian River Pathogen Project Database (ICE 2008). The data for 2008 are presented by the Regional Water Board (NCRWQCB 2008).

Data Reference: Russian River Pathogen Data Report of the Russian River Pathogen Project Database. Information Center for the Environment. Version 1. Beta. 2008.
<http://rrpp.ice.ucdavis.edu/>
Summer 2008 Russian River Bacteria Data. Downloaded July 23, 2008 from
http://www.waterboards.ca.gov/northcoast/water_issues/programs/water_quality_sampling/russian_river.shtml. North Coast Regional Water Quality Control Board

Water Quality Objective/Criterion: Per the Basin Plan (NCRWQCB 2007): The bacteriological quality of waters of the North Coast Region shall not be degraded beyond natural background levels. In no case shall coliform concentrations in waters of the North Coast Region exceed the following: In waters designated for contact recreation (REC-1), the median fecal coliform concentration based on a minimum of not less than 5 samples for any 30-day period shall not exceed 50 MPN* / 100 ml, nor shall more than 10% of total samples during any 30-day period exceed 400 MPN / 100 ml. *Note: MPN is the most probable number of coliform units.

Objective/Criterion Reference: Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board

Evaluation Guideline: Guideline Reference:

Spatial Representation: Samples were collected from the mainstem Russian River at Forestville Access Beach near Hacienda. Samples were collected as far into the main river flow as possible while wading.

Temporal Representation: In 2007, samples were collected from July 3 to August 7. In 2008, samples were collected from Memorial Day to July 15. The samples were often collected on the same day of the week and at the same time of day.

Environmental Conditions: There are no known environmental conditions (e.g., seasonality, land use practices, fire events, storms, etc.) that are related to these data.

QAPP Information: The samples were collected in accordance with the "Protocol for Conducting Russian River Bacteriological Sampling at Summer Recreational Beaches" (Goodwin 2007).

QAPP Information Reference(s): Protocol for Conducting Russian River Bacteriological Sampling at Summer Recreational Beaches. Prepared by Cathy Goodwin, NCRWQCB - July 21, 1999, July 29, 1999, May 2005, and May 22, 2007. North Coast Regional Water Quality Control Board

LOE ID: 7021

Pollutant: Total Coliform
 LOE Subgroup: Pollutant-Water
 Matrix: Water
 Fraction: Total

Beneficial Use: Water Contact Recreation

Number of Samples: 2
 Number of Exceedances: 0

Data and Information Type: Physical/Chemical Monitoring
 Data Used to Assess Water Quality: None of the 2 total coliform samples collected from Dutch Bill Creek exceed the evaluation guideline. Both sample concentrations are 1,011 MPN / 100 ml. The samples were collected by the Community Clean Water Institute (CCWI 2006).
 Data Reference: Community Clean Water Institute Master Data for 2005. Downloaded from <http://ccwi.org/issues/data.htm> on August 25, 2008

Water Quality Objective/Criterion: Per the Basin Plan (NCRWQCB 2007): The bacteriological quality of waters of the North Coast Region shall not be degraded beyond natural background levels.
 Objective/Criterion Reference: Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board

Evaluation Guideline: Per the "Draft Guidance for Fresh Water Beaches" (DHS 2006): Beach posting is recommended when single sample total coliform levels exceed 10,000 MPN / 100 ml.
 *Note: MPN is the most probable number of coliform units.

Guideline Reference: Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Health Services Division of Drinking Water and Environmental Management.

Spatial Representation: Samples were collected from two locations in Dutch Bill Creek as follows: (1) from Dutch Bill Creek at the fish ladder; and (2) from Dutch Bill Creek at the Graton Road

and Main Street bridge in Occidental.

Temporal Representation: The samples were collected on December 19, 2005.

Environmental Conditions: There are no known environmental conditions (e.g., seasonality, land use practices, fire events, storms, etc.) that are related to these data.

QAPP Information: Samples were collected in accordance with the "Community Clean Water Institute Volunteer Water Quality Monitoring Program Sampling and Analysis Methods" (CCWI 2007).

QAPP Information Reference(s): Community Clean Water Institute Volunteer Water Quality Monitoring Program Sampling and Analysis Methods. Updated April 12, 2007

LOE ID: 6039

Pollutant: Fecal Coliform
 LOE Subgroup: Pollutant-Water
 Matrix: Water
 Fraction: Total

Beneficial Use: Water Contact Recreation

Number of Samples: 103
 Number of Exceedances: 4

Data and Information Type: Physical/Chemical Monitoring

Data Used to Assess Water Quality: In total between 1992 and 2008, of the 103 median fecal coliform or median E. coli samples collected from the Russian River at Johnson's Beach, 4 exceed the objective.

Fecal coliform samples were collected from 1997 to 2001. Of the 70 fecal coliform samples collected, 48 median fecal coliform concentration values were calculated based on a minimum of not less than 5 samples for any 30-day period. Of these 48 median values, 2 exceed the objective. The median values range from 13 to 70 MPN / 100 ml.

From 2002 to 2008, E. coli samples were collected while fecal coliform samples were not collected. Since E. coli is one of the group of bacteria that comprise the fecal coliform group, it is logical that if median E. coli concentrations for any 30-day period are greater than 50 MPN / 100 ml, then the median fecal coliform concentrations for any 30-day period will also be greater than 50 MPN / 100 ml. Of the 78 E. coli samples collected, 55 median E. coli concentration values were calculated based on a minimum of not less than 5 samples for any 30-day period. Of these 55 median values, 2 exceed the objective. E. coli median values range from 10 to 51 MPN / 100 ml.

The samples were collected by staff of the North Coast Regional Water Quality Control Board. The data for 1992 to 2007 are presented in the Russian River Pathogen Data Report of the Russian River Pathogen Project Database (ICE 2008). The data for 2008 are presented by the Regional Water Board (NCRWQCB 2008).

Data Reference: Russian River Pathogen Data Report of the Russian River Pathogen Project Database. Information Center for the Environment. Version 1. Beta. 2008.
<http://rrpp.ice.ucdavis.edu/>
Summer 2008 Russian River Bacteria Data. Downloaded July 23, 2008 from
http://www.waterboards.ca.gov/northcoast/water_issues/programs/water_quality_sampling/russian_river.shtml. North Coast Regional Water Quality Control Board

Water Quality Objective/Criterion: Per the Basin Plan (NCRWQCB 2007): The bacteriological quality of waters of the North Coast Region shall not be degraded beyond natural background levels. In no case

	shall coliform concentrations in waters of the North Coast Region exceed the following: In waters designated for contact recreation (REC-1), the median fecal coliform concentration based on a minimum of not less than 5 samples for any 30-day period shall not exceed 50 MPN* / 100 ml, nor shall more than 10% of total samples during any 30-day period exceed 400 MPN / 100 ml. *Note: MPN is the most probable number of coliform units.
Objective/Criterion Reference:	<u>Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board</u>
Evaluation Guideline: Guideline Reference:	
Spatial Representation:	The samples were collected from the mainstem Russian River at Johnson's Beach in Guerneville. The Johnson's Beach sampling site is located downstream of the children's swim area and upstream of the bridge. Samples were collected as far into the main river flow as possible while wading.
Temporal Representation:	The samples were generally collected once a week during the summer months between Memorial Day and Labor Day from 1997 to 2003 and from 2005 - 2007. In 2008, samples were collected once a week during the summer months between Memorial Day and July 15. The samples were often collected on the same day of the week and at the same time of day.
Environmental Conditions:	There are no known environmental conditions (e.g., seasonality, land use practices, fire events, storms, etc.) that are related to these data.
QAPP Information:	The samples were collected in accordance with the "Protocol for Conducting Russian River Bacteriological Sampling at Summer Recreational Beaches" (Goodwin 2007).
QAPP Information Reference(s):	<u>Protocol for Conducting Russian River Bacteriological Sampling at Summer Recreational Beaches. Prepared by Cathy Goodwin, NCRWQCB - July 21, 1999, July 29, 1999, May 2005, and May 22, 2007. North Coast Regional Water Quality Control Board</u>

LOE ID: 5951

Pollutant: Enterococcus
 LOE Subgroup: Pollutant-Water
 Matrix: Water
 Fraction: Total

Beneficial Use: Water Contact Recreation

Number of Samples: 103
 Number of Exceedances: 1

Data and Information Type: Physical/Chemical Monitoring

Data Used to Assess Water Quality: One of the 103 Enterococcus samples from the Russian River at Steelhead Beach, Forestville Access Beach, Odd Fellows Bridge, and Johnson's Beach exceeds the evaluation guideline. At Steelhead Beach, 38 samples were collected with concentrations ranging less than 10 to 31 MPN / 100 ml. At Forestville Access Beach, 18 samples were collected with concentrations also ranging from less than 10 to 31 MPN / 100 ml. At Odd Fellows Bridge, 11 samples were collected with a constant concentration of 10 MPN / 100 ml. At Johnson's Beach, 38 samples were collected with concentrations ranging from less than 10 to 63 MPN / 100 ml. The samples were collected by staff of the North Coast Regional Water Quality Control Board. The data for 2006-2007 are presented in the Russian River Pathogen Data Report of the Russian River Pathogen Project Database (ICE 2008). The data for 2008 are presented by the Regional Water Board (NCRWQCB

Data Reference:	2008). <u>Russian River Pathogen Data Report of the Russian River Pathogen Project Database, Information Center for the Environment. Version 1. Beta. 2008.</u> <u>http://rrpp.ice.ucdavis.edu/</u> <u>Summer 2008 Russian River Bacteria Data. Downloaded July 23, 2008 from</u> <u>http://www.waterboards.ca.gov/northcoast/water_issues/programs/water_quality_sampling/russian_river.shtml</u> . North Coast Regional Water Quality Control Board
Water Quality Objective/Criterion: Objective/Criterion Reference:	Per the Basin Plan (NCRWQCB 2007): The bacteriological quality of waters of the North Coast Region shall not be degraded beyond natural background levels. <u>Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board</u>
Evaluation Guideline:	Per the "Draft Guidance for Fresh Water Beaches" (DHS 2006): Beach posting is recommended when single sample Enterococcus levels exceed 61 MPN / 100 ml. *Note: MPN is the most probable number of coliform units.
Guideline Reference:	<u>Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Health Services Division of Drinking Water and Environmental Management.</u>
Spatial Representation:	The samples were collected from the mainstem Russian River at Steelhead Beach (near Forestville), Forestville Access Beach (near Hacienda), Odd Fellows Bridge (near Korbel), and Johnson's Beach (in Guerneville). The Odd Fellows Bridge sampling site is accessed via Odd Fellows Park Road and the samples are collected by wading from the small sandy beach upstream of the summer bridge. The Johnson's Beach sampling site is located downstream of the children's swim area and upstream of the bridge. Samples were collected as far into the main river flow as possible while wading.
Temporal Representation:	For all the samples collected between 2006 and 2007, samples were generally collected once a week during the summer months between Memorial Day and Labor Day. For all of the samples collected in 2008, samples were collected once a week from May 27 to July 15, 2008. The samples were often collected on the same day of the week and at the same time of day. For Steelhead Beach and Johnson's Beach, the samples were collected in 2006-2008. For Forestville Access Beach, the samples were collected in 2007-2008. For Odd Fellows Bridge, the samples were collected in 2006.
Environmental Conditions: QAPP Information:	There are no known environmental conditions (e.g., seasonality, land use practices, fire events, storms, etc.) that are related to these data. The samples were collected in accordance with the "Protocol for Conducting Russian River Bacteriological Sampling at Summer Recreational Beaches" (Goodwin 2007).
QAPP Information Reference(s):	<u>Protocol for Conducting Russian River Bacteriological Sampling at Summer Recreational Beaches. Prepared by Cathy Goodwin, NCRWQCB - July 21, 1999, July 29, 1999, May 2005, and May 22, 2007. North Coast Regional Water Quality Control Board</u>

LOE ID:	5945
Pollutant:	Escherichia coli (E. Coli)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Water Contact Recreation
Number of Samples:	228
Number of Exceedances:	1

Data and Information Type:	Physical/Chemical Monitoring
Data Used to Assess Water Quality:	One of the 228 E. coli samples from the Russian River at Steelhead Beach, Forestville Access Beach, Odd Fellows Bridge and Johnson's Beach exceeds the evaluation guideline. At Steelhead Beach, 75 samples were collected with concentrations ranging from 0 to 132 MPN / 100 ml. At Forestville Access Beach, 18 samples were collected with concentrations ranging from less than 10 to 62 MPN / 100 ml. At Odd Fellows Bridge, 52 samples were collected with concentrations ranging from 10 to 42 MPN / 100 ml. At Johnson's Beach, 83 samples were collected with concentrations ranging from less than 10 to 1,091 MPN / 100 ml. The samples were collected by staff of the North Coast Regional Water Quality Control Board. The data for 2002 - 2007 are presented in the Russian River Pathogen Data Report of the Russian River Pathogen Project Database (ICE 2008). The data for 2008 are presented by the Regional Water Board (NCRWQCB 2008).
Data Reference:	<u>Russian River Pathogen Data Report of the Russian River Pathogen Project Database, Information Center for the Environment. Version 1. Beta. 2008.</u> <u>http://rrpp.ice.ucdavis.edu/</u> <u>Summer 2008 Russian River Bacteria Data. Downloaded July 23, 2008 from http://www.waterboards.ca.gov/northcoast/water_issues/programs/water_quality_sampling/russian_river.shtml. North Coast Regional Water Quality Control Board</u>
Water Quality Objective/Criterion:	Per the Basin Plan (NCRWQCB 2007): The bacteriological quality of waters of the North Coast Region shall not be degraded beyond natural background levels.
Objective/Criterion Reference:	<u>Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board</u>
Evaluation Guideline:	Per the "Draft Guidance for Fresh Water Beaches" (DHS 2006): Beach posting is recommended when single sample E. coli levels exceed 235 MPN / 100 ml. *Note: MPN is the most probable number of coliform units.
Guideline Reference:	<u>Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Health Services Division of Drinking Water and Environmental Management.</u>
Spatial Representation:	The samples were collected from the mainstem Russian River at Steelhead Beach (near Forestville), Forestville Access Beach (near Hacienda), Odd Fellows Bridge (near Korbel), and Johnson's Beach (in Guerneville). The Odd Fellows Bridge sampling site is accessed via Odd Fellows Park Road and the samples are collected by wading from the small sandy beach upstream of the summer bridge. The Johnson's Beach sampling site is located downstream of the children's swim area and upstream of the bridge. Samples were collected as far into the main river flow as possible while wading.
Temporal Representation:	For all the samples collected between 1997 and 2007, samples were generally collected once a week during the summer months between Memorial Day and Labor Day. For all of the samples collected in 2008, samples were collected once a week from May 27 to July 15, 2008. The samples were often collected on the same day of the week and at the same time of day. For Steelhead Beach and Johnson's Beach, the samples were collected in 2002-2003 and 2005-2008. For Forestville Access Beach, the samples were collected in 2007-2008. For Odd Fellows Bridge, the samples were collected from 2002-2003 and 2005.
Environmental Conditions:	There are no known environmental conditions (e.g., seasonality, land use practices, fire events, storms, etc.) that are related to these data.
QAPP Information:	The samples were collected in accordance with the "Protocol for Conducting Russian River Bacteriological Sampling at Summer Recreational Beaches" (Goodwin 2007).
QAPP Information Reference(s):	<u>Protocol for Conducting Russian River Bacteriological Sampling at Summer Recreational Beaches. Prepared by Cathy Goodwin, NCRWQCB - July 21, 1999, July 29, 1999, May 2005, and May 22, 2007. North Coast Regional Water Quality Control Board</u>

LOE ID:	6077
Pollutant:	Enterococcus
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Water Contact Recreation
Number of Samples:	38
Number of Exceedances:	4
Data and Information Type:	Physical/Chemical Monitoring
Data Used to Assess Water Quality:	Four of the 38 Enterococcus samples from the Russian River at Monte Rio Beach exceed the evaluation guideline. Concentrations range from less than 10 to 74 MPN / 100 ml. The samples were collected by staff of the North Coast Regional Water Quality Control Board. The data for 2006-2007 are presented in the Russian River Pathogen Data Report of the Russian River Pathogen Project Database (ICE 2008). The data for 2008 are presented by the Regional Water Board (NCRWQCB 2008).
Data Reference:	<u>Russian River Pathogen Data Report of the Russian River Pathogen Project Database. Information Center for the Environment. Version 1. Beta. 2008.</u> <u>http://rrpp.ice.ucdavis.edu/</u> <u>Summer 2008 Russian River Bacteria Data. Downloaded July 23, 2008 from http://www.waterboards.ca.gov/northcoast/water_issues/programs/water_quality_sampling/russian_river.shtml.</u> North Coast Regional Water Quality Control Board
Water Quality Objective/Criterion:	Per the Basin Plan (NCRWQCB 2007): The bacteriological quality of waters of the North Coast Region shall not be degraded beyond natural background levels.
Objective/Criterion Reference:	<u>Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board</u>
Evaluation Guideline:	Per the "Draft Guidance for Fresh Water Beaches" (DHS 2006): Beach posting is recommended when single sample Enterococcus levels exceed 61 MPN / 100 ml. *Note: MPN is the most probable number of coliform units.
Guideline Reference:	<u>Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Health Services Division of Drinking Water and Environmental Management.</u>
Spatial Representation:	The samples were collected from the mainstem Russian River at Monte Rio Beach in Monte Rio. The sampling site is located downstream of the children's swim area. Samples were collected as far into the main river flow as possible while wading.
Temporal Representation:	Samples were generally collected once a week during the summer months between Memorial Day and Labor Day in 2006 to 2007. Samples for 2008 were collected from May to July. The samples were often collected on the same day of the week and at the same time of day.
Environmental Conditions:	There are no known environmental conditions (e.g., seasonality, land use practices, fire events, storms, etc.) that are related to these data.
QAPP Information:	The samples were collected in accordance with the "Protocol for Conducting Russian River Bacteriological Sampling at Summer Recreational Beaches" (Goodwin 2007).
QAPP Information Reference(s):	<u>Protocol for Conducting Russian River Bacteriological Sampling at Summer Recreational Beaches. Prepared by Cathy Goodwin, NCRWQCB - July 21, 1999, July 29, 1999, May 2005, and May 22, 2007. North Coast Regional Water Quality Control Board</u>

LOE ID:	6074
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Water Contact Recreation
Number of Samples:	157
Number of Exceedances:	2
Data and Information Type:	Physical/Chemical Monitoring
Data Used to Assess Water Quality:	Two of the 157 total coliform samples from the Russian River at Monte Rio Beach exceed the evaluation guideline. Sample concentrations range from 30 to more than 24,192 MPN / 100 ml. The samples were collected by staff of the North Coast Regional Water Quality Control Board. The data for 1997 - 2007 are presented in the Russian River Pathogen Data Report of the Russian River Pathogen Project Database (ICE 2008). The data for 2008 are presented by the Regional Water Board (NCRWQCB 2008).
Data Reference:	<u>Russian River Pathogen Data Report of the Russian River Pathogen Project Database. Information Center for the Environment. Version 1. Beta. 2008.</u> <u>http://rrpp.ice.ucdavis.edu/</u> <u>Summer 2008 Russian River Bacteria Data. Downloaded July 23, 2008 from http://www.waterboards.ca.gov/northcoast/water_issues/programs/water_quality_sampling/russian_river.shtml.</u> North Coast Regional Water Quality Control Board
Water Quality Objective/Criterion:	Per the Basin Plan (NCRWQCB 2007): The bacteriological quality of waters of the North Coast Region shall not be degraded beyond natural background levels.
Objective/Criterion Reference:	<u>Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board</u>
Evaluation Guideline:	Per the "Draft Guidance for Fresh Water Beaches" (DHS 2006): Beach posting is recommended when single sample total coliform levels exceed 10,000 MPN / 100 ml. *Note: MPN is the most probable number of coliform units.
Guideline Reference:	<u>Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Health Services Division of Drinking Water and Environmental Management.</u>
Spatial Representation:	The samples were collected from the mainstem Russian River at Monte Rio Beach in Monte Rio. The sampling site is downstream of the children's swim area. Samples were collected as far into the main river flow as possible while wading.
Temporal Representation:	Samples were generally collected once a week during the summer months between Memorial Day and Labor Day in 1997 - 2003 and 2005 - 2007. For 2008, samples were collected from May 27, 2008 to July 15, 2008. The samples were often collected on the same day of the week and at the same time of day.
Environmental Conditions:	There are no known environmental conditions (e.g., seasonality, land use practices, fire events, storms, etc.) that are related to these data.
QAPP Information:	The samples were collected in accordance with the "Protocol for Conducting Russian River Bacteriological Sampling at Summer Recreational Beaches" (Goodwin 2007).
QAPP Information Reference(s):	<u>Protocol for Conducting Russian River Bacteriological Sampling at Summer Recreational Beaches. Prepared by Cathy Goodwin, NCRWQCB - July 21, 1999, July 29, 1999, May 2005, and May 22, 2007. North Coast Regional Water Quality Control Board</u>

LOE ID:	6131
Pollutant:	Escherichia coli (E. Coli)
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Water Contact Recreation
Number of Samples:	3
Number of Exceedances:	3
Data and Information Type:	Physical/Chemical Monitoring
Data Used to Assess Water Quality:	Three of the 3 E. coli samples from Dutch Bill Creek exceed the evaluation guideline. Concentrations range from 933 to 50,000 MPN / 100 ml. The samples were collected as part of the Russian River First Flush sampling event. Data are summarized by Katznelson et al. (2003).
Data Reference:	<u>2002 Russian River First Flush Summary Report. Clean Water Team. Citizen Monitoring Program of the State Water Resources Control Board</u>
Water Quality Objective/Criterion Reference:	Per the Basin Plan (NCRWQCB 2007): The bacteriological quality of waters of the North Coast Region shall not be degraded beyond natural background levels. <u>Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board</u>
Evaluation Guideline:	Per the "Draft Guidance for Fresh Water Beaches" (DHS 2006): Beach posting is recommended when single sample E. coli levels exceed 235 MPN / 100 ml. *Note: MPN is the most probable number of coliform units.
Guideline Reference:	<u>Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Health Services Division of Drinking Water and Environmental Management.</u>
Spatial Representation:	Samples were collected from 3 sites in Dutch Bill Creek as follows: (1) at Camp Meeker / Alliance Redwoods Camp; (2) at Graton Road at Bohemian Highway; and (3) in Dutch Bill Creek's headwaters at Graton Road.
Temporal Representation:	The samples were collected on November 7, 2002. At each site, 3 instantaneous grab samples were collected over half hour increments. The data are averaged for each site.
Environmental Conditions:	Samples were collected during the first runoff event of the rainy season.
QAPP Information:	Samples were collected in accordance with the study plan and quality control procedures described by Katznelson et al. (2003).
QAPP Information Reference(s):	<u>2002 Russian River First Flush Summary Report. Clean Water Team. Citizen Monitoring Program of the State Water Resources Control Board</u>

LOE ID:	5944
Pollutant:	Total Coliform
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	Total
Beneficial Use:	Water Contact Recreation

Number of Samples: 357
Number of Exceedances: 0

Data and Information Type: Physical/Chemical Monitoring

Data Used to Assess Water Quality: None of the 357 total coliform samples from the Russian River at Steelhead Beach, Forestville Access Beach, Odd Fellow's Bridge, and Johnson's Beach exceed the evaluation guideline. At Steelhead Beach, 75 samples were collected with concentrations ranging from 457 to 2,909 MPN / 100 ml. At Forestville Access Beach, 18 samples were collected with concentrations ranging from 546 to 2,187 MPN / 100 ml. At Odd Fellows Bridge, 116 samples were collected with concentrations ranging from 23 to 4,611 MPN / 100 ml. At Johnson's Beach, 178 samples were collected with concentrations ranging from 23 to 9,804 MPN / 100 ml. The samples were collected by staff of the North Coast Regional Water Quality Control Board. The data for 1997 - 2007 are presented in the Russian River Pathogen Data Report of the Russian River Pathogen Project Database (ICE 2008). The data for 2008 are presented by the Regional Water Board (NCRWQCB 2008).

Data Reference: [Russian River Pathogen Data Report of the Russian River Pathogen Project Database. Information Center for the Environment. Version 1. Beta. 2008.](http://rrpp.ice.ucdavis.edu/)
[http://rrpp.ice.ucdavis.edu/](http://www.waterboards.ca.gov/northcoast/water_issues/programs/water_quality_sampling/russian_river.shtml)
[Summer 2008 Russian River Bacteria Data. Downloaded July 23, 2008 from http://www.waterboards.ca.gov/northcoast/water_issues/programs/water_quality_sampling/russian_river.shtml.](http://www.waterboards.ca.gov/northcoast/water_issues/programs/water_quality_sampling/russian_river.shtml) North Coast Regional Water Quality Control Board

Water Quality Objective/Criterion: Per the Basin Plan (NCRWQCB 2007): The bacteriological quality of waters of the North Coast Region shall not be degraded beyond natural background levels. In no case shall coliform concentrations in waters of the North Coast Region exceed the following: In waters designated for contact recreation (REC-1), the median fecal coliform concentration based on a minimum of not less than 5 samples for any 30-day period shall not exceed 50 MPN* / 100 ml, nor shall more than 10% of total samples during any 30-day period exceed 400 MPN / 100 ml. At all areas where shellfish may be harvested for human consumption (SHELL), the fecal coliform concentration throughout the water column shall not exceed 43 MPN / 100 ml for a 5-tube decimal dilution test or 49 MPN / 100 ml when a three-tube decimal dilution is used. *Note: MPN is the most probable number of coliform units.

Objective/Criterion Reference: [Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board](#)

Evaluation Guideline: Per the "Draft Guidance for Fresh Water Beaches" (DHS 2006): Beach posting is recommended when single sample total coliform levels exceed 10,000 MPN / 100 ml.

Guideline Reference: [Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Health Services Division of Drinking Water and Environmental Management.](#)

Spatial Representation: The samples were collected from the mainstem Russian River at Steelhead Beach (near Forestville), Forestville Access Beach (near Hacienda), Odd Fellows Bridget (near Korbel), and Johnson's Beach (in Guerneville). The Odd Fellows Bridge sampling site is access via Odd Fellows Park Road and the samples are collected by wading from the small sandy beach upstream of the summer bridge. The Johnson's Beach sampling site is located downstream of the children's swim area and upstream of the bridge. Samples were collected as far into the main river flow as possible while wading.

Temporal Representation: For all the samples collected between 1997 and 2007, samples were generally collected once a week during the summer months between Memorial Day and Labor Day. For all of the samples collected in 2008, samples were collected once a week from May 27 to July 15, 2008. The samples were often collected on the same day of the week and at the

Environmental Conditions: same time of day. For Steelhead Beach, the samples were collected in 2002-2003 and 2005-2008. For Forestville Access Beach, the samples were collected in 2007-2008. For Odd Fellows Bridge, the samples were collected from 1997-2003 and 2005-2006. For Johnson's Beach, the samples were collected from 1997-2003 and 2005-2008.

QAPP Information: There are no known environmental conditions (e.g., seasonality, land use practices, fire events, storms, etc.) that are related to these data.

QAPP Information Reference(s): The samples were collected in accordance with the "Protocol for Conducting Russian River Bacteriological Sampling at Summer Recreational Beaches" (Goodwin 2007). [Protocol for Conducting Russian River Bacteriological Sampling at Summer Recreational Beaches. Prepared by Cathy Goodwin, NCRWQCB - July 21, 1999, July 29, 1999, May 2005, and May 22, 2007. North Coast Regional Water Quality Control Board](#)

LOE ID: 6079

Pollutant: Fecal Coliform
 LOE Subgroup: Pollutant-Water
 Matrix: Water
 Fraction: Total

Beneficial Use: Water Contact Recreation

Number of Samples: 80
 Number of Exceedances: 3

Data and Information Type: Physical/Chemical Monitoring

Data Used to Assess Water Quality: In total between 1992 and 2007, of the 80 median fecal coliform or median E. coli samples collected from the Russian River at Odd Fellows Beach, 3 exceed the objective.

Fecal coliform samples were collected from 1992 to 2001. Of the 68 fecal coliform samples collected, 45 median fecal coliform concentration values were calculated based on a minimum of not less than 5 samples for any 30-day period. Of these 45 median values, 3 exceed the objective. The median fecal coliform values range from 11 to 70 MPN / 100 ml.

From 2002 to 2007, E. coli samples were collected while fecal coliform samples were not collected. Since E. coli is one of the group of bacteria that comprise the fecal coliform group, it is logical that if median E. coli concentrations for any 30-day period are greater than 50 MPN / 100 ml, then the median fecal coliform concentrations for any 30-day period will also be greater than 50 MPN / 100 ml. Of the 51 E. coli samples collected, 35 median E. coli concentration values were calculated based on a minimum of not less than 5 samples for any 30-day period. Of these 35 median values, none exceed the objective. E. coli median values range from 10 to 31 MPN / 100 ml.

The samples were collected by staff of the North Coast Regional Water Quality Control Board. The data for 1992 to 2007 are presented in the Russian River Pathogen Data Report of the Russian River Pathogen Project Database (ICE 2008). The data for 2008 are presented by the Regional Water Board (NCRWQCB 2008).

Data Reference: [Russian River Pathogen Data Report of the Russian River Pathogen Project Database. Information Center for the Environment. Version 1. Beta. 2008.
<http://rrpp.ice.ucdavis.edu/>
 Summer 2008 Russian River Bacteria Data. Downloaded July 23, 2008 from
\[http://www.waterboards.ca.gov/northcoast/water_issues/programs/water_quality_sampli\]\(http://www.waterboards.ca.gov/northcoast/water_issues/programs/water_quality_sampli\)](#)

[ng/russian_river.shtml](#). North Coast Regional Water Quality Control Board

Water Quality Objective/Criterion: Per the Basin Plan (NCRWQCB 2007): The bacteriological quality of waters of the North Coast Region shall not be degraded beyond natural background levels. In no case shall coliform concentrations in waters of the North Coast Region exceed the following: In waters designated for contact recreation (REC-1), the median fecal coliform concentration based on a minimum of not less than 5 samples for any 30-day period shall not exceed 50 MPN* / 100 ml, nor shall more than 10% of total samples during any 30-day period exceed 400 MPN / 100 ml. *Note: MPN is the most probable number of coliform units.

Objective/Criterion Reference: [Water Quality Control Plan for the North Coast Region](#). North Coast Regional Water Quality Control Board

Evaluation Guideline:
Guideline Reference:

Spatial Representation: The samples were collected from the mainstem Russian River at Odd Fellows Bridge near Korbel. The sampling site is accessed via Odd Fellows Park Road and the samples are collected by wading from the small sandy beach upstream of the summer bridge as far into the main river flow as possible.

Temporal Representation: Individual samples were collected in June 1992, October 1992, and June 1994. The majority of the samples were generally collected once a week during the summer months between Memorial Day and Labor Day from 1997 to 2003 and from 2005 - 2007. The samples were often collected on the same day of the week and at the same time of day.

Environmental Conditions: There are no known environmental conditions (e.g., seasonality, land use practices, fire events, storms, etc.) that are related to these data.

QAPP Information: The samples were collected in accordance with the "Protocol for Conducting Russian River Bacteriological Sampling at Summer Recreational Beaches" (Goodwin 2007).

QAPP Information Reference(s): [Protocol for Conducting Russian River Bacteriological Sampling at Summer Recreational Beaches](#). Prepared by Cathy Goodwin, NCRWQCB - July 21, 1999, July 29, 1999, May 2005, and May 22, 2007. North Coast Regional Water Quality Control Board

LOE ID: 6093

Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Total

Beneficial Use: Water Contact Recreation

Number of Samples: 3
Number of Exceedances: 0

Data and Information Type: Physical/Chemical Monitoring

Data Used to Assess Water Quality: None of the 3 total coliform samples from Fife Creek exceed the evaluation guideline. Sample concentrations range from 7 to more than 1,600 MPN / 100 ml. The samples were collected by Regional Water Board staff as part of a targeted sampling event on Fife Creek. Data are summarized by Goodwin (1999).

Data Reference: [Interoffice Communication from Cathy Goodwin to the Russian River Monitoring File Regarding Fife Creek Monitoring Data](#). North Coast Regional Water Quality Control Board. July 9, 1999

Water Quality Objective/Criterion: Objective/Criterion Reference:	Per the Basin Plan (NCRWQCB 2007): The bacteriological quality of waters of the North Coast Region shall not be degraded beyond natural background levels. <u>Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board</u>
Evaluation Guideline:	Per the "Draft Guidance for Fresh Water Beaches" (DHS 2006): Beach posting is recommended when single sample total coliform levels exceed 10,000 MPN / 100 ml. *Note: MPN is the most probable number of coliform units.
Guideline Reference:	<u>Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Health Services Division of Drinking Water and Environmental Management.</u>
Spatial Representation:	The samples were collected from 3 sites in Fife Creek, a tributary to the Russian River. The first site is Upper Fife Creek, which is located immediately upstream of the Armstrong Woods State Preserve upper parking area and picnic grounds. The second site is Mid Fife Creek, which is located approximately 500' downstream of the Armstrong Woods Ranger Kiosk. The third site is Fife Creek at Mill Street, which is located at the dead end of Mill Street.
Temporal Representation:	The samples were collected on June 17, 1999, as instantaneous grab samples and do not represent diurnal conditions.
Environmental Conditions:	There are no known environmental conditions (e.g., seasonality, land use practices, fire events, storms, etc.) that are related to these data.
QAPP Information:	Minimal quality control was conducted as described by Goodwin (1999).
QAPP Information Reference(s):	<u>Interoffice Communication from Cathy Goodwin to the Russian River Monitoring File Regarding Fife Creek Monitoring Data. North Coast Regional Water Quality Control Board. July 9, 1999</u>

LOE ID: 6094

Pollutant: Fecal Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Total

Beneficial Use: Water Contact Recreation

Number of Samples: 3
Number of Exceedances: 0

Data and Information Type: Physical/Chemical Monitoring

Data Used to Assess Water Quality: Since less than 5 samples over a 30-day period were collected, the evaluation guideline is used for comparison to grab samples. None of the 3 fecal coliform samples collected from Fife Creek exceed the evaluation guideline. Sample concentrations range from less than 2 to 140 MPN / 100 ml. The samples were collected by Regional Water Board staff as part of a targeted sampling event on Fife Creek. Data are summarized by Goodwin (1999).

Data Reference: Interoffice Communication from Cathy Goodwin to the Russian River Monitoring File Regarding Fife Creek Monitoring Data. North Coast Regional Water Quality Control Board. July 9, 1999

Water Quality Objective/Criterion: Per the Basin Plan (NCRWQCB 2007): The bacteriological quality of waters of the North Coast Region shall not be degraded beyond natural background levels. In no case shall coliform concentrations in waters of the North Coast Region exceed the following: In waters designated for contact recreation (REC-1), the median fecal coliform

	concentration based on a minimum of not less than 5 samples for any 30-day period shall not exceed 50 MPN* / 100 ml, nor shall more than 10% of total samples during any 30-day period exceed 400 MPN / 100 ml. *Note: MPN is the most probable number of coliform units.
Objective/Criterion Reference:	<u>Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board</u>
Evaluation Guideline:	Per the "Draft Guidance for Fresh Water Beaches" (DHS 2006): Beach posting is recommended when single sample fecal coliform levels exceed 400 MPN / 100 ml. *Note: MPN is the most probable number of coliform units.
Guideline Reference:	<u>Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Health Services Division of Drinking Water and Environmental Management.</u>
Spatial Representation:	The samples were collected from 3 sites in Fife Creek, a tributary to the Russian River. The first site is Upper Fife Creek, which is located immediately upstream of the Armstrong Woods State Preserve upper parking area and picnic grounds. The second site is Mid Fife Creek, which is located approximately 500' downstream of the Armstrong Woods Ranger Kiosk. The third site is Fife Creek at Mill Street, which is located at the dead end of Mill Street.
Temporal Representation:	The samples were collected on June 17, 1999, as instantaneous grab samples and do not represent diurnal conditions.
Environmental Conditions:	There are no known environmental conditions (e.g., seasonality, land use practices, fire events, storms, etc.) that are related to these data.
QAPP Information:	Minimal quality control was conducted as described by Goodwin (1999).
QAPP Information Reference(s):	<u>Interoffice Communication from Cathy Goodwin to the Russian River Monitoring File Regarding Fife Creek Monitoring Data. North Coast Regional Water Quality Control Board. July 9, 1999</u>

LOE ID: 6139

Pollutant: Escherichia coli (E. Coli)

LOE Subgroup: Pollutant-Water

Matrix: Water

Fraction: Total

Beneficial Use: Water Contact Recreation

Number of Samples: 1

Number of Exceedances: 1

Data and Information Type: Physical/Chemical Monitoring

Data Used to Assess Water Quality: One of the 1 E. coli sample from the Fife Creek exceed the evaluation guideline. The sample concentration is 993 MPN / 100 ml. The sample was collected as part of the Russian River First Flush sampling event. Data are summarized by Katznelson et al. (2003).

Data Reference: 2002 Russian River First Flush Summary Report. Clean Water Team, Citizen Monitoring Program of the State Water Resources Control Board

Water Quality Objective/Criterion: Per the Basin Plan (NCRWQCB 2007): The bacteriological quality of waters of the North Coast Region shall not be degraded beyond natural background levels.
Objective/Criterion Reference: Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board

Evaluation Guideline: Per the "Draft Guidance for Fresh Water Beaches" (DHS 2006): Beach posting is recommended when single sample E. coli levels exceed 235 MPN / 100 ml. *Note: MPN is the most probable number of coliform units.

Guideline Reference: Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Health Services Division of Drinking Water and Environmental Management.

Spatial Representation: The samples were collected from 1 site at Fife Creek where it intersects with Highway 116.

Temporal Representation: The samples were collected on November 7, 2002. At each site, 3 instantaneous grab samples were collected over half hour increments. The data are averaged for each site.

Environmental Conditions: Samples were collected during the first runoff event of the rainy season.

QAPP Information: Samples were collected in accordance with the study plan and quality control procedures described by Katznelson et al. (2003).

QAPP Information Reference(s): 2002 Russian River First Flush Summary Report. Clean Water Team, Citizen Monitoring Program of the State Water Resources Control Board

LOE ID: 6140

Pollutant: Total Coliform
 LOE Subgroup: Pollutant-Water
 Matrix: Water
 Fraction: Total

Beneficial Use: Water Contact Recreation

Number of Samples: 1
 Number of Exceedances: 1

Data and Information Type: Physical/Chemical Monitoring

Data Used to Assess Water Quality: One of the 1 total coliform sample from Fife Creek exceeds the evaluation guideline. The sample concentration is more than 240,000 MPN / 100 ml. The sample was collected as part of the Russian River First Flush sampling event. Data are summarized by Katznelson et al. (2003).

Data Reference: 2002 Russian River First Flush Summary Report. Clean Water Team, Citizen Monitoring Program of the State Water Resources Control Board

Water Quality Objective/Criterion: Per the Basin Plan (NCRWQCB 2007): The bacteriological quality of waters of the North Coast Region shall not be degraded beyond natural background levels.
 Objective/Criterion Reference: Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board

Evaluation Guideline: Per the "Draft Guidance for Fresh Water Beaches" (DHS 2006): Beach posting is recommended when single sample total coliform levels exceed 10,000 MPN / 100 ml. *Note: MPN is the most probable number of coliform units.

Guideline Reference: Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Health Services Division of Drinking Water and Environmental Management.

Spatial Representation: The samples were collected from 1 site at Fife Creek where it intersects with Highway 116.

Temporal Representation: The samples were collected on November 7, 2002. At each site, 3 instantaneous grab samples were collected over half hour increments. The data are averaged for each site.

Environmental Conditions: Samples were collected during the first runoff event of the rainy season.

QAPP Information: Samples were collected in accordance with the study plan and quality control procedures described by Katznelson et al. (2003).

QAPP Information Reference(s): 2002 Russian River First Flush Summary Report. Clean Water Team, Citizen Monitoring Program of the State Water Resources Control Board

LOE ID: 6076

Pollutant: **Escherichia coli (E. Coli)**

LOE Subgroup: Pollutant-Water

Matrix: Water

Fraction: Total

Beneficial Use: Water Contact Recreation

Number of Samples: 83

Number of Exceedances: 5

Data and Information Type: Physical/Chemical Monitoring

Data Used to Assess Water Quality: Five of the 83 E. coli samples from the Russian River at Monte Rio Beach exceed the evaluation guideline. Concentrations range from 10 to 1,071 MPN / 100 ml. The samples were collected by staff of the North Coast Regional Water Quality Control Board. The data for 2002 - 2007 are presented in the Russian River Pathogen Data Report of the Russian River Pathogen Project Database (ICE 2008). The data for 2008 are presented by the Regional Water Board (NCRWQCB 2008).

Data Reference: Russian River Pathogen Data Report of the Russian River Pathogen Project Database. Information Center for the Environment. Version 1. Beta. 2008.
<http://rrpp.ice.ucdavis.edu/>
Summer 2008 Russian River Bacteria Data. Downloaded July 23, 2008 from
http://www.waterboards.ca.gov/northcoast/water_issues/programs/water_quality_sampling/russian_river.shtml. North Coast Regional Water Quality Control Board

Water Quality Objective/Criterion: Per the Basin Plan (NCRWQCB 2007): The bacteriological quality of waters of the North Coast Region shall not be degraded beyond natural background levels.

Objective/Criterion Reference: Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board

Evaluation Guideline: Per the "Draft Guidance for Fresh Water Beaches" (DHS 2006): Beach posting is recommended when single sample E. coli levels exceed 235 MPN / 100 ml. *Note: MPN is the most probable number of coliform units.

Guideline Reference: Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Health Services Division of Drinking Water and Environmental Management.

Spatial Representation: The samples were collected from the mainstem Russian River at Monte Rio Beach in Monte Rio. The sampling site is located downstream of the children's swim area. Samples were collected as far into the main river flow as possible while wading.

Temporal Representation: Samples were generally collected once a week during the summer months from Memorial Day to Labor Day in 2002-2003 and 2005-2007. Sample for 2008 were collected from May to July. The samples were often collected on the same day of the week and at the same time of day.

Environmental Conditions: There are no known environmental conditions (e.g., seasonality, land use practices, fire events, storms, etc.) that are related to these data.

QAPP Information: The samples were collected in accordance with the "Protocol for Conducting Russian River Bacteriological Sampling at Summer Recreational Beaches" (Goodwin 2007).
QAPP Information Reference(s): Protocol for Conducting Russian River Bacteriological Sampling at Summer Recreational Beaches. Prepared by Cathy Goodwin, NCRWQCB - July 21, 1999, July 29, 1999, May 2005, and May 22, 2007. North Coast Regional Water Quality Control Board

LOE ID: 7077

Pollutant: Escherichia coli (E. Coli)

LOE Subgroup: Pollutant-Water

Matrix: Water

Fraction: Total

Beneficial Use: Water Contact Recreation

Number of Samples: 1

Number of Exceedances: 0

Data and Information Type: Physical/Chemical Monitoring

Data Used to Assess Water Quality: None of the 1 E. coli samples from the Russian River at Laurel Dell Road exceeds the evaluation guideline. The sample concentration is 20 MPN / 100 ml. The sample was collected by the Community Clean Water Institute (CCWI 2006).

Data Reference: Community Clean Water Institute Master Data for 2005. Downloaded from <http://ccwi.org/issues/data.htm> on August 25, 2008

Water Quality Objective/Criterion: Per the Basin Plan (NCRWQCB 2007): The bacteriological quality of waters of the North Coast Region shall not be degraded beyond natural background levels.
Objective/Criterion Reference: Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board

Evaluation Guideline: Per the "Draft Guidance for Fresh Water Beaches" (DHS 2006): Beach posting is recommended when single sample E. coli levels exceed 235 MPN / 100 ml. *Note: MPN is the most probable number of coliform units.

Guideline Reference: Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Health Services Division of Drinking Water and Environmental Management.

Spatial Representation: The sample was collected from the mainstem Russian River from a private beach in a trailer park on Laurel Dell Road, which is located off Highway 116 between Monte Rio and Cazadero.

Temporal Representation: The sample was collected on July 20, 2005.

Environmental Conditions: There are no known environmental conditions (e.g., seasonality, land use practices, fire events, storms, etc.) that are related to these data.

QAPP Information: The sample was collected in accordance the "Community Clean Water Institute Volunteer Water Quality Monitoring Program Sampling and Analysis Methods" (CCWI 2007).

WATER BODY NAME: RUSSIAN RIVER HU, LOWER RUSSIAN RIVER HA, GUERNEVILLE HSA
Water Body ID: CAR1141104119990614110247
Water Body Type: River & Stream

DECISION ID 12910

Pollutant: DDT
Final Listing Decision: List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status: Revised
Sources: Agriculture | Source Unknown
Expected TMDL: 2021
Completion Date:
Pollutant or Pollution: Pollutant

Weight of Evidence: This pollutant is being considered for placement on the Section 303(d) List under Section 3.1 of the Listing Policy. Under Section 3.1 a single line of evidence is necessary to assess listing status. One line of evidence is available in the administrative record to assess this pollutant. Two of the 19 DDT samples exceed the evaluation guideline used to interpret the water quality objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the Section 303(d) List in the Water Quality Limited Segments category (i.e., sufficient justification to list). This conclusion is based on the staff findings that: (1) The data used satisfies the data quality requirements of Section 6.1.4 of the Policy. (2) The data used satisfies the data quantity requirements of Section 6.1.5 of the Policy. (3) Two of the 19 DDT samples exceed the evaluation guideline and this exceeds the allowable frequency listed in Table 3.1 of the Listing Policy. (4) Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

RWQCB Staff Recommendation: After review of the available data and information, North Coast Regional Water Board staff concludes that the water body-pollutant combination should be placed on the Section 303(d) List because applicable water quality standards are not attained and a pollutant contributes to or causes the problem.

SWRCB Board Decision / Staff Recommendation:

USEPA Decision:

Lines of Evidence (LOEs) for Decision ID 12910

LOE ID: 25646
Pollutant: DDT
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None
Beneficial Use: Municipal & Domestic Supply
Number of Samples: 19
Number of Exceedances: 2

Data and Information Type:	Physical/Chemical Monitoring
Data Used to Assess Water Quality:	Two of the 19 DDT samples collected in the mainstem Russian River exceed the evaluation guideline. Sample concentrations range from non-detect (with a reporting limit of 0.005 ug/l) to detected but not quantified with a concentration of at least 0.005 ug/l. The samples were collected as part of the Surface Water Ambient Water Monitoring Program (SWAMP). The data are found in the 5-Year Monitoring Report (NCRWQCB 2008).
Data Reference:	<u>Surface Water Ambient Monitoring Program (SWAMP) Summary Report for the North Coast Region (RWQCB-1) for Years 2000-2006. North Coast Regional Water Quality Control Board</u>
Water Quality Objective/Criterion:	Per the Basin Plan (NCRWQCB 2007): No individual pesticide or combination of pesticides shall be present in concentrations that adversely affect beneficial uses. There shall be no bioaccumulation of pesticide concentrations found in bottom sediments or aquatic life. Waters designated for use as domestic or municipal supply shall not contain concentrations of pesticides in excess of the limiting concentrations set forth in California Code of Regulations, Title 22, Division 4, Chapter 15, Article 4, Section 64444, and listed in Table 3.2 of the Basin Plan.
Objective/Criterion Reference:	<u>Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board</u>
Evaluation Guideline:	Per the National Recommended Water Quality Criteria (USEPA 2006): The recommended criterion for DDT for the protection of source waters for human health consumption of water and organisms is 0.00022 ug/l.
Guideline Reference:	<u>National Recommended Water Quality Criteria. United States Environmental Protection Agency. Office of Water. Office of Science and Technology. 4304T</u>
Spatial Representation:	Samples were collected from the mainstem Russian River at Johnson's Beach (SWAMP Station ID 114RRJB01). Samples were collected from well-mixed flows in glides or riffles.
Temporal Representation:	Samples were collected over 22 site visits from June 2001 to June 2006. These site visits corresponded to fall, winter, spring and early summer seasonal conditions.
Environmental Conditions:	There are no known environmental conditions (e.g., seasonality, land use practices, fire events, storms, etc.) that are related to these data.
QAPP Information:	Quality control was conducted in accordance with the SWAMP Quality Assurance Management Plan (SWAMP 2002).
QAPP Information Reference(s):	<u>Quality Assurance Management Plan for the State of California's Surface Water Ambient Monitoring Program. Sacramento, CA. State Water Resources Control Board. SWAMP. December 2002 (1st version)</u>

WATER BODY NAME: RUSSIAN RIVER HU, LOWER RUSSIAN RIVER HA, GUERNEVILLE HSA
Water Body ID: CAR1141104119990614110247
Water Body Type: River & Stream

DECISION ID 4555

Pollutant: PH
Final Listing Decision: Delist from 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: List on 303(d) list (TMDL required list)(2006)
Revision Status: Revised
Reason for Delisting: State determines water quality standard is being met
Pollutant or Pollution: Pollutant

Weight of Evidence: The pollutant pH in the Guerneville Hydrologic Sub-Area (HSA) is being considered in 2 parts: for removal from the Section 303(d) List for Pocket Canyon Creek, and for placement on the Section 303(d) List for the remainder of the Guerneville HSA.

(A) For Pocket Canyon Creek, this pollutant is being considered for removal from the Section 303(d) List under Section 4.2 of the Listing Policy. Two lines of evidence (LOEs 1712 and 8992) are available in the administrative record to assess this pollutant. Combined, 6 out of 130 pH samples exceed the water quality objective. The weight of evidence indicates that there is sufficient justification in favor of removing this water segment-pollutant combination from the Section 303(d) List in the Water Quality Limited Segments category (i.e., sufficient justification to de-list). This conclusion is based on the staff findings that: (1) The data used satisfies the data quality requirements of Section 6.1.4 of the Policy. (2) The data used satisfies the data quantity requirements of Section 6.1.5 of the Policy. (3) Six of the 130 pH samples exceed the water quality objective, and this does not exceed the allowable frequency of 21 per the binomial distribution described in Section 4.2 of the Listing Policy. (4) Pursuant to Section 4.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

(B) For the remainder of the Guerneville HSA, this pollutant is being considered for placement on the Section 303(d) List under Section 3.2. Eight lines of evidence are available in the administrative record to assess this pollutant. Combined, 11 out of 405 pH samples exceed the water quality objective. The weight of evidence indicates that there is sufficient justification against placing this water segment-pollutant combination on the Section 303(d) List in the Water Quality Limited Segments category (i.e., sufficient justification to not list). This conclusion is based on the staff findings that: (1) The data used satisfies the data quality requirements of Section 6.1.4 of the Policy. (2) The data used satisfies the data quantity requirements of Section 6.1.5 of the Policy. (3) Eleven out of 405 pH samples exceed the water quality objective, and this does not exceed the allowable frequency of 68 per the binomial distribution described in Section 3.2 of the Listing Policy. (4) Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

RWQCB Staff Recommendation: For Pocket Canyon Creek, after review of the available data and information, North Coast Regional Water Board staff concludes that the water body-pollutant combination should be removed from the Section 303(d) List because applicable water quality standards for the pollutant are being attained.

For the rest of the Guerneville HSA, after review of the available data and information, North Coast Regional Water Board staff concludes that the water body-pollutant combination should not be placed on the Section 303(d) List because applicable water

quality standards are being attained.

**SWRCB Board Decision
/ Staff Recommendation:**

USEPA Decision:

Lines of Evidence (LOEs) for Decision ID 4555

LOE ID: 6086

Pollutant: pH
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: None

Beneficial Use: Cold Freshwater Habitat
Aquatic Life Use: Fish Migration | Fish Spawning | Freshwater Replenishment | Preservation of Rare & Endangered Species | Warm Freshwater Habitat | Wildlife Habitat

Number of Samples: 3
Number of Exceedances: 0

Data and Information Type: Physical/Chemical Monitoring

Data Used to Assess Water Quality: None of the 3 pH samples collected in Fife Creek exceed the pH water quality objective. The samples were collected by Regional Water Board staff as part of a targeted sampling event on Fife Creek. Data are summarized by Goodwin (1999).

Data Reference: [Interoffice Communication from Cathy Goodwin to the Russian River Monitoring File Regarding Fife Creek Monitoring Data. North Coast Regional Water Quality Control Board. July 9, 1999](#)

Water Quality Objective/Criterion: Per the Basin Plan (NCRWQCB 2007, p. 3-8.00): The maximum pH objective is 8.5. The minimum pH objective is 6.5.
Objective/Criterion Reference: [Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board](#)

Evaluation Guideline: Guideline Reference:

Spatial Representation: The samples were collected from 3 sites in Fife Creek, a tributary to the Russian River. The first site is Upper Fife Creek, which is located immediately upstream of the Armstrong Woods State Preserve upper parking area and picnic grounds. The second site is Mid Fife Creek, which is located approximately 500' downstream of the Armstrong Woods Ranger Kiosk. The third site is Fife Creek at Mill Street, which is located at the dead end of Mill Street.

Temporal Representation: The samples were collected on June 17, 1999, as instantaneous grab samples and do not represent diurnal conditions.

Environmental Conditions: There are no known environmental conditions (e.g., seasonality, land use practices, fire events, storms, etc.) that are related to these data.

QAPP Information: Minimal quality control was conducted as described by Goodwin (1999).
QAPP Information Reference(s): [Interoffice Communication from Cathy Goodwin to the Russian River Monitoring File Regarding Fife Creek Monitoring Data. North Coast Regional Water Quality Control Board. July 9, 1999](#)

LOE ID:	6127
Pollutant:	pH
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Aquatic Life Use:	Fish Migration Fish Spawning Freshwater Replenishment Preservation of Rare & Endangered Species Warm Freshwater Habitat Wildlife Habitat
Number of Samples:	3
Number of Exceedances:	1
Data and Information Type:	Physical/Chemical Monitoring
Data Used to Assess Water Quality:	One of the 3 pH samples collected in Dutch Bill Creek exceeds the pH water quality objective. Sample pH concentrations range from 6 to 7.2. The samples were collected as part of the Russian River First Flush sampling event. Data are summarized by Katznelson et al. (2003).
Data Reference:	<u>2002 Russian River First Flush Summary Report. Clean Water Team, Citizen Monitoring Program of the State Water Resources Control Board</u>
Water Quality Objective/Criterion:	Per the Basin Plan (NCRWQCB 2007, p. 3-8.00): The maximum pH objective is 8.5. The minimum pH objective is 6.5.
Objective/Criterion Reference:	<u>Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board</u>
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from 3 sites in Dutch Bill Creek as follows: (1) at Camp Meeker / Alliance Redwoods Camp; (2) at Graton Road at Bohemian Highway; and (3) in Dutch Bill Creek headwaters at Graton Road.
Temporal Representation:	The samples were collected on November 7, 2002. At each site, 3 instantaneous grab samples were collected over half hour increments. The data are averaged for each site.
Environmental Conditions:	Samples were collected during the first runoff event of the rainy season.
QAPP Information:	Samples were collected in accordance with the study plan and quality control procedures described by Katznelson et al. (2003).
QAPP Information Reference(s):	<u>2002 Russian River First Flush Summary Report. Clean Water Team, Citizen Monitoring Program of the State Water Resources Control Board</u>

LOE ID:	6135
Pollutant:	pH
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Aquatic Life Use:	Fish Migration Fish Spawning Freshwater Replenishment Preservation of Rare & Endangered Species Warm Freshwater Habitat Wildlife Habitat

Number of Samples:	1
Number of Exceedances:	1
Data and Information Type:	Physical/Chemical Monitoring
Data Used to Assess Water Quality:	One of the 1 pH samples collected in Fife Creek exceeds the pH water quality objective. The sample pH concentration is 5.8. The sample was collected as part of the Russian River First Flush sampling event. Data are summarized by Katznelson et al. (2003).
Data Reference:	<u>2002 Russian River First Flush Summary Report. Clean Water Team, Citizen Monitoring Program of the State Water Resources Control Board</u>
Water Quality Objective/Criterion Reference:	Per the Basin Plan (NCRWQCB 2007, p. 3-8.00): The maximum pH objective is 8.5. The minimum pH objective is 6.5. <u>Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board</u>
Evaluation Guideline Reference:	
Spatial Representation:	The samples were collected from 1 site at Fife Creek where it intersects with Highway 116.
Temporal Representation:	The samples were collected on November 7, 2002. At each site, 3 instantaneous grab samples were collected over half hour increments. The data are averaged for each site. Samples were collected during the first runoff event of the rainy season.
Environmental Conditions:	
QAPP Information:	Samples were collected in accordance with the study plan and quality control procedures described by Katznelson et al. (2003).
QAPP Information Reference(s):	<u>2002 Russian River First Flush Summary Report. Clean Water Team, Citizen Monitoring Program of the State Water Resources Control Board</u>

LOE ID: 8986

Pollutant: pH
 LOE Subgroup: Pollutant-Water
 Matrix: Water
 Fraction: None

Beneficial Use: Cold Freshwater Habitat
 Aquatic Life Use: Fish Migration | Fish Spawning | Preservation of Rare & Endangered Species | Warm Freshwater Habitat | Wildlife Habitat

Number of Samples: 33
 Number of Exceedances: 1

Data and Information Type: Physical/Chemical Monitoring
 Data Used to Assess Water Quality: One of the 33 samples for pH collected in Lancel Creek exceeded the pH water quality objective. The pH values ranged from 6.7 to 9.1. These samples were collected by the Community Clean Water Institute's Volunteer Water Quality Monitoring Program (CCWI 2005, CCWI 2006, CCWI 2007).
 Data Reference: Community Clean Water Institute Master Data for 2005. Downloaded from <http://ccwi.org/issues/data.htm> on August 25, 2008
Community Clean Water Institute Master Data for 2006. Downloaded from <http://ccwi.org/issues/data.htm> on August 25, 2008

Community Clean Water Institute Master Data for 2004. Downloaded from <http://ccwi.org/issues/data.htm> on October 1, 2008

Water Quality Objective/Criterion: Per the Basin Plan (NCRWQCB 2007): The maximum pH objective is 8.5. The minimum pH objective is 6.5.
 Objective/Criterion Reference: Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board

Evaluation Guideline:
 Guideline Reference:

Spatial Representation: One site was monitored on Lancel Creek.
 Temporal Representation: The pH samples were collected during 33 site visits from January 2004 to December 2006. The pH samples were collected as instantaneous measurements and do not represent diurnal conditions.

Environmental Conditions: There are no known environmental conditions (e.g., seasonality, land use practices, fire events, storms, etc.) that are related to these data.
 QAPP Information: Samples were collected in accordance with the "Community Clean Water Institute Volunteer Water Quality Monitoring Program Sampling and Analysis Methods" (CCWI 2007).

QAPP Information Reference(s): Community Clean Water Institute Volunteer Water Quality Monitoring Program Sampling and Analysis Methods. Updated April 12, 2007

LOE ID: 6143

Pollutant: pH
 LOE Subgroup: Pollutant-Water
 Matrix: Water
 Fraction: None

Beneficial Use: Cold Freshwater Habitat
 Aquatic Life Use: Fish Migration | Fish Spawning | Freshwater Replenishment | Preservation of Rare & Endangered Species | Warm Freshwater Habitat | Wildlife Habitat

Number of Samples: 1
 Number of Exceedances: 0

Data and Information Type: Physical/Chemical Monitoring
 Data Used to Assess Water Quality: None of the 1 pH sample collected in Hobson Creek exceeds the pH water quality objective. The sample pH concentration is 7.5. The sample was collected as part of the Russian River First Flush sampling event. Data are summarized by Katznelson et al. (2003).

Data Reference: 2002 Russian River First Flush Summary Report. Clean Water Team. Citizen Monitoring Program of the State Water Resources Control Board

Water Quality Objective/Criterion: Per the Basin Plan (NCRWQCB 2007, p. 3-8.00): The maximum pH objective is 8.5. The minimum pH objective is 6.5.
 Objective/Criterion Reference: Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board

Evaluation Guideline:
 Guideline Reference:

Spatial Representation: The samples were collected from 1 site in Hobson Creek where it intersects with Skyline

Temporal Representation: Road near McPeak Road. Hobson Creek empties into the Russian River near Hacienda. The samples were collected on November 7, 2002. At each site, 3 instantaneous grab samples were collected over half hour increments. The data are averaged for each site.

Environmental Conditions: Samples were collected during the first runoff event of the rainy season.

QAPP Information: Samples were collected in accordance with the study plan and quality control procedures described by Katznelson et al. (2003).

QAPP Information Reference(s): 2002 Russian River First Flush Summary Report. Clean Water Team, Citizen Monitoring Program of the State Water Resources Control Board

LOE ID: 8917

Pollutant: pH
 LOE Subgroup: Pollutant-Water
 Matrix: Water
 Fraction: None

Beneficial Use: Cold Freshwater Habitat
 Aquatic Life Use: Fish Migration | Fish Spawning | Preservation of Rare & Endangered Species | Warm Freshwater Habitat | Wildlife Habitat

Number of Samples: 29
 Number of Exceedances: 0

Data & Information Type: Physical/Chemical Monitoring
 Data Used to Assess Water Quality: None of the 29 samples for pH collected in Jenner Gulch exceed the pH water quality objective. The pH values range from 7.5 to 8.5. These samples were collected by the Community Clean Water Institute's Volunteer Water Quality Monitoring Program (CCWI 2005, CCWI 2006, CCWI 2007).

Data Reference: Community Clean Water Institute Master Data for 2005. Downloaded from <http://ccwi.org/issues/data.htm> on August 25, 2008
Community Clean Water Institute Master Data for 2006. Downloaded from <http://ccwi.org/issues/data.htm> on August 25, 2008
Community Clean Water Institute Master Data for 2004. Downloaded from <http://ccwi.org/issues/data.htm> on October 1, 2008

Water Quality Objective/Criterion: Per the Basin Plan (NCRWQCB 2007): The maximum pH objective is 8.5. The minimum pH objective is 6.5.
 Objective/Criterion Reference: Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board

Evaluation Guideline:
 Guideline Reference:

Spatial Representation: The samples were collected from one site in Jenner Gulch.
 Temporal Representation: The pH samples were collected during 29 site visits from February 2004 to October 2006. The pH samples were collected as instantaneous measurements and do not represent diurnal conditions.

Environmental Conditions: There are no known environmental conditions (e.g., seasonality, land use practices, fire events, storms, etc.) that are related to these data.
 QAPP Information: Samples were collected in accordance with the "Community Clean Water Institute Volunteer Water Quality Monitoring Program Sampling and Analysis Methods" (CCWI 2007).

QAPP Information Reference(s): Community Clean Water Institute Volunteer Water Quality Monitoring Program Sampling and Analysis Methods. Updated April 12, 2007

LOE ID:	8993
Pollutant:	pH
LOE Subgroup:	Pollutant-Water
Matrix:	Water
Fraction:	None
Beneficial Use:	Cold Freshwater Habitat
Aquatic Life Use:	Fish Migration Fish Spawning Preservation of Rare & Endangered Species Warm Freshwater Habitat Wildlife Habitat
Number of Samples:	174
Number of Exceedances:	6
Data and Information Type:	Physical/Chemical Monitoring
Data Used to Assess Water Quality:	Six of the 176 samples for pH collected in the Russian River exceeded the pH water quality objective. The pH values ranged from 6.9 to 9.0. These samples were collected by the Community Clean Water Institute's Volunteer Water Quality Monitoring Program (CCWI 2005, CCWI 2006, CCWI 2007).
Data Reference:	<u>Community Clean Water Institute Master Data for 2005. Downloaded from http://ccwi.org/issues/data.htm on August 25, 2008</u> <u>Community Clean Water Institute Master Data for 2006. Downloaded from http://ccwi.org/issues/data.htm on August 25, 2008</u> <u>Community Clean Water Institute Master Data for 2004. Downloaded from http://ccwi.org/issues/data.htm on October 1, 2008</u>
Water Quality Objective/Criterion:	Per the Basin Plan (NCRWQCB 2007): The maximum pH objective is 8.5. The minimum pH objective is 6.5.
Objective/Criterion Reference:	<u>Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board</u>
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	Eight sites were sampled on the lower Russian River mainstem from Odd Fellow's Park downstream of Rio Dell to the mouth of the river in Jenner.
Temporal Representation:	The pH samples were collected during 174 site visits from February 2004 to December 2006. The pH samples were collected as instantaneous measurements and do not represent diurnal conditions.
Environmental Conditions:	There are no known environmental conditions (e.g., seasonality, land use practices, fire events, storms, etc.) that are related to these data.
QAPP Information:	Samples were collected in accordance with the "Community Clean Water Institute Volunteer Water Quality Monitoring Program Sampling and Analysis Methods" (CCWI 2007).
QAPP Information Reference(s):	<u>Community Clean Water Institute Volunteer Water Quality Monitoring Program Sampling and Analysis Methods. Updated April 12, 2007</u>

LOE ID: 1712

Pollutant: pH
 LOE Subgroup: Pollutant-Water
 Matrix: Water
 Fraction: None

Beneficial Use: Cold Freshwater Habitat

Number of Samples: 27
 Number of Exceedances: 6

Data and Information Type: Not Specified
 Data Used to Assess Water Quality: Six out of 27 samples did not meet the minimum of the objective. The samples below 6.5 ranged from 6 to 6.4 (Sandler, 2004).
 Data Reference: Placeholder reference 2006 303(d)

Water Quality Objective/Criterion: Basin Plan: pH for Russian River shall not be depressed below 6.5 nor raised above 8.5. Changes in normal ambient pH levels shall not exceed 0.2 units in waters with designated marine (MAR) or saline (SAL) beneficial uses nor 0.5 units within the range specified above in fresh waters with designated COLD or WARM beneficial uses.
 Objective/Criterion Reference: Placeholder reference 2006 303(d)

Evaluation Guideline: Guideline Reference:

Spatial Representation: Sampling was done in Pocket (Canyon) Creek a tributary to the lower Russian River within the greater Guerneville HSA. PCC020 is located in Guerneville, at 12170 Hwy 116, downstream of Inn and the tank in the creek. PCC030 is located in Guerneville, at 11900 Hwy 116, in the backyard. PCC040 is located in Guerneville, 50 feet upstream from bridge along Hwy 116 at May's Canyon Road. This listing should be focused on Pocket Canyon Creek because sampling was limited to Pocket Creek a tributary to the lower Russian River within the greater Guerneville HSA.

Temporal Representation: Samples were taken at all 3 sites once a month on the same days in January, February, March, May, and August through December 2003.

Environmental Conditions:
 QAPP Information: Draft QAPP for Volunteer Water Quality Monitoring Project for the Community Clean Water Institute.
 QAPP Information Reference(s):

LOE ID: 8992

Pollutant: pH
 LOE Subgroup: Pollutant-Water
 Matrix: Water
 Fraction: None

Beneficial Use: Cold Freshwater Habitat
 Aquatic Life Use: Fish Migration | Fish Spawning | Preservation of Rare & Endangered Species | Warm

Freshwater Habitat | Wildlife Habitat

Number of Samples: 103
 Number of Exceedances: 0

Data and Information Type: Physical/Chemical Monitoring

Data Used to Assess Water Quality: None of the 103 samples for pH collected in Pocket Canyon Creek exceeded the pH water quality objective. The pH values ranged from 6.9 to 8.4. These samples were collected by the Community Clean Water Institute's Volunteer Water Quality Monitoring Program (CCWI 2005, CCWI 2006, CCWI 2007).

Data Reference: [Community Clean Water Institute Master Data for 2005. Downloaded from http://ccwi.org/issues/data.htm on August 25, 2008](http://ccwi.org/issues/data.htm)
[Community Clean Water Institute Master Data for 2006. Downloaded from http://ccwi.org/issues/data.htm on August 25, 2008](http://ccwi.org/issues/data.htm)
[Community Clean Water Institute Master Data for 2004. Downloaded from http://ccwi.org/issues/data.htm on October 1, 2008](http://ccwi.org/issues/data.htm)

Water Quality Objective/Criterion: Per the Basin Plan (NCRWQCB 2007): The maximum pH objective is 8.5. The minimum pH objective is 6.5.
 Objective/Criterion Reference: [Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board](#)

Evaluation Guideline:
 Guideline Reference:

Spatial Representation: Samples were collected from three sites on Pocket Canyon Creek from May's Canyon Road to Santa Nella House.

Temporal Representation: The pH samples were collected during 103 site visits from January 2004 to December 2006. The pH samples were collected as instantaneous measurements and do not represent diurnal conditions.

Environmental Conditions: There are no known environmental conditions (e.g., seasonality, land use practices, fire events, storms, etc.) that are related to these data.

QAPP Information: Samples were collected in accordance with the "Community Clean Water Institute Volunteer Water Quality Monitoring Program Sampling and Analysis Methods" (CCWI 2007).

QAPP Information Reference(s): [Community Clean Water Institute Volunteer Water Quality Monitoring Program Sampling and Analysis Methods. Updated April 12, 2007](#)

LOE ID: 8908

Pollutant: pH
 LOE Subgroup: Pollutant-Water
 Matrix: Water
 Fraction: None

Beneficial Use: Cold Freshwater Habitat
 Aquatic Life Use: Fish Migration | Fish Spawning | Preservation of Rare & Endangered Species | Warm Freshwater Habitat | Wildlife Habitat

Number of Samples: 161
 Number of Exceedances: 2

Data and Information Type: Physical/Chemical Monitoring

Data Used to Assess Water Quality:	Two of the 161 samples for pH collected in Dutch Bill Creek exceeded the pH water quality objective. The pH values ranged from 6.6 to 8.9. These samples were collected by the Community Clean Water Institute's Volunteer Water Quality Monitoring Program (CCWI 2005, CCWI 2006, CCWI 2007).
Data Reference:	<u>Community Clean Water Institute Master Data for 2005. Downloaded from http://ccwi.org/issues/data.htm on August 25, 2008</u> <u>Community Clean Water Institute Master Data for 2006. Downloaded from http://ccwi.org/issues/data.htm on August 25, 2008</u> <u>Community Clean Water Institute Master Data for 2004. Downloaded from http://ccwi.org/issues/data.htm on October 1, 2008</u>
Water Quality Objective/Criterion:	Per the Basin Plan (NCRWQCB 2007): The maximum pH objective is 8.5. The minimum pH objective is 6.5.
Objective/Criterion Reference:	<u>Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board</u>
Evaluation Guideline:	
Guideline Reference:	
Spatial Representation:	The samples were collected from 5 sites in the upper half of the mainstem of Dutch Bill Creek from Occidental to the fish ladder.
Temporal Representation:	The pH samples were collected during 161 site visits from January 2004 to December 2006. The pH samples were collected as instantaneous measurements and do not represent diurnal conditions.
Environmental Conditions:	There are no known environmental conditions (e.g., seasonality, land use practices, fire events, storms, etc.) that are related to these data.
QAPP Information:	Samples were collected in accordance with the "Community Clean Water Institute Volunteer Water Quality Monitoring Program Sampling and Analysis Methods" (CCWI 2007).
QAPP Information Reference(s):	<u>Community Clean Water Institute Volunteer Water Quality Monitoring Program Sampling and Analysis Methods. Updated April 12, 2007</u>

WATER BODY NAME: RUSSIAN RIVER HU, MIDDLE RUSSIAN RIVER HA, LAGUNA DE SANTA ROSA

Water Body ID: CAR1142102019980709171122
Water Body Type: River & Stream

DECISION ID 13350

Pollutant: INDICATOR BACTERIA

Final Listing Decision: List on 303(d) list (TMDL required list)
Last Listing Cycle's Final Listing Decision: New Decision
Revision Status: Revised
Sources: Source Unknown
Expected TMDL Completion Date: 2012
Pollutant or Pollution: Pollutant

Weight of Evidence: Indicator bacteria (which includes E. Coli and total coliform) in the Laguna de Santa Rosa is being considered for placement on the Section 303(d) List under Section 3.2 of the Listing Policy. Under Section 3.2, a single line of evidence is necessary to assess listing status. Four lines of evidence are available in the administrative record to assess this pollutant. All 7 of the 7 E. Coli samples and 6 of the 7 total coliform samples exceed the evaluation guidelines used to interpret the water quality objective. Based on the readily available data and information, the weight of evidence indicates that there is sufficient justification in favor of placing this water segment-pollutant combination on the Section 303(d) List in the Water Quality Limited Segments category (i.e., sufficient justification to list). This conclusion is based on the staff findings that: (1) The data used satisfies the data quality requirements of Section 6.1.4 of the Policy. (2) The data used satisfies the data quantity requirements of Section 6.1.5 of the Policy. (3) All 7 of the 7 E. Coli samples and 6 of the 7 total coliform samples exceed the evaluation guidelines used to interpret the water quality objective, and this exceeds the allowable frequency listed in Table 3.2 of the Listing Policy. (4) Pursuant to Section 3.11 of the Listing Policy, no additional data and information are available indicating that standards are not met.

RWQCB Staff Recommendation: After review of the available data and information, North Coast Regional Water Board staff concludes that the water body-pollutant combination should be placed on the Section 303(d) List because applicable water quality standards are not being attained and a pollutant contributes to or causes the problem.

SWRCB Board Decision / Staff Recommendation:

USEPA Decision:

Lines of Evidence (LOEs) for Decision ID 13350

LOE ID: 6207
Pollutant: Total Coliform
LOE Subgroup: Pollutant-Water
Matrix: Water
Fraction: Total

Beneficial Use:	Water Contact Recreation
Number of Samples:	6
Number of Exceedances:	5
Data and Information Type:	Physical/Chemical Monitoring
Data Used to Assess Water Quality:	Five of the 6 total coliform samples from the Laguna de Santa Rosa Watershed exceed the evaluation guideline. Sample concentrations range from 8,700 to more than 240,000 MPN / 100 ml. The samples were collected as part of the Russian River First Flush sampling event. Data are summarized by Katznelson et al. (2003).
Data Reference:	<u>2002 Russian River First Flush Summary Report. Clean Water Team, Citizen Monitoring Program of the State Water Resources Control Board</u>
Water Quality Objective/Criterion Objective/Criterion Reference:	Per the Basin Plan (NCRWQCB 2007): The bacteriological quality of waters of the North Coast Region shall not be degraded beyond natural background levels. <u>Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board</u>
Evaluation Guideline:	Per the "Draft Guidance for Fresh Water Beaches" (DHS 2006): Beach posting is recommended when single sample total coliform levels exceed 10,000 MPN / 100 ml. *Note: MPN is the most probable number of coliform units.
Guideline Reference:	<u>Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Health Services Division of Drinking Water and Environmental Management.</u>
Spatial Representation:	The samples were collected from 6 sites in the Laguna de Santa Rosa Watershed as follows: (1) in Zymfin Creek at Morris Street in Sebastopol; (2) in Calder Creek at the Joe Radota Trail in Sebastopol; (3) in Cooper Creek at Cooper Road; (4) in Copeland Creek at Commerce Boulevard in Rohnert Park; (5) in an outfall into Cotati Creek north of East Cotati Avenue; and (6) in Cotati Creek at East Cotati Avenue.
Temporal Representation:	The samples were collected on November 7, 2002. At each site, 3 instantaneous grab samples were collected over half hour increments. The data are averaged for each site.
Environmental Conditions:	Samples were collected during the first runoff event of the rainy season.
QAPP Information:	Samples were collected in accordance with the study plan and quality control procedures described by Katznelson et al. (2003).
QAPP Information Reference(s):	<u>2002 Russian River First Flush Summary Report. Clean Water Team, Citizen Monitoring Program of the State Water Resources Control Board</u>

LOE ID: 7075

Pollutant: Escherichia coli (E. Coli)
 LOE Subgroup: Pollutant-Water
 Matrix: Water
 Fraction: Total

Beneficial Use: Water Contact Recreation

Number of Samples: 1
 Number of Exceedances: 1

Data and Information Type: Physical/Chemical Monitoring
 Data Used to Assess: One of the 1 E. coli samples from the Laguna de Santa Rosa exceeds the evaluation

Water Quality: guideline. The sample concentration is 23,100 MPN / 100 ml. The sample was collected by the Community Clean Water Institute (CCWI 2006).

Data Reference: Community Clean Water Institute Master Data for 2005. Downloaded from <http://ccwi.org/issues/data.htm> on August 25, 2008

Water Quality Objective/Criterion: Per the Basin Plan (NCRWQCB 2007): The bacteriological quality of waters of the North Coast Region shall not be degraded beyond natural background levels.

Objective/Criterion Reference: Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board

Evaluation Guideline: Per the "Draft Guidance for Fresh Water Beaches" (DHS 2006): Beach posting is recommended when single sample E. coli levels exceed 235 MPN / 100 ml. *Note: MPN is the most probable number of coliform units.

Guideline Reference: Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Health Services Division of Drinking Water and Environmental Management.

Spatial Representation: As described by CCWI, the sample was collected from the Laguna de Santa Rosa at the gage station behind the Sebastopol Community Center in Sebastopol. Regional Water Board staff are unaware of any gage in this area of the Laguna de Santa Rosa.

Temporal Representation: The sample was collected on January 4, 2006.

Environmental Conditions: There are no known environmental conditions (e.g., seasonality, land use practices, fire events, storms, etc.) that are related to these data.

QAPP Information: The samples were collected in accordance the "Community Clean Water Institute Volunteer Water Quality Monitoring Program Sampling and Analysis Methods" (CCWI 2007).

QAPP Information Reference(s): Community Clean Water Institute Volunteer Water Quality Monitoring Program Sampling and Analysis Methods. Updated April 12, 2007

LOE ID: 7067

Pollutant: Total Coliform
 LOE Subgroup: Pollutant-Water
 Matrix: Water
 Fraction: Total

Beneficial Use: Water Contact Recreation

Number of Samples: 1
 Number of Exceedances: 1

Data and Information Type: Physical/Chemical Monitoring

Data Used to Assess Water Quality: One of 1 total coliform samples collected from the Laguna de Santa Rosa exceeds the evaluation guideline. The sample concentration is 101,120 MPN / 100 ml. The sample was collected by the Community Clean Water Institute (CCWI 2007).

Data Reference: Community Clean Water Institute Master Data for 2006. Downloaded from <http://ccwi.org/issues/data.htm> on August 25, 2008

Water Quality Objective/Criterion: Per the Basin Plan (NCRWQCB 2007): The bacteriological quality of waters of the North Coast Region shall not be degraded beyond natural background levels.

Objective/Criterion Reference: Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board

Evaluation Guideline: Per the "Draft Guidance for Fresh Water Beaches" (DHS 2006): Beach posting is

recommended when single sample total coliform levels exceed 10,000 MPN / 100 ml.
 *Note: MPN is the most probable number of coliform units.

Guideline Reference: Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Health Services Division of Drinking Water and Environmental Management.

Spatial Representation: As described by CCWI, the sample was collected from the Laguna de Santa Rosa at the gage station behind the Sebastopol Community Center in Sebastopol. Regional Water Board staff are unaware of any gage in this area of the Laguna de Santa Rosa.

Temporal Representation: The sample was collected on January 4, 2006.

Environmental Conditions: There are no known environmental conditions (e.g., seasonality, land use practices, fire events, storms, etc.) that are related to these data.

QAPP Information: The sample was collected in accordance with the "Community Clean Water Institute Volunteer Water Quality Monitoring Program Sampling and Analysis Methods" (CCWI 2007).

QAPP Information Reference(s): Community Clean Water Institute Volunteer Water Quality Monitoring Program Sampling and Analysis Methods. Updated April 12, 2007

LOE ID: 6206

Pollutant: **Escherichia coli (E. Coli)**
 LOE Subgroup: Pollutant-Water
 Matrix: Water
 Fraction: Total

Beneficial Use: Water Contact Recreation

Number of Samples: 6
 Number of Exceedances: 6

Data and Information Type: Physical/Chemical Monitoring

Data Used to Assess Water Quality: All 6 of the 6 E. coli samples from the Laguna de Santa Rosa Watershed exceed the evaluation guideline. Concentrations range from 307 to 27,700 MPN / 100 ml. The samples were collected as part of the Russian River First Flush sampling event. Data are summarized by Katznelson et al. (2003).

Data Reference: 2002 Russian River First Flush Summary Report. Clean Water Team, Citizen Monitoring Program of the State Water Resources Control Board

Water Quality Objective/Criterion: Per the Basin Plan (NCRWQCB 2007): The bacteriological quality of waters of the North Coast Region shall not be degraded beyond natural background levels.
 Objective/Criterion Reference: Water Quality Control Plan for the North Coast Region. North Coast Regional Water Quality Control Board

Evaluation Guideline: Per the "Draft Guidance for Fresh Water Beaches" (DHS 2006): Beach posting is recommended when single sample E. coli levels exceed 235 MPN / 100 ml. *Note: MPN is the most probable number of coliform units.

Guideline Reference: Draft Guidance for Fresh Water Beaches. Last Update: May 8, 2006. Initial Draft: November 1997. California Department of Health Services Division of Drinking Water and Environmental Management.

Spatial Representation: The samples were collected from 6 sites in the Laguna de Santa Rosa Watershed as follows: (1) in Zymfin Creek at Morris Street in Sebastopol; (2) in Calder Creek at the Joe Radota Trail in Sebastopol; (3) in Cooper Creek at Cooper Road; (4) in Copeland Creek at Commerce Boulevard in Rohnert Park; (5) in an outfall into Cotati Creek north

of East Cotati Avenue; and (6) in Cotati Creek at East Cotati Avenue.

Temporal Representation: The samples were collected on November 7, 2002. At each site, 3 instantaneous grab samples were collected over half hour increments. The data are averaged for each site.

Environmental Conditions: Samples were collected during the first runoff event of the rainy season.

QAPP Information: Samples were collected in accordance with the study plan and quality control procedures described by Katznelson et al. (2003).

QAPP Information Reference(s): 2002 Russian River First Flush Summary Report. Clean Water Team, Citizen Monitoring Program of the State Water Resources Control Board

Appendix B: Response to Comments Submitted During the Data Solicitation Period

The public solicitation of data and information began on December 4, 2006, and concluded on February 28, 2007. Regional Water Board staff received twenty-three requests for the review of the 2006 303(d) List for particular waterbodies and/or pollutants. Many of these requests included data and information used to develop and revise fact sheets for the 2008 Integrated Report. This appendix includes detailed responses by Regional Water Board staff to comments raised by the public in their submittal letters during the data solicitation period.

LIST OF INDIVIDUALS THAT SUBMITTED COMMENTS

The following individuals submitted comments during the public data solicitation period.

1. Anonymous
2. Margaret Bacigalupi, Northern California River Watch
3. Jess Brown, Geomatrix Consultants, Inc.
4. Daniel Cheney, Pacific Shellfish Institute
5. Regina Chichizola, Klamath Riverkeeper – Regarding microcystin toxin.
6. Regina Chichizola, Klamath Riverkeeper – Regarding sediment.
7. Patricia Clary, Californians for Alternatives to Toxics
8. Susan Corum, Karuk Tribe Department of Natural Resources
9. Andrea Davis, Wiyot Tribe
10. Michele Dias, California Forestry Association
11. Clark Fenton, Salmon Forever
12. Ken Fetcho, Yurok Tribe Environmental Program
13. Stephen Fuller-Rowell, Sonoma County Water Coalition
14. Larry Hanson
15. Stephen Horner, Barnum Timber Company
16. William P. Krum, Siskiyou Resource Conservation District
17. David Leland, North Coast Regional Water Board
18. Pamela Miller
19. Miyoko Sakashita, Center for Biological Diversity
20. John Sanders, Department of Pesticide Regulation
21. Sarah Shaeffer, Community Clean Water Institute
22. Michelle Smith, Humboldt Baykeeper
23. John R. West, USFS, Klamath National Forest

Staff responses to comments applicable to the Integrated Report are listed below by comment number.

Specifics on staff's data analysis, information, and decisions are found in the fact sheets for each waterbody/pollutant pair and are not included in this Appendix verbatim.

STAFF RESPONSES TO COMMENTS SUBMITTED DURING THE DATA SOLICITATION PERIOD

1.1 Anonymous

Comment: Attachments in support of Klamath River 303 d listing for sediment.

Response: North Coast Regional Water Board staff assessed the documents attached to the anonymous e-mail. Data and information from the Beaver Creek Environmental Analysis (USFS 1996) and the Horse Creek Ecosystem Analysis (USFS 2002) were analyzed and incorporated into the fact sheets for the sediment in the Klamath River as part of the 2008 Integrated Report update. The letter from Patrick Higgins to Art Baggett dated June 11, 2004, was assessed previously during the 2006 303(d) List update. The Plaintiffs' Memorandum in Support of Motion for Summary Judgment in regards to the Klamath-Siskiyou Wildland Center et al. v. USFS case does not contain data that can be analyzed under the provisions of the 303(d) Listing Policy. The Six Rivers National Forest Roads Analysis (USFS 2003) also does not contain data that can be analyzed to evaluate instream sediment conditions in the Klamath River. While the Roads Analysis does contain hazard ratings for several sediment-related categories, the hazard ratings only show the potential for water quality impairment.

2.1 Margaret Bacigalupi, Northern California River Watch

Comment: Please accept this letter in support of the March 16, 2007 request from the Sonoma County Water Coalition for the listing of the Laguna de Santa Rosa as impaired with respect to Ludwigia.

Response: In 2004, the Sonoma County Ludwigia Task Force hosted by the Laguna Foundation stated that the most desirable solution for Ludwigia control is to restore the natural processes that reduce Ludwigia growth in the Laguna system. The worst infestations are associated with thick sediments in shallow, slow-moving, nutrient-rich waters in full sun. The Task Force recommended an effort for long-term control strategies that included improved water quality to reduce nutrient loads and sedimentation.

North Coast Regional Water Board staff agree with the Task Force's recommendation and have determined that the presence of Ludwigia in the Laguna de Santa Rosa is a symptom of the sediment, nutrients, temperature, and dissolved oxygen impairments. The Regional Water Board is currently developing total maximum daily loads (TMDL) that will address these impairments in the Laguna and its tributaries. The TMDL Implementation Plan will result in reductions in loads for nutrients and sediment that provide habitat which favors natural aquatic communities in place of Ludwigia. As such, the TMDL process will address the pollutant loads that result in providing habitat for the Ludwigia to thrive.

3.1 Jess Brown, Geomatrix

Comment: The Harbor Bay Harbor, Recreation, and Conservation District requests that North Coast Regional Water Board staff evaluate and use submitted data and information (a total of 17 reports make up the submittal) in developing the 2008 Integrated Report and conducting a listing/de-listing analysis for polychlorinated dibenzo-p-dioxins and polychlorinated dibenzo-p-furans (dioxins) in Humboldt Bay in accordance with the requirements of the Water Quality Control Policy For Developing California's Clean Water Act Section 303(d) List.

The submitted data was not reviewed during the State Water Board staff evaluation that led to the October 25, 2006, Humboldt Bay dioxins Clean Water Act Section 303(d) listing, except for the two following reports:

1. "Scoping Ecological and Off-Site Human Health Risk Assessment, Sierra Pacific Industries, Arcata Division Sawmill, Arcata California. September 2004." Sierra Pacific Industries.
2. "Cooperative Eureka Waterfront Facilities Maintenance Dredging Project, Eureka Channel, Humboldt Bay, California, Sampling Results Report for Dioxins/Furans, PCP and PCB Testing. December 2005." City of Eureka and Humboldt Bay Harbor District.

Response: Data from five of the submitted reports were analyzed and have been input into the fact sheets for the 2008 Integrated Report. Three of these reports are baseline surveys from fiscal years 1993, 1994, and 1995 for the "Chemical Analysis, Toxicity Evaluation, and Bioaccumulation Exposure of Sediments from Humboldt Bay." The fourth report is "California Department of Health Services Dioxins in Molluscan Shellfish, Humboldt Bay Sampling, April 15 to April 18, 2003." The fifth report is "Dioxin Lab Sheet and Summaries, Pulp Mill Effluent Summaries, 1989 and 1990."

Three of the submitted reports were already analyzed by State Water Board staff during the 2006 303(d) List process. These reports are the two mentioned above in the comment, plus the "Revised Supplement to Scoping Ecological and Of-site Human Health Risk Assessment, Sierra Pacific Industries, Arcata Division Sawmill, Arcata California. September 2006." North Coast Regional Water Board staff did not re-analyze these reports.

The rest of the submitted reports were not analyzed by staff nor input into the fact sheets for the Integrated Report due to data limitations of the reports as described below:

1. "Bioassays and Bioaccumulation Testing, Humboldt Bay, Final Report," "Bioassays and Bioaccumulation Testing of Sediments from Humboldt Harbor," "Bioassay, Bioaccumulation, and Chemical Testing of Sediments from Humboldt

Bay Harbor," "Chemical Analysis of Sediments from Humboldt Bay, Final Report," "United States Army Corps of Engineers Humboldt Harbor Interior Channels: FY 2001 O&M Maintenance Dredging, Sampling and Analysis Results," and "Chemical, Physical and Biological Testing of Sediments from the Humboldt Harbor Federal Channel, Eureka, California" all do not contain dioxin or furan data, only PCB data. There was no request for the staff to analyze PCB data.

2. "Chemical Analysis and Toxicity Evaluation of Sediments from Eureka Channel Extension, Humboldt Harbor for 1999 Maintenance Dredging, Final Report" does not include the individual dioxin and furan congeners used to calculate the total PCDD and PCDF values. The raw data, which were supposedly found in Appendix C-1, were not submitted. Additionally, the report does not state which of the toxic equivalent factors (e.g., mammal, fish, or bird) were used to calculate the toxic equivalent concentration. Due to these limitations, staff were unable to compare the data to the evaluation guideline.

3. "United States Army Corps of Engineers Humboldt Harbor Bar and Entrance Channel FY 2000 O&M Maintenance Dredging, Sampling and Analysis Results" does not include dioxin or furan data, only data on sediment grain size.

4. "Chemical, Physical and Biological Testing of Sediments from the Humboldt Harbor Federal Channel, Eureka, California: Addendum Report: Bioaccumulation Tissue Chemistry" does not include dioxin or furan data, only data on copper. There was no request for staff to analyze copper data.

3.2 Jess Brown, Geomatrix

Comment: The data quality limitations of the 2002 tissue data from "Cooperative Eureka Waterfront Facilities Maintenance Dredging Project, Eureka Channel, Humboldt Bay, California, Sampling Results Report for Dioxins/Furans, PCP and PCB Testing, December 2005" were not considered by the State Water Board staff during the 2006 303(d) List process.

Response: State Water Board staff analyzed the tissue data in accordance with the data quality and data quantity requirements found in Sections 6.1.4 and 6.1.5 of the Listing Policy during the 2006 303(d) List process.

3.3 Jess Brown, Geomatrix

Comment: Additional data on file at the Regional Water Board office in Santa Rosa that was not reviewed by State Water Board staff as part of the 2006 listing evaluation include effluent and receiving water priority pollutant analysis results that permitted dischargers have performed pursuant to their National Pollutant Discharge Elimination System (NPDES) permit requirements. These priority

pollutant results include dioxin data that should be evaluated in development of the 2008 Integrated Report and in the listing/de-listing analysis.

Response: North Coast Regional Water Board staff reviewed and analyzed readily available data and information for dioxins in Humboldt Bay. This included selected data possessed by the Regional Water Board, such as the "Preliminary Report on Mussel Collections and Analyses for Dioxins and Furans along the North Coast from the Mouth of San Francisco Bay to Crescent City," dated September 25, 1989. This was done in accordance with Section 6.1.1 of the 303(d) Listing Policy. If the Humboldt Bay Harbor District and Geomatrix are familiar with additional data and information they would like analyzed, please submit them for consideration during the 2010 Integrated Report update process.

3.4 Jess Brown, Geomatrix

Comment: A selected subset of available data was reviewed by State Water Board staff for the 2006 listing. All of the available and pertinent Humboldt Bay dioxin data from all media, shellfish tissue, fin fish tissue, sediment, water column, should be reviewed in the 2008 process.

Response: North Coast Regional Water Board staff reviewed and analyzed readily available data and information for dioxins in Humboldt Bay. Tissue data and sediment were input into lines of evidence for the 2008 Integrated Report.

3.5 Jess Brown, Geomatrix

Comment: The 2006 evaluation guideline used for the listing assumed an inappropriate consumption rate for shellfish. The 2008 evaluation guideline should be based on appropriate, species-specific consumption rates such as those published by the United States Environmental Protection Agency.

Response: North Coast Regional Water Board staff determined that it is appropriate to use the screening value of 0.3 ng/kg in Humboldt Bay that was developed by the California Office of Environmental Health Hazard Assessment (Brodberg and Pollock 1999). Staff also recognize that the OEHHA screening value is based on a low mean consumption value of fish at 21 g/day. In order to be protective of subsistence fishing in Humboldt Bay, the screening value should be recalculated. Staff intend for a more protective, subsistence-based screening value to be calculated during the TMDL development process.

3.6 Jess Brown, Geomatrix

Comment: Whole fin fish tissue data were compared to human health screening criteria in the 2006 listing process. Consistent with guidance from the California Office of

Environmental Health Hazard Assessment (OEHHA) and USEPA, fin fish filet data should be used in the 2008 process rather than whole fin fish data.

Response: Section 3.5 of the 303(d) Listing Policy allows the use of whole body residue measurements when evaluating the potential for bioaccumulation of pollutant concentrations in aquatic life tissue. The Listing Policy states that acceptable tissue concentrations may be based on composite samples measured either as muscle tissue or whole body residues. OEHHA requires data from fillets because of the consequence of fish advisories that may be issued. The Listing Policy's approach is precautionary and therefore triggers listings at potentially lower tissue concentrations. This approach is aimed at avoiding the loss of beneficial uses signaled by a fish consumption advisory.

3.7 Jess Brown, Geomatrix

Comment: Dioxin Toxicity Equivalency Factors for aquatics species were used incorrectly for comparison to human health screening values. The correct, mammalian TEFs should be used during the 2008 process.

Response: Mammalian toxicity equivalence factors were used for the 2008 Integrated Report.

4.1 Daniel Cheney, Pacific Shellfish Institute

Comment: The Pacific Shellfish Institute has compiled the enclosed report, titled: "Status Report and Synopsis of Organic Pollutants in Relation to Shellfish Safety in the Mad River Slough and Humboldt Bay, California." This report summarizes recent studies and supporting literature on dioxin levels in bivalve shellfish. We conclude that available literature indicates there is no risk of contamination from consuming shellfish grown in Humboldt Bay.

For the Mad River Slough and Humboldt Bay, a 2002 survey of dioxins and other chemicals in shellfish revealed levels the same as or marginally higher than those detected in the majority of studies at other locations. In 2003, the California Department of Health Services (DHS) sampling from Humboldt Bay indicated much lower levels, with dioxin concentrations in shellfish at or near the detection limits.

Response: In the report submitted by Pacific Shellfish Institute, several data sets were summarized. Each data set was addressed by the North Coast Regional Water Board as follows:

1. Data from the California Department of Health Services letter of March 3, 2006, were obtained and analyzed by North Coast Regional Water Board staff. Dioxin toxic equivalent values from sampled shellfish tissue were incorporated

into fact sheets for dioxin in Humboldt Bay. Dioxin toxic equivalent values from sampled sediments were not analyzed by staff nor incorporated into fact sheets. This is because the Department of Health Services did not state which toxic equivalent factors (mammal, fish, or bird) were used to calculate the dioxin toxic equivalent value. All of the data from the Department of Health Services letter were of poor data quality.

2. Data from the EnviroNet and ENVIRON report on "Evaluation of the Results of Dioxin and Other Chemical Testing of Commercial Oyster Beds in Humboldt Bay, California from June and October, 2002" were obtained and analyzed by staff. Dioxin toxic equivalent values from sampled shellfish tissue were incorporated into fact sheets for dioxin in Humboldt Bay. As stated in the fact sheets, 11 of 25 TCDD equivalent samples collected by EnviroNet and ENVIRON exceed the evaluation guideline.

3. Detailed data from a City of Eureka and the Humboldt Bay Harbor, Recreation and Conservation District report on dioxin levels in marine sediments from dredging area were not submitted and therefore not analyzed by staff. Without the details of the report, including the monitoring methodology and quality control information, the summarized results found in the report submitted by the Pacific Shellfish Institute are not comparable to the evaluation guideline. However, many dredging reports were submitted by the Humboldt Bay Harbor District and reviewed by staff.

The rest of the report submitted by Pacific Shellfish Institute, while informative, did not contain any additional data pertaining to the dioxin impairment of Humboldt Bay. Based on the information and data described in the fact sheets, staff recommends Humboldt Bay remain listed as a dioxin-impaired waterbody on the Section 303(d) List

4.2 Daniel Cheney, Pacific Shellfish Institute

Comment: Current studies of dioxin levels in bivalve shellfish indicate that in most regions, concentrations are well below levels considered by the USFDA and USEPA to be a human health risk. Furthermore, most long-term studies demonstrate a decline in dioxin levels, and for a large part, industries releasing these pollutants have come under more stringent regulation.

Response: Information pertaining to regions other than Humboldt Bay were not provided by Pacific Shellfish Institute and were not analyzed by the North Coast Regional Water Board.

4.3 Daniel Cheney, Pacific Shellfish Institute

Comment: While long-term data of dioxin levels in Humboldt Bay shellfish do not exist, trends in recent years demonstrate in the absence of continued inputs, dioxins are continuing to decrease to naturally occurring levels. Because of this, the Pacific Shellfish Institute believes that current shellfish production in Humboldt Bay - valued at over \$5.5 million in 2004, and accounting for nearly 64% of the entire state of California's \$8.6 million shellfish industry - should not be jeopardized by an inaccurate label of "impaired for dioxin".

Response: North Coast Regional Water Board staff are unable to determine trends from the limited timeframe in which data were collected. Samples collected in 2002 provide the only data that is useable to determine compliance with water quality objectives and impairment under Section 303(d).

5.1 Regina Chichizola, Klamath Riverkeeper

Comment: The following comments and attachments are supporting comments for the Karuk Tribes request for the listing of the toxic algae, *Microcystis aeruginosa* and associated toxin microcystin. For the last two years massive algae blooms of the blue green algae *M. aeruginosa* and the associated toxic potent toxin microcystin have plagued the Iron Gate and Copco reservoirs on the Klamath River. These blooms are in excess of 4000x what is considered safe for recreational contact and are violating as least four water quality standards including standards for toxicity, taste and odor, Biostimulatory Substances and suspended material.

Response: Following analysis of data submitted by Klamath Riverkeeper and other entities, North Coast Regional Water Board staff recommend the mainstem Klamath River from Copco Reservoir to the mouth (including Copco and Iron Gate reservoirs) be added to or remain on the 303(d) List as impaired waterbodies for microcystin toxins.

5.2 Regina Chichizola, Klamath Riverkeeper

Comment: The comment letter includes several pages of summarized data on *Microcystis aeruginosa* cells and microcystin toxins collected in Copco Reservoir, Iron Gate Reservoir, and the mainstem Klamath River from 2001 to 2006.

Response: Many of the documents cited in the comment letter were analyzed by the U.S. EPA during their reconsideration of the 2006 303(d) List microcystin toxin listings for the Klamath River. For more information on US EPA's analysis, see "Staff Report Reconsideration of California's 2006 Section 303(d) List Omission of Microcystin Toxin Listings for three Klamath River Segments and Determination to Add Microcystin Toxins Listing for Klamath River Hydrologic Unit (HU), Middle HA Hydrologic Area (HA), Oregon to Iron Gate" by the US

EPA, Region IX, which was attached to a March 13, 2008 letter from Alexis Strauss, EPA, to Dorothy Rice, State Water Board. Because the data were previously considered and are part of the Integrated Report record, North Coast Regional Water Board staff did not re-analyze the data already analyzed by the US EPA.

In addition, Regional Water Board staff analyzed Microcystin aeruginosa cells and microcystin toxin data collected in 2007 and 2008 from several sources. These data were analyzed in order to base the 303(d) List recommendation on the most current and pertinent data available. The fact sheets for microcystin toxins in the Klamath River have been updated to include these data.

5.3 Regina Chichizola, Klamath Riverkeeper

Comment: PacifiCorp also is discharging levels of temperature, dissolved oxygen and pH that are harmful to the beneficial uses of the Klamath River. The Regional Board already has identified the Klamath River as impaired by temperature and low dissolved oxygen (as well as nutrients). The Regional Board should address these pollutants, as well as any other pollutants identified through the permitting process, by issuing appropriate WDRs fully implementing the Klamath River's water quality standards.

Response: North Coast Regional Water Board staff recommend that the Klamath River remain listed for nutrients, temperature, and dissolved oxygen. The TMDLs for these pollutants are currently being developed. The TMDLs will include implementation actions to address these pollutants.

6.1 Regina Chichizola, Klamath Riverkeeper

Comment: The following comments detail that many of the tributaries of the Klamath are sediment impaired and a sediment listing for the mid-Klamath is warranted. Beaver Creek, Horse Creek, Elk Creek, and Indian Creek in the mid-Klamath have long documented sediment problems. There are no bigger issues for the tributary creeks, and some of the river of the mid-Klamath than sediment.

Response: Based on data and information submitted by Klamath Riverkeeper and other sources, North Coast Regional Water Board staff propose to list the above watersheds as sediment impaired. The justification for these recommendations is found in the fact sheets.

Please note that many of the comments are arguments and quotes from several watershed analyses, timber sale documents, and other sources that staff were unable to use in analyzing possible sediment impairment. These comments lacked data or information that can be analyzed under the provisions of the Section 303(d) Listing Policy.

6.2 Regina Chichizola, Klamath Riverkeeper

Comment: The Klamath River from Cottonwood Creek to the mouth should be listed for sediment, as this area shows very similar road and timber harvest related issues to the Scott River, have the same levels of road density and are underlain with the same decomposed granite soils and are also riddled with slides. Cottonwood, Beaver, Horse Creek, Bluff Creek and Elk Creek are of special concern to us as some of these creeks have as many as five road miles for square miles of forest. Many of these roads are located on Decomposed Granite or schist soil types that are highly erosive. Furthermore many of these creeks are of checkerboard ownership and therefore are not given time for recovery between harvest.

Klamath National Forest quotes: Westside 11 Project EA: "Roads contribute the highest per acre sedimentation rate of all watershed disturbances, averaging 58 times background from landsliding and 290 times background from surface erosions." p2.

Per the Beaver Creek Timber Sale Administrative record, Plaintiffs' Memo In Support Of Motion For Summary Judgment: Fish habitat conditions in the Beaver Creek 5th-field watershed are "not properly functioning" for substrate, pool frequency, pool quality, and large woody debris. AR 443. Hydrology and watershed conditions are "not properly functioning" for peak/base flow, drainage network and road density.

Response: North Coast Regional Water Board staff are not able to base a decision to list or de-list a waterbody on the above statements without supporting data. Staff did analyze available road density data for the Beaver Creek Watershed. The Westside 11 Project Environmental Assessment was not provided.

6.3 Regina Chichizola, Klamath Riverkeeper

Comment: "Bumble Bee and Hungry Creek subwatershed appear below threshold only when the ERA model is applied. When the USLE and mass wasting models were applied these sub watersheds appear over threshold do to the high erodibility of soils" Beaver Creek ID Team Meeting Notes 1/25/00

Beaver Creek Road density is over 4 to 5 miles of road per mile of forest in Beaver Creek.

Hungry and Bumblebee/Deer subwatersheds have high rates of predicted sediment delivery (488% of the assumed "background" levels for Hungry and 282% for Bumblebee). The Forest Service states that values about 200% indicate at-risk conditions. These two subwatersheds also have elevated erosion rates, exceeding background eleven-fold in Hungry Creek and nearly thirteen-fold in Bumblebee. See AR 1058. The forest considers models above 800% are indicative of at-risk conditions. AR 993.

Response: Several data sets from the Beaver Creek Watershed Analysis (USFS 1996) were analyzed and incorporated into fact sheets for sediment in the Klamath River. These include landslide volumes (from models), Equivalent Roaded Area / Threshold of Concern (ERA/TOC) ratios (from models), road density, percent fines, and embeddedness.

6.4 Regina Chichizola, Klamath Riverkeeper

Comment: Please see page 3-6 the Tables 3-6 of the Horse Creek Environmental Analysis. Universal Soil Loss Equation (USLE) Index Sources and Table 3-7 Mass Wasting Index Sources from the Attached Current Conditions Section of the Horse Creek WA. These tables show that roads sediment are up to 1304.39 or 619% background for soil loss. 200% is consider an issue by the Klamath. These charts also show creeks at 200% background for mass wasting.

The overall average density for the analysis area is 4.2 mi/mi, with 53% of the area having over 4mi/mi. Page 3-26 Horse Creek WA. Please also see table 5-6 Universal Soil Loss Equation Index scores, which shows scores of 1051% Background.

Response: Several data sets from the Horse Creek Watershed Analysis (USFS 2002) were analyzed and incorporated into fact sheets for sediment in the Klamath River. These include landslide volumes (from models), Equivalent Roaded Area / Threshold of Concern (ERA/TOC) ratios (from models), and surface erosion volume from USLE models. Data for road densities were not comparable to the evaluation guideline and were not incorporated into fact sheets.

6.5 Regina Chichizola, Klamath Riverkeeper

Comment: The primary management related component of episodic sediment originates from road associated landslides, road-associated fill and cut failures, and road/stream crossing failures. According to "The Flood of 1997: Klamath National Forest" (de la Fuede et al. 1998), 83% of flood damage sites resulting from the January, 1997 floods where the result of these three sources of episodic sediment.

Response: North Coast Regional Water Board staff analyzed the above cited document and input the report's conclusions into fact sheets for sediment in the Klamath River.

7.1 Patricia Clary, Californians for Alternatives to Toxics

Comment: Humboldt Bay is impaired with dioxin and 2,3,7,8-TCDD Equivalent. The information presented is sufficient to support a 303(d) listing of Humboldt Bay for dioxin impairment due to the overwhelming evidence that reservoir sources of

dioxin are contributing CDDs and CDFs to Humboldt Bay. That empirical data supports this information is proof enough that this listing should be extended until these sources are removed and discharges are negligible.

Response: The information presented primarily describes the sources of dioxin to Humboldt Bay. None of this information supports de-listing of Humboldt Bay for dioxin toxic equivalents.

7.2 Patricia Clary, Californians for Alternatives to Toxics

Comment: Humboldt Bay is already listed as impaired for PCBs. The toxic equivalency of a dioxin or dioxin-like compound relative to 2,3,7,8-TCDD (TEQ) for PCB are not part of the data sets currently under consideration, i.e. PCB was previously found in tissue of organisms that live in Humboldt Bay and, in separate measurements that did not include PCBs, dioxins have been found in the tissue of organisms that live in Humboldt Bay. As yet, no one has conducted tests that take into consideration the presence of both PCB and dioxin in tissue samples or analyzed the symbiosis or magnification that would result. This factor adds further emphasis to the need to keep the Bay listed as impaired for dioxin, since the health effects, to both humans and wildlife, caused by dioxin itself is exacerbated by the same effects caused by the dioxin-like PCBs.

Response: Comment noted.

7.3: Patricia Clary, Californians for Alternatives to Toxics

Comment: It is time to get on with identifying sources of dioxin and ways to eliminate or vastly reduce those sources. The Regional Water Board could, and should now undertake a serious investigation of former sawmill sites based on several indicators of historic pentachlorophenol use.

Response: Comment noted. The investigation and cleanup of dioxin-contaminated sites is underway, and it is outside of the scope of the Integrated Report.

8.1 Susan Corum, Karuk Tribe Department of Natural Resources

Comment: Since the last 303(d) Listing update, new water quality impairments have been identified in the Klamath, are harming beneficial uses, and need to be added to the 303(d) List. These impairments are the toxigenic cyanobacteria *Microcystis aeruginosa* and its associated toxin microcystin. Copco and Iron Gate Reservoirs and the Klamath River from Iron Gate to the mouth need to be listed for both *Microcystis aeruginosa* and microcystin.

Beneficial uses impaired due to the toxic algae include (but are not limited to): Native American cultural use, water contact recreation, non-contact water recreation, commercial and sport fishing, subsistence fishing, and wildlife habitat. The NCRWQCB's Basin Plan is clearly being violated for standards including: Toxicity, Color, Floating Material, Suspended Material, Biostimulatory Substances, and Tastes and Odors.

Response: Following analysis of data submitted by Karuk Tribe and other entities, North Coast Regional Water Board staff recommend the mainstem Klamath River from Copco Reservoir to the mouth (including Copco and Iron Gate reservoirs) be added to or remain on the 303(d) List as impaired waterbodies for microcystin toxins.

8.2 Susan Corum, Karuk Tribe Department of Natural Resources

Comment: MSAE and microcystin were first identified in Copco in 2004 from a sample taken by the Klamath Basin Tribal Water Quality Workgroup (Kann 2005). The sample taken in September from a cove in Copco had 1.9 million cells/ml MSAE and 482 pg/L microcystin. Subsequent sampling in 2005 and 2006 by the Karuk Tribal Water Quality Program in Copco and Iron Gate and the Klamath River showed that toxic blooms of MSAE dominated the reservoirs during the hot summer months and into the fall (Kann 2006b, Kann and Corum 2006). Duration of the blooms was similar in both 2005 and 2006, starting in July and tapering off by early November. In 2005 levels of MSAE and microcystin peaked in September with a sample by a boat ramp in Copco that had 163 million cells/ml MSAE and 1995 pg/L microcystin (Kann and Corum 2006). In 2006 maximum levels of toxic algae were higher and the bloom started off stronger in July than the previous year yielding a sample with 393 million cells/ml by a Copco boat ramp. The bloom was still strong in August and September, including a microcystin concentration of 12,176 pg/L from Copco (Kann 2006b). MSAE is occasionally found in the lakes, reservoirs, and river in the upper basin (Kann 2006a), yet at much lower frequency and at lower levels than those in Copco and Iron Gate. It should also be noted that after 2 years of sampling by the Karuk Tribe, MSAE was never detected directly above Copco and microcystin was only detected in very low amounts (Kann 2006b, Kann and Corum 2006). However, MSAE and microcystin were found in the Klamath River below Iron Gate at levels lower than the reservoirs, but following the same seasonal trajectory. MSAE is visibly pulled into the intake at Iron Gate and discharged into the Klamath River below (Photo 1).

Response: Three of the four documents cited in the comment were analyzed by the U.S. EPA during their reconsideration of the 2006 303(d) List microcystin toxin listings for the Klamath River. The three documents are the Kann 2006a, Kann 2006b, and Kann and Corum 2006 documents cited above. For more information on US EPA's analysis, see "Staff Report Reconsideration of California's 2006 Section 303(d) List Omission of Microcystin Toxin Listings for three Klamath River

Segments and Determination to Add Microcystin Toxins Listing for Klamath River Hydrologic Unit (HU), Middle HA Hydrologic Area (HA), Oregon to Iron Gate" by the US EPA, Region IX, which was attached to a March 13, 2008 letter from Alexis Strauss, EPA, to Dorothy Rice, State Water Board. Because the data were previously considered and are part of the Integrated Report record, North Coast Regional Water Board staff did not re-analyze the data from the technical memoranda.

The fourth document, which is cited in the comment as Kann 2005, includes data collected in 2004 and 2005. These data were not analyzed by North Coast Regional Water Board staff. In order to base the 303(d) List recommendation on the most current and pertinent data available, North Coast Regional Water Board staff instead analyzed data collected in 2008 and summarized in the "Karuk Tribe 2008 Blue Green Algae Data (KR TOX Table 2008)" document. The fact sheets for microcystin toxins in the Klamath River have been updated to include these data.

9.1 Andrea Davis, Wiyot Tribe

Comment: Enclosed please find copies of all Wiyot Tribe water quality data and meta data for our sampling locations in Humboldt Bay. The Wiyot Tribe hopes the State will be able to use this information to result in real improvements in the health of Humboldt Bay.

Response: North Coast Regional Water Board staff have analyzed the submitted data and included much of the data in the fact sheets for Humboldt Bay and the Eel River.

10.1 Michele Dias, California Forestry Association

Comment: I would like to alert you to a science literature review currently underway that will provide you with critical information for purposes of your assessment and ask you to hold a place for the final report upon its completion later this year.

The State Board of Forestry and Fire Protection (Board) has taken on the task of contracting for an independent scientific literature review of the "Protection and Restoration in Watersheds with Threatened or Impaired Values" or T/I Rules to ensure their regulatory effectiveness. This will include a review of recent information related to forest management effects on anadromy.

While I understand the necessity to cut off the submission of information and data from the public in order to stay on schedule to complete your 2008 Integrated Report, I urge you to allow a late submission of this important work as it could be critical to your decision making process for the many water bodies in the North Coast Region listed as either temperature or sediment impaired.

Response: North Coast Regional Water Board staff were unable to review the report as it was not provided nor available during the assessment period.

11.3 Clark Fenton, Salmon Forever

Comment: I am submitting turbidity and suspended sediment data to be entered into the record of Freshwater Creek and Elk River. Enclosed are the results of HY 2005 and HY 2006 water quality monitoring in these watersheds. Elk River contributed over 35 million tons in HY 2005 and over 90 million tons in HY 2006 of suspended sediment into Humboldt Bay. Freshwater Creek contributed over 9 million tons in HY 2005 and 19 million tons in HY 2006 of suspended sediment into Humboldt Bay.

Response: The submitted turbidity and suspended sediment data will be used in the sediment total maximum daily loads (TMDL) for both Elk River and Freshwater Creek, which are currently being developed by North Coast Regional Water Board staff. The data will be an integral part of the TMDL analysis and are currently in the TMDL record.

12.1 Ken Fetcho, Yurok Tribe Environmental Program

Comment: The Yurok Tribe Environmental Program would like to provide the North Coast Regional Water Board information on the Klamath River that indicate that this waterbody should be placed on the 303(d) List for violation of the North Coast Basin Plan's biostimulatory substances and toxicity water quality objectives. The information provided in the reports listed below should be adequate to list not only the hydrologic unit that encompasses the reservoirs but all of the hydrologic units that encompass the entire Klamath River downstream of Iron Gate Dam.

- Klamath River BGA Bloom Report, March 2006.
- Technical Memorandum, Microcystis aeruginosa occurrence in the Klamath River systems of Southern Oregon and Northern California, February 2006.
- Technical Memorandum: Longitudinal Analysis of Klamath River Phytoplankton Data 2001 2004, September 2006.

Response: Following analysis of data submitted by Yurok Tribe and other entities, North Coast Regional Water Board staff recommend the mainstem Klamath River from Copco Reservoir to the mouth (including Copco and Iron Gate reservoirs) be added to or remain on the 303(d) List as impaired waterbodies for microcystin toxins.

The "Klamath River Blue Green Algae Bloom Report" (Fetcho 2006) included data from water year 2005. In order to base the 303(d) List recommendation on the most current and pertinent data available, North Coast Regional Water Board staff analyzed data from the "2007 Klamath River Blue Green Algae Summary

Report" (Fetcho 2008) and the September 16, 2008 memorandum from Ken Fetcho to the Klamath River BGA Work Group with September 3, 2008 Phytoplankton Results. The fact sheets for the microcystin toxins in the Klamath River have been updated to include these data. Data from 2005 were not analyzed.

The two technical memoranda were analyzed by the U.S. EPA during their reconsideration of the 2006 303(d) List microcystin toxin listings for the Klamath River. For more information on this analysis, see "Staff Report Reconsideration of California's 2006 Section 303(d) List Omission of Microcystin Toxin Listings for three Klamath River Segments and Determination to Add Microcystin Toxins Listing for Klamath River Hydrologic Unit (HU), Middle HA Hydrologic Area (HA), Oregon to Iron Gate" by the US EPA, Region IX, which was attached to a March 13, 2008 letter from Alexis Strauss, EPA, to Dorothy Rice, State Water Board. Because the data were previously considered and are part of the Integrated Report record, North Coast Regional Water Board staff did not re-analyze the data from the technical memoranda.

13.1 Stephen Fuller-Rowell, Sonoma County Water Coalition

Comment: The excess of biostimulatory substances, N and P, along with high levels of sediment, are creating the conditions for secondary water quality impairment by supporting the colonization of the Laguna de Santa Rosa by the invasive and nuisance plant species - Ludwigia.

There is significant information in the record, from past monitoring and evidence presented by the Laguna Foundation, to indicate that nuisance aquatic growth of Ludwigia is a serious problem in the Laguna de Santa Rosa -with public health implications for the surrounding neighborhoods.

There is evidence that the colonization of the Laguna de Santa Rosa by Ludwigia has spread over the years and presents a mosquito control issue. As indicated, the Regional Board has in the record, from previous listing cycles, significant evidence supporting the ongoing existence of the Ludwigia infestation and related nuisance effects where water quality objectives can not be met and beneficial uses can not be protected. In addition there is the ongoing public health risk presented by this invasive plant as a mosquito and disease vector.

We believe there is sufficient information in the file, prior to February 28, 2007, in the form of monitoring data, data points, history, photos, etc., to support this listing under State Listing Policy - numeric and narrative criteria.

Response: In 2004, the Sonoma County Ludwigia Task Force hosted by the Laguna Foundation stated that the most desirable solution for Ludwigia control is to restore the natural processes that reduce Ludwigia growth in the Laguna system. The worst infestations are associated with thick sediments in shallow, slow-

moving, nutrient-rich waters in full sun. The Task Force recommended an effort for long-term control strategies that included improved water quality to reduce nutrient loads and sedimentation.

North Coast Regional Water Board staff agree with the Task Force's recommendation and have determined that the presence of *Ludwigia* in the Laguna de Santa Rosa is a symptom of the sediment, nutrients, temperature, and dissolved oxygen impairments. The Regional Water Board is currently developing total maximum daily loads (TMDL) that will address these impairments in the Laguna and its tributaries. The TMDL Implementation Plan will result in reductions in loads for nutrients and sediment that provide habitat which favors natural aquatic communities in place of *Ludwigia*. As such, the TMDL process will address the pollutant loads that result in providing habitat for the *Ludwigia* to thrive.

14.1 Larry Hanson

Comment: I am submitting water testing data from the Community Clean Water Institute's web link. I am submitting data from the Russian River Interactive System's web link.

Response: Data collected by the Community Clean Water Institute has been analyzed and incorporated into several fact sheets for the Russian River and Salmon Creek. While there is abundant information found on the Russian River Interactive System's website, it is not clear what information or report is associated with the 303(d) and 305(b) Water Quality Assessment. It is also not clear which document contains data that is useable in the Assessment. This precludes an assessment by North Coast Regional Water Board staff of the web site.

15.1 Stephen Horner, Barnum Timber Company

Comment: The considerable abundance of salmonids being produced in Redwood Creek does not suggest or support a designation of impairment from either sediment or temperature in Redwood Creek. Barnum believes, based upon the scientific information available, that Redwood Creek is not impaired by sediment, temperature or any other pollutant; that, in fact, Redwood Creek is today in as good a condition as has existed in the historical past and is a healthy and productive water body.

Response: Regional Water Board staff have determined that water temperatures and sediment conditions in Redwood Creek do not attain water quality objectives, and thusly, Redwood Creek is appropriately listed as temperature and sediment impaired. The presence of salmonids in Redwood Creek does not equal water quality standard attainment.

15.2 Stephen Horner, Barnum Timber Company

Comment: In order for Redwood Creek to be listed as impaired due to sediment, there still must be substantial evidence in the record that the suspended sediment load and suspended sediment discharge rate have been altered so as to cause a nuisance or so as to adversely affect beneficial uses. The evidence that was the administrative basis of the original listing and the subsequent re-listings of Redwood Creek was very limited and mostly anecdotal. The listing was based primarily on a report from the Humboldt Chapter of the American Fisheries Society and a letter from the U.S. Fish and Wildlife Service. Neither contained any scientific data regarding conditions in Redwood Creek.

Response: Based on available data and information, North Coast Regional Water Board staff concludes that the existing sediment load in the Redwood Creek watershed present a continued threat to beneficial uses, including the COLD, SPWN, MUN, REC-1, and REC-2 uses. A draft Sediment TMDL was developed by Regional Water Board staff, which was subsequently established as a final TMDL by US EPA in December 1998. The TMDL confirmed that Redwood Creek is impaired by sediment. Additionally, in 2001 staff found that there is a continued impairment or threat of impairment of Redwood Creek by sediment, following a review of the information submitted by Barnum Timber Company and others in 2001. Please see the "North Coast Regional Water Quality Control Board 303(d) List Update Recommendations" dated November 16, 2001, for more details on the 2001 staff review and conclusions.

15.3 Stephen Horner, Barnum Timber Company

Comment: The Board's case for its temperature listing of Redwood Creek is flawed. The entire evidence supporting the Board's 2002 Maximum Weekly Average Temperature (MWAT) of 14.8 degrees Celsius is a single study of temperatures of rivers in Washington, Oregon, and Idaho - none in California - all scores or hundreds of miles north of Redwood Creek. No evidence exists to suggest that the MWAT is even achievable, much less sustainable, in Redwood Creek.

Response: The methodology used to determine temperature impairment for the 2006 303(d) List was appropriately applied to Redwood Creek. For the 2008 Integrated Report, North Coast Regional Water Board staff have reviewed the data submitted by Barnum (Sparkman 2005), and have determined that Redwood Creek remains impaired by temperature.

15.4 Stephen Horner, Barnum Timber Company

Comment: Barnum previously submitted voluminous information to the Regional Water Board for the 2002 303(d) List cycle and the 2006 303(d) List cycle. The entire Barnum record supporting delisting of Redwood Creek already submitted to the

State and Regional Water Boards is included in the 2008 Integrated Report by referencing it herein. New information not previously submitted includes the 2005 Annual Report Upper Redwood Creek Juvenile Salmonid (Smolt) Downstream Migration Study (Sparkman 2005).

Response: The information submitted for the 2002 and 2006 303(d) List cycles was considered at that time. Regional Water Board staff have reviewed Sparkman's data, and have determined that Redwood Creek remains impaired by temperature. Sparkman did not include any sediment data.

16.1 William P. Krum, Siskiyou Resource Conservation District

Comment: The Siskiyou Resource Conservation District is supporting the delisting of Wooley Creek in the Salmon River watershed as a water quality limited segment that is impaired for temperature. There are no human-induced or controllable sources affecting stream temperature since the pristine Wooley Creek watershed is 96.7% within a federal Wilderness Area. Anthropogenic impacts to temperature do not exist. The Clean Water Act in section 303(d) specifically refers to "effluent," "pollutants," and "thermal discharges," none of which exist to impair temperature in Wooley Creek's 95,150-acre watershed. Secondly, the beneficial uses of Wooley Creek's waters are fully protected under current management.

Response: Regional Water Board staff have determined that the temperature objective is being attained in Wooley Creek as natural receiving water temperatures are not altered by human activities. Staff will recommend Wooley Creek be de-listed. Staff analyzed data and information that was submitted by the Klamath National Forest in 2001 and more recent temperature data submitted in July 2008 at the request of Regional Water Board staff. Fact sheets for the Salmon River were updated to include these data.

17.1 David Leland, North Coast Regional Water Quality Control Board

Comment: Submitted an article from the Santa Rosa Press Democrat, Saturday, August 4, 2001, Section B, page 1, entitled "Creek pollution unsolved. SR pursues source of high coliform count." Suggested this be included as part of the 2008 Integrated Report Update.

Response: The City of Santa Rosa's bacteria data for Santa Rosa Creek that is discussed in the Press Democrat article is included in lines of evidence as part of the 2008 Integrated Report Update.

18.1 Pamela Miller

Comment: The California State Mussel Watch Marine Water Quality Monitoring Program has been monitoring sites within Humboldt Bay since 1979. Six pollutants of concern have been identified by past monitoring efforts; Mercury, Cadmium, Chromium, Pentachlorophenol, Tetrachlorophenol and Alpha-HCH.

The Water Quality Monitoring Report No. 86-3WQ, prepared by Stephen P. Hayes, Ph.D. and Peter T. Phillips, identified high levels of Cadmium and Chromium and elevated levels of Pentachlorophenol and Tetrachlorophenol within Humboldt Bay. Sample results clearly show a source of Chromium exists within Humboldt Bay and the unidentified source started contributing high levels of Chromium to Humboldt Bay around January 1984. The Water Quality Monitoring Report No. 86-3WQ also recommended that the Regional Board continue to monitor for Alpha-HCH.

Response: There is insufficient information available to compare cadmium, chromium, pentachlorophenol, and Tetrachlorophenol data collected in 1984 through the California Mussel Watch Program to the toxicity water quality objective. This is due to the lack of appropriate and applicable numeric evaluation guidelines for instantaneous measurements of these parameters in fish/shellfish tissue, which is needed in order to interpret the narrative toxicity objective. North Coast Regional Water Board staff found numeric evaluation guidelines for these parameters that are either applicable to water (not tissue) samples, or were expressed as an average over a 1-hour, 24-hour, or 4-day time frame. In addition, staff have determined that it is not appropriate to use the Median International Standards for Trace Elements in Shellfish included in the Mussel Watch Program Report because it is unknown what these international standards are based on and what use they are protecting.

Staff were able to analyze mercury data and make comparison to a numeric evaluation guideline. Therefore, mercury data collected in 1984 from the Mussel Watch Program are incorporated into fact sheets for Humboldt Bay.

Staff did not analyze alpha-hexachlorocyclohexane data as the suggestion was to continue monitoring, and there is no evidence presented that levels exceed water quality objectives.

18.2 Pamela Miller

Comment: A Chemical Examination Report by North Coast Laboratories, LTD. 11-05-86, NCL 24054, of soot boiler spoils from an upland deposit on the Samoa Peninsula near the former LP Pulp Mill shows Barium at 370 mg per Kg, Chromium at 40 mg per Kg and Lead at 47 mg per Kg.

Response: North Coast Regional Water Board staff require additional information in order to analyze the data suggested by Ms. Miller. This data is lacking the minimum

quality assurance information required by Section 6.1.4 of the 303(d) Listing Policy. Additionally, the above data might not be relevant if the data is only from upland sites.

19.1 Miyoko Sakashita, Center for Biological Diversity

Comment: The Center for Biological Diversity respectfully requests that the North Coast Water Quality Control Board recommend that all ocean waters under Region 1s jurisdiction be included in the state List of Impaired Waters, 303(d) List, under Section 303(d) of the Clean Water Act as impaired for pH due to absorption of anthropogenic carbon dioxide pollution. Similar requests are concurrently being filed with each Regional Water Quality Control Board with jurisdiction over ocean waters of California. We seek to have all California ocean segments added to the Clean Water Act 303(d) List as these waters are impaired for pH due to ocean acidification occurring as a result of past, ongoing, and projected absorption of anthropogenic carbon dioxide pollution.

The beneficial uses of California's oceans are threatened by acidification. California's ocean waters are experiencing a trend of declining water quality for pH. Ocean acidification is causing degradation of marine communities.

Response: Staff of the State Water Resources Control Board reviewed the Center For Biological Diversity's request and the scientific papers they provided. In response, Shakoora Azimi-Gaylon of the State Water Board sent a letter to Emily Jeffers of the Center for Biological Diversity dated September 10, 2008. The letter explains how staff conduct assessments and summarizes the data that was reviewed by staff. As stated in the letter, Section 6.1.4 of the Listing Policy requires consideration of only the data and information that meet the minimum quality assurance requirements. The variable pH data submitted by the Center for Biological Diversity do not meet the data quality requirements described in the Listing Policy and the research results cannot be used for 303(d) listing.

20.1 John Sanders, Department of Pesticide Regulation

Comment: The Department of Pesticide Regulation (DPR) is providing data and information for use in assessing impaired surface waters of California. DPR maintains a Surface Water Database that contains data for various environmental monitoring studies dating back to 1991 regarding pesticides in California waterways.

Response: North Coast Regional Water Board staff identified the data and information from DPR's database that pertains to the North Coast Region and included that data in the Integrated Report fact sheets. The majority of the data was collected by the Surface Water Ambient Monitoring Program (SWAMP) and was already incorporated into fact sheets. The only non-SWAMP data set available from DPR's database (Ganapathy 2007) was also incorporated into fact sheets.

21.1 Sarah Shaeffer, Community Clean Water Institute

Comment: Enclosed are three years of water quality data collected through Community Clean Water Institute's Volunteer Water Quality Monitoring Program in response to the State Water Resources Control Boards Public Solicitation of Water Quality Data and Information for the 2008 Integrated Report. This submittal is intended to assist the North Coast Water Quality Board in determining where TMDL initiation is appropriate within the Russian River and Salmon Creek watersheds. We expect it will compliment other information gathered to make a comprehensive assessment.

Response: The data submitted by the Community Clean Water Institute has been analyzed and incorporated into fact sheets for appropriate waterbody pollutant pairs.

22.1 Michelle Smith, Humboldt Baykeeper

Comment: We believe that it is important to note that the water quality objective under which Humboldt Bay has been listed as impaired for dioxins is not only designed to be protective of human health but is also supposed to be protective of plant, animal, and aquatic life. Though the potential impacts to organisms other than humans can be difficult to quantify, they must also be considered with regards to the quality of Humboldt Bay waters, and the potential impacts of dioxin contamination. In furtherance of a complete analysis, we have compiled and attached summaries of a number of articles that discuss these potential impacts as Exhibit A.

Response: In analyzing dioxins for sediments in Humboldt Bay, staff did compare data to an evaluation guideline that is protective of marine aquatic life. In analyzing dioxins from fish and shellfish tissue in Humboldt Bay, North Coast Regional Water Board staff compared data to an evaluation guideline that is protective of human consumption of fish and shellfish at a subsistence level. This level of protection is necessary to protect the Native American Culture beneficial use, which is more sensitive (due to higher consumption levels) than the population captured by the Commercial and Sport Fishing beneficial use. Staff conclude that this level of protection is also protective of aquatic life in Humboldt Bay until we have other information about the sensitivity of aquatic life to dioxins via tissue.

22.2 Michelle Smith, Humboldt Baykeeper

Comment: Since the submittal of our original comments, additional data is available that should be included in the assessment of water quality on Humboldt Bay. These data include sediment and biota sampling conducted by the North Coast Regional Water Board in 1989 and 1990, and sediment data collected by Humboldt Baykeeper in April of 2006. We believe these data further support the inclusion of Humboldt Bay on the CWA 303(d) List as impaired for dioxins.

Response: Data from the North Coast Regional Water Board's 1989 sampling effort and the sediment data collected by Humboldt Baykeeper's consultant Soil/Water/Air Protection Enterprise have been analyzed by staff and included in the fact sheets for dioxins in Humboldt Bay.

22.3 Michelle Smith, Humboldt Baykeeper

Comment: In regards to the letter from Michael Hernandez of the California Department of Health Services to Mary Middleton of Pacific Shellfish Institute date March 3, 2006: Unfortunately, there is no sampling report, chain of custody documents, field notes, analytical laboratory reports, or quality assurance and control documents associated with these data. Therefore, it is impossible to determine sample size, collection techniques, storage and handling information, sampling methodology, reporting limits, specific congeners sampled, TEQ calculations and a host of additional information needed to assess the data. Therefore, we do not believe this data meets the data quality requirements of Section 6.1.4 of the Listing Policy.

Response: North Coast Regional Water Board staff analyzed the data from the California Department of Health Services and included the data in the fact sheets for dioxin in Humboldt Bay. Staff concur that the data quality is poor as it is lacking information on sampling and analysis methods and quality assurance and control documents. As stated in Section 6.1.4 of the Listing Policy, "Data without rigorous quality control can be used in combination with high quality data and information . . . If the data collection and analysis is not supported by a QAPP (or equivalent) . . . then the data and information should not be used by itself to support listing or delisting of a water segment." Staff intend to use the data in full acknowledgement of its limitations.

22.4 Michelle Smith, Humboldt Baykeeper

Comment: Although we believe the California Office of Environmental Health and Hazard Assessment (OEHHA) screening values may be properly relied on, for the following reasons we believe the US EPA guidelines set out in its policy document entitled "Guidance for Assessing Chemical Contaminant Data for Use in Fish Advisories," (EPA 823-B-00-007, November 2000) is more appropriate for screening dioxin risks to humans. The Humboldt Bay area has a sizeable population of Asians, Native Americans, and low income families. A San Francisco Study indicates that these populations may be at greatest risk for toxic exposures caused by ingestion of locally-caught fish and shellfish. We believe the US EPA recommended screening value for dioxin exposures to subsistence fishers (0.03 parts-per-trillion) is the most protective and appropriate screening value.

Response: North Coast Regional Water Board staff determined that it is appropriate to use the screening value of 0.3 ng/kg in Humboldt Bay that was developed by the California Office of Environmental Health Hazard Assessment (Brodberg and Pollock 1999). Staff also recognize that the OEHHA screening value is based on a low mean consumption value of fish at 21 g/day. In order to be protective of subsistence fishing in Humboldt Bay, the screening value should be recalculated. Staff intend for a more protective, subsistence-based screening value to be calculated during the TMDL development process.

22.5 Michelle Smith, Humboldt Baykeeper

Comment: It is critical that any dioxin sampling of fish used to evaluate the risks from Humboldt Bay seafood consumption be conducted with skin-on or whole-fish samples.

Response: North Coast Regional Water Board staff accepted tissue data measured either as muscle tissue or whole body residues in accordance with Section 3.5 of the Listing Policy.

23.1 John R. (Jack) West, USDA - Forest Service - Klamath National Forest

Comment: In their letter of August 16, 2001, from Margaret Boland of the Klamath National Forest to Matt St. John of the Regional Water Board, the Klamath National Forest provided information, data, and narrative rationale supporting the modification of the 303(d) List in 2002 to remove Clear Creek, Grider Creek, North Fork Salmon River, Thompson Creek, Upper South Fork Salmon River, and Wooley Creek from the impaired waters list. Mr. West assumes that these requests would be reviewed again without re-submittal of those documents and data.

Per the August 16, 2001 Letter: The watersheds meet the two following criteria: they meet the definition of Category 1 Analysis Watersheds and 70% or greater of their analysis watersheds are contained in land allocations which are "management-constrained," or relatively pristine. These land allocations are Congressionally designated (i.e., Wilderness), Late-Successional Reserve, or Riparian Reserve.

Response: In regards to the temperature listing, North Coast Regional Water Board staff have determined that the Wooley Creek Watershed should be de-listed because natural receiving water temperatures have not been altered by human activities. Staff have determined that the other five waterbodies remain temperature impaired and should not be de-listed. Staff analyzed data and information that was submitted by the Klamath National Forest in 2001 and more recent temperature data submitted in July 2008 at the request of Regional Water Board staff. Fact sheets for these waterbodies were updated to include these data.

In regards to the nutrient listings for Clear Creek, Grider Creek, and Thompson Creek, there is not enough information provided in the Watershed Condition Assessments summarized in Attachment A to the August 16, 2001 Letter to support a decision to de-list per Section 4.2 of the Listing Policy. However, the fact sheets for these waterbodies have been updated to include the information from the Assessments.

In regards to the dissolved oxygen listings for Clear Creek, Grider Creek, and Thompson Creek, the information provided by the Klamath National Forest does not contain any numeric dissolved oxygen data for comparison to the water quality objective. There is not enough information provided to support a decision to de-list per Section 4.2 of the Listing Policy.